Grand Union Canal Transfer

Moving water together

# Scheme Development and Options Report

February 2026

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# 1. Executive Summary

## 1.1 Introduction

1.1.1 The Grand Union Canal Transfer (the Proposed Development) is a nationally significant water project that is being developed in partnership by Affinity Water (AfW), Severn Trent (ST) and the Canal & River Trust (the Trust).

1.1.2 The primary objective of the Proposed Development is to transfer up to 115 megalitres per day of water from ST's supply area in the Midlands to areas of forecast water deficit in AfW's supply area in the South East, thereby enhancing regional water resilience.

1.1.3 This report has been prepared to provide an overview of the work undertaken in respect of the identification and consideration of options for the various elements of the Proposed Development and the ongoing design development of the Proposed Development.

1.1.4 This report takes as its reference point the position set out in the Site and Route Evaluation Report of September 2024 (the September 2024 report) which was produced for and consulted upon during the Phase One Public Consultation in September and October 2024. This report sets out the position as at the end of 2025.

1.1.5 The previous work reported in the September 2024 report was largely undertaken to inform three separate but interrelated processes, namely:

(i) the RAPID Gated Process;
(ii) the production of Water Resources Management Plans and related Regional Plans, and
(iii) the development of the Proposed Development to be taken forward to a DCO application.

1.1.6 The main factors that have influenced the scope of work undertaken since the September 2024 report include:

(i) taking account of relevant responses during the Phase One Public Consultation which resulted in a review of aspects of the work previously undertaken;
(ii) taking account of the implications from the finalisation of AfW's WRMP24 and changes to policy contained within the updated National Policy Statement for Water Resources Infrastructure (NPSWRI, July 2025), and
(iii) recognition of the need for further scheme design development from the position presented at the Phase One Public Consultation.

## 1.2 Minworth Advanced Water Treatment Plant (AWTP)

1.2.1 The September 2024 report highlighted that the Curdworth Beds site – located within the envelope of the ST Minworth WwRC site – was the preferred site option for the AWTP, along with a part of the treatment process being located within the main WwRC site.

1.2.2 Following the Phase One Public Consultation, further survey, investigative and assessment work has been undertaken. This work has led to:

(i) the addition of a new treatment stage relating to nitrate removal being added into the AWT process;
(ii) the removal of the previously proposed wetlands area aspect of the process on the site, and
(iii) the identification of appropriate access arrangements to the AWTP works elements for both construction and operational purposes.

## 1.3 Minworth to Atherstone Transfer Pipeline

1.3.1 The September 2024 report identified the preferred transfer option being a new underground pipeline from the new AWTP at Minworth to the Coventry Canal at Atherstone. Work was undertaken to present, for the purposes of Phase One Public Consultation, an appropriate pipeline corridor.

1.3.2 Following the Phase One Public Consultation, ongoing design development and evolution work has been undertaken. In summary this has considered:

(i) Issues arising from other third-party developments proposed along and interacting with the pipeline corridor. These considerations have resulted in localised amendments being made to the alignment of the pipeline corridor.

(ii) The appropriate route of the pipeline corridor around the village of Hurley, the result being that a pipeline route corridor running to the south of the village is now the preferred option.

(iii) The appropriate location for the required Break Pressure Tank along the alignment of the pipeline route, the conclusion being that a location providing optimal hydraulic conditions, suitable overflow discharge conditions, where limited visual impacts are considered likely and with the ability to benefit from appropriate access has been identified.

(iv) A review of the potential for a pipeline corridor route and outfall location further to the south of Atherstone. The conclusion is that there is no viable route further to the south.

(v) A review of the potential outfall locations at Atherstone which concluded that the route through the Atherstone Golf Course is preferable.

## 1.4 The Canal Section

1.4.1 The work reported in the September 2024 report on the canal section of the Proposed Development related to the identification of the appropriate route and method to transfer the water.

1.4.2 Following Phase One Public Consultation, the scheme design and optioneering work that has been undertaken has largely consisted of identifying the appropriate works and infrastructure necessary along the canal network and further design development on those identified works and infrastructures. The works identified are a combination of new infrastructure and adaptations of existing infrastructure to enable the relevant sections of the canal to be used to transfer the appropriate amount of water, whilst retaining the canal network's navigation function. The proposed works and infrastructure consist of:

(i) *Canal Bank Raising and modifications* – Bank raising is required to maintain a minimum freeboard (the vertical distance from the top of the canal bank to the water

surface) required to prevent potential overtopping and prevent water loss. The work undertaken has looked to minimise the extent of bank raising required through the inclusion of new transfer locks at certain points along the canal network.

(ii) *Transfer Locks* – These are proposed new locks at points along specific sections of the canal network. Three transfer locks are proposed at:

(a) a location close to Nuneaton on the Atherstone to Hawkesbury section of the canal network;
(b) a location to the east of Coventry on the Hawkesbury to Hillmorton section of the canal, and
(c) a location to the east of Daventry on the section of the canal between Whilton Locks and Stoke Bruerne.

The work undertaken considers localised options in respect of the provision of these locks and the reasons for identifying the preferred solutions.

(iii) *Pumped and Gravity Lock Bypasses* – Bypasses are required around existing locks on the canal network as without such interventions the existing locks would otherwise restrict the flow of water being transferred. Pumped bypasses are required to allow the water to flow around the locks where it is going 'uphill' and gravity bypasses where it is going 'downhill'. The general location and nature of the bypasses required are, therefore, dictated by the location of existing lock infrastructure and the existing nature of the canal in that location in terms of water flow.

The work undertaken considers the bypasses that are considered to be required and explains the localised options considered in respect of these interventions and reasons for identifying the preferred solutions.

(iv) *Works to a bridge and aqueduct* – The conclusion of the work undertaken is that no works to any tunnels along the canal network are necessary to adequately accommodate the water being transferred.

Only one bridge has been identified as potentially requiring some form of intervention – Bridge 88 on the Grand Union Canal – to ensure sufficient space under the bridge remains for the appropriate passage of canal boats. The appropriate solution is a matter that is subject to ongoing consideration.

One aqueduct – the Iron Trunk Aqueduct located close to Milton Keynes - has been identified as potentially requiring minor work to accommodate the proposed water flows. The alternative to these minor works is the construction of a further new transfer lock.

(iv) *Proposed works to the existing Drayton and Daventry Reservoirs* – Different options have been considered as to how these existing reservoirs could support the transfer of water along the canal network and continue their function of supplying water for navigation. The preferred option is to use some of the flows within a nearby newly created lock bypass to keep the reservoirs 'topped up' and to undertake some improvement works to the inlet and discharge structures at the reservoirs.

(v) *Weir upgrades* – The canal network has a number of 'waste' weirs which enable excess water to flow out of the canal in times of excess flows. In addition, the canal network has a number of existing bypass inlet and discharge weirs at existing locks.

The work undertaken has identified that works to some of these existing assets will be required.

## 1.5 Abstraction, Storage and Treatment

1.5.1 The position set out in the September 2024 report was that three site options were considered to offer the greatest potential as sites for storage and / or treatment of abstracted water. Those options being:

- Site B (at Great Brickhill) as a site close to the canal for abstraction and able to provide for both the storage and treatment requirements.
- Site H (West of Slapton) as a site close to the canal for abstraction and able to provide for both the storage and treatment requirements.
- Site P (East of Leighton Buzzard) as a site for water treatment only with the storage element provided at Site H.

1.5.2 The work undertaken following the Phase One Public Consultation on these aspects of the Proposed Development can be summarised as follows:

(i) *A review was undertaken of the approach to the consideration of Green Belt land* –. . From this review it was possible to discount sites within the Green Belt for these elements of the Proposed Development, which included Site P.

(ii) *A review of the site search area* – this resulted in a revised site search area being identified.

(iii) *A review of the site selection process* – this resulted in certain changes being made to the selection criteria and methodology used to identify potential sites to then be taken forward to further assessment as set out in (iv) and (v).

(iv) *A review of the assessment undertaken of previously identified sites* – this led to the removal of Site P from further consideration in the process.

(v) *An assessment of additional site options identified* – An additional ten site options were identified and consisted of those options that had been identified by respondents to the Phase One Public Consultation and those which the project's engineering team identified from a further review. These sites were subject to the relevant assessment and appraisal process with the result being that a further site located close to the village of Slapton was identified as having potential.

(vi) *A further assessment of the identified sites with potential* – The three sites identified as having potential (Site B, Site H and the further site close to Slapton) were subject to a further detailed assessment. This assessment work - which considered engineering, operational, environmental, social, access, land planning and cost matters - concluded that Site B was the preferred site for the treatment and storage elements of the Proposed Development.

## 1.6 Chaul End Transfer Pipeline

1.6.1 In the September 2024 report several different pipeline corridor options were identified with preferred corridor options presented. This work undertaken and reported in the September 2024 report had to consider different options on the basis that a starting point for the pipeline

had not been determined because a preferred site for the abstraction, storage and treatment elements had not been identified.

1.6.2 Following the identification of Site B as the preferred site for the abstraction, storage and treatment elements of the Proposed Development, further work was undertaken to consider the most appropriate pipeline corridor from Site B to the identified connection point into AfW's water supply network. That connection point being an existing underground reservoir at Chaul End, near Luton.

# 2. Introduction

## 2.1 Overview

2.1.1 The Grand Union Canal Transfer ('the Proposed Development') is a proposed water transfer project between two water companies, Severn Trent (ST) and Affinity Water (AfW) and the Canal & River Trust charity ('the Trust') who are the owner and navigation authority for the majority of the canal network in England and Wales. The Proposed Development utilises parts of the Coventry, Oxford and Grand Union Canals.

2.1.2 This report sets out the work that has been undertaken to evaluate potential sites and routes for the different elements of the Proposed Development and to further the development of its design. The report builds upon the information presented in the 'Site and Route Evaluation Report' (September 2024) ('the September 2024 report') which was produced for the purposes of the Phase One Public Consultation that was undertaken on the Proposed Development between 11 September and 25 October 2024. It reports the position on scheme development and optioneering matters as at the end of 2025.

2.1.3 The Proposed Development will transfer up to 115 megalitres per day (Ml/d) of surplus water from Severn Trent's (ST) supply area to areas of forecast water deficit in Affinity Water's (AfW) supply area. Water will be diverted from an existing ST Wastewater Recycling Centre (WwRC) to a new Advanced Water Treatment Plant (AWTP) on the same ST operational site that is located to the north-east of Birmingham at Minworth. It will then be transferred via a new underground pipeline from the AWTP to a new outfall into the Coventry Canal at Atherstone. The existing canal network comprising the Coventry, Oxford and Grand Union Canals will then convey, with the aid of interventions, the water to an abstraction point on the Grand Union Canal located south of Bletchley, Milton Keynes, where the water will be stored in a new storage site before being treated at a new Water Treatment Works (WTW). The treated water will then be transferred to an existing AfW underground reservoir at Chaul End near Luton via a new underground pipeline prior to its distribution to AfW customers through existing infrastructure.

2.1.4 The Proposed Development is a central component of both the final regional Water Resources South East Plan (June 2025) and AfW's final Water Resources Management Plan 2024 (WRMP24). These plans establish the need for an increase in water resilience and identify an inter-regional water transfer scheme using the canal network to transfer water from the Midlands to the South-East as part of the solution. The Proposed Development is also referred to within ST's final Water Resources Management Plan 2024 as a scheme that potentially interacts with the ST WRMP 2024.

2.1.5 The Proposed Development is also part of the Regulators' Alliance for Progressing Infrastructure Development's (RAPID) programme of Strategic Resource Options (SRO) to meet the water needs set out in the Environment Agency's National Framework (2025), matters which are further explained in Chapter 3 of this report.

## 2.2 Purpose of the Report

2.2.1 This report has been prepared to provide – for the purposes of Phase Two Public Consultation - an explanatory overview of the work undertaken by the promoters of the Proposed Development in respect of the identification and consideration of options for the various

elements of the Proposed Development and in respect of the ongoing design development of the Proposed Development.

2.2.2 As indicated, the position on option related work at the time of Phase One Public Consultation was set out in a report that formed part of the first round of public consultation information – 'the September 2024 report'.

2.2.3 This report takes as its reference point the position set out in the September 2024 report and focuses on explaining the further work undertaken since that time and the implications arising in terms of scheme developing and optioneering. This report does not, therefore, repeat the detail published in the September 2024 report - although a high-level summary of the position is provided for ease of reference at various relevant points within this report. For further detail of the work undertaken up to September 2024, the September 2024 report remains available on the Grand Union Canal Transfer project web page and is available in Appendix A.4 of this report.

2.2.4 The main factors that have influenced the scope and extent of scheme development and options related work since September 2024 include:

- taking account of relevant responses provided during the Phase One Public Consultation on the Proposed Development, which in turn resulted in a review of certain aspects of the option related work previously undertaken;
- taking account of the implications arising from the finalisation of AfW's WRMP24 and the further development of policy contained within the National Policy Statement for Water Resources Infrastructure (NPSWRI, 2025), and
- recognising the need to further develop the design of the Proposed Development for the purposes of the Phase Two Public Consultation.

2.2.5 This report and the September 2024 report, therefore, collectively explain the development of the Proposed Development which is the subject of the Phase Two Public Consultation. Following the Phase Two Public Consultation, the Proposed Development that is set out within this report – and described elsewhere within the consultation information (for example, Chapter 3 of the Preliminary Environmental Information Report) – will be subject to further design development and assessment through the ongoing Environmental Impact Assessment (EIA) process and having regard to any relevant matters raised but stakeholders and consultees during the Phase Two Public Consultation. The outcome of this process will be the finalisation of the Proposed Development to be taken forward within the Development Consent Order (DCO) application.

## 2.3 Structure of the Report

2.3.1 Following this introduction, this report is structured in the following way:

- *Chapter 3* – Provides an overview summary of the optioneering and scheme development work undertaken by, and the position at, the point of the Phase One Public Consultation. The chapter provides a summary of the position reflected in the September 2024 report.
- *Chapter 4* – Provides an overview summary of the optioneering and scheme development work that has been undertaken since the Phase One Public Consultation. Details of the specific work undertaken in respect of the various elements of the Proposed Development are subsequently provided in Chapters 5 to 9.

- *Chapters 5 to 9* – Further details the optioneering and scheme development work undertaken, and the conclusions reached, since the Phase One Public Consultation, for each element of the Proposed Development in turn as follows;
    - *Chapter 5* – the Minworth Advanced Water Treatment Works Plant elements,
    - *Chapter 6* – the Minworth to Atherstone pipeline elements,
    - *Chapter 7* – the proposed outfall and works to the existing Coventry, Oxford and Grand Union canals, the associated Drayton and Daventry reservoirs and associated infrastructure,
    - *Chapter 8* – the abstraction, storage and further treatment works elements of the Proposed Development.
    - *Chapter 9* – the pipeline transfer to existing AfW infrastructure elements of the Proposed Development.
    - *Chapter 10* – Provides a conclusion to the report.

# 3. Overview of previous work undertaken

## 3.1 Introduction

3.1.1 This chapter provides an explanation of the optioneering and scheme development work that had been undertaken by the time of the Phase One Public Consultation.

3.1.2 The explanation provided is an overview summary of this previous work. Further information on the previous work undertaken can be found within the September 2024 report.

3.1.3 The previous work undertaken was largely carried out to inform three separate but interrelated processes, namely:

i. the RAPID Gated Process;

ii. the developing WRMPs and Regional Plans, and

iii. the form and detail of the Proposed Development to be taken forward to a DCO application.

3.1.4 A summary of these processes and the work undertaken up to September 2024 is provided in the following sections. To aid understanding, the following is provided to explain key terms referred to.

3.1.5 ***RAPID –*** stands for the Regulators' Alliance for Progressing Infrastructure Development and is made up of the Environment Agency (EA), Ofwat and the Drinking Water Inspectorate (DWI). Its purpose is to accelerate the development of new water infrastructure and design future regulatory frameworks for them, focusing on Strategic Resource Options (SROs). SROs are strategic schemes that have the potential to provide solutions to water needs for regions and between regions across England.

3.1.6 The RAPID process involves a series of technical, financial and environmental investigations and studies which are reported through a series of RAPID Gates. These enable RAPID to assess the studies and investigations on the SROs, set out and consult on the draft conclusions of those studies and investigations and provide a final decision on whether and how the SRO should continue to be assessed and promoted. The Proposed Development is a combination of two SROs – the Minworth SRO and the Grand Union Canal Transfer SRO – both of which have progressed and are progressing through the RAPID process.

3.1.7 ***WRMP –*** stands for Water Resources Management Plan. Each water company is required to prepare and regularly (every 5 years) update a statutory WRMP which looks ahead over a minimum 25-year period to set out proposals to ensure that customer supplies are secure, taking into account changes to water supply through climate change and environmental legislation and policy, and customer demand, including through planned growth and customer behaviour. WRMP24, for example, is the WRMP for the period 2025 to 2075.

3.1.8 ***Regional Plans -*** Alongside the WRMP process, water companies work together as part of five regional groupings to prepare Regional Plans. These regional groupings enable water companies, environmental and financial regulators and other stakeholders to work collaboratively on shared regional water resource plans. These plans are consistent with and

integrate with the individual water company level WRMPs and the five regions work together to ensure there is consistency between Regional Plans, particularly over the details of existing and proposed water resource transfers between regions. ST lies within the Water Resources West (WRW) region and AfW lies within the Water Resources in the South-East (WRSE) region.

## 3.2 The Proposed Development, the WRMP and Regional Plan processes

3.2.1 An option to treat and transfer water through the canal network was first formally identified as part of the WRMP19 process (covering the period 2020 to 2080). In the AfW WRMP19, a number of other strategic and water resources options were selected as part of the preferred plan based on the assessment work undertaken at that time, and in light of the future supply demand balance challenges presented in that plan. The Grand Union Canal Transfer Option was selected as the next strategic option for development should one or more of those options not come forward, or if the scale of the supply demand balance were to worsen from that identified in the plan. The Grand Union Canal Transfer was identified as a feasible option and work was undertaken through the RAPID process (further described in the following section) to investigate its feasibility in more detail.

3.2.2 For their WRMP24, water companies worked collaboratively within regional groupings to ensure that consistent methodologies and data were used for both the WRMP and Regional Plan processes, including the identification and assessment of options. Options from WRMP19 together with new options were assessed through this process, and new supply and demand forecasts undertaken for WRMP24.

3.2.3 The Proposed Development was identified and considered through the WRMP24 and Regional Plan processes as firstly a supply of water from the Minworth WwRC, and secondly its transfer from ST to AfW areas through pipeline and canal transfer, including its treatment for public water supply purposes. The option of transferring water from ST to AfW is also an inter-regional transfer between WRW and WRSE. Extensive liaison and collaboration took place between ST and AfW, and WRW and WRSE, as part of the preparation of the WRMP24s and Regional Plans to ensure that the Proposed Development was consistently represented and assessed through these plan processes.

3.2.4 The work undertaken on scheme development and optioneering matters that is summarised in the following sections was used as appropriate within the process undertaken by both AfW and ST to produce their WRMP24. At the time of the September 2024 report and the Phase One Public Consultation, both water companies WRMP24 had still to be finalised.

3.2.5 The implications arising from the subsequent finalisation of both WRMPs is considered further within the next chapter of this report.

## 3.3 Scheme Development through the RAPID Gated Process

3.3.1 The Proposed Development consists of two SRO schemes, namely ST's Minworth SRO and AFW's Grand Union Canal Transfer SRO respectively, each of which has and is progressing through the RAPID gated process.

3.3.2 In respect of the Proposed Development, RAPID Gate 1 Reports were submitted in July 2021, RAPID Gate 2 Reports were submitted in November 2022 and RAPID Gate 3 Reports were submitted in May 2025.

3.3.3 The work undertaken on scheme development and optioneering and reported in those submissions is summarised and explained below.

**RAPID Gate 1 Submission (July 2021)**

3.3.4 In the Gate 1 submission, the existing Minworth Wastewater Recycling Centre (WwRC) to the east of Birmingham was identified as the source of water for the transfer. Minworth WwRC is the largest of ST's WwRCs, currently discharging treated wastewater to the River Tame, a tributary of the River Trent. Wastewater is produced by customers and flows into the Minworth WwRC at all times. The discharge to the river operates continuously and is resilient to drought and other environmental conditions which can constrain other potential water sources.

3.3.5 At the time of the Gate 1 submission, it was assessed that Minworth WwRC could support either the Grand Union Canal Transfer or the separate Severn to Thames Transfer or a combination of the two, with necessary additional water treatment being required somewhere at the Minworth WwRC site or in the vicinity to ensure that water quality for any transfer would meet environmental conditions for the discharge location. At the Gate 1 stage, for the purposes of the Grand Union Canal Transfer, the Minworth WwRC was identified as being able to provide sufficient water for a 50Ml/d or 100Ml/d transfer.

3.3.6 The Gate 1 submission considered six potential options for transferring treated wastewater from the Minworth WwRC to the canal system for onward transfer south through the Grand Union Canal. These options included transfers wholly through the canal network (the Birmingham and Fazeley Canal running adjacent to Minworth WwRC), or through buried pipeline transfer to discharge points at different locations on the canal network, either the Coventry Canal or the Grand Union Canal. As explained further within Chapter 5 of the September 2024 report, within the Gate 1 submission three of the transfer options (one canal and two pipeline) were considered to have potential for further assessment and consideration.

3.3.7 The Gate 1 submissions identified the need for infrastructure enhancements and other works to the canal network to facilitate the transfer of water through the canal. At the southern end of the project, the Gate 1 submissions shortlisted three potential abstraction points along the Grand Union Canal at Tring, Hemel Hempstead and The Grove (near Watford).

3.3.8 The combination of 50Ml/d or 100Ml/d transfer options, combined with three transfer options from Minworth WwRC to the canal network, and three potential abstraction locations at the southern section of the Proposed Development, resulted in eighteen potential combinations of options reported at Gate 1 which it was recommended should be further assessed at Gate 2. RAPID's determination on the Gate 1 submission supported the continued investigation of these options.

**RAPID Gate 2 Submission (November 2022)**

3.3.9 In the Gate 2 submissions, the Minworth WwRC remained as the identified source of water, with significant additional work undertaken to support the identification and consideration of necessary additional treatment for the use of the water for the Proposed Development and/or the separate Severn to Thames Transfer project. The work undertaken during Gate 2 supported the work undertaken for the WRMP and Regional Plan processes, demonstrating the ability of an Advanced Water Treatment Plant (AWTP) at Minworth to meet identified water quality standards at sufficient volume to support both potential transfer projects. At the time of the Gate 2 submissions, the work undertaken supported the selection of an initial Grand Union Canal Transfer phase by 2032 and a further potential requirement by 2040 to 2050 in accordance with the WRSE requirement at that time.

3.3.10 In relation to the transfer from the existing Minworth WwRC to the canal network, and as explained further in Chapter 5 of the September 2024 report the three shortlisted options from RAPID Gate 1 were further assessed and a preferred option of a pipeline transfer to a discharge point on the Coventry Canal near Atherstone was identified as preferred. This option was assessed as having the lowest environmental impact with the lowest whole-life carbon cost and use of materials compared to the other options. Engineering and other assessments of this preferred option were submitted at RAPID Gate 2, supporting the estimation of cost, carbon and other environmental impacts of the proposals. Further and more detailed engineering and other assessments were undertaken on the canal network to then be used from Atherstone for the water transfer.

3.3.11 At the southern section of the Grand Union Canal Transfer, the three locations for abstraction and treatment infrastructure shortlisted at Gate 1 were assessed in more detail alongside an additional site that was identified at Leighton Buzzard. This assessment identified the Leighton Buzzard site as the single preferred option at that time. The decision to identify and then select the abstraction and treatment location at Leighton Buzzard was based upon engagement with the Environment Agency as the location avoided interaction with chalk streams downstream (south) of the Tring summit. These chalk streams had the potential to be adversely affected if the three alternative abstraction locations (allocated at or to the south of the Tring summit were selected. The site at Leighton Buzzard was also reported at Gate 2 – which requires projects to present a Single Source Option - to provide good access to the preferred connection point for the treated water to enter AfW's existing water infrastructure network.

3.3.12 The eventual destination for the water to be transferred and treated through the Grand Union Canal Transfer Project was identified in the Gate 2 reports as being an existing underground reservoir at Chaul End near Luton.

3.3.13 The RAPID Gate 2 submissions sought confirmation and funding approval from RAPID for the continued investigation and assessment of the Minworth SRO and the Grand Union Canal SRO, including for more detailed investigation and assessment of the preferred options identified in the Gate 2 reports and the commencement of their progression through planning and other consent processes. RAPID's determination on the Gate 2 submission supported the continued investigation of the options.

**RAPID Gate 3 Submission (May 2025)**

3.3.14 From May 2023 onwards, following the Gate 2 process and RAPID's determination, AfW, ST and the Trust continued to investigate, evaluate and assess the options identified in the Gate 2 submission. The work undertaken in the period up to September 2024 and the Phase One Public Consultation is explained in the following section of this report. The work undertaken to September 2024 informed the content of the Gate 3 reports submitted in May 2025.

## 3.4 Scheme Development and Option Evaluation for the purposes of the DCO application

3.4.1 As indicated above, following the Gate 2 process and RAPID's determination, AfW, ST and the Trust continued to undertake option evaluation and scheme development work. This ongoing work was undertaken to inform both the RAPID Gate 3 submission and the identification of the appropriate form of development to be taken forward for consenting purposes.

3.4.2 The work took, as its starting point, the position reached at Gate 2. The work undertaken consisted of an evaluation of site and route options using a defined methodology. This methodology – explained in further detail below, allowed where necessary and appropriate, for

new or additional options to be identified and evaluated alongside the options previously identified.

3.4.3 An explanation of the methodology used is provided in section 3.2 of the September 2024 report. In summary, the methodology comprised a series of stages which are summarised as follows:

3.4.4 ***Stage 1 –*** consisted of the identification of potential pipeline route corridors and sites for treatment works. This process utilised a series of exclusionary criteria to ensure that identified options avoided, as far as possible, constraints and designations that were considered likely to represent significant challenges to obtaining consent for and constructing the development. These criteria are summarised in Table 3.1 of the September 2024 report. This review work considered the options identified during the earlier phases of work (in effect the Gate 1 and 2 work) and identified new options.

3.4.5 ***Stage 2 –*** at this stage the identified options from Stage 1 were screened against engineering, environment, planning and land related criteria (summarised in Table 3.2 of the September 2024 report).

3.4.6 ***Stage 3 -*** this stage consisted of workshops involving engineering, environment, planning and land specialists to discuss and consider the findings of the Stage 1 and 2 review, identify the options with the greatest potential and challenge the justification for their selection.

3.4.7 ***Stage 4 –*** during this stage, the engineering, environment, planning and land teams undertook additional technical work on those options with the greatest potential.

3.4.8 ***Stage 5*** – this stage involved further workshops with the engineering, environment, planning and land teams to consider the overall findings of the review process, the aim being to identify those options with the greatest potential. Where this consideration of options concluded that additional assessments were necessary to inform decision-making, those additional assessments were undertaken prior to another workshop to discuss outcomes. Through Stage 5, options with the greatest potential were identified for external consideration through the Phase One Public Consultation in respect of the emerging form of the Proposed Development.

3.4.9 ***Stage 6*** – this stage consisted of the writing up of the information in the September 2024 report which was published and consulted upon during the Phase One Public Consultation.

3.4.10 The September 2024 report made it clear that the assessment outcomes it reported were predominantly based on desk-based assessments, and that at the time ecological and engineering site-based surveys had not been completed for site options and corridors, nor had engagement with all potentially affected landowners been completed across the site options and corridors.

3.4.11 It was also made clear within the September 2024 report that further optioneering and scheme development work would be taking place. Further detail of the process undertaken and the position reached in respect of the specific elements of the Proposed Development, as of September 2024, is provided at the start of each of the following chapters (5 to 9) that deal with the elements of the Proposed Development in turn.

# 4. Overview of new work undertaken

## 4.1 Introduction

4.1.1 This chapter provides, for context, an overview explanation of the optioneering and scheme development work that has been undertaken since the form of the Proposed Development was subject to Phase One Public Consultation in September and October 2024. Further more specific detail and explanation of this further work undertaken in respect of the different elements of the Proposed Development is provided in Chapters 5 to 9 of this report.

4.1.2 As indicated in Chapter 2 of this report, the main factors that have influenced the scope and extent of options and scheme development work since September 2024 include:

i. taking account of relevant responses provided during the Phase One Public Consultation, which resulted in a review of certain aspects of the work previously undertaken;

ii. taking account of the implications arising from the finalisation of AfW's WRMP24 and changes to policy contained within the National Policy Statement for Water Resources Infrastructure (NPSWRI, 2025), and

iii. recognising the need to further develop the design of the Proposed Development for the purposes of Phase Two Public Consultation.

4.1.3 Further explanation of these matters, along with how this has influenced the scheme development and optioneering work taken place subsequent to the Phase One Public Consultation, is provided in the following sections.

## 4.2 Phase One Public Consultation Responses

4.2.1 Some responses received during Phase One Public Consultation raised matters of relevance to the ongoing consideration of options and scheme development work. These matters are summarised as appropriate within the relevant section chapters of this report that follow (Chapters 5 to 9).

## 4.3 Policy and Procedural Developments

4.3.1 Subsequent to the completion of the September 2024 report and the position set out in that report, a number of policy and procedural developments have occurred to which regard has been had in the ongoing scheme development and optioneering work that has subsequently taken place.

4.3.2 The first of these developments is the October 2024 Direction from the Secretary of State for the Environment, Food and Rural Affairs under Section 35 of the Planning Act 2008, which confirms that the Proposed Development is a project of national significance. As a consequence of the Direction, the Proposed Development is development requiring development consent under the Planning Act 2008 and an application for a Development Consent Order (DCO) will be made for the Secretary of State to determine on the advice of the Planning Inspectorate.

4.3.3 The second of these developments is the publication of the final AfW WRMP24 in October 2024 and the publication of the final ST WRMP24 in June 2025.

4.3.4 The third of these developments is the publication of a revised National Policy Statement for Water Resources Infrastructure (NPSWRI) in July 2025, which sets out Government policy for nationally significant water resources infrastructure. This further confirmed the position in respect of matters of need, as summarised in the following paragraphs.

4.3.5 Paragraph 1.3.1 of the NPSWRI makes it clear that for the purposes of the policy statement, water resources infrastructure includes development which meets the criteria set out in section 35 of the Planning Act 2008.

4.3.6 In respect of the need for projects covered by the NPSWRI, the statement, at paragraph 1.4.5 states that:

*"For nationally significant infrastructure projects included in a published final water resources management plan, the 'need' for that scheme has been demonstrated in line with government policy. The applicable statutory requirements, for water resources management planning and 'need' will not be revisited as part of the application for development consent. The Examining Authority and the Secretary of State will begin start* [sic] *their assessment of applications for infrastructure covered by the National Policy Statement on that basis."*

4.3.7 Paragraph 1.4.6 of the NPSWRI goes on to further clarify that:

*"The Secretary of State will also consider applications for development consent for projects which do not meet the nationally significant infrastructure project criteria, as set out in sections 27, 28 and 28A of the Planning Act, but which the Secretary of State directs are to be treated as a development for which development consent is required under section 35 of the Planning Act. Where a section 35 direction is made in relation to a project which has been identified as a preferred option in a final water resources management plan, this National Policy Statement will apply and, as with national significant infrastructure projects under paragraph 1.4.5, the 'need' will not be revisited as part of the application for development consent".*

4.3.8 It is emphasised that paragraphs 1.4.5 and 1.4.6 of the NPSWRI make it clear that if a specific project or scheme is included in a published final WRMP then the need for that specific scheme or project is demonstrated and it is not subsequently necessary at DCO application or examination stage to revisit or further demonstrate the need for that scheme or project.

4.3.9 AfW's WRMP24 makes clear that its strategic plan 'Preferred Solution' includes strategic supply options based on the initial development of the 100Ml/d Grand Union Canal transfer (see AfW WRMP24 page 274) (for clarity this is 100ml/d Annual Average Deployable Output). Within the WRMP24 the Grand Union Canal transfer is described in the following way:

*"This transfer will take treated water from Severn Trent's Minworth site, via a new closed pipeline transfer (circa 15.5km) to a location on the canal near Atherstone in Warwickshire. The transfer will utilise the existing canal structure, passing through the Coventry Canal, the Oxford canal and the Grand Union canal, with a small number of pump and lock upgrades required. Water would be abstracted at a location near Leighton Buzzard and stored, before being treated at a new Water Treatment Works onsite, and then transferred to our* [AfW's] *supply area"* (AfW WRMP24, paragraph 7.32).

4.3.10 In addition to the above, AfW's WRMP (at paragraph 7.34) makes it clear that *"The Minworth reuse SRO provides the source water"* for the Grand Union Canal scheme and *"will develop additional treatment capacity at the existing Minworth Wastewater Treatment Works (WwTWs)."*. It is further made clear that this additional treatment would facilitate and enable the outflow from Minworth, part of which would be diverted to support the Grand Union Canal strategic transfer.

4.3.11 The inclusion of the specific Grand Union Canal Transfer project within AfW's published final WRMP24, therefore, establishes the need for the project (as it is described in the WRMP24) in accordance with the NPSWRI. The need for the specific project as described above is, therefore, established in the NPSWRI and does not need to be further demonstrated or established.

4.3.12 As the need for the specific Grand Union Canal Transfer project as detailed in AfW's WRMP24 is already established through the NPSWRI, the approach to the ongoing consideration of scheme development and optioneering since the September 2024 position has had regard to the fact that the process carried out through the development of AfW's WRMP24 and the conclusions reached through that process as they relate to scheme development and optioneering matters do not need to be retested. The effect of this is that work undertaken since Phase One Public Consultation has not revisited or retested those aspects of the Proposed Development which are described within the AfW WRMP24.

## 4.4 Refinements to the assessment

4.4.1 Following Phase One Public Consultation, certain aspects of the assessment and appraisal work undertaken were reviewed and refined to further assist in the ongoing progression of scheme development and optioneering work. Such refinements taken forward include, for example, a refinement to the approach of identifying potential sites for the southern treatment and storage elements of the Proposed Development and a refinement to certain engineering criteria used in aspects of the appraisal process.

4.4.2 This review and the refinements resulting are explained further in detail within the various section chapters that follow in this report.

# 5. Minworth Advanced Treatment Works

## 5.1 Introduction

5.1.1 This chapter of the report provides a more detailed update of the scheme development and optioneering work that has been undertaken since the production of the September 2024 report for the Phase One Public Consultation in respect of the Minworth Advanced Water Treatment Plant (AWTP) aspects of the Proposed Development. This element forms Part 1a of the Proposed Development as detailed within the Preliminary Environmental Information Report that is also provided as part of the Phase Two Public Consultation information.

## 5.2 Overview of previous work undertaken

5.2.1 The work undertaken at the time of the Phase One Public Consultation on scheme development and optioneering matters of relevance to the Minworth AWTP are explained within Chapter 4 of the September 2024 report.

5.2.2 In summary, the September 2024 report explains that:

i. Through the processes associated with the planning for water resources, the existing Minworth Wastewater Recycling Centre (WwRC) had been identified as the source of the water for the Proposed Development. The Minworth WwRC being an Activated Sludge Treatment Works owned and operated by ST, located to the east of Birmingham near Sutton Coldfield and serving the needs of an approximate 2 million population equivalent including trade effluent.

ii. The water source at the Minworth WwRC would be obtained by diverting some of the treated recycled water that is currently discharged to the adjacent River Tame. A key benefit of using the Minworth WwRC site as a source of water for the Proposed Development is that wastewater is produced and fed into the Minworth WwRC for treatment under all conditions, and is, therefore, resilient to drought, improving the resilience of the transfer.

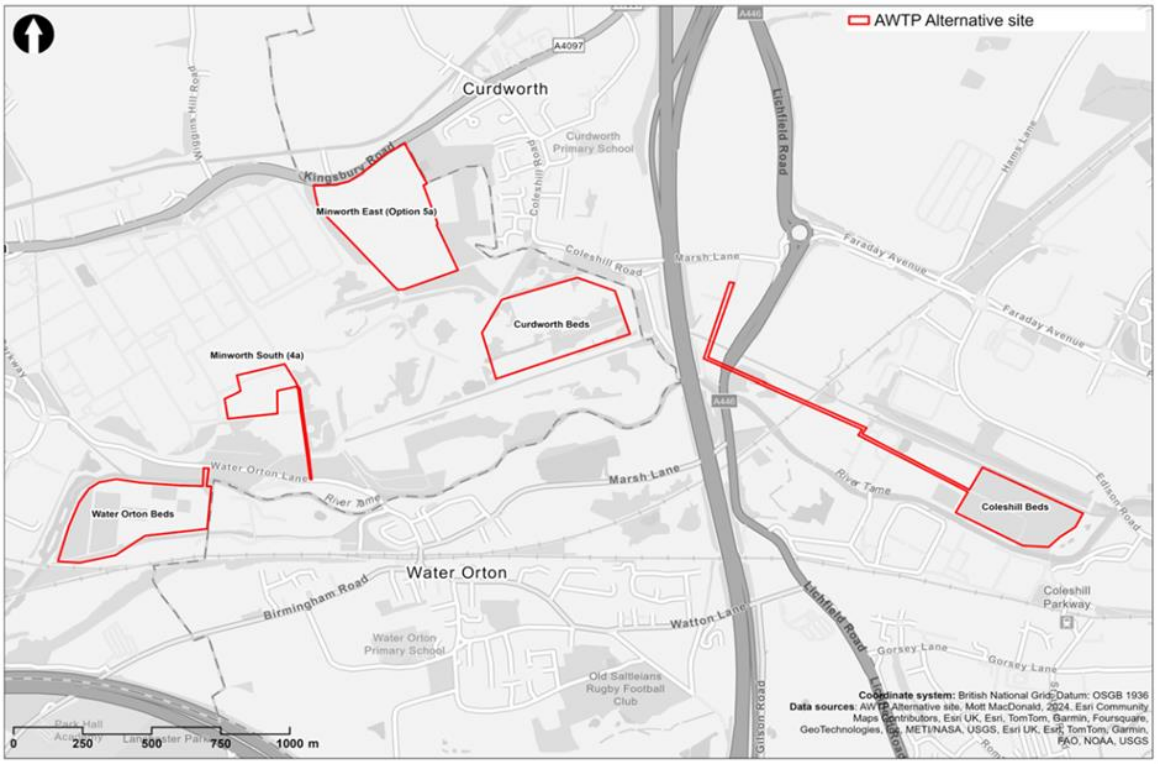
iii. There would be a need for a new AWTP to further treat the already treated recycled water to the necessary environmental discharge requirements for discharge to the Coventry Canal.

iv. A site within the operational boundary of the Minworth WwRC that had been identified earlier within the process as the preferred site was identified as being unavailable following a strategic prioritisation review of operational requirements of the WwRC by ST.

v. Following an optioneering exercise to determine the location for the AWTP, which involved consistent engineering, environmental, planning and land assessments of potential sites, the Curdworth Beds site - a site of former sludge drying beds located to the south east of the main envelope of the Minworth WwRC area – was identified as the preferred site option for the AWTP, in combination with a proportion of the process being located within the main Minworth WwRC site. Figure 5.1 shows the location of the potential sites for the

AWTP that were considered and the assessment undertaken is detailed in section 4.4 and Appendix A of the September 2024 report.

**Figure 5.1: AWTP Alternative Sites**




5.2.3 The assessment work had due regard to the nature of the advanced treatment processes envisaged at the time. In summary key aspects of the processes and associated elements that that were taken account included:

i. The need to ensure that the AWTP is located in the vicinity of the existing Minworth WwRC final effluent channel from which the treated recycled water would be drawn for further treatment and processing through the AWTP.

ii. The need for the site to be approximately 5 hectares in size to be able to accommodate the plant, buildings infrastructure and facilities required for the treatment processes. These processes are described below in the order in which they would occur-

- **Nitrate Removal -** Nitrate will be removed by microorganisms within the Moving Bed Biofilm Reactor (MBBR) tanks.

- **Flocculation and sedimentation (Floc-Sed)** – a chemically enhanced coagulation, flocculation and sedimentation system that efficiently reduces total suspended solids, total phosphorus and turbidity and prepares the water for effective filtration. It uses ballast material to enhance agglomeration of the flocs and accelerates settling rates.

- **Ozonation** - The ozonation process in this design is used primarily to oxidise the bulk and trace organic matter, although the system will also benefit from its disinfection capabilities. It degrades bulk organic matter into smaller molecules by breaking chemical bonds making some of them easier to assimilate biologically.

- **Biological Activated Carbon (BAC) Filtration** – This is a multi-media filter bed with 0.3m sand under 1.5m of granular activated carbon. The activated carbon is used to develop a biological community to biodegrade the organics that the ozone process has made assimilable and the sand filters out suspended solids.

- **Granular Activated Carbon (GAC) / Enhanced Media Absorption** – This process step relies on adsorption as the primary removal mechanism of the remaining bulk and trace organics. The Enhanced Media is introduced to improve the adsorption performance and reduce the operational costs of this step, particularly in dealing with perfluorooctane sulphonate (PFOS).

- **Free Surface Water (FSW)** – The provision of an area of wetlands to treat instantaneous BAC and GAC backwash materials resulting as part of a process.

## 5.3 Policy and Procedural Developments

5.3.1 As explained within Chapter 4 of this report, subsequent to the completion of the September 2024 report, a number of policy and procedural developments occurred.

5.3.2 The implications of these developments mean that – in accordance with the position clearly stated within paragraphs 1.4.5 and 1.4.6 of the NPSWRI and having regard to both the status of the Proposed Development and the way in which it is described within AfW's WRMP24 - the justification for the source of the water for the Proposed Development, being treated recycled water taken from ST's Minworth WwRC, is established.

## 5.4 Phase One Public Consultation

5.4.1 The preferred location for the proposed AWTP and the work undertaken to inform that decision was consulted on as part of the Phase One Public Consultation. Responses received in respect of this element of the Proposed Development can be summarised as follows:

- General concerns about the potential impacts of the AWTP upon nearby residential areas, particularly Curdworth as a result of the proximity of the proposed AWTP site to surrounding residential areas compared to other sites that could be used.

- Concerns over potential noise and air pollution impacts resulting from the construction of the AWTP, and how these impacts would be mitigated.

- Concerns around construction traffic impacts during the construction of the AWTP, particularly around Curdworth,

- The potential for emissions of and odours to be emitted from the plant during operation.

Comments in relation to wider development of the area and other projects being planned, with particular emphasis on the potential cumulative impacts.

5.4.2 Further detail on the feedback received during the Phase One Public Consultation is provided in the Consultation Brochure and Phase One Consultation Report that are published alongside this report for the purposes of the Phase Two Public Consultation.

5.4.3 Consideration was given to this feedback as appropriate during the scheme development and optioneering work undertaken in respect of the AWTP subsequent to the Phase One Public Consultation.

## 5.5 Design Development following Phase One Public Consultation

5.5.1 Following the Phase One Public Consultation, additional survey and work has been undertaken in respect of the AWTP element of the Proposed Development to ensure that both an optimum treatment process and the appropriate location for the required buildings and infrastructure is being taken forward.

5.5.2 Small-scale experiments to understand the effectiveness of different advanced treatment processes on the highly treated recycled water being discharged from the WwRC have been undertaken to ensure that the water that will enter the transfer elements of the Proposed Development is of an acceptable standard. A pilot plant has been built (February 2025) at the existing Minworth WwRC site as a scaled down version of the AWTP. This Pilot Plant will operate for a period of at least 12 months to evaluate the efficacy of the selected treatment processes and understand the potential water quality variations that might be experienced during different circumstances.

5.5.3 A series of environmental and engineering surveys were undertaken to further inform the ongoing design of the AWTP element of the Proposed Development, which includes ecology surveys, topographical surveys, ground investigations and drainage surveys. Further details of this survey work is contained within the Preliminary Environmental Information Report published alongside this report.

5.5.4 As a result of ongoing investigative work and experiments in relation to water quality following the Phase One Public Consultation, an additional treatment stage relating to nitrate removal has been introduced at the start of the process that is described above in paragraph 5.2.3(ii).

5.5.5 Nitrate will be removed by microorganisms within Moving Bed Biofilm Reactor (MBBR) tanks. The MBBR process structures will be located within the main Minworth WwRC operational site, to the south of the final settlement tanks of the WwRC.

5.5.6 This would leave the remaining processes (Floc-Sed, Ozonation, BAC Filtration and GAC Absorption) to be retained within a new filter building or close to that new building on the preferred Curdworth Beds site previously identified. A vehicular access route and underground pipelines would be provided to link the two locations.

5.5.7 As a result of the further assessment work, it has also been determined that the previously proposed wetlands area would likely have had an adverse impact upon the wide diversity of flora and fauna in the area where they were initially proposed. The wetlands area has therefore been removed from the AWTP element of the Proposed Development. It is now proposed that backwash from the BAC and GAC processes would be pumped back to the Minworth WwRC inlet where it would flow back through the various treatment processes once more.

5.5.8 Following a review, the removal of the wetlands element was found not to have altered the conclusions of the previous site selection exercise which determined the location for the AWTP as being Curdworth Beds. This is due to the significance of the operational, engineering, planning and environmental constraints of the other sites considered, as summarised as follows.

(i) The Minworth South site is currently occupied by ST's Network Response Team and even if it was available, it is constrained in terms of overall area for the AWTP and would require the diversion of critical existing infrastructure associated with the Minworth WwRC site.

(ii) The Coleshill Beds and Water Orton Beds sites have engineering constraints associated with the construction and operation of the AWTP, including the proximity to the Minworth WwRC's effluent channel, and the requirement for additional pumping and distribution pipelines. There are also key interfaces with major public infrastructure, including HS2 and the M6 / M42 Motorway, as well as potential flood risk issues.

(iii) The Minworth East site may be required for future operational development associated with storm overflow storage infrastructure, as well as being situated closer to the village of Curdworth on land that is currently undeveloped and which is outside the current operational boundary of the Minworth WwRC site.

5.5.9 In addition, further work has been undertaken in relation to the operational and construction access arrangements for the AWTP. As a result of this work, both permanent and construction access to the AWTP facilities is proposed to be from the A4079 Kingsbury Road and would utilise an existing access track which would be upgraded. An additional construction access is also proposed off Water Orton Lane via an existing track that would need to be upgraded.

# 6. Minworth to Atherstone Transfer Pipeline

## 6.1 Introduction

6.1.1 This chapter of the report provides an update of the scheme development and optioneering work that has been undertaken in respect of the Minworth to the canal network transfer elements of the Proposed Development. This element forms Part 1b of the Proposed Development as detailed within the Preliminary Environmental Information Report that is also provided as part of the Phase Two Public Consultation information.

## 6.2 Overview of previous work undertaken

6.2.1 The work undertaken at the time of the Phase One Public Consultation on scheme development and optioneering matters of relevance to these elements of the Proposed Development is explained within Chapter 5 and Appendix B of the September 2024 report.

6.2.2 In summary, that chapter of the September 2024 report explains that:

i. During the early stages of the Proposed Development, initial assessment work was undertaken and workshops held, involving representatives of ST, AfW, the Trust and the Environment Agency, which sought to establish a series of sub-route options for transferring the water from Minworth to the Grand Union Canal SRO.

iii. This work resulted in the identification of six sub-routes, involving a mix of canal, river and pipeline transfer modes, for the transfer of water to the Grand Union Canal SRO.

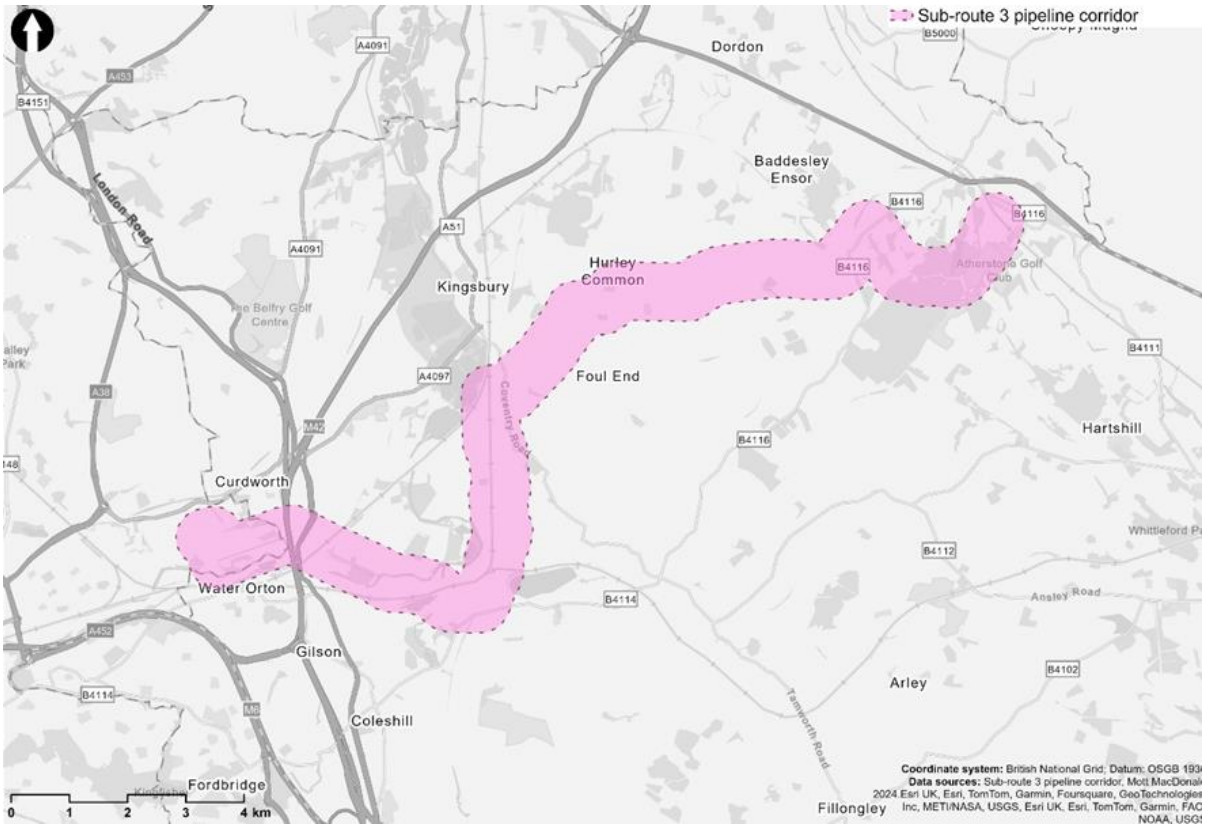
iii. Following an assessment of these sub-route options – a process covering engineering, environment, planning and land matters – a preferred option was identified.

iv. The preferred sub-route option identified was ‘Sub-route 3’, which envisaged the use of a new underground pipeline running from Minworth to the Coventry Canal at Atherstone. The subsequent transfer south from Atherstone would be via the Coventry and Oxford Canal to a connection with the Grand Union Canal to the north of Daventry.

v. Sub-route option 3 – shown on Figure 6.1 below – was concluded to present the lowest overall risk and the most flexible option of the various sub-routes assessed.

vi. Following identification of sub-route option 3 as the preferred pipeline corridor, a further review of the corridor was undertaken to ensure that, amongst other things, an appropriate pipeline corridor was presented during the Phase One consultation. A summary of this further review is provided in the following paragraphs.

**Figure 6.1: Sub-route 3 Pipeline Corridor**




**Review and refinement of the preferred pipeline corridor prior to Phase One Public Consultation**

6.2.3 The review of the preferred pipeline corridor that was undertaken was conducted in the following route sections, with the outcome summarised in turn. The pipeline corridor resulting from this review and which was then consulted upon during the Phase One Public Consultation is shown on Figure 6.2.

6.2.4 ***Minworth WwTRCto Lea Marston*** - The sub-route 3 pipeline corridor leaves the Minworth WwRC to the southeast and travels through an existing permitted landfill before crossing the M6 / M42 motorway. It then passes to the south of the Hams Hall industrial estate near to an historic landfill. Upon review this corridor was not considered optimal for several reasons, including passing through a permitted landfill site, a section included the Minworth Effluent Conduit and several pockets of historic landfill.

6.2.5 The review confirmed that the optimal route should leave Minworth to the northeast before crossing the M6 / M42 motorway. The route would then head north towards Kingsbury Road, avoiding Hams Hall Substation and other utilities which are to be diverted as part of the HS2 works in the vicinity.

6.2.6 ***Lea Marston -*** The transfer route would need to navigate several constraints in this section, including the need to avoid an historic landfill, committed developments, residential areas and the presence of medium pressure gas mains. The route crosses the River Tame, its floodplain and flood defences. The implications of these constraints have been the subject of ongoing review in the work following the Phase One Public Consultation. This further work is explained within the paragraphs that follow.

6.2.7 ***Lea Marston to Hurley –*** Following navigation through the Lea Marston area the proposed transfer routes would then run in a north easterly direction, avoiding the Whitacre Heath Site of Special Scientific Interest and an historic landfill.

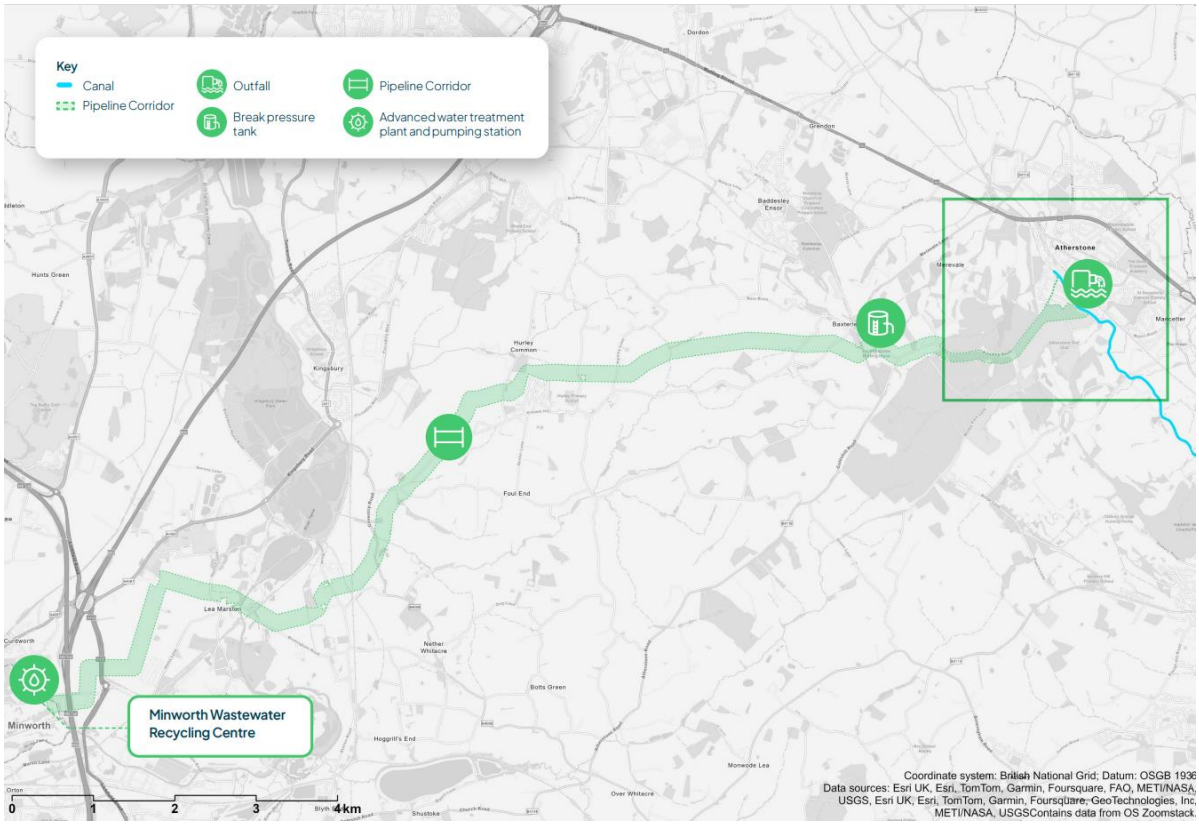
6.2.8 ***Hurley to the break-pressure tank –*** The route then passes to the north of Hurley, running through a predominantly rural area before reaching the proposed location of the Break-pressure tank. As explained in section 6.5.9 onwards, this section of the corridor has been the subject of ongoing review following the Phase One Public Consultation.

6.2.9 ***Break-pressure tank to outfall location –*** The review identified a break-pressure tank location and corresponding pipeline corridor that avoided a registered park and garden (Grade II* Merevale Hall). This would then see the pipeline routed along Coleshill Road towards Atherstone. As explained in paragraphs 6.5.17 and following paragraphs, this section of the corridor has been the subject of ongoing review following the Phase One Public Consultation.

6.2.10 ***Alternative outfall locations -*** Two options were identified as being deliverable and subject to further assessment as part of the optioneering process, covering engineering, environment, planning and land disciplines. The two options were a route via Coleshill Road to the Coventry Canal (Option 2) and a route via Atherstone Golf Course (Option 1) to the Coventry Canal.

6.2.11 ***Following*** the completion of the assessment, workshops were undertaken to review the findings, the outcome was that the Atherstone Golf Course option was generally preferred – as explained within sections 5.5 and 5.6 of the September 2024 report.

**Figure 6.2: Northern Section Minworth to Atherstone pipeline corridor**



## 6.3 Policy and Procedural Developments

6.3.1 As explained within Chapter 4 of this report, subsequent to the completion of the September 2024 report and the position set out in that report, a number of policy and procedural developments occurred.

6.3.2 The implications of these developments mean that – in accordance with the position clearly stated within paragraphs 1.4.5 and 1.4.6 of the NPSWRI and having regard to both the status of the Proposed Development and the way in which it is described within AfW's WRMP24 - the justification for the proposed transfer of the source water via a pipeline from Minworth to a location on the canal network near Atherstone is established.

## 6.4 Phase One Public Consultation

6.4.1 The preferred pipeline transfer route and outfall location and the work undertaken to inform those decisions was consulted on as part of the Phase One Public Consultation. Consultation responses that were received in respect of these aspects of the Proposed Development can be summarised as raising the following points:

- Concerns that the pipeline corridor route was located too close to the village of Hurley and that a more appropriate route would be to the south of the village;
- Concerns that the potential for a pipeline corridor route along Coleshill Road to an outfall location in Atherstone would result in significant impacts on local homes and businesses in Atherstone;
- Concerns that the alternative pipeline corridor route to an outfall location across Atherstone Golf Course could damage the golf course and ancient woodland.

6.4.2 In addition to the feedback from Phase One Consultation, subsequent ongoing landowner and stakeholder consultation and engagement has raised a number of matters of relevance to the Minworth to Atherstone transfer aspects of the Proposed Development. These matters include various points around the interaction of the Proposed Development with land identified for other forms of development and how the pipeline will minimise disruption when crossing roads providing access to settlements. In addition, questions have been asked as to why a possible pipeline route further to the south of Atherstone is not being proposed.

6.4.3 Further detail on the feedback received during the Phase One Public Consultation is provided in the Consultation Brochure and Phase One Consultation Report that are published alongside this report.

6.4.4 Consideration has been given to this feedback during the scheme development and subsequent option work relating to the Minworth to canal transfer elements of the Proposed Development which is explained further in section 6.5 of this chapter.

## 6.5 Design Development following Phase One Public Consultation

6.5.1 Following the Phase One Public Consultation, ongoing design development and evolution work has been undertaken. In summary, this work has consisted of:

- a review of issues arising from other third-party developments proposed along and interacting with the preferred pipeline corridor;
- a review of potential routes around the village of Hurley;
- further consideration of the appropriate location for the required Break-pressure tank;
- a further review of a potential pipeline corridor route and outfall location to the south of Atherstone, and
- ongoing refinement of the pipeline corridor generally.

6.5.2 The further work undertaken in respect of these matters is explained below.

**Schemes interacting with the pipeline corridor**

6.5.3 The following paragraphs provide a summary of the key third party schemes and developments that interact with the proposed pipeline corridor and how this has influenced the ongoing work on defining the appropriate route of the pipeline corridor.

6.5.4 ***Proposed Employment development adjacent to the M42/M6 to the east of the Minworth WwRC (ref: PAP/2024/0297) -*** At the time of writing, a 'live' planning application is in the process of being determined by North Warwickshire Borough Council for an employment development (Marsh Lane Employment Park Development) together with habitat creation, landscaping, parking, service yards, HGV waiting area, footpaths/cycleways and other associated infrastructure on land at Lichfield Road. With all matters reserved apart from access. The development site is bounded either side by the M42 (Junction 9) and Lichfield Road (A446). The indicative layout for the development directly impacts the preferred pipeline corridor presented at Phase One Public Consultation.

6.5.5 This application has not yet been determined, but is an outline application with the layout of the proposed development not yet identified and reserved for later determination. However, a review of the application has been undertaken and an alternative localised pipeline corridor has been identified to remove the risk associated with interaction with the proposed employment development. This amended route was considered by engineering, planning, environment, land and stakeholder specialists and is shown in Figure 6.3.

6.5.6 ***Battery Storage Development (ref PAP/2021/0473) and Sand and Gravel extraction proposal (ref: NWB/24CM023) -*** The Hams Hall Battery Farm Development is under construction and directly impacts the pipeline corridor presented at Phase One Public Consultation. Engagement with the battery farm developer has confirmed that it is not feasible to accommodate the transfer pipeline within their site boundary and, therefore, an alternative pipeline corridor alignment is required.

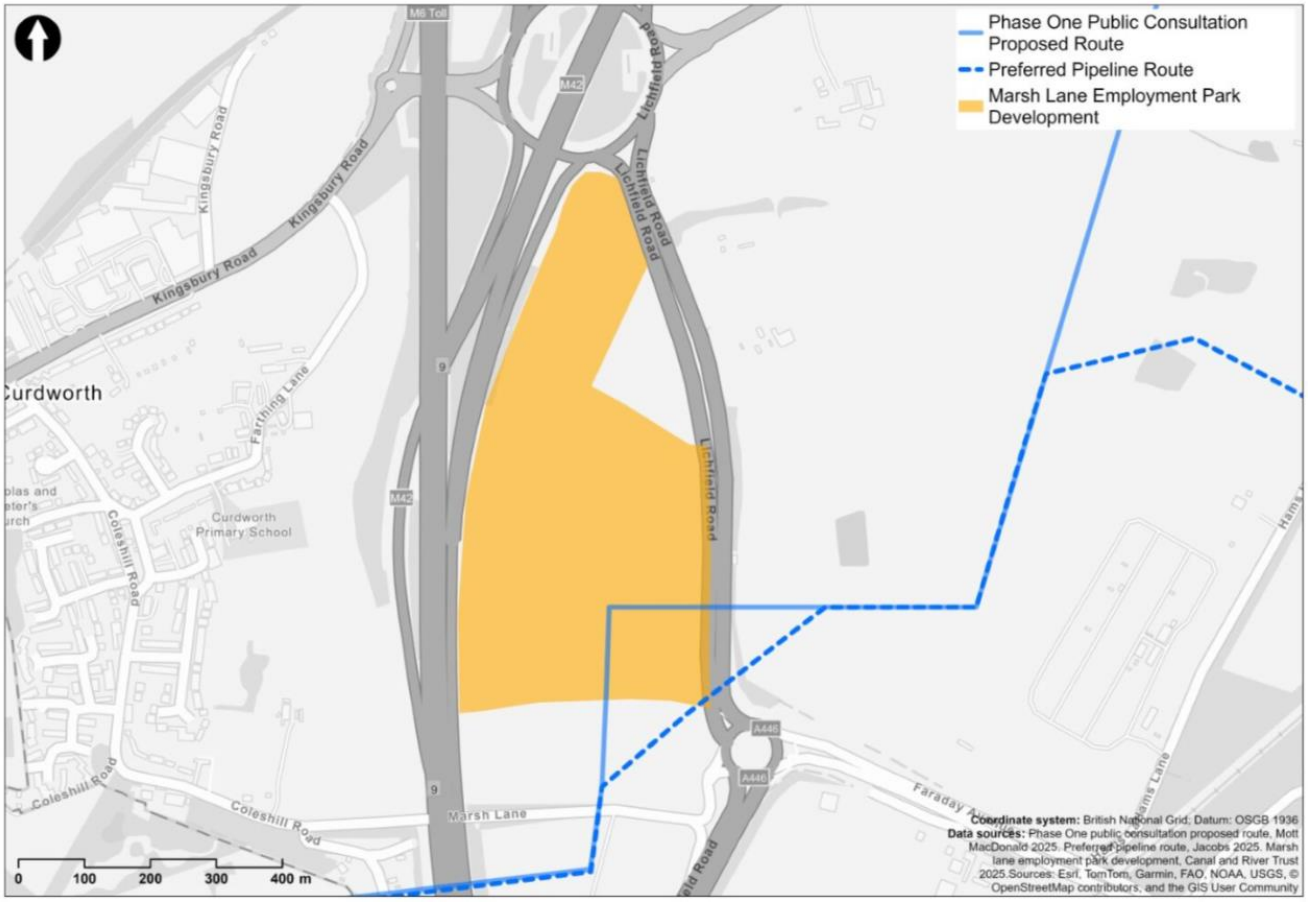
6.5.7 In addition, within the same locality there is a planning application being determined for sand and gravel extraction (ref: NWB/24CM023) submitted that was submitted on18 June 2025, with consultation on the application ending 30 October 2025. The proposals would involve the winning and working of minerals from the site, with subsequent restoration through infilling with inert materials. This application at the time of writing is still being determined.

6.5.8 Following a review by the engineering team, four alternative route options were proposed (shown in Figure 6.4), limiting the potential impact on the Battery Farm Development and the

potential minerals extraction site, the subject of a current planning application. The planning, environment, stakeholder and land teams subsequently reviewed the four alternative options to identify a preferred solution. Common to all route options is an unavoidable minor impact on the Hams Hall Battery Farm Development, running through the southern boundary of the development. This impact only relates to the working area and could be reduced in this location to avoid any impact, following engineering review. Through the assessment, Route 3 was confirmed as the preferred pipeline corridor to be taken forward as it avoided the minerals planning application boundary and other known constraints in the area. Option 4 directly conflicts with the mineral planning application and whilst Options 1 and 2 avoid the area, they involve multiple crossings of Hams Lane, which is an access for the Hams Hall substation.

6.5.9 ***The Severn – Thames Transfer Project (STT)*** - The STT is a water infrastructure is a water infrastructure plan by Thames Water, Severn Trent water and United Utilities to move surplus water from the River Severn to the Thames catchment. Minworth has been identified as a source for that transfer. and route optioneering work to date has identified that the pipeline for the STT is likely to be required to be in the same corridor as the GUC Transfer proposed pipeline corridor for several kilometres of the route. The STT corridor also has regard to the same constraints as identified in the GUC pipeline corridor and is understood to require trenchless crossings of the same third party infrastructure as the GUC pipeline corridor within the areas where these routes overlap. Design development of the GUC pipeline corridor has accordingly had regard to the proposals for STT routing in this area and has been developed with an objective of not preventing or unreasonably restricting the development of the STT pipeline in the corridor, should that project progress.

**Figure 6.3: Employment Development Planning Application Boundary**

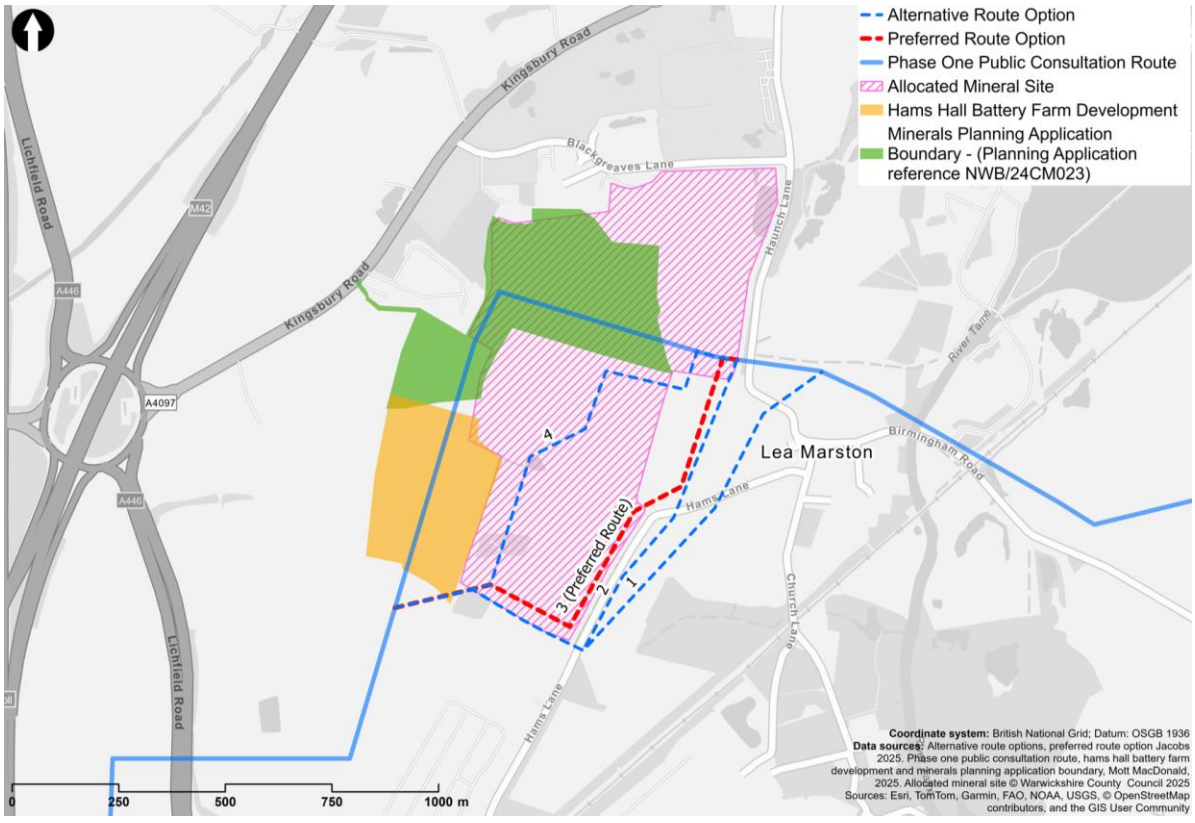


### Alternative Routes around the village of Hurley

6.5.10 Feedback received during the Phase One Public Consultation queried the rationale for routeing the transfer pipeline to the north of the village of Hurley as opposed to a route to the south. In addition, following the Phase One Public Consultation a planning application was submitted for a large solar farm development to the west of Hurley (ref: PAP/2024/0586) on the alignment of the proposed transfer pipeline which presents challenges in respect of the pipeline corridor consulted on during Phase One Public Consultation (the application was subsequently approved on 18/08/25). The project team, therefore, reviewed the selection of this aspect of the pipeline corridor route.

6.5.11 An assessment was carried out using a revised version of the methodology assessment process used prior to Phase One Public Consultation and which was reported in the September 2024 report. This revised methodology was applied consistently in the assessment work undertaken after the Phase One Public Consultation and is explained further in Chapter 8 of this report which also considers the southern elements of the Proposed Development (see in particular paragraphs 66 to 76). To support this further assessment of routes around Hurley, the revised 'Stage 2a' criteria (as detailed in Chapter 8) were applied, which enabled the identified potential pipeline corridors to be considered against consistent engineering, environment, planning and land criteria.

**Figure 6.4: Hams Hall Farm Development, Minerals Application Boundary and alternative route options**




6.5.12 The routes that were identified and assessed are presented in Figure 6.5 and consist of:

- Hurley Pipeline Route (HPR) Northern Option 1 – this consisted of the pipeline corridor north of Hurley consulted on during Phase One Public Consultation.

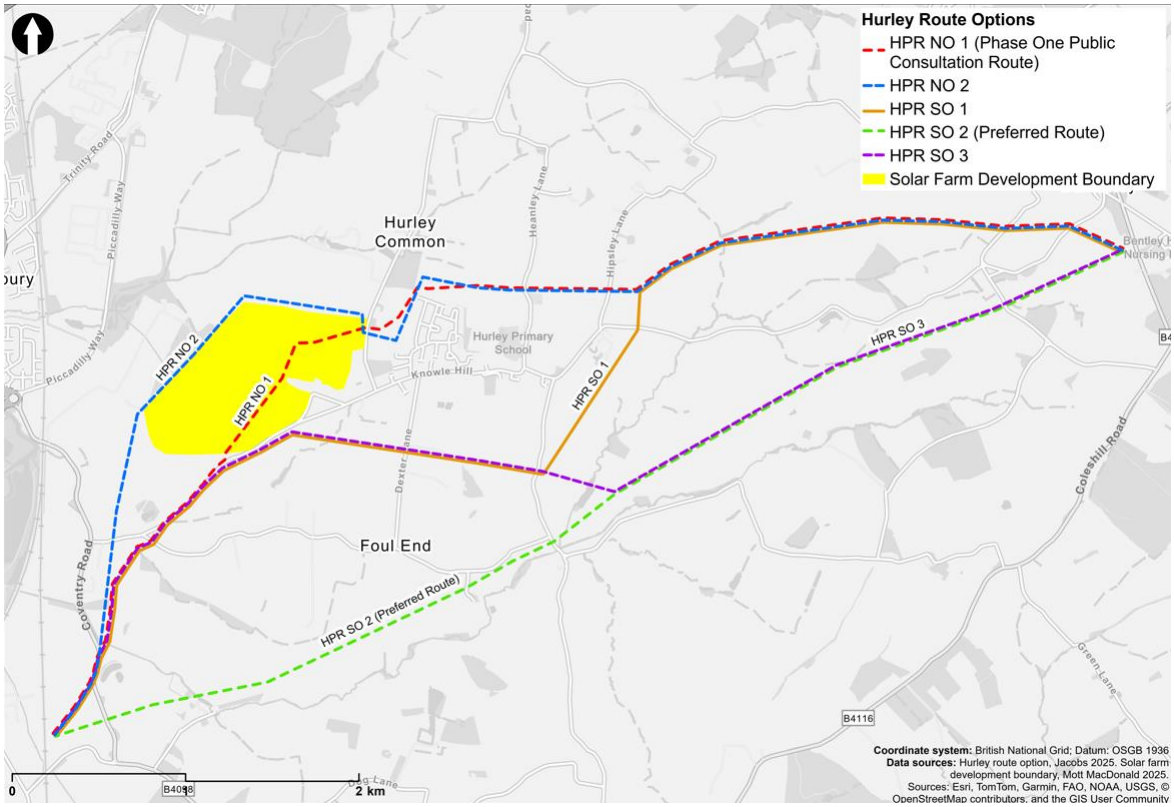
- HPR Northern Option 2 – a variation of Northern Option 1, accommodating the emerging solar farm development, if it were to be approved and were to come forward (which was unclear at the time of the assessment).

- HPR Southern Option 1 – a southern route option around Hurley that follows the alignment of Northern Option 1, until reaching the south of the solar farm development where it then follows a southern alignment around Hurley until rejoining the Northern Option 1 alignment.

- HPR Southern Option 2 – a southern option around Hurley that avoids the previous original alignment within Northern Option 1, extending from Lea Marston to Baxterley where it joins with the current pipeline corridor.

- HPR Southern Option 3 – southern option around Hurley that follows the existing alignment of Northern Option 1 until reaching the south of the solar farm development, where it then follows a southern alignment around Hurley extending to Baxterley where it joins with the current pipeline corridor.

**Figure 6.5: Hurley route options for assessment**




6.5.13 An assumed pipeline route corridor width of 50m was used for the assessment to enable a comparative assessment. This corridor width was used as this was a focused pipeline refinement exercise in a localised setting and to allow for a comparative assessment to take place.

6.5.14 From the assessment work undertaken it was concluded that whilst from an engineering perspective the northern routes were preferred in terms of better access for construction,

operation and maintenance, from an environmental, land and planning perspective, the southern routes have less significant constraints overall.

6.5.15 In this regard it was noted that the solar farm development would be an issue for the delivery of the two northern options, which would also be closer to residential properties. The northern options also had the potential for heritage impacts as there is a Grade II Listed Building within the pipeline route (Wood End War Memorial 1438051). The pipeline corridor intersects with the boundary of the cemetery associated with the listed war memorial. Based on this information, it was determined that the southern options would benefit from further investigation as it was considered that the engineering benefits associated with the northern options were not sufficient to outweigh the environmental, land and planning issues with those options.

6.5.16 The conclusions reached from the further consideration of the southern options was that, from an environmental, land and planning perspective, recognising that potential constraints such as a local wildlife site and areas of priority habitat could be avoided by careful design and detailed routeing work, there were no key or determinative differentiators between the different route options.

6.5.17 However, from an engineering perspective, HPR Southern Option 2 was considered the preferred route because it is the route that is the most direct and shortest overall. It would result in the lowest operational cost, lowest amount of material used and waste generated, and generate the lowest operational carbon costs. This route also provides the fewest bends in the pipe in comparison to all the other options, resulting in the smoothest hydraulic profile. Based on these conclusions, it was concluded that HPR Southern Option 2 should be progressed as the preferred option and this is the route which is now being progressed as part of the Proposed Development.

**Break-pressure tank locations**

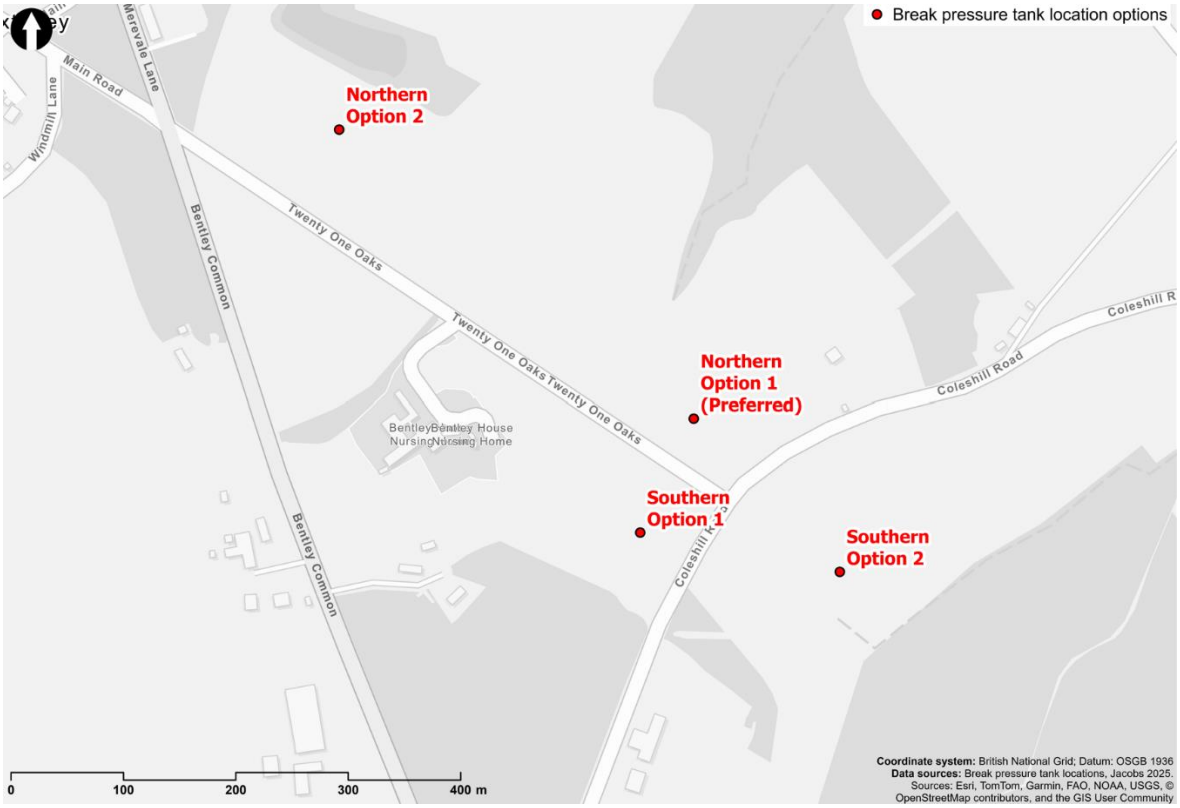
6.5.18 The first 12 km of the pipeline from Minworth to the canal network is pumped uphill, rising to a high point roughly 2km to the west of the canal network at Atherstone. At this point, the water is required to flow through a break-pressure tank. This is part-buried infrastructure that controls the flow rate of water entering the canal. Pumping water through the pipeline to the high point on the route is required and a Break-pressure tank is necessary to manage the water pressures that will be generated in the pumped rising main section, and the subsequent transition from a pumped flow to a gravity flow within the pipeline. Accordingly, the break-pressure tank needs to be sited at or close to the highest point along the pipeline route.

6.5.19 At the Phase One Public Consultation stage, the break-pressure tank was shown to be in the vicinity of the highest point along the pipeline corridor to the south of Merevale, with the exact location to be confirmed through further investigations and assessment by the design team.

6.5.20 The identification of potential locations for the break-pressure tank is principally driven by the elevation of the land and the need for optimal hydraulic conditions. There are also several secondary factors influencing the identification of a suitable site including size of the required site, distance from properties and the proximity to a watercourse for overflow discharge. The reason for the need for overflow discharge is for the storage of excess water in the event of failure within the gravity flow system and the continuation of the pumped flow, resulting in the build-up of water in the break-pressure tank until the system is shut down. This is a precautionary measure in the extremely rare event of failure in recognition of there being limited volume in the break-pressure tank. There is also a requirement for discharge from a retention pond to the watercourse for the surface water runoff from the break-pressure tank

area. The retention pond would be incorporated within the break-pressure tank location to help attenuate the drainage flows from the break-pressure tank. Since the Phase One Public Consultation further consideration has been given to the appropriate location for the break-pressure tank and four potential locations (Northern Option 1, Northern Option 2, Southern Option 1 and Southern Option 2) have been identified and assessed, as shown in Figure 6.6.

**Figure 6.6: Break-pressure tank location options**




6.5.21 A comparative, but largely engineering led, assessment has been undertaken of the options and Northern Option 1 has been identified to be the preferred location, providing optimal hydraulic conditions with suitable site conditions for overflow discharge storage. In addition, the considerations undertaken concluded that limited visual impact would likely result and appropriate access for construction and access purposes could be provided.

6.5.22 Southern Option 1 is a suitable location from a hydraulic perspective, in terms of being at a high elevation, though it presents other challenges and does not provide any significant additional benefit in comparison to Northern Option 1. It would require the creation of a new access for construction and operational purposes and is estimated to have a higher operational carbon output in comparison to other options, due to the pumping requirements. There would be a greater visual impact than other options particularly noting its proximity to residential dwellings and a Care Home (the Bentley House Care Centre). The corresponding pipeline would also result in less conducive hydraulic conditions due to the routeing to the site, and it would also require open cut construction methods to install the pipeline.

6.5.23 Northen Option 2 would present challenges associated with it being sited at a lower elevation than the other options resulting in sub-optimal hydraulic conditions. The option is estimated to have a higher construction carbon impact in comparison to the other options due to the length

of the required overflow pipeline. Northern Option 2 also has potential contaminated land issues. As with Southern Option 1, the corresponding transfer pipeline would also result in less conducive hydraulic conditions due to the alignment into and out of the break-pressure tank.

6.5.24 Southern Option 2 is also not considered to be an appropriate location because the discharge overflow watercourse would need to connect with an existing watercourse located in an ancient woodland. The location is also considered to have significant access issues, is at a less than favourable elevation from a hydraulic perspective and would also likely result in visual impacts that would need to be mitigated.

6.5.25 In summary, Northern Option 1 has been identified as the preferred location for the Break-pressure tank and will be subject to further assessment and ongoing design to determine the best design response.

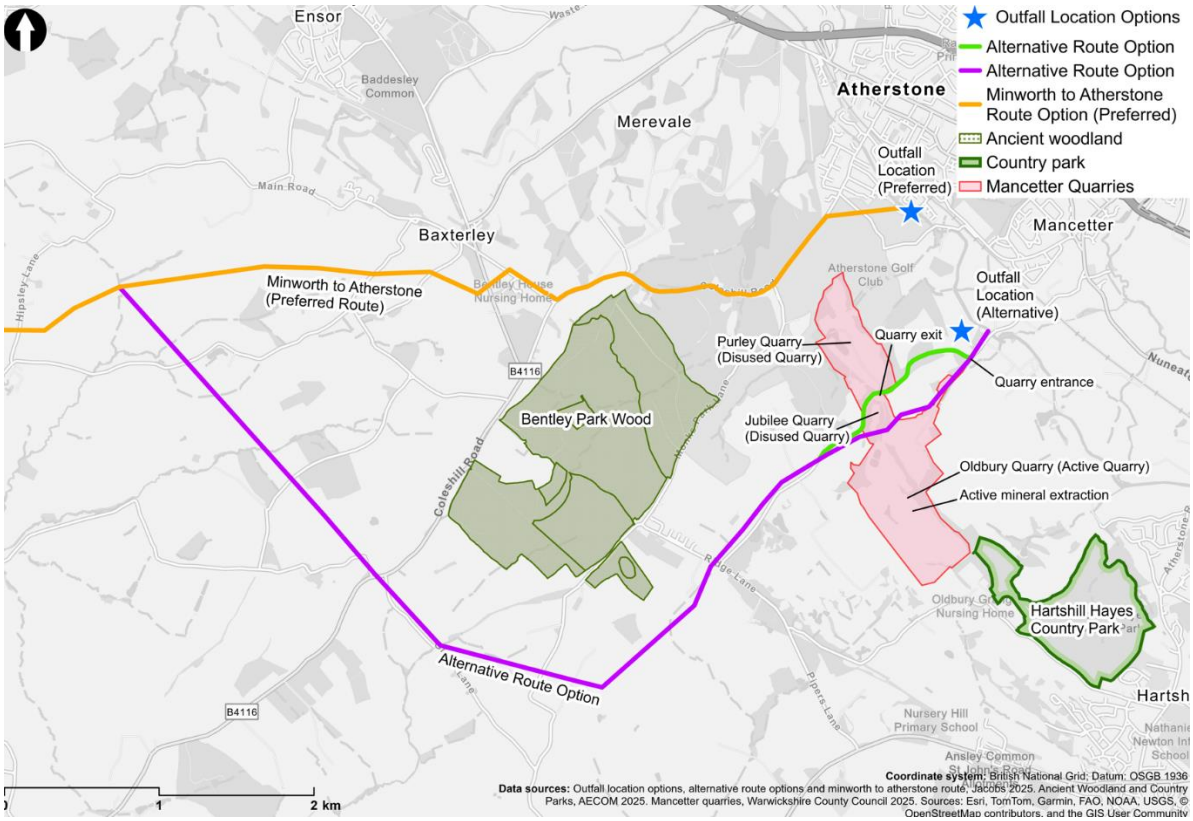
**Alternative Pipeline and outfall location to the south of Atherstone**

6.5.26 Following the Phase One Public Consultation and subsequent stakeholder engagement, feedback received questioned whether a potential alternative pipeline route exists to the south of the preferred route identified between Minworth and Atherstone.

6.5.27 An engineering review was undertaken as to whether a potential southern route or routes exist having regard to known or identifiable constraints. A potential alternative pipeline route was identified at the eastern end of the pipeline transfer corridor running to an outfall location on the Coventry Canal near the village of Mancetter. This potential Mancetter alternative route is shown as the purple Mancetter Alternative on Figure 6.7 and the outcome of the review that considered whether this route would be appropriate is summarised in the following paragraphs.

6.5.28 The route represents the most appropriate potential alternative corridor for assessment in this location due to it being the shortest pipeline route through to the alternative outfall location identified. The main constraint impacting the alignment is the Bentley Park Ancient Woodland, which is located to the north of the Mancetter alternative route. A potential route further south would also not be feasible due to the location of Hartshill Hayes Country Park to the south. These constraints present a limited ‘gap’ through which a potential alternative corridor could route to the canal.

**Figure 6.7: Potential Alternative Routes**




6.5.29 The most significant challenge associated with the potential alternative route identified is the presence of disused or active quarries in the area at the eastern end of the route in the 'gap' identified. The proposed alternative outfall location is near to Mancetter Quarry (an amalgamation of three mineral workings known as Purely Quarry, Jubilee Quarry and Oldbury Quarry). Oldbury Quarry is still an active Quarry with Purley and Jubilee Quarry now being restored. The presence of disused or active quarries poses significant engineering risks through unknown ground conditions, historic backfill material and residual stability concerns following the installation of a new pipeline. The proposed alternative southern route goes through the Jubilee Quarry and through a site where the operating plant for the Oldbury Quarry is located (adjacent to Jubilee Quarry).

6.5.30 Currently, Purley Chase Lane is used as a route for HGVs to access Oldbury Quarry and the associated plant via a one-way system. Construction activities associated with the installation of the pipeline would block this access to the quarry and limit HGV movements which could have a temporary, but potentially significant, operational impact on the quarry. An alternative localised route at the eastern end of the Mancetter Alternative was therefore reviewed - shown as the green labelled 'Alternative Route' in Figure 6.7. This localised 'Alternative Route' would however block the exit for the quarry and could also have operational impacts on the operation of the quarry.

6.5.31 Furthermore, within the Warwickshire Minerals Local Plan 2018-2032 (adopted July 2022), Mancetter Quarry is recognised as being a resource of national importance, so any implications for its operation have to be viewed in this regard. The pipeline route would be sited within an allocated Mineral Safeguarding Area for Crushed Rock defined by the adopted Minerals Local Plan. An application to extend the life of the quarry is under determination to extend operations at Mancetter Quarry for a further 5-year period until 1st January 2030.

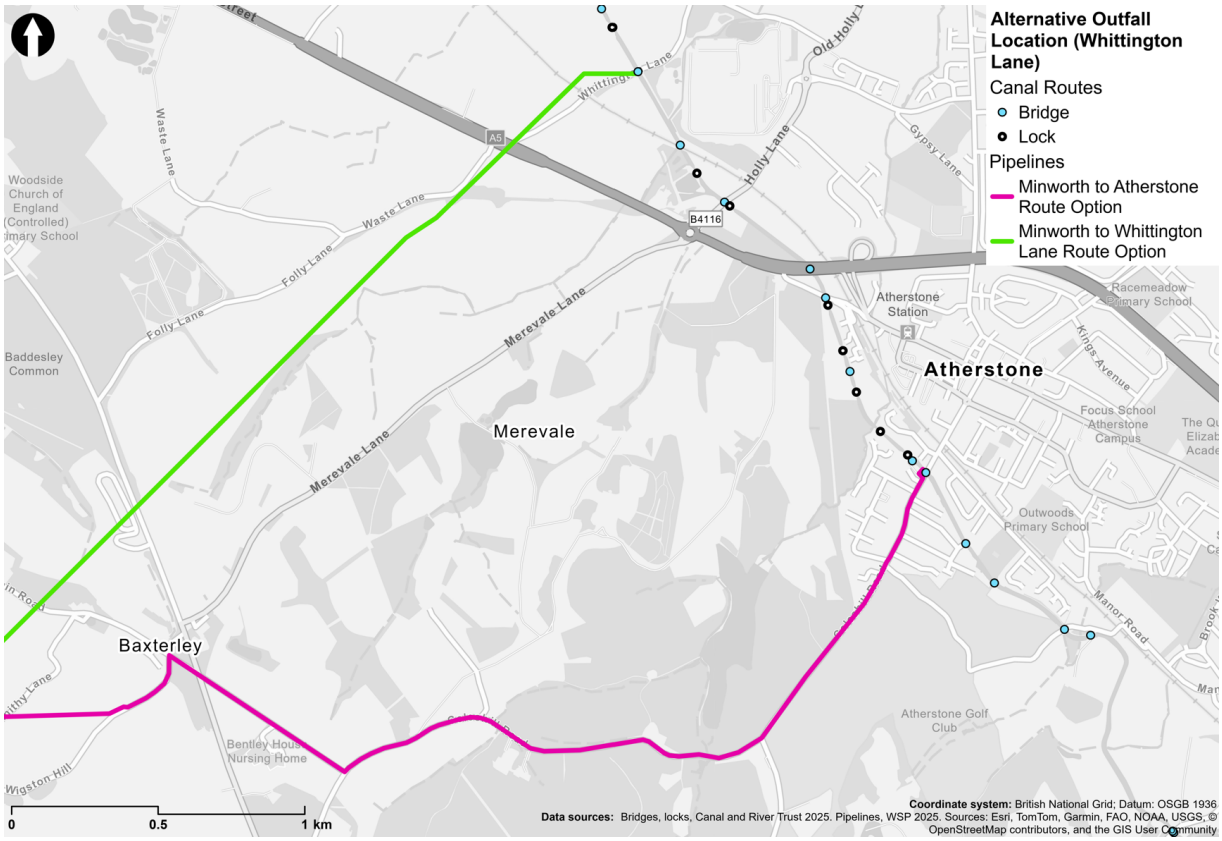
6.5.32 An alternative outfall location would also require a new location for the break-pressure tank and this would need to be at a higher elevation for this option, resulting in higher operational costs. The associated pipeline would also be longer than the identified preferred option to Atherstone (shown in yellow on Figure 6.7) resulting in higher operational and construction carbon impacts, in terms of additional waste, and materials and additional pumping energy requirements. Other constraints present include the route being in close proximity to parcels of Ancient Woodland and potential conflicts with priority habitats. The route also passes near to listed buildings and runs through a water drinking zone.

6.5.33 Overall, it has not been possible to identify a pipeline route to the south of the preferred route that is considered to be viable, the potential alternative route that has been considered presents several significant challenges.

6.5.34 It is highlighted, for completeness, that a pipeline route to an outfall location north of Atherstone has also previously been examined through earlier assessment work. The outfall location at Whittington Lane (Figure 6.8), in summary, also presented a number of significant challenges including the need to discharge into a lock flight which fall is in the opposite direction to the required water transfer flow direction. To overcome this a canal pumping station and bypass pipework (around 1000m long, a considerable proportion of which would be within the built up area of Atherstone) would be needed to transfer the water to the top of the lock flight. There would also be a need for a mainline railway crossing.

6.5.35 Assessment work undertaken to date has, therefore, demonstrated that both a pipeline route and outfall option north of Atherstone and an option south of Atherstone, are not preferable in relation to a location in Atherstone, which is discussed further in the following section.

**Figure 6.8: Outfall Location Whittington Lane**




### Consideration of outfall location options at Atherstone

6.5.36 At the Phase One Public Consultation, two potential options for connecting to the Coventry Canal at Atherstone were identified as being deliverable and subject to further assessment (see Figure 6.9). Option 1 (Atherstone Golf Course) is a route that runs from Coleshill Road across a section of Atherstone Golf Course. Option 2 (Coleshill Road) is a route that would see the pipeline continuing along the Coleshill Road to meet the canal at the point where it crosses Coleshill Road in the centre of the built up area of Atherstone.

6.5.37 Having reviewed the feedback received through the Phase One Public Consultation, further engagement with a range of stakeholders has been undertaken along with further assessment work on the two options. Option 1 (labelled Atherstone Golf Course on Figure 6.9) has been identified as the preferred route and outfall location option due to engineering benefits, operationally and because the construction of the pipeline would avoid the need to significantly divert critical utility services within Coleshill Road and limit disruption to the residents of Atherstone. Option 2 (labelled Coleshill Road on Figure 6.9) would involve routeing the pipeline further along Coleshill Road in a location with properties either side through Atherstone. This would result in significant disruption to the local population and businesses over the construction period. There would also be major utility diversion including the need to divert a large sewer main in south Atherstone.

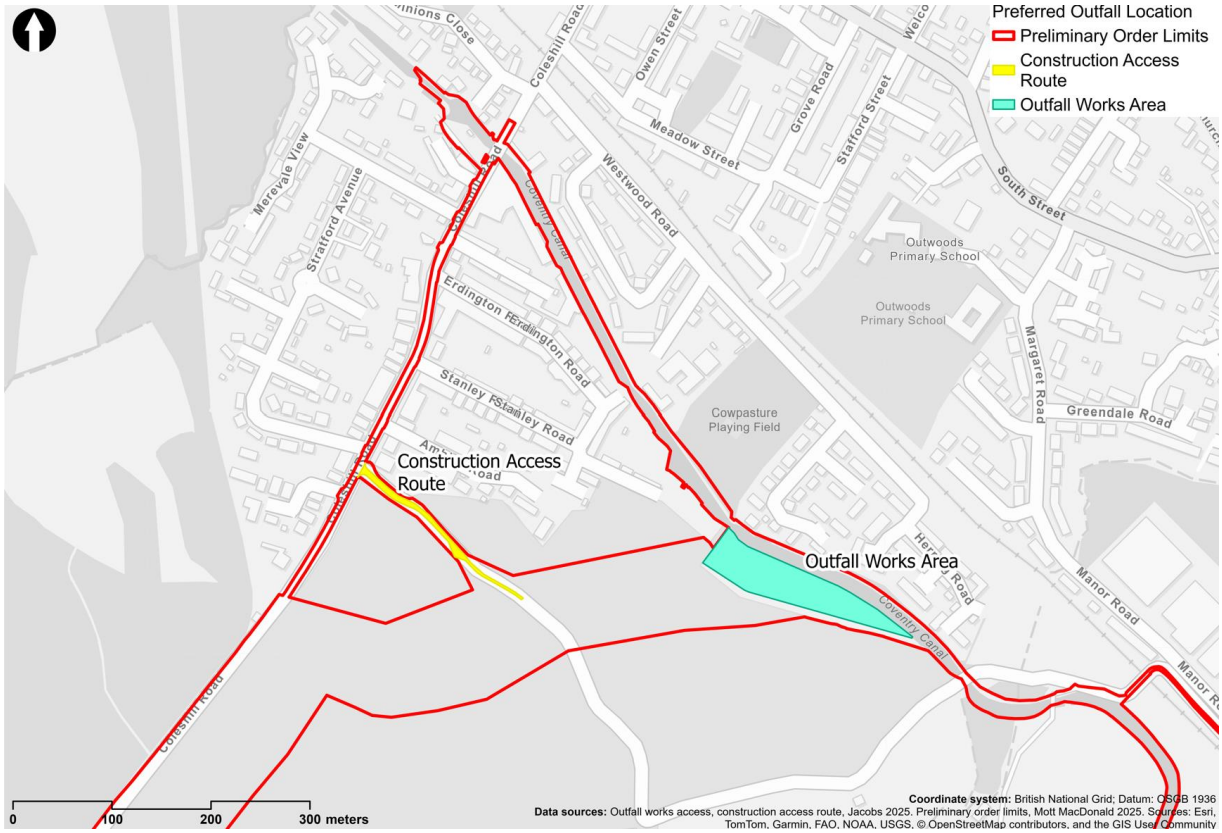
**Figure 6.9: Alternative Outfall Location Options Presented at the Phase One Public Consultation**

6.5.38 The decision to proceed with Option 1 has also been influenced by the feedback received through the Phase One Public Consultation and that the option significantly reduces the potential disruption on residents and businesses within Atherstone when compared with Option 2.

6.5.39 It is noted that part of the land associated with the Atherstone Golf Course preferred option is 'Common Land' and there would be works required within that area associated with the installation of the pipeline, in addition to the provision of a route for ongoing maintenance access. As the pipeline will be buried and the construction works would be a temporary activity only, it is not considered that de-registration and replacement of the common land would be required. However, consent to undertake the works would be required under the Commons Act 2006, which will need to be secured alongside the DCO.

6.5.40 Further work on the preferred option has been carried out (see Figure 6.10) and is ongoing to identify a precise route for the pipeline that will minimise impacts on both Atherstone Golf Course and the Ancient Woodland within this area. This includes ongoing root radar survey work which will assist refining the route along Coleshill Road.

## Figure 6.10: Preferred Outfall Location



# 7. The Canal Section

## 7.1 Introduction

7.1.1 This chapter explains the scheme development and optioneering related work that has been undertaken in respect of the canal section of the Proposed Development. Elements along the canal section form Parts 2 and 3 of the Proposed Development as detailed within the Preliminary Environmental Information Report that is also provided as part of the Phase Two Public Consultation information.

## 7.2 Overview of previous work undertaken

7.2.1 The work undertaken at the time of the Phase One Public Consultation of relevance to the canal section of the Proposed Development largely related to the identification of the appropriate route and method to transfer water from the WTW at Minworth to the Grand Union Canal. This assessment work is detailed in Chapter 5 of the September 2024 report and considered further in Chapter 6 of this report.

7.2.2 In addition, the Phase One Public Consultation Brochure (in Chapter 4) and the accompanying Phase One Public Consultation plans that were also produced in September 2024 did provide some further details on the likely type of infrastructure works that would be needed on the canal section of the Proposed Development. Some indication as to the likely locations of this new infrastructure on the canal section was also provided. The types of infrastructure and works referred to at that time included canal bank raising, pumping stations, lock bypasses, weirs and potential works to bridges.

7.2.3 The information provided in September 2024 made clear that further work was ongoing in respect of canal related infrastructure and that further detail would be provided at the next consultation. This further work is explained as appropriate in this Chapter.

## 7.3 Policy and Procedural Developments

7.3.1 As explained within Chapter 4 of this report, subsequent to the completion of the Phase One Public Consultation a number of policy and procedural developments have occurred.

7.3.2 These developments mean that in accordance with the position stated within paragraphs 1.4.5 and 1.4.6 of the NPSWRI and having regard to both the status of the Proposed Development and the manner in which it is described within AfW's WRMP24, the justification for the Proposed Development as described in the AfW WRMP24 is not a matter which will be revisited as part of the application for development consent.

7.3.3 Unlike other parts of the Proposed Development discussed in earlier chapters, however, there is less specificity given in the AfW WRMP24 in terms of the canal elements of the Proposed Development. Paragraph 7.32 of AfW's WRMP simply indicates that, *"The transfer will utilise the existing canal structure, passing through the Coventry Canal, the Oxford Canal and the Grand Union Canal, with a small number of pump and lock upgrades required. Water would be abstracted at a location near Leighton Buzzard …"*

7.3.4 Whilst the transfer of water using the Coventry, Oxford and Grand Union Canals in principle has been identified through the WRMP process – as further explained in Chapter 5 of the September 2024 report – further explanation and justification for the specific interventions needed along those stretches of the canal – these being elements of the Proposed

Development covered by this chapter – in terms of scheme development and optioneering work is necessary.

## 7.4 Phase One Public Consultation

7.4.1 A broad range of responses were received in respect of the canal section of the Proposed Development during the Phase One Public Consultation. Responses commonly centred around matters such as the impact on water flow in the canal, navigation matters, flood risk, water quality, the design and appearance of interventions and potential impact on the historic character of the canal network.

7.4.2 Comments received have been considered as part of the ongoing scheme design process. This has included exploring opportunities to reuse existing canal infrastructure and considering ways of minimising the extent of canal bank raising needed to accommodate the water transfer.

7.4.3 The potential impact on navigation and concerns surrounding increases in flow velocity have been considered through the process of defining necessary canal interventions, as detailed in the sub sections that follows.

7.4.4 Further detail on the feedback received from the Phase One Public Consultation is set out within the Phase One Public Consultation report published alongside this report.

## 7.5 Design Development following Phase One Public Consultation

7.5.1 The scheme design development and optioneering work that has been undertaken since the Phase One Public Consultation on the canal section has largely consisted of:

(i) identifying in further detail the appropriate works and infrastructure – including their location – needed along those sections of the canal network to be used for the purposes of water transfer, and

(ii) the undertaking of further design development on those identified works and infrastructure.

7.5.2 The work that has been undertaken is detailed in the following sections of this chapter by reference to the following types of works and infrastructure:

- Canal bank raising and modifications;
- Transfer locks;
- Pumped and gravity lock bypasses;
- Works to the Daventry and Drayton reservoirs that serve the canal network;
- Works to bridges, tunnels and aqueducts, and
- Works to weir structures.

7.5.3 The works identified as being necessary are a combination of new infrastructure and adaptations of existing infrastructure and are those works required to enable the relevant sections of the canal network to be used to transfer a maximum of 115 million litres of water per day (115Ml/d). This is the maximum level of water transfer necessary to meet the requirements indicated within AfW's WRMP24 – namely a 100Ml/d Annual Average Deployable Output level.

7.5.4 Other design factors identified and used to inform the ongoing identification of works and infrastructure and the development of their design included:

(i) ensuring that flow velocities within the canal network affected do not exceed 0.3m/s – which is the flow velocity limit for the operation of the Canal, as set by the Canal & River Trust;

(ii) ensuring that lateral flow velocities in the canal network affected will not exceed 0.3m/s or that no new complex water flow patterns occur around new structures;

(iii) preventing rapid changes in water levels and ensuring that the frequency of water levels within the canal network dropping below minimum navigable depth did not increase;

(iv) preventing overtopping of canal banks;

(v) preventing as far as possible, adverse impacts upon the air draught clearance for canal vessels at bridges and tunnels;

(vi) minimising the overall impact on canal assets as far as possible, and

(vii) improving, as necessary, the structural resilience of relevant significant existing canal assets that support the conveyance of the transfer water flow.

7.5.5 The ongoing identification of infrastructure and works was informed by modelling of the canal flows, to understand the hydraulics of the canal network and the likely implications of proposed interventions and works.

7.5.6 In addition, confirmation of the appropriate outfall location at Atherstone (as explained in Chapter 6) and the decision to proceed with Site B and corresponding abstraction point from the Grand Union Canal (as explained in Chapter 8), has confirmed the extent of the canal network along which infrastructure and works need to be considered.

7.5.7 It is highlighted that the scheme development and optioneering work undertaken for those aspects of the Proposed Development required along the canal network is different to the work undertaken on the northern and southern parts of the Proposed Development. This is because the work is considering the interventions required to an existing infrastructure asset (i.e. the canal network) which has an existing important function and way of operating rather than creation of a new infrastructure asset.

## 7.6 Bank raising and modifications

7.6.1 Bank raising is required along certain parts of the canal network in order to ensure that an appropriate level of freeboard is available – freeboard being the distance between the water level in the canal and the corresponding top of the bankside element of the canal that contains the water. There are broadly four types of ‘canal banks’:

(i) Hard banks – typically on the towpath side of the canal to provide boat moorings and usually constructed from steel sheet piles;

(ii) Soft banks – typically on the offside, non-towpath side of the canal, typically of earth construction and generally not as easily accessible;

(iii) Masonry walls normally found at the location of canal infrastructure such as locks, and

(iv) Masonry or brick walls that form part of buildings that form the edge of the canal.

7.6.2 Due to the likely disruption that would be caused and the practical implications of undertaking bank raising, scheme development work has looked to minimise the extent of bank raising through the provision of new transfer locks. These new locks are discussed further in section 7.7 and effectively break up stretches of the canal network into smaller canal sections, or pounds, enabling changes in water levels to be reduced and more easily controlled.

7.6.3 The extent of bank raising with such transfer locks in place has been informed by hydraulic modelling of the canal, surveys of existing bank heights, the use of LIDAR data and localised ground based hydrographic surveys.

7.6.4 The general design principle for the extent of bank raising is to ensure that, a minimum of 150mm of freeboard of a sufficiently robust nature is in place when the water transfer is occurring at the maximum 115Ml/d flow level and approximately 250mm during maximum 'business as usual' transfer rates of 80Ml/d when the transfer locks are open. This freeboard level is considered sufficient to manage the implications of increased water levels and wave surges. Some limited exceptions to this general principle may be made in circumstances where providing such a freeboard level is considered problematic due to existing canal operations or environmental sensitivities.

*7.6.5* The precise extent of bank raising required is a matter still under consideration. In terms of the nature of the bank raising to be provided it is generally proposed that the method of raising will match the existing form of the 'bank' which needs to be raised. Plans showing the indicative bank raising works are provided as part of the Preliminary Environmental Information produced separately as part of the Phase Two Public Consultation Information (*Parts 2 & 3 Canal and Reservoir Works Indicative Layout Plans - Figure 3-P2&3-1)*

7.6.6 Investigations are ongoing to ensure that all aspects of the canal network and the assets along it which require resilience interventions as a result of the Proposed Development have been identified.

## 7.7 Transfer locks

7.7.1 A transfer lock is a new lock on the canal network that shortens the length of the canal that exists between locks, which is known as a 'pound'. The transfer locks are designed to provide a small change in water levels from the upstream to the downstream side. This effectively breaks up the hydraulic gradient across a long pound during high water flows and significantly reduces bank raising requirements within the upstream end of the pound.

7.7.2 Investigations were undertaken using hydraulic modelling, to test the effect of introducing new transfer locks and bypasses within certain long pounds that exist on the canal transfer section of the Proposed Development. As a result of the investigations undertaken, three new transfer locks, and accompanying bypass structures, are proposed as part of the Proposed Development within the following pounds:

(i) Atherstone to Hawkesbury pound - the stretch of canal between Atherstone Lock and Hawkesbury Junction (broadly between the urban areas of Atherstone and Coventry) that is approximately 18 km in length;

(ii) Hawkesbury to Hillmorton pound - the stretch of canal between Hawkesbury Junction and Hillmorton locks (broadly between the urban areas of Coventry and Rugby) that is approximately 20 km in length, and

(iii) Weedon pound - the stretch of canal between Whilton Locks and Stoke Bruerne Lock (broadly between the urban areas of Daventry and Milton Keynes) that is approximately 22 km in length.

7.7.3 Further detail is provided on the proposed transfer locks within these pounds in the following sections. In terms of the location of the transfer locks, general hydraulic principles mean that they are ideally located in the centre of the pound, albeit that there is considered to be little difference in varying the precise location within 2km of the centre point of the pound.

7.7.4 In addition to the transfer lock needing to be appropriately located, they also require:

(i) an appropriate access for construction and maintenance – the identification of which has taken account of matters such as the availability of any existing access arrangements and the local environment;

(ii) a bypass pipeline with associated inlet and outlet weirs;

(iii) a power supply to operate the lock gates and weirs.

7.7.5 The choice of location for a transfer lock is influenced by these matters and also environmental considerations and the minimising of impacts to canal users, local residents and businesses.

7.7.6 The transfer locks will normally remain open for all water flows up to 80Ml/d. When higher transfer flows are required – which will only be in severe drought or exceptional operational conditions (considered likely to occur once every 10 to 20 years) – then the lock gates will shut and bypass pumping will start. This will act to equal out as far as necessary the water levels in the upstream and downstream parts of the canal either side of the lock to water levels within normal operating levels.

7.7.7 The type of lock gates proposed for the new transfer locks will be similar to locks found elsewhere on the canal network. The type of lock gate will be defined during ongoing design work.

**Atherstone to Hawkesbury pound – the Springwood Transfer Lock**

7.7.8 One new transfer lock is required along this pound. Two potential locations (a northern and a southern option) for this transfer lock (proposed to be called the Springwood Transfer Lock) within the Atherstone to Hawkesbury Pound in the area north of Nuneaton are still being considered. The locations of these are shown in Figure 7.1 and discussed further in the following paragraphs.

7.7.9 The currently preferred option (the southern option) lies to the east of Wood Bridge (Bridge 27 on the Coventry Canal) and is shown on Figures 7.1 and Figure 7.2. The site of the lock and its associated construction areas would be largely located on agricultural fields. The preferred access to this lock site would be provided from the B4114, Tuttle Hill to the south-east, from where the access route would follow Common Lane westbound before turning north-east onto Yamley Lane, arriving at the proposed lock site. Alternative access to this lock site has been considered along Yamley Lane directly off the B4111 (Mancetter Road). However, this route is currently not preferred due to a number of factors including its proximity to residential receptors and narrow width.

7.7.10 The preferred southern option overlaps with an outline planning application for up to 400 dwellings (Planning reference: 040102, Nuneaton and Bedworth BC). This overlap, however, only relates to the proposed access to the transfer lock site at a point close to the junction with the B4114,Tuttle Hill and proposed temporary construction compounds for the Proposed

Development located in that same area (see Figures 7.1 and 7.2). Although the planning application has not yet been determined, it has been taken into account during the development of this transfer lock option. Appropriate access to the lock site is considered to remain feasible, but the design and location of temporary compounds will require further review.

7.7.11 This location is also understood to benefit from a nearby power supply which would be needed to support the proposed pumping station, the operation of the lock gates and control of the weir required as part of the transfer lock. It is also considered possible that the construction would have a minimal impact on the towpath due to the majority of the works taking place on the offside (non-towpath) side of the Canal.

**Figure 7.1: Indicative general arrangement of potential Springwood Transfer Lock locations, including access and approaches**

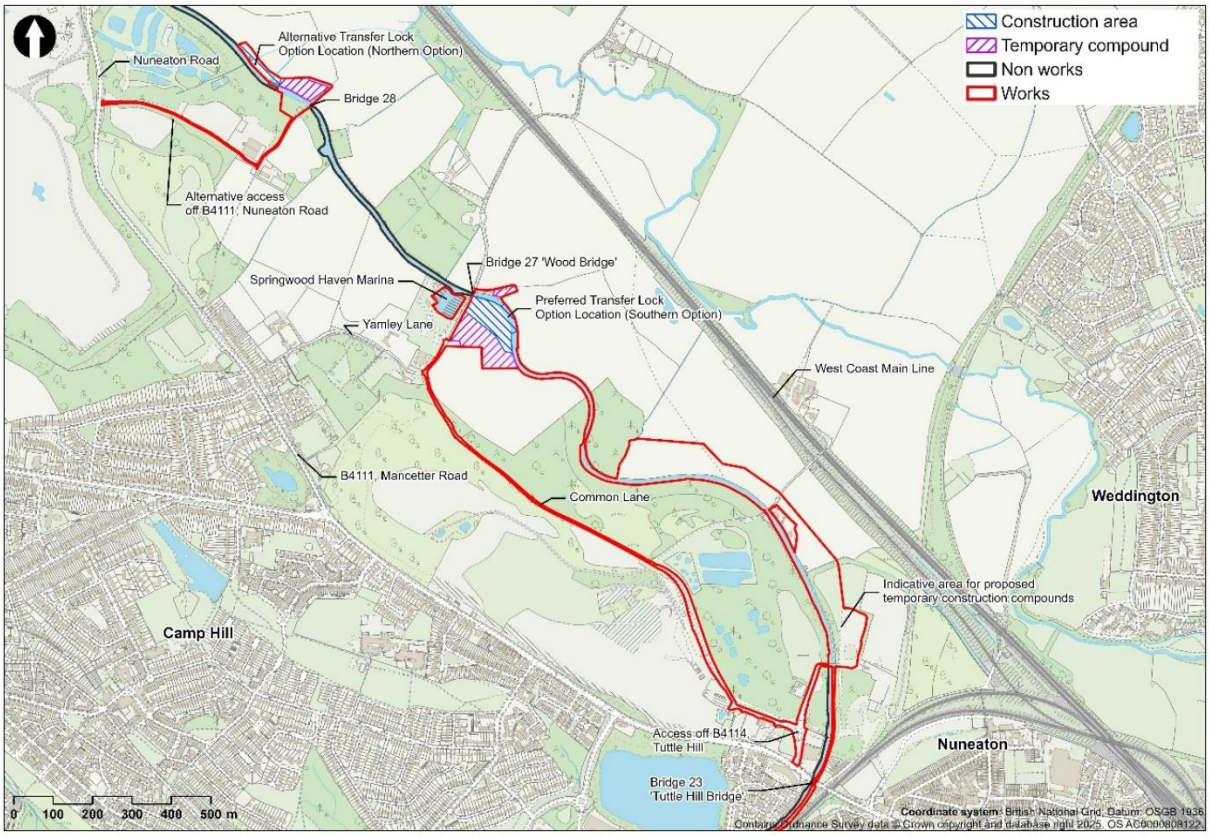
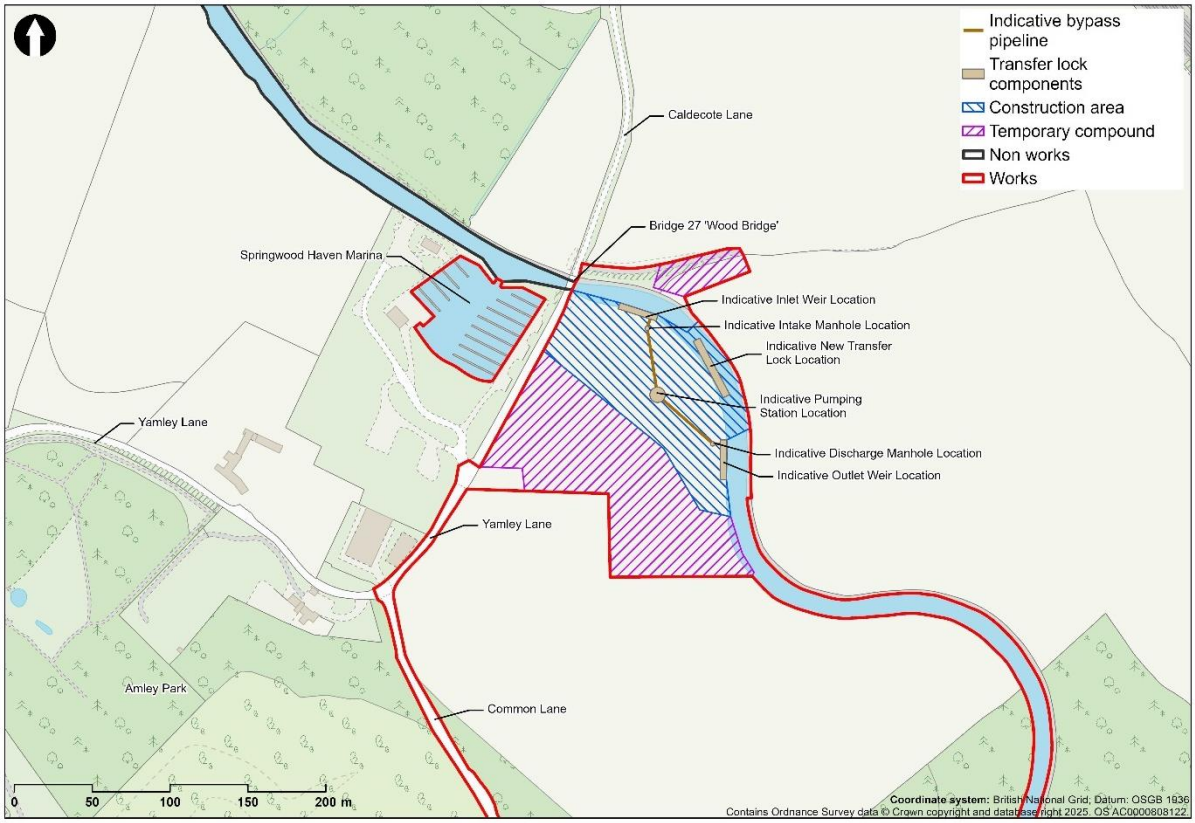
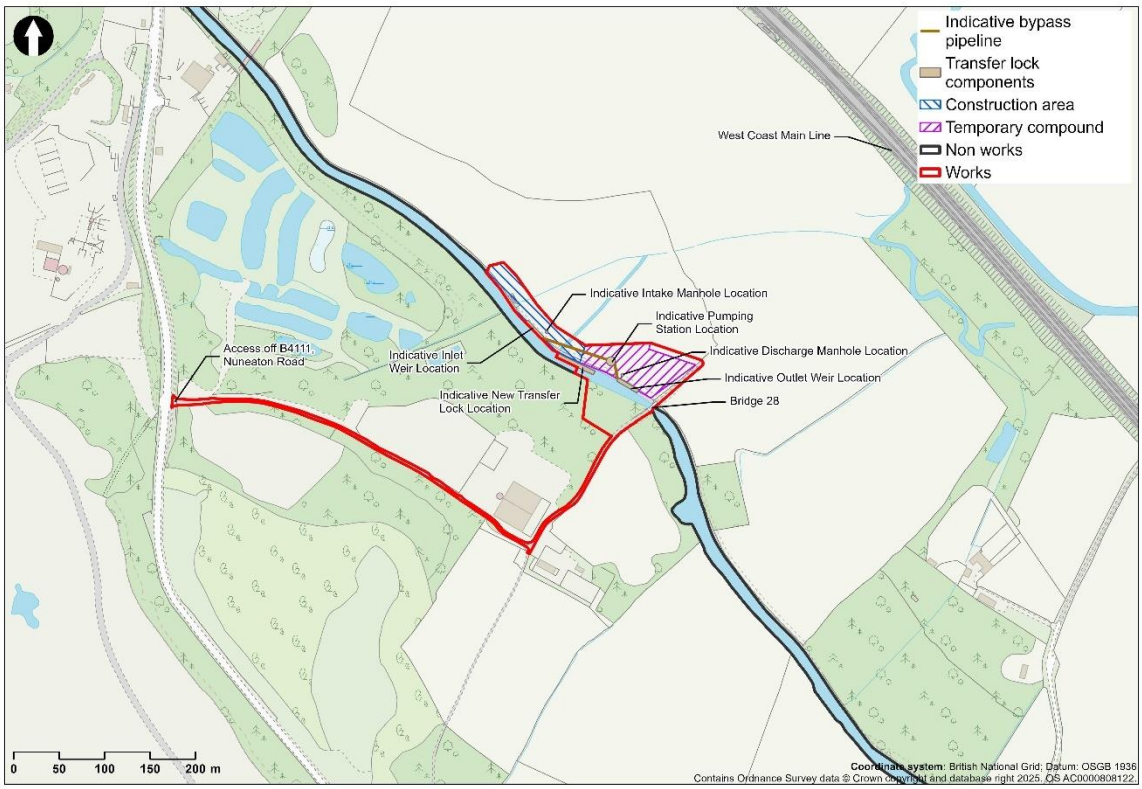


**Figure 7.2: Indicative general arrangement of Springwood Transfer Lock (Southern option)**




7.7.12 The alternative location for this new lock, shown in Figures 7.1 and Figure 7.3 (the northern option) lies approximately 700m upstream from the preferred southern option and adjacent to the upstream side of Bridge 28. The new lock in this location would be accessed via a farm access off the B4111, Nuneaton Road.

**Figure 7.3: Indicative general arrangement of Springwood Transfer Lock (northern option)**



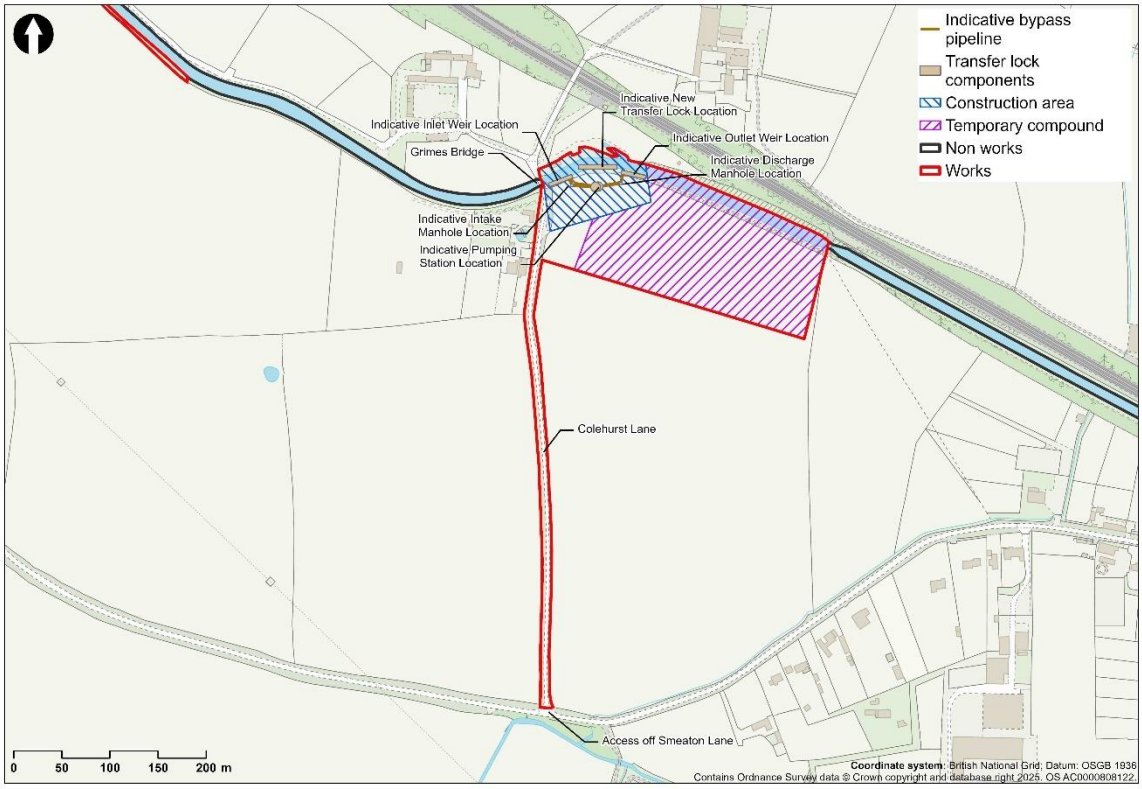

7.7.13 This option is more constrained than the preferred option in terms of both available space and space not currently covered by vegetation. Unlike the southern option, it is considered that due to space constraints the provision of temporary construction compound areas would require a greater level of vegetation to be removed. A further drawback for this option is the likely need for piling along the open edge of the canal to maintain the canal bank in this location and to ensure there are no impacts from bank slippage on the canal and boats navigating along it. The likely need for piling is because in this location the canal bank slopes downwards towards the canal. The majority of construction activity would also have to take place on the towpath side of the canal with the potential associated disruption for canal users that would result.

**Hawkesbury to Hillmorton pound - the Grimes Bridge Transfer Lock**

7.7.14 Having regard to the various requirements for transfer locks summarised earlier, only one viable location has been identified for a transfer lock (proposed to be called the Grimes Bridge Transfer Lock) within the Hawkesbury to Hillmorton pound on the Oxford Canal part of the canal route section. This location is approximately 3.5km south-east of the M6 / M69 junction to the east of Coventry. The proposed site is accessed from the B4029 via Smeaton Land and Colehurst Lane and is located adjacent to Grimes Bridge (Bridge 26 on the Oxford Canal). Indicative details of the proposed transfer lock and its location are shown in Figure 7.4

7.7.15 Good access is considered to be available to the site via Colehurst Lane and Smeaton Lane to the south. The area around the new lock location is primarily arable land and there is an existing power supply source within the vicinity.

**Figure 7.4: Indicative general arrangement of Grimes Bridge Transfer Lock**




**Weedon pound – the Dodford Road Transfer Lock**

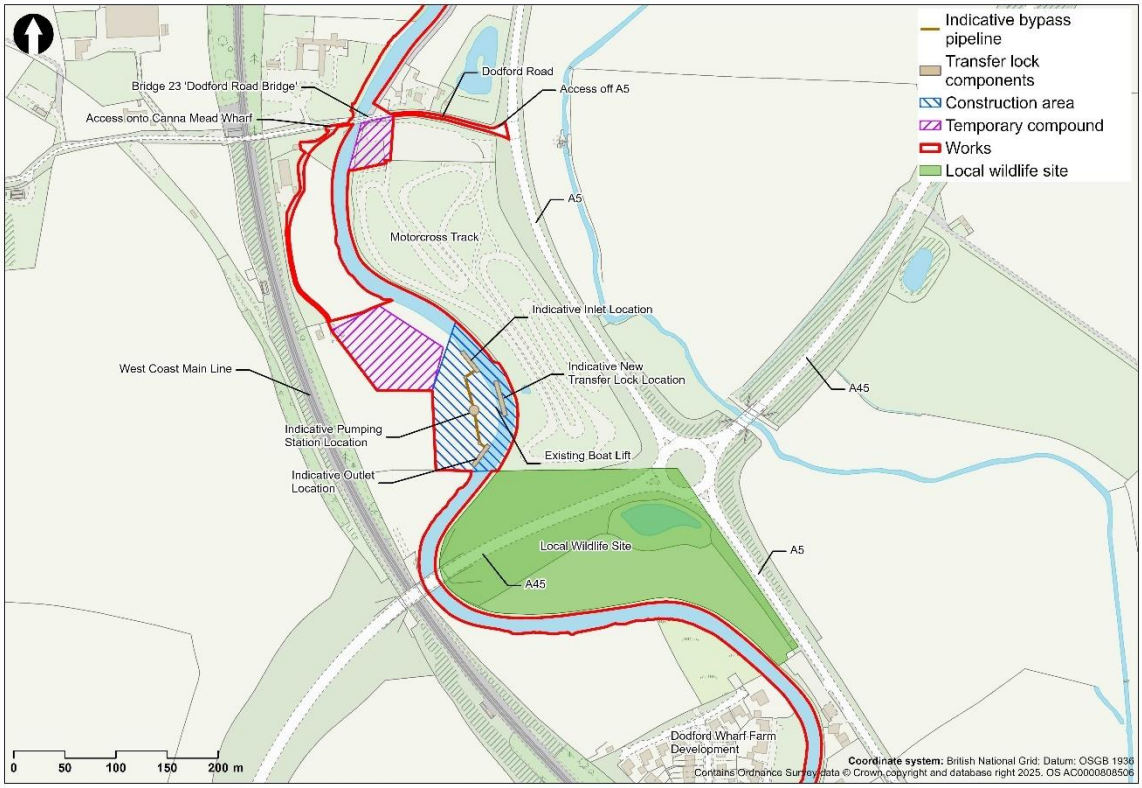
7.7.16 For the proposed new transfer lock location within the Weedon pound (proposed to be called the Dodford Road Transfer Lock) different locations have been considered. An early option was considered at a location of what is now a recently completed housing development (Dodford Wharf Farm) which was, therefore, discounted. Consideration was also given to an agricultural field located on the towpath (northern) side of the canal, adjacent to the south of the A45. However, this was identified as a being a Local Wildlife Site and its arboricultural and ecological sensitivities, as well as the potential impact on the towpath, which would require diversion during construction and likely lead to a permanent realignment post works completion, led to this option being discounted.

7.7.17 The preferred proposed location lies approximately 200m north of the point where the A45 crosses the canal, on the opposite side of the canal to a motorcross track and adjacent to an existing boat yard with a boat lift facility that serves the canal community. This site would be accessed off Dodford Road off the A5 and after crossing over Dodford Road Bridge access to the lock site would be via Canna Mead Wharf (Bridge 23). Indicative details of the proposed transfer lock and its location are shown in Figure 7.5.

7.7.18 The area adjacent to the proposed new transfer lock location is predominantly a grassed area and, therefore, would require minimal vegetation clearance to facilitate the works.

7.7.19 Although there could be some impact on the boat lift, options have been considered and are being discussed with the landowner as to how the mobile crane can be moved elsewhere. Opportunities are also being explored as to how the Proposed Development can provide long term enhancements to the boat lifting yard.

**Figure 7.5: Indicative general arrangement of Dodford Road Transfer Lock**




## 7.8 Pumped and gravity bypasses

7.8.1 A key intervention necessary to enable the transfer of water through the canal network at the rate required is the means by which some of the water flow can bypass existing locks. Without such interventions the existing locks would otherwise restrict the flow of water. Whilst locks along the canal already benefit from some form of bypass system, these are not sufficient to accommodate the water transfer flows that could be generated as a result of the Proposed Development. It is, therefore, necessary for additional bypass interventions to be provided at relevant locks on the affected stretches of the canal network, as identified in the Phase One consultation. These works have been the subject of ongoing consideration since the Phase One Public Consultation.

7.8.2 Dependent on the existing features of a particular lock, its location and the gradient, different types of bypass intervention are required. Gravity bypasses transfer water downhill around a lock under the action of gravity. They comprise an intake weir structure, an inlet weir control building including power supply, a bypass pipeline round the lock and an outlet weir structure. Pumped bypasses require water to be pumped uphill around a lock from one pound to the next. Pumped bypasses, therefore, also require a pump station and power in addition to an inlet structure, pipeline and outlet structure. In certain instances, it may also be necessary for the bypass intervention to include some form of design feature on the outlet structure in order to reduce the velocity of water as it is discharged back into the canal network to ensure that velocities at the discharge point are no greater than 0.3m/s.

7.8.3 The general location of the bypasses and the nature of the bypasses required are, therefore, dictated by the location of existing lock infrastructure and the existing nature of the canal in

that location in terms of water flows. It is only the detail of the works and precisely where they could be located within the general locality where any optionality exists.

7.8.4 In the ongoing work of considering the appropriate more precise specific location of the various elements of infrastructure required for each bypass, regard has been had not only to technical considerations but also to matters such as accessibility (for construction and maintenance, the identification of which has taken account of matters such as the availability of any existing access arrangements and the local environment), high level environmental considerations, including heritage, and the minimising of impacts to canal users, local residents and businesses. Such matters in respect of each bypass are identified as relevant in the summary explanations that follow. The preliminary environmental implications of these works and interventions are, however, considered within the Preliminary Environmental Information Report, which is produced alongside this report for the purposes of Phase Two Public Consultation.

**Hawkesbury Junction**

7.8.5 The Hawksbury Junction marks the point at which the Coventry Canal meets the northern limit of the Oxford Canal. To the north and north-west of the junction is the settlement of Hawkesbury.

7.8.6 A pumped bypass is required at Hawkesbury Junction to transfer water from the Coventry Canal to the Oxford Canal, around the existing lock structure (Hawkesbury Lock). Due to the existing arrangement of the canal junction, the layout of the bypass is relatively simple as the inlet weir structure can be located on the southern bank of the Coventry Canal, connected via a short stretch of underground pipeline to the outlet weir structure on the northern bank of the Oxford Canal, thereby only needing to span approximately 25m of land between the respective canals. The proposed pumping station can be located on the stretch of land between the inlet and outlet structures.

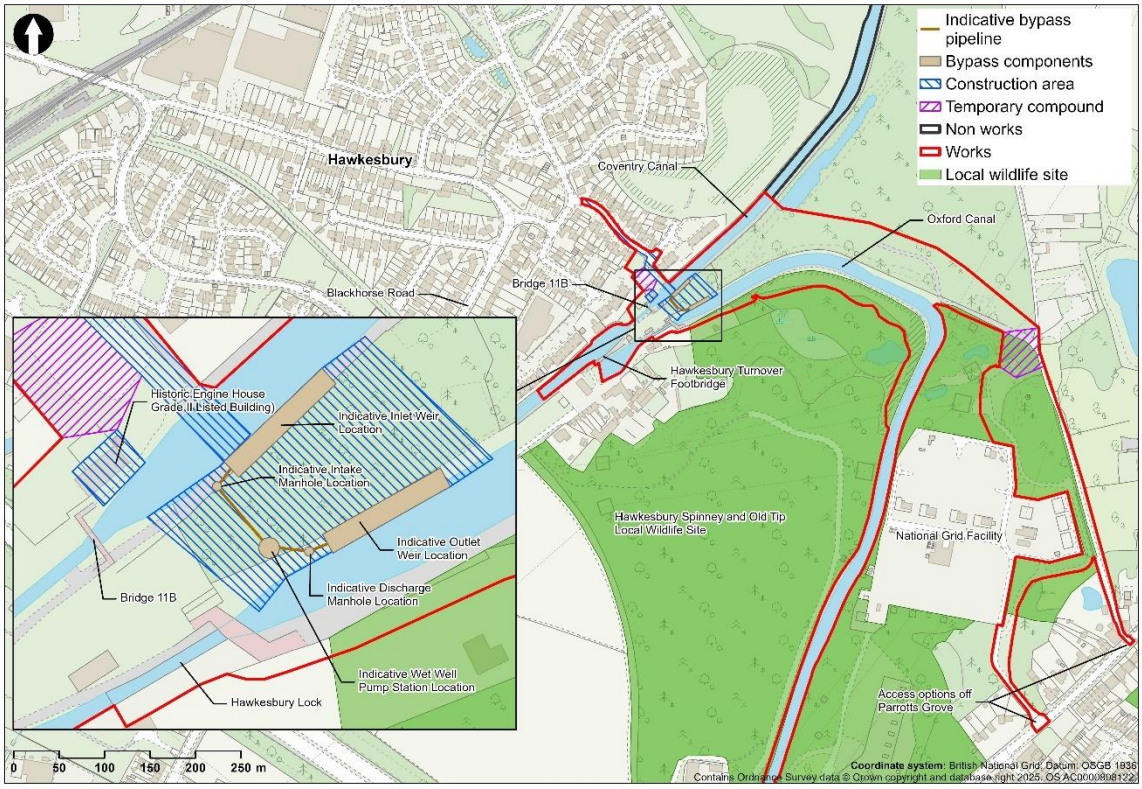
7.8.7 Access to the site of the proposed lock transfer and associated temporary laydown area can be provided via two separate access points along Parrotts Grove to the south-east of Hawkesbury Lock – one of which is an existing access into a National Grid facility. These two access route options converge to the east of the National Grid facility and then effectively follow the alignment of the canal along tracks through a vegetated area – part of which is a Local Wildlife Site. Some vegetation clearance is likely to be required to provide suitable access. No other vehicle access route to the site of the proposed bypass is considered possible.

7.8.8 Consideration was given as to whether elements of the bypass could be housed within an existing historic engine house (Grade II listed) located on the northern bank of the Coventry Canal. This possibility was not taken forward in respect of the pump elements of the bypass intervention because the location of the engine house building on the northern bank of the Coventry Canal would require a more complex bypass arrangement with infrastructure such as the inlet weir structure also being located on the northern bank of the Coventry Canal and a requirement for the pipeline to cross under the Coventry Canal and then the land to the south before reaching the discharge point on the Oxford Canal.

7.8.9 However, it was determined that relevant bypass control panels and infrastructure could be located in the Grade II historic engine house with it only being necessary for power and control cables to run under the Coventry Canal. Using the engine house in this way would result in improvements being made to the condition of that building and remove the need for a new control kiosk structure to be constructed on the land between the Coventry and Oxford Canals.

7.8.10 A plan showing the indicative general arrangement of these various interventions is shown on Figure 7.6.

**Figure: 7.6: Indicative general arrangement of pumped bypass at Hawkesbury Junction**




## Hillmorton

7.8.11 Hillmorton Locks – consisting of three sets of locks known as a lock flight – are situated north-east of Hillmorton, on the eastern edge of Rugby beyond the West Coast Main Line railway.

7.8.12 A pumped bypass is required at Hillmorton Locks. An inlet weir structure is proposed approximately 60m north of locks 2 and 3 on the western bank of the canal, with a pipeline then proposed to run a distance of approximately 650m generally following the western boundary of the canal before discharging back into the canal just to the south of locks 6 and 7 (the most southerly of the three sets of locks). Whilst the locks are currently served by an existing pumping station, this is not considered suitable due to its size and capability for the requirements of the water transfer. A new pumping station to service the new bypass is, therefore, proposed close to the proposed new inlet weir structure.

7.8.13 The area immediately surrounding the locks is predominantly open and undeveloped. Access to the area from the south is available via The Locks which in turn is accessed from Brindley Road in the west. This road underpasses the West Coast Main Line railway through a tunnel and is subject to a height restriction of 3.5m. Access from The Locks would be through the car park of St John the Baptist Church – a Grade II* listed building – and then through scrubland. This approach would require traffic management due to spatial constraints.

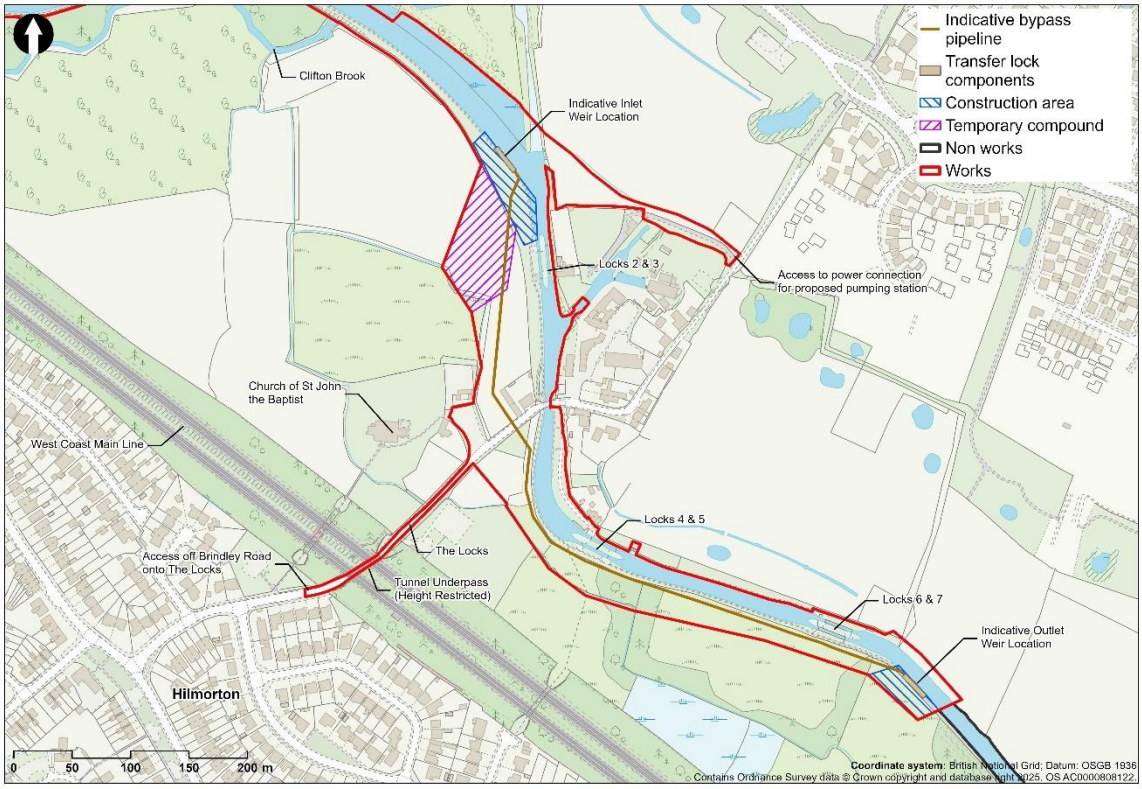
7.8.14 An alternative access option was considered, which would approach the site of the works from Hillmorton Lane to the northwest. However, this was discounted as it would require establishment of an access across an extensive area of scrubland and would have required

the bridging/culverting of Clifton Brook. For these summarised reasons this option in respect of access was discounted.

7.8.15 An access to the north of Hillmorton has also been included to facilitate a power supply to the proposed pumping station. Power supply would be taken from the east and routed underneath the canal to serve the proposed pumping station.

7.8.16 A plan showing the indicative general arrangements for the bypass is shown in Figure 7.7.

**Figure 7.7: Indicative general arrangement of pumped bypass at Hillmorton Locks**




**Braunston**

7.8.17 Braunston locks (a flight of 6 locks) lie to the south and south-east of the village of Braunston. The locks are located between Braunston Wharf and Marina to the west, and the entrance to the Braunston Tunnel on the canal to the east. The tunnel is approximately 1.8km long.

7.8.18 The area around the canal and the locks is semi-rural in character with some limited residences and businesses located around and along the canal. The area is a busy boating area with boating businesses and mooring sites within the locality.

7.8.19 A pumped bypass is required at Braunston to enable transfer past the full flight of locks and the full length of the Braunston Tunnel. The proposed bypass will also support the transfer of water to the existing Daventry and Drayton reservoirs via a pipeline spur off the proposed bypass (an element of the Proposed Development discussed further in section 7.11).

7.8.20 The main bypass interventions at Braunston will consist of:

- An inlet weir structure west of Lock 1.

- A new pumping station close to the inlet structure.
- A bypass pipeline running south from the inlet structure which then turns east to broadly follow the southern bank of the canal. At a point close to the entrance to the Braunston Tunnel the pipeline would diverge into two. The discharge pipeline would continue along the line of the canal, and the second spur would continue south-east to feed the Drayton and Daventry reservoirs.
- An outlet structure east of the eastern end of the Braunston tunnel.

7.8.21 In developing the design and location of these bypass works consideration was given, amongst other things, as to whether it would be possible to use the existing pump house for this bypass and position the inlet structure closer to Lock 1. However, due to its location in close proximity to a concentration of moorings and commercial uses, and issues with the location and gradient of the existing rising main connecting to the pump house it was determined that overall, this would be less favourable than the preferred option above.

7.8.22 Access to the proposed inlet weir location is currently envisaged to be taken from the A45/ Brindley Quays near Braunston Marina and utilise an existing disused railway corridor. Potential construction compounds would be located at various points along the bypass route. Access to the outlet weir is proposed via an access track running off Welton Lane to the east.

7.8.23 A plan showing the indicative general arrangements for the bypass are shown in Figure 7.8 and Figure 7.9.

**Figure 7.8: Indicative general arrangement of pumped bypass at west of Braunston Tunnel**

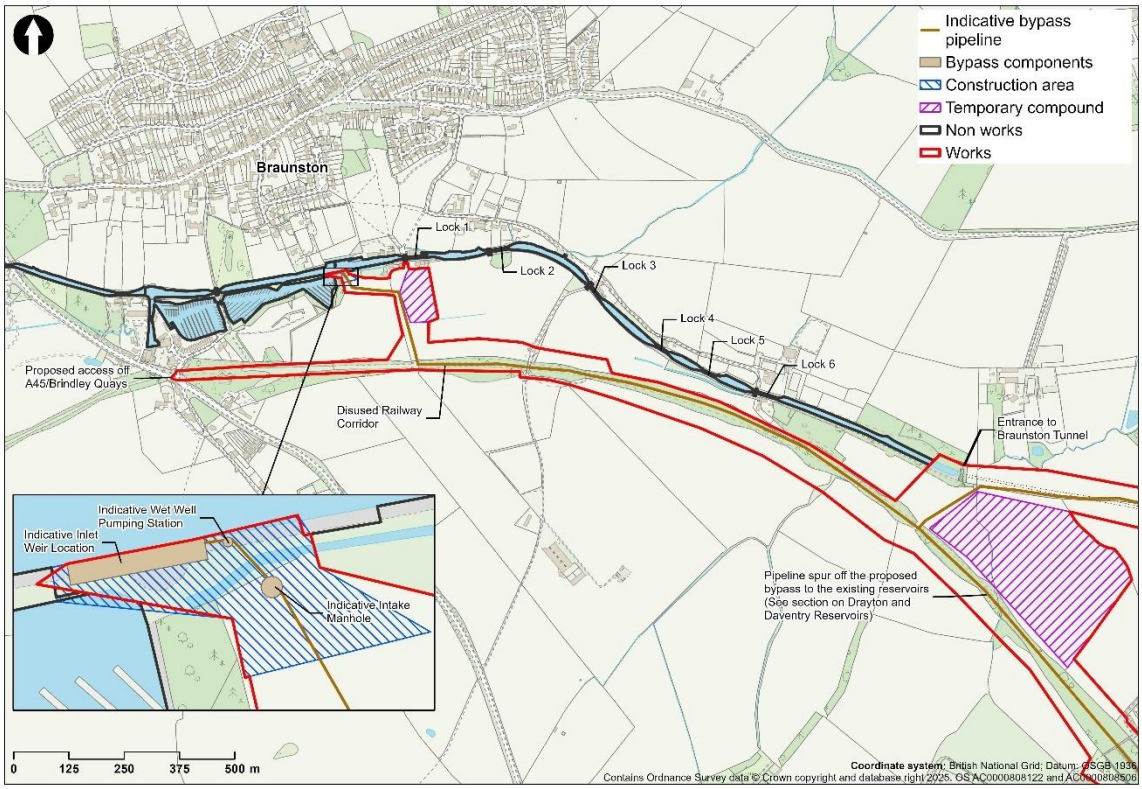
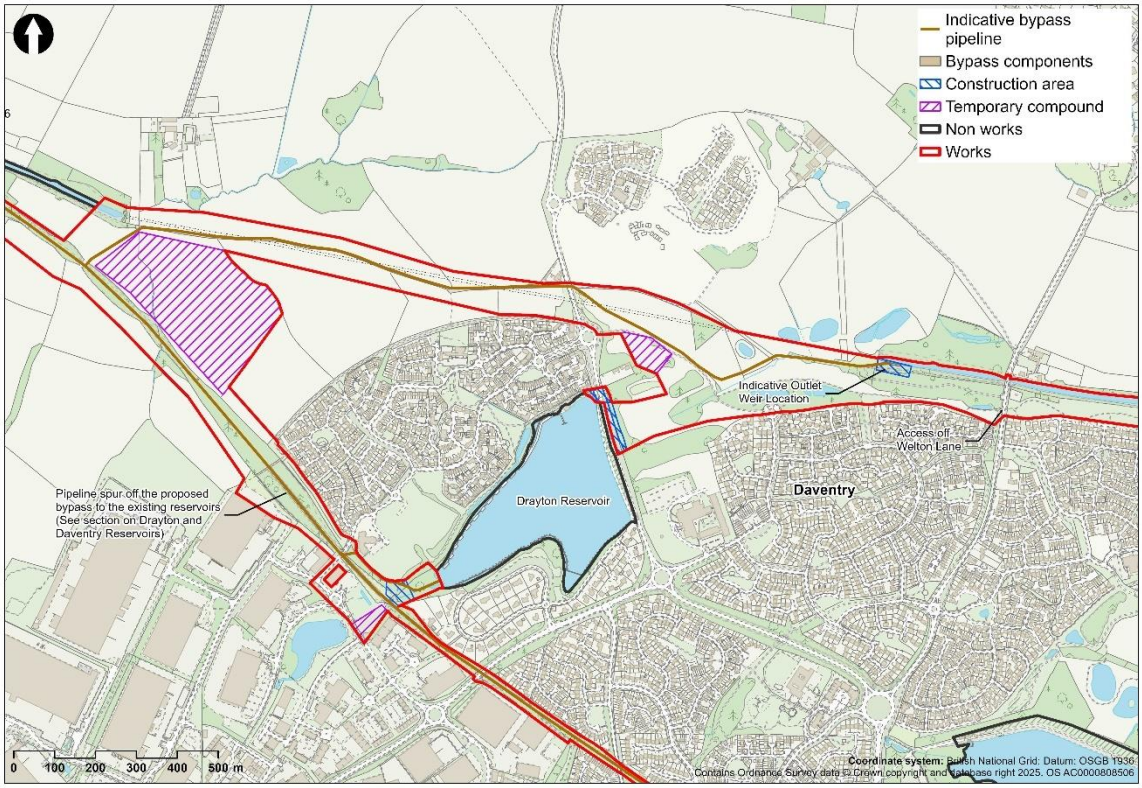


**Figure 7.9: Indicativegeneral arrangement of pumped bypass at south of Braunston Tunnel**




**Lock 7 (Buckby Top Lock)**

7.8.24 This lock is situated to the north-west of Long Buckby Wharf and to the east of Norton Junction, east of where two branches of the Grand Union Canal meet. The A5 crosses the canal on a bridge immediately to the east of the lock.

7.8.25 A gravity bypass is required at this lock. Options considered included various layouts of infrastructure for the bypass of this single lock, or the collective bypass of this lock and a further two locks (locks 8 and 9) located further along the canal, with a single pipeline. This latter option was not taken forward in order to minimise the extent of physical works and disruption. The bypass works to locks 8 and 9 are discussed in further detail in following paragraphs.

7.8.26 The preferred option for this bypass is to locate the inlet weir approximately 100m west of lock 7, and to locate the outlet weir structure to the south-east, to the east of the A5, with these locations chosen to minimise impact on mooring locations. The proposed connecting transfer pipeline is routed south of the canal and the New Inn public house before crossing underneath the A5 to connect into the outlet structure. This arrangement enables water transfer through the existing canal infrastructure up to lock 8. Access can be provided to the inlet works and pipeline route via an access track directly from the A5 using the existing access into the New Inn public house.

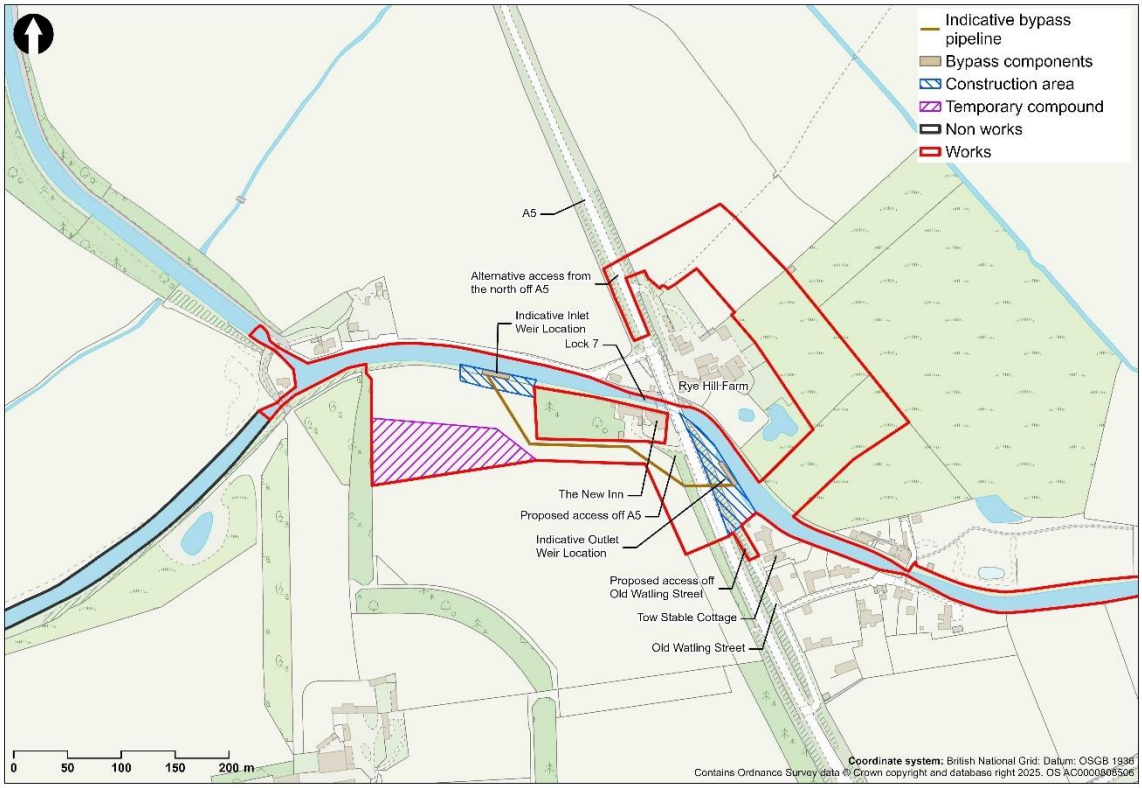
7.8.27 Access to the outlet structure from the A5 would also be necessary, and it proposed that this is provided via an existing electricity network maintenance access in this location, which would be improved. An alternative access route was considered from the north around Rye Hill Farm to lift equipment via crane over the canal in constructing the outlet weir structure. Although this

is not a preferred option it is currently being considered pending clarity on the preferred southern access.

7.8.28 Further options to bypass lock 7 included the possible use of the existing A5 underpass at the lock as the bypass pipe route. This option was discounted due to the spatial constraints of the underpass, structural risk to the bridge above, and the need to demolish existing features where this could feasibly be avoided through pursuing other options.

7.8.29 A plan showing the indicative general arrangements for the preferred bypass are shown in Figure 7.10.

**Figure 7.10: Indicative general arrangement of gravity bypass at Lock 7**




**Lock 8**

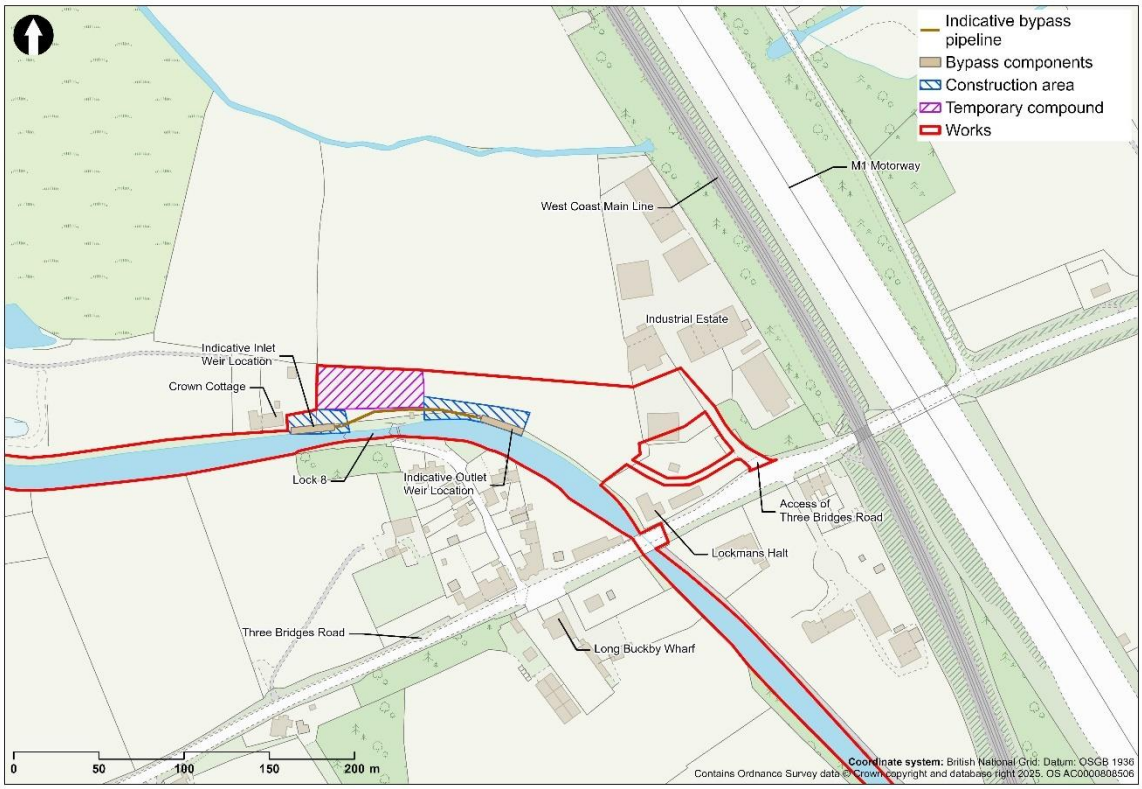
7.8.30 Lock 8 is situated to the west of Long Buckby Wharf, in a rural setting adjacent to some residences and businesses within a small settlement.

7.8.31 A gravity bypass is required at Lock 8. Having discounted the option to bypass locks 7, 8 and 9 collectively, the preferred option for the bypass of Lock 8 is along the northern side of the canal with an inlet weir structure proposed close to Crown Cottage and an outlet weir structure approximately 50m east of the lock, with the connecting transfer pipeline routed through undeveloped land to the north of the towpath. Work is ongoing to consider whether the proposed works would require the provision of a replacement lock landing area.

7.8.32 Two possible access routes off Three Bridges Road are considered achievable, either through a small industrial estate or via Lockman's Halt which is the current preferred access route option due to it being an established existing access. Access through the industrial estate would require some work to provide such an access.

7.8.33 A plan showing the indicative general arrangements for the bypass are shown in Figure 7.11.

**Figure 7.11: Indicative general arrangement of gravity bypass at Lock 8**




**Lock 9**

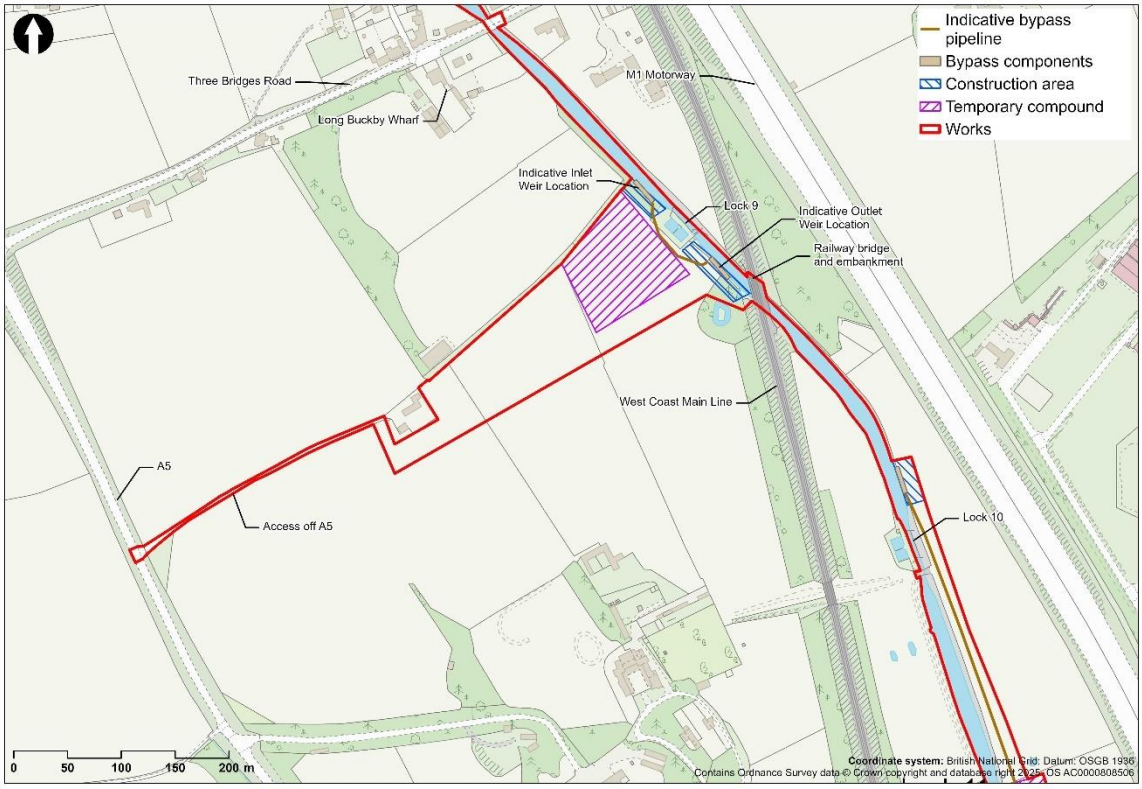
7.8.34 Lock 9 is located to the south-east of Long Buckby Wharf immediately to the west of the West Coast Main Line railway and the M1 motorway.

7.8.35 As at locks 7 and 8, a gravity bypass is required at Lock 9. Inlet and outlet structures are proposed adjacent to each side of the lock on its southern bank connected by a short transfer pipeline. The outlet structure is located close to the abutment of the neighbouring railway bridge. Access to this location would be provided from the A5 incorporating elements of an existing property access road.

7.8.36 A second option was considered on the northern side of the canal. However, due to the constraints associated with the railway embankment and access on the northern side of the canal, this was discounted.

7.8.37 A plan showing the indicative general arrangements for the bypass are shown in Figure 7.12.

**Figure 7.12: Indicative general arrangement of gravity bypass at Lock 9 (also showing relationship with Whilton Locks proposed gravity bypass to the south east)**




### Whilton Locks

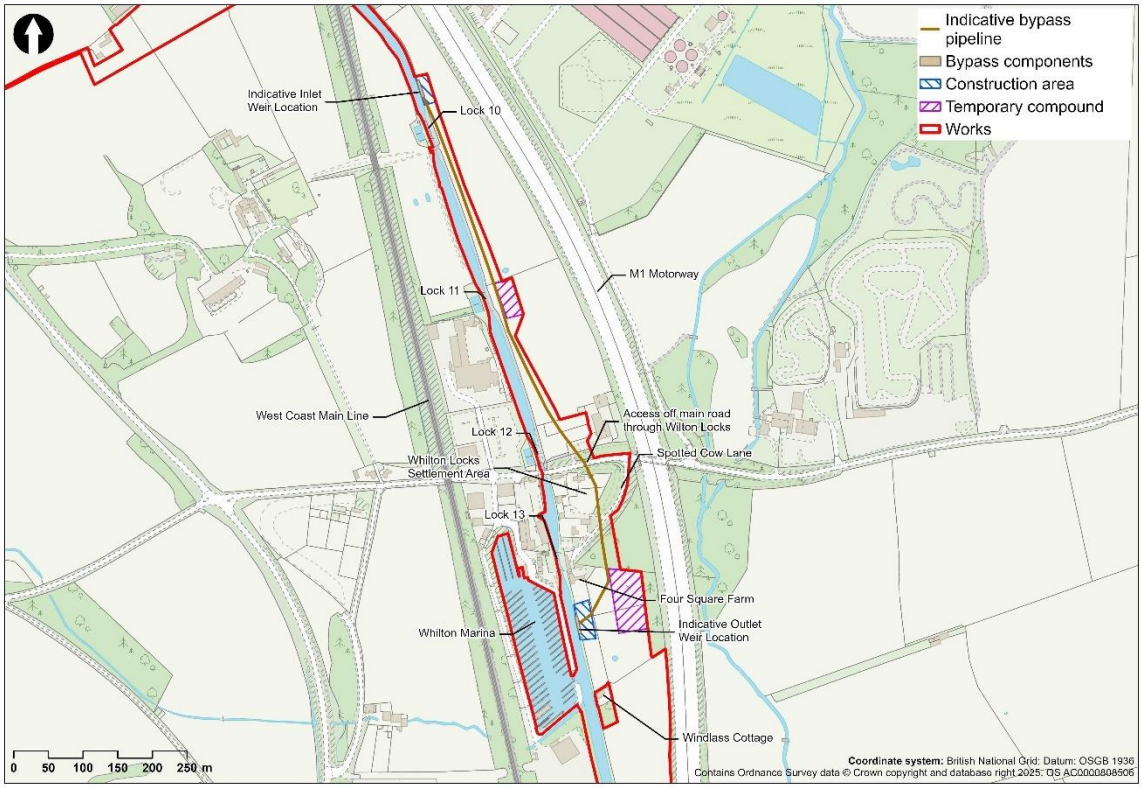
7.8.38 The Whilton Locks flight (locks 10-13) runs through the settlement of Whilton Locks, between the West Coast Main Line railway and the M1 motorway.

7.8.39 Two bypass options have been considered. One option was to bypass the lock flight in two sections, the first being along the eastern bank of the canal, with an inlet weir north of lock 10 and an outlet weir structure south of lock 11, then bypassing Locks 12 and 13 on the western bank, using a section of tunnel to then discharge into the Whilton Marina.

7.8.40 The second option would bypass the entire lock flight via a pipeline under and around the Whilton Locks settlement area on the eastern side of the canal. The inlet structure would be located on the eastern bank of the canal approximately 25m north of lock 10, and an outlet structure would be located midway between Four Square Farm and Windlass Cottage, south of Whilton Locks.

7.8.41 In selecting a preferred option, consideration was given to the potential impact of works on the various features of the built and natural environment including surrounding infrastructure as well as construction phase considerations such as achieving access to the works areas. The bypass of all locks with a single pipeline (the second option) was preferred in respect of these matters and this indicative arrangement, including proposed access routes, is shown in Figure 7.13.

**Figure 7.13: Indicativegeneral arrangement of gravity bypass at Whilton Locks**




**Stoke Bruerne (Locks 14 and 15)**

7.8.42 Locks 14 and 15 are situated in the small rural settlement of Stoke Bruerne.

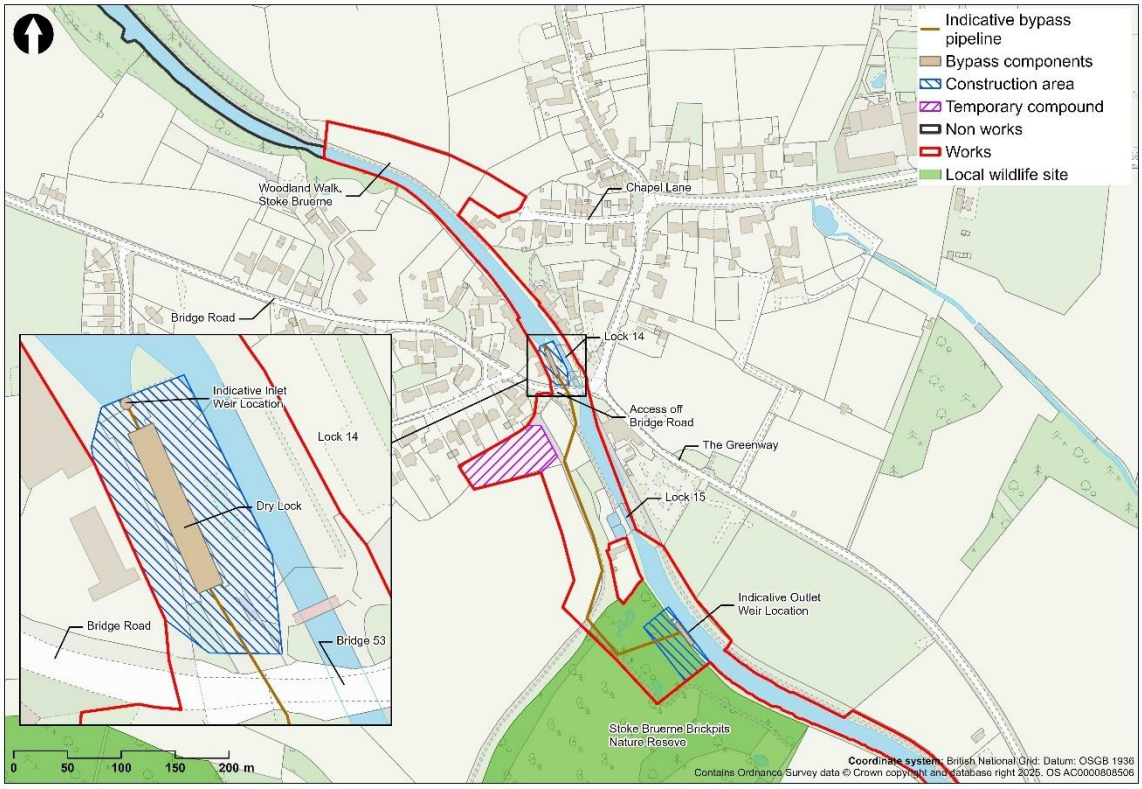
7.8.43 A gravity bypass is required at locks 14 and 15. An initial option considered routing the bypass pipeline north-east of the canal, primarily using road carriageway space through Stoke Bruerne between an inlet structure north of the village and an outlet structure south of lock 15. This option relied on access to a wooded area (Woodland Walk) to the north-west of Chapel Lane for the purposes of installing the inlet weir structure, but also on closures to roads throughout the village to install the pipeline and associated pumping station.

7.8.44 An alternative option was developed utilising the existing dry lock (which could be re-watered) immediately adjacent to lock 14, to bypass water past lock 14, before continuing with a pipeline on the south-western side of the canal past lock 15, where it would discharge back into the canal adjacent to the Brick Pitts nature reserve.

7.8.45 A further alternative was considered to bypass the village entirely around its western side, but this was discounted due to constructability challenges stemming from the Canal lying in a deep cutting north of the village.

7.8.46 The option using the dry lock is the preferred option having regard to various engineering, environmental and constructability factors as indicated in the preceding paragraphs. Access to the dry lock would be achieved off Bridge Road, with an existing track which spurs south off Bridge Road providing access to the remaining works areas south of Stoke Bruerne. This preferred bypass option is shown indicatively in Figure 7.14.

**Figure 7.14: Indicative general arrangement of gravity bypass at Stoke Bruerne (Locks 14 and 15)**




**Stoke Bruerne (Locks 16 to 20)**

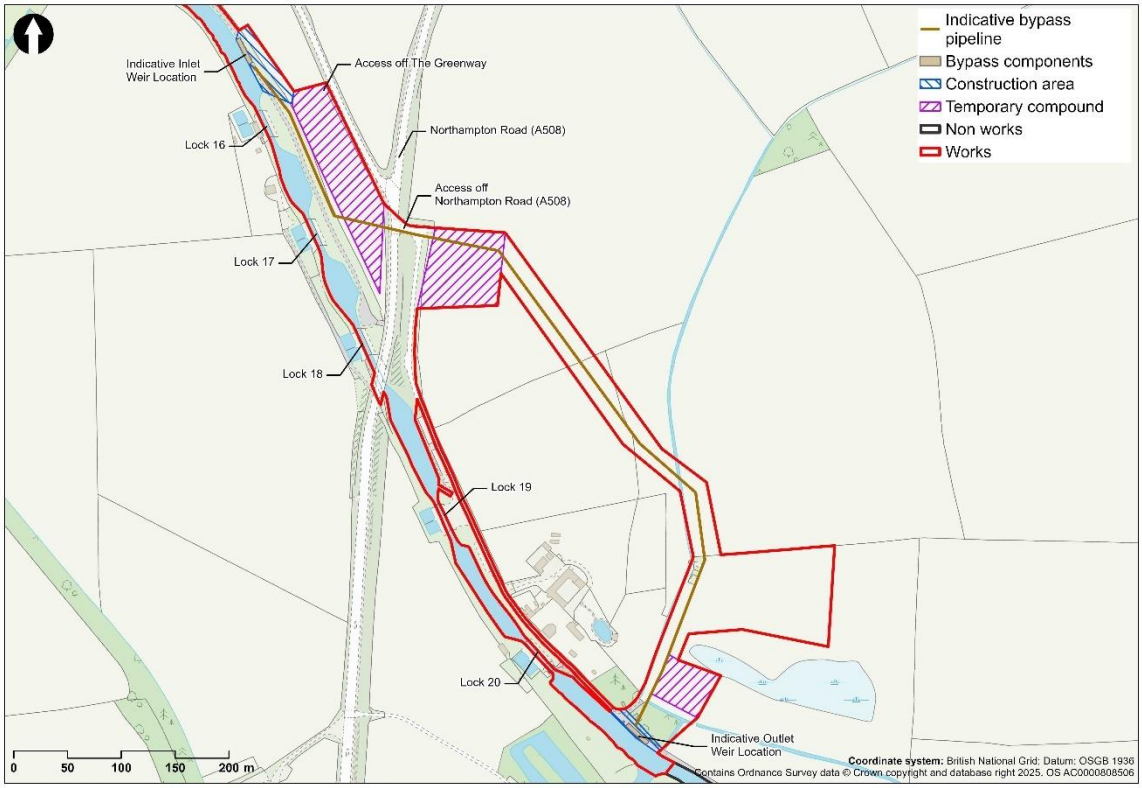
7.8.47 Locks 16-20 are situated to the south-east of Stoke Bruerne, either side of Northampton Road (A508) in an otherwise rural location.

7.8.48 A gravity bypass is required for locks 16-20. One option considered, broadly follows and runs along the eastern bank of the canal within Canal & River Trust land, with an inlet structure north of lock 16 and an outlet structure approximately 100m south-east of lock 20.

7.8.49 A second option – which is preferred due to the likely lesser impact on the integrity of the towpath and the canal bank itself – would have an inlet north of Lock 16 on the eastern bank, which would be accessed through an existing access off The Greenway. The bypass route continues across the A508 where it intentionally circumvents a prominent tree on the eastern side of the road and residential properties on the north-eastern side of the canal. The bypass route then turns south along a stream and footpath when it joins and discharges through an outlet into the canal after lock 20.

7.8.50 The preferred option layout, accesses and associated works are shown indicatively on Figure 7.15.

**Figure 7.15: Indicative general arrangement of gravity bypass at Stoke Bruerne (Locks 16 to 20)**




### Cosgrove

7.8.51 Cosgrove Lock is located to the south-east of Cosgrove and north-west of the Iron Trunk Aqueduct, where the canal passes over the River Great Ouse. The area surrounding this lock is semi-rural. Cosgrove Marina adjoins the lock site, which consists of boat maintenance facilities and some moorings. Adjoining the lock site is the closed arm of the Buckingham Canal, which is currently under restoration. A Scheduled Monument (Roman villa SE of Cosgrove Hall) lies adjacent to the south of the lock, and the canal and lock are included within a conservation area. Trees and vegetation line the lock surroundings, and a woodland TPO exists along an area of woodland on the northern side of the closed arm of the canal.

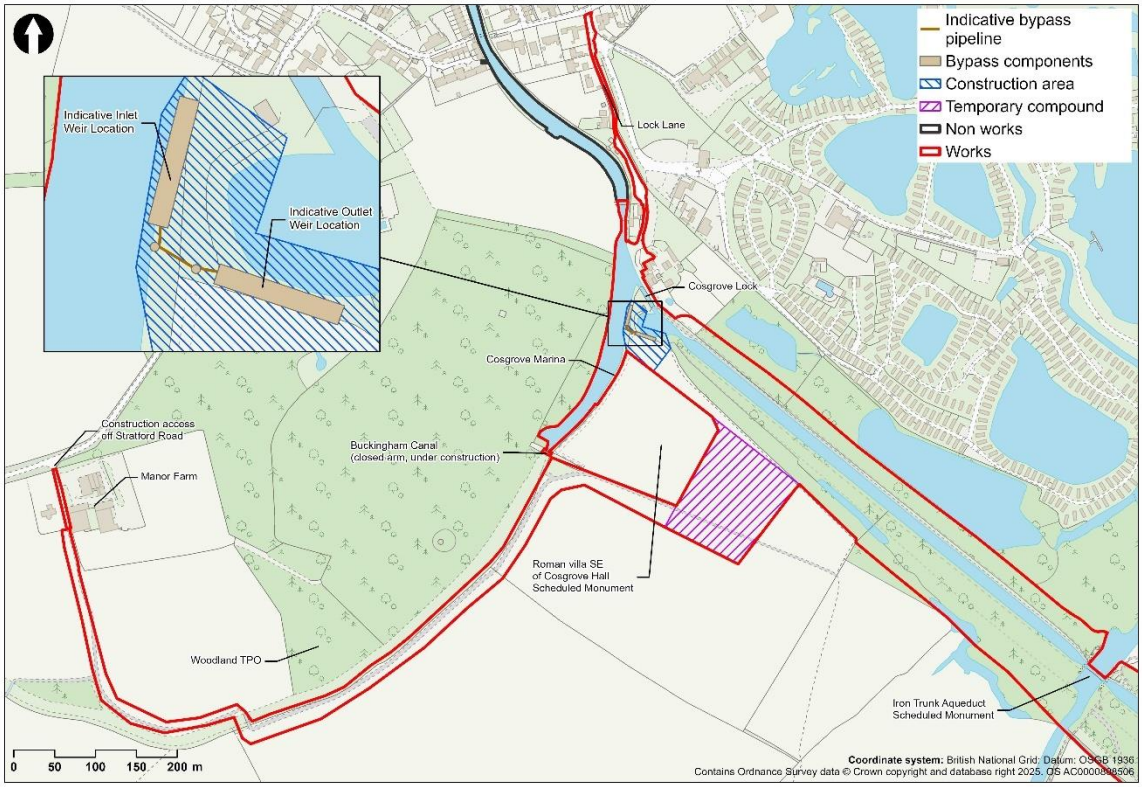
7.8.52 Cosgrove Lock is a single lock requiring a gravity bypass with a short connection. A single design option has been considered for the location of each bypass element, which would take water from the canal above the lock through to the winding hole just below the lock. Options for access have been considered, including from the south via Watermill Lane, through an Old Mill complex of buildings, across a bridge over the River Great Ouse and then through agricultural fields along the alignment of a public footpath. However, the bridge crossing is a footbridge which is unsuitable for construction traffic and even with significant modifications the remainder of the route to the lock site (approximately 2km) would also require significant upgrades and modifications to accommodate construction traffic.

7.8.53 The preferred access option is from the west via Manor Farm, using an informal culverted crossing over the former alignment of the Buckingham Canal and following its alignment towards the lock site area using a surfaced footpath The preferred access route would avoid by way of circumventing the site of the former Roman Villa.

7.8.54 The use of work boats has been considered from Lock Lane to the north, but this is considered to be unviable due to the heavy and bulky construction plant and equipment needed to construct the bypass. The handling of such equipment and materials is not considered possible by boat in this location. The northern access off Lock Lane is required for permanent maintenance access.

7.8.55 The general layout of the preferred option, accesses and associated works are shown indicatively on Figure 7.16. The indicative general arrangement shown is for a standard design where the inlet and outlet weirs are connected via a pipeline. Due to the very short distance, however, a variant is under consideration whereby the water is transferred directly through an open cascade channel with appropriate covers and access provided.

**Figure 7.16: Indicative general arrangement of gravity bypass at Cosgrove Lock**




### Fenny Stratford

7.8.56 Lock 22, the Fenny Stratford Lock, is situated in an urban location to the northeast of Fenny Stratford within Milton Keynes. The lock is located adjacent to and north of the Marston Vale railway line, with residential dwellings, businesses, and employment facilities also in the immediate surroundings.

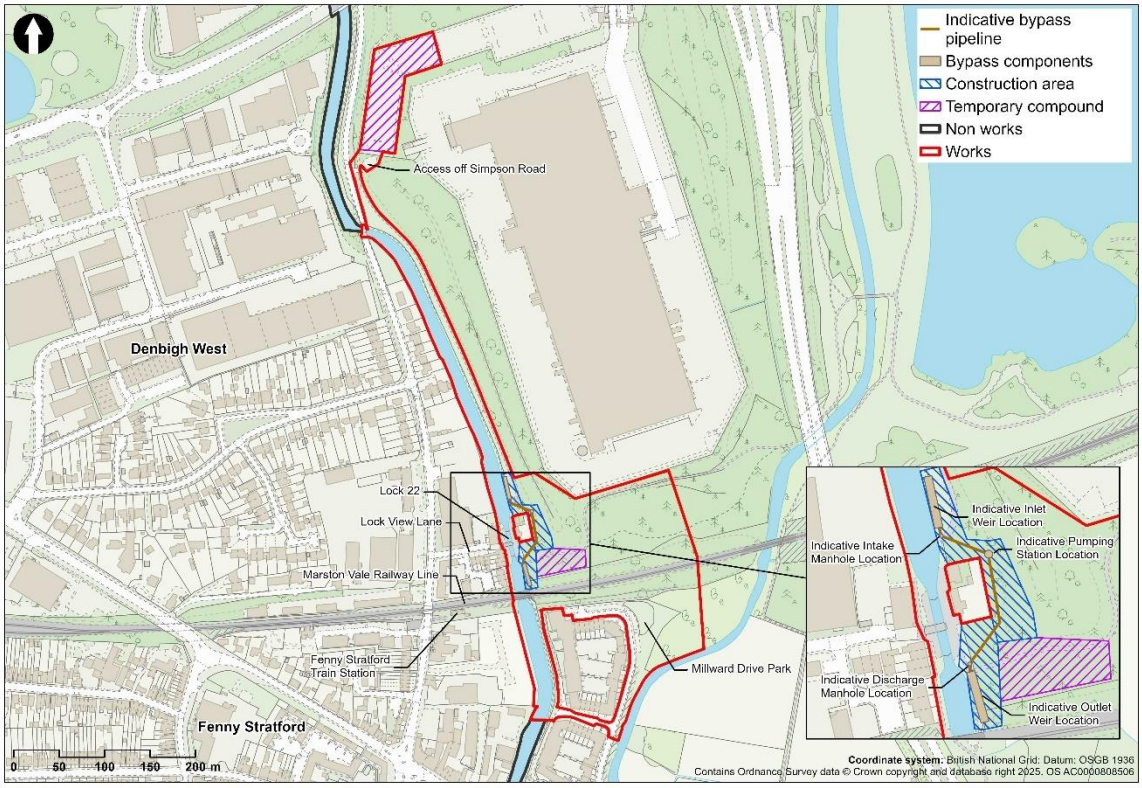
7.8.57 Fenny Stratford requires a pumped bypass. The currently preferred design option proposes an inlet structure on the eastern side of the canal, north of lock 22, followed by a pumping station within the order of 25m of the inlet structure. This option routes the pipeline through a small section of Millward Drive Park, before rejoining the canal through a bespoke weir just to the south of lock 22, in between the lock and the main railway line.

7.8.58 Although not preferred due to, amongst other things, the impact on residents of Millward Drive, the need to cross the railway line and the need to route through a larger proportion of Millward

Drive Park, an alternative option considered requires a significantly longer bypass pipeline from an inlet structure in the same location, through Millward Drive Park before entering the tunnel underneath the railway line and following Millward Drive to discharge at the canal edge.

7.8.59 The general arrangement of the preferred option layout, accesses and associated works are shown indicatively on Figure 7.17.

**Figure 7.17: Indicative general arrangement of pumped bypass at Fenny Stratford**




## 7.9 Bridges, tunnels and aqueducts

7.9.1 Further investigation using modelling information was undertaken to determine whether any modifications would be required to any of the bridges which pass over the canal route section affected by the transfer.

7.9.2 Upon the completion of bridge surveys, modelling then assessed the full range of possible craft dimensions typically passing under them. Both the Coventry and Oxford Canals are considered narrow canals, and so an assessment of air-draught – this being the measured gap between the bridge structure and the water level – was based on a single boat passing under the bridge at a time. The Grand Union Canal part of the canal route section is a broad canal, and, therefore, air-draught in this section was assessed on two boats side-by-side or a broad beamed boat passing under the structure. This work indicated that only Bridge 88 on the Grand Union Canal may have insufficient air-draught clearance for the full range of boat sizes when the water transfer is operational.

7.9.3 Potential works are currently being considered in respect of Bridge 88 including an increase in the height of the bridge span. The appropriate solution to be taken forward is a matter that is continuing to be explored further as the scheme design develops.

7.9.4 The canal section of the Proposed Development also includes three tunnels, these being the Newbold Tunnel near Rugby, the Braunston Tunnel north of Daventry and the Blisworth Tunnel north of Stoke Bruerne. These tunnels and their air-draught were similarly assessed. The conclusion of this being that air-draught within the tunnels along the canal section is not identified as an issue by the Trust.

7.9.5 The canal route section of the Proposed Development also includes four aqueducts which allow canal users to pass over rivers and roads. These include the Rugby aqueduct which passes over Old Leicester Road and the Swift River Aqueduct, both north of the Rugby, as well as the Iron Trunk Aqueduct near Cosgrove and the V6 Aqueduct which passes over V6 Grafton Street.

7.9.6 Modelling was used to assess the level change on the available freeboard of these aqueducts. This identified that that the freeboard on the offside of the Iron Trunk Aqueduct – which is a registered Scheduled Monument – is insufficient. Options are currently being considered as to how to accommodate or manage the higher-level water flow transfers through this aqueduct to prevent overtopping.

7.9.7 One option would involve the addition of a simple circa 150mm high extension to the offside trough wall of the aqueduct.

7.9.8 An alternative option to this proposed minor alteration to the Iron Trunk aqueduct would be the construction of a fourth new transfer lock further east (downstream) along the canal, within Milton Keynes.

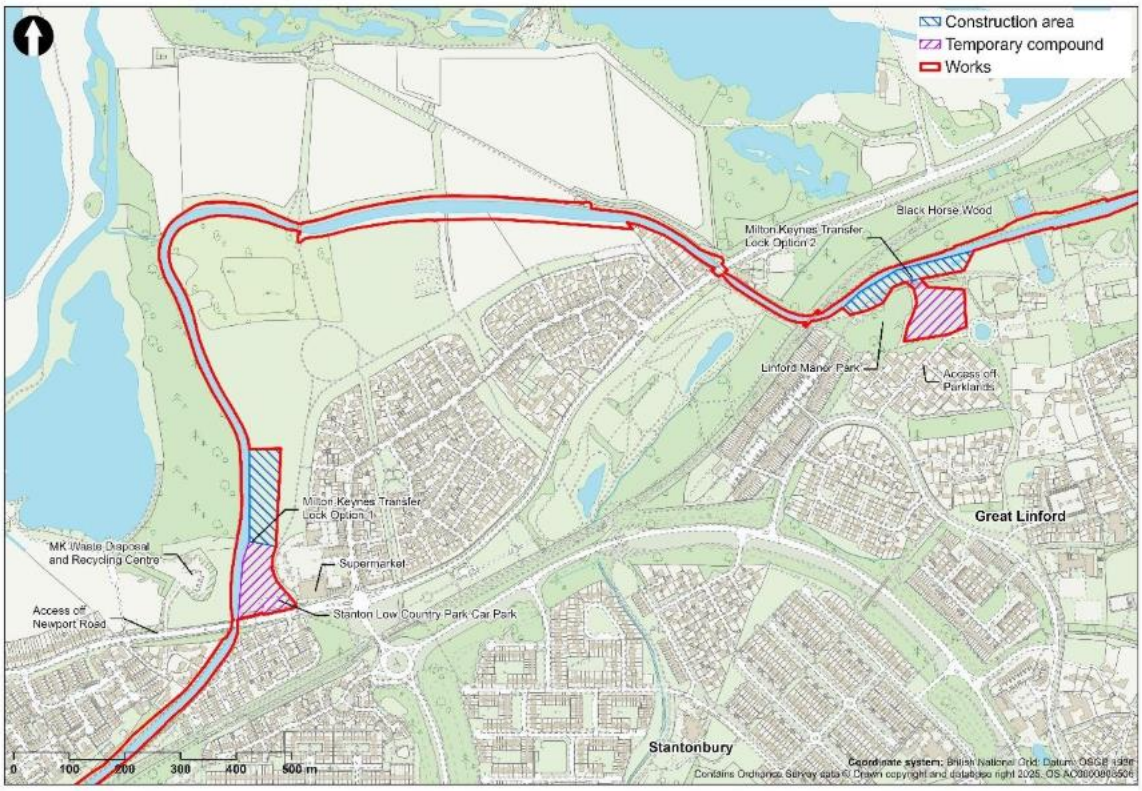
7.9.9 Having regard to the requirements of a transfer lock one possibility (option 1) would be to construct such a new transfer lock within the canal north of Newport Road in Milton Keynes, between the civic amenity site to the west and a field adjacent to a supermarket to the east. Access here would be off Newport Road via the Stanton Low Country Park Car Park.

7.9.10 The second possibility (option 2) is to construct a new transfer lock further east between Black Horse Wood to the north of the canal and an open space field to the south, off Parklands. It is anticipated that access to the proposed new transfer lock at this location would be via this open space off Parklands.

7.9.11 These two possibilities for an additional new transfer lock – of which only one would be required as an alternative to the aqueduct works – are presented indicatively in Figure 7.18.

7.9.12 Alterations to the aqueduct are the preferred option due to the minimal nature of the work required in comparison to the more extensive work that would be required to provide a further transfer lock within an urban environment. Furthermore, it is considered that the alterations to the aqueduct – which are considered minimal – can be designed in an appropriately sensitive way.

**Figure 7.18: Indicative locations for an additional transfer lock downstream of the Iron Trunk Aqueduct.**




## 7.10 Drayton and Daventry Reservoirs

7.10.1 In the vicinity of the Braunston locks and tunnel there are two reservoirs that form part of the canal network – the Drayton and Daventry Reservoirs. These reservoirs are designed to collect and store water from the surrounding catchment, which can then be used to supply the canal network. Their primary purpose is to augment water supply into the canal network to ensure sufficient water is in the canal for the purposes of navigation.

7.10.2 Options have been considered since Phase One Public Consultation as to how the reservoirs could support the transfer of water along this part of the canal.

7.10.3 One option considered was to incorporate the reservoirs into the bypass of the Braunston locks, with the bypass pipeline feeding into the reservoirs directly and constantly, transferring most of the transferred water through them and then back into the canal. This option was discounted from further consideration on the basis of concerns from the Trust regarding the wear and tear on these historic structures caused by a constant flow of water running through them.

7.10.4 The preferred option would see the Braunston Lock bypass operate separately from the reservoirs (as discussed above) but with a pipeline spur being constructed from the new bypass pipeline to the reservoirs. This feeder pipeline would provide the ability for transferred water within the bypass to be periodically diverted into the reservoirs in order to keep them topped up. From the reservoirs, the water can be supplied back into the canal network, via the existing feeder infrastructure, when needed. The reservoirs would, therefore, continue to provide water for navigation as they do at present whilst also acting as storage and resilience for the Proposed Development.

7.10.5 The proposed pipeline route running from the new bypass pipeline to the reservoirs is proposed to be along the general alignment of the disused railway corridor, as this is a direct route and it is considered that a pipeline can be constructed with minimal disruption.

7.10.6 Alongside the pipeline works, other works to the reservoirs would be required.

7.10.7 For Drayton Reservoir, this would include:

(i) the provision of a discharge structure to the south-west of the reservoir, and

(ii) works to the existing overflow structure to the north of the reservoir including a new siphon and siphon discharge structure.

7.10.8 For Daventry Reservoir, this would include:

(i) replacement of the existing inlet structure with a new structure that would be connected to an existing culvert;

(ii) construction of an additional outlet structure, and

(iii) modifications to the bank and culvert along the existing reservoir outlet channel.

7.10.9 Figures 7.19 and 7.20 below shows the proposed general arrangement of interventions associated with the reservoirs required to achieve this preferred option.

**Figure 7.19: Indicative works to the Drayton Reservoir**

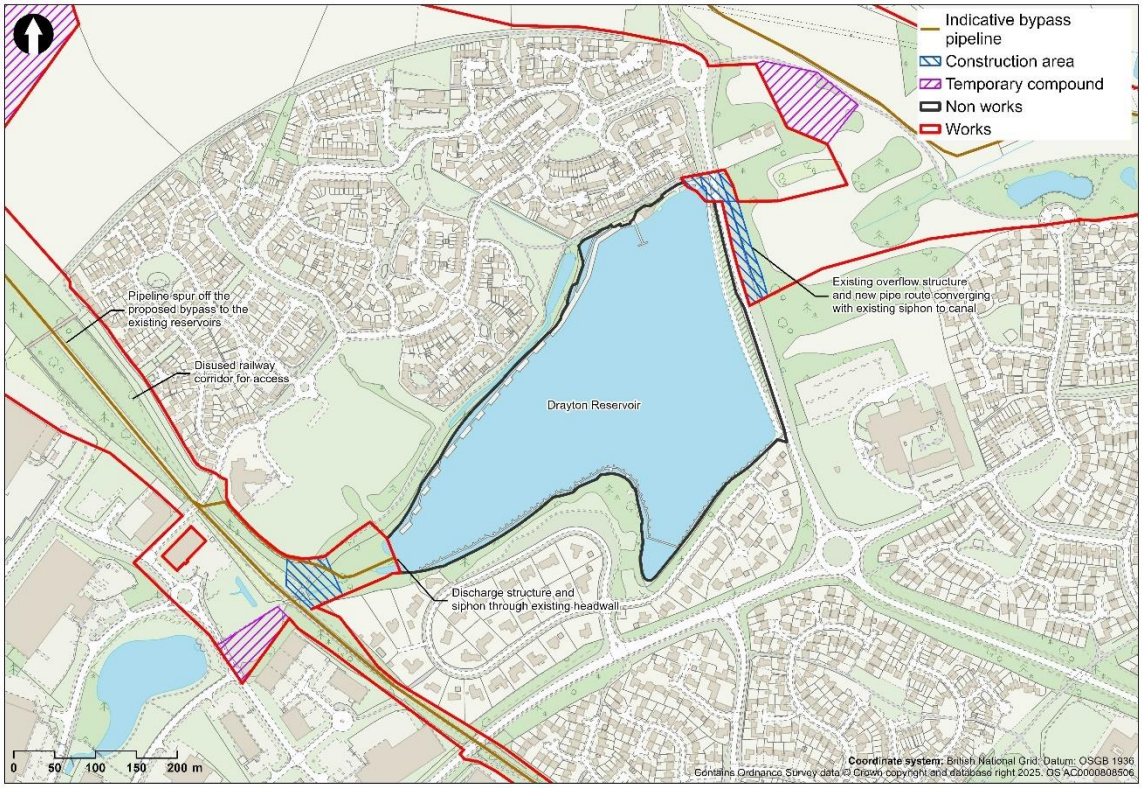
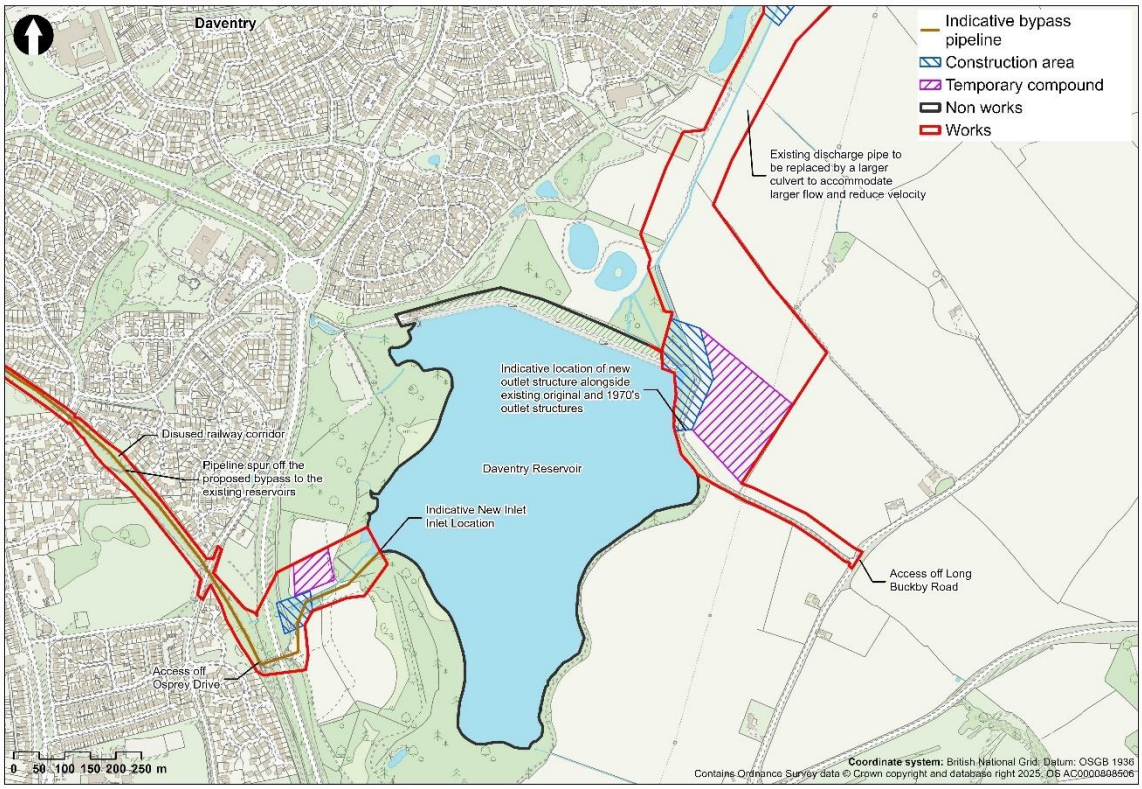



**Figure 7.20: Indicative works to the Daventry Reservoir**



## 7.11 Weir upgrades

7.11.1 The canal network has a number of existing ‘waste’ weirs (weirs on the canal network that enable excess water to flow out of the canal network in times of excess flows). In addition, there are a number of existing bypass inlet and discharge weirs at existing locks which allow water to bypass locks without going to waste.

7.11.2 With water levels in the canal to rise as a result of the Proposed Development, levels and adjustments may be needed to these existing weirs and structures to avoid the additional water from being wasted or mis-managed within the network.

7.11.3 Most of the weirs potentially affected in this way can be modified by very minor interventions, for example, level adjustments through the provision of a new fixed weir plate to allow for the required flow level. Modelling has identified 17 weirs in total that may require works. Works to existing weirs and structures is a matter that is subject to ongoing review, particularly given that a number of these weirs have heritage value or are located in areas of historical character.

# 8. Abstraction, Storage and Treatment Works

## 8.1 Introduction

8.1.1 This chapter of the report provides an update of the scheme development and optioneering work that has been undertaken in respect of the abstraction, storage and treatment elements located at the southern end of the Proposed Development. These elements make up Part 4a of the Proposed Development as detailed within the Preliminary Environmental Information Report that is also provided as part of the Phase Two Public Consultation information.

## 8.2 Overview of previous work undertaken

8.2.1 The work undertaken at the time of the Phase One Public Consultation on scheme development and optioneering of relevance to the abstraction, storage and treatment elements are explained further within Chapter 6 and Appendix C of the September 2024 report.

8.2.2 In summary, that chapter and appendix of the September 2024 report explain that:

i. The identification of where to abstract the transferred water from the Grand Union Canal, store and treat it, and where to connect into AfW's water supply network has evolved during the ongoing evolution of the Proposed Development.

ii. During the early stages of the evolution of the Proposed Development,

- four potential locations for the abstraction of water from the Grand Union Canal were identified – being locations at Tring, Hemel Hempstead, the Grove (near Watford) and Leighton Buzzard.
- three options for connecting into AfW's water supply network were also considered – being at an existing underground reservoir near Luton, at Boxted and at Abbots Langley.
- a need for raw water storage alongside the treatment activities was identified to provide a buffer and operational resilience should it not be possible to temporarily abstract water from the canal.

iii. Initially the Leighton Buzzard abstraction and treatment potential site with onward transferring of water to the underground reservoir near Luton was identified for further consideration at the RAPID Gate 2 stage, the guidance for which required a single site to be identified. The Leighton Buzzard site was, in general terms, identified as a solution as it would abstract water from the Grand Union Canal upstream (north of) and at a point topographically lower than the Tring Summit, thereby meeting the requirement of the Environment Agency that interaction with chalk streams located downstream and south of the Tring Summit is avoided.

iv. As a result of a reassessment of the position reached, the Leighton Buzzard site was subsequently deemed unsuitable due to significant planning and engineering constraints, including the designation of the site as Green Belt land, its designation as Suitable Alternative Natural Greenspace (SANG) and its allocation for outdoor recreation and biodiversity enhancement. In addition, it was considered that a storage reservoir in this location would need to be lined due to the presence of underlying Woburn Sands at the site.

v. A broader site search was, therefore, conducted, guided by environmental, planning, land and engineering considerations to consider options which met the Environment Agency requirement that water is abstracted from the Grand Union Canal north of the Tring Summit. A total of 23 sites were identified and assessed through a multi-stage methodology. Enhanced appraisals were conducted for three options considered to offer the greatest potential, namely:

- Site B (at Near Brickhill, South East of Milton Keynes): Offered strong engineering and environmental performance, with good access and water quality at the point of abstraction from the Grand Union Canal but faced potential planning challenges due to its promotion for housing development by one of the landowners.
- Site H (West of Slapton): Technically viable but raised concerns over proximity to the village of Slapton, construction traffic access and impact on public rights of way and a local wildlife site. Site P (East of Leighton Buzzard): Considered only for the Water Treatment Works (WTW),with water storage provided at Site H (West of Slapton), recognising the potential impact of accommodating the WTW on the site West of Slapton. Concerns raised about development of a WTW on Site P considering its location within the Green Belt.

vi. These three sites were identified as sites that may have more potential as the location for the water treatment and storage elements and were consulted upon during the Phase One Public Consultation. At that time there was a recognition that additional surveys and assessment work, and any relevant feedback from the Phase One Public Consultation, would be used to further progress these aspects of the Proposed Development.

## 8.3 Policy and Procedural Developments

8.3.1 As explained within Chapter 4 of this report, subsequent to the completion of the September 2024 report and the position set out in that report, a number of policy and procedural developments occurred.

8.3.2 The implications of these developments mean that – in accordance with the position stated within paragraphs 1.4.5 and 1.4.6 of the NPSWRI and having regard to both the status of the Proposed Development and the way in which it is described within AfW's WRMP24 - the need for the Proposed Development will not be revisited as part of its application for development consent.

8.3.3 Unlike other parts of the Proposed Development discussed in earlier chapters of his report, there is less specificity given in the AfW WRMP24 in terms of the elements considered in this chapter. Paragraph 7.32 of AfW's WRMP simply indicates that in respect of these elements of the Proposed Development, *"Water would be abstracted at a location near Leighton Buzzard and stored, before being treated at a new Water Treatment Works onsite, and then transferred to our* [AfW's] *supply area".*

8.3.4 Whilst some further detail is provided in AfW's WRMP24, it is noted that this is to the earlier elements of the appraisal work undertaken which indicated the identification of a single abstraction location at Leighton Buzzard– a location which, as explained in Section 8.2, is no longer considered suitable due to significant planning and engineering constraints.

8.3.5 It was, therefore, considered that further work on the justification of the location of the elements of the Proposed Development covered by this chapter in terms of scheme development and optioneering work was necessary.

## 8.4 Phase One Public Consultation

8.4.1 Outcomes of the Phase One Consultation are included in the Phase One Public Consultation Report published alongside this report for the Phase Two Public Consultation. There was feedback on the site options presented as having the greater potential at the Phase Public One Consultation (Sites B, H and P), the site options that had been considered but not progressed through the site assessment process and the site selection process in general and potential for other site options to be considered. A summary of the consultation feedback with relevance to the options assessment is set out below.

8.4.2 The consultation feedback on Site B, revealed a mix of support and concern from respondents. Many participants favoured Site B over other options, particularly Site H, citing several advantages. These included its greater distance from residential areas, its location outside the Green Belt, and the potential to reduce the amount of infrastructure needed along the canal, such as pumping stations and gravity bypasses. Some also appreciated that Site B could offer community leisure benefits.

8.4.3 However, there were also concerns about Site B. Some respondents felt that the development of a WTW at Site B would negatively affect the surrounding open agricultural landscape, which forms part of the Great Brickhill Area of Attractive Landscape. Additionally, the longer pipeline required to connect Site B to the reservoir near Luton was seen by some as a disadvantage, both in terms of cost and environmental impact. Environmental considerations were a key theme, with respondents highlighting the presence of mature trees, native hedgerows, and two streams on the site. In terms of land use, respondents noted that the northern part of Site B has been promoted for future residential development.

8.4.4 Feedback on Site H, located near Slapton, revealed a range of views, with both support and opposition expressed by respondents. Some supported Site H due to its proximity to a village, suggesting it could offer leisure and recreation opportunities. It was also noted that the site had better road access and parking than Site B, was located outside the Green Belt, and consisted mainly of agricultural land.

8.4.5 However, a significant number of respondents opposed the use of Site H. Concerns centred on its closeness to Slapton, with fears that the development would cause disruption to nearby homes and a local children's play area. Visual and noise impacts from both the construction and operation of the water treatment works were also raised. Respondents felt that the site would bring additional environmental harm, particularly to local wildlife, and that the surrounding roads were unsuitable for heavy construction traffic. There were also questions about how the site aligned with local planning policies, including the Slapton Neighbourhood Development Plan and the Vale of Aylesbury Local Plan.

8.4.6 Feedback on Site P, located to the east of Leighton Buzzard, focused primarily on its designation as Green Belt land. Respondents expressed concern that using Green Belt land for the scheme would require strong justification and could undermine local planning protections. Despite these concerns, there was some support for Site P, particularly when considered in combination with Site H. Supporters of this combined option noted that it could reduce the visual impact on Site H by locating the water treatment works elsewhere, while still providing community benefits. The potential for water storage at Site H to offer recreational value and walking amenities was highlighted, as was Site P's proximity to existing development, which some felt made it a more practical and less intrusive choice.

8.4.7 Some respondents supported the site selection process for considering accessibility and environmental constraints, and future operational requirements. Others felt that the

assessment of sites was not consistent, and that some sites had been ruled out whilst other sites with similar characteristics were taken forward for further consideration. A number of alternative sites were provided by respondents as well as comments received on the sites not progressed during the site selection process.

## 8.5 Design Evolution following Phase One Public Consultation

8.5.1 Following the Phase One Public Consultation and having regard to the feedback received, further scheme development and option related work has been undertaken. In summary, this work has consisted of:

- a review of the approach to the consideration of Green Belt within the process;
- a review of the site search area;
- a review of the site selection process;
- a review of the assessment undertaken of previously assessed sites, and
- an assessment of additional site options.

8.5.2 The work undertaken in respect of these matters is explained further in Sections 8.6 to 8.10 that follow.

## 8.6 Review of the approach to the consideration of Green Belt land

8.6.1 Following the Phase One Public Consultation, further consideration was given as to the appropriateness of Site P (being a site within the Green Belt) as a potential site for the water treatment element only and the approach generally to other sites considered located within the Green Belt.

8.6.2 Central Bedfordshire Council (CBC) in their response to the Phase One Public Consultation specifically commented on the identification of Site P. CBC indicated their reservation about the consideration of Site P within the designated Green Belt, when there are other options available that are outside of the Green Belt and which appear to be more suitable, being able to accommodate both the WTW and storage elements. CBC noted in its response that any release of Green Belt land would require a Green Belt Assessment and a demonstration of very special circumstances, a key policy test set within the NPSWRI in respect of consenting inappropriate development (as defined) in the Green Belt.

8.6.3 CBC provided further advice on this matter in December 2024, indicating that in respect of Site P it was considered that the beneficial impacts of the Proposed Development would not outweigh the harm to the Green Belt by reason of inappropriateness, loss of openness, conflict with the five purposes of the Green Belt, and other harm to the character and appearance of the area and the rural landscape. CBC's view was that very special circumstances were not considered to be demonstrated, and if Site P were progressed with, it would likely lead to a negative consultation response from CBC.

8.6.4 Having regard to the advice received from CBC, and undertaking an analysis of the position in light of that advice, it was concluded that whilst there are sites with potential to accommodate the WTW and storage outside of the Green Belt, there would, in planning terms, be consenting risks in taking forward development within the Green Belt both in terms of Site P but also any other sites for the WTW and storage located within the Green Belt. For these reasons, Site P was discounted and the inclusion of Green Belt sites within the site search area and within the

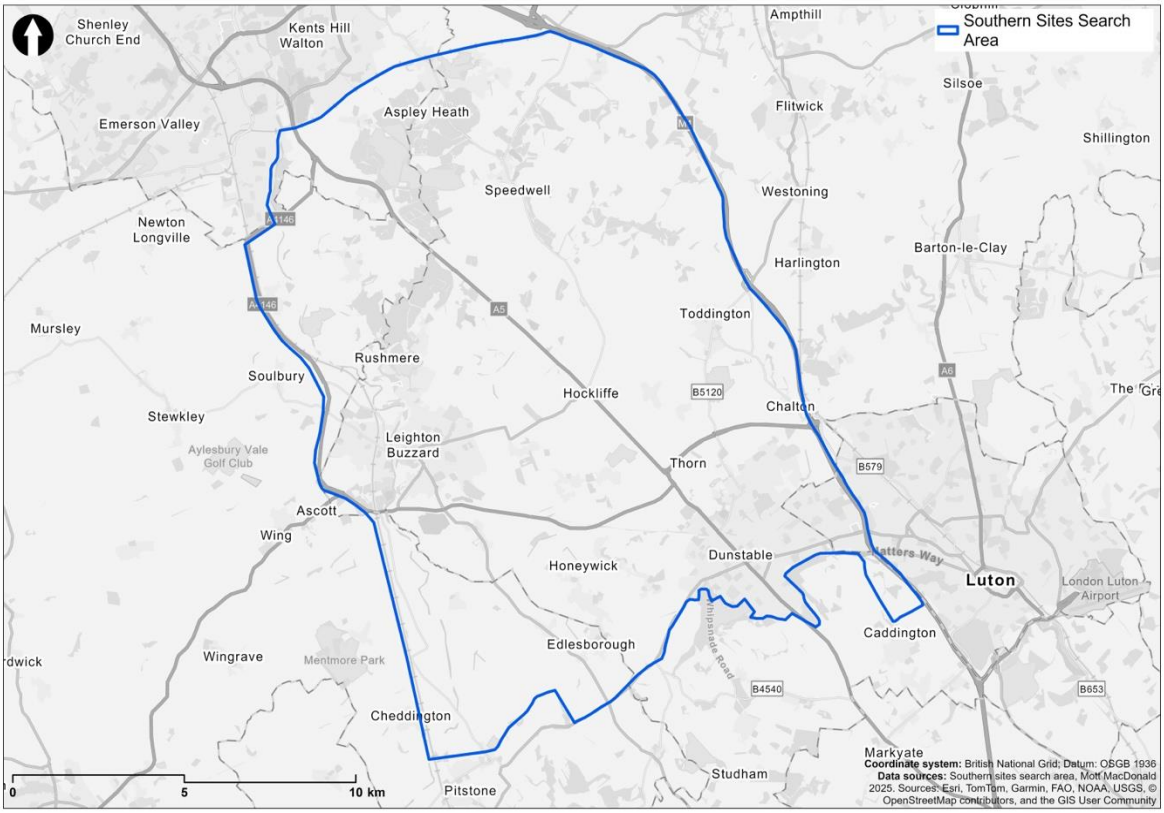
site identification and assessment process was revisited, matters which are further explained in the sections that follow.

## 8.7 Review of the site search area

8.7.1 As set out in Section 6.3 of the September 2024 Report, a key part of the methodology for identifying and assessing site options included identifying at the outset an appropriate site search area.

8.7.2 Following the Phase One Public Consultation the basis for the site search area was reviewed and the search area was expanded – as explained further below. This review was to ensure that a robust site search process had been undertaken. The search area extends to the north and south of Leighton Buzzard and is defined on the basis of a number of factors including planning, environmental and engineering constraints and project considerations, such as project cost, carbon and environmental impact; factors which are explained in the following paragraphs. The revised search area along with some of the features referred to in the following paragraphs, is shown on Figure 8.1.

**Figure 8.1: Revised site search area**




8.7.3 ***Underground Reservoir near Luton –*** The post Phase One Public Consultation review of the search area commenced by ensuring that the identified end point of the Proposed Development – i.e. the point at which the treated water would enter AfW's network – was appropriate.

8.7.4 During earlier stages of the evolution of the Proposed Development the existing AfW underground reservoir at Chaul End to the west of Luton was identified as the site from which to manage water into AfW's supply network.

8.7.5 Following Phase One Public Consultation, AfW confirmed that that there are only two strategic service reservoirs within the AfW's supply system in the general area that could receive water from the Proposed Development, one to the west of Luton / south of Dunstable at Chaul End and another to the north of Luton.

8.7.6 The reservoir to the north of Luton does not have any spare onward transfer capacity, and the development of new strategic mains linking round the north of AfW's Water Resource Zone 3 (which is the area the Proposed Development will service) was not considered to be viable. If the service reservoir to the north of Luton was used, this would subsequently require a new pipeline to be built from it to the service reservoir to the west of Luton / south of Dunstable at Chaul End. This pipeline would either need to be provided through the built-up area of Luton and Dunstable, or cross areas of land with the same or similar planning and environmental constraints that would be encountered by linking the Grand Union Canal abstraction directly to the service reservoir at Chaul End.

8.7.7 On the basis of the above, the review undertaken confirmed that, for the purposes of the site search area, the appropriate point at which the treated water would enter the AfW supply network was the AfW existing underground reservoir to the west of Luton / south of Dunstable at Chaul End.

8.7.8 ***Southern boundary of the site search area –*** The post Phase One Public Consultation review of the search area confirmed the southern boundary of the search area as being the northern boundary of the Chilterns National Landscape. The NPSWRI is clear that major development in the National Landscape should be refused, except in exceptional circumstances. The WTW and water storage elements would comprise major development and would not gain development consent unless the exceptional case could be demonstrated, which requires evidence of the cost of and scope for developing elsewhere outside of the designated landscape or meeting the need in another way, as well as evidence of need (see section 4.9.12 of the NPSWRI).

8.7.9 The review, therefore, identified that the promotion of a WTW and water storage site within the National Landscape would be unlikely to be acceptable to the Secretary of State as the decision maker for the Grand Union Canal DCO application – particularly if a suitable site is available outside of the designated landscape. As such the National Landscape boundary was confirmed as the firm southern edge to the site search area.

8.7.10 ***Western boundary of the site search area -*** As the underground reservoir west of Luton at Chaul End lies to the east of the Grand Union Canal, site locations to the east of the Grand Union Canal are clearly preferable in engineering terms, as this avoids the cost, construction complexity and risk, and operational risks associated with the need to pipe water underneath the Grand Union Canal to the reservoir site at Chaul End.

8.7.11 Whilst site locations to the west of the Grand Union Canal were not automatically excluded, the further to the west of the Grand Union Canal a site is located, the greater the distance that water would need to be pumped to the site for storage and treatment in the first instance, and then pumped back (including back under the Grand Union Canal) to reach the underground reservoir at Chaul End). The further to the west a site is located, the greater the project cost,

carbon, and other environmental impacts associated with the additional pipeline length and infrastructure required.

8.7.12 It is also the case that to the west of the Grand Union Canal lies a mainline railway, a further significant engineering constraint to overcome in respect of sites to the west of the Grand Union Canal. To the north of Leighton Buzzard, the A4146 also lies to the west of the Grand Union Canal. These railway and road routes and associated crossings that would be necessary would increase the cost, construction complexity and risk, and operational risks associated with the need to pipe water underneath rail and road infrastructure as well as the Grand Union Canal.

8.7.13 The western boundary of the site search area was, therefore, confirmed to be a broader corridor boundary (rather than a specific hard linear boundary) formed by the canal, rail and road corridors. In identifying a corridor as the boundary, it was recognised that there may be sites within or running along the outside of that corridor which could have potential (located between the Grand Union Canal and railway for example).

8.7.14 ***Northern boundary of the site search area -*** The northern most extent of the site search area is formed by the edge of the Milton Keynes urban area and a railway line. The railway line forms an infrastructure constraint (as identified above) which represents additional costs and risks should it be crossed. More fundamentally, the urban area of Milton Keynes to the north represents significant challenges to the identification of an available abstraction point on the Grand Union Canal, with associated bankside infrastructure.

8.7.15 The further to the north the abstraction, storage and WTW elements are located, the greater the length of transfer pipeline to the underground reservoir west of Luton. As Milton Keynes is effectively at the low point on the canal transfer, there is no advantage in terms of fewer pumping stations or pumped bypasses in moving the abstraction point further north, therefore any site north of Milton Keynes was considered to add significant additional pipeline construction, with associated environmental and carbon impacts.

8.7.16 The northern boundary was, therefore, confirmed to be the Milton Keynes built up area boundary and the railway.

8.7.17 ***Eastern boundary of the site search area -*** The eastern most extent of the site search area consists of the M1 motorway, as any site locations further to the east of the M1 would require a tunnelled crossing of the M1 to take the abstracted water to the site for storage and treatment, and a second tunnelled crossing of the M1 to take the treated water back to the underground reservoir west of Luton. These major road crossings - involving cost, construction complexity and risk, and operational risks associated with the need to pipe water underneath the motorway - are avoided by the site search area boundary stopping at the M1 motorway.

8.7.18 Although the M1 motorway has been taken as the eastern most boundary, there is (for similar reasons) a preference for sites that are located to the west of the A5 (which runs through the central parts of the search area), as the further to the east a site is located, the greater the distance of pipeline transfer to the site for storage and treatment and corresponding road crossing, with a requirement to then transfer back west and south westwards to return to the underground reservoir near Luton.

## 8.8 Review of the site selection process

8.8.1 As set out in Section 6.3 of the September 2024 Report, Stage 1 of the Methodology included identifying sites within the search area. Following the Phase One Public Consultation, and

having regard to the feedback received, this part of the process was reviewed and, where necessary, updated as explained in the following paragraphs.

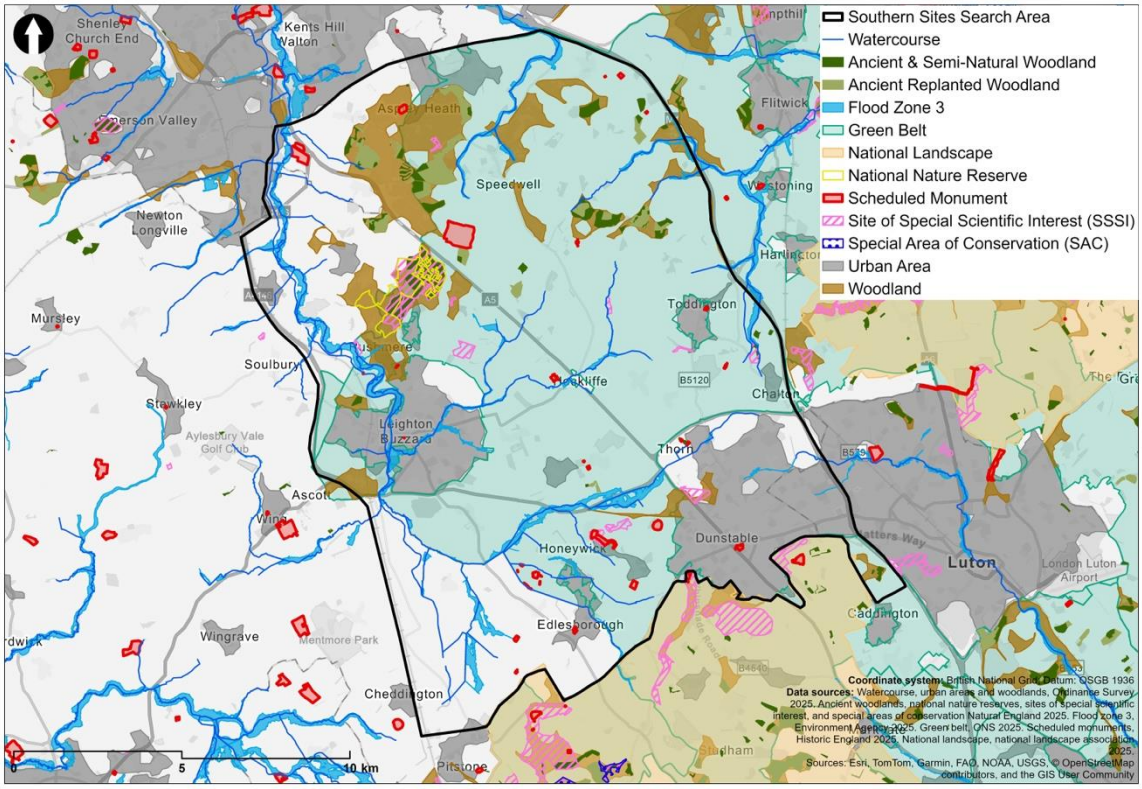
8.8.2 Sites within the study area were initially identified based on the high-level exclusionary criteria set out in the site assessment methodology – detailed in Table 3.1 of Chapter 3 of the September 2024 Report. These criteria sought to identify potential sites that avoided:

- Buildings and settlements;
- Ancient woodland;
- Scheduled monuments;
- the national landscape designation;
- international and national biodiversity designations, and
- Flood zone 3 areas.

8.8.3 In addition to these exclusionary criteria, heavily wooded areas identified through desk top assessment, were avoided. Part of the site identification process also considered at a high level where suitable road access could be provided. This generally resulted in sites adjacent to existing roads being identified within the study area, albeit that it was noted that access matters would be further considered through the assessment process that then followed.

8.8.4 The initial identification of sites did not automatically exclude Green Belt land, primarily as there is extensive Green Belt in Central Bedfordshire District within the search area. However, and as explained further in section 8.6, this position was reviewed and as it has been possible to identify suitable sites outside of the Green Belt, Green Belt land was added as an exclusionary criterion within the review of the site search process. Figure 8.2 shows the updated exclusionary criteria applied to the site search area.

**Figure 8.2: Exclusionary criteria applied to the search area**




8.8.5 In identifying sites, consideration was also initially given to the potential for the water storage and WTW to be located on or adjoining existing operational water sector sites within the search areas. However, the opportunity to do so is limited by the lack of any large-scale existing water resources infrastructure within the search area, and the fact that the majority of the search area is, in any event, outside of AfW's operational supply area. The exception to this is the existing operational underground reservoir near Luton. Therefore, the potential to accommodate water storage and WTW alongside that location was considered in the September 2024 Report.

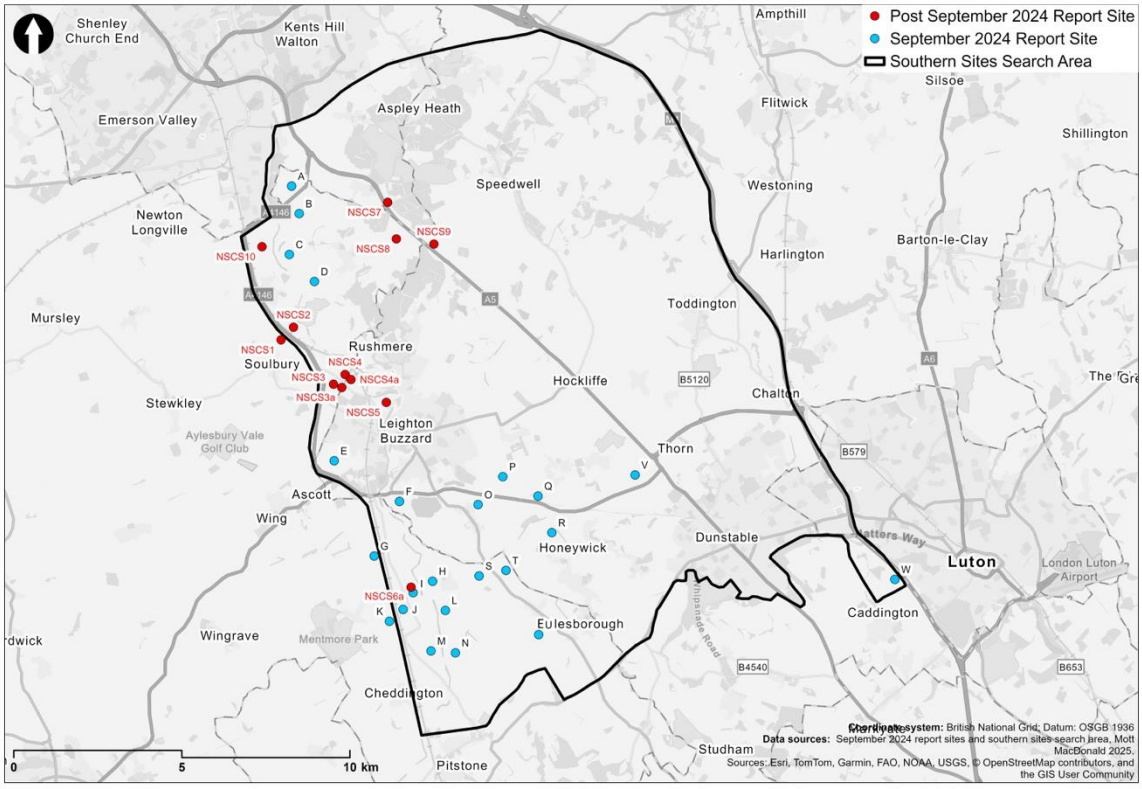
8.8.6 For the purposes of the site selection work presented in the September 2024 Report, a minimum size requirement of 10 hectares was used as the space necessary to accommodate the combined WTW and storage elements albeit at the time, it was recognised that the area needed for the storage element would be influenced by site topography meaning that in certain circumstances a site in excess of 10 hectares would be needed. Further development of conceptual designs for the WTW and storage undertaken post the Phase One Public Consultation identified that a minimum site footprint for the combined water storage and WTW elements would more typically be between 13 and 25 hectares, depending on the slope and topography of the site.

## 8.9 Review of the assessment of previously assessed sites

8.9.1 Taking into account the revised exclusionary criteria referred to in the preceding section and relevant feedback received at the Phase One Public Consultation, the twenty three (23) sites identified in the September 2024 report and the assessment undertaken at that time in respect of those sites was reviewed to confirm the robustness of the conclusions previously reached.

The location of the sites are shown on Figure 6.4 of the September 2024 report but are included on Figure 8.3 for ease of reference.

**Figure 8.3: Site options considered at the Phase One Public Consultation with additional site options considered for the Phase Two Public Consultation**




8.9.2 The site options review methodology used for the purposes of the September 2024 report was a staged methodology as explained in Chapter 3 of that report. This was described by reference to a series of six stages. The post Phase One Public Consultation review was carried out in a series of steps. However, within the explanation that is provided in the following paragraphs, it is made clear what the relationship is between the earlier stages of the appraisal methodology set out in Chapter 3 of the September 2024 Report and the various steps carried out in the review process.

**Step 1 – Preliminary High Level Project Team Appraisal**

8.9.3 In the period prior to the Phase One Public Consultation, twenty-three (23) identified sites were subject to preliminary high-level appraisal by the Grand Union Canal project team, which for certain sites included holding an internal project workshop session at the early stage of the process. Along with the initial identification of the sites and the subsequent preliminary planning appraisal (which is Step 2 of the review process discussed further in following paragraphs) the high-level appraisal of the sites formed Stage 1 of the options review methodology set out in Chapter 3 of the September 2024 Report.

8.9.4 Following Phase One Public Consultation, this previous high-level appraisal was reviewed and was considered to be robust. The review confirmed the decision not to progress Sites M, N, K and G – which is explained within Section 6.4.1 and Table 6.1 of the September 2024 report.

8.9.5 Site L was revisited based on the Phase One Public Consultation feedback which indicated that Site L had similar access constraints to Site H. Site L would require construction traffic to

travel further from the B488 and cross the junction with Horton Road, therefore it is considered that access is more of a constraint than Site H. Furthermore, comments received in respect of Site H and potential access and traffic constraints would apply to Site L, reinforcing why Site L should not be progressed.

8.9.6 The post Phase One Public Consultation review undertaken in respect of this step in the process did not, therefore, alter the overall conclusions reached in terms of those sites not taken forward for further assessment and consideration.

**Step 2 – Preliminary Planning Appraisal**

8.9.7 The sites not discounted from the preceding high-level appraisal were then subject to a preliminary planning appraisal, which formed a part of the Stage 1 of the options review methodology set out in Chapter 3 of the September 2024 Report.

8.9.8 Following Phase One Public Consultation, the outcomes of the preliminary planning appraisal were reviewed and was considered to be robust. This review confirmed the decision not to progress Sites J, S, T and U (see section 6.4.2 and Table 6.2 of the September 2024 Report). For Sites E, O, R, and W, as these sites are within the Green Belt it was noted that these would be further excluded on this basis of the revised site exclusionary criteria.

8.9.9 The post Phase One Public Consultation review undertaken in respect of this step in the process did not, therefore, alter the overall conclusions reached in terms of those sites not taken forward for further assessment and consideration.

**Step 3 – Detailed Appraisal**

8.9.10 This step forms a review of Stage 2 of the site options assessment set out in Chapter 3 of the September 2024 Report. This part of the process involved assessing the remaining ten (10) sites against engineering, environment, planning and land criteria.

8.9.11 Following the Phase One Public Consultation and a review of the assessment work undertaken, the engineering suitability for each site was reconsidered in accordance with revised engineering criteria as summarised in Table 8.1; the previous criteria being set out in Table 3.2 of the September 2024 report. The criteria were revised to better capture potential engineering risks associated with siting of the WTW and storage.

**Table 8.1: Revised engineering criteria for the consideration of the WTW and storage options**

| Criterion | Factors considered |
|---|---|
| **Risk to project delivery (construction phase)** | Factors that are inherent to the site engineering that are likely to cause delay or disruption to construction |
| **Risk to project delivery (operation)** | Factors that are inherent to the site that could result in outage or output constraints once the Proposed Development is operational |
| **Risk to scheme carbon objectives (construction phase)** | Factors that will increase carbon emissions on a comparative basis during construction |
| **Risk to scheme carbon objectives (operation)** | Factors that will increase carbon emissions on a comparative basis during operation |
| **Risk to project delivery (Site geology)** | Factors that could affect the scale and complexity of construction for the storage facility |
| **Risk to project delivery (Site geometry)** | Factors associated with the size and topography of the site that affect the scale and complexity of construction of the storage and treatment facilities. The engineering team have – post Phase One Public Consultation - identified that the site footprint should typically be somewhere between 13 and 25 hectares, depending on the slope and topography of the site. A gentle slope, preferably with a shallow valley type structure tends to be the most favourable for the construction of the storage facility. Flat sites will tend to be much larger due to cut and fill balancing requirements (if cut and fill do not match then this will result in large amounts of materials being imported or exported from the site). Groundwater occurrence can affect this as well, if it limits the depth of excavation.<br>The assessment of geometry further takes into account site limiting factors such as flood risk areas or major existing infrastructure. |
| **Risk to project delivery (Site location)** | Local factors that could affect the delivery and movement of materials and plant during construction |

8.9.12 The sites not progressed at this stage following this assessment and supporting reasons are summarised within Table 8.2 (which supersedes Table 6.3 of the September 2024 report). This includes, as relevant, any key conclusions reached by the engineering team from the application of the revised engineering criteria detailed above and any relevant matters provided through the Phase One Public Consultation process.

8.9.13 The use of revised engineering criteria did not affect the overall outcome of the earlier assessment work. Moreover, the revised engineering criteria in some instances further supported the exclusion of some sites removed during the earlier assessment work as set out in Table 8.2.

8.9.14 In addition, the content of Table 8.2 has for completeness, been amended to reflect relevant feedback received during the Phase One Public Consultation exercise.

**Table 8.2: Options not progressed to further assessment following detailed appraisal**

| Site Name | Description |
|---|---|
| **Site I** | Concerns have been raised about the viability and developability of the site, primarily focusing on the ability to accommodate the water storage element. The flatness of the site necessitates greater excavation, and there is a risk of inundation or flooding to the railway. Two national transfer gas mains through the site would be costly and difficult to divert. From a biodiversity perspective, the site has no major obstacles to development, but habitats of principal importance need to be considered. From a landscape perspective, the site was not favoured due to its elevated nature and the surrounding open countryside and potential distance views from the National Landscape. In planning terms, the scale of the Proposed Development requires careful consideration of its impact on the countryside and potential amenity impacts to nearby properties.<br>Post Phase One Public Consultation a site that includes some of the land that forms Site I has been re-valuated based on a greater understanding of the engineering of the water storage requirements, informed by further analysis of the nearby Site H (which sits on the other side of the Grand Union Canal to Site I). This further consideration is set out in section 8.10.5 for Site NSC6A. |
| **Site F**<br>*(note: this is the Leighton Buzzard site identified at the end of the Gate 2 process)* | The site's topography minimises cut and fill requirements for the water storage, interstage pumping across treatment works, and inundation/flood risk, making it a preferred engineering site. There are, however, significant planning constraints. The western part of site F also forms part of a designated SANG with proposals in place to enhance the opportunities for outdoor recreation and provide an alternative destination for local residents to mitigate the impact of visitors to the Chilterns Beechwood Special Area of Conservation. It is cited that the close proximity of both the Grand Union Canal and the River Ouzel further increases the value of the site for recreation and conservation. Furthermore, the site is within the Green Belt where there is a presumption against inappropriate development in the Green Belt except in very special circumstances. As part of establishing very special circumstances there would need to be no alternative sites that perform the same function that don't result in the same harm to the Green Belt. This, alongside allocations and proposals to actively develop Site F as open space and SANG, it is not considered that the site should be progressed to further work at this stage.<br>Post Phase One Public Consultation – Further explanation has been added as to why the planning constraints on the site are significant, in particular the SANG and Green Belt designations.<br>The Grovebury Quarry SANG is one of three inter-linked sites which in total provide 40ha of SANG mitigation land. The sites are located in close proximity to each other and depend on each other for the provision of the 2.3km circular walk (a Natural England SANG requirement). This joint site size above 20ha is critical to Central Bedfordshire Council, as it enables the SANG mitigation land to meet the requirements of new development within a 5km radius of the site. If the site were smaller (e.g. 15ha+) then it can only meet requirements of new development within 3km of the site. Any land used for water storage would sit outside of the 20ha space requirement. Consideration was given to whether the WTW and water storage development could be located on the land that sits outside the SANG, however from a Natural England and Central Bedfordshire Council perspective, it is really important for the functioning of the SANG (and for a SANG to be designated) that it is not subject to noise or views of nearby development. The intention is to introduce screening planting to limit visual intrusion into the SANG from Grovebury Quarry and the A4146. On this basis, achieving the WTW development alongside the SANG would not be possible.<br>Further consideration of the Green Belt designation – as explained further in section 8.8.4 this is now considered a significant planning risk for the project and sites within the Green Belt should not be taken forward. Furthermore, a review of the site's geology indicates that the site directly overlies Woburn Sands, meaning it is likely that the water storage would need to be lined. This would introduce project delivery risk. |
| **Site V** | Concerns have been raised about the viability and developability of the site, primarily focusing on the ability to accommodate the water storage. The flatness of the site necessitates greater excavation. High voltage power lines run through the site, and these would be costly to relocate or avoid.<br>Post Phase One Public Consultation – Site is within the Green Belt and would therefore not be taken forward for the reasons explained. |
| **Site A** | The site option includes land which has already been granted consent for 1800 houses and associated infrastructure so would be unavailable for the development of the WTW and storage. |

| Site Name | Description |
|---|---|
| | Post Phase One Public Consultation – It is understood that the planning application for housing on the part of the development site within Buckinghamshire was withdrawn by the applicant. It is noted that the site has been put forward for future housing development in the Buckinghamshire 'call for sites' but the Housing and Economic Land Availability Assessment has not yet been published to determine if the site is considered suitable for development and future allocation. In this respect it is similar to Site B, albeit that a planning application for housing has been submitted in the past. However, further analysis of the engineering constraints means that Site A is considered sub-optimal. The abstraction point is on the canal embankment at a known area of archaeological findings. As there are known archaeological findings in the embankment this could constrain the intake works. Furthermore, the site is flat so would require a large, fully excavated storage pond with large (6m) embankments fully surrounding the reservoir. Groundwater at 3m below surface is a major constraint to a fully cut reservoir.<br>It is therefore confirmed that the site option would not be progressed due to engineering risk. |
| **Site C** | Road access would be difficult, especially for large earthmoving vehicles required for water storage construction. The access route is subject to flood risk and rural roads may require road strengthening, passing places and traffic management to facilitate the development. Proximity to commercial and residential properties. Includes land at risk of fluvial flooding. Located within land designated as Countryside and an Area of Attractive Landscape.<br>Post Phase One Public Consultation – Abstraction would need to be located in floodplain on the canal embankment. It has been clarified that the access, in addition to flood risk, is narrow and would require the strengthening of three historic bridges. This would introduce significant engineering risk to the project. |
| **Site D** | Road access would be difficult as there is a 7 tonnes existing weight and access routes are subject to flood risk. Would require the new roads and a bridge to facilitate safe access during construction. Proximity to commercial and residential properties. Includes land at risk of fluvial flooding. Located within land designated as Countryside and as an Area of Attractive Landscape.<br>Post Phase One Public Consultation - Difficult route for site traffic with no suitable route through Stoke Hammond and likely significant impact if routed through Great Brickhill. Would require c. 1km new access road. It is considered that this would introduce significant engineering risk to the project. |

### Step 4 – Options Subject to Enhanced Appraisal

8.9.15 As a result of the preceding aspects of the site options assessment process, at the time of the Phase One Public Consultation, four sites remained from the initially identified 23 sites. These were Site B, Site H, Site P and Site Q. As reported in the September 2024 Report, an enhanced appraisal of these options was undertaken and the outcomes from this assessment are included in Appendix A.1 of this report. For the purposes of the Phase One Public Consultation, Site P was considered preferable to Site Q being closer to a proposed built development to the east of Leighton Buzzard.

8.9.16 As explained in section 6.4.4 of the September 2024 report, as a result of the assessment undertaken the site options considered to have more potential for water treatment and storage, and which were identified for the purposes of the Phase One Public Consultation, were:

- Near Brickhill, South East of Milton Keynes Option (Site B) – as a site for both WTW and storage.
- West of Slapton Option (Site H) – as a site for both WTW and storage.
- West of Slapton Option (Site H) – as a site for storage only with WTW elements provided at a separate site east of Leighton Buzzard (Site P).

8.9.17 As already explained in paragraphs 8.5.3 to 8.5.6, following the Phase One Public Consultation and having regard to relevant feedback received, a revised approach has been adopted in respect of the consideration of Green Belt matters. This has resulted, post the Phase One Public Consultation, in Site P being discounted as a potential site option. Based on

the post Phase One Consultation review, nothing material arose that would discount Site B and Site H from continued consideration in the site optioneering process.

## 8.10 Assessment of additional site options

8.10.1 Through the Phase One Public Consultation exercise, an additional seven sites were suggested in the feedback received. These were labelled as site options NSCS 1-6 and NSCS10 (NSCS being shorthand for non-statutory consultation sites) and shown on Figure 8.3. Sites NSC3 and NSC4 were split into sub options as respondents suggested similar sites with overlapping boundaries (Sites NSC3A and NSC4A).

8.10.2 In addition, to sites identified through feedback received from consultation, the project's engineering team undertook a review of the search area to double check, for robustness, whether there were any other sites not previously identified. This process resulted in the identification of a further three site options, which for ease of reference were labelled NSCS 7 – 9, and which are also shown on Figure 8.3.

**Assessment outcomes**

8.10.3 These ten (10) additional sites were then subject to the Stage 2 appraisal that considered the sites against engineering, environment, planning and land criteria (as explained in both Chapter 3 of the September 2024 report and in paragraphs 8.9.10 – 8.9.13 above). The assessment of these ten additional sites utilised the revised engineering criteria discussed in paragraph 8.9.11.

8.10.4 The results of the Stage 2 appraisal undertaken are set out in Table 8.3.

**Table 8.3: Outcomes of the assessment of additional sites**

| Site Name | Description |
|---|---|
| NSCS1 | Engineering - Concerns have been raised about the viability and developability of the site. The site is not of sufficient size to accommodate both permanent and temporary construction works and could not provide sufficient water storage space. Requires major tunnels to transfer abstracted water from the canal and returned water from the treatment process. Would require a new access bridge and poor access via rural roads.<br>Environment - The site performs relatively well although noted that there is potential Grade 3 agricultural land (Grade 3a being classified as best and most versatile), a listed building in close proximity to the site and nearby residential properties.<br>Planning - Site performs well with no significant planning constraints. Within a sand and gravel minerals safeguarding area so will require a minerals assessment as part of any submission.<br>Land – Site performs well.<br>Site not progressed due to engineering-based risks. |
| NSCS2 | Engineering – Concerns have been raised about the viability and developability of the site. Unlikely that the site could accommodate water storage meaning that offsite secondary storage would be required, leading to significant operational complexity and additional pumping. Size of site means groundworks likely to be required next to the mainline railway which introduces additional construction risk. Tunnel and additional pumping station required for abstraction from the canal and returned water from the treatment process.<br>Environment - The site performs relatively well although noted that there is potential Grade 3 agricultural land (Grade 3a being classified as best and most versatile), three listed building in close proximity to the site and nearby property and community assets.<br>Planning - Site performs well with no significant planning constraints. Within a sand and gravel minerals safeguarding area so will require a minerals assessment as part of any submission.<br>Land – Site performs well.<br>Site not progressed due to engineering-based risks. |
| NSCS3 | Engineering – The site is remote from the canal and river, with tunnels required under the canal and railway adding complexity in respect of deliverability of the project. Due to site geology and superficial deposits water storage is likely to require a full lining raising serious concerns about the constructability of the project. Likely that material would need to be imported/exported to create water storage.<br>Environment - The site performs relatively well although noted that there is potential Grade 3 agricultural land (Grade 3a being classified as best and most versatile) and nearby property and community assets.<br>Planning – The majority of the site is within the Green Belt. The NPSWRI (Section 4.10.26) indicates that there is a general presumption against inappropriate development within the Green Belt. Such development should not be approved except in very special circumstances. In view of the presumption against inappropriate development, the SoS will attach substantial weight to the harm to the Green Belt when considering any application for such development. The site is also within an Area of Attractive Landscape. Policy NE4 of the Vale of Aylesbury Local Plan indicates that development will be supported where appropriate mitigation can be agreed to overcome any adverse impact to the character of the receiving landscape and that this mitigation will be conditioned. The NPSWRI says that where a policy is based on landscape character assessment, these should be given particular consideration. However, local landscape designations, should not be used in themselves as a reason to refuse consent, as this may unduly restrict acceptable development (Section 4.9.15). The landscape character impact of any development would be a consideration in the SoS decision-making but development within a local landscape designation is not ruled out by the NPS.<br>Land – Site performs well.<br>Site not progressed due to engineering and planning based risks. |
| NSCS3A | Engineering – The site is remote from the canal and river, with tunnels required under the canal and railway adding complexity in respect of the deliverability of the project. Due to site geology and superficial deposits water storage is likely to require a full lining raising serious concerns about the constructability of the project. Likely that material would need to be imported/exported to create water storage.<br>Environment - The site performs relatively well although noted that there is potential Grade 3 agricultural land (Grade 3a being classified as best and most versatile) and nearby property and community assets.<br>Planning – The site wholly is within the Green Belt. The NPSWRI (Section 4.10.26) indicates that there is a general presumption against inappropriate development within the Green Belt. Such development should not be approved except in very special circumstances. In view of the presumption against inappropriate development, the SoS will attach substantial weight to the harm to the Green Belt when considering any application for such development. The site is also within an Area of Attractive Landscape. Policy NE4 of the Vale of Aylesbury Local Plan indicates that development will be supported where appropriate mitigation can be agreed to overcome any adverse impact to the character of the receiving landscape and that this mitigation will be conditioned. The NPSWRI says that where a policy is based on landscape character assessment, these should be given particular consideration. However, local landscape designations, should not be used in themselves as a reason to refuse consent, as this may unduly restrict acceptable development (Section 4.9.15). The landscape character impact of any proposed development would be a consideration in |

| Site Name | Description |
|---|---|
| | the SoS decision-making but development within a local landscape designation is not ruled out by the NPS. The site is also located within the Greensand Ridge Nature Improvement Area.<br>Land – Site performs well.<br>Site not progressed due to engineering and planning based risks. |
| **NSCS4** | Engineering – The site is remote from the canal and river, with tunnels required under the canal and railway adding complexity to the deliverability of the project. Need to consider inundation risk from significant embankment and water being retained above the level of the West Coast Mainline. Due to site geology and superficial deposits water storage is likely to require a full lining raising serious concerns about the constructability of the project. Likely that material would need to be imported/exported to create water storage.<br>Environment - The site performs relatively well although noted that there is potential Grade 3 agricultural land (Grade 3a being classified as best and most versatile), a listed building in close proximity to the site and nearby property and community assets.<br>Planning – Approximately 40% of the site is within the Green Belt. The NPSWRI (Section 4.10.26) indicates that there is a general presumption against inappropriate development within the Green Belt. Such development should not be approved except in very special circumstances. In view of the presumption against inappropriate development, the SoS will attach substantial weight to the harm to the Green Belt when considering any application for such development. The site is also within an Area of Attractive Landscape. Policy NE4 of the Vale of Aylesbury Local Plan indicates that development will be supported where appropriate mitigation can be agreed to overcome any adverse impact to the character of the receiving landscape and that this mitigation will be conditioned. The NPSWRI says that where a policy is based on landscape character assessment, these should be given particular consideration. However, local landscape designations, should not be used in themselves as a reason to refuse consent, as this may unduly restrict acceptable development (Section 4.9.15). The landscape character impact of any proposed development would be a consideration in the SoS decision-making but development within a local landscape designation is not ruled out by the NPS. The site is also located within the Greensand Ridge Nature Improvement Area.<br>Land – Site performs well.<br>Site not progressed due to engineering and planning based risks – development of non-Green Belt land only would significantly constrain the constructability of the Project. |
| **NSCS4A** | Engineering – The site is remote from the canal and river, with tunnels required under the canal and railway adding to the complexity and deliverability of the project. Need to consider inundation risk from significant embankment and water being retained above the level of the West Coast Mainline. Due to site geology and superficial deposits water storage is likely to require a full lining raising serious concerns about the constructability of the project. Likely that material would need to be imported/exported to create water storage.<br>Environment - The site performs relatively well although noted that there is potential Grade 3 agricultural land (Grade 3a being classified as best and most versatile), proximity to ancient woodland and Grade II Listed heritage asset and nearby property and community assets.<br>Planning –The site is within the Green Belt. The NPSWRI (Section 4.10.26) indicates that there is a general presumption against inappropriate development within the Green Belt. Such development should not be approved except in very special circumstances. In view of the presumption against inappropriate development, the SoS will attach substantial weight to the harm to the Green Belt when considering any application for such development. The site is also located within the Greensand Ridge Nature Improvement Area. Evidence that planning permission on the site for residential development on the site has been previously sought but it was refused.<br>Land - Performs well in land terms, however, does include 5 titles and includes farm buildings which would need to be considered.<br>Site not progressed due to engineering and planning based risks. |
| **NSCS5** | Engineering – Significant concerns have been raised about the viability and developability of the site. There would be insufficient space on the site to accommodate the water storage, and the site is adjacent to a Wastewater Treatment Works which presents risks to the treatment of clean water. Due to site geology and superficial deposits water storage is likely to require a full lining raising serious concerns about the constructability of the project. Site geometry would mean the water storage would be steep sided, with a risk of inundation to critical infrastructure (the Wastewater Treatment Works).<br>Environment - The site performs relatively well however there is a residential property within the site boundary. In addition, the site is close to two Grade II Listed assets and property and community assets.<br>Planning – Around two thirds of the site is within the Green Belt. The NPSWRI (Section 4.10.26) indicates that there is a general presumption against inappropriate development within the Green Belt. Such development should not be approved except in very special circumstances. In view of the presumption against inappropriate development, the SoS will attach substantial weight to the harm to the Green Belt when considering any application for such development. The site is also located within the Greensand Ridge Nature Improvement Area. Evidence that planning permission on the site for residential development on the site has been previously sought but it was refused. The site is also within an Area of Attractive Landscape. Policy NE4 of the Vale of Aylesbury Local Plan indicates that development will be supported where |

| Site Name | Description |
|---|---|
| | appropriate mitigation can be agreed to overcome any adverse impact to the character of the receiving landscape and that this mitigation will be conditioned. The NPSWRI says that where a policy is based on landscape character assessment, these should be given particular consideration. However, local landscape designations, should not be used in themselves as a reason to refuse consent, as this may unduly restrict acceptable development (Section 4.9.15). The landscape character impact of any proposed development would be a consideration in the SoS decision-making but development within a local landscape designation is not ruled out by the NPS. The site is also located within the Greensand Ridge Nature Improvement Area. The site is also used for car boot sales (granted under successive temporary consents).<br>Land – Developer has indicated potential to develop land for housing.<br>Site not progressed due to engineering and planning based risks – development of non-Green Belt land only would significantly constrain the constructability of the Project. |
| **NSCS6** | Engineering – Site performs relatively well in engineering terms with the exception of site geometry as the southern part of the site would be unable to accommodate the Water Treatment Works or water storage as currently configured.<br>Environment - The site performs relatively well although noted that there is potential Grade 3 agricultural land (Grade 3a being classified as best and most versatile) and nearby property and community receptors.<br>Planning - Site performs well with no significant planning constraints. Within a sand and gravel minerals safeguarding area so will require a minerals assessment as part of any submission.<br>Land – Site performs well in land terms.<br>Considered that with changes to the site boundary that a site option based on site 6A could have potential. A variation of the site – NSCS6A was developed and assessed (see section 8.10.5 below). |
| **NSCS7** | Engineering - Due to site geology water storage is likely to require extensive materials working and a full lining raising serious concerns about the constructability of the project. Furthermore, the site configuration is not efficient for accommodating the water storage and there would be a limited space for construction.<br>Environment – The site performs well although proximity to nearby property and community receptors noted.<br>Planning - Site is within designated open countryside and within a biodiversity opportunity area. Identified in the emerging Milton Keynes City Plan 2050 as a solar farm area of search. These factors should not preclude the site from being further examined from a planning perspective, but it would be necessary to understand whether the solar farm area of search would preclude development for other uses.<br>Land – Site performs well in land terms.<br>Site not progressed due to engineering-based risks. |
| **NSCS8** | Engineering - Due to site geology water storage is likely to require extensive materials working and a full lining raising serious concerns about the constructability of the project.<br>Environment – The site performs well although proximity to nearby property and community receptors noted.<br>Planning – The site generally performs well in planning terms. The site is within an Area of Attractive Landscape. Policy NE4 of the Vale of Aylesbury Local indicates that development will be supported where appropriate mitigation can be agreed to overcome any adverse impact to the character of the receiving landscape and that this mitigation will be conditioned. The NPSWRI says that where a policy is based on landscape character assessment, these should be given particular consideration. However, local landscape designations, should not be used in themselves as a reason to refuse consent, as this may unduly restrict acceptable development (Section 4.9.15). The landscape character impact of any proposed development would be a consideration in the SoS decision-making but development within a local landscape designation is not ruled out by the NPS.<br>Land – Site performs well in land terms.<br>Site not progressed due to engineering-based risks. |
| **NSCS9** | Engineering - Due to site geology water storage is likely to require extensive materials working and a full lining raising serious concerns about the constructability of the project.<br>Environment - The site performs relatively well although noted that there is potential Grade 3 agricultural land (Grade 3a being classified as best and most versatile), a Scheduled Monument in close proximity to the site and nearby property and community assets.<br>Planning - The site is within the Green Belt. The NPSWRI (Section 4.10.26) indicates that there is a general presumption against inappropriate development within the Green Belt. Such development should not be approved except in very special circumstances. In view of the presumption against inappropriate development, the SoS will attach substantial weight to the harm to the Green Belt when considering any application for such development. The site is also located within the Greensand Ridge Nature Improvement Area.<br>Land – Site performs well in land terms.<br>Site not progressed due to engineering and planning based risks. |
| **NSCS 10** | Engineering - The water storage would have to be constructed away from the east where the geology is unsuitable. The water storage would therefore need to adjoin the mainline railway, where there would be associated geotechnical and inundation risks. The restriction on location also means there would be conflicting needs for space between the access road and water storage.<br>Environment - The site is generally favourable. There is Flood Zone 3 land present within the centre of the site. Given the size of the site there is a reasonable prospect that the flood zone area could be avoided. It is |

| Site Name | Description |
|---|---|
| | noted that there is potential Grade 3 agricultural land (Grade 3a being classified as best and most versatile), three listed heritage assets within 100m of the Site and property and community facilities, including Lindens Residential Care Home, Old Dairy Farm Camping and Caravaning site and St Luke's church all within 100m of the Site boundary.<br>Planning - Site performs well with no significant planning constraints. Within a sand and gravel minerals safeguarding area so will require a minerals assessment as part of any submission. Evidence that the site is being promoted for future development through the Local Plan 'call for sites' process.<br>Land – Site performs relatively well in land terms but noted that there are 10 land titles, including some equestrian land.<br>Site not progressed due to engineering-based risks. |

**Further assessment of additional site NSCS6A**

8.10.5 Based on the assessment work summarised in Table 8.4, and due to its potential, the boundary of NSCS6 was reviewed by the engineering team and a variation of it – labelled NSCS 6A - was developed as shown on Figure 8.4. Site 6A is located to the west of Site H and the Grand Union Canal, so further away from the village of Slapton and accessible from the B488.

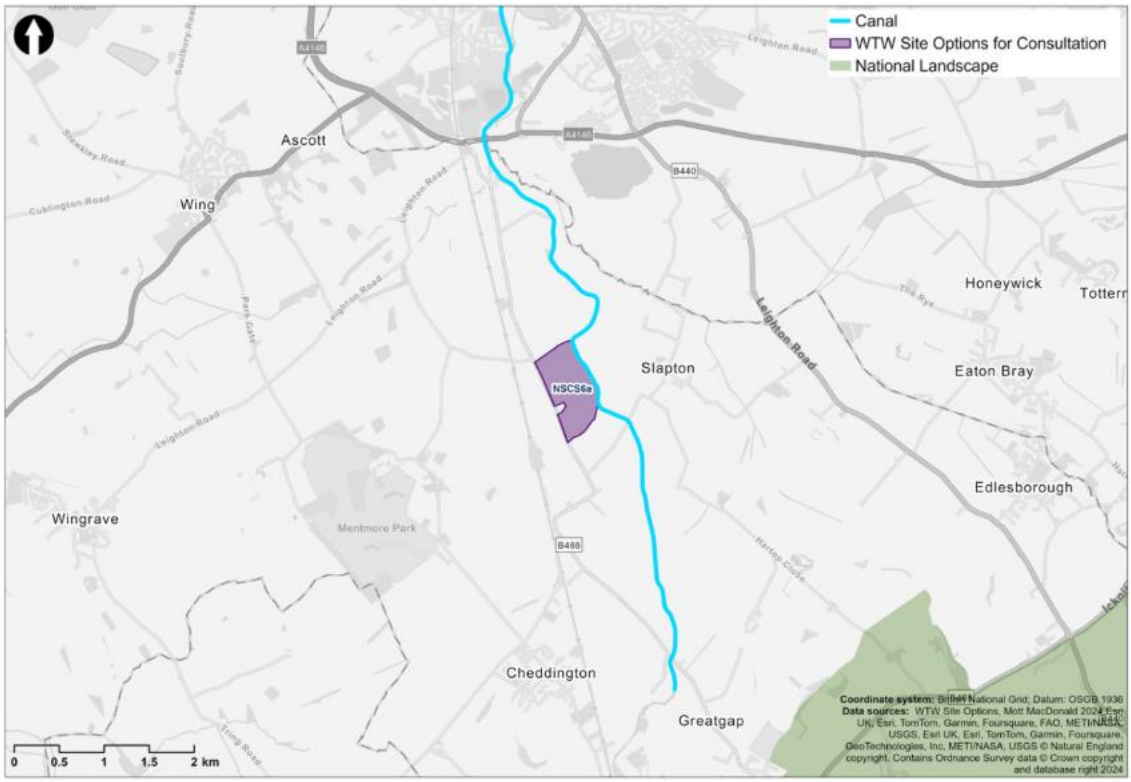
8.10.6 Site 6A was then subject to the engineering, environment, planning and land assessment set out in Stage 2 of the process and following that assessment, was then subject to the enhanced appraisal set out in section 6.4.4 of the September 2024 report and referred to in paragraphs 8.7.17 to 8.7.19 above. A high-level summary of the appraisal outcome is provided in Table 8.4, and a more detailed discipline summary is included at Appendix A.2.

## Table 8.4: Summary of Site NSC6A Assessment

### Site NSC6A Assessment

| | |
|---|---|
| **Engineering Assessment** | Performs well in engineering terms but with some constraints and issues that would need to be accounted for in the scheme design. Being located to the west of the Grand Union Canal it would require a tunnel beneath the canal to transfer treated water and for overflow to the river which would add engineering complexity. Surface water flooding does restrict the amount of land available for development, but WTW and water storage could be accommodated on site. The WTW and water storage would be separated by a gas pipe crossing but considered that this could be addressed through scheme design. Geology of the site is suitable to accommodate the water storage however it is noted that the cut and fill requirements are likely to be greater than Site B due to the undulating nature of the site. New access onto B488 would be relatively straight forward and it should be feasible for construction related traffic to be directed away from residential areas. |
| **Environment** | Performs well in environmental terms but with some constraints and issues that would need to be accounted for in the scheme design. The site comprises four agricultural fields divided by hedgerows, noting that is not known whether it is best and most versatile agricultural land. Surveys required to determine if hedgerows are protected and if veteran trees are present. There are no designated sites within the boundary of NSC6A nor in close proximity to the site. Whilst most of the site is at low risk of surface water flooding, there are areas of low to high risk at the northeast and southeast corner and eastern boundary of the site. The site is approximately 4km from the Chilterns National Landscape and 1km from Mentmore Towers, a Grade II* registered park and garden. The impact of development on these designations will need to be considered. There are residential receptors in the isolated properties to the north and south, and from the edge of villages, Horton to the south and Slapton to the east. There are PRoWs along the northern boundary of the Site, and PRoWs to the east and south. The B488 is not part of the Strategic Road Network (SRN), however, it is recognized as a suitable route for Heavy Goods Vehicles (HGVs). There are no designated heritage sites within the site boundary. |
| **Land Assessment** | No significant land constraints to developing the site. No Special Category Land identified. Presence of oil and gas pipelines are noted. The proximity of the neighbouring barns and bungalow means there is a risk of compensation claims, despite these assets not being impacted directly. Further consultation with landowner would be required. |
| **Planning Assessment** | Performs well in planning terms but with some constraints and issues that would need to be addressed as part of the DCO submission. The site is not designated within the Aylesbury Local Plan 2013-2033; however, the site does sit outside of the settlement boundary so the development would be considered to be located within the countryside. The location of Site NSC6A is such that it could change the character of the countryside between settlements. The site's separation from Slapton by the canal and agricultural land could mean it would have a lesser impact on the identity of the neighbouring settlement of Slapton than Site H.<br>Site is within a Minerals Safeguarding Area for Sand and Gravel and any planning application for non-mineral development would need to be accompanied by a Mineral Assessment. There are recent planning applications relating to the Horton Hill Farm for agricultural development that are within the boundary of the site. Adjoining the eastern boundary of the site is the Grand Union Canal, beyond which is the village of Slapton. The site adjoins the existing farm, Horton Hill Farm. The western boundary of the site is defined by the B488. |

**Figure 8.4: Site Option NSC6A**




8.10.7 Following the workstream assessments, the conclusion was that Site NSC6A could not be discounted at this stage, as it performed well across the above assessment criteria.

## 8.11 Further consideration of site B, site H and site NSCS6A

8.11.1 From all of the assessment and appraisal work undertaken, Site NSC6A (site located between the B488 and the Grand Union Canal to the west of Slapton), Site B (Near Brickhill, South East of Milton Keynes) and Site H (west of Slapton) emerged as the sites considered to have potential for siting of the WTW and storage elements of the Proposed Development. For ease of reference, Figure 8.5 shows the location of Site B and Figure 8.6 shows the location of Site H.

**Figure 8.5: Site Option B**

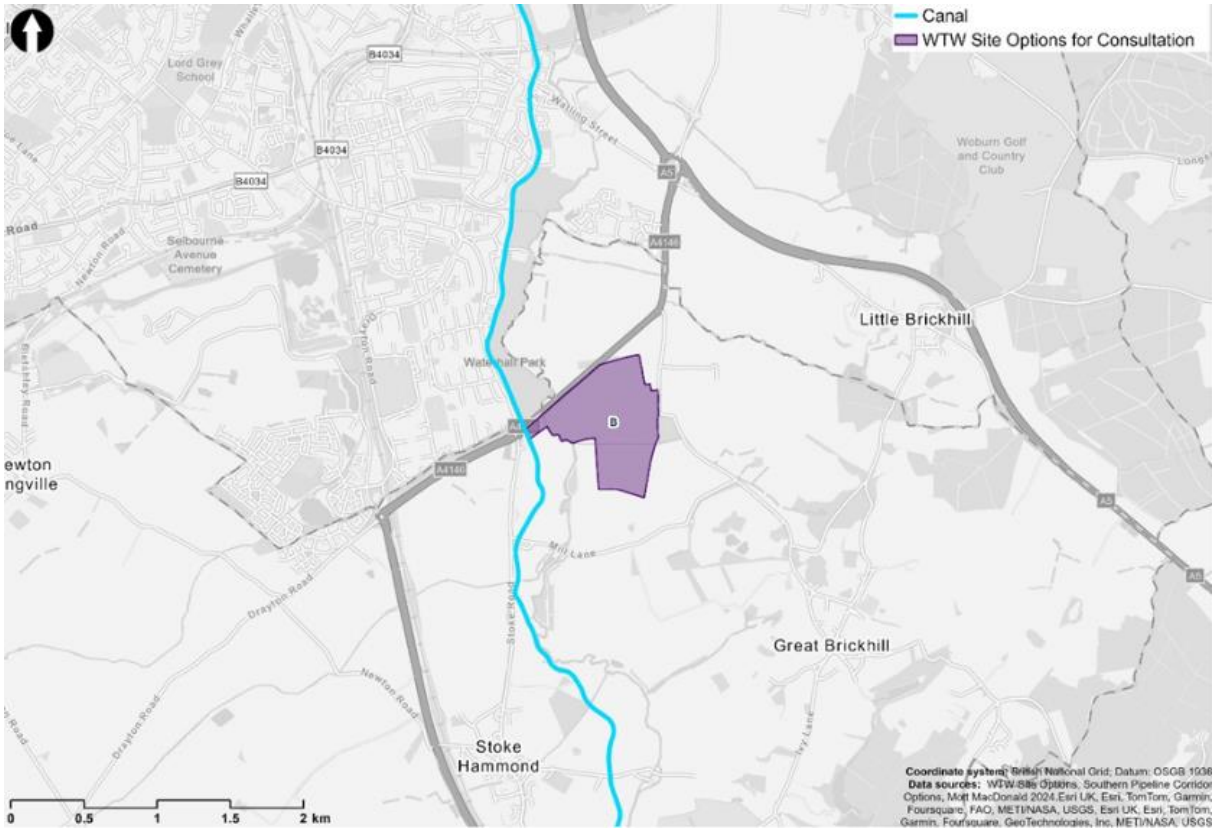
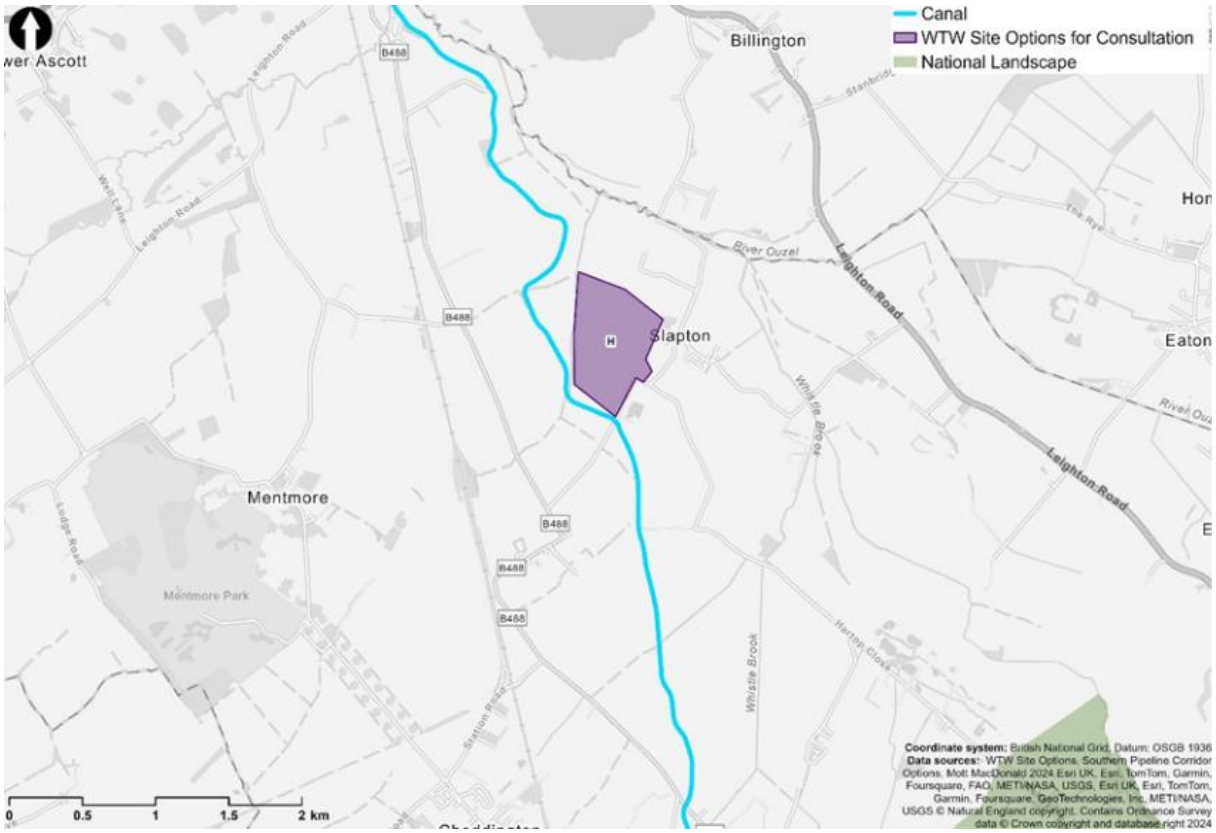



**Figure 8.6: Site Option H**



8.11.2 To determine a preferred option to take forward, including for the purposes of the Phase Two Public Consultation, a series of workshops were held with the Project Partners, informed by the engineering, environment, planning and land teams.

8.11.3 Given the proximity of Site 6A to Site H, the technical workstreams gave consideration as to whether both Site 6A and Site H should be considered as sites with potential moving forward. In summary, these considerations concluded that in engineering terms, there is little difference between Sites 6A and H, with the need to work in close proximity to buried gas and oil pipelines noted for both sites. For Site 6A there would be the additional need for transfer pipelines to cross beneath the Grand Union Canal to reach the underground reservoir near Luton and to overflow to the River Ouzel, but this is considered manageable in terms of engineering risk. In respect of both environment and planning matters, there is clear benefit in Site 6A in comparison to Site H given its distance from the residents of Slapton, the fact it avoids direct impacts to public rights of way and would not include the loss of a Local Wildlife Site. The concerns expressed in respect of Site H during Phase One Public Consultation relating to the amenity impact to the village of Slapton are a further consideration. In terms of land matters, there would be a need to determine the impact on the existing farm buildings and associated bungalow immediately adjacent to but outside the boundary of Site 6A.

8.11.4 It was concluded by the technical workstreams that Site 6A was preferable to Site H and should be taken forward in the process, with Site H no longer being considered.

8.11.5 In respect of options Site B and Site NSC6A, the following was, in summary, noted on the basis of the information obtained and available:

- **Access** – For Site B, possible direct access off the A4146 would be a significant benefit. For Site NSC6A, access off the B488 was considered reasonable but it is understood that the road is prone to flooding.
- **Land matters** – Site B is being actively promoted for housing development by the landowner through the emerging Buckinghamshire Local Plan process. Notwithstanding the fact that the suitability of the site for housing is a matter to be determined by the local planning authority through the local plan process, it is considered that potential exists for some housing to be developed alongside the relevant WTW and storage elements on the site. Immediately adjacent to Site NSC6A are some agricultural buildings and an associated bungalow which, although not directly affected, would be impacted if Site NSC6A were developed as part of the Proposed Development.
- **Planning** – Site B is located in a locally significant Area of Attractive Landscape but Site NSC6A sits outside this area. The NPSWRI, however, indicates that such local landscape designations need not be a barrier to development.
- **Infrastructure requirements and operational risk** – Abstracting water from the canal at Site B would mean a longer transfer pipeline to the underground reservoir near Luton at Chaul End. However, whilst Site NSC6A would have a shorter pipeline transfer to the underground reservoir it would require additional pumping stations and bypasses on the Grand Union Canal between the abstraction point at Site B and the abstraction point for Site NSC6A. Environmental analysis of these two options indicated that, on balance, the impacts from the construction and permanent works associated with such additional canal related infrastructure would be less favourable than the temporary construction impacts associated with the longer transfer pipeline required for Site B. In addition, Site NSC6A requires pipeline connections to be provided underneath the canal.

- **Canal interventions** - The part of the Grand Union Canal south of Leighton Buzzard (and therefore south of the Site B abstraction point but upstream of the Site NSC6A abstraction point) is also known to flood which would potentially also require further canal related infrastructure over and above that indicated above. At Leighton Lock (the Lock located in the northern part of Leighton Buzzard), where, as is the case at all the locks, a bypass would need to be installed, this bypass could not be to the west as there is existing housing development immediately adjacent to the canal bank. To the east is the River Ouzel, with Ouzel Meadows located between the canal and the river. The Meadows flood regularly, which has the potential to impact access during construction and operation/maintenance of the bypass. To address this, new access ways would need to be constructed if the Proposed Development were to require development on the Ouzel Meadows, which as a minimum would include the construction of new access roads with the potential requirement for floodplain compensation and loss of open space.
- **Water quality** - The Grand Union Canal at the Site B abstraction location has better water quality than at the Site NSC6A abstraction point, meaning that treatment infrastructure requirements may well be less at Site B than at Site NSC6A.
- **Overflow from the WTW** - The River Ouzel in the vicinity of Site B is a more substantive watercourse than it is in the vicinity of Site NSC6A, meaning that in the context of Site B it is likely to operate well as an overflow for the WTW. The River Ouzel at the location of Site NSC6A is more stream like, meaning that the addition of overflow from the treatment process if located at Site NSC6A would likely have a greater impact.
- **Cost** – There was considered not to be a significant difference in the cost of building the WTW and storage at Sites B and NSC6A, however there were differences, as noted above, that would make the operation of a site at NSC6A more complex and the additional canal infrastructure required would increase the risk associated with NSC6A.

**Conclusion**

8.11.6 Taking into account all of the assessment work completed as summarised within this chapter, Site B (now referred to as Galley WTW) was identified as the preferred site for the advanced treatment and storage elements of the Scheme. A summary of the key reasons for choosing Site B are set out below.

8.11.7 ***Engineering and Operational Benefits -*** Site B is relatively flat but has a sufficient slope to support water storage construction, reducing the need for extensive excavation. Siting the relevant elements at Site B results in abstracting water at a point on the Grand Union Canal where there is better recorded water quality than further south, reducing treatment complexity and cost. Furthermore, there is no need to provide canal infrastructure in and around Leighton Buzzard which would result in additional complexity and risk to the project. The River Ouzel near Site B is more suitable for managing overflow from the WTW.

8.11.8 ***Environmental and Social Benefits –*** Recognising that further work in respect of these aspects would need to progress along with further detailed design, the site mainly comprises low-quality grassland and arable fields, minimising the impact on biodiversity. The site is well screened from the north, reducing visual intrusion. Only one potential heritage asset, which is not designated, has been identified.

8.11.9 ***Planning Advantages*** - Site B is outside the Green Belt, avoiding significant planning consenting risks. Whilst located within an Area of Attractive Landscape, the NPSWRI does not treat this as a barrier to development and there will be opportunities to design the development to mitigate landscape and visual impacts. It is considered that housing could be developed

alongside the Proposed WTW and Storage elements should this be something that the local authority were, in any event, supportive of.

8.11.10 ***Access & Logistics –*** Site B has the potential for direct access off the A4146 which is a major advantage for construction and operations. It avoids complex pipeline crossings under the Grand Union Canal, railways, or major roads.

8.11.11 ***Cost Considerations -*** Construction costs are similar to other sites, but Site B offers lower operational complexity and risk, potentially leading to long-term savings.

8.11.12 As a further step to confirm the robustness of the optioneering process, further analysis and testing of the site identification process was undertaken. This is included in Appendix A.3.

## 8.12 Abstraction, treatment and storage

8.12.1 Following the identification of Site B as the location for the treatment and storage elements of the Proposed Development, work has been undertaken on further determine the elements of the Proposed Development needed on the site and the appropriate location for those elements.

# 9. Chaul End Transfer Pipeline

## 9.1 Introduction

9.1.1 This chapter of the report provides an update of the scheme development and optioneering work that has been undertaken in respect of identifying the appropriate pipeline corridor to transfer the treated water from the new WTW to its input into AfW's water supply network at the existing reservoir at Chaul End near Luton. This element is located at the southern end of the Proposed Development and makes up Part 4b of the Proposed Development as described within the Preliminary Environmental Information Report that has also been published for the Phase Two Public Consultation .

## 9.2 Overview of previous work undertaken

9.2.1 The work undertaken at the time of the Phase One Public Consultation on scheme development and optioneering matters of relevance to the transfer of water to Chaul End is reported in Chapter 7 of the September 2024 Report.

9.2.2 That chapter outlines the strategic context, the evolution of the transfer corridor options, and the assessment of potential pipeline corridors for transferring treated drinking water to the underground reservoir at Chaul End, near Luton.

9.2.3 The strategic context confirms that the existing underground reservoir near Luton is the preferred operational site for integrating the transferred drinking water into the public supply. This decision is based on AfW's Connect 2050 strategy, which identifies future supply-demand challenges and the need for resilient infrastructure.

9.2.4 As explained in Chapter 8 of this report, the previously preferred site for water treatment and storage was located at the former Grovebury Quarry near Leighton Buzzard. An engineering led assessment of potential transfer corridors was undertaken at the time which identified a potential water pipeline transfer corridor from this site to Chaul End, broadly passing in an easterly direction from the site alongside the A505 road corridor, and then eastwards through Dunstable and the southern edge of Houghton Regis. However, the subsequent decision that the site at Leighton Buzzard was not an appropriate site for water treatment and storage prompted a reassessment of alternative sites and corresponding pipeline corridors. The updated review, presented at the Phase One Public Consultation, considered Sites B (Near Brickhill, South of Milton Keynes), H (Slapton), and P (east of Leighton Buzzard) as viable options for water treatment and/or storage.

9.2.5 The methodology for identifying pipeline corridors from these sites involved a desk-based analysis, applying exclusionary criteria to avoid sensitive environmental and planning constraints, where possible, such as ancient woodland, scheduled monuments, flood zones and designated biodiversity sites as set out in Table 3.1 of the September 2024 Report. Due to the extent of Green Belt, National Landscape and biodiversity site designations in the area, some corridors inevitably ran through or included these areas. The September 2024 report acknowledged that while buried pipelines may not constitute inappropriate development in the Green Belt, associated above-ground infrastructure and temporary works could require justification under planning policy.

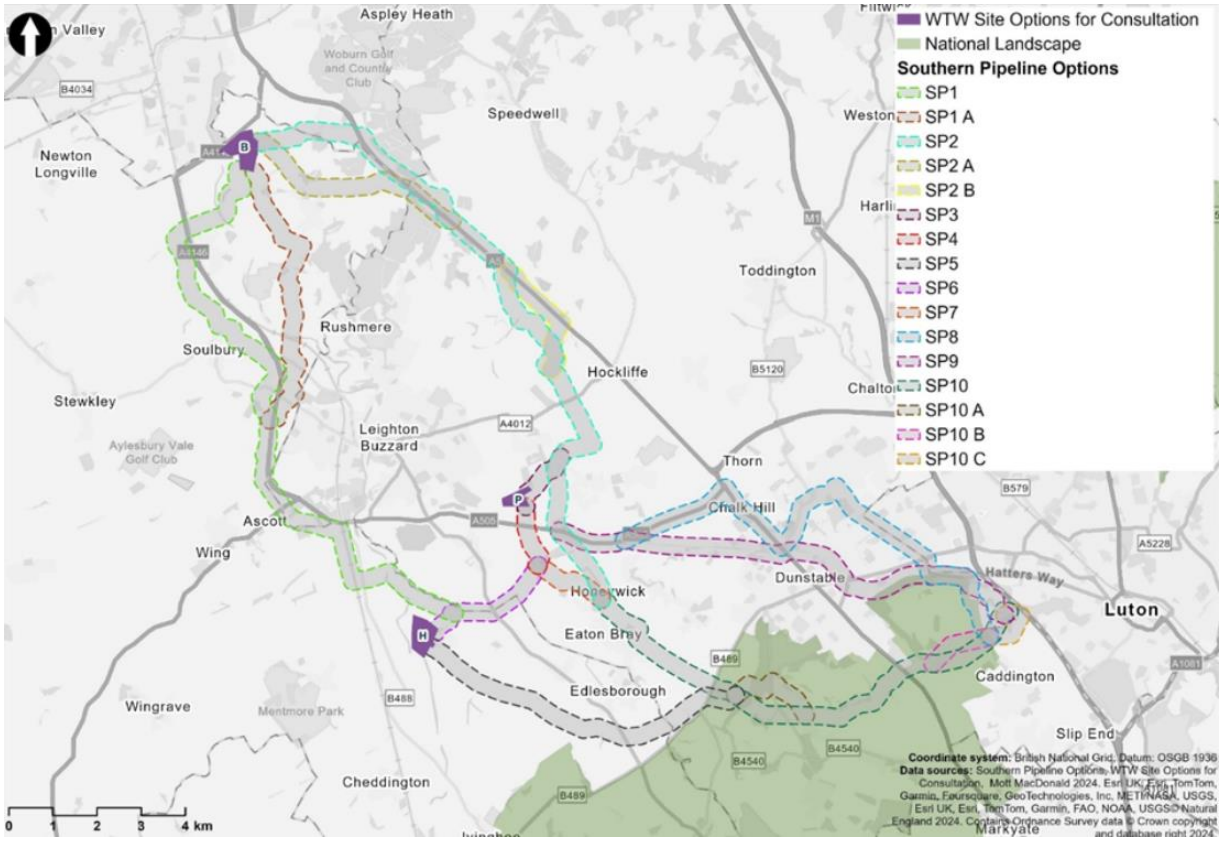
9.2.6 Several pipeline corridors were identified and assessed for their feasibility, environmental impact, planning and land implications. These corridors – reproduced on Figure 9.1- were grouped based on the site from which they would start, as follows:

- **From Site B (WTW and storage):** Options SP1, SP1A, SP2, SP2A, and SP2B were considered. SP2 and its sub-options (SP2A and SP2B) were preferred due to fewer infrastructure crossings and reduced environmental risks. For the southern part of the transfer route from Site B, the pipeline corridor options joined the corridor options for Site H and Site P as described below.

- **From Site H (WTW and storage)**: Options SP6, SP7, SP10, SP5, SP8, and SP9 were evaluated. SP10 and its sub-options (SP10A, SP10B, SP10C) were considered preferable, especially for their ability to avoid sensitive areas through trenchless construction under the Dunstable Downs.

- **From Site H (storage only) to Site P (WTW)**: The raw water transfer would follow SP6 and SP4, while the drinking water transfer would use SP4, SP7, and SP10 or alternatives SP8 and SP9. SP4, SP7, and SP10 were preferred due to reduced urban disruption and better environmental compatibility.

**Figure 9.1 Potential Pipeline routes assessed prior to Phase One Public Consultation (from the September 2024 Report)**




9.2.7 Each corridor was assessed for engineering complexity, environmental sensitivity, planning policy alignment, and land ownership or acquisition risks. Urban corridors involving in-road construction (e.g., SP8 and SP9) were generally considered to be less favourable due to higher disruption and technical challenges.

9.2.8 Following this assessment, the range of preferred pipeline transfer options presented at Phase One Public Consultation, as set out below, reflected the optionality that existed in respect of the water treatment and storage sites.

**Pipeline Transfer from Site B (water storage and WTW) to Chaul End:**

- Corridor Option SP2 (including potential sub-options SP2A, SP2B), combined with Option SP10 (including potential sub-options SP10A, SP10B, SP10C).

**Pipeline Transfer from Site H (water storage and WTW) to Chaul End:**

- Corridor Options SP6, SP7 and SP10 (including potential sub-options SP10A, SP10B, SP10C)
- Corridor Option SP5 combined with SP10 (including potential sub-options SP10A, SP10B, SP10C)

**Pipeline Transfer from Site H (water storage) to Site P (WTW) and to Chaul End:**

- Corridor option SP6 combined with SP4 for the raw water transfer from Site H to Site P
- Corridor option SP4, SP7, SP10 (including potential sub-options SP10A, SP10B, SP10C) for the drinking water transfer from Site P to Chaul End.

9.2.9 These options were consulted on the Phase One Public Consultation, along with a recognition that additional surveys and assessment work, and any relevant feedback would be used to further progress these aspects of the Proposed Development.

## 9.3 Policy and Procedural Developments

9.3.1 As explained within Chapter 4 of this report, subsequent to the completion of the September 2024 report and the position set out in that report, a number of policy and procedural developments have occurred.

9.3.2 The implications of these developments mean that – in accordance with the position clearly stated within paragraphs 1.4.5 and 1.4.6 of the NPSWRI and having regard to both the status of the Proposed Development and the way in which it is described within AfW's WRMP24 - the need for the Proposed Development will not be revisited as part of its application for development consent.

9.3.3 It is recognised, however, that unlike other parts of the Proposed Development discussed in earlier chapters of his report, there is less specificity given in the AfW WRMP24 in terms of the elements considered in this chapter. Paragraph 7.32 of AfW's WRMP simply indicates that in respect of these elements of the Proposed Development, *"Water would be abstracted at a location near Leighton Buzzard and stored, before being treated at a new Water Treatment Works onsite and then transferred to our [AfW's] supply area".*

9.3.4 As explained above and in Chapter 3, during the development of the Proposed Development, AfW has confirmed that the underground reservoir at Chaul End near Luton was the operationally preferable site from which to manage water into supply. Therefore, this site has set the end point for the pipeline transfer corridor. In terms of the origins of the pipeline transfer, this is dependent upon the outcomes set out in Chapter 8 as to where the preferred location for the treatment works and storage is located.

## 9.4 Phase One Public Consultation

9.4.1 Responses to the Phase One Public Consultation provided comments on the potential pipeline corridors, including those considered to have more potential, and also those that had been assessed and not taken forward to the Phase One Public Consultation process. The responses can be grouped into the themes and issues identified below.

**General comments regarding the principles of the underground pipeline**

9.4.2 These comments related to the potential impact that could arise from pipeline corridor routeing and construction activities. Points raised included the potential impacts on local communities such as traffic disruption, landscape and visual impacts and any disruption that may occur to other utilities and infrastructure within the area such as gas and oil pipelines. There were also concerns regarding the impact the project would have on existing businesses such as farms, equestrian facilities and commercial properties during construction. Potential environmental impacts such as loss of hedgerows and other vegetation, effects on biodiversity and flooding implications were also raised.

**Comments on specific pipeline corridor options**

9.4.3 Generally, responses received indicated that pipeline corridor SP2 was supported ahead of corridor SP1, due to it being shorter in length with resulting less overall impact. Pipeline corridor SP2 was further preferred to SP1 due to the latter corridor having numerous crossings of features such as rivers, the canal, rail and roads.

9.4.4 Some respondents preferred corridors SP8 or SP9, which run through the urban areas of Dunstable and Luton, and which avoid the Chilterns National Landscape. These comments were further expressed as concerns regarding corridor SP10 and its sub-options, with further concerns regarding the potential implications for National Trust land including the Dunstable Downs and Ivinghoe Beacon.

9.4.5 There were concerns raised regarding the pipeline corridors that were in close proximity to the settlements of Slapton, Church End and Chaul End and the impact the construction of the pipelines may have on local residents.

**Comments on potential alternative corridor options**

9.4.6 Potential alternative corridors to those presented at the Phase One Public Consultation were also commented upon. These included querying whether there was potential to consider co-usage of the pipeline running to Kensworth Quarry, which travels from Rugby to the quarry via Totternhoe along the route of the National Gas Distribution Main. It was considered that this would involve going alongside an area where there is already ground disturbance and probable space constraints.

9.4.7 Re-routeing of SP10 to avoid impacts on residential accesses was also suggested. There was a further suggestion to build a new water supply reservoir on the northern edge of Dunstable/Luton conurbation close to the A505/M1 link road to shorten the distance over which disturbance from pipeline construction would occur.

## 9.5 Design Development following Phase One Public Consultation

9.5.1 Following the Phase One Public Consultation and having regard to the feedback received, further scheme development and option related work has been undertaken on the pipeline transfer to the reservoir at Chaul End. In summary, this work has consisted of:

- A review of the pipeline options following the decision to progress with Site B as the preferred option for locating the water treatment and storage – and therefore confirming the starting point of the transfer pipeline.

- A review of the SP2 pipeline corridor (the section of pipeline from Site B to the north of Eaton Bray), including options SP2A and SP2B.

- A review of the SP10 pipeline corridor (the section of pipeline from the north of Eaton Bray to the underground reservoir at Chaul End near Luton).

9.5.2 The work that has been undertaken in respect of these matters is explained in the following paragraphs.

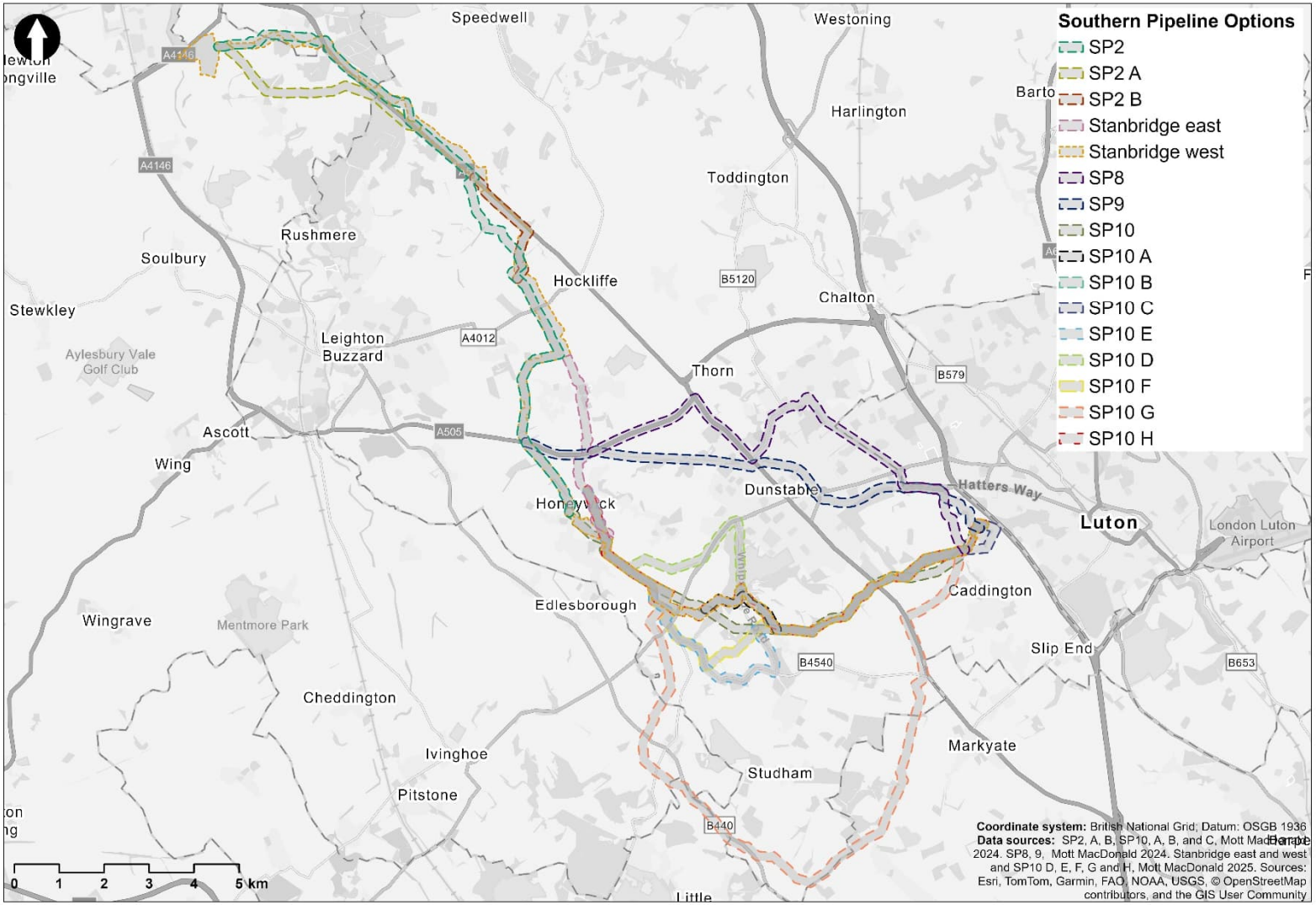
**Progression of Site B as location for water treatment and storage**

9.5.3 The selection of Site B as the preferred site for the water treatment and storage elements of the Proposed Development confirmed the identification of the canal abstraction point from where water will be pumped from the Grand Union Canal to the new storage and water treatment works and the location of where the pipeline to transfer drinking water would originate.

9.5.4 As a result of selecting Site B, it was determined that there was no benefit in retaining corridors SP3, SP4, SP5, SP6 and SP7 within the optioneering process as these connected to or went via Sites H and P, which were no longer being taken forward. Whilst a corridor from Site B to the reservoir at Chaul End would be possible along these corridors or parts of these corridors, they would be less direct than other remaining corridors with no clear benefits justifying their retention as options.

9.5.5 This left pipeline corridor SP2 (along with options SP2A and SP2B) and pipeline corridor SP10 (along with options SP10A, SP10B and SP10C) within the ongoing optioneering and scheme development process. Additional technical work was undertaken to review these options, taking into account the feedback received at the Phase One Public Consultation, to identify a preferred corridor for the purposes of the Phase Two Public Consultation. As set out below, this additional work has included considering other alternative corridors and variations of those corridors to confirm the selection of the preferred corridor. These are shown on Figure 9.1.

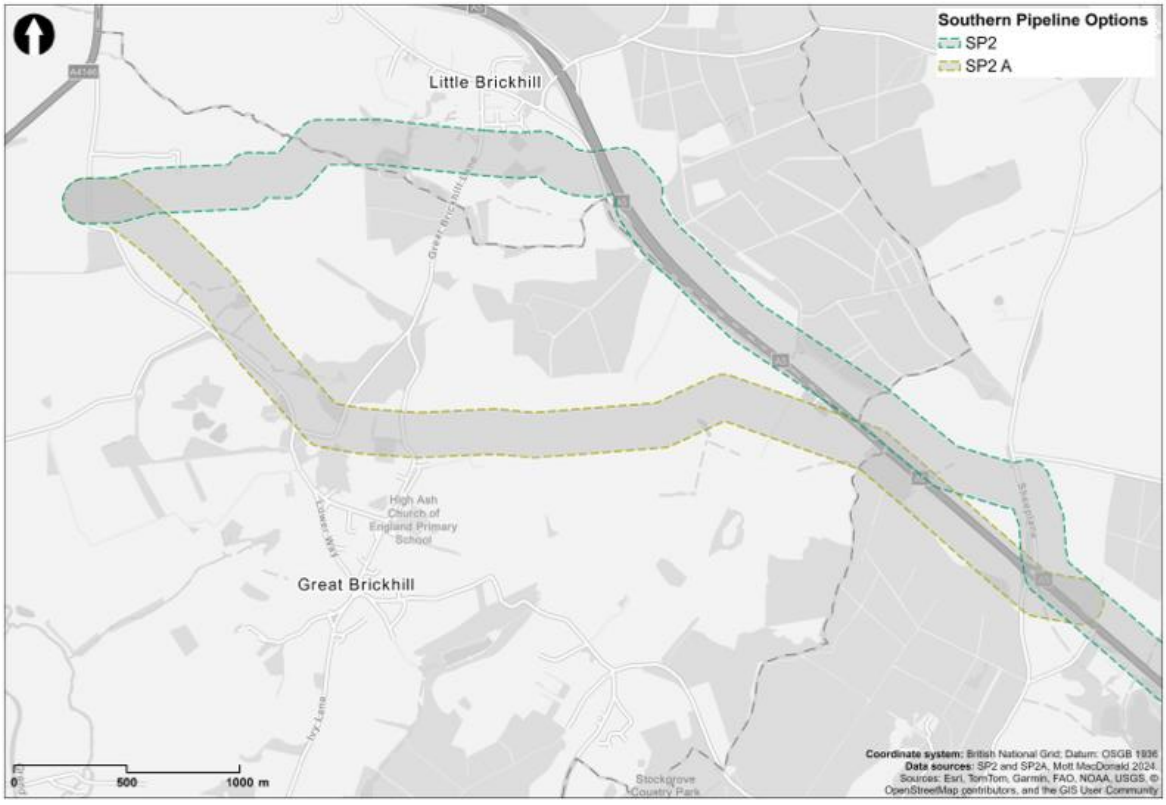
**Figure 9.1: Southern Pipeline Options – All Routes**



**Review of Corridor SP2**

9.5.6 Through a series of design workshops involving planning, environmental, land and engineering inputs, corridor SP2 was reviewed including the corridor options (SP2A and SP2B) identified for the Phase One Public Consultation. In addition, a further corridor option in the area of the settlement of Stanbridge was identified. Corridors SP2, SP2A and SP2B were subject to assessment by the technical workstreams prior to the Phase One Public Consultation, as explained within Chapter 7 of the September 2024 Report. The option identified around Stanbridge was subject to the same assessment. The outcome of the assessments undertaken, included those that took place in advance of Phase One Public Consultation, is summarised in the following paragraphs.

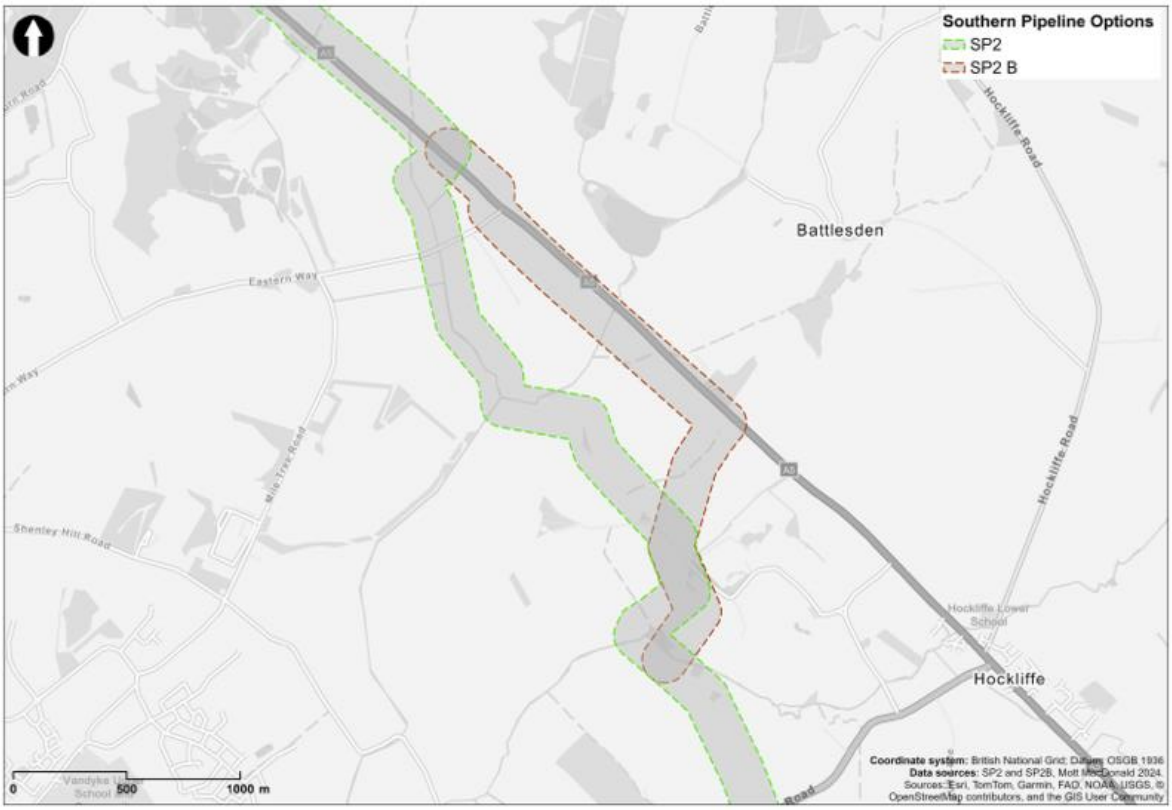
**Figure 9.2: Southern Pipeline Options SP2 and SP2A**




9.5.7 ***Route Corridor SP2 and SP2A -*** Route corridor SP2A provides an alternative to route corridor SP2 on how the pipeline would run from Site B to the A5 corridor (see Figure 9.2). Route corridor SP2 travels in an eastern direction from Site B close to Little Brickhill with route corridor SP2A travelling in a more southern-easterly direction closer to Great Brickhill.

9.5.8 The further assessment of route corridor SP2A found that this would intersect with various environmental sites such as local wildlife sites and areas of priority habitats. This corridor also ran across an area of Common Land. It was found that SP2 corridor intersects with the Levante Gate Strategic City Extension which is a proposed allocation within the Regulation 19 Milton Keynes City Plan, however, it was deemed that the eventual pipeline routeing could avoid this allocation. As a result of the further assessment of work undertaken, and for the reasons summarised above, route corridor SP2A was discounted, with route corridor SP2 in this location taken forward to Phase Two Public Consultation.

**Figure 9.3: Southern Pipeline Options SP2 and SP2B**




9.5.9 ***Route Corridor SP2 and SP2B –*** Route corridor SP2B provides an alternative on how the pipeline would travel away from the A5 corridor to the west of Hockliffe (see Figure 9.3). Route corridor SP2 travels west away from the A5 corridor at a point close to the junction of the A5 with Eastern Way, whereas route corridor SP2B travels further south parallel to the A5 before diverting from the road corridor and running to the west of Hockliffe.

9.5.10 The further consideration of route corridor SP2 found that this corridor would intersect with a granted planning application for a travelling fairground site. In addition, it was considered that route corridor SP2B would have less of an impact overall on landowners and on agricultural land by running along the margins of the A5 highway carriageway for a longer length. It was also considered that route corridor SP2B would be less likely to interfere with accesses to residential properties.

9.5.11 For the reasons summarised above, the assessment and considerations undertaken concluded that route corridor option SP2B should be selected over route corridor SP2 in this area as the route corridor to be taken forward to the Phase Two Public Consultation.

9.5.12 ***Routeing around the settlement of Stanbridge -*** It was noted during the post Phase One Public Consultation work that the SP2 corridor west of the settlement of Stanbridge was partly a legacy of the need to link it with previous route corridor options associated with Sites H and P. Consideration was, therefore, given as to whether a more direct pipeline corridor might exist to link route corridor SP2 with route corridor SP10. A potential route corridor was identified, routeing the pipeline corridor to the east of Stanbridge, closer to the settlement of Tilsworth (see Figure 9.4).

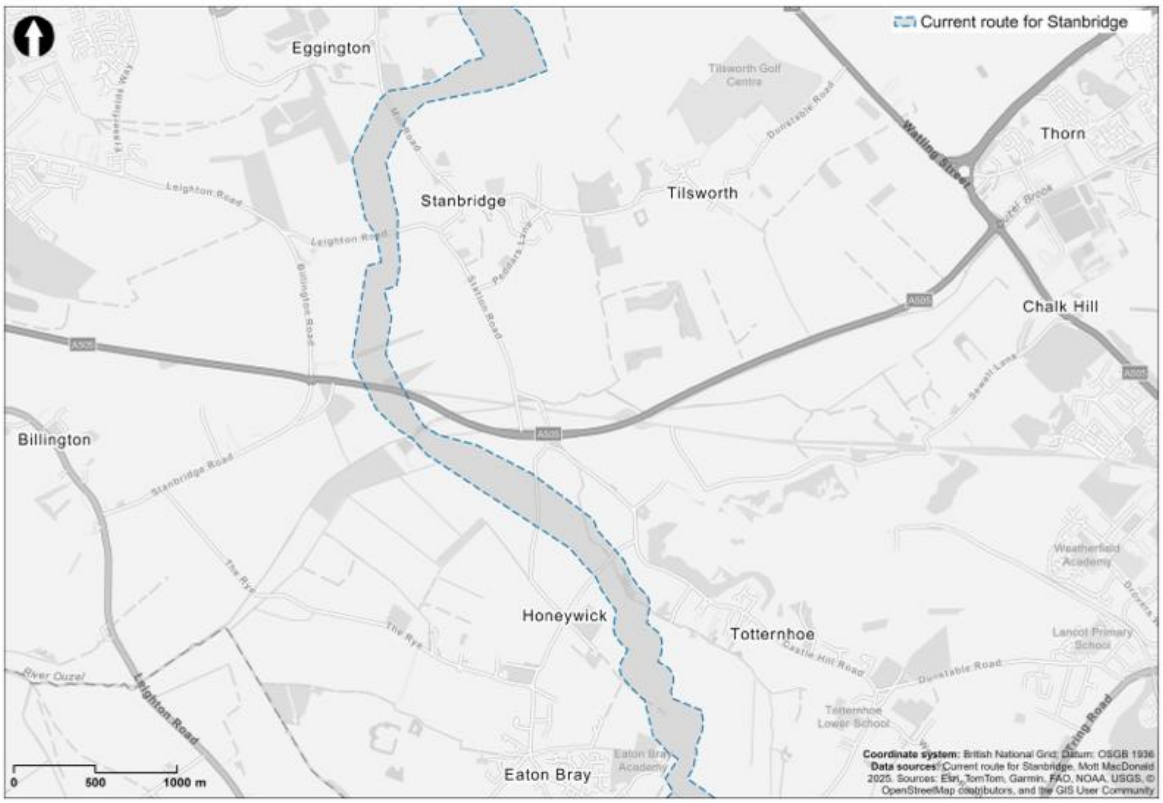
**Figure 9.4:Southern Pipeline Options East and West**

9.5.13 These two options (termed the east and west option) were then considered further. The new east option route corridor passes between Stanbridge and Tilsworth and travels south over the A505 with the corridor then continuing south, routeing north of the settlement of Honeywick and south of the settlement of Middle End. The west option (the previous SP2 option) travels west around Stanbridge and crosses the A505 but at a more western point than the new east option. This corridor then travels in a south-eastern direction to the south of Honeywick.

9.5.14 The assessment of the new east option identified that it would intersect with an area of well-used open space and the Leighton United football ground. The new east option would also run close to residential properties, although it was noted that this could potentially be mitigated by narrowing the width of the route corridor. The new east option was found to be within 100m of mapped ancient woodland and the route would include areas of high value (Grade 2) agricultural land.

9.5.15 For the reasons summarised in the preceding paragraphs, it was determined that the new east option should not be taken forward in preference to the previous SP2 west option. However, it was identified that the southern section of the new east option did appear to offer some advantages over the west SP2 corridor south of the A505 as it would avoid a watercourse located between the A505 and Honeywick. The decision was made that the preferred route in this location for the purposes of Phase Two Public Consultation should be a corridor that followed the line of the original SP2 west option, but which then diverted at its southern end around the settlement of Honeywick as shown on Figure 9.5.

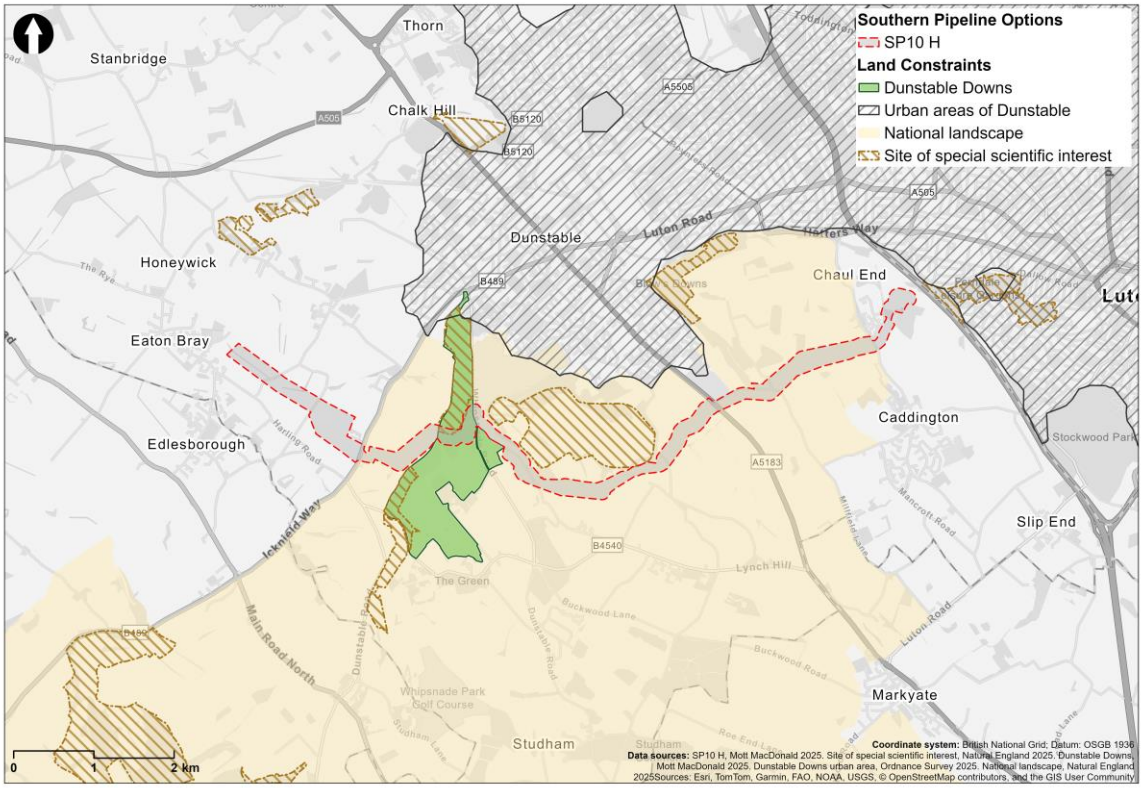
**Figure 9.5: Southern Pipeline Option Stanbridge**




### Review of Corridor SP10

9.5.16 Identifying a preferred pipeline route corridor eastwards from the Eaton Bray area to the existing reservoir at Chaul End presents a number of challenges. It either involves routeing across the Dunstable Downs which forms part of the Chilterns National Landscape and the Dunstable and Whipsnade Downs SSSI, or routeing a pipeline corridor through the main urban area of Dunstable (see Figure 9.6).

**Figure 9.6: Indicative Southern Pipeline Route and Land Constraints**




9.5.17 Within the Dunstable Downs there is also National Trust landholdings, including some land which is considered 'inalienable', which can enact special parliamentary procedures. There is also land which is designated as Common Land within the Downs.

9.5.18 In respect of the Chilterns National Landscape, the NPSWRI requires that it is demonstrated that major development within such a National Landscape is unavoidable and in the public interest. The NPSWRI also directs that the cost of, and scope for, developing elsewhere, outside the designated area is also considered.

9.5.19 Following Phase One Public Consultation, further engagement was undertaken with the National Trust, with information provided as to the extent of alienable, inalienable land, and clear indication given that the National Trust would need to see a clear justification why a route through the Dunstable Downs was the most appropriate route if ultimately such a route was promoted. In this regard, the National Trust questioned why a potential alternative pipeline corridor further to the west and the south could not be progressed, as this would avoid National Trust landholdings. This alternative suggestion was drawn up and assessed, as discussed further in the next section of this report.

9.5.20 Post Phase One Public Consultation engagement also took place with the Chilterns Conservation Board. The Board, amongst other things, highlighted the need to consider alternative corridors that avoid or reduce potential impacts on the National Landscape.

9.5.21 In light of the above, a review of the corridor options leading from the Eaton Bray area to the existing reservoir at Chaul End was undertaken. This work, which is explained further in the following paragraphs, consisted of:

- A review of potential corridors through the urban area of Dunstable (route corridor options which in the period prior to Phase One Public Consultation had been determined not to be suitable – namely route corridor options SP8 and SP9);

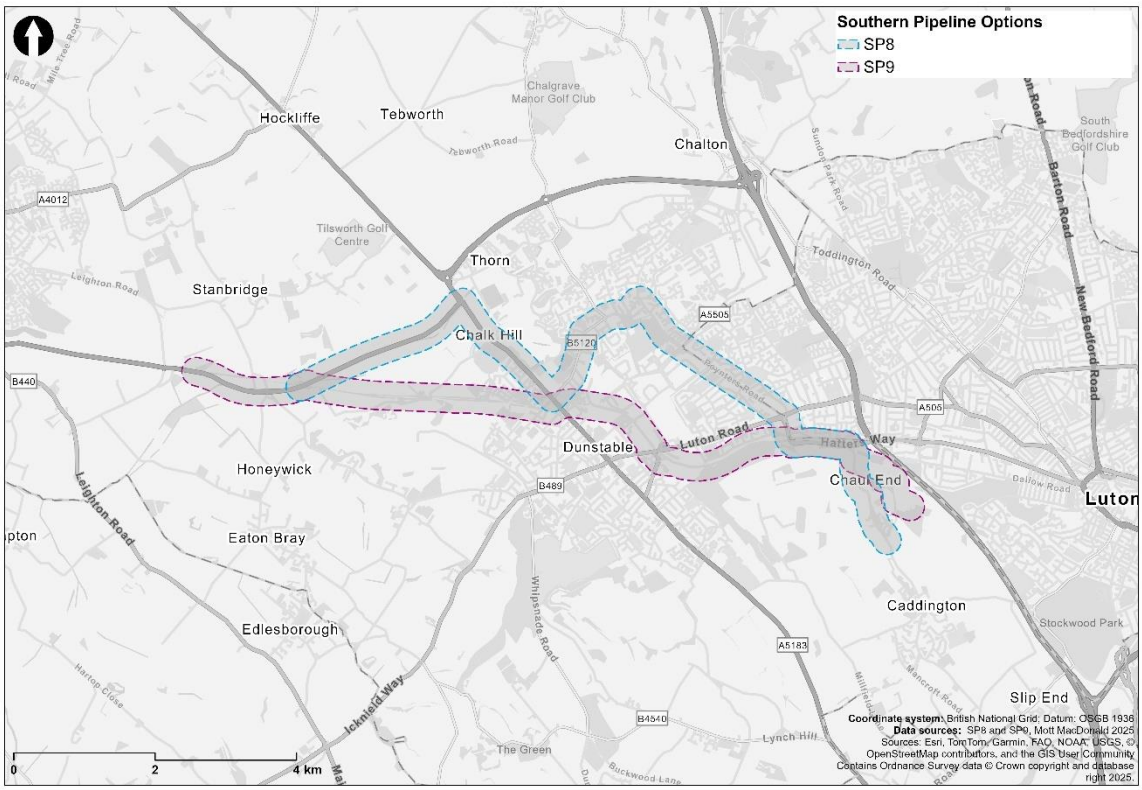
- Identification and review of various alternative routeing options across the Dunstable Downs, and

- A review of the remaining optionality along route options SP10 remaining from the Phase One Public Consultation in the form of route options SP10B and SP10C.

**Review of Corridor Options Through Dunstable**

9.5.22 Through the earlier optioneering work reported in the September 2024 report, pipeline route corridors SP8 and SP9 were concluded not to have potential for the reasons set out below (see Figure 9.7).

**Figure 9.7:** Southern Pipeline Corridor Options SP8 and SP9




9.5.23 Following reconsideration of these routes, the reasons why they are not considered to be feasible options are summarised below.

9.5.24 ***Route corridor SP8 –*** This route corridor involves routeing the pipeline along the A505 (part of the Strategic Road Network within Central Bedfordshire District) and through the centre of Houghton Regis. The majority of construction activity to lay the pipeline would occur within the highway carriageway or highway verge given the urban nature of the area and the need to avoid routeing the pipeline beneath properties. Evaluation of this route option further noted that due to the built-up nature of the area there would be limited land available to accommodate the construction working areas required to construct the pipeline.

9.5.25 Constructing the pipeline through major urban areas would cause significant disruption to the local community and visitors to the town. Even with traffic management, the construction would give rise to significant traffic delays which would impact adversely on the life of residents and businesses within the town for a potentially significant length of time. In addition, there are Listed Buildings within Houghton Regis that would be on either side of the proposed pipeline route, which again, further constrains the route.

9.5.26 As the route would be wholly within the highway carriageway or verge, the construction itself would take longer than through agricultural land, and in addition there would be other utilities already within the road space which would likely extend the construction process and make it more complicated.

9.5.27 From the work undertaken, the significant lengths of pipeline routes within a highway and with construction occurring within a major urban environment, the engineering risks and wider disruption to the local area associated with this option were considered significant and it was therefore the conclusion that this option was not feasible.

9.5.28 ***Route corridor SP9 -*** Running through agricultural land in its approach to Dunstable, route option SP9 would avoid direct disruption to the A505. This option would then route through central Dunstable and parts of Luton along the alignment of the Dunstable guided busway. Before reaching the guided busway, the pipeline would need to go under the former central Bedfordshire council offices. These offices were built on land that was previously the Dunstable oil depot, which means that there is a possibility that there are residual hydrocarbons on the site, which would pose a significant water quality risk.

9.5.29 It was determined that this option would need to be constructed within the guided busway corridor itself, with no adjacent space available for construction. Given the size of the pipeline to be installed and the mechanical plant that would be required to install the pipeline it would be expected that the busway would need to be closed to traffic while construction is occurring along it as the concrete track would need to be removed and then reinstated. The loss of the guided busway for the duration of the pipelaying activities would cause significant disruption to those living, working and operating businesses within Dunstable and the surrounding areas linked by the guided busway.

9.5.30 Due to the above summarised reasons, this route option was considered not to be feasible.

***Other corridors through Dunstable***

9.5.31 Following Phase One Public Consultation and the subsequent engagement activities an exercise was undertaken to check whether any other previously unidentified routes through the Dunstable area were available. No further routes were identified that would not give rise to the general issues set out above in respect of options SP8 and SP9. The area is heavily constrained by the density of properties within the urban area and utilising the highway would give rise to disruption to local residents and those visiting and working in the area.

***Further Dunstable Downs Route Options***

9.5.32 Following Phase One Public Consultation a process was undertaken to investigate whether there were any potential additional routes that could avoid interaction with the various aspects of the Dunstable Downs. The routes were identified by the Project engineers, taking into account mapped environmental constraints, and, in particular, the routes sought to avoid, where it was possible to do so, interaction with National Trust inalienable and alienable land, the Dunstable and Whipsnade Downs SSSI, Kensworth Chalk Pit SSSI and ancient woodland. Five additional potential corridors – as detailed below and shown in Figure 9.8 - were identified

and then subject to the Stage 2a assessment (as set out in the Methodology in Chapter 3 of the September 2024 Report) which considers engineering, environment, planning and land matters.

- **SP10D North Route** – Consisting of the diversion of route corridor SP10 north into the southern outskirts of Dunstable to avoid all interactions with the National Trust Land and Dunstable Downs SSSI.
- **SP10E South Route 1** – Consisting of the diversion of corridor SP10 to the south to avoid the National Trust land and Dunstable Downs SSSI, utilising highway corridors via Whipsnade Zoo.
- **SP10F South Route 2** – Consisting of the diversion of corridor SP10 south but diverting back north across open land to limit interaction with Whipsnade Zoo.
- **SP10G Dagnall and Stedham Route** – Consisting of the diversion of corridor SP10 further south to avoid interaction with National Trust Land.
- **SP10H Alternative Common Route** – A modification to route corridor SP10A that was presented at Phase One Public Consultation to avoid National Trust inalienable land.

**Figure 9.8: Southern Pipeline Route Options Dunstable Downs Route Options**

9.5.33 All of the corridor options are located within the Chilterns National Landscape, the policy implications of which are discussed in paragraph 9.5.19. Further consideration of development within the National Landscape is discussed in paragraph 9.5.83. In addition, all of the corridor options include Green Belt land. This is not considered a significant constraint, given that the permanent pipeline development is below ground and will therefore not impact on the function of the Green Belt.

9.5.34 The assessment below, as far as it is able, focuses on areas of difference between the route options.

9.5.35 ***Route corridor SP10D (North Route) –*** This route follows the previously identified SP10 corridor but includes a variation between Church Road and Isle of Wight Farm to avoid all interactions with National Trust land. Within this section, the corridor would involve constructing the pipeline within the alignment of existing roads and verges with some crossing of farmland.

9.5.36 The corridor would follow the northern bank of a small watercourse, Well Head, crossing a minor road (Dolittle Lane) and continuing through farmland. The pipeline would then enter Wellhead Road and continue along this road southeast to the B489, Icknield Way / Tring Road turning north along this road corridor into the southern outskirts of Dunstable. At the junction with the B4541, Whipsnade Road, the pipeline corridor would turn sharply south along the B4541 Whipsnade Road back south and rising in gradient towards the crest of the Dunstable Downs. The pipeline would then turn into Isle of Wight Lane and continue to follow this road until it rejoins route corridor SP10 to the south of Kensworth Quarry.

9.5.37 The environmental assessment identified that this corridor would intersect with the Dunstable and Whipsnade Downs SSSI, more so than corridor SP10H. and also the Well Head, Badgerdell Wood, Dunstable and Whipsnade Downs County Wildlife Sites. A small section of the corridor intersects Slough Wood and Round Wood Ancient Woodland east of Tring Road, but this is common across all the options, with the expectation that this risk will be managed through pipeline routeing within the corridor. The corridor would interact with two historic landfill sites . In respect of heritage matters, the pipeline corridor interacts with the Kensworth Church End Conservation Area where it joins the SP10 Common Route. Specific to this option is the proximity to several Scheduled Monuments located between Tring Road and the B4541.

9.5.38 In respect of planning, the key constraint is the Chiltern National Landscape, the policy implications of which are discussed in paragraph 9.5.19. In addition, corridor SP10D interacts with the Dunstable Downs, which incorporates the Dunstable and Whipsnade Downs SSSI, a designated Outdoor, Leisure, Open Space Site (Policy EE13 Central Bedfordshire Local Plan Adopted 2021 (CBLP)), Local Geological Site and County Wildlife Sites (Policy EE3 CBLP). The proximity to the London Gliding Club is also noted.

9.5.39 The land assessment identified interaction with inalienable land, open space, common land, residential properties, the golf course although it is noted that careful pipeline routeing within the corridor could reduce and mitigate risk in respect of these constraints. The potential for temporary impacts on the operation on the National Trust Visitor Centre during construction were also highlighted.

9.5.40 An engineering assessment of this corridor found that there would be a significant amount of construction within major and highly trafficked roads leading into and out of Dunstable, which would likely result in the need for full road closures. There is limited space to construct outside of the carriageway due to the close proximity of constraints such as residential housing and National Trust inalienable land. There is considered to be further engineering risk with this potential option as it would require a sharp change of direction of the pipeline at the junction between Tring Road and Whipsnade Road, which would have a negative impact on the hydraulic performance of the pipeline.

9.5.41 On the basis of these construction and operational risks and given this corridor has no significant environmental, planning or land advantages over other options, this potential route corridor was not considered a preferred option.

9.5.42 ***Route Corridor SP10E (South Route 1 Option) -*** This corridor option was developed by diverting route corridor SP10 to the south to avoid the National Trust inalienable land and Dunstable Downs SSSI, utilising the highway via Whipsnade Zoo.

9.5.43 The corridor diverts from route SP10 close to its crossing of Dolittle Road. It then turns south east, east and then south across open fields until it meets Harling Road. It continues along Harling Road, crossing the roundabout junction with the B489, Icknield Way / Tring Road before continuing along the B4506, Dagnall Road corridor. Along this stretch of the corridor the land either side of the road forms part of a SSSI or is National Trust Inalienable Land. The installation of this pipeline would very likely require a full closure of the road in both directions to allow access for the plant and materials. Local diversions could be implemented, but this would cause disruption within the local area for both local residents and businesses for the duration of the relevant construction works.

9.5.44 At the junction of Dagnall Road and the B4540 the pipeline corridor would travel east to follow the B4540 which is the road which provide access to Whipsnade Zoo. The pipeline corridor along the B4540 carriageway would route between the main zoo complex and the main car parking area. The construction through this area would likely cause significant disruption to the access to and from Whipsnade Zoo.

9.5.45 The route would continue eastwards along the B4540 road corridor until its junction with the B4541. At this point the pipeline corridor would turn in a northerly direction along the B4541 corridor until rejoining route corridor SP10.

9.5.46 The environmental evaluation of the corridor identified that this corridor would intersect with the Dunstable and Whipsnade Downs SSSI and County Wildlife Site, more so than the Common Route corridor SP10H and also the Whipsnade Heath and Badgerdell Wood County Wildlife Site and Cottage Bottom Fields Local Nature Reserve. Corridor SP10E intersects areas of ancient woodland, some of which run alongside the B4540 and the B4541. The corridor would interact with two historic landfill sites. In respect of heritage matters, the corridor intersects with several listed buildings and the Whipsnade Conservation area along with the Kensworth Church End Conservation Area.

9.5.47 The key planning constraint is the Chiltern National Landscape, the policy implications of which are discussed in paragraph 9.5.19. In addition, corridor SP10E interacts with several County Wildlife Sites, Whipsnade Green - a designated Outdoor, Leisure, Open Space Site (Policy EE13 CBLP), Whipsnade Conservation Area (Policy HE3 CBLP) and does not avoid interaction with the Dunstable Downs and Whipsnade SSSI, County Wildlife Site, Local Geological Site and the land designated as for Outdoor Sport, Leisure, Open Spaces Sites (Policy EE15 CBLP), similar to SP10D.

9.5.48 The land assessment identifies interaction with inalienable land, open space, residential properties and light commercial units although it is noted that careful routeing within the corridor could reduce the risk. The potential temporary disruption to the operation of Whipsnade Zoo is highlighted. It is also noted that there are small parcels of land in different ownership at the southern end of Isle of Wight Lane which could make delivery of the Project more complex.

9.5.49 From an engineering perspective, this option would give rise to the highest amount of construction within the highway leading to likely significant disruption to the local community and local businesses in the area, in particular Whipsnade Zoo. Given this route has no significant environmental, planning or land advantages over other options, this potential route corridor was not considered a preferred option.

9.5.50 ***Route Corridor SP10F (South Route 2 Option)*** This corridor option was developed as a variation of SP10E to minimise the impact of construction work in the immediate vicinity of Whipsnade Zoo. The corridor follows the SP10E option but turns north at the B4540 after passing through a gap in the SSSI before meeting the main complex of Whipsnade Zoo.

9.5.51 The environmental assessment notes, as with SP10E, the corridor continues to intersect with the Dunstable and Whipsnade Downs SSSI, more so than the Common Route corridor SP10H. Furthermore, the corridor intersects with the Sallowspring Wood and Badgerdell Wood County Wildlife Site, whilst avoiding the Whipsnade Heath County Wildlife Site. The corridor has greater interaction with ancient woodland than the SP10H corridor. The corridor does not interact with any further heritage assets as it diverts from the SP10E route.

9.5.52 In planning terms, there is no significant difference between SP10E and SP10F, noting however that Sallowspring County Wildlife Site is designated Outdoor Sport, Leisure and Open Space (Policy EE13 CBLP).

9.5.53 For the land assessment, the SP10E corridor would directly interact with inalienable land and whilst it would have more limited interaction with Whipsnade Zoo, there would be a greater impact on farmland and farms within the corridor.

9.5.54 In engineering terms, this option would still involve significant construction within the highway, with limited working space, leading to construction risks as a result.

9.5.55 As this option would pass through areas of inalienable land, would present a significant consenting risk and offered no significant benefits in engineering, environment or planning terms over the other options it was discounted from further consideration as it was considered not to be a viable option.

9.5.56 ***Route Corridor SP10G (Dagnall and Studham Route Option) -*** This corridor option was developed following engagement with the National Trust to try and identify a potential route that would avoid entirely their landholdings within the Dunstable Downs and the Downs area more generally.

9.5.57 This corridor option would be approximately 22km in length from its diversion away from route corridor SP10 close to Eaton Bray to it rejoining corridor SP10 close to the Chaul End reservoir. The pipeline within this corridor would be constructed within road verges and farmland. This corridor option would be approximately 16.5km longer than corridor option SP10H, for example, and would add significant rise and fall to the profile of the pipeline. This length of the pipeline is such that additional roads and hedgerows would need to be crossed, including the crossing of the A5183 – albeit that trenchless methods could be used. Due to the likely requirement for extensive works within road carriageways, this corridor would cause significant construction disruption within the local area and to the community.

9.5.58 In addition, this corridor option has the potential to interact with the Buncefield fuel distribution pipeline, itself a piece of infrastructure of national importance, which is present in the area north of Dagnall. There are many limitations associated with crossing an oil pipeline alignment with potable watermains with a major risk of contamination which would require special protection measures.

9.5.59 Environmentally, this option would avoid interaction with any SSSIs but does interact with the Wentworth Fields, Folly Wood and Badgerdell Wood County Wildlife Site. The corridor intersects with nine areas of Ancient Woodland, significantly more than the SP10H corridor. Furthermore, the corridor includes a significantly longer section of pipeline in the National Landscape, approximately 16.5km compared to around 7.5km for other options. In respect of

heritage, there is interaction with a Grade II Listed Building, but this corridor does avoid interaction with the Kensworth Church End Conservation Area.

9.5.60 In terms of planning, the additional corridor length within the National Landscape is noted. The corridor would also intersect with Holmans Field Recreation Space which is designated as an Outdoor Sport, Leisure and Open Space Site (Policy EE3 CBLP).

9.5.61 Alongside these points, from an engineering perspective, this corridor adds significant length to the transfer pipeline and would, therefore, significantly increase the cost, construction activity and embedded and operational carbon from increased pumping requirements, not just due to the length of the pipeline but also the change in elevation.

9.5.62 Due to the reasons summarised above, this potential route corridor was not considered a viable option from an engineering perspective. Furthermore, the increased length of the pipeline would be likely to have increased environmental impacts within the Chilterns National Landscape, more hedgerow loss and would involve construction within the vicinity of an increased number of ancient woodlands.

9.5.63 ***Route Corridor SP10H (Alternative Common Route) –*** This route corridor option is a modified SP10 corridor based on option SP10A which was presented at Phase One Public Consultation (see Figure 9.9). Corridor SP10H has been modified to avoid National Trust Inalienable Land and reduces the level of disruption without adding significant length to the corridor.

9.5.64 Environmentally, only a small section of the corridor intersects the Dunstable and Whipsnade Downs SSSI as shown in Figure 9.9. There is also interaction with the Dunstable and Whipsnade Downs County Wildlife Site and the Badgerdell Wood County Wildlife Site near Chaul End. A small section of the corridor intersects Slough Wood and Round Wood Ancient Woodland, but this could be avoided through careful routeing of the pipeline within the corridor. The route does not interact directly with any historic landfill sites. The corridor is within the Chilterns National Landscape but is the shortest route of the routes considered. The corridor does run close to some heritage designations, including a Grade II Listed Building, and also intersects with a small section of the Kensworth Church End Conservation Area.

9.5.65 In respect of planning, the key constraint is the Chiltern National Landscape, the policy implications of which are discussed in section 9.5.19. In addition, corridor SP10H interacts with the Dunstable Downs, which incorporates the SSSI, a designated Outdoor. Leisure, Open Space Site (Policy EE13 Central Bedfordshire Local Plan Adopted 2021 (CBLP)), Local Geological Site and County Wildlife Sites (Policy EE3 CBLP). The proximity to the London Gliding Club is also noted.

9.5.66 The land assessment identified that interaction with inalienable land is avoided by this option, but the corridor does include alienable land, open space and common land. A potential temporary impact on the operation of the National Trust Visitor Centre during construction is also noted – although this depends upon further considerations of the precise alignment of the corridor and the method of construction (which are matters discussed further below)

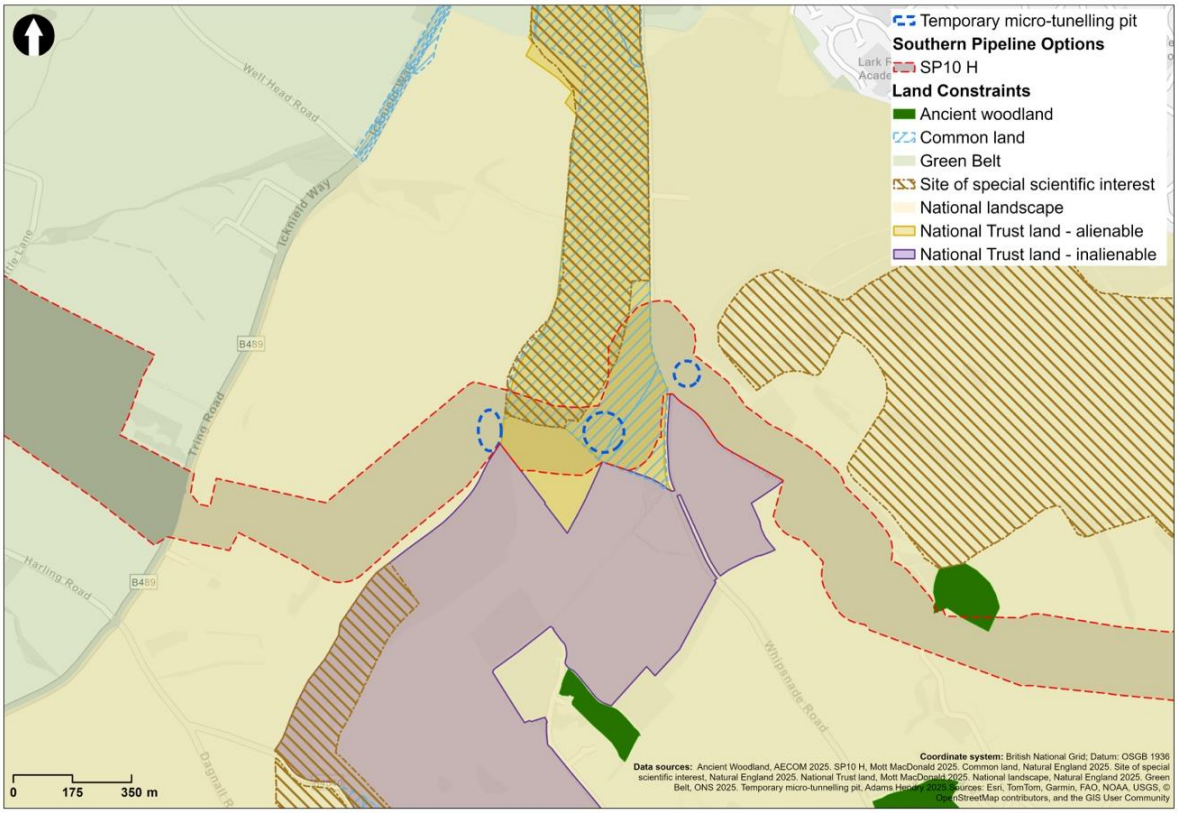
9.5.67 In engineering terms, Corridor SP10H was preferred being the shortest of the options, which is beneficial in terms of embedded and operational carbon, with no significant construction risks being identified.

9.5.68 Of the preceding options, Corridor SP10H was preferred, performing strongly from both an engineering and operational perspective but also not giving rise to significant environmental, planning and land risks above the other options identified.

9.5.69 Being the preferred option, further work was undertaken to look at how the pipeline could be potentially constructed and locally aligned within the SP10H corridor to minimise and mitigate any potential issues during construction.

9.5.70 Trenchless construction techniques could be utilised to mitigate the impact on the SSSI, the alienable land and common land found within and adjacent to this corridor.

**Figure 9.9: Indicative Southern Pipeline Route - Corridor Option SP10H, Land Constraints and potential temporary micro-tunnelling pits**




9.5.71 As indicatively shown in Figure 9.9, at the toe of the Dunstable Downs escarpment, this corridor option would divert from route corridor option SP10 north eastwards along the toe of the escarpment before entering the south-east corner of the site of the London Gliding Club. This position is, however, located away from the both the take off point and landing point within the gliding club site.

9.5.72 From the south-east corner of the gliding club the pipeline corridor would turn east across the Dunstable Downs. Recognising the critical nature of this part of the route, further engineering design consideration has been undertaken, and is ongoing.

9.5.73 These considerations to date have identified that from the corner of the gliding club and across the Downs the pipeline could be constructed using trenchless techniques. These considerations identified that it would be possible to have a launch site for the trenchless pipe installation at the base of the escarpment within the corner of the gliding club (outside of National Trust land, common land and the Dunstable and Whipsnade SSSI) and a final receiving site for the trenchless crossing to the east of Isle of Wight Lane (also outside of National Trust land, common land and the SSSI).

9.5.74 The engineering assessment, however, identifies that this option would require an intermediate receiving and launching site somewhere between these main launching and receiving sites within the Dunstable Downs area. It has been determined that, if needed, this temporary requirement (which would be needed solely for a limited period of time during the trenchless installation of the pipeline) could be accommodated outside of National Trust inalienable land, and outside of the SSSI, albeit within an area of common land (see Figure 9.9).

9.5.75 The engineering analysis and assessment undertaken to date has further identified that no permanent above ground structures would need to be left within the Dunstable Downs area under this scenario, as any necessary air valve infrastructure within this section of the pipeline route could be located in the receiving area within the field to the east of Isle of Wight Lane.

9.5.76 Furthermore, during the consideration of this potential route, it was also noted that there was precedent whereby existing underground pipelines and services crossed underneath the Dunstable Downs in this general location. Upon reaching the point to the east of Isle of Wight Lane, the corridor would then continue along the fields to the north-east of Isle of Wight Lane to avoid the area of National Trust Inalienable land to the south of the Lane. The route would then connect back into the alignment of pipeline corridor SP10.

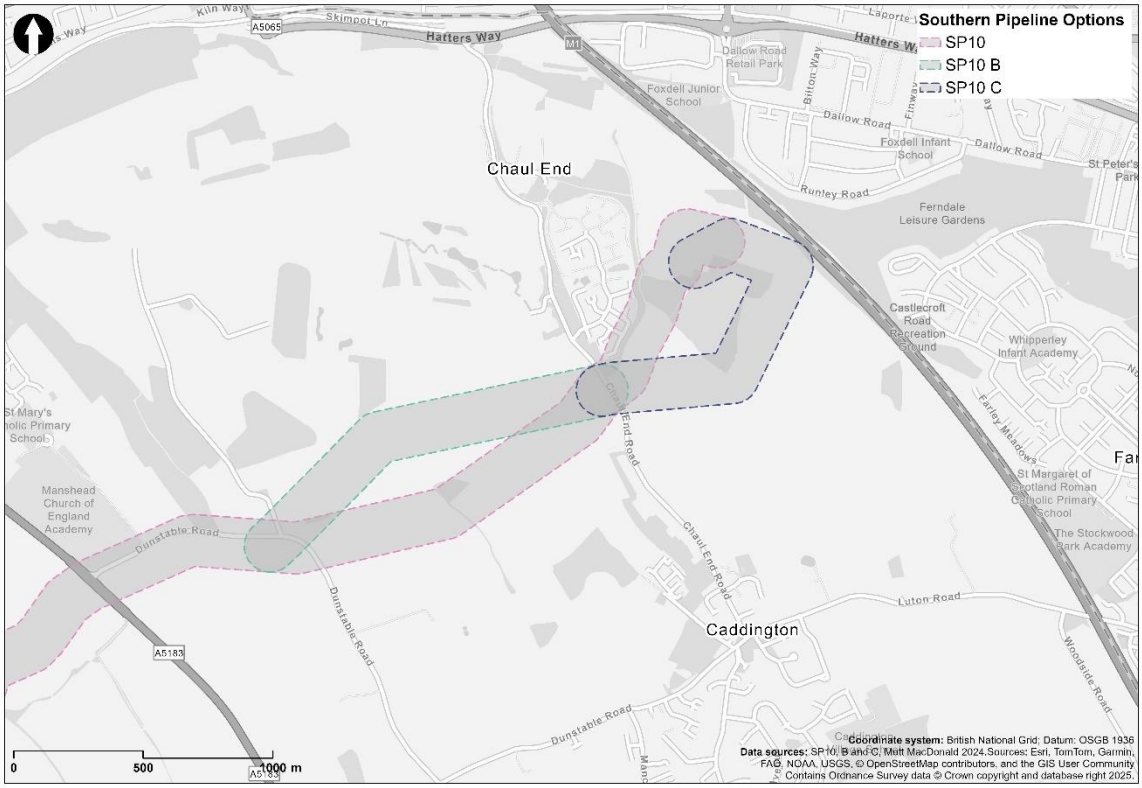
9.5.77 From the engineering assessment work undertaken to date, this pipeline route corridor option was identified as the corridor to take to Phase Two Public Consultation. In particular it was noted that the potential impact of the construction of the pipeline through this area could be mitigated in the way summarised in the preceding paragraphs. The presence of a Local Geological Site, a non-statutory designation which is afforded protection through the CBLP, is noted and the impact of pipe laying across this site will be considered and assessed as part of the Project's Environmental Impact Assessment.

9.5.78 Further engineering work is ongoing in respect of that part of the proposed pipeline corridor across the Dunstable Downs. This work is considering the different trenchless techniques that could be used to cross the Dunstable Downs, and their associated engineering requirements and environmental implications, in order to refine the Proposed Development in this area.

**Review of route options SP10, SP10B and SP10C**

9.5.79 Following Phase One Public Consultation, further consideration was given to the various route options presented at that time in respect of the final length of pipeline towards the existing reservoir at Chaul End (route corridor options SP10, SP10B and SP10C as shown on Figure 9.10). Further to the work undertaken and reported in the September 2024 report some preliminary site walkover information was obtained to further inform consideration of these options.

**Figure 9.10: Southern Pipeline Options SP10, SP10B and SP10C**




9.5.80 Further assessment work determined that corridor option SP10C, which would necessitate the pipeline entering Chaul End reservoir to the east of the reservoir where the water leaves the reservoir system and enters the AfW distribution network, would not work hydraulically. Therefore, this sub-option was discounted.

9.5.81 This further assessment and consideration found that corridor SP10 would pass through a row of oak trees. In order to reduce the impact trenchless crossings techniques would need to be adopted but this would add engineering complexity to the corridor due to the depth needed in order to not impact the root ball of these trees. It was further determined that other environmental impacts could also result if route SP10 were adopted in the vicinity of Chaul End.

9.5.82 It was concluded that route option SP10B would not be engineeringly complex as it passes through relatively flat arable land. Due to the lack of complexity, it would allow for an easier pipeline installation which would reduce the likely disturbance impact on relevant landowners during construction. It was further noted that the corridor could be amended to avoid an area of ancient woodland. Sub option SP10B, amended to avoid the ancient woodland was, therefore, concluded to be preferred option to be taken forward to the Phase Two Public Consultation.

**National Landscape**

9.5.83 Noting the requirements in respect of National Landscape set out in the NPSWRI (see section 9.5.19), a confirmatory process was undertaken to determine the possibility of identifying a viable pipeline transfer route that did not interaction with the Chilterns National Landscape.

9.5.84 As set out in paragraphs 9.5.23 to 9.5.32 above, route options through the urban area of Dunstable are not considered to be viable or feasible options, but in any event would likely have to interact at some point with the National Landscape. The National Landscape stretches

in a continuous belt from north of Reading at its most southerly point to Hitchen at its most northerly point, with the urban area of Luton and Dunstable being the only break in that designated area. A route around this extensive designated area is, therefore, not feasible.

# 10. Conclusion

10.1.1 This report has been prepared to provide an overview of the work undertaken in respect of the identification and consideration of options for the various elements of the Proposed Development and in respect of its ongoing design development.

10.1.2 The report takes as its reference point the position that was stated in the Site and Route Evaluation Report of September 2024 (the September 2024 report) which was produced for and consulted upon during the Phase One Public Consultation undertaken in respect of the Proposed Development in September and October 2024.

10.1.3 The report sets out the extensive additional scheme development and optioneering work that has been undertaken since the publication of the September 2024 report and the Phase One Public Consultation and reaches the following conclusions in respect of the different elements of the Proposed Development.

I. *Minworth Advanced Water Treatment Plant* – the Curdworth Beds site located within the envelope of the ST Minworth WwRC remains the preferred site option for the AWTP, along with locating a part of the treatment process within the main WwRC site.

II. *Minworth to Atherstone Transfer Pipeline* – the preferred pipeline corridor is similar to that detailed in the September 2024 report but now runs to the south of the village of Hurley and incorporates some localised amendments as a result of third-party developments.

III. *The Canal Transfer* – various interventions are identified as required to facilitate the transfer of water along the canal network whilst retaining the canal's primary navigation function. Optionality currently remains, primarily in respect of the Springwood Transfer Lock, works to the Iron Trunk Aqueduct and potential works to Bridge 88.

IV. *Abstraction, Storage and Treatment* – the preferred site for the abstraction, storage and treatment aspects of the Proposed Development is at Site B close to Great Brickhill (now referred to as Galley Water Treatment Works).

V. *Chaul End Transfer Pipeline* – a preferred pipeline corridor can now be identified from Site B to the identified connection point into AfW's water supply network. That connection point being an existing underground reservoir at Chaul End, near Luton.

# Appendices

## A.1 Summary of Stage 5 assessment of initial sites selected for enhanced assessment

| Assessment summary | Great Brickhill Site Option - Site B | Slapton Site Option – Site H | East of Leighton Buzzard – Site P – WTW Only | East of Leighton Buzzard – Site Q – WTW Only |
|---|---|---|---|---|
| Engineering | Energy costs and embedded carbon costs are likely to be higher than for the other sites but the location is likely to provide resilience for longer term use. Better recorded water quality at this abstraction location as further south on the canal there are inputs from local streams and drains that potentially result in poorer water quality. This could mean that less treatment processes would be required at this location. Abstracting water on this part of the GUC would reduce the amount of development that would be needed further south on the canal but would involve a longer pipeline transfer to the existing underground reservoir near Luton. Option offers good road access via the A4146/A5 for both construction and operational activities, with the need for a new access/entrance noted. The need for further topographical and ground condition information is identified, although the potential to encounter contaminated land is considered to be low. The site is relatively flat but has sufficient slope to allow for the construction of the water storage (subject to more detailed investigation of ground conditions). Interstage pumping would be required across the WTW. Gas | Site likely to have lower embedded and current operating costs than other options. There is potentially poorer water quality abstracting from this location which may require additional treatment processes/ energy to treat. Additional development, including pumping stations, on the GUC would be required south from Leighton Buzzard but the transfer pipeline to the service reservoir near Luton would be shorter. Access to the site is limited to B roads with potential height and weight restrictions for construction and operational access. The suitability of the existing bridge on Horton Road over the GUC for construction traffic access requires further consideration. Site is also within Buckinghamshire's Freight Strategy Zone and restrictions need to be fully explored. The need for further topographical and ground condition information is identified, although the potential to encounter contaminated land is considered to be low. Flat site meaning unlikely that all excavated material can be reused on site and will need to be exported off site (subject to more detailed investigation of ground conditions this is considered to be greater than at the Great Brickhill site). Two power lines currently transect the sites and would require diverting, although these do | Site considered only suitable for accommodating the WTW. Access from the A505 to the site for construction and operation is good. There are high voltage power lines adjacent to the site. Ground conditions appear to indicate a low risk for construction but the need for further investigation of ground conditions is noted. As the site has no raw water storage it requires a raw water pipeline to the site and a way to return excess flows to a drainage channel or river/canal. Considered to offer good resilience to future flood risk. | Site considered only suitable for accommodating the WTW. Access from the A505/A5 to the site for construction and operation is good. There are high voltage power lines adjacent to the site. Ground conditions appear to indicate a low risk for construction but the need for further investigation of ground conditions is noted. As the site has no raw water storage it requires a raw water pipeline to the site and a way to return excess flows to a drainage channel or river/canal. Considered to be good resilience to future flood risk. |

| Assessment summary | Great Brickhill Site Option - Site B | Slapton Site Option – Site H | East of Leighton Buzzard – Site P – WTW Only | East of Leighton Buzzard – Site Q – WTW Only |
|---|---|---|---|---|
| | main running through the site that will need to be considered in the siting of any development. The site is adjacent to the canal but beyond flood plain extents. | indicate a power supply close to the site. | | |
| Environment | Site is mainly low-quality grassland habitats and arable fields (with groups of tree stands), with a parcel of woodland. Includes hedgerow boundaries and hedgerows with trees present. Surveys required to determine if hedgerows are protected and if veteran trees are present. Woodland is of high distinctiveness in BNG terms. No designated or non-designated biodiversity sites within the option boundary but does fall within several SSSI impact risk zones. There is no priority habitat within the site. There is a Local Wildlife Site within 400m of the site (Water Hall Park). Protected species records have been examined and presence of common species of bats and Great Crested Newts indicated adjacent to the site. Proximity of residential properties and businesses to the option boundary is noted. No designated heritage assets within the site. Potential for a single non-designated heritage asset to be present (linear/trackway identified from aerial photographs). Site | The site is generally open agricultural or woodland planting land intersected and bordered by hedgerows and relatively recent woodland plantation. Surveys required to determine if hedgerows are protected and if veteran trees are present. There is an important wildlife corridor (Green Lane) that bisects the centre of the site. It is designated as a local wildlife site due to its hedges and ditches. The site is located within a SSSI risk zone but all SSSIs are more than 2km from the site. Protected species records have been examined and presence of common bats identified adjacent to the site and otters to the north of the site. The site is approximately 3km from the Chilterns National Landscape and potential effects on the setting would need to be explored. The site is on the western edge of the village of Slapton. There are some intermittent belts of vegetation to the village edge that will help screen the proposed works. There are a number of residential, commercial and community properties and facilities within close proximity to the site, including an equestrian centre and sports playing field and park. | Generally open agricultural land bordered by well-maintained mature native deciduous trees and shrub hedgerows. Surveys required to determine if hedgerows are protected and if veteran trees are present. Small copse of scrub and likely relatively immature woodland to northeast of site boundary. No designated nature conservation sites or heritage sites within the site option boundary but site is within a SSSI impact risk zone. Protected species records have been examined, and presence of common bats, badgers, otters and notable plant species are identified within the vicinity of the site. There are no priority habitats within the site boundary. Proximity of residential properties along Leighton Road, Billington Road, Leighton Buzzard Rugby Club and playing fields noted. Potential impact on residential and recreational views. The site is located within the Green Belt and within 5km of the Chilterns National Landscape and potential effects on the setting would need to be explored. Further work required to determine the agricultural land classification. This site does not include fluvial flood areas (Flood Zone 3 or 2). | Generally open agricultural land bordered by well-maintained mature native deciduous trees and shrub hedgerows. Woodland plantation to north and south beyond boundary. Scattered individual trees within hedgerow along eastern and northwestern boundary are likely semi mature to mature. Noted there are smaller field sizes closer to village of Stanbridge which is east of the site option. No designated nature conservation sites or heritage sites within the site option boundary. Site falls within a SSSI impact risk zone. Protected species records have been examined, and presence of common bats, badgers, otters and notable plant species are identified within the vicinity of the site. Directly surrounding the site are agricultural fields. Proximity of residential and commercial properties along Leighton Road, Billington Road and Station Road noted. Potential to directly impact two public rights of way. Potential impact on residential and recreational views. The site is located within the Green Belt and within 5km of the Chilterns National Landscape and potential effects on the setting would need to be explored. Further work required to determine the agricultural land |

| Assessment summary | Great Brickhill Site Option - Site B | Slapton Site Option – Site H | East of Leighton Buzzard – Site P – WTW Only | East of Leighton Buzzard – Site Q – WTW Only |
|---|---|---|---|---|
| | topography is typically flat, gently falling from the eastern boundary to | There are two public rights of way running through the site and recreational use of the canal adjacent to the option boundary. Approximately 50m east of the site are residential receptors along Horton Road, Bury Farm and Mill Road. During construction, nearby sensitive receptors may experience increased noise and vibration levels from construction activities, construction traffic, excavations, groundworks and interior work activities. Construction traffic would need to travel circa. 1.5 miles on local roads with some sections of single carriageway/ kerbside parking pinch points. No heritage sites within the boundary although there is a recorded single non-designated heritage asset located within this site boundary which requires further investigation. Further work required to determine the agricultural land classification. This site does not include fluvial flood areas (Flood Zone 3 or 2). | | classification. This site does not include fluvial flood areas (Flood Zone 3 or 2). |
| Planning | Within the countryside where there is a policy presumption against development that would compromise the character of the countryside between settlements or communities leading to coalescence. Designated as an area of attractive landscape where there is a need to have regard to | Within the the countryside where there is a policy presumption against development that would compromise the character of the countryside between settlements or communities leading to coalescence. Close proximity to Bury Farm Equestrian Centre, Grand Union Canal, Lock Keeper's cottage, Hill Farm and village | The main constraint is that the site is located within the Green Belt and would be considered inappropriate development. It would be necessary to demonstrate very special circumstances to outweigh any harm as required by planning policy including that set out in the Water Resource Infrastructure | The main constraint is that the site is within the Green Belt and would be considered inappropriate development. It would be necessary to demonstrate very special circumstances to outweigh any harm as required by planning policy including that set out in the Water Resource Infrastructure National Policy Statement. In terms of land use, to the |

| Assessment summary | Great Brickhill Site Option - Site B | Slapton Site Option – Site H | East of Leighton Buzzard – Site P – WTW Only | East of Leighton Buzzard – Site Q – WTW Only |
|---|---|---|---|---|
| | the character of the landscape and provide mitigation to overcome any adverse impact. Proximity to residential areas and consented residential development in the Bletchley area where there is the opportunity to promote recreational benefit of the storage. Site is within Minerals Safeguarding Area for Sand and Gravel. Northern parts of the site are known to be being promoted by landowner/developer for potential future residential development through the Buckinghamshire Council Housing and Economic Land Availability Assessment, as part of the preparation of a new Local Plan. | of Slapton noted. To the northwest of the site planning permission was granted in 2022 for the construction of a solar farm but to date the development does not appear to have been implemented. Public Rights of Way running through the site providing access to the canal. Potential to develop recreational benefit of storage. Potential impact on neighbouring land uses during construction, in particular amenity and highway impacts that would need to be addressed were this site to be taken forward. Site is within Minerals Safeguarding Area for Sand and Gravel. | National Policy Statement. Located within the Greensand Ridge Nature Improvement Area where there is an onus on developing biodiversity, minimising visual impact and protecting local amenity. Planning permission has been granted (April 2024) for an energy park (wind turbine, solar array, battery energy storage, EV charging including new access) to the west of the proposed site. In terms of land use, to the south of the site is the A505, with residential/commercial areas of Leighton Buzzard to the north and west and Billington Road to the east. To the north is a site allocated for Outdoor Sport Leisure and Open Space. Site was previously identified within Central Bedfordshire Council's call for housing development sites but was rejected citing impact to the wider landscape that could not be outweighed by the benefits of the proposed development. | south of the site is the A505 with the site predominantly surrounded by agricultural land. To the northeast of the site is the village of Stanbridge, which along with residential properties includes a school and amenity spaces. |
| Land | No Special Category Land identified within the site option boundary. Several landowners across site option and could involve changes to access arrangements across land parcels. It is noted there is a gas easement that crosses the site. | No Special Category Land identified within the site option boundary. Development could involve changes to access arrangements across land parcels. | No Special Category Land identified within the site option boundary. One landowner across site option. | No Special Category Land identified within the site option boundary. Could involve changes to access arrangements across land parcels. |

# A.2 Summary of assessment of Site 6A

| Site Name | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
|---|---|---|---|---|
| Site 6A | Performs well in engineering terms but with some constraints and issues that would need to be accounted for in the scheme design. As located to the west of the GUC will require a tunnel beneath the canal to transfer treated water and for overflow to the River. Will require protection of existing services, including overhead cable diversion. Surface water flooding does restrict the amount of land available for development but WTW and water storage could be accommodated on site. The WTW and water storage would be separated by a gas pipe/crossing but considered that this could be addressed through scheme design. In respect of construction carbon, there would be the crossing of the GUC and requirement for longer pipelines and additional protection around services. For operational carbon, there is additional pumping and maintenance requirements from the site being to the west of the canal. Geology of the site is suitable to accommodate the water storage however it is noted that the cut and fill requirements are likely to be greater than Site B due to the undulating nature of the site. The site is agricultural land the risk of encountering contaminated land is considered to be low. New access onto B488 would be relatively straight forward but transient flooding of this road is noted. Should be feasible for construction related traffic to be directed away from residential areas. No direct access to the river for overflow and returns is noted. There are a number of airfields within | Performs well in environmental terms but with some constraints and issues that would need to be accounted for in the scheme design. The site comprises four agricultural fields divided by hedgerows. The internal hedgerows appear from aerial imagery to contain only a single hedgerow tree. To the east, the site is separated from the GUC by a towpath with a line of trees, the line of trees broadens at the north-eastern field boundary so that the trees form a group. Surveys required to determine if hedgerows are protected and if veteran trees are present. There are no designated sites within the boundary of 6A nor in close proximity to the site. Protected species records have been examined and presence of common bats identified along the southern boundary of the site. Whilst most of the site is also at low risk of surface water flooding, there are areas low to high risk at the northeast and southeast corner and eastern boundary of the site - this reflects the site topography where water surface water generated from rain would flow west to east across the site and towards watercourses to the north and south of the site. The site is approximately 4km from the Chilterns National Landscape with potential long distance views from high ground within the National Landscape. Mentmore Towers, a Grade II* registered park and garden is within 1km south-west of the Site, with potential long distance views of the proposed development from the edge of the designated area. There are no protected or designated views identified in the immediate area. There is potential for visual impacts for residential receptors in the isolated properties to the north and south, and from the edge of villages, Horton to the south and Slapton to the east. Other visual receptors include recreational users of the PRoW along the northern boundary of the Site, and | Performs well in planning terms but with some constraints and issues that would need to be addressed as part of the DCO submission. The site is not designated within the Aylesbury Local Plan 2013-2033 however the site does sit outside of the settlement boundary so the development would be considered to be located within the countryside. Policy S3 of the Aylesbury Local Plan says that development in the countryside should be avoided, especially where it would:<br>1. compromise the character of the countryside between settlements, and<br>2. result in a negative impact on the identities of neighbouring settlements or communities leading to their coalescence.<br>The location of Site 6a is such that it could change the character of the countryside between settlements. The site's separation from Slapton by the canal and agricultural land could mean it would have a lesser impact on the identity of the neighbouring settlement of Slapton than say Site H.<br>Site is within Minerals Safeguarding Area for Sand and Gravel within Buckinghamshire Minerals and Waste Local Plan 2016-2036. Policy 1 of the Buckinghamshire Minerals and Waste Local Plan (2019) applies to the land within Site 6A. Any planning application for non-mineral development would need to be accompanied by a Mineral Assessment. The Water Resource Infrastructure NPS says that the impact of the proposed project may have on mineral safeguarded areas should be assessed with the relevant Mineral Planning Authority (4.10.17) and where development has an impact on a mineral safeguarding area, the SoS must ensure that the applicant has put forward | No significant land constraints to developing the site. No Special Category Land identified. Presence of oil and gas pipelines are noted. Due to proximity of recently developed neighbouring barns and bungalow there is a risk of compensation claims despite these assets not being impacted directly. Further consultation with landowner is required. |

| Site Name | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
|---|---|---|---|---|
| | 40km of the site so the potential for bird strike issues from a waterbody will need to be considered (this is the same for all sites within the search area). | recreational users of PRoWs to the east and south. During construction, nearby sensitive receptors may also experience increased noise and vibration levels from construction activities. The B488 is not part of the Strategic Road Network (SRN), which primarily consists of major 'A' roads and motorways managed by National Highways. However, it is recognized as a suitable route for Heavy Goods Vehicles (HGVs). Buckinghamshire Council encourages HGVs to use the B488, along with other 'A' and 'B' class roads, to connect to major routes like the A41 and A505, thereby avoiding smaller village roads that are less suitable for heavy traffic.<br>No heritage sites within the boundary although there are several recorded non-designated heritage asset located within this site boundary which requires further investigation. Further work required to determine the agricultural land classification. | appropriate mitigation or compensation to safeguard mineral resources. There are three planning application relating to the Horton Hill Farm agricultural uses within the last 5 years: proposed erection of replacement agricultural unit, demolition of existing farm buildings and erection of agricultural building. Adjoining the eastern boundary of the site is the Grand Union Canal, beyond which is the village of Slapton. The site adjoins the existing farm, Horton Hill Farm<br>The western boundary of the site is defined by the B488.d | |

# A.3 Analysis and testing of the site identification process

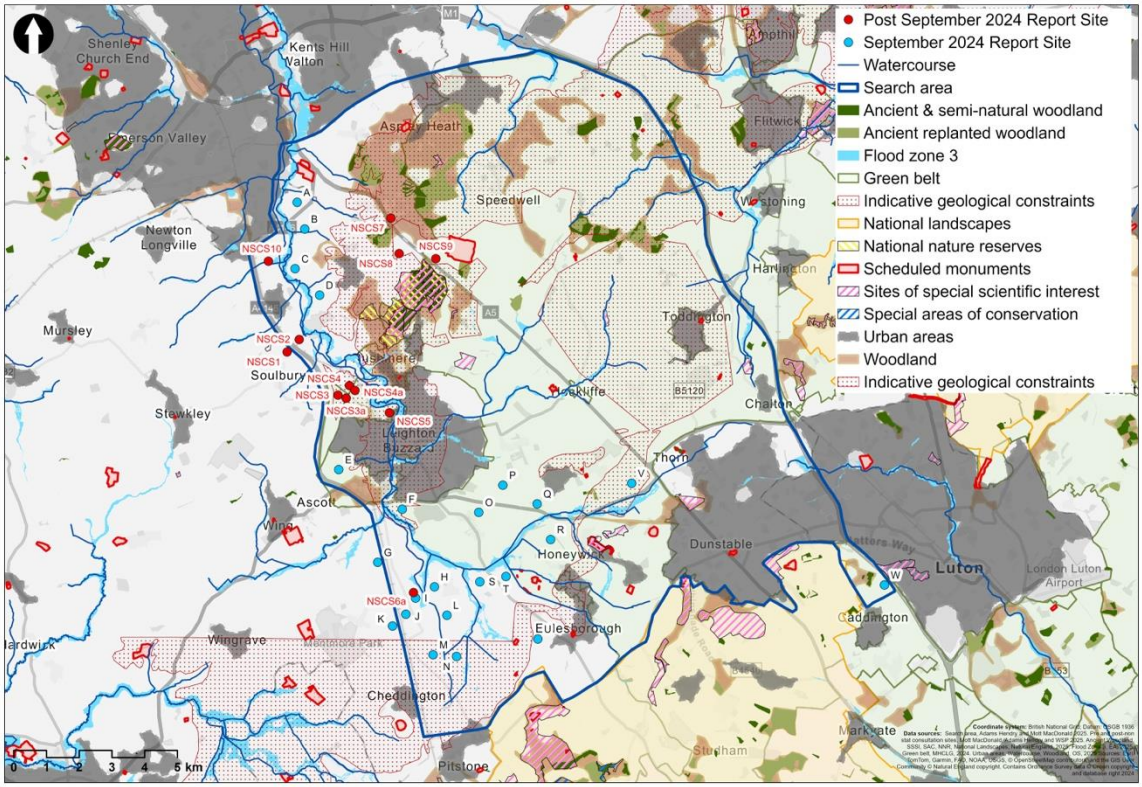
## Introduction

An exercise was undertaken to address the risk that other sites may exist within the site search area that the Project has not identified or considered.

To do this, the exclusionary criteria, as set out in Section 8.8, were mapped. In addition to this, geology which the Project Engineers considered would be sub-optimal for the development of water storage was overlain. Based on the British Geological Society (BGS) Onshore GeoIndex, areas that have either Woburn Sands or Upper Greensands (based on the Bedrock layer) are considered unsuitable. The combined exclusionary criteria, geological constraints and the 33 site options that were considered are shown on Figure A8.3.1. Part 1 of this exercise examined the potential for site options in the areas not subject to the aforementioned exclusionary criteria.

Within the areas considered to have unsuitable geology, it was noted that some of the areas with a significant layer of superficial clay deposits, however, could be suitable. These areas are considered separately in Part 2.

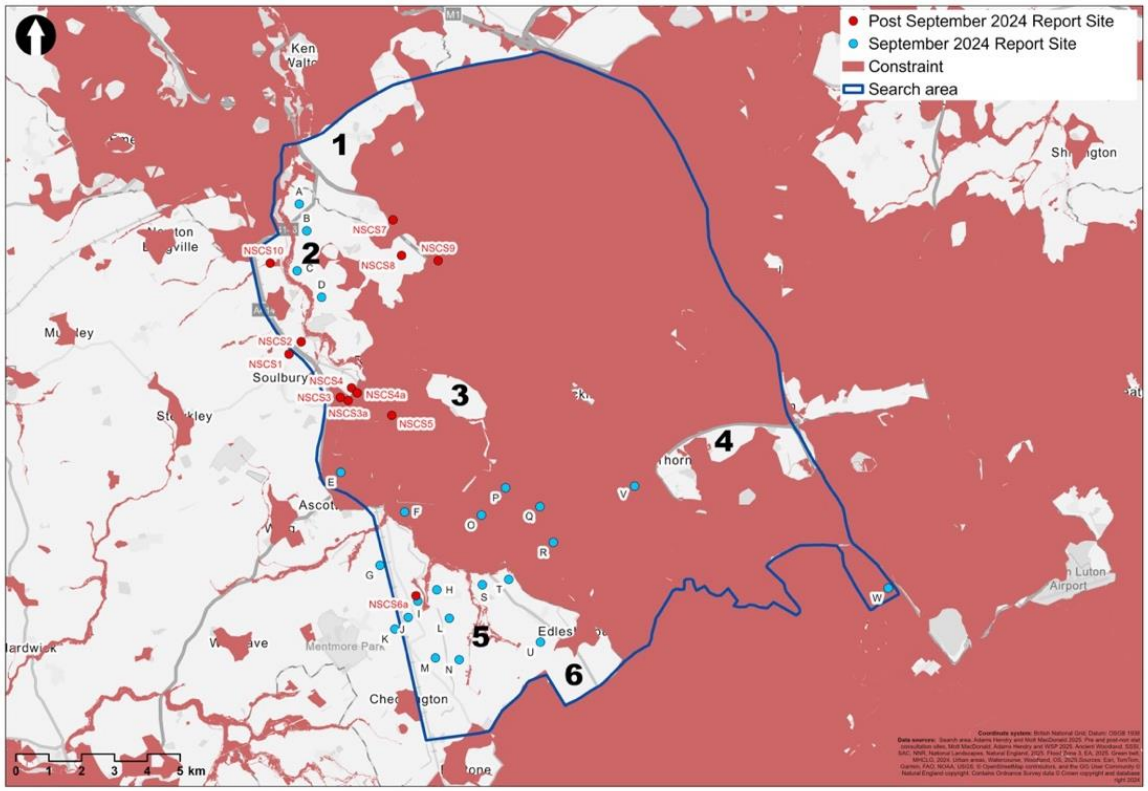
**Figure A3.8.1** – Exclusionary criteria, geological constraints and site options considered



## Part 1 – Examination of areas not excluded from the search area

As shown in Figure A8.3.2, there were some limited areas within the search area that were not subject to exclusionary criteria, geological constraints and had no site options identified within them. These are numbered in Figure A8.3.2 and as part of a high level back check exercise the suitability of these areas was considered based on a high level planning assessment as to their potential to accommodate a WTW and water storage site. This is set out below.

**Figure A8.3.2: Areas subject to further high level suitability assessment**



| | |
|---|---|
| Area 1 | The northern part of Area 1 comprises land that is included in the Milton Keynes emerging Local Plan 2050 (Regulation 18 submission) – Caldecotte South Strategic Site Allocation and the South East Milton Keynes Strategic Site Allocation.<br><br>The parcel of land that sits between Bow Brickhill and the A5 has been put forward for future development as part of Milton Keynes Call for Sites. The suitability of that land is considered as part of Milton Keynes Land Availability Assessment Report July 2024. Across several land parcels the land is considered suitable and available for delivering a future wider strategic extension to Milton Keynes. Therefore, whilst not included as an allocation in the current draft Local Plan, it could be identified in future Local Plans for development. It is stated in the Land Availability Assessment Report that the land would need to be allocated in the Local Plan to overcome the current planning policy constraints, being designated as Countryside and as a Special Landscape Area. This land also includes areas that have been identified in the emerging Local Plan as being possible areas of search for solar development.<br><br>The land is adjacent to a significant area of woodland heath which includes ancient woodland. Any development proposals would have to consider and demonstrate no detriment to the ancient woodland.<br><br>The status of the land within this area, having been either proposed for allocation in the emerging Milton Keynes City Plan or having been identified as being suitable for a future strategic extension to Milton Keynes, means that sites in this location are more advanced in terms of potential allocation, at this time, than Site B and would therefore appear to offer no advantage over Site B. |
| Area 2 | Five sites have been considered within this area, including Site B. The site assessment work has identified potential inundation risks with sites located adjacent to the railway line. The sites assessed within the central section of Area 2 had poor accessibility with roads subject to flood risk and rural roads that would require strengthening. The requirement for new dedicated access roads was highlighted which would introduce significant engineering risk.<br><br>For areas not identified as specific sites within Area 2, it is considered that similar assessment outcomes to those outlined above would apply to these sites and would similarly not be taken forward. |
| Area 3 | There are a raft of planning permissions across the area for substantial residential development leaving no available land for the development of WTW.<br><br>CB/11/01937/OUT – Mixed development including up to 950 dwellings, a local centre comprising retail and community uses; informal open space and country park, incorporating allotments, orchards, new tree and shrub planting, and play areas; and a new halt for the Narrow Gauge Railway (NGR). Various reserved matters applications have been submitted indicating that development is proceeding.<br><br>CB/11/04444/OUT - Hybrid application for residential development comprising up to 270 dwellings with associated landscaping, open space, parking and internal access roads (in outline with all maters reserved); provision of formal public open space; cemetery; allotments; informal open space and structural landscaping; and access roads (change of use). Various reserved matters and conditions discharge applications have been submitted indicating that development is proceeding.<br><br>CB/11/02827/OUT - Outline: Mixed use urban extension including 1210 dwellings, 70 units of Assisted Living for the Elderly, Class B1, B2, B8 Employment, Renewable Energy Plant and Recycling Facility and a Neighbourhood Centre. |

| | |
|---|---|
| Area 4 | The whole of this area is covered by Policy SC1 of the adopted Central Bedfordshire Local Plan – Houghton Regis North Sites 1 and 2 Strategic Commitment which seeks to deliver 7000 homes. There are two planning permissions covering the area which have either been implemented or are in the process of being implemented - CB/12/03613/OUT for the development of 5150 dwellings and associated infrastructure and CB/15/00297/OUT for the development of 1850 dwellings and associated development.<br>It is not considered that there would be available land for the development of the WTW and associated water storage. |
| Area 5 | Across Area 5, ten sites have been assessed as part of the site evaluation process. The sites identified were considered to be representative of potential sites for locating the WTW and storage area within that wider area.<br>Sites to the south and east of Slapton were not taken forward for a number of reasons including accessibility and impact on open and relatively flat countryside. For areas not identified as specific sites, it is considered that similar assessment outcomes would apply to these sites and they would similarly not be taken forward.<br>Land between the Grove and Site 6A is bisected by overhead pylons and has a number of properties at The Grove and Whaddon Farm which would constrain available land. Site 6A is less constrained than this land and would be selected ahead of this area. |
| Area 6 | Area 6 sits adjacent to the Chilterns National Landscape. It is bisected by overhead pylons. The conclusions reached for Site U would apply to this land in that whilst there would be reasonable access off Leighton Road, the landscape is flat and open interspersed with individual properties/farms. There would be views over the land from higher land at Leighton Buzzard and escarpment. Introduction of WTW structures would be a significant addition to the landscape and surrounding countryside in this location. In addition, the proximity to the Chilterns National Landscape would likely require significant design mitigation, more so than other sites. |

**Part 2 - Further Analysis of Geological Constraints**

As noted in Part 1, within the geological constraint exclusion layer, there may be areas of Woburn Sands or Upper Greensands (based on the Bedrock layer underlain by gault clay) where there is a significant layer of superficial clay deposits which could make development suitable. These are mapped below on Figure A8.3.3. As noted in Figure A8.3.3, the area underlain by gault clay is too far from a suitable watercourse so would not facilitate the construction of the water storage.

The areas with suitable geology are shown in orange on Figure A8.3.4. The northern most area with suitable geology, also includes woodland, ancient woodland and Green Belt land (denoted by the green hatched area). As such, a site in this location would be excluded on this basis. Where there aren't any exclusion constraints, then this area has been assessed through sites NSCS7, 8 and 9. The area to the south includes Site L, which has been subject to assessment, and also sits within the Green Belt so sites would similarly be excluded on this basis.

**Figure A8.3.3-** Areas with a significant layer of superficial clay deposits

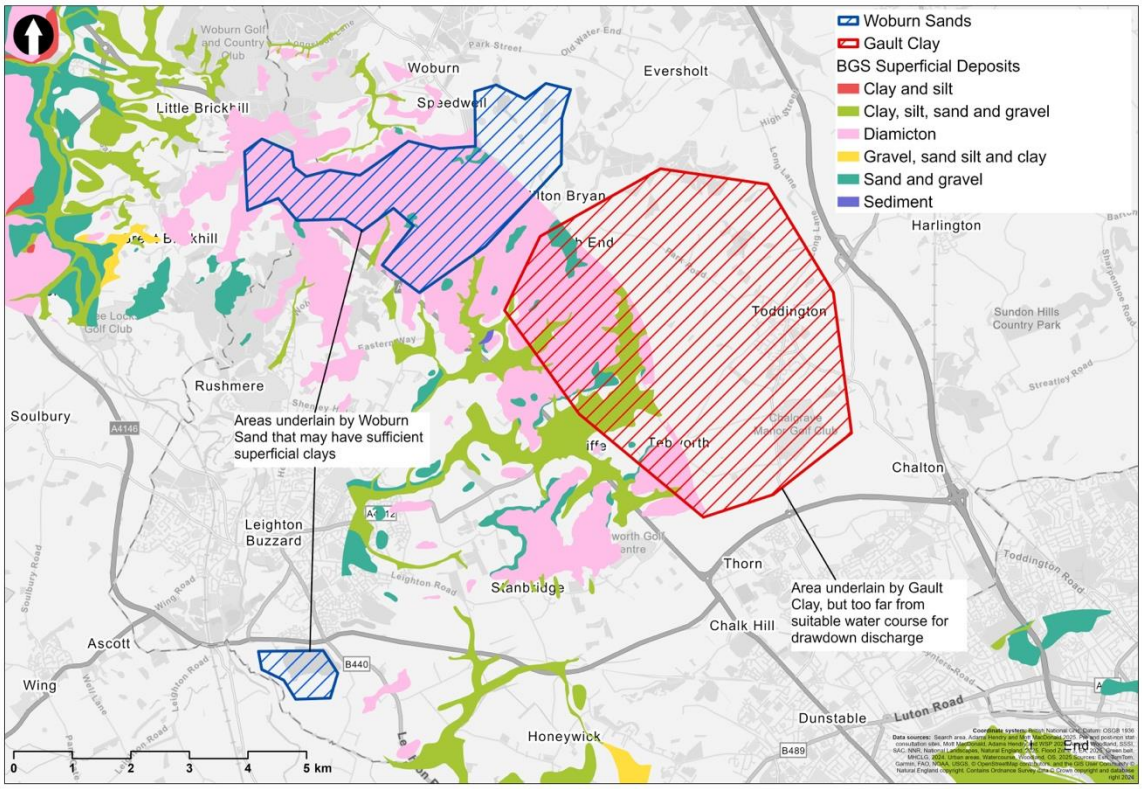
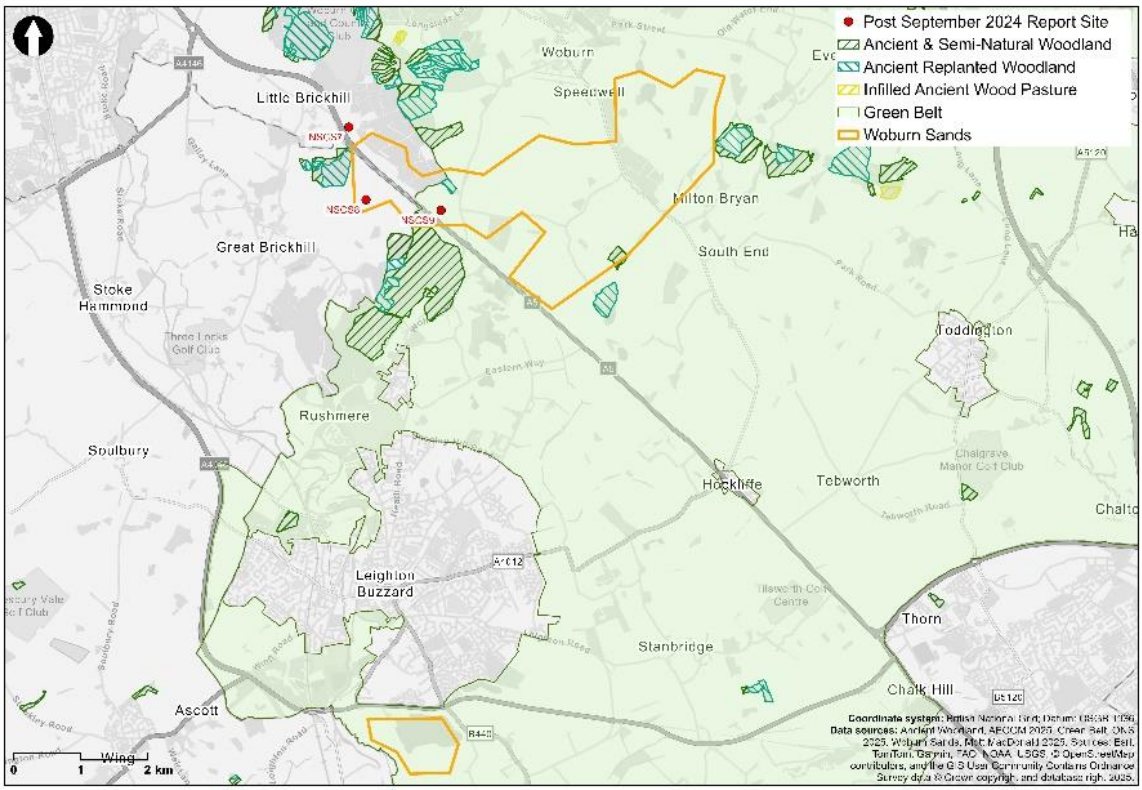


**Figure A8.3.4** – Areas of Woburn Sands where development might be suitable




## Conclusion

The limited areas within the search area that are not subject to exclusionary criteria and do not include assessment sites have been further considered. This further consideration has demonstrated that the risk of identifying other site options that perform better than those already identified and assessed is low.

# A.4 Grand Union Canal Transfer - Site and Route Evaluation Report (September 2024)

Grand Union
Canal Transfer

# Grand Union Canal Transfer Site and Route Evaluation Report

September 2024

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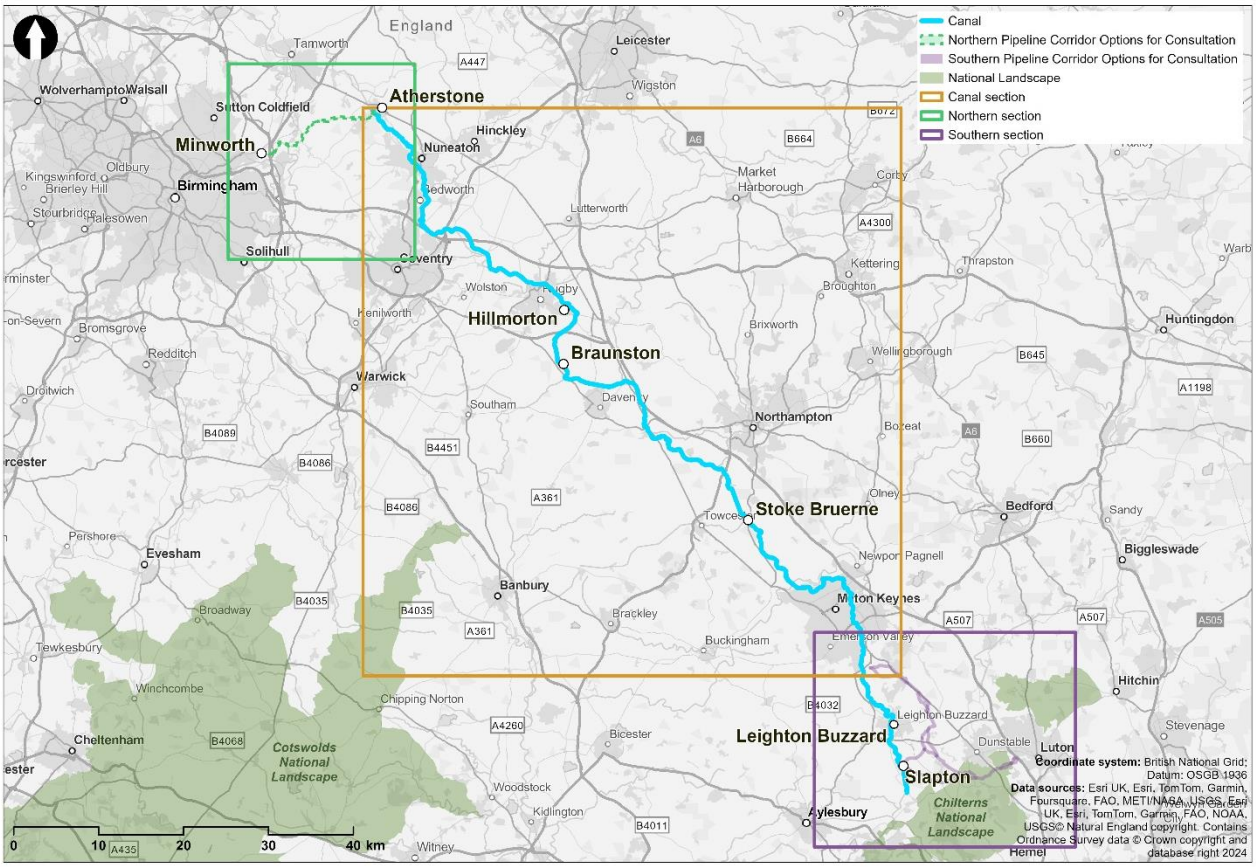
# 1 Introduction

The Grand Union Canal (GUC) Transfer is a new project to bring water from the Midlands to the southeast. It is a joint water transfer project between two water companies, Severn Trent (ST) and Affinity Water (AFW), and the Canal & River Trust charity (the Trust) who are the owner and navigation authority of the canals in England and Wales. This report sets out the work that has been undertaken to evaluate the sites and routes for the GUC Transfer project. The report does not include any evaluation work relating to the canal section of the route. This information will be provided as part of future public consultations.

## 1.1 The Project

The GUC Transfer Project will be designed to transfer 115 million litres of highly treated recycled water per day from ST's Minworth Wastewater Recycling Centre (WwRC) into AFW's water supply network for customers. This will require a combination of new pipelines, water treatment plants and other infrastructure as well as improvement to the canals to enable water to be transferred through them.

**Figure 1.1: Illustrative plan of the GUC Transfer Project**




In the northern section of the scheme, water from Minworth WwRC will receive enhanced treatment. The water will be transferred using the existing canal network (the Coventry, Oxford and Grand Union Canals, collectively referred to as GUC for this project), owned and operated by the Trust. To manage flow velocities and level changes within the canal system resulting from the transferred water, a range of ancillary infrastructure, along with bank raising and adaptations to existing equipment will be required.

In the southern section of the scheme, the water will then be abstracted and transferred into a new water treatment works (WTW) in the north Buckinghamshire/ south Bedfordshire area. Water storage will also be developed, providing up to five days storage. Following treatment, the clean drinking water will then be transferred through a new buried pipeline into AfW's supply for customers.

## 1.2 Purpose of the Report

This report has been prepared to provide an overview of the site and pipeline assessment process for the various elements of the GUC Transfer Project. It provides the outcome of the initial appraisal of the identified options for the various elements of the GUC Transfer Project that have been the subject of a consistent engineering, environmental, planning and land assessment. This will form the basis for the site selection of the scheme that will be the subject of the Development Consent Order (DCO) application.

This report provides an overview of the progress to date for the purposes of non-statutory consultation which will help inform the selection of preferred options, alongside more detailed assessment as the project progresses. As noted above, the report does not include the evaluation of the canal section of the route. This will be provided as part of future public consultations.

## 1.3 Structure of the Report

The structure of this report is summarised below:

- **Chapter 2** (Scheme Background and Context)
- **Chapter 3** (Methodology)
- **Chapter 4** (Advanced Water Treatment Plant)
- **Chapter 5** (Minworth to Grand Union Canal Transfer)
- **Chapter 6** (Abstraction, Water Treatment Works and Storage)
- **Chapter 7** (Transfer to Chaul End)
- **Chapter 8** (Summary and Conclusions)

# 2 Scheme Background and Context

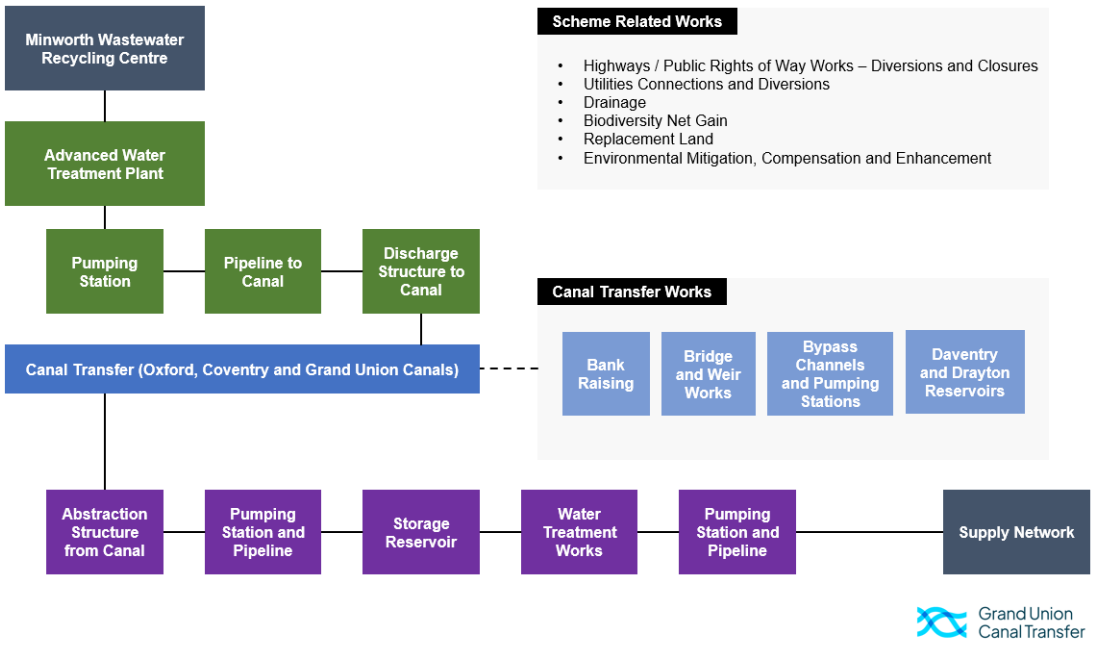
## 2.1 Project Overview

Starting at Minworth WwRC, water will be treated in a new Advanced Water Treatment Plant (AWTP) and then transferred to the Coventry Canal, where it will begin an approximately 131-kilometre journey along the canal. The water from Minworth's WwRC is currently discharged into the River Tame. The proposed AWTP plant at Minworth WwRC will undertake further treatment to some of its water to ensure that the water to be transported via the Coventry, Oxford and Grand Union canals meets the environmental requirements for discharge into the existing canal network. Water will be helped on its way by using the existing canal network.

To manage flow velocities and level changes within the canal system resulting from the increased volume of water being transferred, a range of new infrastructure works will be required, including new pipes, bypasses, pumping stations, canal-widening, bank raising and improvements to existing equipment. The water will then be abstracted, stored and transferred to a new water treatment works (WTW) in the north Buckinghamshire/ south Bedfordshire area. Water storage will also be developed, providing up to five days storage. Following treatment, the clean drinking water will then be transferred through a new buried pipeline into AfW's supply for customers.

The elements that make up the proposed development are summarised in Figure 2.1.

**Figure 2.1: Overview of development required by the GUC Transfer Project**



Minworth WwRC is ST's largest WwRC with a capacity to treat wastewater produced by a population of 1.75 million people in the Birmingham area. Additionally, the WwRC also treats a high volume of imported sludge from industry and regional works. Minworth WwRC is located in Sutton Coldfield, north east of Birmingham, and between the villages of Minworth and Curdworth. The WwRC lies within the administrative boundary of Birmingham City Council but is close to the boundary with North Warwickshire Borough Council.

The AWTP will be developed within or in the vicinity of the existing Minworth WwRC site to treat flow diverted from the current discharge into the River Tame. The design details of the proposed new treatment processes are being developed to ensure that any substances that may cause any deterioration of the receiving waterbodies or create an impediment to achieving target Water Framework Directive (WFD) status will be removed as part of the treatment process.

The new AWTP will include an activated carbon treatment process, which will include flocculation, and sedimentation followed by ozone oxidation, biologically active carbon (BAC) filtration, and granular activated carbon (GAC) adsorption.

The AWTP will require a site in excess of 5 hectares to accommodate the necessary plant and buildings to be developed either within or in the vicinity of Minworth WwRC along with the wetlands.

## 2.2 Transfer from Minworth WwRC to Discharge into the Coventry Canal

The treated water from Minworth WwRC will be delivered to the Coventry Canal by a new pumping station at Minworth WwRC and a new buried raw water pipeline which will run approximately due east from Minworth to a discharge point near Atherstone, Warwickshire. This section of the Project will be within the administrative area of North Warwickshire Borough Council.

The 1000mm diameter pipeline will be approximately 18km long and will include a level-controlled break tank. The treated water will be pumped as far as the break tank and then flow under gravity to the discharge location into the Coventry Canal.

A discharge structure will be required to release the treated water into the Coventry Canal in a controlled way at a sufficiently low velocity to avoid compromising and adversely impacting canal users and wildlife.

## 2.3 Transfer of Water Through the Coventry, Oxford and Grand Union Canals

Approximately 131km of canal will be utilised to transfer water from Atherstone to the north Buckinghamshire/ south Bedfordshire area. The water will travel along the Coventry Canal at Atherstone southwards into the Oxford Canal, through the Oxford Canal, and then into the GUC to an abstraction point in north Buckinghamshire/ south Bedfordshire area. This incorporates the administrative areas of North Warwickshire Borough Council, Nuneaton and Bedworth Borough Council, Coventry City Council, Rugby Borough Council, West Northamptonshire Council, Milton Keynes City Council, Buckinghamshire Council and Central Bedfordshire Council.

To manage flow velocities and level changes within the canal system resulting from the transferred water, a range of new infrastructure, along with adaptations to existing equipment will be required. At this stage of the design development process, this work is expected to include:

- Pumping stations and gravity bypasses, to detour around 'uphill' and 'downhill' locks along the route.
- The potential raising of canal banks and towpath levels where necessary.
- The adaptation of some existing bridges to maintain sufficient head room for vessels and people using the towpaths.
- The improvement to a number of existing waste weirs to maintain a consistent water level.

The Trust's existing Daventry and Drayton reservoirs store water and release it into the canal network to maintain flows. This will continue as part of the project. At this stage of the project design, the project includes sending some water into the reservoirs, to use as storage for when there may be less water in the canal system from Minworth.

## 2.4 Abstraction, Treatment and Transfer of Water to AfW Customers

Water will be abstracted from the canal at a location located in the north Buckinghamshire/ south Bedfordshire area and will require the construction of an abstraction structure on the canal, which will include a weir built into the bank and a pumping station.

New water storage will be required to store water before it goes through to treatment. This will allow the transfer to be more resilient as it will provide a buffer between the water in the canal and the water reaching the new WTW. If there were issues on the canal, the new storage would provide up to 5 days storage, storing up to 575,000$m^3$ of water. The current design assumes non-impounding embanked storage that will be filled with raw water via the abstraction from the canal.

The water abstracted from the canal would require treatment to potable (drinking) water standards. This will require the construction of a new WTW capable of removing pollutants and contaminants from the water. This is currently proposed to involve a multi-stage process, including tertiary treatment by ultra-violet. This will require a site in excess of 10 hectares to accommodate the necessary plant and buildings.

From the WTW, water would be pumped through a new buried pipeline to an existing Water Supply Reservoir (WSR), located near Luton. At this stage of project design this is anticipated to require in the region of 15-30km of new buried pipeline (depending upon the location of the WTW), involving development within the administrative areas of Central Bedfordshire Council and Buckinghamshire Council and possibly Luton Borough Council depending upon the routeing of the pipeline.

## 2.5 Other Works

Other works will be required to support the construction and operation of the project. At this stage of the project design process, these could include, but not be limited to:

- Temporary works to support construction, including access, compounds, working areas;
- Permanent works to support operation and maintenance;
- Land drainage works;
- Access and utility connections including electrical sub-stations, telecoms, water and sewerage facilities; and
- Reinstatement following construction, landscaping, environmental mitigation, enhancement, Biodiversity Net Gain and compensation measures.

# 3 Overview of Methodology

## 3.1 Option development though the RAPID Gated Process

Ofwat has provided funding for water companies to investigate, then develop, Strategic Resource Options (SROs) to help meet national water needs that will benefit customers and wider society, and help to protect and enhance the environment.

The development of these nationally important SROs is being overseen by the Regulators' Alliance for Progressing Infrastructure Development (RAPID), an alliance of regulators, including the Environment Agency, Ofwat and Drinking Water Inspectorate, formed to help accelerate the development of new water infrastructure.

AfW and ST are jointly developing two separate SROs, the GUC Transfer SRO and the Minworth SRO respectively, each of which is progressing through the RAPID gated process[1] and combine to form the GUC Transfer Project which will be the subject of the DCO application. The SROs were identified through the Water Resources Management Plan 2019 process[2],[3].

The gated process has involved submissions to RAPID to review the progression of the SROs, their cost efficiency and whether solutions merit further investigation. Through this RAPID process, options for delivering the project have been developed and assessed. RAPID Gate 1 assessments were submitted to RAPID in July 2021[4] and RAPID Gate 2 assessments were submitted to RAPID in November 2022[5].

## 3.2 Option Evaluation

The purpose of the option evaluation exercise undertaken was to ensure that developing options were subject to consistent engineering, environmental, planning and land assessments, of an appropriate level of detail, to inform decisions around option selection for progression through the DCO process. The methodology used is consistent with the approach advocated in the All Company Working Group Design principles for Strategic Resource Options[6]. This comprises a series of stages as summarised below in Figure 3.1 and explained in subsequent sections of this document.

[1] RAPID Gated Process

[2] Affinity Water WRMP19 Documents

[3] Severn Trent Water WRMP19 Documents

[4] Gate 1 Submissions

[5] Gate 2 Submissions

[6] Water Resources: Design Principles & User Guidance, All Company Working Group (March 2023)

**Figure 3.1: Options Review Methodology**

Stage 1 of this optioneering process took the engineering options for the pipelines needed in the northern and southern parts of the project to connect treatment infrastructure to the canal and the treatment works sites, that were identified through the previous phases of work (RAPID Gates 1 and 2), and applied criteria to identify pipeline corridors and sites for subsequent assessment. This report expands in sections 4 to 7 on how the RAPID Gate 1 and 2 work fed into developing options for the optioneering process. Stage 1 also included the identification of any other potential new options generated by this review work.

Exclusionary criteria, as summarised in Table 3.1, were used to ensure that identified options avoided, as far as practicable, constraints and designations that are likely to represent significant challenges to securing necessary consents for development and pose risks to delivery of the scheme. These criteria were used in Stage 1 to define the initial route corridors and sites available to the project, seeking to identify and exclude sites and options. Exclusionary criteria differ for site and pipeline development, reflecting that pipeline developments have less requirement for above ground, permanent development.

**Table 3.1: Summary of exclusionary criteria**

| Site development | Pipeline development |
|---|---|
| **Buildings and settlements** – avoid existing settlements, unless alternative site are not feasible. | **Building and settlements** – avoid routeing beneath habitable buildings and where routed through settlements, limit likely impacts, through route selection. |
| **Ancient woodland** - avoid areas of mapped ancient woodland. Seek to locate construction activities at least 15m away. | **Ancient woodland** – avoid areas of mapped ancient woodland. If unavoidable, trenchless pipeline construction will be necessary. |
| **Scheduled Monuments** – avoid siting in locations which will impact the setting of a Scheduled Monument. | **Scheduled Monuments** – avoid routeing beneath Scheduled Monuments, |
| **National Landscape** – priortise locations that avoid impact to the National Landscape. Where locations within the National Landscape are unavoidable, minimise potential impacts through site selection. | **National Landscape** – avoid routeing through National Landscape, but if this is not possible, minimise likely impacts through routeing. |
| **Environmental designations** – no siting within any International or National biodiversity designations. | **Environmental designations** – avoid routeing through International and National biodiversity designations. If unavoidable, trenchless pipeline construction will be necessary. |
| **Flood zone** – avoid siting above ground development within Flood Zone 3 for river and sea flooding or areas of high risk of surface water flooding. | **Flood zone** – avoid being routed within Flood Zone 3 for river and sea flooding or areas of high risk of surface water flooding. If unavoidable, mitigation will be adopted. |
| **Green Belt** – priortise locations that avoid impact to the Green Belt. Where locations within the Green Belt are unavoidable, minimise potential impacts through site selection. | **Existing infrastructure and main river crossings** – minimise the number of crossings of major infrastructure |

Stage 2a and 2b took the identified options and sites and screened them against engineering, environment, planning and land criteria. This facilitated a comparison assessment of the corridors and sites against criteria derived from national policy objectives and/or engineering requirements and known environmental limitations that inform the project's design. A summary of the criteria used is included in Table 3.2. The stage was used to identify which pipeline corridors and sites were considered less preferable and unlikely to proceed.

**Table 3.2: Criteria considered for pipeline corridor and site evaluation**

| Consideration | Aspects considered for pipeline corridor | Aspects considered for site evaluation |
|---|---|---|
| **Engineering** | • Construction cost<br>• Embedded carbon<br>• Flexibility<br>• Operational cost<br>• Operational carbon<br>• Route selection features<br>• Route selection means of access | • Construction cost<br>• Embedded carbon<br>• Operational cost<br>• Operational carbon<br>• Site features, including geology and ground conditions<br>• Site location<br>• Means of access |
| **Environment and Social** | • Biodiversity, flora and fauna – designated sites and ancient woodland<br>• Soils – agricultural land and landfill sites<br>• Water – flood zones<br>• Water Framework Directive impacts<br>• Landscape<br>• Historic environment<br>• Population and human health – property and community assets | • Biodiversity, flora and fauna – designated sites and ancient woodland<br>• Soils – agricultural land and landfill sites<br>• Water – flood zones<br>• Landscape<br>• Historic environment<br>• Population and human health – property and community assets |

| Consideration | Aspects considered for pipeline corridor | Aspects considered for site evaluation |
|---|---|---|
| **Planning** | • Existing or designated use of the site<br>• Emerging potential designated use or evidence of land being promoted for development<br>• Mineral extraction<br>• Green Belt<br>• Neighbouring land uses | • Existing or designated use of the site<br>• Emerging potential designated use or evidence of land being promoted for development<br>• Mineral extraction<br>• Green Belt<br>• Neighbouring land uses |
| **Land** | • Special category land<br>• Residential land impact risks<br>• Acquisition costs risks | • Special category land<br>• Residential land impact risks<br>• Acquisition costs risks |

Stage 3 involved workshops with engineering, environment, planning and land teams to discuss the findings of the review, identify the options with the greatest potential and discuss and challenge the justifications for their selection or rejection. The workshop enabled the outcomes to be carefully reviewed to ensure all options were considered comparatively, with the results robustly tested. The workshop considered the need for verification of assessments undertaken and also identified any disciplines where additional consideration of opportunities and constraints relating to options identified as having the greatest potential was necessary (through Stage 4).

Stage 4 enabled engineering, environment, planning and land teams to undertake additional technical work on those options with the greatest potential. Additional consideration of opportunities and constraints that were identified via the workshop in Stage 3 along with any additional sites identified.

Stage 5 involved further workshops with engineering, environment, planning and land teams to discuss the overall findings of the options review process. The aim of the workshop was to identify those options with the greatest potential. Where this consideration of options concluded that additional assessments were necessary to inform the decision-making process, those additional assessments were undertaken before another workshop held to discuss outcomes. Through Stage 5 options with the greatest potential were identified for consideration through non-statutory consultation.

Stage 6 is the formal writing up of the Site and Route Evaluation Report for non-statutory consultation (this document).

The outcomes from the non-statutory consultation and additional surveys and assessments will be considered prior to confirming selection of preferred option(s) for the future progression of the Project.

## 3.3 Additional Work

It should be noted that the assessment outcomes reported are predominantly based on desk-based assessments. At the time of this report, ecological and engineering site-based surveys have not yet been completed for site options and corridors, nor has engagement with all potentially affected landowners been completed across the site options and corridors.

Information from further assessments and engagement will be reviewed, alongside the consultation responses to the non-statutory consultation process, and will be taken into account as part of the subsequent refinement and final selection of preferred site options and transfer pipeline corridors. This will include reviewing conclusions reached to date in light of any new information received.

Further engineering design work, environmental and technical assessments, and engagement will be undertaken on the preferred site options and pipeline corridors, leading to the identification of preferred designs for the sites and pipeline corridors, as well as construction working areas required for their proposed construction. Further Statutory Consultation in accordance with the Planning Act 2008 will then be undertaken on those proposals before the application for development consent is finalised.

In relation to transfer elements of the project, it is important to note that the inclusion of land does not mean that the full site or corridor will be developed. At this stage, the assessments have been undertaken on the approximately 200m wide potential transfer pipeline corridors. The corridors have deliberately been kept broad to provide flexibility for the consideration of appropriate routeing as part of the further progression of the project. This includes environmental and engineering assessments and landowner engagement referred to above.

Some environmental designations and other constraints have been avoided through the optioneering review of the potential transfer pipeline corridors. Corridor routeing has sought to avoid existing settlements where practicable. However, some environmental designations and other constraints, together with some buildings remain within the corridors at the current time. As work progresses, the corridors will be refined and narrowed as transfer pipeline route selection is undertaken and confirmed. Where residential properties are currently shown within corridors, these will be avoided by pipeline route selection.

# 4 Advanced Water Treatment Plant

## 4.1 Strategic Context

Minworth SRO is one of the SRO projects being developed as part of the Water Resources South East (WRSE) Regional Plan to help secure the national water supply under the National Framework for Water Resources. ST and AfW are required to deliver Minworth SRO (as part of the GUC Transfer Project) which will provide a source of raw water to support inter-regional transfers from the Water Resources West (WRW) region to the WRSE region.

Minworth WwRC is an Activated Sludge Treatment Works located to the east of Birmingham near Sutton Coldfield. Through the National Framework for Water Resources, it has been identified that Minworth SRO will provide water to the GUC Transfer SRO by diverting some of the recycled wastewater from Minworth WwRC to a new Advanced Water Treatment Plant (AWTP) and transfer treated water to AfW and Thames Water regions to supplement existing water supplies. Minworth was identified as the optimal place to locate the new AWTP from an environmental and supply perspective, noting it being an existing works site and the corresponding reduction in cost and operational risk relating to flow, transfer and treatment.

An AWTP to treat Minworth's recycled wastewater is required to meet the necessary environmental discharge requirements. The AWTP is required for the GUC Transfer Project and is to be built in 4 trains to provide operational flexibility and resilience for the operating regimes potentially required in the future, though the DCO for this project is only seeking consent for those elements that are required for the GUC Transfer Project.

## 4.2 RAPID Gate 2 Site

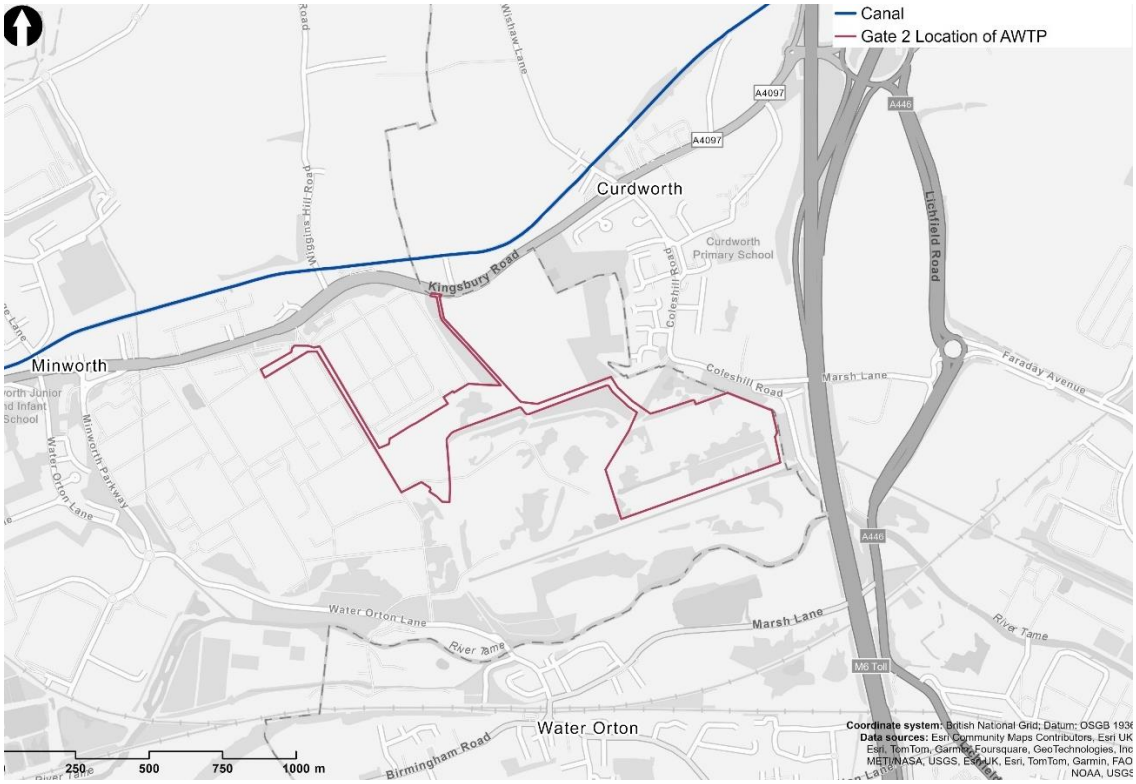
The site that was identified for the AWTP at RAPID Gate 2 is shown in Figure 4.1 and was situated within the operational boundary of the Minworth WwRC site. After the RAPID Gate 2 submission, a ST strategic review of the operational requirements of the WwRC site confirmed that the site identified for the AWTP was required for a different future expansion project, to provide phosphorous removal for the whole of the Minworth WwRC site to meet anticipated changes to discharge permits.

Due to those identified future requirements for the land within the operational Minworth WwRC site to allow ongoing operation of that site, an additional optioneering exercise was undertaken to determine the most favourable location for the AWTP. In addition to the phosphorous removal scheme, the following other operational land demands required consideration as part of this process:

- Network Response Team (NRT) Tanker Area expansion.
- New Activated Sludge Process Train to enhance the capacity of Minworth WwRC.
- Upgrade of the Storm Overflow storage capacity and additional sludge drying facilities.

The identified land uses and corresponding projects are required in connection with the discharge permit for the Minworth WwRC and are therefore given priority over the Minworth SRO when allocating the land required.

**Figure 4.1: RAPID Gate 2 Location of AWTP**



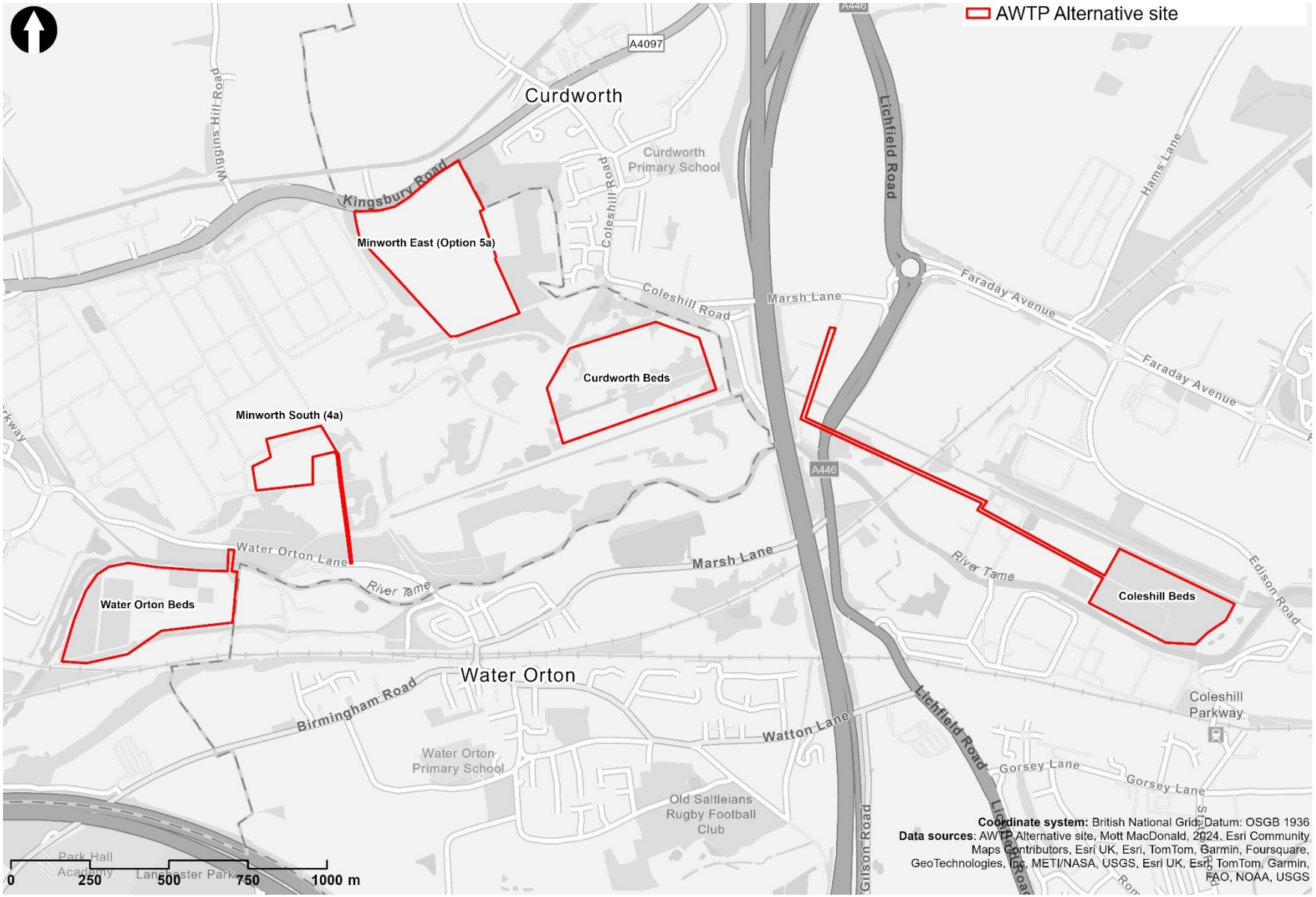

## 4.3 Alternative Sites Considered

An optioneering exercise was undertaken to determine the favourable location for the AWTP utilising consistent engineering, environmental, planning and land assessments of an appropriate level of detail to derive a preferred site ahead of non-statutory consultation. Following initial discussions with ST on the available land for the AWTP, 5 sites were identified as having the greatest potential, which are shown in Figure 4.2 and summarised below:

- **Minworth South (Option 4a)** – siting of the AWTP on the current location for the NRT tanker area.
- **Minworth East (Option 5a)** – locating the AWTP in the field to the east of Minworth outside of the current operational boundary of the Minworth WwRC site but within the ownership of ST.
- **Coleshill Beds** – locating the AWTP at the Coleshill site on land formerly used for sludge drying.
- **Curdworth Beds** – siting on the former sludge drying beds located to the south east of the main envelope of the Minworth WwRC site.
- **Water Orton Beds** – locating the AWTP on former sludge drying beds located immediately south of the Minworth WwRC site.

A further option was initially considered. This option proposed to locate the AWTP at Coleshill, specifically on the site of a demolished incinerator. However, this site was discounted due to the size of the site not being large enough for the AWTP.

**Figure 4.2: AWTP Alternative Sites**



## 4.4 Assessment of Alternative Sites

**Minworth South** is currently occupied by the NRT team and discussions initially focussed on the long-term occupier of the land and whether it was suitable for the AWTP. In addition to its long-term availability, the site has several other engineering challenges including the requirement for a significant amount of additional distribution pipes from the effluent channel and to the conveyance pipelines. It would also require the diversion of critical existing infrastructure and is constrained in terms of overall area for the AWTP.

**Minworth East** is considered to have an 'operational status' and is within ST's land ownership. Through the assessment, it was identified as favourable from an engineering perspective, technically viable and cost effective. This option involved the least number of pipelines and pumping and was considered to have a lower risk from contaminated land and other geotechnical challenges. The northern part of the site was located outside of the Flood Zone, and there were considered to be no significant environmental risks. However, the site was not preferrable as the land within the site may be required for future operational development, associated with storm overflow storage infrastructure.

The locating of the AWTP on the **Coleshill Beds** site also had significant challenges, including being sited approximately 2km away from the Minworth WwRC's effluent channel, which is the required feed for the AWTP and would involve additional pumping requirements. Consequently, the option would require significantly more and longer distribution pipelines which would have to cross significant public infrastructure, including HS2 and the M6/M42 motorway. The land is also likely contaminated and there is a risk of ecological and flood risk impacts. The **Water Orton Beds** site had similar findings, though flood risk was identified as a more significant constraint than the Coleshill Beds site.

The **Curdworth Beds** site has similar challenges and characteristics as the Coleshill Beds and Water Orton Beds locations. However, this site performed better due to requiring less additional pipes and pumping. The option also provides greater flexibility providing sufficient capacity for the required stream for the GUC Transfer Project and the wetlands, whilst providing the opportunity for further streams in the future, if required and consented. It would also enable parts of the AWTP to remain on the RAPID Gate 2 site.

Considering the engineering, planning and environmental constraints associated with the other sites, and through subsequent technical workshops and engagement with internal stakeholders, the result of the optioneering process was that the Curdworth Beds site was the preferred site option for the AWTP.

A summary of the assessment outcomes for each site is presented at **Appendix A**.

## 4.5 Summary of Assessment and Conclusions

A strategic review of the operational requirements of the Minworth WwRCs site confirmed that the RAPID Gate 2 location identified for the AWTP was required for a future expansion project related to the discharge permit for the site. An optioneering exercise was undertaken to determine the most favourable location for the AWTP utilising consistent engineering, environmental, planning and land assessments of an appropriate level of detail to derive a preferred site ahead of non-statutory consultation.

Several of the sites identified, including Minworth South, Coleshill Beds and Water Orton Beds, contain engineering constraints associated with the construction and operation of the AWTP, including overall site capacity and the requirement for significant distribution pipes interfacing with public infrastructure. The Minworth East site, whilst preferable from an engineering perspective, would be located on land that may be required for the future operational development, such as enhancing storm overflow storage capacity.

The Curdworth Beds site, whilst having some complex technical constraints, performed better than other sites due to requiring less additional pipelines and pumping. The option remains within the operational envelope of the Minworth WwRCs site and provides flexibility for future expansion in the future, if required. Elements of the AWTP will also remain on the RAPID Gate 2 site. Through the optioneering process, it was confirmed that the Curdworth Beds site was the preferred site option for the AWTP.

These conclusions reflect the information on the sites and their development available at the time of the optioneering process and are reached in advance of the non-statutory consultation process and planned site surveys and investigations. The outcomes from the non-statutory consultation and additional surveys and assessments will be considered prior to confirming the preferred option.

# 5 Minworth to Grand Union Canal Transfer

## 5.1 Strategic Context

Development of the GUC Transfer Project has evolved from AfW's Water Resources Management Plan (WRMP) 2019 through RAPID Gates 1 and 2 and has considered and assessed the transfer of the recycled water into the GUC, covering the discharge location in the ST water supply area and the potential canal routes associated with these discharge locations.

Initial assessment work and workshops with ST, AfW, The Trust and the Environment Agency sought to establish a series of sub-route options for transferring the water into the GUC to be assessed. Involvement of the Environment Agency and The Trust as part of the process allowed for multiple considerations to be factored into generating an unconstrained list of sub–route options for the GUC Transfer Project to enable further investigation via the technical workstreams to identify a preferred sub-route.

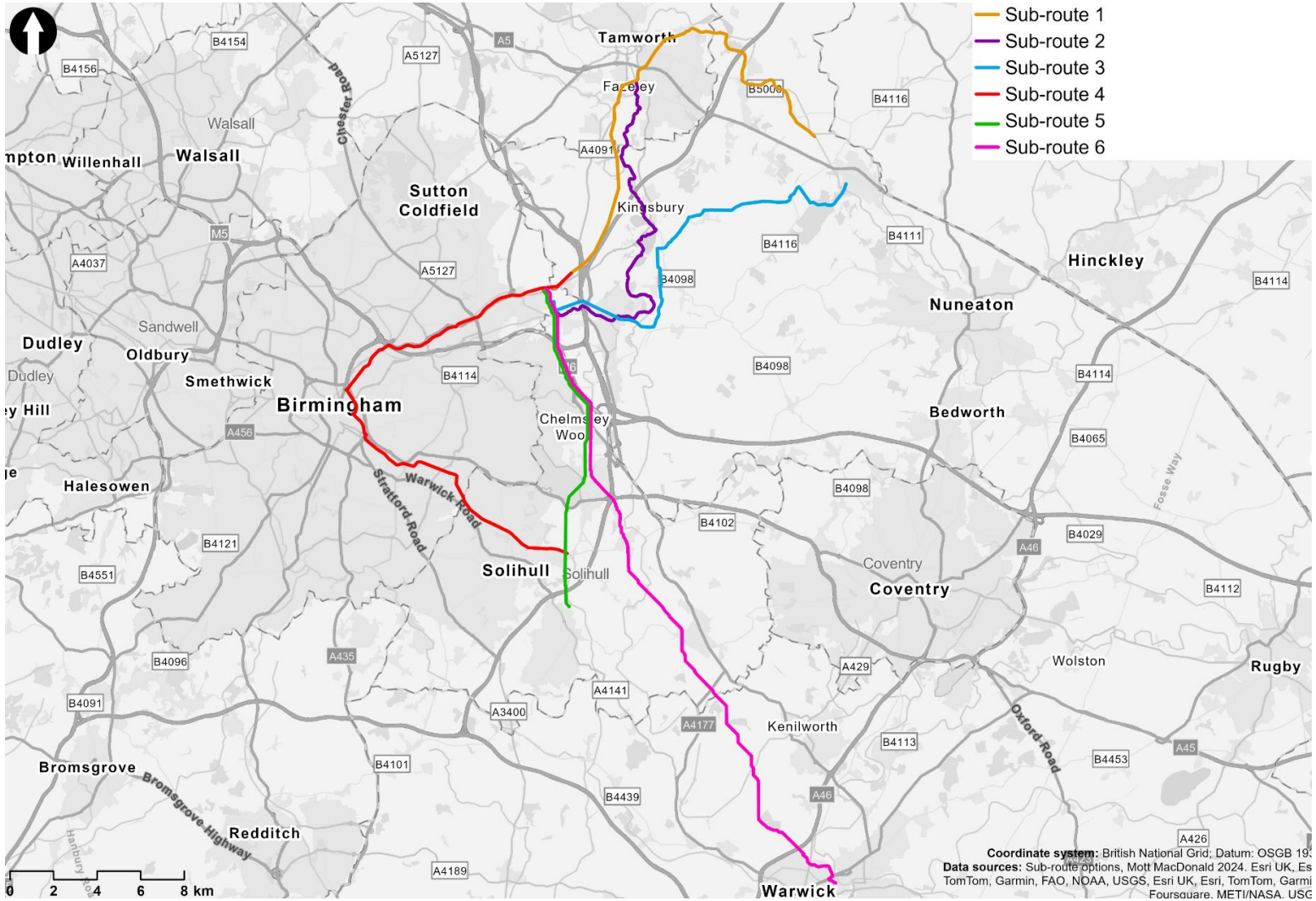
The initial work sought to identify sub-route options which could facilitate the canal transfer. The purpose of generating multiple options was to ensure a robust and consistent assessment process of sub-route options to identify a preferred mode for the transfer of recycled wastewater.

The sub-routes identified through the initial assessment work are summarised in Table 5.1 and shown within Figure 5.1, with a more detailed summary of each provided within Section 5.2.

**Table 5.1: Summary of sub-route options**

| Route Name | Mode | Description |
|---|---|---|
| **Sub-Route 1** | Canal | Discharge from Minworth into Birmingham Fazeley Canal. Connection to Coventry Canal at Fazeley and transfer south via Coventry/Oxford Canal to Grand Union Canal just north of Daventry. |
| **Sub-Route 2** | River and Canal | Discharge from Minworth into the River Tame. Connection to Coventry Canal at Fazeley and transfer south via Coventry/Oxford Canal to Grand Union Canal just north of Daventry. |
| **Sub-Route 3** | Pipeline | Discharge from Minworth into a new proposed pipeline across country to Coventry Canal at Atherstone and transfer south via Coventry/Oxford Canal to Grand Union Canal just north of Daventry. |
| **Sub-Route 4** | Canal | Discharge from Minworth into Birmingham Fazeley Canal. Connection to Grand Union Canal near Junction 6 of the M6 and transfer south via Grand Union Canal. |
| **Sub-Route 5** | Pipeline | Discharge from Minworth into a new proposed pipeline across country to Grand Union Canal at Copt Heath and transfer south via Grand Union Canal |
| **Sub-Route 6** | Pipeline | Discharge from Minworth into a new proposed pipeline across country to Grand Union Canal at Leamington Trough Pound, south of Leamington Spa and transfer south via Grand Union Canal |

**Figure 5.1: Plan showing sub-option**

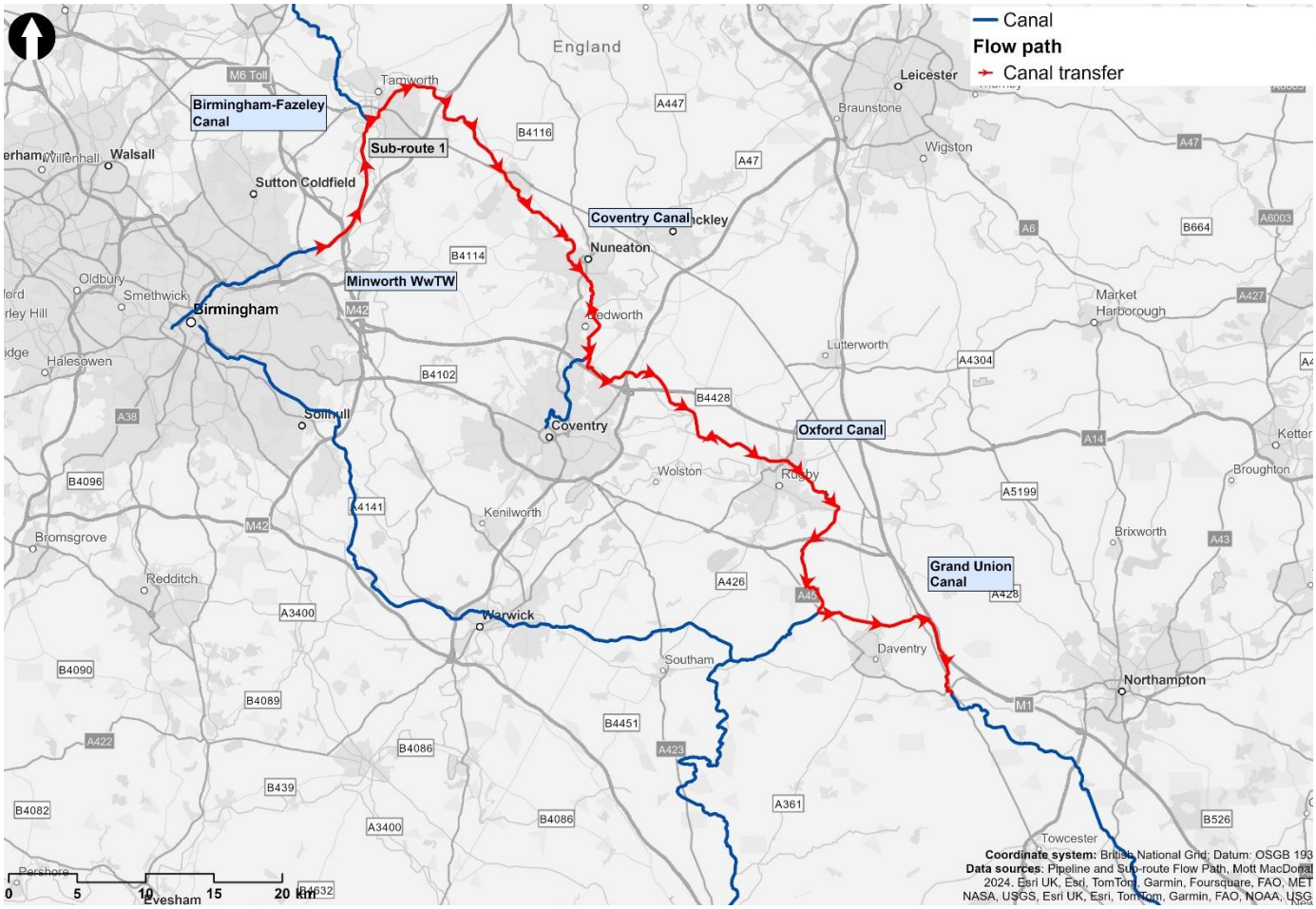


## 5.2 Identified Transfer Options

### 5.2.1 Sub-Route 1 – Birmingham and Fazeley Canal

The Birmingham and Fazeley Canal passes north of the existing Minworth WwRCs site and offers an efficient means to discharge into the canal network. Sub-route 1 would discharge water a short distance northward from Minworth WwRC into the Birmingham and Fazeley Canal. The canal runs approximately south-west to north-east where it connects to the Coventry Canal at Fazeley in Staffordshire. The Coventry Canal then connects to the Oxford Canal and finally to the GUC near Braunston.

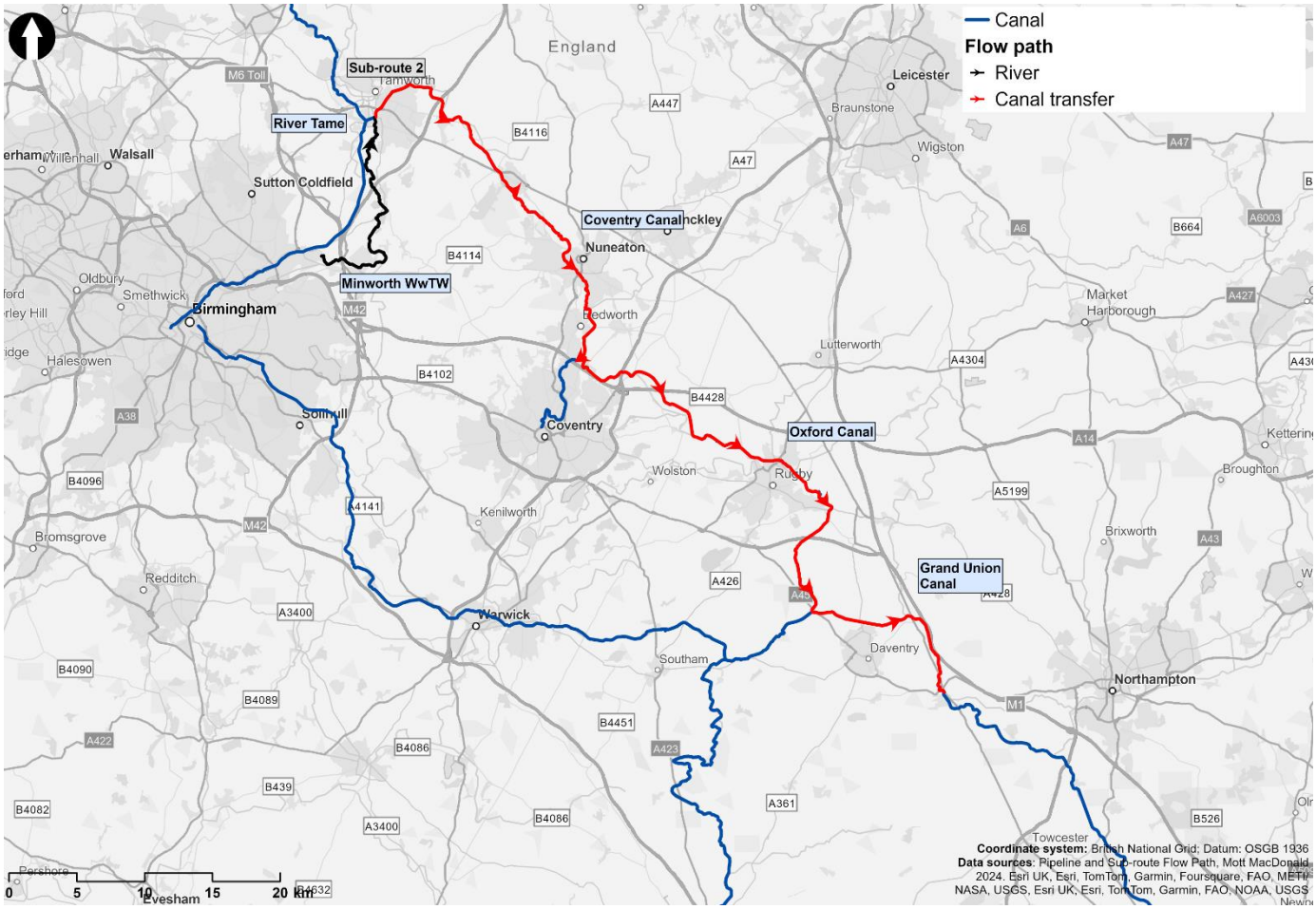
**Figure 5.2: Sub-route 1 flow path.**



### 5.2.2 Sub-Route 2 – River Tame to Coventry Canal

The existing configuration at Minworth WwRC is to discharge to the River Tame at two specific locations from both the Minworth and Coleshill WwRC. Sub-route 2 utilises this existing arrangement by discharging recycled water to the River Tame which runs approximately north-eastwards and crosses underneath the Coventry Canal, close to Fazeley. This would be a suitable location to abstract from the river and discharge into the Coventry Canal, connecting to the GUC as per sub-route 1.

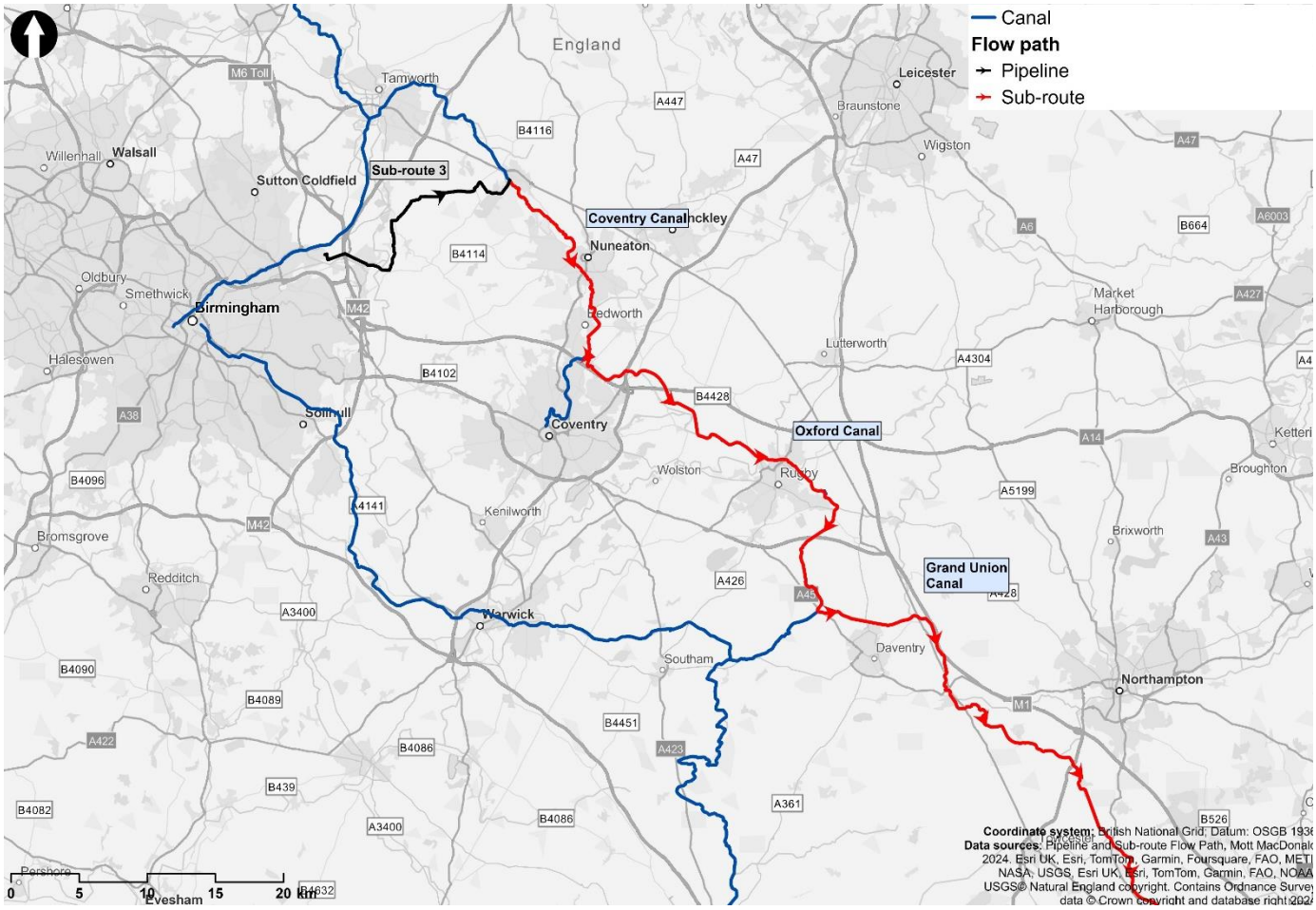
**Figure 5.3: Sub-route 2 flow path.**



### 5.2.3 Sub-Route 3 – Pipeline to Coventry Canal at Atherstone

Sub-route 3 follows a similar routeing to sub-routes 1 and 2, leaving Minworth WwRC and flowing north before coming back south in the direction of its intended destination and offers an alternative to remove the initial flow north in the canal. Sub-route 3 would transfer water via a new pipeline to discharge into the Coventry Canal at Atherstone, connecting to the GUC as per sub-routes 1 and 2.

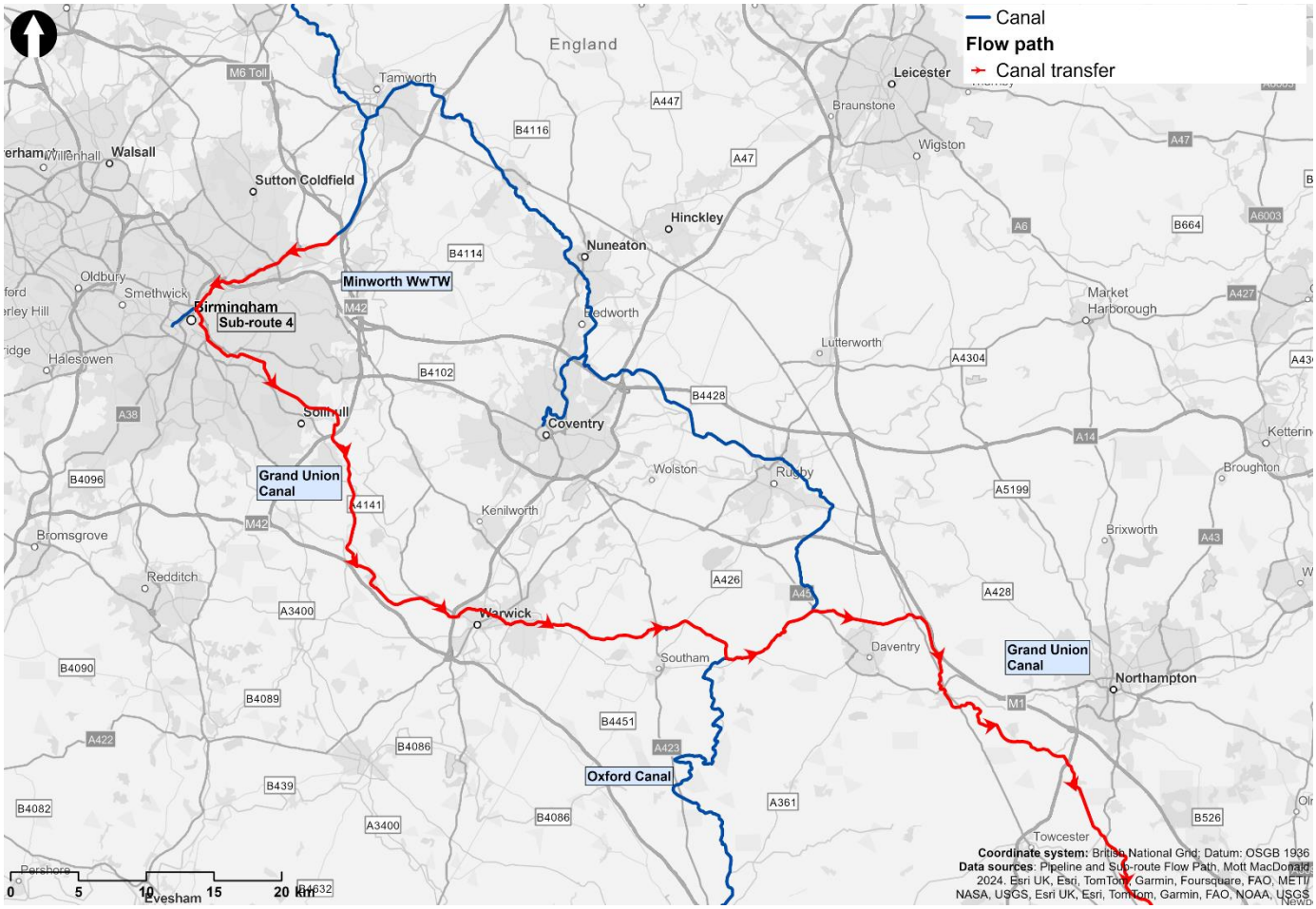
**Figure 5.4: Sub-route 3 flow path.**



### 5.2.4 Sub-Route 4 – Birmingham and Fazeley Canal

Sub-route 4 would adopt the same discharge into the Birmingham and Fazeley Canal as sub-option 1, however; it would flow to the west and back into Birmingham. The canal then meets the Birmingham and Warwick Junction Canal, where it flows south until its confluence with the GUC due west of Kington Hill local park.

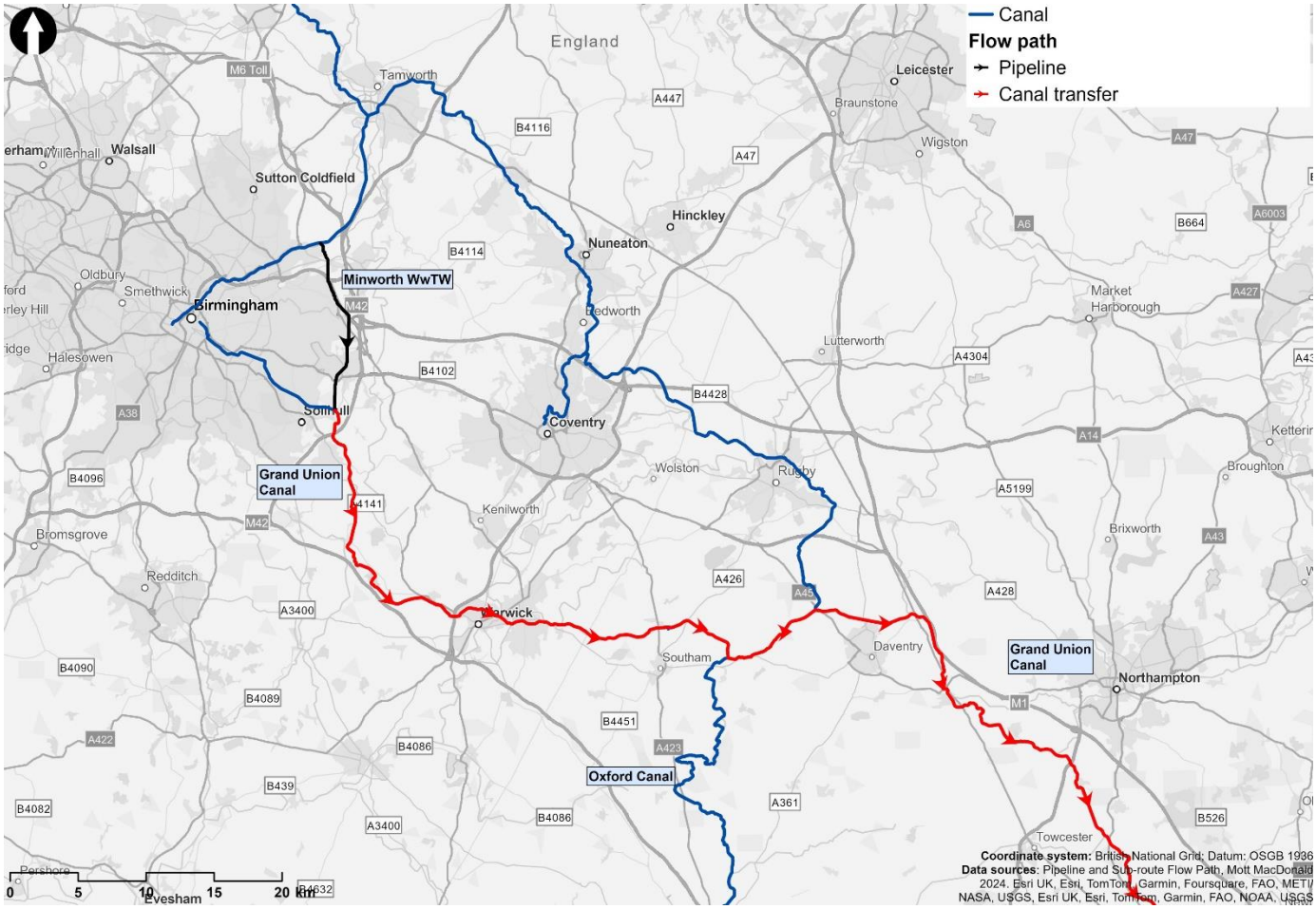
**Figure 5.5: Sub-route 4 flow path.**



### 5.2.5 Sub-Route 5 – Pipeline to Grand Union Canal at Copt Heath

Sub-route 5 would take water via a pipeline to a discharge point at Copt Heath Wharf which sits on the GUC to the north of Copt Heath and the M42. Once in the GUC, this route would follow the canal into the AfW supply area for abstraction and distribution.

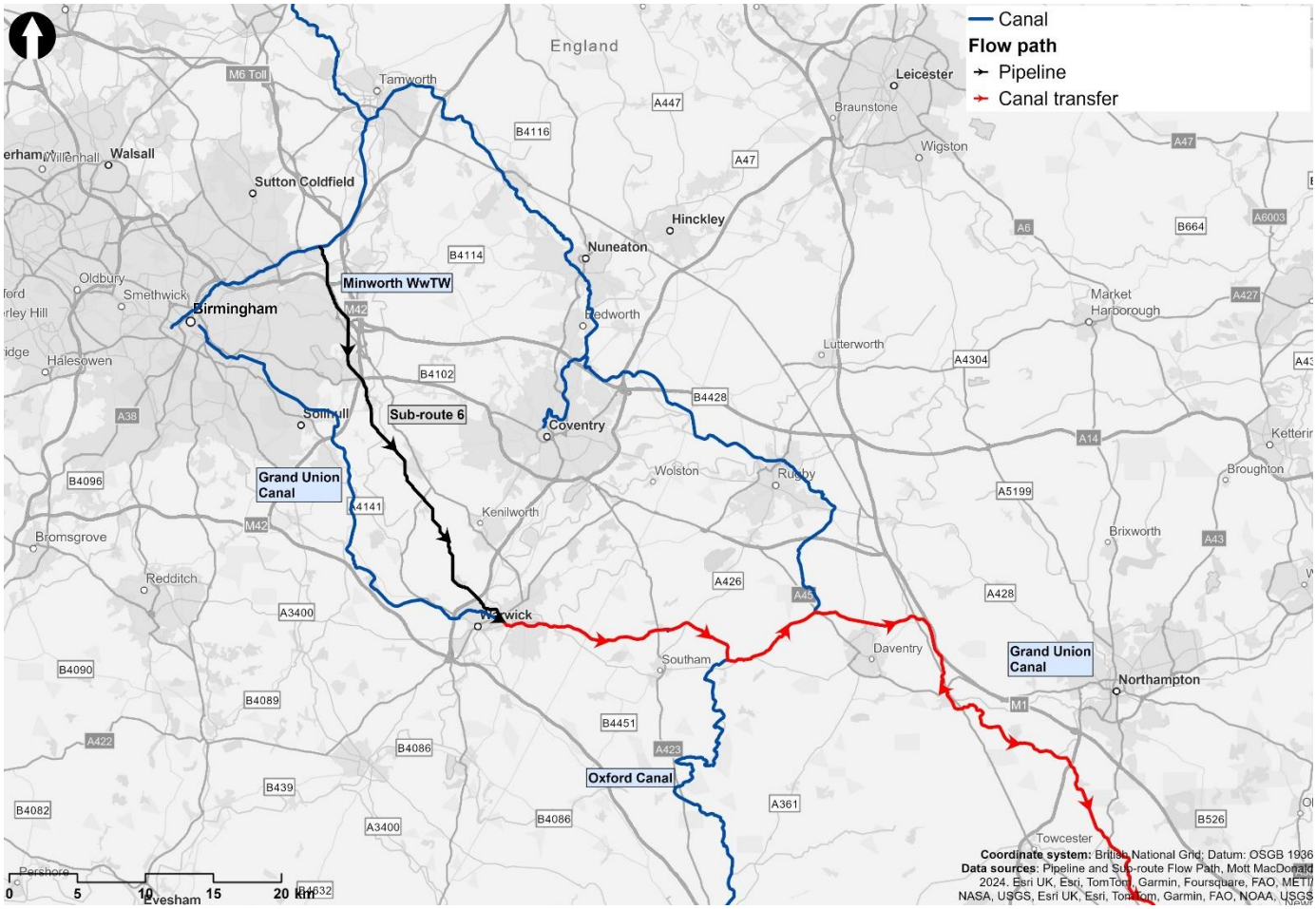
**Figure 5.6: Sub-route 5 flow path.**



### 5.2.6 Sub-Route 6 – Pipeline to Grand Union Canal at Leamington Trough Pound

Sub-route 6 is a variant of sub-route 5, in which the transfer of water is completed further downstream, into the Leamington Trough Pound. The total length of the pipeline is much longer in this sub-route, running north-west to south-east sub-parallel to the A452 which connects Leamington Spa to Coleshill and Sutton Coldfield.

**Figure 5.7: Sub-route 6 flow path.**



## 5.3 Assessment of Transfer Options

The sub-route options have been the subject of assessment through RAPID Gate 1 where three sub-options were considered and taken forward to RAPID Gate 2[7] for further assessment to select a preferred sub-option to develop further within RAPID Gate 3. The sub-route options have been further reviewed to ensure that the options have been subject to consistent engineering, environmental, planning and land assessments of an appropriate level of detail, to be used as the basis for decisions around option selection for progression through the DCO process.

Those options utilising existing infrastructure (i.e. river and canal) have focussed on the assets for assessment, however, for those options with new infrastructure (i.e. pipelines) a corridor-based assessment has been followed, as the exact location of the infrastructure would be subject to further design work and investigation.

A summary of the assessment outcomes for each sub-route option is presented at **Appendix B**.

### 5.3.1 Sub-Route 1 – Birmingham and Fazeley Canal

Sub-route 1 performed favourably alongside other sub-routes, particularly those western sub-routes, namely sub-routes 4, 5 and 6. However, a number of issues were identified following further assessment, the most significant being the hydraulic implications and several sections that would limit the capacity to transfer flow and achieve the required peak flow without additional measures.

Due to being an existing asset, the planning and land impacts are not considered significant. However, the assessment identified potential negative environmental impacts through the River Tame and River Anker flood plains. The addition of transfer flow into the canal may also be unacceptable from a flood risk perspective, where an element of the sub-route is fully within the flood risk area.

### 5.3.2 Sub-Route 2 – River Tame to Coventry Canal

Sub-route 2 utilises the River Tame which currently receives water from the Minworth WwRC site. The assessment confirmed that River Tame has a significant flood zone extent and locating the extraction and transfer point on the River Tame could cause a potential deterioration of the water source quality. This is due to it being mixed with the storm flows, then conveyed into the Canal with potentially more sediments and other pollutants.

As stated above, this sub-route utilises the River Tame before water is abstracted, treated and discharged into the canal. This route would therefore require a new abstraction point and license, in addition to the discharge permits required for all sub-routes. Furthermore, this route would encompass treating water twice, once at Minworth and again post-abstraction, which would minimise the efficiency of this route. The sub-route was assessed as being the least flexible due to it being a natural system that is impacted by seasonal environmental changes, most notably being the frequent flooding experienced across the majority of the sub-route. Significant works would also be required in the flood plain to lift the flow out of the river and up to the canal.

### 5.3.3 Sub-Route 3 – Pipeline to Coventry Canal at Atherstone

Sub-route 3 would transfer recycled water via a new pipeline from Minworth to discharge to the Coventry Canal at Atherstone. Through the assessment work undertaken sub-route 3 has several advantages over the other options considered. The sub-route involves less work to locks, fewer and easier to construct pumping stations and avoids the canal section from Minworth to Atherstone required by sub-routes 1 and 2 which would require greater intervention.

[7] Grand Union Canal – Annex A1.2 Gate 2 Position Paper – Route Selection (November 2022)

The assessment work confirmed that the pipeline routes provide most flexibility as they reduce the amount of canal infrastructure requiring modification. Sub-route 3 is considered the most flexible as it is largely rural and less vulnerable to interfacing projects, which is more likely with sub-routes 5 and 6. Sub-route 3 also has the shortest overall programme, being shorter and easier to construct than other pipeline options resulting in a shorter period of disruption.

### 5.3.4 Sub-Route 4 – Birmingham and Fazeley Canal

Sub-route 4 would take water into the Birmingham and Fazeley Canal to the west and into Birmingham. The route is significantly more urbanised and potentially more complex from a land and planning perspective. The upgrade to the canal system within the Birmingham and Fazeley Canal approach to Gravelly Hill in Birmingham, and around Birmingham up to the connection with the GUC, would require works to be undertaken within the heavily built-up area of Birmingham, therefore increasing the complexity of this option and number of receptors likely to be affected during construction.

It was identified through the engineering assessment that the sub-route would potentially require the upgrade of the whole lock section and significant amounts of canal structures (such as bridges and aqueducts) to enable the water transfer in this direction of the Birmingham and Fazeley Canal from Minworth. This contrasts with other western sub-routes that would bypass these works via a piped option.

### 5.3.5 Sub-Route 5 – Pipeline to Grand Union Canal at Copt Heath

Sub-route 5 would involve the transfer of water via a pumped pipeline of approximately 15.75km to a discharge point at Copt Heath. The engineering assessment identified that any route would need to navigate several complex interfacing land uses, including HS2, Birmingham International Airport and the NEC lying almost due south from Minworth, and several major trunk roads including M6, M6 toll road, M42, A452, A446 and A45. This would impact the flexibility of the option and could potentially impact the overall delivery of the transfer.

Sub-route 5 offers benefits in relation to sub-route 4 as it bypasses the urban area and corresponding works to the Birmingham and Fazeley Canal. However, the proposed discharge location is situated upstream and potentially involves more upgrades to the canal infrastructure than other sub-options that were assessed.

### 5.3.6 Sub-Route 6 – Pipeline to Grand Union Canal at Leamington Trough Pound

Sub-route 6 presents similar characteristics to sub-route 5, in that it faces similar constraints associated with infrastructure interfaces within the Birmingham area, including the airport, NEC, HS2 and several major trunk roads. The route performs strongest out of the western transfer options, avoiding work associated with the Birmingham and Fazeley Canal, and reduces works to canal infrastructure, including the number of locks for upgrade between Minworth and Leamington Spa. It also avoids the significant level variation of Hatton Locks and reducing the extent of upgrades required overall.

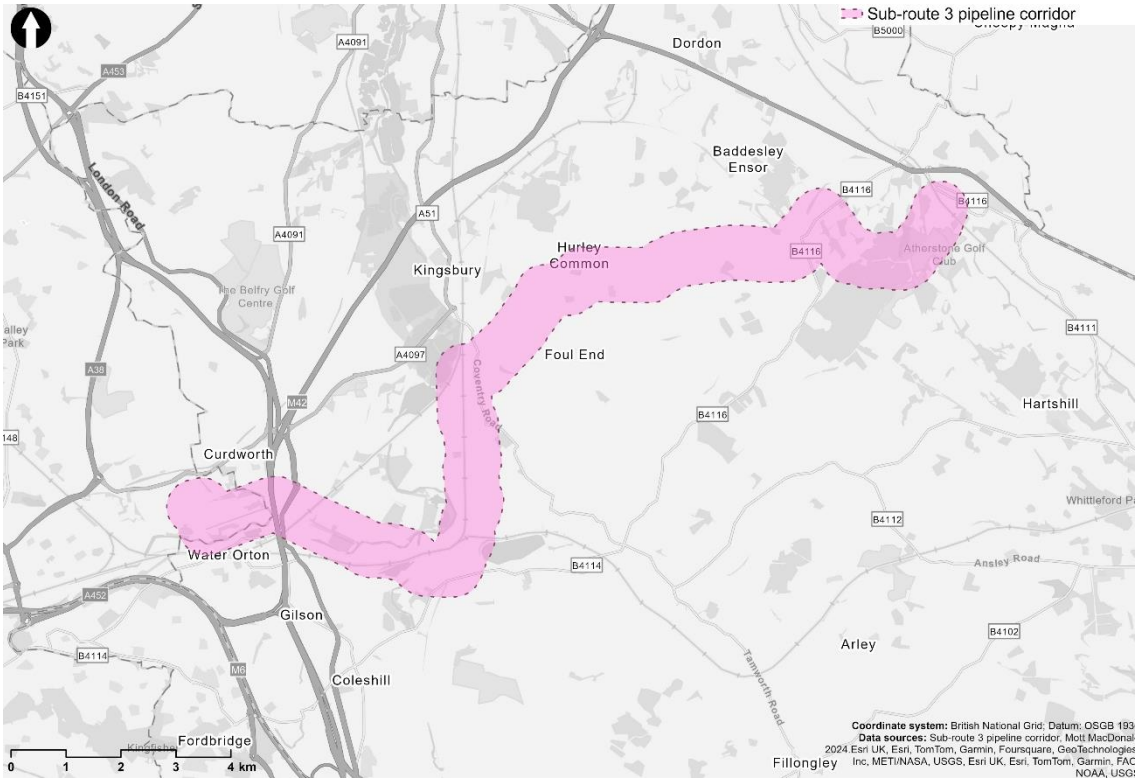
Whilst preferable of the other western sub-routes, the route was assessed as having several constraints including material use and carbon impacts. Sub-route 6 would require the most material for the construction and the additional pumping requirement results in much higher carbons costs than cannot be mitigated sufficiently in comparison to other options. Operationally, the option also has more points of failure and would generally be more difficult to operate to minimise negative fluctuations and adapt to long-term trends.

## 5.4 Summary of Assessment and Conclusions of Sub-Route Options

An optioneering exercise has been undertaken to assess sub-route options for the transfer of the water into the GUC. Multiple options were generated covering a range of transport modes, including canal only, river and canal and pipeline route options. The options generated were subject to a robust and consistent assessment process, covering engineering, environment, planning and land disciplines to identify a preferred mode for the transfer of recycled wastewater.

Sub-route 3 would transfer recycled wastewater via a new pipeline from Minworth to discharge to the Coventry Canal at Atherstone. Following the assessment process, sub-route 3 was confirmed as the preferred option, presenting lowest overall risk, through reducing the amount of canal infrastructure requiring modification, and presenting the shortest overall programme. It was also the most flexible option, with a largely rural corridor and less vulnerable to interfacing projects around Minworth.

**Figure 5.8: Sub-route 3 Pipeline Corridor**

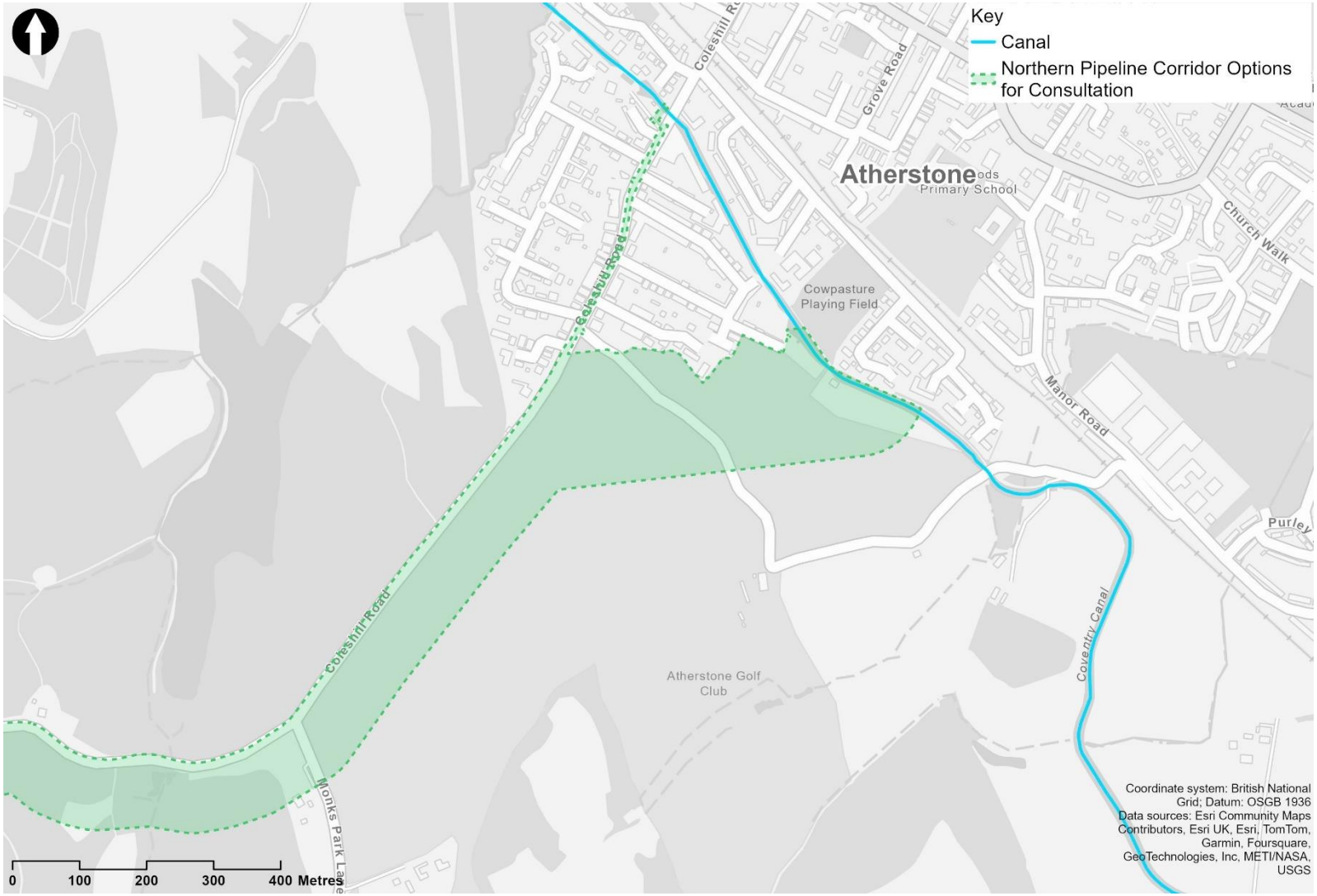



## 5.5 Alternative Outfall Location Options for the Preferred Corridor

Following selection of the preferred pipeline corridor for the transfer of water from the Minworth WwRC AWTP to discharge via the Coventry Canal at Atherstone, a more detailed review of the pipeline corridor was undertaken. The purpose of the review to ensure that the optimal pipeline corridor is taken forward for further assessment and to inform non-statutory consultation for the GUC Transfer Project.

A key component of this review has been reviewing the preferred outfall location. Two options were identified as being deliverable and subject to further assessment as part of the optioneering process, covering engineering, environment, planning and land disciplines. The two alternative options are shown in Figure 5.9 and include an option via Coleshill Road, and an option through Atherstone Golf Course.

**Figure 5.9: Alternative Outfall Location Options for the Preferred Corridor**



### 5.5.1 Coleshill Road

The Coleshill Road option involves the pipeline corridor following the alignment of Coleshill Road into Atherstone, discharging into the canal via an existing access to the canal side and a new discharge structure.

The construction of the water transfer pipeline within the highway along Coleshill Road would require the diversion of significant utilities in the area, including the large sewer main in south Atherstone. Coleshill Road has properties either side through Atherstone, and as a result there would be a much-reduced construction area and access arrangements, with significant disruption to the local population and businesses over an extended construction programme.

The engineering assessment confirmed that with the discharge location being adjacent to a series of locks, upstream of an existing road bridge where the canal narrows, there is a potential hydraulic restriction which would mean that the option is not considered optimal when compared with the Atherstone Golf Course option (see 5.5.2).

The Coleshill Road option would involve work primarily within the highway boundary, and no significant impacts were identified in relation to planning and land considerations. Furthermore, the discharge location for this option falls on land occupied by the Trust, which would be advantageous for land access and acquisition. Impacts to the natural environment and local amenity would not be as significant as the Atherstone Golf Course option, though the proximity of the works to residential, commercial properties and community assets is an important consideration. The option would require extensive traffic management implementation and the works would take a considerable time to complete, which would have a significant local amenity impact.

### 5.5.2 Atherstone Golf Course

The Atherstone Golf Course option follows Coleshill Road until the road reaches the first residential properties of Atherstone where the route then diverges east through the golf course and joins Coventry Canal just south of the Westwood Recreation Area. The route is still within the Atherstone Pound, but downstream of the Coleshill Road option.

The Atherstone Golf Course option would avoid the diversion of a significant number of utilities and the large sewer main in south Atherstone that are associated with the Coleshill Road Option (see Section 5.5.1). It would also avoid the extensive road closure of Coleshill Road and corresponding impacts on local residents, reducing programme and allowing increased space for construction. The outfall location is located further downstream than the Coleshill Road option and avoids the identified hydraulic issues.

The option would result in temporary disruption to Atherstone Golf Course through the construction of the pipeline, which would require further investigation. Part of the land associated with the golf course option is ‘Common Land’, though it is likely that due to the nature and extent of the works that it would be below the threshold requiring deregistration and replacement common land to be provided (i.e. temporary use or footprint under 200m$^2$), though common land consent would still be required.

The option passes through an area of high ecological potential, within an ancient woodland where veteran trees are present. This presents a significant constraint. Further investigation of the constraints and opportunities to avoid, reduce or mitigate impacts will be undertaken. Noting the extent of potential land available for the option within the pipeline corridor it has been identified that there may be a feasible route through that would minimise the overall impact through detailed design of the alignment, and available construction techniques. This would be subject to further assessment and investigation work to be undertaken.

## 5.6 Summary of Assessment and Conclusions of Outfall Location Options

Following the assessment and workshops with the respective workstream teams, the outcome was that the Atherstone Golf Course option was generally preferred. This is due to the significant engineering benefits both operationally and through the construction of the pipeline itself, avoiding significant utility diversions and disruption to the residents of Atherstone. Whilst this option would have a greater impact on the natural environment, it was identified that this could be minimised and mitigated through detailed design and the use of available construction techniques, subject to further investigation and assessment.

These conclusions reflect the information available in relation to the options at the Scheme development stage, in advance of non-statutory consultation and planned site surveys and investigations. To confirm the preferred option for the outfall location, it is proposed to consult on both options through non-statutory consultation, along with consideration of the overall pipeline corridor. The outcomes from non-statutory consultation and additional surveys and assessments will be considered prior to confirming the selection of a preferred option for the future progression of the project.

# 6 Abstraction, Water Treatment Works and Storage

## 6.1 Strategic Context

Where to abstract the transferred water from the GUC, treat and store the water and where to connect into AFW's water network has evolved through RAPID Gates 1 and 2, which included the consideration and assessment of:

- The point within the GUC canal system water should be abstracted.
- Potential locations for the WTWs.
- The need for storage and the amount of storage required.
- Where the water is needed within AFW's water network.

At RAPID Gate 1 (July 2021) options for abstraction and location of the WTW focused on AfW's central region where there was the predicted deficit in water supply. AfW's Water Resources Management Plan 2019 identified deficits in the north and north east of AfW's central region.

Sites were identified within AfW's central region within a search area based on AFW's water supply infrastructure 5km either side of the GUC as it passes through their supply area. Potential sites were considered through RAPID Gate 1 and Gate 2 which were in reasonable proximity to major water distribution mains, in close proximity to planned or existing water storage, in excess of 10 hectares, outside of Environment Agency flood plains and not in conflict with areas reserved for the delivery of HS2.

The process resulted in eight abstraction options, including a site in Tring which, although outside of AfW's supply area, was included following the Environment Agency's feedback that abstraction locations needed to be considered upstream of the canal's interactions with sensitive chalk streams. The following three sites were considered at RAPID Gate 1:

- Tring
- Hemel Hempstead
- The Grove

At RAPID Gate 1, the treatment process requirements were explored based on drinking water requirements. This work identified that should it not be possible to temporarily abstract water from the canal as normal, raw water storage should be provided as a buffer and to provide operational resilience.

At RAPID Gate 2 (November 2022), the WTW sites from RAPID Gate 1 were considered alongside a further site identified at Leighton Buzzard. The Leighton Buzzard site was included in response to review by the Environment Agency and in consideration of the risk to changes in flow regime in the chalk streams that interact with the canal network south of the Tring summit.

Alongside the four sites under consideration, the following three options for connection into AfW's water network were considered:

- Underground reservoir near Luton
- Boxted
- Abbots Langley

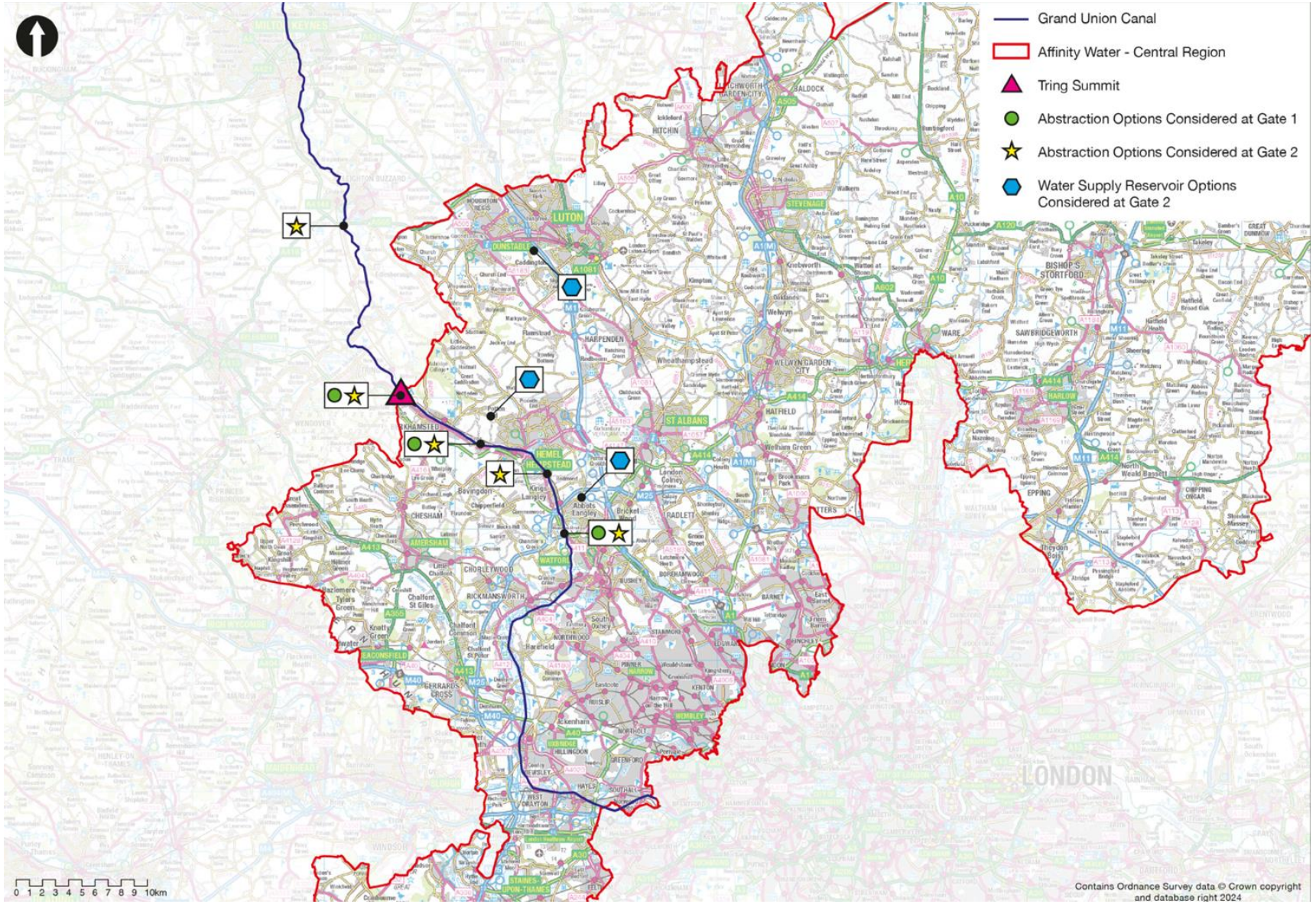
Criteria for site consideration included site constraints, energy efficiency, environmental risk, carbon emissions, cost, and social and environmental benefits. The assessment was further informed by two key outcomes during the RAPID Gate 2 assessment work:

- AfW confirmed their assessment that the underground reservoir near Luton would be the most useful site from which to manage water into supply. This finding came from AWL's Connect 2050[8] strategy study which examined the supply demand balance at a network demand level up to 2050 and considers the best options to meet the forecast deficits.
- There were concerns about abstracting water south of the Tring summit on the GUC, the highest of the three summits on the GUC. The canal south of Tring is very interconnected with local high quality chalk streams. Although the transfer of GUC Transfer Project water over the Tring summit was, at the time, considered to be infrequent, the Environment Agency were concerned that this would impact on the flow regime within these chalk streams. Furthermore, from Leighton Buzzard, the GUC starts rising towards the south-east. To pass flow further along the canal, it would be necessary to bypass the locks up to Tring utilising a series of new pumping stations and pipelines.

The Leighton Buzzard site option transferring water to the underground reservoir near Luton was therefore considered at RAPID Gate 2 as it would abstract from the GUC upstream and is topographically lower than Tring, therefore avoiding interaction with the chalk streams south of the Tring summit.

[8] Affinity Water Connect 2050 Report

**Figure 6.1: Map of AfW's central region showing options at RAPID Gates 1 and 2.**



## 6.2 RAPID Gate 2 Site and Review

For RAPID Gate 2 and to further assess the feasibility and cost of the GUC Transfer Project for RAPID's consideration, work was undertaken to develop an example WTW site. Flow was proposed to be abstracted from the GUC just south of the A4146 bridge, adjacent to the River Ouzel and near to Leighton Buzzard. Flow would pass beneath the River Ouzel and be pumped into a water storage, before gravitating into the first stage of treatment. The water storage was sized to provide five-day storage (575,000$m^3$).

The Leighton Buzzard site for the treatment works was proposed close to the abstraction point, slightly raised from the river and canal and adjacent to an operational sand quarry (Grovebury Road). Additional interstage pumping would be required in the treatment works.

Final high-lift pumps would transfer potable treated water via a new pipeline approximately 15.6km long, to a new clean water holding tank at the existing underground reservoir near Luton.

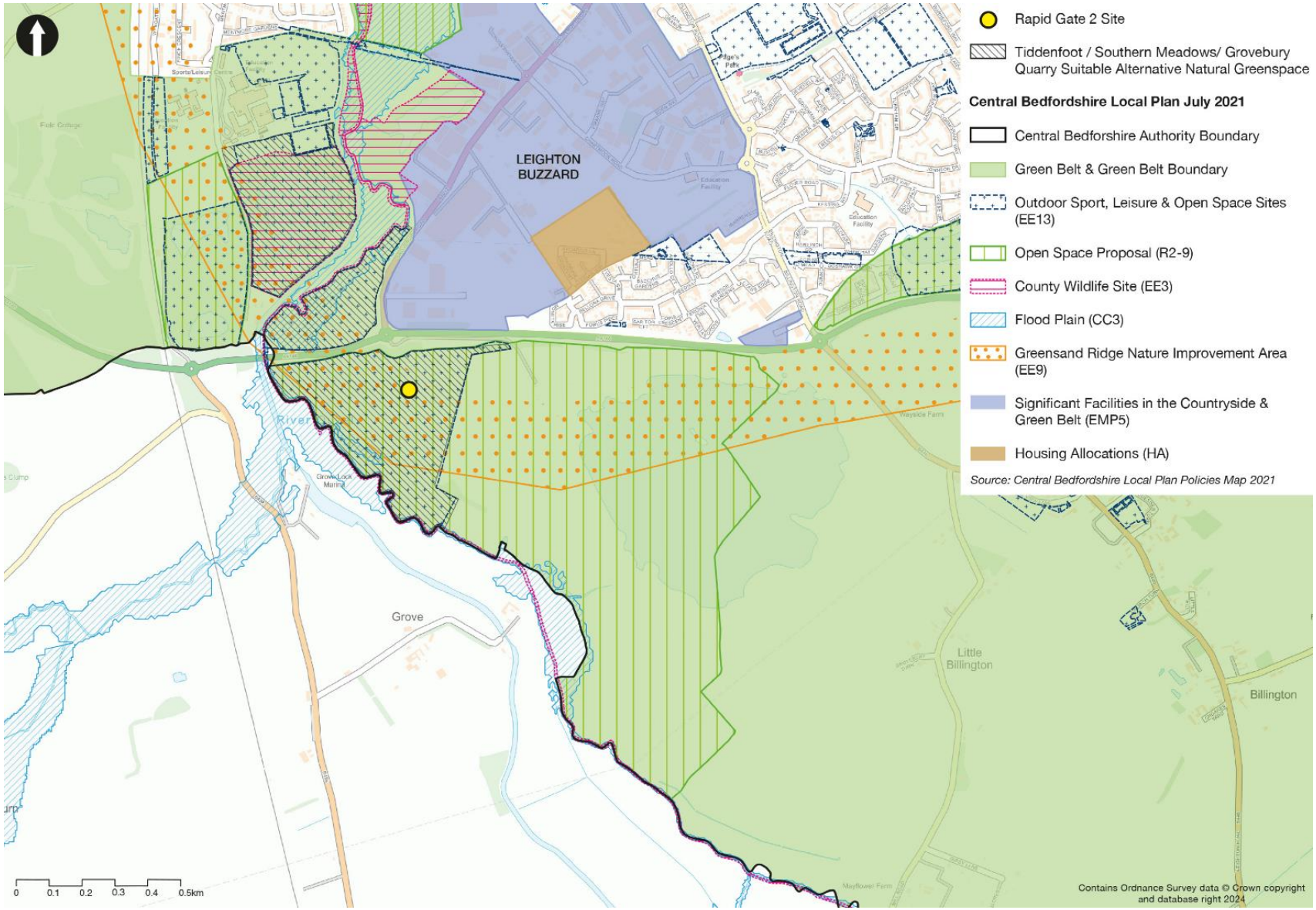
A review of the RAPID Gate 1 and 2 site assessment work was undertaken within Gate 3 as part of the optioneering exercise to ensure the options have been subject to consistent engineering, environmental, planning and land assessments. This included reviewing the RAPID Gate 2 site at Leighton Buzzard.

The locational advantages of the Leighton Buzzard site were noted as being close to the GUC and having the space to accommodate a WTW and water storage. However, several planning designations and constraints were identified. These include:

- The site's location within the Green Belt. Planning policy, including that set out in the Water Resource Infrastructure National Policy Statement (WRINPS), requires consideration of whether there are other sites outside of the Green Belt or sites within the Green Belt that are less harmful.
- The site's designation as a Suitable Alternative Natural Greenspace (SANG) by Central Bedfordshire Council in March 2023. The purpose of the designation is to relieve recreational pressure on the Chiltern Beechwoods Special Area of Conservation (SAC) and land within the Leighton Buzzard RAPID Gate 2 site is part of larger SANG designation.
- Other planning designations and allocations. The site is allocated as an Outdoor Sport Leisure and Open Space Site. It also sits within the Greensand Ridge Nature Improvement Policy, as set out in Central Bedfordshire Local Plan.

On the basis of the above, it was determined that further site options should be considered and evaluated within the RAPID Gate 3 optioneering process.

**Figure 6.2: Designations at the RAPID Gate 2 Leighton Buzzard Site**



## 6.3 Alternative Sites Considered

A site assessment review of alternatives was undertaken based on the methodology set out in section 3 of this report. The review considered the Leighton Buzzard RAPID Gate 2 site and identified and assessed other options for the abstraction and siting of the WTW that would:

1. Abstract water before the Tring Summit and before the canal started rising towards the summit.
2. Facilitate the transfer of the treated water to the underground reservoir near Luton.
3. Allow for consideration of sites outside of the Green Belt or sites where they may be less harmful to the Green Belt.

The site search area was developed and expanded through the assessment period. The search area extended north and south of Leighton Buzzard and was defined based on the:

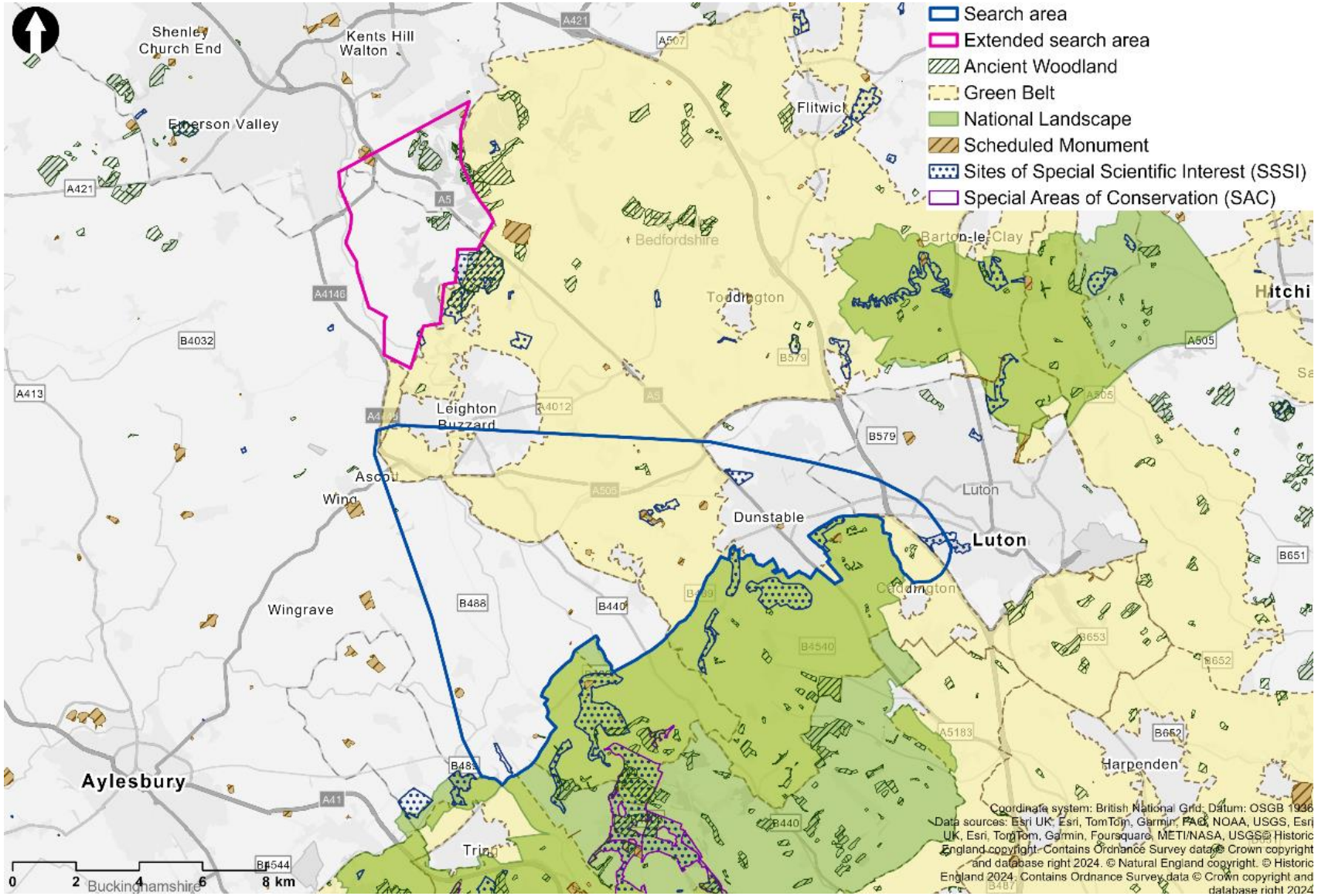
- Location of the GUC and the underground reservoir near Luton
- Boundary of the Chilterns National Landscape designation – built above ground development within the National Landscape would not be supported by planning policy if there are alternatives available outside of that area.

Sites were identified based on the high-level criteria as set out in Table 3.1 and sought to avoid:

- Building and settlements
- Ancient woodland
- Scheduled monuments
- National landscape
- Environmental designations (international and national biodiversity designations)
- Flood zones

The extent of the search area and the environmental designations relating to it are shown in Figure 6.3.

**Figure 6.3: Map showing environmental designations within the search area**



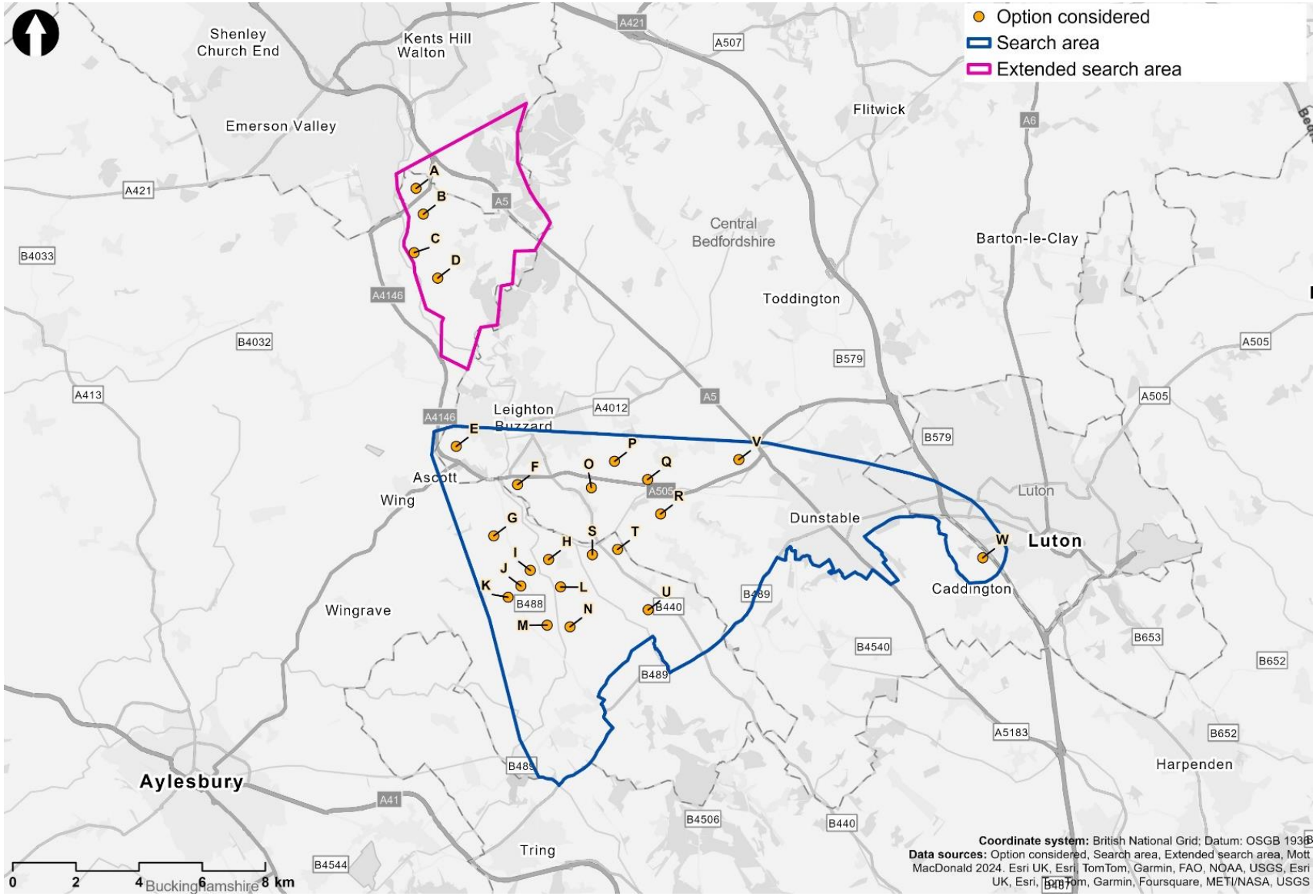
Whilst the search areas sought to avoid Green Belt land, the extent of Green Belt land within Central Bedfordshire District meant that the search area did extend into the Green Belt east and south of Leighton Buzzard as sites within this location were well located to the GUC and underground reservoir near Luton. As part of the site consideration and assessment process, the locational advantage of these sites was considered against Green Belt policy considerations.

Consideration was given to the potential for the water storage and WTW to be located on or adjoining existing operational water sector sites within the search areas. However, the opportunity to do so is limited by the lack of any large-scale existing water resources infrastructure within the search areas, and as the majority of the search areas lie outside of AfW's operational supply area. The exception to this is the existing operational underground reservoir near Luton, therefore the potential to accommodate water storage and WTW alongside that location was considered in the assessment.

A minimum size requirement of 10 hectares was applied to the site requirements, which would include the space necessary to accommodate the WTW plus some capacity to accommodate the water storage. The area needed for the storage is influenced by the topography of the site meaning that in most circumstances sites need to be in excess of 10 hectares.

In total, 23 sites were identified within the search areas, as identified in the figure below, and subsequently assessed.

**Figure 6.4: Map of 23 sites identified within the search area**



## 6.4 Assessment of Alternative Sites

As part of the staged approach to the methodology, all of the identified site options were assessed, with the extent of the assessment undertaken dependent on how far an option progressed through the appraisal process. For some options, the decision not to undertake further work at this stage was made early in the process. For other options that progressed through the appraisal process, more detailed assessment was carried out.

The outcome of the assessment process for the 23 site options is set out below based on the stage the site reached in the decision-making process.

### 6.4.1 Options considered not suitable for further work at this stage following a preliminary high level project team appraisal

**Table 6.1: Options not progressed to further work at this stage following high level project team appraisal**

| Site Name | Description |
|---|---|
| Sites M and N | Poor or difficult accessibility during construction and on-going operation of WTW. Traffic would need to be routed through Horton to the north of the site and Ivinghoe to the south. These sections of the B488 involve the routeing through residential settlements with on street parking limiting the width of the carriageway. Whilst operational traffic associated with the WTW would be limited, access for tankers and HGVs will be required on an on-going basis. |
| Sites K and G | Poor or difficult accessibility during construction during construction and on-going operation of WTW. Access to the site based on the existing road network would be via the B488 and Aylesbury Road which crosses the railway in two locations. In both locations, the crossing involves the road significantly narrowing under the railway bridge with the tunnels having apparent height and width restrictions. Alternative access would involve routeing traffic through the settlements of Ledburn, Crafton and Mentmore using rural roads. |
| Site L | Poor or difficult accessibility during construction and on-going operation of WTW. Access to the site would need to be through Slapton, a residential settlement with on street parking limiting the width of the carriageway. Other access opportunities limited by the need to cross the Grand Union Canal. |

### 6.4.2 Options considered not suitable for further work at this stage following preliminary planning appraisal

In addition, a planning focused evaluation of sites was undertaken that included consideration of:

- The Green Belt designation criteria - unrestricted sprawl of large built-up areas, prevent neighbouring towns merging into one another, safeguarding the countryside from encroachment, preserve the setting and special character of historic towns; and to assist in urban regeneration, by encouraging the recycling of derelict and other urban land.
- Countryside policy (Policy S3 Aylesbury Vale Local Plan) criteria – development should avoid compromising the character of the countryside between settlements; avoid a negative impact on the identities of neighbouring settlements or communities leading to their coalescence; maintain the individual identity of villages and avoid extensions to built-up areas that might lead to further coalescence between settlements.

**Table 6.2: Options not progressed to further work at this stage following preliminary planning appraisal**

| Site Name | Description |
|---|---|
| Site J | Site option is adjacent to railway line and site is flat and relatively open. Access reasonable from B488 and Horton Road, although would need to avoid routeing any traffic through Slapton. Long, thin configuration of the site along with its openness would make siting of a WTW in this location difficult without compromising the character of the countryside between settlements. |
| Sites S, T and U | Reasonable access off Leighton Road but road is rural in nature. Landscape is flat and open interspersed with individual properties/farms. Views over the land from higher land at Leighton |

| Site Name | Description |
|---|---|
| | Buzzard and escarpment. Introduction of WTW structures would be significant addition to the landscape and surrounding countryside in this location. |
| Site O | Good access opportunities from the A505 and background noise from A505. Marked difference in the character of land to south of A505. More rural and open landscape with views from higher land to the east. Proximity to Little Billington noted. Introduction of WTW structures would be significant addition to the landscape and surrounding countryside in this location. |
| Site R | Good access opportunities from the A505 and background noise from A505. Marked difference on land to south of A505. More rural and open landscape with views from higher land to the east. Site flat with pockets of hedgerow and tree belts. Proximity to the settlements of Lower End and Tottenhoe noted. Introduction of WTW structures would be significant addition to the landscape and surrounding countryside in this location. |
| Site E | Good accessibility off Wing Road. Site comprises a number of well-defined agricultural fields with hedgerow and tree belts. Development would significantly impact on the open and attractive landscape features. |
| Site W | Second covered reservoir being constructed to the west of the existing reservoir. Reservoirs are in an elevated position. Towards the M1 land steeply slopes downwards. WTW would be highly visible in the vicinity of the reservoirs. Moving southwards, the landscape is open accommodating the heritage trail that leads from the ancient woodland. Viewed from the M1 the land appears open and attractive. Area appears well used recreationally being well located to the new housing developed at Chaul End. New access would be required from Chaul End Road where there are a number of properties on and in the vicinity of Chaul End Road. Development would impact on recreational enjoyment of area, occupy an elevated position and be close to a residential area. |

### 6.4.3 Options not progressed to further work at this stage following detailed appraisal

The remaining ten sites were subject to the engineering, environment, planning and land assessment set out in Section 3. A summary of the assessment outcomes for each of the ten site option is presented at **Appendix C**.

The sites not progressed to further work at this stage following this assessment and the reasons for not progressing those options are summarised within Table 6.3.

**Table 6.3: Options not progressed to further work at this stage following detailed appraisal**

| Site Name | Description |
|---|---|
| Site I | Concerns have been raised about the viability and developability of the site, primarily focusing on the ability to accommodate the water storage. The flatness of the site necessitates greater excavation, and there's a risk of inundation or flooding to the railway. Two national transfer gas mains through the site would be costly and difficult to divert. From a biodiversity perspective, the site has no major obstacles to development, but habitats of principal importance need to be considered. From a landscape perspective, the site was not favoured due to its elevated nature and the surrounding open countryside and potential distance views from the National Landscape. In planning terms, the proposed development's scale requires careful consideration of its impact on the countryside and potential amenity impacts to nearby properties. |
| Site F | The site's topography minimises cut and fill requirements for the water storage, interstage pumping across treatment works, and inundation/flood risk, making it a preferred engineering site. There are, however, significant planning constraints. The western part of site F also forms part of a designated SANG with proposals in place to enhance the opportunities for outdoor recreation and provide an alternative destination for local residents to mitigate the impact of visitors to the Chilterns Beechwood Special Area of Conservation. It is cited that the close proximity of both the Grand Union Canal and the River Ouzel further increases the value of the site for recreation and conservation. Furthermore, the site is within the Green Belt where there is a presumption against inappropriate development in the Green Belt except in very special circumstances. As part of establishing very special circumstances there would need to be no alternative sites that perform the same function that don't result in the same harm to the Green Belt. This, alongside allocations and proposals to actively develop Site F as open space and SANG, it is not considered that the site should be progressed to further work at this stage. |
| Site V | Concerns have been raised about the viability and developability of the site, primarily focusing on the ability to accommodate the water storage. The flatness of the site necessitates greater excavation. High voltage power lines run through the site, and these would be costly to relocate or avoid. |

| Site Name | Description |
|---|---|
| Site A | The site option includes land which has already been granted consent for 1800 houses and associated infrastructure so would be unavailable for the development of the WTW and storage. |
| Site C | Road access would be difficult, especially for large earthmoving vehicles required for water storage construction. The access route is subject to flood risk and rural roads may require road strengthening, passing places and traffic management to facilitate the development. Proximity to commercial and residential properties. Includes land at risk of fluvial flooding. Located within land designated as Countryside and an Area of Attractive Landscape. |
| Site D | Road access would be difficult as there is a 7 tonnes existing weight and access routes are subject to flood risk. Would require the new roads and a bridge to facilitate safe access during construction. Proximity to commercial and residential properties. Includes land at risk of fluvial flooding. Located within land designated as Countryside and as an Area of Attractive Landscape. |

### 6.4.4 Options subject to enhanced appraisal

Following the detailed appraisal, site options H and B underwent further consideration. For site option H, a further option was developed whereby sites P and Q, whilst considered less favourable for storage, could potentially be utilised for the WTW development with site option H providing storage.

The following site options were therefore considered that may have more potential:

- Bletchley Option (Site B) – WTW and storage
- West of Slapton Option (Site H) – WTW and storage
- West of Slapton Option (Site H) – Storage only with WTW at a separate site east of Leighton Buzzard (Site P or Site Q)

To further assess and consider these options, an enhanced appraisal of them was undertaken against the criteria contained within Table 6.4.

**Table 6.4: Aspects considered as part of the enhanced appraisal**

| Consideration | Aspects considered |
|---|---|
| Engineering | • Access during construction and operation<br>• Site conditions – topography, contaminated land, conflict with existing services<br>• Utilities – connection to power supply<br>• Pipeline infrastructure required<br>• Proximity to airports/airfields |
| Environment and Social | • Potential impact on designated biodiversity sites (statutory and non-statutory)<br>• Potential impact on habitats and species where known to be present<br>• Baseline Biodiversity Net Gain habitat<br>• Potential impacts to woodland and forestry<br>• Potential impact on water features and quality<br>• Potential impact on air quality<br>• Potential impact to community facilities and sites<br>• Potential impact on heritage assets<br>• Potential landscape and visual impacts<br>• Potential noise impacts<br>• Traffic and transport – suitability of construction traffic routes |
| Planning | • Interaction with other Nationally Significant Infrastructure Projects<br>• Evidence of land being promoted for development<br>• Neighbouring land uses<br>• Proximity to urban areas, potential for benefits and accessibility (storage only) |
| Land | • Loss of assets<br>• Reasonableness of land acquisition costs |

| Consideration | Aspects considered |
|---|---|
| | • Impact on access to land<br>• Special category land |

A combined summary of the detailed and enhanced assessment for each of the options with the greatest potential is set out in Table 6.5 and the discipline summary is presented within **Appendix C.**

**Table 6.5: Summary of sites considered that may have more potential**

| **Bletchley option (Site B WTW and storage)** | |
|---|---|
| Engineering assessment | The site is relatively flat but has sufficient slope to allow for the construction of the water storage. Likely that import and export of material from the site will be required to facilitate construction (subject to more detailed investigation of ground conditions). Abstracting water on this part of the GUC would reduce the amount of development that would be needed further south on the canal. Better recorded water quality at this abstraction location as further south on the canal there are inputs from local streams and drains that potentially result in poorer water quality. This could mean that less treatment processes would be required at this location. |
| Environment and social assessment | Site is mainly low quality grassland habitats and arable fields (with groups of tree stands), with a parcel of woodland. Includes hedgerow boundaries and hedgerows with trees present. Surveys required to determine if hedgerows are protected and if veteran trees are present. Woodland is of high distinctiveness in BNG terms. No designated or non-designated biodiversity sites within the option boundary but does fall within several SSSI impact risk zones. Some protected species noted adjacent to the site. Proximity of residential properties and businesses to the option boundary is noted. Potential for a single non-designated heritage asset to be present (linear/trackway identified from aerial photographs). Site considered to be well screened from the north. |
| Land | Agricultural land with no special category land. |
| Planning | Within the countryside where there is a policy presumption against development that would compromise the character of the countryside. Designated as an area of attractive landscape where there is a need to have regard to the character of the landscape and provide mitigation to overcome any adverse impact. Located within the Greensand Ridge Nature Improvement Area where there is an onus on developing biodiversity, minimising visual impact and protecting local amenity. Proximity to residential areas and residential development in the Bletchley area where there is the opportunity to promote recreational benefit of the storage. Site is within Minerals Safeguarding Area for Sand and Gravel. Northern parts of the site are known to be being promoted by landowner/developer for potential future residential development through the Buckinghamshire Council Housing and Economic Land Availability Assessment, as part of the preparation of a new local plan. |
| **Slapton option (Site H WTW and storage)** | |
| Engineering assessment | Flat site meaning unlikely that all excavated material can be reused on site and will need to be exported off site. The suitability of the existing bridge on Horton Road over the GUC for construction traffic access requires further consideration. Site is also within Buckinghamshire's Freight Strategy Zone and restrictions need to be fully explored. Additional development, including pumping stations, on the GUC would be required south from Leighton Buzzard. Poorer quality water recorded south of Leighton Buzzard meaning increased on site treatment could be required. |
| Environment and social assessment | The site is generally open agricultural or woodland planting land intersected and bordered by hedgerows and relatively recent woodland plantation. Surveys required to determine if hedgerows are protected and if veteran trees are present. There is an important wildlife corridor (Green Lane) that bisects the centre of the site. It is designated as a local wildlife site due to its hedges and ditches. The site is on the western edge of the village of Slapton. There are some intermittent belts of vegetation to the village edge that will help screen the proposed works. There are a number of residential, commercial and community properties and facilities within close proximity to the site, including an equestrian centre and sports playing field and park. There are two public rights of way running through the site and recreational use of the canal adjacent to the option boundary. No heritage sites within the boundary. |
| Land | No Special Category Land. Multiple residential properties at Slapton to the east of the site option is noted. |

| **Bletchley option (Site B WTW and storage)** | |
|---|---|
| Planning | Within the the countryside where there is a policy presumption against development that would compromise the character of the countryside. Close proximity to Bury Farm Equestrian Centre, Grand Union Canal, Lock Keeper's cottage, Hill Farm and village of Slapton noted. Public Rights of Way running through the site providing access to the canal. Potential to develop recreational benefit of storage. Potential impact on neighbouring land uses during construction, in particular amenity and highway impacts. Site is within Minerals Safeguarding Area for Sand and Gravel. |

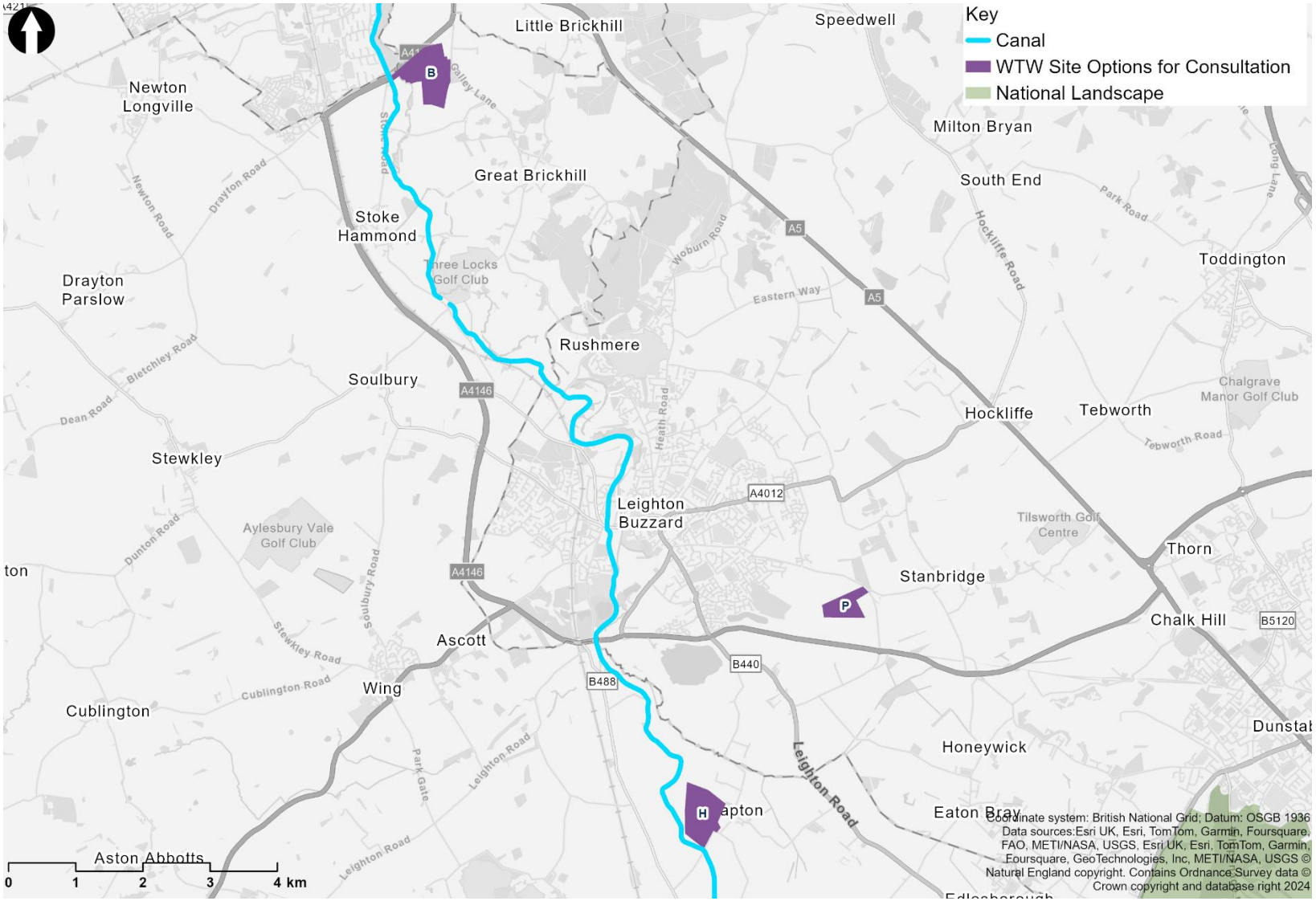
| **Slapton option (Site H Storage only)** | |
|---|---|
| Engineering assessment | Same issues as for storage and WTW together except has reduced operational vehicle access requirement (i.e. only visits for inspection/maintenance required). Option will require pumping and screening facilities on site to transfer water from the water storage for treatment. |
| Environment and social assessment | Assessment for storage and WTW option applies, however, storage only option is likely to reduce the extent of landscape and visual impacts. |
| Land | Assessment for storage and WTW option applies. |
| Planning | Would still represent development within the Countryside and would be contrary to policy but there would be less above ground built development and opportunities to assimilate storage within countryside location, developing the recreational and ecological potential of the site. Lesser impact on local amenity both during construction and once operational. |
| **East of Leighton Buzzard (Site P) (WTW Only)** | |
| Engineering assessment | Good access from the A505. Would require a raw water pipeline to link with the site west of Slapton where water would be abstracted and stored. High voltage power lines adjacent to the site. Good resilience to future flood risk |
| Environment and social assessment | Generally open agricultural land bordered by well-maintained mature native deciduous trees and shrub hedgerows. Surveys required to determine if hedgerows are protected and if veteran trees are present. Small copse of scrub and likely relatively immature woodland to northeast of site boundary. No designated nature conservation sites or heritage sites within the site option boundary. Proximity of residential properties along Leighton Road, Billington Road and Leighton Buzzard Rugby Club noted. Potential impact on residential and recreational views. |
| Land | No Special Category Land. Understood one landowner for the entire landholding. |
| Planning | Within the Green Belt and would be considered inappropriate development. It would be necessary to demonstrate very special circumstances to outweigh any harm as required by planning policy. Located within the Greensand Ridge Nature Improvement Area where there is an onus on developing biodiversity, minimising visual impact and protecting local amenity. Planning permission has been granted (April 2024) for an energy park (wind turbine, solar array, battery energy storage, EV charging including new access) to the west of the proposed site. In terms of land use, to the south of the site is the A505, with residential/commercial areas of Leighton Buzzard to the north and west and Billington Road to the east. To the north is a site allocated for Outdoor Sport Leisure and Open Space. |
| **East of Leighton Buzzard (Site Q) (WTW Only)** | |
| Engineering assessment | Good access from the A505. Would require a raw water pipeline to link with the site west of Slapton where water would be abstracted and stored. High voltage power lines adjacent to the site. Good resilience to future flood risk |
| Environment and social assessment | Generally open agricultural land bordered by well-maintained mature native deciduous trees and shrub hedgerows. Woodland plantation to north and south beyond boundary. Scattered individual trees within hedgerow along eastern and northwestern boundary are likely semi mature to mature. Noted smaller field sizes closer to village of Stanbridge, which is east of the site option. No designated nature conservation sites or heritage sites within the site option boundary. Directly surrounding the site are agricultural fields. Proximity of residential and commercial properties along Leighton Road, Billington Road and Station Road noted. Potential to directly impact two public rights of way. Potential impact on residential and recreational views. |
| Land | No Special Category Land. |

| | |
|---|---|
| Planning | Within the Green Belt and would be considered inappropriate development. It would be necessary to demonstrate very special circumstances to outweigh any harm as required by planning policy. In terms of land use, to the south of the site is the A505 with the site predominantly surrounded by agricultural land. |

## 6.5 Summary of Assessment Outcomes and Conclusions

Following the detailed appraisal and workshop, and the enhanced assessment reported above, the assessment outcomes led to the conclusion that for the purposes of non-statutory consultation site options H and B remain, on the work done to date, as sites that may have more potential for water treatment and storage, as shown in Figure 6.5.

**Figure 6.5: WTW Site Options that may have more potential for Consultation**



The assessment outcomes recognised, at this optioneering stage of assessment, the potential for impacts associated with accommodating the WTW on the site west of Slapton (Site H). Consequently, it was concluded to take forward to non-statutory consultation both the option to accommodate the water storage and WTW on Site H, and the option to accommodate only the water storage on Site H, with the WTW located on another separate site. Of the alternative potential WTW sites P and Q, Site P may be the more appropriate location for the WTW, given the recently consented development adjoining that site, notwithstanding its Green Belt location.

The following site options, of which more work has at this stage been undertaken, are therefore seen as sites that may have more potential for water treatment and storage:

- Bletchley Option (Site B – Figure 6.6) – WTW and storage (Figure 6.6)
- West of Slapton Option (Site H – Figure 6.7) – WTW and storage (Figure 6.7 H)
- West of Slapton Option (Site H) – Storage only with WTW on a site east of Leighton Buzzard (Site P - Figure 6.8)

These conclusions reflect the information available at the time of optioneering and are reached in advance of the non-statutory consultation process and planned site surveys and investigations. The outcomes from the non-statutory consultation and additional surveys and assessments will be considered prior to confirming selection of preferred option(s) for the future progression of the Project.

**Figure 6.6: Bletchley Option (Site B)**

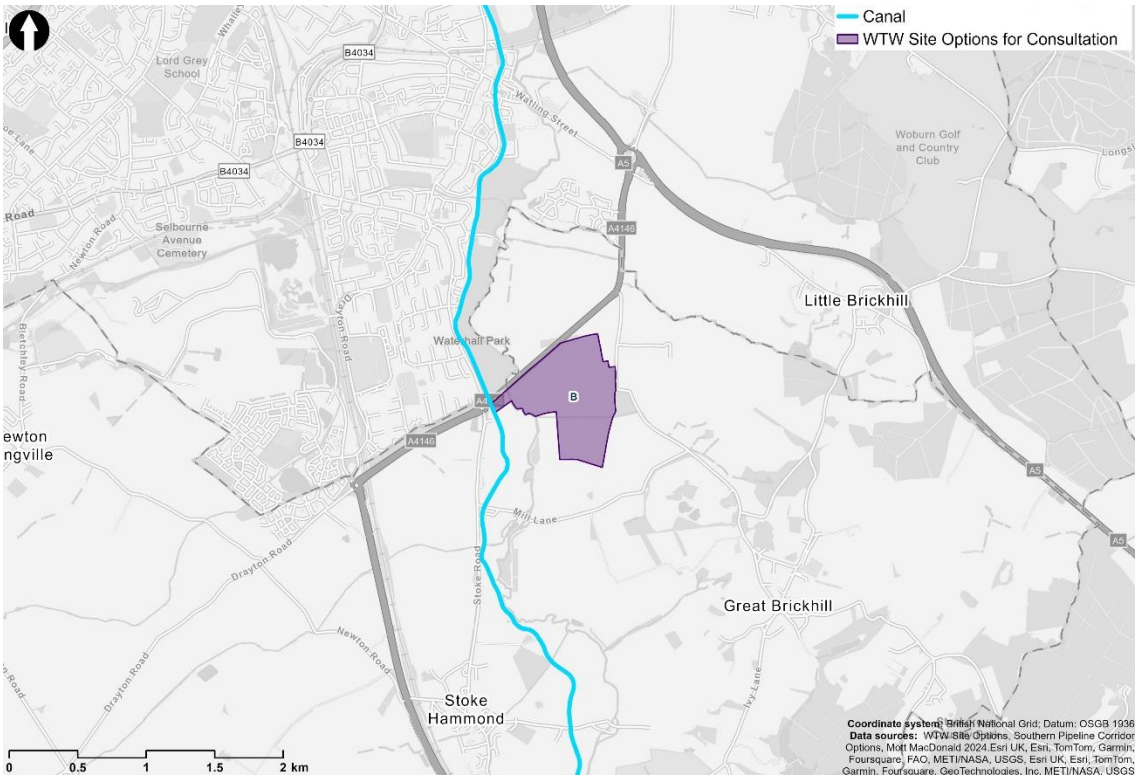


**Figure 6.7: Slapton Option (Site H)**

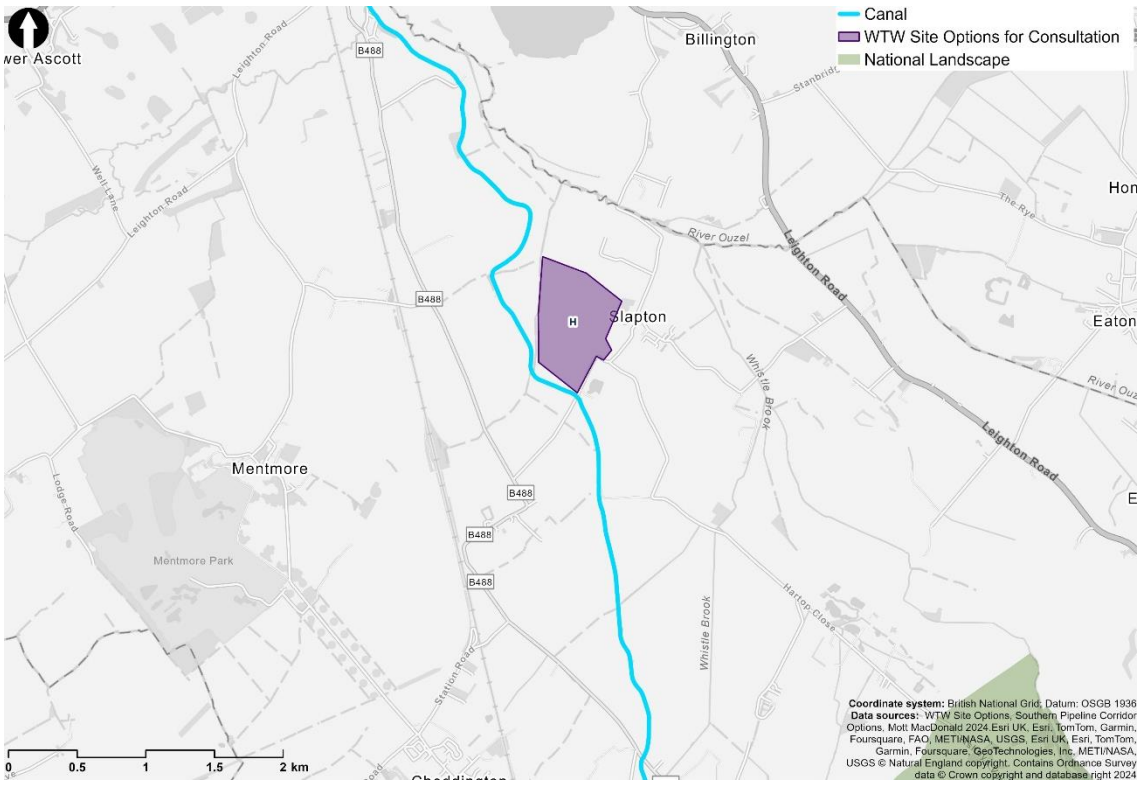
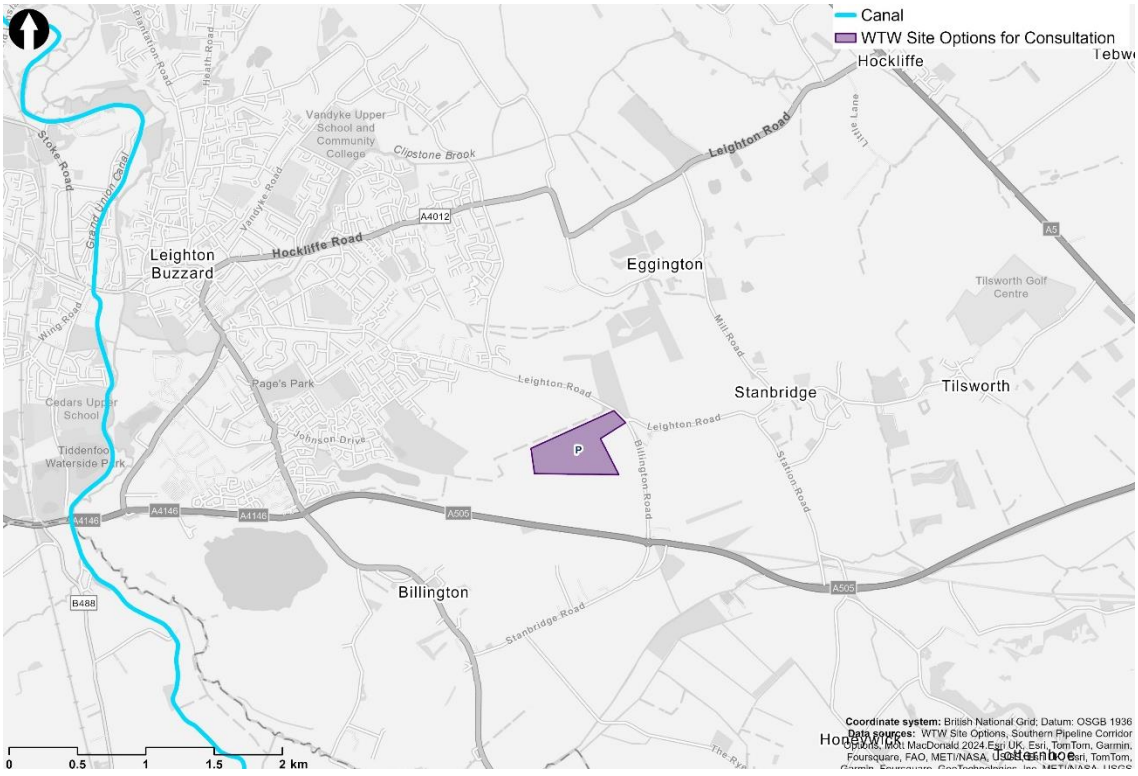



**Figure 6.8: Leighton Buzzard Option – WTW Only (Site P)**



# 7 Transfer to Chaul End

## 7.1 Strategic Context

As explained in section 6.1, development of the GUC Transfer Project has evolved through RAPID Gates 1 and 2.

AfW confirmed through this process and the associated assessment that the underground reservoir near Luton would be operationally preferable site from which to manage water into supply. This finding is included in AWL's Connect 2050[9] strategy study, which examined the supply demand balance at a network demand level up to 2050 and considered the best options to meet the forecast deficits. AfW therefore identified the underground reservoir near Luton as the proposed destination for drinking water from the GUC Transfer Project.

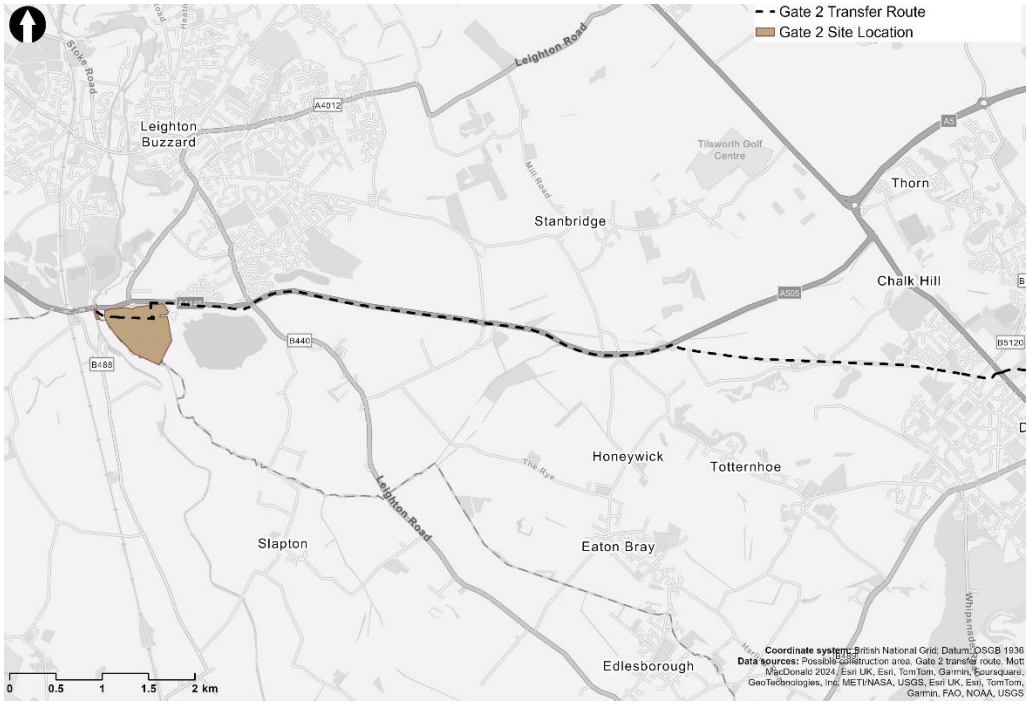
To facilitate this, there is a need to identify a raw water pipeline transfer route from the canal to the water storage and WTW site(s), as well as an additional pipeline transfer route for the onward transfer of drinking water to Chaul End, the location of the underground reservoir near Luton.

## 7.2 RAPID Gate 2 Transfer Route

At RAPID Gate 2, the potential site considered for the water storage and WTW was site F, part of the former Grovebury Quarry site to the south of Leighton Buzzard, as explained in section 6 above.

An engineering led assessment of potential transfer routes was undertaken and reported to RAPID at Gate 2. The conclusion of this was the identification of a potential water pipeline transfer route from site F to Chaul End, broadly passing in an easterly direction from site F alongside the A5050 road corridor, and then eastwards through Dunstable and the southern edge of Houghton Regis. The route is illustrated in Figure 7.1.

**Figure 7.1: RAPID Gate 2 transfer route**




[9] Affinity Water Connect 2050 Report

## 7.3 Alternative Transfer Routes Considered

As described in Section 6, an updated review of site F (the preferred site from RAPID Gate 2) during RAPID Gate 3 optioneering confirmed that site F was no longer available to the project. Therefore, consideration was given to alternative potential pipeline transfer routes between the canal to the water storage and WTW site(s), and an additional pipeline transfer route for the onward transfer of drinking water to Chaul End. This work was undertaken alongside and additional to the consideration of potential water storage and WTW sites as reported in Section 6 of this report, consistent with the methodology set out in section 3 of this report.

For the purposes of the assessment process, pipeline corridors of approximately 200m width were identified as part of a desk-based exercise using GIS data and other publicly available information on planning, environmental, engineering and land constraints and designations.

The identification of potential pipeline corridors sought to avoid (as set out in Table 3.1):

- Building and settlements
- Ancient woodland
- Scheduled monuments
- Environmental designations (international and national biodiversity designations)
- Flood zones

The extent of Green Belt land within the search area for the pipeline corridors meant it was not feasible to exclude land within the Green Belt from the search area. It should also be noted that buried pipeline infrastructure is not expected to constitute 'inappropriate development' in the Green Belt. However, temporary works and permanent above ground infrastructure may represent 'inappropriate development', for which justification would need to be made as part of any application for development consent.

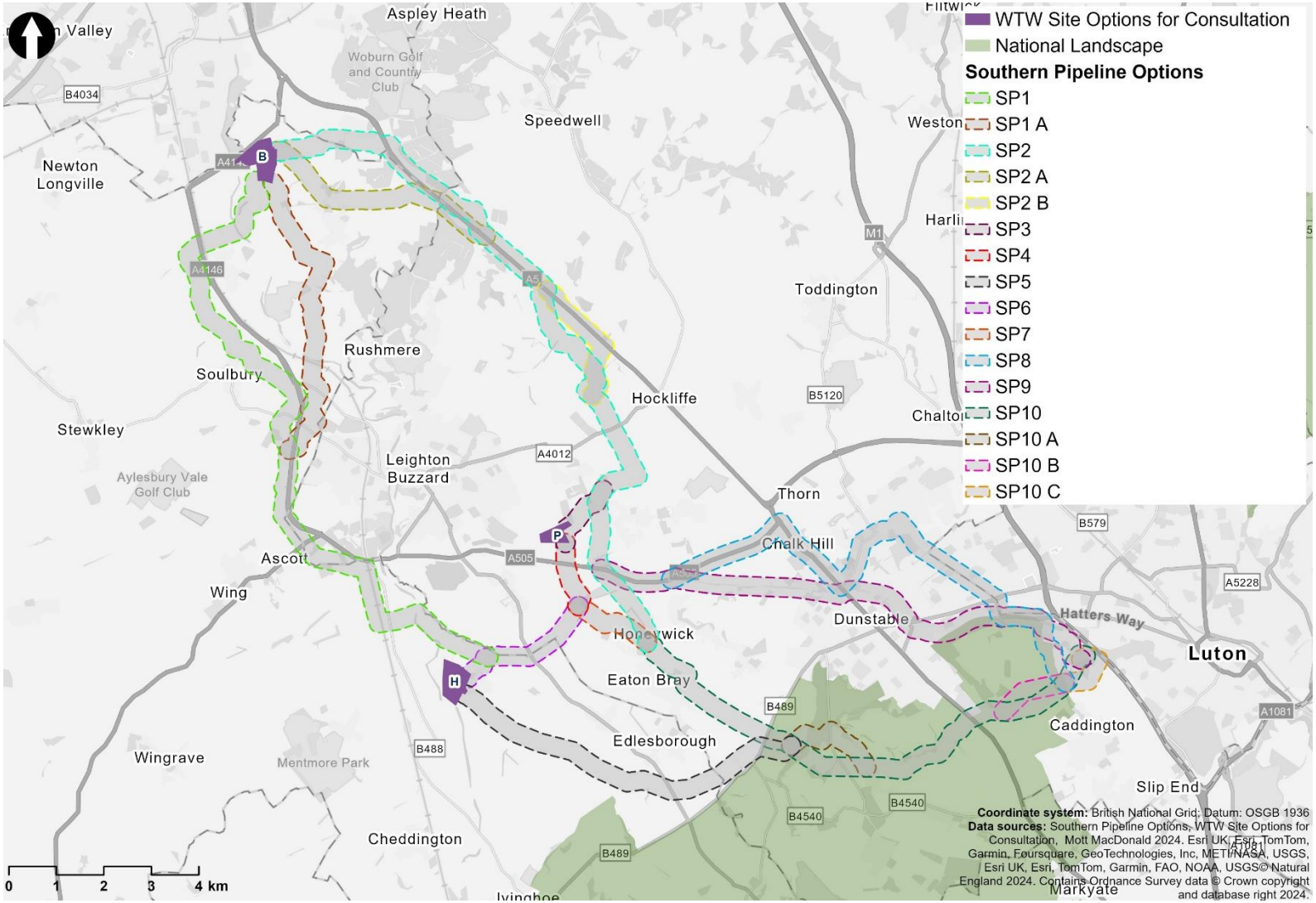
On a similar basis, the extent of the Chilterns National Landscape (former AONB) and its position and proximity to Chaul End, means that it is not feasible to exclude land within the National Landscape from the search area for potential pipeline corridors. National and local planning policy for the protection of National Landscapes is clear that major development should only exceptionally be permitted within the designated landscape and that applications for consent must set out, for the decision maker to consider, the need for the development including national considerations, the cost and scope for developing outside of the National Landscape or meeting the need in some other way, and any detrimental effects on the environment, landscape and recreational opportunities and how that could be moderated.

For the purposes of the potential pipeline corridor assessment, potential corridors that could avoid or minimise the extent of development within the National Landscape were identified and assessed, alongside potential pipeline corridors that pass through the National Landscape. The eventual selection of a preferred pipeline corridor and more detailed routeing for the preferred option(s) for the DCO application will need to fully explore and justify its position in relation to the National Landscape and the policy protection that is afforded to it. This includes consideration of the need to avoid or minimise impacts on the National Landscape, and setting out the case for major development within the designated landscape.

### 7.3.1 Summary of potential transfer pipeline corridors considered

From the desk-based work undertaken, the potential pipeline routes from Sites B, H and P to the Chaul End are summarised below.

**Figure 7.2: Potential pipeline routes**



As can be seen from the figure overleaf, the series of potential pipeline corridors that were identified for assessment have the potential to link together in differing combinations to form potential raw water transfer pipeline routes between the canal and the water storage and WTW site, and to form potential drinking water transfer pipeline routes from the WTW site to Chaul End.

These are described in further detail below and illustrated on the plans provided.

### 7.3.2 Alternative transfer pipeline corridors from Site B

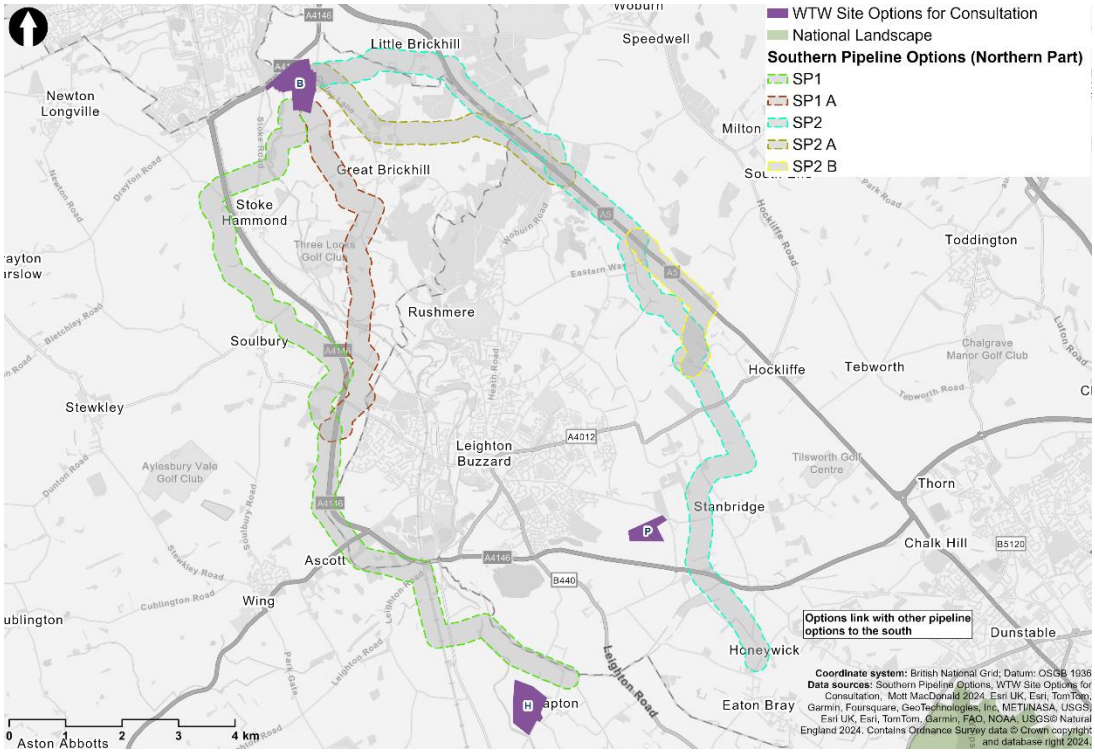
Site B lies in close proximity to the GUC. The raw water transfer pipeline from the canal to the water storage and WTW location would be within the boundary of Site B.

Following treatment at the WTW, there are two broad potential transfer pipeline corridor options that have been identified to transfer the drinking water south from Site B towards Chaul End for the northern part of the transfer route:

- **Corridor SP1 (including sub-option SP1A)** - a potential corridor routeing south from Site B, crossing the River Ouzel and canal, and then the mainline railway line and A4146, with sub-options to the west (SP1) or east (SP1A) of Stoke Hammond, with the pipeline corridor routed to the west of the A4146 and Leighton Buzzard before crossing back over the mainline railway to the east of Ledburn and routeing to the north of Slapton where it joins other pipeline corridors for the section towards Chaul End
- **Corridor SP2** (**including sub-options SP2A, SP2B**) – a potential corridor routeing east and then south from Site B, with sub-options to the north of Great Brickhill (SP2A) or to the south of Little Brickhill (SP2), with the pipeline broadly following the A5 road corridor to the north and south of the road with sub-options (SP2 or SP2B) north of Church End, crossing the A4012 between Hockcliffe and Eggington before routeing to the west of Stanbridge where it joins other pipeline corridors for the section towards Chaul End.

These potential transfer pipeline corridors are shown in Figure 7.3.

**Figure 7.3: Site B alternative transfer pipeline corridors**



For the southern part of the transfer route from Site B, the potential transfer pipeline corridors join with the proposed pipeline corridors from water storage and WTW site options from Site H (water storage and WTW) or Site H (water storage) and Site P (WTW) to Chaul End, as described below.

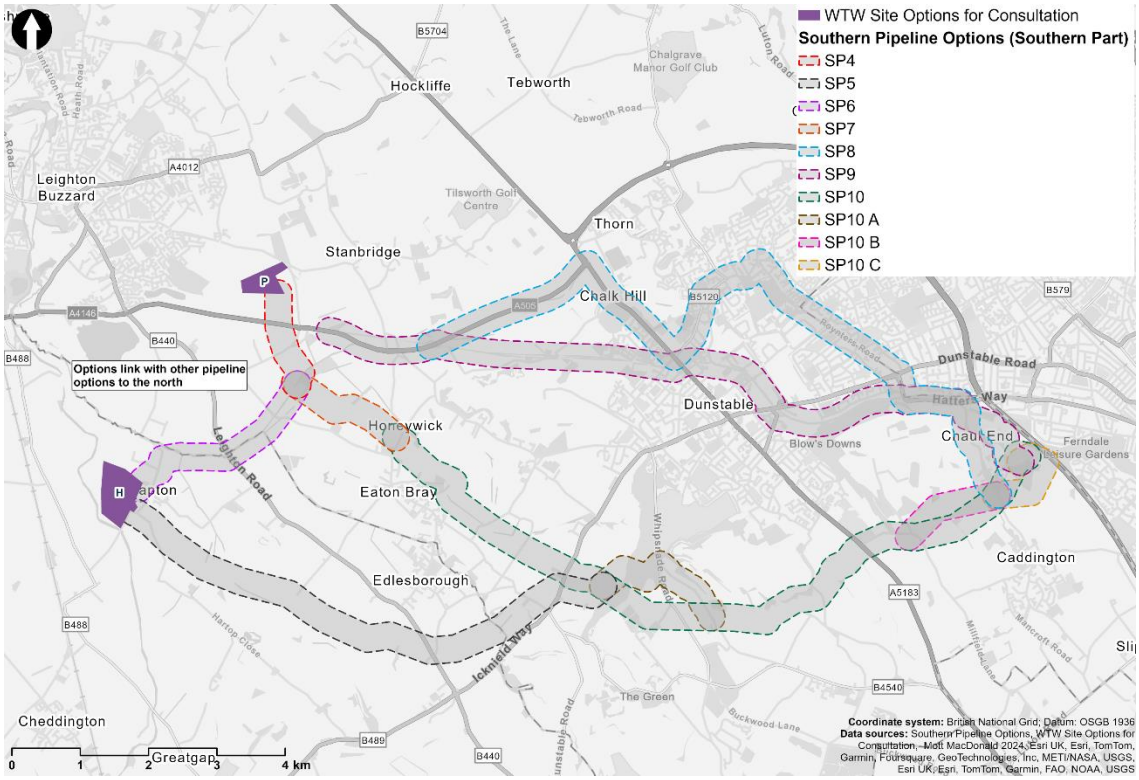
### 7.3.3 Alternative transfer pipeline corridors from Site H

Site H lies in close proximity to the GUC. If Site H is considered as the preferred location for the water storage and water treatment, the raw water transfer pipeline from the canal to the water storage and WTW location would be within the boundary of Site H.

Once the water is treated at the WTW on Site H, there is a need for a drinking water pipeline transfer from the WTW to Chaul End. There are a number of potential transfer pipeline corridor options that have been identified to transfer the drinking water from Site H towards Chaul End, as described below:

- **Corridor SP6, SP7 and SP10** – a potential corridor routeing to the north east around Slapton village, and then to the south of Billington before routeing to the south east passing between Totternhoe and Eaton Bray where it routes south and eastwards through the Dunstable Downs and Chilterns National Landscape, routeing to the north of Whipsnade and Kensworth before crossing the A5183 and routeing east between Caddington and Chaul End to reach the existing underground reservoir. There are a number of potential sub-options associated with this corridor, particularly within the Chilterns National Landscape and for the final section towards the existing underground reservoir.
- **Corridor SP5 and SP10** - a potential corridor routeing south east from Site H at Slapton, routeing to the south of Edlesborough and then (joining with corridor SP10 as described above), eastwards through the Dunstable Downs routeing to the north of Whipsnade and Kensworth before crossing the A5183 and routeing east between Caddington and Chaul End to reach the existing underground reservoir.
- **Corridor SP6 and then corridor SP8** – a potential corridor routeing to the north east around Slapton village, and then to the south of Billington before routeing broadly alongside the A505 road corridor and then southwards within the A505 through Chalk Hill before then routeing through urban roads within Dunstable and Houghton Regis before routeing around Chaul End to the existing underground reservoir.
- **Corridor SP6 and then corridor SP9** – a potential corridor routeing to the north east around Slapton village, and then to the south of Billington before routeing alongside the A505 road corridor to the north of Lower End, and then eastwards along the disused railway line corridor to Dunstable, crossing the A505 within Dunstable and then routed within the Luton Guided Busway corridor through Dunstable and to the south of Houghton Regis, before routeing around Chaul End to the existing underground reservoir.

**Figure 7.4: Potential transfer pipeline corridors from Site H**




### 7.3.4 Alternative transfer pipeline corridors from Site H and from Site P

Site H lies in close proximity to the GUC. If Site H is considered as the preferred location for the water storage only, with the WTW to be located on Site P, there would be a raw water pipeline from the canal to the water storage within Site H, as well as a further raw water transfer pipeline from Site H to Site P. Once the water is treated at the WTW on Site P, there is a need for a drinking water pipeline transfer from the WTW to Chaul End.

There is a single potential transfer pipeline corridor option that has been identified to transfer the raw water from the water storage on Site H to the WTW on Site P:

- **Corridor SP6 and SP4** – a potential corridor routeing to the north east around Slapton village, and then to the south of Billington before routeing to the north, crossing the A505 to the potential WTW site location at Site P, to the east of Leighton Buzzard.

From the potential WTW on Site P, there are a number of potential transfer pipeline corridor options that have been identified to transfer the drinking water from Site P towards Chaul End. These options are broadly the same as the potential transfer pipeline options associated with a WTW on Site H, as described below:

- **Corridor SP4, SP7 and SP10** – a potential corridor routeing to the south from Site P crossing the A505 and then routeing to the south east passing (as per the corridor described for Site H above) between Totternhoe and Eaton Bray where it routes south and eastwards through the Dunstable Downs and Chilterns National Landscape, routeing to the north of Whipsnade and Kensworth before crossing the A5183 and routeing east between Caddington and Chaul End to reach the existing underground reservoir. There are a number of potential sub-options associated with this corridor, particularly within the Chilterns National Landscape and for the final section towards the existing underground reservoir.

- **Corridor SP4 and then corridor SP8** – a potential corridor routeing to the south from Site P to the A505 road corridor before routeing broadly alongside the A505 road corridor and then southwards within the A505 through Chalk Hill before then routeing through urban roads within Dunstable and Houghton Regis before routeing around Chaul End to the existing underground reservoir.
- **Corridor SP4 and then corridor SP9** – a potential corridor routeing to the south from Site P to the A505 road corridor before routeing alongside the A505 road corridor to the north of Lower End, and then eastwards along the disused railway line corridor to Dunstable, crossing the A505 within Dunstable and then routed within the Luton Guided Busway corridor through Dunstable and to the south of Houghton Regis, before routeing around Chaul End to the existing underground reservoir.

A potential corridor utilising options SP4, SP6, SP5 and SP10 has not been identified in association with Site P for the WTW, as such a combination of corridor routes involves routeing the potential drinking water transfer pipeline to the west and south back to Site H, before then heading south and then east again – and so would lead to a significantly greater length of pipeline than the more direct SP4, SP7 and SP10 route.

These potential transfer pipeline corridors are shown in Figure 7.4 and a summary of the assessment findings contained in Section 7.4.

## 7.4 Assessment of Alternative Transfer Routes

The identified potential transfer pipeline corridors were assessed, with the extent of the assessment undertaken dependent on how far an option progressed through the appraisal process.

A summary of the outcome of the assessment process for the potential pipeline transfer corridors is set out below, supported by tables in Appendix D. As stated in section 3 of this report, it should be noted that the assessment outcomes reported below are predominantly based on desk based assessments. At the time of this report, ecological and engineering site based surveys have not yet been completed for these corridors, nor has engagement with all potentially affected landowners been undertaken across the corridors.

Information from further assessments and engagement will be undertaken, as well as analysis of consultation responses to the Non Statutory Consultation process will be taken into account as part of the subsequent selection of preferred transfer pipeline corridors.

### 7.4.1 Alternative drinking water transfer pipeline corridors from Site B (water storage and WTW) – <u>northern section only</u>

#### 7.4.1.1 Corridor Option SP1

This section of the pipeline corridor option extends to approximately 15km in length. The route requires the pipeline to cross the River Ouzel, the GUC itself, the mainline railway, A4146 and A418. These crossings involve environmental and engineering risks and complexity, and would be likely to increase the overall cost of this option compared to options with less complex crossings. Installing the pipeline below the GUC and railway represent ongoing operational risks due to constraints on future maintenance of those sections of pipeline.

The pipeline corridor option passes through open countryside, with sections routeing close to villages and isolated residential, equestrian and other properties. There is the potential for properties to experience some disruption during construction. Parts of the route are designated as an Area of Attractive Landscape or as Green Belt, and Minerals Safeguarding Areas. Some areas of land are being promoted by landowners/developers as potential future development sites through the emerging local plan.

The corridor encroaches partly into an SSSI and part of a Registered Park and Garden (both of which could potentially be avoided by narrowing the corridor). The corridor also intersects with areas of floodplain, and county and local level environmental designations which may require routeing refinement and/or mitigation. There may be potential for special category land within the pipeline corridor.

From the assessment work undertaken to date, the additional crossings are considered to make this transfer pipeline corridor less preferrable than other potential corridor options.

#### 7.4.1.2 Corridor Sub-option SP1A

Sub-option 1A is an alternative routeing for the northernmost section of corridor Option 1. Sub-option SP1A involves approximately 1km shorter overall length than Option SP1, however the route (in common with SP1) requires the drinking water transfer pipeline to cross the River Ouzel, the GUC itself, together with the mainline railway, and A4146.

Like option SP1, this pipeline corridor option passes through open countryside, with sections routeing close to villages and isolated residential, equestrian and other properties as well as a golf course. There is the potential for properties to experience some disruption during construction. Parts of the sub-option route are designated as an Area of Attractive Landscape, Green Belt and Minerals Safeguarding Areas. The corridor also intersects with areas of floodplain, and county and local level environmental designations which may require routeing refinement and/or mitigation. There is special category land within the pipeline corridor.

From the assessment work undertaken to date, the additional crossings are considered to make this transfer pipeline corridor less preferrable than other potential corridor options.

#### 7.4.1.3 Corridor Option SP2

This section of the pipeline corridor option extends to approximately 16km in length and the routeing to the east from Site B avoids crossings of the River Ouzel and the GUC itself associated with Option SP1/1A. Option SP2 requires a number of major road crossings including the A5 (twice), A2012 and A505, which would require trenchless crossings of these features.

The majority of this pipeline corridor option passes through open countryside, with sections routeing close to neighbouring villages and isolated residential, equestrian and other properties. There is the potential for properties to experience some disruption during construction. Parts of the route are designated as an Area of Attractive Landscape or as Green Belt, and Minerals Safeguarding Areas. There are conservation areas and other local planning designations near to or affecting parts of the corridor, and a playing field within the corridor. Some areas of land are being promoted by landowners/developers as potential future development sites through the emerging local plan.

The corridor intersects with areas of floodplain, county and local level environmental designations (including wildlife sites) and a former landfill site which may require routeing refinement and/or mitigation. There is an area of Ancient Woodland close to the corridor. There is special category land within the pipeline corridor.

From the assessment work undertaken to date, Option SP2 is considered to be preferable to Option SP1 or sub-option SP1A, having fewer notable infrastructure crossings and avoiding the mainline railway and River Ouzel crossings associated with those options, and less likelihood of significant environmental impact, and should be taken forward to non-statutory consultation.

#### 7.4.1.4 Corridor Sub-options SP2A and SP2B

**Sub-option 2A** is a potential alternative route corridor for the northernmost section of Option SP2. The pipeline corridor follows a route further south than Option SP2 and the sub-option is approximately 200m shorter route than Option SP2.

The pipeline corridor option passes through open countryside, with sections close to neighbouring villages and isolated residential, equestrian and other properties. There is the potential for properties to experience some disruption during construction.

Parts of the route are designated as an Area of Attractive Landscape or as Green Belt, and Minerals Safeguarding Areas. Some areas of land are being promoted by landowners/developers as potential future development sites through the emerging local plan. The corridor intersects with a small part of an SSSI, and with county and local level environmental designations (including wildlife sites), a listed building, and a former landfill site which may require routeing refinement and/or mitigation. There may be potential for special category land within the pipeline corridor.

From the assessment work undertaken to date, sub-option SP2A is considered to be a potential alternative corridor to the northernmost part of Option SP2, and should be taken forward to non-statutory consultation.

**Sub-option 2B** is a potential alternative route corridor for an approximately 3km section of Option SP2, to the north of Church End. The pipeline corridor follows a route closer to the A5, before routeing south and then west of Church End to rejoin Option SP2. The sub-option would require a trenchless crossing under the A5 (as for Option SP2).

The pipeline corridor option passes through open countryside, with sections close to isolated properties. There is the potential for properties to experience some disruption during construction.

Parts of the route are designated as an Area of Attractive Landscape or as Green Belt, and Minerals Safeguarding Areas. The corridor intersects with a small part of a registered park and garden (which could potentially be avoided by narrowing the corridor) and with part of a county level environmental designation (wildlife site) which may require routeing refinement and/or mitigation. There may be potential for special category land within the pipeline corridor.

From the assessment work undertaken to date, sub-option SP2B is considered to be a potential alternative corridor to the northernmost part of Option SP2, and should be taken forward to non-statutory consultation.

### 7.4.2 Alternative drinking water transfer pipeline corridors from Site H (water storage and WTW) to Chaul End

#### 7.4.2.1 Corridor Option SP6, SP7 and SP10

This section of the pipeline corridor option extends to approximately 16km in length and requires the pipeline to cross the A5183, and potentially also the River Ouzel, which would require trenchless crossings. There is a need for use of a trenchless technique to construct below the Dunstable Downs, which requires sensitive routeing to minimise impacts on Dunstable Downs during construction, and represents some engineering risk and additional cost.

The majority of this pipeline corridor option passes through open countryside, with sections close to neighbouring villages and isolated properties, as well as open space, and part of a gliding club. There is the potential for properties to experience some disruption during construction.

Parts of the route are designated within the Chilterns National Landscape, and also intersect with Green Belt, and Minerals Safeguarding Areas. The corridor encroaches partly into an SSSI (which could potentially be avoided by narrowing the corridor). The corridor also intersects with areas of floodplain, a former landfill site and county and local level environmental designations (including

wildlife sites), and two areas of Ancient Woodland which may require routeing refinement and/or mitigation. Some areas of land are being promoted by landowners/developers as potential future development sites through the emerging local plan.

Part of the corridor passes through National Trust land at Dunstable Downs and intersects with an area of potential common land. This is a potentially significant land constraint, and there are areas of land including public open space that will be special category land within the pipeline corridor.

From the assessment work undertaken to date, Option SP10 is considered to be a potential corridor Option, and should be taken forward to non-statutory consultation, and for engagement with the National Trust and other stakeholders.

#### 7.4.2.2 Corridor Sub-options SP10A, SP10B and SP10C

**Sub-option 10A** is a potential alternative route corridor for an approximately 2km central section of Option SP10 where the pipeline corridor routes through the Dunstable Downs. This pipeline corridor sub-option routes to the north of the National Trust visitor centre and then south east to rejoin option SP10. The route is approximately 300m longer than Option SP10 and would require sensitive routeing to minimise impacts on Dunstable Downs during construction.

The whole of the sub-option lies within the Chilterns National Landscape, and within the Green Belt. Parts of the route are within a Minerals Safeguarding Area. The corridor intersects with part of an SSSI, and with county and local level environmental designations, and lies close to Ancient Woodland and a former landfill site which may require routeing refinement and/or mitigation. Part of the sub-option pass through National Trust land, and could intersect common land. These are potentially significant land constraints and there is special category land within the sub-option corridor.

From the assessment work undertaken to date, and given the constraints associated with Option SP10, sub-option SP10A is considered to be a potential alternative corridor that should be taken forward to non-statutory consultation, and for engagement with the National Trust and other stakeholders.

**Sub-option 10B** is a potential alternative route corridor for an approximately 1.5km eastern section of Option SP10 where the pipeline corridor routes to the north of Caddington. The sub-option passes through open countryside and there is the potential for isolated properties to experience some disruption during construction.

The whole of the sub-option lies within the Chilterns National Landscape, and within the Green Belt. The corridor lies close to Ancient Woodland and land within the corridor includes grade 2 and 3 agricultural land. There is unlikely to be special category land within the sub-option corridor.

From the assessment work undertaken to date, sub-option SP10B is considered to be a potential alternative corridor to SP10 that should be taken forward to non-statutory consultation.

**Sub-option 10C** is a potential alternative route corridor for the approximately 800m final section of Option SP10 where the pipeline corridor routes to the existing underground reservoir. The pipeline corridor sub-option follows a route further to the east, around an area of woodland. The sub-option route is approximately 500m longer than Option SP10.

An initial small section of the sub-option lies within the Chilterns National Landscape, and the whole sub-option lies within the Green Belt. The area of woodland lying adjacent to the sub-option includes parts of Ancient Woodland and a County Wildlife Site. There is unlikely to be special category land within the sub-option corridor.

From the assessment work undertaken to date, and given the woodland constraints on the final section of Option SP10, sub-option SP10C is considered to be a potential alternative corridor that should be taken forward to non-statutory consultation.

#### 7.4.2.3 Corridor Option SP5 and SP10

This section of the pipeline corridor option extends to approximately 15km in length and requires the pipeline to cross the A5183 by a trenchless crossing, but avoids the River Ouzel. A trenchless section of the pipeline below the Dunstable Downs requires sensitive routeing to minimise impacts on Dunstable Downs during construction, and represents some engineering risk and additional cost. The corridor also crosses high voltage electricity lines.

The corridor passes through open countryside, with sections close to neighbouring villages and isolated residential, equestrian and other properties and part of a gliding club. There is the potential for properties to experience some disruption during construction.

Parts of the route are designated within the Chilterns National Landscape, and also intersect with Green Belt, Minerals Safeguarding Areas and an Area of Attractive Landscape. The corridor encroaches partly into an SSSI (which could potentially be avoided by narrowing the corridor). The corridor intersects with areas of floodplain, county and local level environmental designations, and two areas of Ancient Woodland which may require routeing refinement and/or mitigation. Some areas of land are being promoted by landowners/developers as potential future development sites through the emerging local plan.

Part of the corridor passes through National Trust land at Dunstable Downs and may involve common land. This is a potentially significant land constraint, and there are areas of land including public open space that will be special category land within the pipeline corridor.

From the assessment work undertaken to date, Option SP5 and SP10 is considered to be a potential corridor Option, and should be taken forward to non-statutory consultation, and for engagement with the National Trust and other stakeholders.

#### 7.4.2.4 Corridor Option SP6 and SP8

This section of the pipeline corridor option extends to approximately 17km in length and requires the pipeline to cross the River Ouzel, which would require trenchless crossing. The first half of this corridor passes through open countryside, with the second half routeing through built up areas comprising parts of Dunstable and Houghton Regis. There is a significant length of in road pipeline construction proposed, which represents engineering risks and challenges relating to existing buried services and traffic and associated impacts on local communities. The availability of land for temporary construction compounds within the urban area is a further constraint.

The sections of pipeline constructed close to rural communities and properties have the potential to experience some disruption during construction. The sections of in road construction through Dunstable and Houghton Regis would lead to significant traffic and other impacts on the local communities, with a very significant number of residential and community receptors potentially affected.

Parts of the route corridor are designated within the Chilterns National Landscape, and also intersect with Green Belt, and Minerals Safeguarding Areas. The corridor partially encroaches into an SSSI (which could potentially be avoided by narrowing the corridor). The corridor also intersects with areas of floodplain, a former landfill site and county and local level environmental designations which may require routeing refinement and/or mitigation. Some areas of land are being promoted by landowners/developers as potential future development sites through the emerging local plan.

There are areas of land including public open space that will be special category land within the pipeline corridor.

From the assessment work undertaken to date, the significant lengths of in road and urban construction associated with the Option 6 and Option 8 corridor are considered to make this transfer pipeline corridor less preferrable than other potential corridor options.

#### 7.4.2.5 Corridor Option SP6 and SP9

Approximately the first half of this 15km pipeline corridor option passes through open countryside, with the second half routeing through built up areas comprising parts of Dunstable and Houghton Regis. This pipeline option requires the pipeline to cross the River Ouzel, which would require trenchless crossing. There is a significant length of pipeline construction proposed either in road, within the guided busway corridor, or within the disused railway line, each of which represents engineering risks and challenges relating to existing buried services and traffic and associated impacts on local communities. The availability of land for temporary construction compounds within the urban area is a further constraint.

The sections of pipeline constructed close to rural communities and properties have the potential to cause some disruption during construction. The sections of in road construction, and construction along the guided busway corridor through Dunstable and Houghton Regis would lead to significant traffic and other impacts on the local communities, with a very significant number of residential and community receptors potentially affected.

Parts of the route corridor are designated within the Chilterns National Landscape, and also intersect with Green Belt, and Minerals Safeguarding Areas. The corridor partially encroaches into an SSSI (which could potentially be avoided by narrowing the corridor). The corridor also intersects with areas of floodplain, and county and local level environmental designations which may require routeing refinement and/or mitigation. Some areas of land south are being promoted by landowners/developers as potential future development sites through the emerging local plan. There are areas of land including public open space that will be special category land within the pipeline corridor.

From the assessment work undertaken to date, the significant lengths of in road, guided busway and urban construction associated with the Option 6 and Option 9 corridor are considered to make this transfer pipeline corridor less preferrable than other potential corridor options.

### 7.4.3 Raw water transfer pipeline corridor from Site H (water storage) to Site P (WTW) to Chaul End

#### 7.4.3.1 Corridor Option SP6, SP4

This section of the pipeline corridor option extends to approximately 4.5km in length and the route requires the pipeline to cross the A505 and the River Ouzel, which would require trenchless crossings of these features. The option passes through open countryside, with sections routeing close to neighbouring villages and isolated residential, equestrian and other properties, and open space. There is the potential for parts of these settlements and other properties to experience some disruption during construction.

Parts of the route are designated as Green Belt, Minerals Safeguarding Areas and an Area of Attractive Landscape. The corridor also intersects with areas of floodplain and county and local level environmental designations which may require routeing refinement and/or mitigation. There are planning applications and permissions for development within parts of the corridor.

There are areas of land including public open space that will be special category land within the pipeline corridor.

From the assessment work undertaken to date, Option SP6 and SP4 is considered to be a potential corridor Option, and should be taken forward to non-statutory consultation.

### 7.4.4 Alternative drinking water transfer pipeline corridors from Site P (WTW) to Chaul End

#### 7.4.4.1 Corridor SP4, SP7 and SP10

This section of the pipeline corridor option extends to approximately 14.5km in length and requires the pipeline to cross the A505 and A5183, which would require trenchless crossings of these features. There is also a need for trenchless construction of a section of the pipeline below the Dunstable Downs, requiring sensitive routeing to minimise impacts, and which represents some engineering risk and additional cost.

The majority of this drinking water transfer pipeline corridor option passes through open countryside, with sections close to neighbouring villages and isolated residential, equestrian and other properties, open space, and part of a gliding club.

There is the potential for properties to experience some disruption during construction.

Parts of the route are designated within the Chilterns National Landscape, and also intersect with Green Belt, and Minerals Safeguarding Areas. The corridor encroaches partly into an SSSI (which could potentially be avoided by narrowing the corridor). The corridor also intersects with areas of floodplain, a former landfill site and county and local level environmental designations, and two areas of Ancient Woodland which may require routeing refinement and/or mitigation. Some areas of land are being promoted by landowners/developers as potential future development sites through the emerging local plan.

Part of the corridor passes through National Trust land at Dunstable Downs and may involve common land. This is a potentially significant land constraint, and there are areas of land including public open space that will be special category land within the pipeline corridor.

From the assessment work undertaken to date, Corridor Option SP4, SP7 and SP10 is considered to be a potential corridor Option, and should be taken forward to non-statutory consultation, and for engagement with the National Trust and other stakeholders.

#### 7.4.4.2 Corridor SP4 and then corridor SP8

This section of the pipeline corridor option extends to approximately 14.5km in length and requires the pipeline to cross the A505 and other major roads which may require trenchless crossing. The first half of this corridor option passes through open countryside, with sections routeing close to neighbouring villages and isolated residential, equestrian and other properties. The second half of this pipeline corridor option routes through the built up areas comprising parts of Dunstable and Houghton Regis. There is a significant length of in road pipeline construction proposed, which represents engineering risks and challenges relating to existing buried services and traffic and associated impacts on local communities. The availability of land for temporary construction compounds within the urban area is a further constraint.

The sections of pipeline constructed close to rural communities and properties have the potential to experience some disruption during construction. The sections of in road construction through Dunstable and Houghton Regis would lead to significant traffic and other impacts on the local communities, with a very significant number of residential and community receptors potentially affected.

Parts of the route corridor are designated within the Chilterns National Landscape, and also intersect with Green Belt, and Minerals Safeguarding Areas. The corridor partially encroaches into an SSSI (which could potentially be avoided by narrowing the corridor). The corridor also

intersects with areas of floodplain, a former landfill site and county and local level environmental designations which may require routeing refinement and/or mitigation. Some areas of land are being promoted by landowners/developers as potential future development sites through the emerging local plan.

There are areas of land including public open space that will be special category land within the pipeline corridor.

From the assessment work undertaken to date, the significant lengths of in road and urban construction associated with the Option 4 and Option 8 corridor are considered to make this transfer pipeline corridor less preferrable than other potential corridor options.

#### 7.4.4.3 Corridor SP4 and then corridor SP9

This section of the pipeline corridor option extends to approximately 12.5km in length. Approximately the first half passes through open countryside, with sections of the pipeline corridor routeing close to neighbouring villages and isolated residential, equestrian and other properties. The second half of this pipeline corridor option routes through the built up areas comprising parts of Dunstable and Houghton Regis. The route requires a significant length of pipeline construction proposed either in road, within the guided busway corridor, or within the disused railway line, each of which represents engineering risks and challenges relating to existing buried services and traffic and associated impacts on local communities. The availability of land for temporary construction compounds within the urban area is a further constraint.

The sections of pipeline constructed close to rural communities and properties have the potential to cause some disruption during construction. The sections of in road construction, and construction along the guided busway corridor through Dunstable and Houghton Regis would lead to significant traffic and other impacts on the local communities, with a very significant number of residential and community receptors potentially affected.

Parts of the route corridor are designated within the Chilterns National Landscape, and also intersect with Green Belt, and Minerals Safeguarding Areas. The corridor partially encroaches into an SSSI (which could potentially be avoided by narrowing the corridor). The corridor also intersects with areas of floodplain, and county and local level environmental designations which may require routeing refinement and/or mitigation. A significant length of the former railway line is a county wildlife site. Some areas of land are being promoted by landowners/developers as potential future development sites through the emerging local plan.

There are areas of land including public open space that will be special category land within the pipeline corridor.

From the assessment work undertaken to date, the significant lengths of in road, guided busway and urban construction associated with the Option 4 and Option 9 corridor are considered to make this drinking water transfer pipeline corridor less preferrable than other potential corridor options.

## 7.5 Summary of Assessment and Conclusions

As reported in Section 6 of this report, site options H and B, with an alternative potential use of Site H for water storage and Site P for WTW, are sites that may have more potential for water treatment and storage.

It is necessary to identify potential transfer routes to provide for a raw water pipeline transfer from the canal to these sites and the transfer of drinking water from these sites on to the existing operational site at Chaul End where it will enter public water supply.

Following the detailed appraisal and workshop consideration of the outcomes, the conclusion reached for the purposes of the non-statutory consultation was that the following options are therefore taken forward to the non-statutory consultation (Figure 7.5):

**Pipeline Transfer from Site B (water storage and WTW) to Chaul End:**

- Corridor Option SP2 (including potential sub-options SP2A, SP2B), combined with Option SP10 (including potential sub-options SP10A, SP10B, SP10C).

**Pipeline Transfer from Site H (water storage and WTW) to Chaul End:**

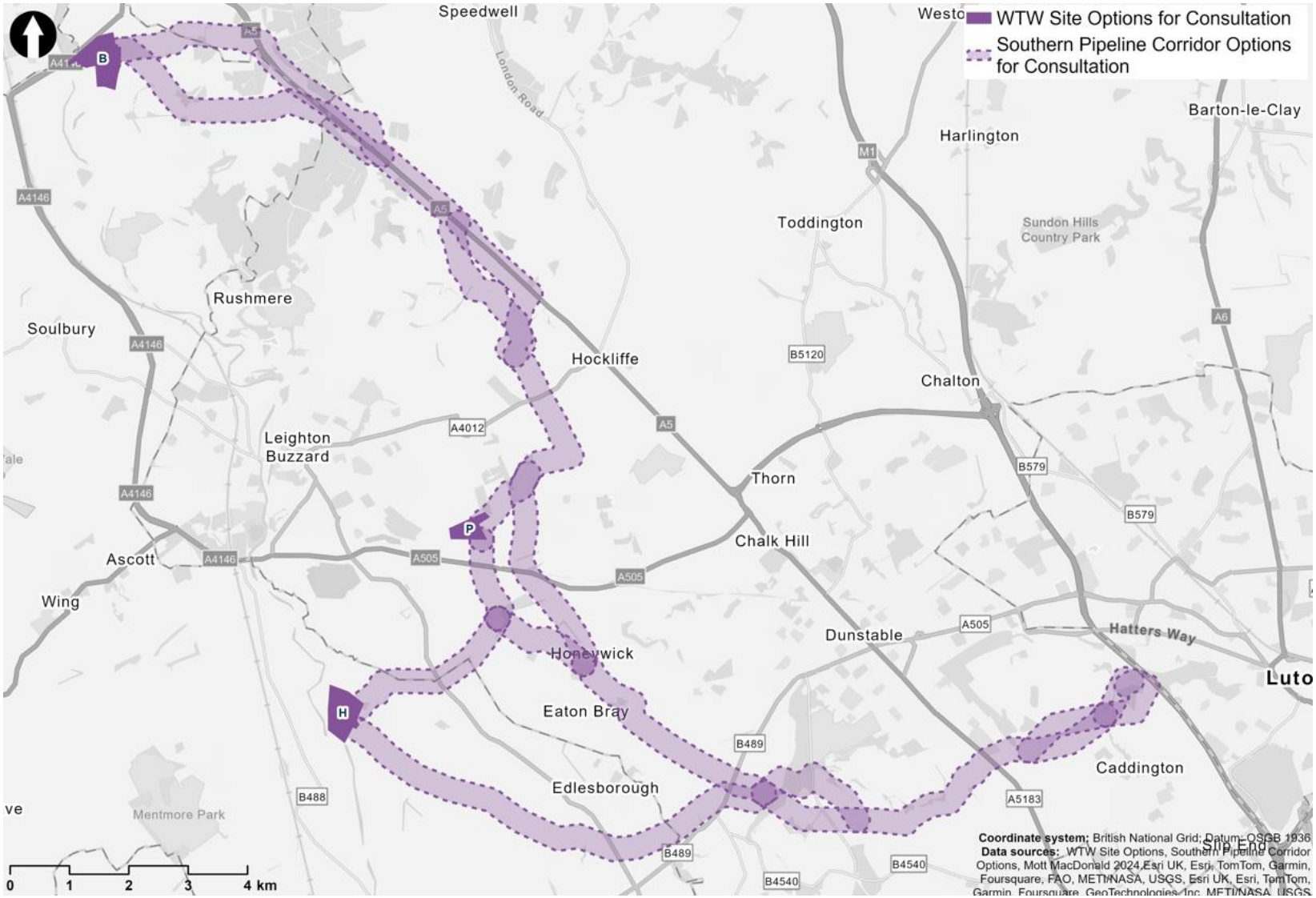
- Corridor Option SP2 combined with SP6, SP7, SP10 (including potential sub-options SP10A, SP10B, SP10C)
- Corridor Option SP5 combined with SP10 (including potential sub-options SP10A, SP10B, SP10C

**Pipeline Transfer from Site H (water storage) to Site P (WTW) and to Chaul End:**

- Corridor option SP6 combined with SP4 for the raw water transfer from Site H to Site P
- Corridor option SP4, SP7, SP10 (including potential sub-options SP10A, SP10B, SP10C) for the drinking water transfer from Site P to Chaul End

These conclusions reflect the information on the potential pipeline transfer routes and their development known at this time, and are reached in advance of the non-statutory consultation process and planned site surveys and investigations. The outcomes from the non-statutory consultation and additional surveys and assessments will be considered prior to confirming selection of preferred option(s) for the future progression of the Project.

**Figure 7.5: Southern Pipeline Corridor Options for Consultation**



# 8 Summary and Conclusion

This report has been prepared to provide an overview of the site and pipeline assessment process for the various elements of the GUC Transfer Project. It sets out the work undertaken to identify and assess suitable routes and locations for infrastructure needed to deliver the GUC Transfer Project.

The work to date has identified those route and site options that are considered, through engineering, environmental, planning and land assessment, to have the most potential. These are:

| Scheme Element | Scheme Elements for Consultation |
|---|---|
| **Advanced Water Treatment Plant** | • Curdworth Beds Site |
| **Minworth to Grand Union Canal Transfer** | • Minworth to Atherstone Pipeline Corridor<br>• Outfall Location – Coleshill Road or Atherstone Golf Course |
| **Abstraction, Water Treatment Works and Storage** | • Bletchley Option (Site B) – WTW and storage<br>• West of Slapton Option (Site H) – WTW and storage<br>• West of Slapton Option (Site H) – Storage only with WTW on a site east of Leighton Buzzard (Site P) |
| **Transfer to Chaul End** | **Pipeline Transfer from Site B (water storage and WTW) to Chaul End:**<br>• Corridor Option SP2 (including potential sub-options SP2A, SP2B), combined with Option SP10 (including potential sub-options SP10A, SP10B, SP10C).<br>**Pipeline Transfer from Site H (water storage and WTW) to Chaul End:**<br>• Corridor Option SP2 combined with SP6, SP7, SP10 (including potential sub-options SP10A, SP10B, SP10C)<br>• Corridor Option SP5 combined with SP10 (including potential sub-options SP10A, SP10B, SP10C<br>**Pipeline Transfer from Site H (water storage) to Site P (WTW) and to Chaul End:**<br>• Corridor option SP6 combined with SP4 for the raw water transfer from Site H to Site P<br>• Corridor option SP4, SP7, SP10 (including potential sub-options SP10A, SP10B, SP10C) for the drinking water transfer from Site P to Chaul End |

These options reflect the information available at the time of optioneering, in advance of the non-statutory consultation process. It should be noted that the assessment outcomes reported are predominantly based on desk-based assessments. At the time of this report, field based ecological, and engineering site-based surveys have not yet been completed for site options and corridors, nor has engagement with potentially affected landowners been completed across the site options and corridors.

The outcomes from the non-statutory consultation and additional surveys and assessments will be considered prior to confirming the selection of preferred option(s) for the future progression of the Project.

Detailed engineering design work, environmental and technical assessments, and engagement will be undertaken, which will enable the identification of preferred designs for the sites and pipeline corridors, as well as construction working areas relating to their proposed construction.

Further Statutory Consultation will be undertaken on those proposals before associated assessments and the application for development consent are completed.

# Glossary

| Term | Definition |
|---|---|
| AfW | Affinity Water |
| AWTP | Advanced Water Treatment Plant |
| Central Region | The water resource zones (WRZs) in the central part of Affinity Waters supply area – it includes Wey (WRZ6), Pinn (WRZ4), Colne (WRZ2), Misbourne (WRZ1), Lee (WRZ3) and Stort. (WRSZ5) |
| DCO | Development Consent Order - a DCO is a statutory instrument that grants consent in accordance with the provisions in the Planning Act 2008 for Nationally Significant Infrastructure Projects or projects of national significance brought into the DCO regime by a section 35 direction. A DCO can combine consent to develop, operate and maintain a project, alongside a range of other approvals that would normally have to be obtained separately such as listed building consent, a marine licence and certain environmental consents. A DCO can also contain powers for the compulsory acquisition and temporary possession of land |
| Drinking Water Inspectorate | Regulator for public water supplies in England and Wales. |
| Environment Agency | The leading public body for protecting and improving the environment in England and Wales |
| GUC | Grand Union Canal |
| HS2 | High Speed 2 |
| National Landscape | Previously known as an Area of Outstanding Natural Beauty – an area of countryside which has been designated under the Countryside and Rights of Way Act 2000 to protect, conserve and enhance its natural beauty |
| Non-Statutory Consultation | A type of consultation that can take place before a Development Consent Order (DCO) application is made, and is used to engage with people who are likely to be interested in a proposed development |
| Ofwat | The economic regulator of the water sector in England and Wales |
| RAPID | Regulators' Alliance for Progressing Infrastructure Development - Made up of the three water regulators: Ofwat, the Environment Agency and the Drinking Water Inspectorate. Formed to help accelerate the development of new water infrastructure and design future regulatory frameworks |
| SRO | Strategic Resource Option - national water resource projects that are being developed to address the challenges of water resource scarcity due to climate change and population growth |
| ST | Severn Trent Water |
| The Trust | Canal & River Trust |
| Water Framework Directive | A European Union directive which commits EU member states to achieve 'good' qualitative and quantitative status of all water bodies by 2027 |
| WRMP | Water Resources Management Plan – 25-year plan which water companies use to plan ahead and manage their water resources |
| WSR | Water Supply Reservoir |
| WTW | Water Treatment Works |
| WwRC | Wastewater Recycling Centre |

# A. Advanced Water Treatment Works – Site Assessment Summary

**Table A.1: AWTP Assessment Site Summaries**

| Site Name | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
|---|---|---|---|---|
| **Minworth South** | The construction and operational costs of this option are moderate, as developing the route would encompass a pipe diversion, possible additional pumping and longer site returns. Embedded and operational carbon is estimated to be moderate due to the requirement for extra pipelines. This route has moderate flexibility but is constrained by unknown ground conditions, a small area that would require substantial spatial reconfiguration and restricted temporary working and compound areas, amongst other things. It is considered that another main compound may be needed at a separate location to support this site. | Areas of the site are of local ecological importance as Local Wildlife Sites (LWSs) and Habitats of Principal Importance are encompassed within and around the site. There are no landscape or historical designations on the site that would pose a major environmental constraint. Significant environmental risks associated with this site relate to soils and flood risk, as the Minworth Landfill abuts the site boundary and as areas of the site fall within Flood Zone 3, which has a high risk of flooding. These risks impact the preferability of this option. | The main planning constraint is that the site partially falls within a Site of Importance for Nature Conservation and is within the Green Belt. It is noted however that the site appears to have been previously developed and is within the operational boundary of the existing Minworth site. Due to this, development on this land would likely have a limited impact on the openness of the Green Belt and purposes of the Green Belt designation than other sites. Therefore, though the Green Belt allocation poses a constraint, this may be overcome if it could be demonstrated that the development would preserve openness and would not conflict with the purposes of including land within the Green Belt. | There are no constraints concerning land ownership and there are no land acquisition risks, as the statutory undertaker for the site is Severn Trent Water. |
| **Minworth East** | The construction and operational costs of this option are the least expensive of the options. Embedded and operational carbon is estimated to be the least of all options due to shorter pipe lengths. This site is considered to be the most flexible as it would require the least degree of changes to the existing layout, there is a good site area for compound facilities and though some areas are in Flood Zones 2 and 3, the site can accommodate this as development can move to other site areas. | Areas of the site are of local ecological importance as Local Wildlife Sites (LWSs) and Habitats of Principal Importance are encompassed within and around the site. There are no landscape or historical designations on the site that would pose a major environmental constraint. There are no significant environmental risks associated with this site, with the only moderate risk relating to some areas of the site falling under Flood Zone 2. Construction in this area may require some degree of mitigation via flood | A major planning constraint associated with this route is that the entirety of the site consists of undeveloped land within the Green Belt, located outside the operational boundary of the Minworth site. Furthermore, the development of the site would be close to Curdworth village and extend outside of the current operational boundary of the land. The site overall would not be preferable from a planning perspective. | There are no constraints concerning land ownership and there are no land acquisition risks, as the statutory undertaken for the site is Severn Trent Water. |

| Site Name | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
|---|---|---|---|---|
| | | compensation storage to overcome this constraint. | | |
| **Coleshill** | The construction and operational costs of this option are the most expensive of the options, owing to factors such as the need for additional pumping and design constraints. Embedded and operational carbon is estimated to be the highest of all options. This option is considered as the most inflexible and the largest amount of site reconfiguration would be required, due to tight site size and constraints within the site such as land in Flood Zone 3 and potential land contamination. Current land take does not appear wide enough for pipeline construction and development at this site would require an extra-long section to/from the existing GUC pipeline route. | Areas of the site are of local ecological importance however as Local Wildlife Sites (LWSs) and Habitats of Principal Importance are encompassed within and around the site. There are no landscape or historical designations on the site that would pose a major environmental constraint. Potential environmental risks associated with this option relate to soils and flood risk, as there are three landfill sites within 500m of the site and as the entirety of the site is within Flood Zone 2, which may require flood mitigation measures in some areas. Risks associated with soils and flooding are not as significant as in the Minworth South option. | This site is subject to a number of moderate planning constraints. The land has multiple uses and also falls under HS2 safeguarded land which could constrain development. As with the Minworth South site, the land within this site is within the Green Belt, however most of the site appears to have been previously developed and is within the operational boundary of the existing Coleshill site. Due to this, development on this land would likely have a limited impact on the openness of the Green Belt and purposes of the Green Belt designation than other sites. Therefore, though the Green Belt allocation poses a constraint, this may be overcome if it could be demonstrated that the development would preserve openness and would not conflict with the purposes of including land within the Green Belt. The site is less favourable from a planning perspective that the Minworth South site overall however, due to existing land uses and safeguarded land. | There are no constraints concerning land ownership and there are no land acquisition risks, as the statutory undertaken for the site is Severn Trent Water. |
| **Curdworth Beds** | Costs associated with this option may arise from site constraints including the presence of contaminated water, owing to its previous use as a former sludge drying beds site, and potential utilities diversions. The Curdworth Beds site has similar challenges as the Coleshill Beds and Water Orton Beds locations; however, this option is | Areas of the site are of local ecological importance as Local Wildlife Sites (LWSs) and Habitats of Principal Importance are encompassed within and around the site. There are no landscape or historical designations on the site that would pose a major environmental constraint. An environmental constraint associated | The land within this site comprises undeveloped land in the Green Belt, though the land lies within an existing operational boundary. Due to this, development on this land would likely have a limited impact on the openness of the Green Belt and purposes than other sites. Therefore, though the Green Belt allocation poses a | There are no constraints concerning land ownership and there are no land acquisition risks, as the statutory undertaken for the site is Severn Trent Water. |

| Site Name | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
|---|---|---|---|---|
| | preferable from an engineering perspective as it requires less additional pipes and pumping. The option is considered as more flexible as it can facilitate the flow required as part of the GUC Transfer Project, whilst providing the opportunity to develop further streams in the future. | with this site is that land within the site, specifically the wetlands, falls within Flood Zone 3 which is therefore subject to high risk of flooding. However, the majority of the land within this site is in Flood Zone 2. This may impact the preferability of this site. There is also an Authorised Landfill site within the site. | constraint, this may be overcome if it could be demonstrated that the development would preserve openness and would not conflict with the purposes of including land within the Green Belt. | |
| **Water Orton Beds** | Medium costs are associated with the required pipeline construction and operational costs of this option. This area is anticipated to involve the increased costs for removal and off-site disposal of contaminated sludge/soil/groundwater, though this is anticipated to be relatively lower than the Coleshill Beds option. This option does require more extensive crossings and pipelines than Coleshill Beds. | As with the Curdworth Beds site, the main environmental constraint is that land within the site falls within Flood Zone 3, which has a high risk of flooding. Mitigation and further assessment would be required to overcome this risk if this route, or any other option with higher flood risk, is selected. | The land within this site comprises undeveloped land in the Green Belt, though the land lies within an existing operational boundary. Due to this, development on this land would likely have a limited impact on the openness of the Green Belt and purposes of the Green Belt designation than other sites. Therefore, though the Green Belt allocation poses a constraint, this may be overcome if it could be demonstrated that the development would preserve openness and would not conflict with the purposes of including land within the Green Belt. | There are no constraints concerning land ownership and there are no land acquisition risks, as the statutory undertaken for the site is Severn Trent Water. |

# B. Minworth to Grand Union Canal – Transfer Options Assessment Summary

**Table B.1: Transfer Option Assessment Summary**

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
|---|---|---|---|---|
| **Sub-Route 1** | Sub-route 1 utilises existing canal infrastructure. This would minimise the need for modification to existing infrastructure to facilitate the pipeline along this route, however the presence of existing infrastructure may make the route design less flexible than other options. This option has the highest operational carbon cost of all of the sub route options, as this route would require significant pumping. | There are 4 Local Nature Reserves (LNRs), 2 Sites of Special Scientific Interest (SSSIs) and 2 Ancient Woodland sites. 5 authorised landfill sites and 24 historic landfill sites located along the route may constrain the scheme design where contamination is present. Parts of the route cover flood zone 2 or flood zone 3 with land therefore subject to a high risk of flooding. As such development may not be favourable in these areas. Heritage designations present an issue, as the route covers 3 conservation areas, 8 Grade II* listed assets, 62 Grade II listed assets and 4 scheduled monuments. The route crosses the M42 and encompasses multiple property and community assets, further adding to environmental risks associated with this option. | The site is located along the Birmingham & Fazeley Canal (Minworth - Fazeley) and the Coventry Canal (Fazeley - Atherstone), which is designated for continued canal use, and therefore current site uses will not constrain development opportunities. The first half of the route (Minworth to Fazeley) is located within the Green Belt, which could pose a risk to obtaining planning permission. There are no allocated/preferred mineral extraction sites within the proposed pipeline area, however the pipeline would pass through Warwickshire County Council Mineral Safeguarding Area. Neighbouring land uses vary and may constrain the scheme design in some areas. | No special category land risks, direct residential land impact risks or acquisition cost risks have been identified as the sub-route design is within the canal. |
| **Sub-route 2** | Sub-route 2 relies on a natural system and therefore this option is considered to be the least flexible as the route could be severely affected by environmental changes. This option would have slightly higher operational and embedded carbon than the other options. Significant works would be required in the flood plain to lift the flow out of the river and up to the canal.<br>The River Tame has a significant flood zone extent and locating the extraction and transfer point on the River Tame could cause a potential | From an environmental perspective, this route has the most constraints and is the least favourable of all of the sub-routes. There are 6 LNRs, 4 SSSIs and 2 Ancient Woodlands along the proposed route, as well as 5 authorised landfill sites. Parts of the route cover flood zone 2 or flood zone 3 and the route covers several heritage designations including: 9 conservation areas, 13 Grade II* listed assets, 103 Grade II listed assets and 6 scheduled monuments. | The site is located on undeveloped greenfield land. The land encompassed within the site is subject to a number of designations, such as the Hams Hall Distribution Park development site, RSPB Middleton Lakes and a housing allocation site. The first half of the route (Minworth to Fazeley) is located within the Green Belt, which could pose risk to obtaining planning permission for certain works. There are no allocated/preferred mineral extraction sites within the proposed route area, however; it would pass through | There are no special category land risks, direct residential land impact risks or acquisition cost risk. |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
|---|---|---|---|---|
| | deterioration of the water source quality. | | Warwickshire County Council Mineral Safeguarding Area. Neighbouring land uses vary and may constrain the scheme design in some areas. | |
| **Sub-route 3** | Sub-route 3 is almost wholly rural and, compared to most urban sub-routes, it is assumed to be less vulnerable to external influence. The construction and embedded carbon costs associated with this option is estimated to be the least of all other options.<br>The sub-route involves less work to locks, fewer and easier to construct pumping stations and avoids the difficult canal section from Minworth to Atherstone.<br>Pipeline routes provide most flexibility as they reduce the amount of canal infrastructure requiring modification. Sub-route 3 is considered the most flexible as it is largely rural and less vulnerable to interfacing projects.<br>Sub-route is considered to have the shortest overall programme and shorter and easier to construct. | Significant environmental constraints are present within this sub-route though they are not as extensive as in sub-routes 1 and moreover, 2. There are 2 SSSIs located within 500m of the route and the route encompasses 2 Ancient Woodland sites. There are 3 authorised landfill sites and 9 historic landfill sites located along the route, which may constrain the scheme design in areas where contamination is present. Part of the route cover flood zone 2 or 3 (around Lea Marston purification lakes). The route covers 34 Grade II listed assets, 1 Grade II registered park and garden and 2 scheduled monuments. These heritage assets may constrain the scheme design.<br><br>Noting the sub-route is a pipeline option there is potentially greater flexibility to avoid and minimise environmental impacts. | Land within the site boundary is subject to a number of uses including agricultural greenfield, motorway infrastructure, HS2 land and rail infrastructure corridors, amongst others. Land at Atherstone, by the Coventry Canal, is allocated for housing development. Around 75% of the route falls within land designated as Green Belt, posing a potential planning constraint, though it is noted that the works are below ground. There are no allocated/preferred mineral extraction sites within the proposed pipeline area, however the pipeline would pass through Warwickshire County Council Mineral Safeguarding Area. Neighbouring land uses vary and may constrain the scheme design in some areas. | Network Rail crossings have been identified as being within the sub-route design that will require consideration. |
| **Sub-route 4** | Sub-route 4 utilises existing canal infrastructure and is not considered as flexible as the pipeline sub-routes The construction and embedded carbon have the potential to become the least costly of the sub-route options and could be the least demanding from a cost/programme perspective.<br>The upgrade to the canal system within the Birmingham and Fazeley Canal approach to Gravelly Hill in | There are 2 LNRs and an Ancient Woodland site along the route, which may constrain the scheme design and require it to include appropriate mitigation measures. There are 3 authorised landfill sites along the route. Parts of the route covers flood zone 2 or flood zone 3. There are significant heritage constraints associated with this sub-route, as the route encompasses 4 conservation | This sub-route spans a range of watercourses, encompassing sections of the Birmingham and Fazeley Canal, the Digbeth Branch Canal, and the Grand Union Canal. Land within the sub-route area is subject to an array of allocations, including designated Growth Areas, Core Employment Areas, mixed-use allocations and industrial areas. Around 10% of the land within the route is designated as | No special category land risks, direct residential land impact risks or acquisition cost risks have been identified as the sub-route.<br>The route is significantly more urbanised and potentially more complex from a land perspective. |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
|---|---|---|---|---|
| | Birmingham, and around Birmingham up to the connection with the GUC, would require works to be undertaken within the heavily built-up area of Birmingham, therefore increasing the complexity of this option.<br>The sub-route would potentially require the upgrade of the whole lock section and significant amounts of canal structures (such as bridges and aqueducts) to enable the water transfer in this direction of the Birmingham and Fazeley Canal from Minworth. | areas, 1 Grade I listed asset, 12 Grade II* listed assets and 84 Grade II listed assets. | Green Belt, posing a potential planning constraint. This is however the lowest percentage of Green Belt land of all the sub-route options. There is a committed development on land within the site, namely a hybrid application for Curzon Wharf (2021/03125/PA) which may affect the ability to use the canal to facilitate the sub-route in this location. Neighbouring land uses vary and may constrain the scheme design in some areas.<br>The route is significantly more urbanised and potentially more complex from a planning perspective. | |
| **Sub-route 5** | Sub-route 5 has to pass close to the congested area around Birmingham International Airport and HS2 Interchange, which presents additional risks. Sub-route 5 is considered more flexible than utilising existing infrastructure but less flexible than sub-route 3.<br>Sub-route 5 offers benefits in relation to sub-route 4 as it bypasses the urban area and corresponding works to the Birmingham and Fazeley Canal. However, the proposed discharge location is situated upstream and potentially involves more upgrades to the canal infrastructure than other sub-options that were assessed. | There are fewer environmental constraints than other sub-route options though constraints remain significant. There route covers 3 LNRs, 2 SSSI sites and 3 Ancient Woodland sites. There is 1 authorised landfill site and 15 historic landfill sites located along the route. Parts of the route cover flood zone 2 or flood zone 3. Development may not be favourable in areas in Flood Zone 3. Located along the route are a number of heritage assets including 2 conservation areas, 2 Grade II* listed assets and 17 Grade II listed assets. | Land within the site boundary is subject to a number of uses including undeveloped greenfield land, undeveloped woodland, rail and road infrastructure, amongst others. Land within the sub-route area is subject to an array of allocations including Birmingham Business Park, Allocated Employment Land (Prologis Park), NEC Designation, UK C Hub Area and Birmingham Airport. Around 66% of the land within the route is designated as Green Belt, posing a potential planning constraint. The pipeline would pass through Warwickshire County Council Mineral Safeguarding Area. There are two notable committed developments along the route, constituting the construction of an automated people mover at Birmingham International Rail Station (PL/2022/00206/HS2DIS) and the | There is a high special category land risk for this sub-route as it encompasses areas of open space, allotments and National Rail land. There are also residential land impact risks and acquisition cost risks relating to the HS2 line, Birmingham Airport, residential properties and community assets. |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
|---|---|---|---|---|
| | | | construction of a Battery Energy Storage System (BESS) (PL/2023/01954/PPFL) which could constrain development in specific areas. Neighbouring land uses vary and may significantly constrain the scheme design in some areas. These land uses include the NEC and Birmingham Airport. | |
| **Sub-route 6** | Sub-route 6 has to pass close to the congested area around Birmingham International Airport and HS2 Interchange, which presents considerable risks. Sub-route 6 is considered more flexible than utilising existing infrastructure but less flexible than sub-route 3<br><br>Sub-route 6 would require the most material for the construction and the additional pumping requirement results in much higher carbon costs that cannot be mitigated sufficiently in comparison to other options. Operationally, the option also has more points of failure and would generally be more difficult to operate to minimise negative fluctuations and adapt to long-term trends. | There are 4 LNRs, 1 SSSI and 5 Ancient Woodland sites located along the route. 1 authorised landfill site and 8 historic landfill sites located along the route may constrain the design. Parts of the route cover flood zone 2 or flood zone 3. There are significant heritage constraints associated with this sub-route, as the route encompasses 3 conservation areas, 1 Grade I listed asset, 4 Grade II* listed assets, 61 Grade II listed assets, 1 Grade II* registered park and garden, 1 Grade II registered park and garden and 3 scheduled monuments. In addition, the route crosses the M42 and encompasses a number of property and community assets. | Land within the site boundary is subject to a number of uses including undeveloped greenfield land, undeveloped woodland, rail and road infrastructure, amongst others. Land within the sub-route area is subject to an array of allocations including Birmingham Business Park, Allocated Employment Land (Prologis Park) and the NEC Designation. Around 85% of the land within the route is designated as Green Belt, posing a potential planning constraint. There are no allocated/preferred mineral extraction sites within the proposed pipeline area, however the pipeline would pass through Warwickshire County Council Mineral Safeguarding Area. There are no relevant emerging allocations within the site, however the construction and operation of a renewable energy park (PL/2023/01952/PPFL) may constrain development. Neighbouring land uses vary and may significantly constrain the scheme design in some areas. | There is a high special category land risk for this sub-route design encompasses areas of open space, allotments and National Rail land. There are also residential land impact risks and acquisition cost risks relating to the HS2 line, residential properties and community assets. |

**Table B.2: Transfer Option Assessment Summary**

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
|---|---|---|---|---|
| Atherstone Golf Course | This option avoids diversion of the large sewer main in south Atherstone as well as the sectional closures of Coleshill Road past Atherstone Golf Course. The outfall is located downstream of the bridge structure and thus is in a 'more optimal' location hydraulically.<br>Further engineering work is required to determine how the option would be constructed as the option would result in temporary disruption to Atherstone Golf Course. | This option has the potential for potential significant impacts on natural environmental assessment criteria as it is routed within areas of high ecological potential, is adjacent to or crossing Ancient Woodland and there is a presence of a veteran tree and several Category A and B trees. Impacts to Ancient Woodland and veteran trees could potentially affect the ability of the scheme to achieve BNG as these are considered irreplaceable habitats. Further work would be required environmentally to understand the extent of impact on the woodland and further consideration of biodiversity net gain. As this option is routed through the golf course, disturbance effects to the local community would be significantly reduced. | No significant land use risks were identified. The main land use associated with the pipeline corridor is associated with 'common land' and Atherstone Golf Club, and it would appear there would be some temporary impact on the operation of the golf course through the construction of the pipeline. There are also several dispersed properties in the vicinity, but the route does reduce impacts on the residents of Atherstone in comparison to the Coleshill Road option. | Crossing the golf course and having the outfall located within Common Land does present additional risk. However, there are no major constraints provided that the outfall location and infrastructure within the Common Land stays under the threshold for special parliamentary procedure (that is temporary use or footprint under 200m$^2$). |
| Coleshill Road | The pipeline option within the highway along Coleshill Road would require the diversion of significant utilities in the area, including the large sewer main in south Atherstone. Coleshill Road has properties either side through Atherstone, and as a result there would be a much-reduced construction area and access arrangements, with significant | Environmental impacts would not be as significant as the Atherstone Golf Course option, though the Ancient Woodland and veteran trees are within the potential working area. This route contains two A Category Trees, Group, Hedge, or Woodland with five B Category Tree, Group, Hedge, or Woodland also intersecting the route. Impacts would largely be avoided as | The Coleshill Road option would involve work primarily within the highway boundary, and no significant impacts were identified in relation to planning. However, the option would result in significant disruption to residents of Atherstone that would need to be further considered. | This option is considered as more favourable from a land and property perspective as the golf course option presents an additional risk due to the additional complications of works within Common Land. No major land impacts are noted at this stage due to works predominantly taking place within the highway boundary. |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
|---|---|---|---|---|
| | disruption to the local population and businesses over an extended construction programme.<br>The discharge location being adjacent a series of locks, upstream of an existing road bridge where the canal narrows, means there is a potential hydraulic restriction. Therefore, the option is not considered optimal when compared with the Atherstone Golf Course option. | the works would predominantly be within the highway boundary. Although a small area of grassland was noted adjacent to the proposed outflow into the GUC.<br>The main impact is the proximity of the works to residential, commercial properties and community assets which is an important consideration. The option would require extensive traffic management implementation and the works would take a considerable time to complete, which would have a significant local amenity impact. | | |

# C. Abstraction, Treatment and Storage – Site Assessment Summary

**Table C.1: Site Assessment Summary**

| Site Name | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
|---|---|---|---|---|
| Bletchley Site Option - Site B | Energy costs and embedded carbon costs are likely to be higher than for the other sites but the location is likely to provide resilience for longer term use. Better recorded water quality at this abstraction location as further south on the canal there are inputs from local streams and drains that potentially result in poorer water quality. This could mean that less treatment processes would be required at this location. Abstracting water on this part of the GUC would reduce the amount of development that would be needed further south on the canal but would involve a longer pipeline transfer to the existing underground reservoir near Luton. Option offers good road access via the A4146/A5 for both construction and operational activities, with the need for a new access/entrance noted. The need for further topographical and ground condition information is identified, although the potential to encounter contaminated land is considered to be low. The site is relatively flat but has sufficient slope to allow for the construction of the water storage (subject to more detailed investigation of ground conditions). Interstage pumping would be required across the WTW. Gas main running through the site that will need to be considered in the siting of any | Site is mainly low quality grassland habitats and arable fields (with groups of tree stands), with a parcel of woodland. Includes hedgerow boundaries and hedgerows with trees present. Surveys required to determine if hedgerows are protected and if veteran trees are present. Woodland is of high distinctiveness in BNG terms. No designated or non-designated biodiversity sites within the option boundary but does fall within several SSSI impact risk zones. There is no priority habitat within the site. There is a Local Wildlife Site within 400m of the site (Water Hall Park). Protected species records have been examined and presence of common species of bats and Great Crested Newts indicated adjacent to the site. Proximity of residential properties and businesses to the option boundary is noted. No designated heritage assets within the site. Potential for a single non-designated heritage asset to be present (linear/trackway identified from aerial photographs). Site topography is typically flat, gently falling from the eastern boundary to the western boundary along the River Ouzel. A mature dense barrier along the A4146 restricts views. The local road network is well vegetated, and has been managed into a well-maintained low hedgerow, allowing | Within the countryside where there is a policy presumption against development that would compromise the character of the countryside between settlements or communities leading to coalescence. Designated as an area of attractive landscape where there is a need to have regard to the character of the landscape and provide mitigation to overcome any adverse impact. Located within the Greensand Ridge Nature Improvement Area where there is an onus on developing biodiversity, minimising visual impact and protecting local amenity. Proximity to residential areas and consented residential development in the Bletchley area where there is the opportunity to promote recreational benefit of the storage. Site is within Minerals Safeguarding Area for Sand and Gravel. Northern parts of the site are known to be being promoted by landowner/developer for potential future residential development through the Buckinghamshire Council Housing and Economic Land Availability Assessment, as part of the preparation of a new Local Plan. | No Special Category Land identified within the site option boundary. Several landowners across site option and could involve changes to access arrangements across land parcels. It is noted there is a gas easement that crosses the site. |

| Site Name | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
|---|---|---|---|---|
| | development. The site is adjacent to the canal but beyond flood plain extents. | views across the open countryside. There are no protected or designated views that could be affected, although some potential visual impacts to recreational users of footpaths and the River Ouzel corridor. The nearest residential receptors are along Galley Lane to the east. Desktop analysis indicates Grade 3A and 3B agricultural land and further work required to confirm classification. This site option includes areas of Flood Zone 3 and Flood Zone 2 in the west side derived from fluvial risk from the River Ouzel that runs along the west boundary. | | |
| Slapton Site Option – Site H | Site likely to have lower embedded and current operating costs than other options. There is potentially poorer water quality abstracting from this location which may require additional treatment processes/ energy to treat. Additional development, including pumping stations, on the GUC would be required south from Leighton Buzzard but the transfer pipeline to the service reservoir near Luton would be shorter. Access to the site is limited to B roads with potential height and weight restrictions for construction and operational access. The suitability of the existing bridge on Horton Road over the GUC for construction traffic access requires further consideration. Site is also within Buckinghamshire's Freight Strategy Zone and restrictions need to be fully explored. The need for | The site is generally open agricultural or woodland planting land intersected and bordered by hedgerows and relatively recent woodland plantation. Surveys required to determine if hedgerows are protected and if veteran trees are present. There is an important wildlife corridor (Green Lane) that bisects the centre of the site. It is designated as a local wildlife site due to its hedges and ditches. The site is located within a SSSI risk zone but all SSSIs are more than 2km from the site. Protected species records have been examined and presence of common bats identified adjacent to the site and otters to the north of the site. The site is approximately 3km from the Chilterns National Landscape and potential effects on the setting would need to be explored. The site is | Within the the countryside where there is a policy presumption against development that would compromise the character of the countryside between settlements or communities leading to coalescence. Close proximity to Bury Farm Equestrian Centre, Grand Union Canal, Lock Keeper's cottage, Hill Farm and village of Slapton noted. To the northwest of the site planning permission was granted in 2022 for the construction of a solar farm but to date the development does not appear to have been implemented. Public Rights of Way running through the site providing access to the canal. Potential to develop recreational benefit of storage. Potential impact on neighbouring land uses during construction, in particular amenity and | No Special Category Land identified within the site option boundary. Development could involve changes to access arrangements across land parcels. |

| Site Name | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| | further topographical and ground condition information is identified, although the potential to encounter contaminated land is considered to be low. Flat site meaning unlikely that all excavated material can be reused on site and will need to be exported off site (subject to more detailed investigation of ground conditions this is considered to be greater than at the Bletchley site). Two power lines currently transect the sites and would require diverting, although these do indicate a power supply close to the site. | on the western edge of the village of Slapton. There are some intermittent belts of vegetation to the village edge that will help screen the proposed works. There are a number of residential, commercial and community properties and facilities within close proximity to the site, including an equestrian centre and sports playing field and park. There are two public rights of way running through the site and recreational use of the canal adjacent to the option boundary. Approximately 50m east of the site are residential receptors along Horton Road, Bury Farm and Mill Road. During construction, nearby sensitive receptors may experience increased noise and vibration levels from construction activities, construction traffic, excavations, groundworks and interior work activities. Construction traffic would need to travel circa. 1.5 miles on local roads with some sections of single carriageway/ kerbside parking pinch points. No heritage sites within the boundary although there is a recorded single non-designated heritage asset located within this site boundary which requires further investigation. Further work required to determine the agricultural land classification. This site does not include fluvial flood areas (Flood Zone 3 or 2). | highway impacts that would need to be addressed were this site to be taken forward. Site is within Minerals Safeguarding Area for Sand and Gravel. | |
| East of Leighton Buzzard – Site P – WTW Only | Site considered only suitable for accommodating the WTW. Access from the A505 to the site for construction and operation is good. | Generally open agricultural land bordered by well-maintained mature native deciduous trees and shrub hedgerows. Surveys required to | The main constraint is that the site is located within the Green Belt and would be considered inappropriate development. It would be necessary to | No Special Category Land identified within the site option boundary. One landowner across site option. |

| Site Name | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| | There are high voltage power lines adjacent to the site. Ground conditions appear to indicate a low risk for construction but the need for further investigation of ground conditions is noted. As the site has no raw water storage it requires a raw water pipeline to the site and a way to return excess flows to a drainage channel or river/canal. Considered to offer good resilience to future flood risk. | determine if hedgerows are protected and if veteran trees are present. Small copse of scrub and likely relatively immature woodland to northeast of site boundary. No designated nature conservation sites or heritage sites within the site option boundary but site is within a SSSI impact risk zone. Protected species records have been examined and presence of common bats, badgers, otters and notable plant species are identified within the vicinity of the site. There are no priority habitats within the site boundary. Proximity of residential properties along Leighton Road, Billington Road, Leighton Buzzard Rugby Club and playing fields noted. Potential impact on residential and recreational views. The site is located within the Green Belt and within 5km of the Chilterns National Landscape and potential effects on the setting would need to be explored. Further work required to determine the agricultural land classification. This site does not include fluvial flood areas (Flood Zone 3 or 2). | demonstrate very special circumstances to outweigh any harm as required by planning policy including that set out in the Water Resource Infrastructure National Policy Statement. Located within the Greensand Ridge Nature Improvement Area where there is an onus on developing biodiversity, minimising visual impact and protecting local amenity. Planning permission has been granted (April 2024) for an energy park (wind turbine, solar array, battery energy storage, EV charging including new access) to the west of the proposed site. In terms of land use, to the south of the site is the A505, with residential/commercial areas of Leighton Buzzard to the north and west and Billington Road to the east. To the north is a site allocated for Outdoor Sport Leisure and Open Space. Site was previously identified within Central Bedfordshire Council's call for housing development sites but was rejected citing impact to the wider landscape that could not be outweighed by the benefits of the proposed development. | |
| East of Leighton Buzzard – Site Q – WTW Only | Site considered only suitable for accommodating the WTW. Access from the A505/A5 to the site for construction and operation is good. There are high voltage power lines adjacent to the site. Ground conditions appear to indicate a low risk for construction but the need for further investigation of ground conditions is | Generally open agricultural land bordered by well-maintained mature native deciduous trees and shrub hedgerows. Woodland plantation to north and south beyond boundary. Scattered individual trees within hedgerow along eastern and north western boundary are likely semi mature to mature. Noted there are | The main constraint is that the site is within the Green Belt and would be considered inappropriate development. It would be necessary to demonstrate very special circumstances to outweigh any harm as required by planning policy including that set out in the Water Resource Infrastructure National | No Special Category Land identified within the site option boundary. Could involve changes to access arrangements across land parcels. |

| Site Name | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| | noted. As the site has no raw water storage it requires a raw water pipeline to the site and a way to return excess flows to a drainage channel or river/canal. Considered to be good resilience to future flood risk. | smaller field sizes closer to village of Stanbridge which is east of the site option. No designated nature conservation sites or heritage sites within the site option boundary. Site falls within a SSSI impact risk zone. Protected species records have been examined and presence of common bats, badgers, otters and notable plant species are identified within the vicinity of the site. Directly surrounding the site are agricultural fields. Proximity of residential and commercial properties along Leighton Road, Billington Road and Station Road noted. Potential to directly impact two public rights of way. Potential impact on residential and recreational views. The site is located within the Green Belt and within 5km of the Chilterns National Landscape and potential effects on the setting would need to be explored. Further work required to determine the agricultural land classification. This site does not include fluvial flood areas (Flood Zone 3 or 2). | Policy Statement. In terms of land use, to the south of the site is the A505 with the site predominantly surrounded by agricultural land. To the northeast of the site is the village of Stanbridge, which along with residential properties includes a school and amenity spaces. | |

# D. Transfer to Chaul End - Transfer Options Assessment Summary

**Table D.1: Transfer Option Assessment Summary**

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| **Alternative Pipeline Corridors from the Bletchley Site (Site B) to Chaul End** | | | | |
| Corridor SP1 | This section of the pipeline corridor option extends to approximately 15km in length and the route requires the drinking water transfer pipeline to cross the River Ouzel, the GUC itself, together with the mainline railway, A4146 and A418. These constraints represent additional environmental and engineering risks and complexity, and the trenchless crossings of these features would be likely to increase the overall cost of this option compared to options with less complex crossings. The routeing of the pipeline below the GUC and railway represent ongoing operational risks due to constraints on future maintenance of those sections of pipeline. | The corridor encroaches partly into an SSSI to the west of the A4146 and part of a Registered Park and Garden south of the A418 (both of which could potentially be avoided by narrowing the corridor). The corridor also intersects with areas of floodplain (Flood Zone 3), and county and local level environmental designations which may require routeing refinement and/or mitigation.<br>The majority of this pipeline corridor option passes through open countryside, with sections of the pipeline routeing close to neighbouring villages and isolated residential, agricultural, equestrian and other properties. Land within the corridor includes grade 2 and 3 agricultural land. The pipeline routes to the north and west of Stoke Hammond, north and east of Soulbury and to the north of Slapton. There is the potential for parts of these settlements and other properties to experience some disruption during construction. | Parts of the route are designated as an Area of Attractive Landscape or as Green Belt, and Minerals Safeguarding Areas. There are other local planning designations near to or affecting parts of the corridor.<br>Some areas of land close to Milton Keynes are being promoted by landowners/developers as potential future development sites through the emerging local plan. Applications for solar farms affect parts of the pipeline corridor. | Engagement with landowners and land referencing has not yet been undertaken for this pipeline route option and there may be potential for special category land within the pipeline corridor. |
| Corridor Sub-option SP1A | Sub-option 1A is an alternative routeing for the northernmost section of corridor Option 1. Sub-option SP1A | The corridor intersects with areas of floodplain (Flood Zone 3 and WFD Impact Zone), and county and local | Parts of the sub-option route are designated as an Area of Attractive Landscape, Green Belt and Minerals | Engagement with landowners and land referencing has not yet been undertaken for this pipeline corridor |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| | involves approximately 1km shorter overall length than Option SP1, however the route (in common with SP1) requires the drinking water transfer pipeline to cross the River Ouzel, the GUC itself, together with the mainline railway, and A4146. These constraints represent additional environmental and engineering risks and complexity, and the trenchless crossings of these features would be likely to increase the overall cost of this option compared to options with less complex crossings. The routeing of the pipeline below the GUC and railway represent ongoing operational risks due to constraints on future maintenance of those sections of pipeline. | level environmental designations which may require routeing refinement and/or mitigation.<br>Like option SP1, the majority of this pipeline corridor option passes through open countryside, with sections of the pipeline routeing close to neighbouring villages and isolated residential, agricultural, equestrian and other properties as well as a golf course. Land within the corridor includes grade 2 and 3 agricultural land. The pipeline routes to the south of Great Brickhill, and to the west of Bragenham and Linslade before rejoining Option SP1. There is the potential for parts of these settlements to experience some disruption during construction. | Safeguarding Areas. There are other local planning designations near to or affecting parts of the corridor. | sub-option but there is special category land within the pipeline corridor. |
| Corridor Option SP2 | This section of the pipeline corridor option extends to approximately 16km in length and the routeing to the east from Site B avoids crossings of the River Ouzel and the GUC itself associated with Option SP1/1A. Option SP2 requires a number of major road crossings including the A5 (twice), A2012 and A505, which would require trenchless crossings of these features. | The corridor intersects with areas of floodplain (Flood Zone 3), county and local level environmental designations (including wildlife sites) and a former landfill site which may require routeing refinement and/or mitigation. There is an area of Ancient Woodland within 15m of the corridor.<br>The majority of this pipeline corridor option passes through open countryside, with sections of the pipeline routeing close to neighbouring villages and isolated residential, agricultural, equestrian and other properties. Land within the corridor includes grade 2 and 3 agricultural land. The pipeline routes to the south of Little Brickhill, between | Parts of the route are designated as an Area of Attractive Landscape or as Green Belt, and Minerals Safeguarding Areas. There are conservation areas and other local planning designations near to or affecting parts of the corridor, and a playing field south of Eggington lies within the corridor.<br>Some areas of land close to Milton Keynes are being promoted by landowners/developers as potential future development sites through the emerging local plan. | Engagement with landowners and land referencing has not yet been undertaken for this pipeline route option but there is special category land within the pipeline corridor. |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| | | Hockliffe and Eggington, to the west of Stanbridge and north of Eaton Bray. There is the potential for parts of these settlements and other properties to experience some disruption during construction. | | |
| Corridor Sub-option SP2A | Sub-option 2A is a potential alternative route corridor for the northernmost section of Option SP2. The pipeline corridor follows a route further south than Option SP2 and the sub-option is approximately 200m shorter route than Option SP2. Like Option SP2, this corridor route would avoid the need for a drinking water pipeline trenchless crossing of the River Ouzel, the GUC itself and the mainline railway. The sub-option would require a trenchless crossing under the A5 (as for Option SP2). | The corridor intersects with a small part of an SSSI, and with county and local level environmental designations (including wildlife sites), a Grade II listed building, and a former landfill site which may require routeing refinement and/or mitigation.<br>The majority of this pipeline corridor option passes through open countryside, with sections of the pipeline routeing close to neighbouring villages and isolated residential, agricultural, equestrian and other properties. Land within the corridor includes grade 2 and 3 agricultural land. The sub-option routes to the north of Great Brickhill before routeing east to follow alongside and then cross the A5 where it rejoins Option SP2. There is the potential for parts of the settlement and other properties to experience some disruption during construction. | Parts of the route are designated as an Area of Attractive Landscape or as Green Belt, and Minerals Safeguarding Areas. Some areas of land close to Milton Keynes are being promoted by landowners/developers as potential future development sites through the emerging local plan, and there are planning applications and permissions for development within parts of the corridor. | Engagement with landowners and land referencing has not yet been undertaken for this pipeline corridor sub-option and there may be potential for special category land within the pipeline corridor. |
| Corridor Sub-option SP2B | Sub-option 2B is a potential alternative route corridor for an approximately 3km section of Option SP2, to the north of Church End. The pipeline corridor follows a route closer to the A5, before routeing south and then west of Church End to rejoin Option SP2. The route is the same approximate length as the related | The corridor intersects with a small part of a registered park and garden (which could potentially be avoided by narrowing the corridor) and with part of a county level environmental designation (wildlife site) which may require routeing refinement and/or mitigation. | Parts of the route are designated as an Area of Attractive Landscape or as Green Belt, and Minerals Safeguarding Areas. Some areas of land close to Milton Keynes are being promoted by landowners/developers as potential future development sites through the emerging local plan, and there are planning applications and | Engagement with landowners and land referencing has not yet been undertaken for this pipeline corridor sub-option and there may be potential for special category land within the pipeline corridor. |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| | section of Option SP2. The sub-option would require a trenchless crossing under the A5 (as for Option SP2). | The majority of this pipeline corridor option passes through open countryside, with sections of the pipeline routeing close to isolated residential, agricultural and other properties. There is the potential for properties to experience some disruption during construction. Land within the corridor includes grade 2 and 3 agricultural land. | permissions for development within parts of the corridor. | |
| **Alternative Pipeline Corridors from the Slapton Site (Site H) to Chaul End** | | | | |
| Corridor Option SP6, SP7 and SP10 | This section of the pipeline corridor option extends to approximately 16km in length and the route requires the drinking water transfer pipeline to cross the A5183, and potentially also the River Ouzel, which would require trenchless crossings of these features. There is a need for use of a trenchless technique to construct a section of the pipeline through and below the Dunstable Downs, which represents some engineering risk and additional cost. This would require sensitive routeing and consideration of trenchless construction technique to minimise impacts on Dunstable Downs during construction. | The corridor intersects with areas of floodplain, a former landfill site and county and local level environmental designations (including wildlife sites), and two areas of Ancient Woodland which may require routeing refinement and/or mitigation. Some areas of land south of Dunstable and Houghton Regis are being promoted by landowners/developers as potential future development sites through the emerging local plan, and there are planning applications and permissions for development within parts of the corridor.<br>The majority of this pipeline corridor option passes through open countryside, with sections of the pipeline corridor routeing close to neighbouring villages and isolated residential, agricultural, equestrian and other properties, as well as areas of open space, and part of a gliding club. Land within the corridor includes predominately grade 2, 3 and 4 agricultural land, but with a small area | Parts of the route are designated within the Chilterns National Landscape, and also intersect with Green Belt, and Minerals Safeguarding Areas. The corridor encroaches partly into an SSSI north of Church End (which could potentially be avoided by narrowing the corridor). There are other local planning designations near to or affecting parts of the corridor, including conservation areas. | Part of the corridor passes through National Trust land at Dunstable Downs and intersects with an area of potential Common Land. Whilst engagement with landowners and land referencing has not yet been undertaken for this pipeline corridor option, this is a potentially significant land constraint, and there are areas of land including public open space that will be special category land within the pipeline corridor. |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| | | of grade 1. The pipeline routes to the west and north of Slapton, to the north of Eaton Bray, to the north of Whipsnade and Church End, and to the south of Chaul End. There is the potential for parts of these settlements and other properties to experience some disruption during construction. | | |
| Corridor Sub-option SP10A | Sub-option 10A is a potential alternative route corridor for an approximately 2km central section of Option SP10 where the pipeline corridor routes through the Dunstable Downs. The pipeline corridor sub-option follows a route further to the north than Option SP10.<br>The route is approximately 300m longer than Option SP10 and (like Option SP10) would require sensitive routeing and consideration of trenchless construction technique to minimise impacts on Dunstable Downs during construction. | The corridor intersects with part of an SSSI, and with county and local level environmental designations (including wildlife sites), a listed building, and lies close to Ancient Woodland and a former landfill site which may require routeing refinement and/or mitigation. The environmental constraints are potentially significant. Land within the corridor includes grade 2 and 3 agricultural land.<br>This pipeline corridor sub-option passes through open countryside routeing to the north of the National Trust visitor centre and then south east to rejoin option SP10. There is the potential for properties to experience some disruption during construction. | The whole of the sub-option lies within the Chilterns National Landscape, and within the Green Belt. Parts of the route are within a Minerals Safeguarding Area. | Part of the sub-option pass through National Trust land and could intersect Common Land. Whilst engagement with landowners and land referencing has not yet been undertaken for this sub-option, these are potentially significant land constraints and there is special category land within the sub-option corridor. |
| Corridor Sub-option SP10B | Sub-option 10B is a potential alternative route corridor for an approximately 1.5km eastern section of Option SP10 where the pipeline corridor routes to the north of Caddington. The sub-option route is the same approximate length to Option SP10. The pipeline corridor sub-option follows a route further to the north than Option SP10, and then rejoining Option SP10. | The corridor lies within 100m of Ancient Woodland and land within the corridor includes grade 2 and 3 agricultural land.<br>The corridor passes through open countryside and there is the potential for isolated properties to experience some disruption during construction. | The whole of the sub-option lies within the Chilterns National Landscape, and within the Green Belt. | Whilst engagement with landowners and land referencing has not yet been undertaken for this sub-option, there is unlikely to be special category land within the sub-option corridor. |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| Corridor Sub-option SP10C | Sub-option 10C is a potential alternative route corridor for the approximately 800m final section of Option SP10 where the pipeline corridor routes to Chaul End. The pipeline corridor sub-option follows a route further to the east than Option SP10 and is approximately 500m longer than Option SP10. | Land within the corridor includes grade 2 and 3 agricultural land and the corridor passes through open countryside around an area of woodland. The area of woodland lying adjacent to the sub-option includes parts of Ancient Woodland and a County Wildlife Site. | An initial small section of the sub-option lies within the Chilterns National Landscape, and the whole sub-option lies within the Green Belt. | Whilst engagement with landowners and land referencing has not yet been undertaken for this sub-option, there is unlikely to be special category land within the sub-option corridor. |
| Corridor Option SP5 and SP10 | This section of the pipeline corridor option extends to approximately 15km in length. The majority of this pipeline corridor option passes through open countryside, with sections of the pipeline corridor routeing close to neighbouring villages and isolated residential, agricultural, equestrian and other properties and part of a gliding club.<br>The route requires the drinking water transfer pipeline to cross the A5183 which would require a trenchless crossing but avoids the River Ouzel. There is a need for use of a trenchless technique to construct a section of the pipeline through and below the Dunstable Downs, which represents some engineering risk and additional cost. This would require sensitive routeing and consideration of trenchless construction technique to minimise impacts on Dunstable Downs during construction. The corridor also crosses high voltage electricity lines. | The corridor encroaches partly into an SSSI north of Church End (which could potentially be avoided by narrowing the corridor). There are other local planning designations near to or affecting parts of the corridor, including conservation areas. The corridor also intersects with areas of floodplain, county and local level environmental designations (including wildlife sites), and two areas of Ancient Woodland which may require routeing refinement and/or mitigation. It also lies close to a former landfill site.<br>Land within the corridor includes predominantly grade 2, 3 and 4 agricultural land, but with a small area of grade 1. The pipeline corridor routes to the south of Slapton and Edlesborough, to the north of Whipsnade and Church End, and to the south of Chaul End. There is the potential for parts of these settlements and other properties to experience some disruption during construction. | Parts of the route are designated within the Chilterns National Landscape, and also intersect with Green Belt, Minerals Safeguarding Areas and an Area of Attractive Landscape.<br>Some areas of land south of Dunstable and Houghton Regis are being promoted by landowners/developers as potential future development sites through the emerging local plan, and there are planning applications and permissions for development within parts of the corridor. | Part of the corridor passes through National Trust land at Dunstable Downs and may involve Common Land. Whilst engagement with landowners and land referencing has not yet been undertaken for this pipeline corridor option, this is a potentially significant land constraint, and there are areas of land including public open space that will be special category land within the pipeline corridor. |
| Corridor Option SP6 and SP8 | This section of the pipeline corridor option extends to approximately 17km in length. The first half of this corridor | Land in the rural sections of the corridor includes predominately grade 2, 3 and 4 agricultural land, but with a | Parts of the route corridor are designated within the Chilterns National Landscape, and also | Whilst engagement with landowners and land referencing has not yet been undertaken for this pipeline corridor |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| | option passes through open countryside, with sections of the pipeline corridor routeing close to neighbouring villages and isolated residential, agricultural, equestrian and other properties. The second half of this pipeline corridor option routes through the built up areas comprising parts of Dunstable and Houghton Regis.<br>The pipeline routes to the west and north of Slapton, and to the south of Billington to reach the A505 road corridor, where the corridor follows the A505 east to the junction with the A5 and then would comprise in road construction along the A505 southwards through Chalk Hill, turning north east along the B5120 through Houghton Regis, and then south along Park Road North and Poynters Road, crossing the A505 and then in the A5065 road corridor before routeing south to Chaul End.<br>The route requires the drinking water transfer pipeline to cross the River Ouzel, which would require trenchless crossing. There is a significant length of in road pipeline construction proposed, which represents engineering risks and challenges relating to existing buried services and traffic and associated impacts on local communities. The availability of land for temporary construction compounds within the urban area is a further constraint. | small area of grade 1. The corridor partially encroaches into an SSSI at Chalk Hill (which could potentially be avoided by narrowing the corridor). The corridor also intersects with areas of floodplain, a former landfill site and county and local level environmental designations (including wildlife sites) which may require routeing refinement and/or mitigation.<br>The sections of pipeline constructed close to rural communities and properties have the potential to cause some disruption during construction. The sections of in road construction through Dunstable and Houghton Regis would lead to significant traffic and other impacts on the local communities, with a very significant number of residential and community receptors potentially affected. | intersect with Green Belt, and Minerals Safeguarding Areas. There are other local planning designations near to or affecting parts of the corridor, including conservation areas and public open space.<br>Some areas of land south of Dunstable and Houghton Regis are being promoted by landowners/developers as potential future development sites through the emerging local plan, and there are planning applications and permissions for development within parts of the corridor. | option, there are areas of land including public open space that will be special category land within the pipeline corridor. |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| Corridor Option SP6 and SP9 | Approximately the first half of this 15km pipeline corridor option passes through open countryside, with sections of the pipeline corridor routeing close to neighbouring villages and isolated residential, agricultural, equestrian and other properties. The second half of this pipeline corridor option routes through the built up areas comprising parts of Dunstable and Houghton Regis.<br>The pipeline routes to the west and north of Slapton, and to the south of Billington to reach the A505 road corridor, where the corridor follows the A505 east to a point north of Lower End, where the corridor then follows the former railway line corridor eastwards towards Dunstable. In Dunstable, the pipeline corridor crosses the A505 and is then routed along the Luton Dunstable guided busway corridor through the Dunstable and Houghton Regis urban area, crossing the A505 and then in the A5065 road corridor before routeing south to Chaul End.<br>The route requires the drinking water transfer pipeline to cross the River Ouzel, which would require trenchless crossing. There is a significant length of pipeline construction proposed either in road, within the guided busway corridor, or within the disused railway line, each of which represents engineering risks and challenges relating to existing buried services and traffic and associated impacts on local | Land in the rural sections of the corridor includes predominantly grade 2 and 3 agricultural land. The corridor partially encroaches into an SSSI south of the Luton Road (which could potentially be avoided by narrowing the corridor). The corridor also intersects with areas of floodplain, and county and local level environmental designations (including wildlife sites) which may require routeing refinement and/or mitigation. A significant length of the former railway line is a county wildlife site.<br>The sections of pipeline constructed close to rural communities and properties have the potential to cause some disruption during construction. The sections of in road construction, and construction along the guided busway corridor through Dunstable and Houghton Regis would lead to significant traffic and other impacts on the local communities, with a very significant number of residential and community receptors potentially affected. | Parts of the route corridor are designated within the Chilterns National Landscape, and also intersect with Green Belt, and Minerals Safeguarding Areas. There are other local planning designations near to or affecting parts of the corridor, including conservation areas and public open space.<br>Some areas of land south of Dunstable and Houghton Regis are being promoted by landowners/developers as potential future development sites through the emerging local plan, and there are planning applications and permissions for development within parts of the corridor. | Whilst engagement with landowners and land referencing has not yet been undertaken for this pipeline corridor option, there are areas of land including public open space that will be special category land within the pipeline corridor. |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| | communities. The availability of land for temporary construction compounds within the urban area is a further constraint. | | | |
| **Alternative Pipeline Corridors from the Slapton Site (water storage- Site H) to site east of Leighton Buzzard (water treatment works – Site P)** | | | | |
| Corridor Option SP6 and SP4 | This section of the pipeline corridor option extends to approximately 4.5km in length. The raw water transfer pipeline routes to the west and north of Slapton, and to the south and east of Billington before crossing the A505.<br>The route requires the raw water transfer pipeline to cross the A505 and the River Ouzel, which would require trenchless crossings of these features. | The corridor intersects with areas of floodplain including Flood Zone 3 and county and local level environmental designations which may require routeing refinement and/or mitigation.<br>Land within the corridor includes predominantly grade 2, 3 and 4 agricultural land. The pipeline corridor option passes through open countryside, with sections of the pipeline corridor routeing close to neighbouring villages and isolated residential, agricultural, equestrian and other properties, as well as areas of open space. There is the potential for parts of these settlements and other properties to experience some disruption during construction. | Parts of the route are designated as Green Belt, Minerals Safeguarding Areas and an Area of Attractive Landscape. There are other local planning designations near to or affecting parts of the corridor, including conservation area and open space.<br>There are planning applications and permissions for development within parts of the corridor. | Whilst engagement with landowners and land referencing has not yet been undertaken for this option, there are areas of land including public open space that will be special category land within the pipeline corridor. |
| **Alternative Pipeline Corridors from the Site east of Leighton Buzzard (water treatment works – Site P) to Chaul End** | | | | |
| Corridor Option SP4, SP7 and SP10 | This section of the pipeline corridor option extends to approximately 14.5km in length. The drinking water transfer pipeline routes south to cross the A505 and then routes to the north of Eaton Bray, to the north of Whipsnade and Church End, and to the south of Chaul End. The route requires the drinking water transfer pipeline to cross the A505 and A5183, which would require trenchless | The corridor encroaches partly into an SSSI north of Church End (which could potentially be avoided by narrowing the corridor). The corridor also intersects with areas of floodplain, a former landfill site and county and local level environmental designations (including wildlife sites), and two areas of Ancient Woodland which may require routeing refinement and/or mitigation. | Parts of the route are designated within the Chilterns National Landscape, and also intersect with Green Belt, and Minerals Safeguarding Areas. There are other local planning designations near to or affecting parts of the corridor, including conservation areas.<br>Some areas of land south of Dunstable and Houghton Regis are being promoted by | Part of the corridor passes through National Trust land at Dunstable Downs and may involve common land. Whilst engagement with landowners and land referencing has not yet been undertaken for this pipeline corridor option, this is a potentially significant land constraint, and there are areas of land including public open space that will be special |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| | crossings of these features. There is a need for use of a trenchless technique to construct a section of the pipeline through and below the Dunstable Downs, which represents some engineering risk and additional cost. This would require sensitive routeing and consideration of trenchless construction technique to minimise impacts on Dunstable Downs during construction. | Land within the corridor includes predominantly grade 2, 3 and 4 agricultural land, but with a small area of grade 1.<br>The majority of this drinking water transfer pipeline corridor option passes through open countryside, with sections of the pipeline corridor routeing close to neighbouring villages and isolated residential, agricultural, equestrian and other properties, as well as areas of open space, and part of a gliding club. There is the potential for parts of these settlements and other properties to experience some disruption during construction. | landowners/developers as potential future development sites through the emerging local plan, and there are planning applications and permissions for development within parts of the corridor. | category land within the pipeline corridor. |
| Corridor Option SP4, and SP8 | The first half of this approximately 14.5km drinking water transfer pipeline corridor option passes through open countryside, with sections of the pipeline corridor routeing close to neighbouring villages and isolated residential, agricultural, equestrian and other properties. The second half of this pipeline corridor option routes through the built up areas comprising parts of Dunstable and Houghton Regis.<br>The drinking water transfer pipeline routes south to cross the A505 road corridor and then to follow the A505 east to the junction with the A5 and then would comprise in road construction along the A505 southwards through Chalk Hill, turning north east along the B5120 through Houghton Regis, and then south along Park Road North and Poynters Road, | The corridor partially encroaches into an SSSI at Chalk Hill (which could potentially be avoided by narrowing the corridor). The corridor also intersects with areas of floodplain, a former landfill site and county and local level environmental designations (including wildlife sites) which may require routeing refinement and/or mitigation. Land in the rural sections of the corridor includes grade 2 and 3 agricultural land.<br>The sections of pipeline constructed close to rural communities and properties have the potential to cause some disruption during construction. The sections of in road construction through Dunstable and Houghton Regis would lead to significant traffic and other impacts on the local communities, with a very significant | Parts of the route corridor are designated within the Chilterns National Landscape, and also intersect with Green Belt, and Minerals Safeguarding Areas. There are other local planning designations near to or affecting parts of the corridor, including conservation areas and public open space.<br>Some areas of land south of Dunstable and Houghton Regis are being promoted by landowners/developers as potential future development sites through the emerging local plan, and there are planning applications and permissions for development within parts of the corridor. | Whilst engagement with landowners and land referencing has not yet been undertaken for this pipeline corridor option, there are areas of land including public open space that will be special category land within the pipeline corridor. |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| | crossing the A505 and then in the A5065 road corridor before routeing south to Chaul End.<br>The route requires the drinking water transfer pipeline to cross the A505 and other major roads which may require trenchless crossing. There is a significant length of in road pipeline construction proposed, which represents engineering risks and challenges relating to existing buried services and traffic and associated impacts on local communities. The availability of land for temporary construction compounds within the urban area is a further constraint. | number of residential and community receptors potentially affected. | | |
| Corridor Option SP4, and SP9 | Approximately the first half of this 12.5km pipeline corridor option passes through open countryside, with sections of the pipeline corridor routeing close to neighbouring villages and isolated residential, agricultural, equestrian and other properties. The second half of this pipeline corridor option routes through the built up areas comprising parts of Dunstable and Houghton Regis.<br>From Site P, the drinking water transfer pipeline routes south from Site P to cross the A505 road corridor and then to follow the A505 east to a point north of Lower End, where the corridor then follows the former railway line corridor eastwards towards Dunstable. In Dunstable, the pipeline corridor crosses the A505 and is then routed along the Luton Dunstable guided busway corridor | The corridor partially encroaches into an SSSI south of the Luton Road (which could potentially be avoided by narrowing the corridor). The corridor also intersects with areas of floodplain, and county and local level environmental designations (including wildlife sites) which may require routeing refinement and/or mitigation. A significant length of the former railway line is a county wildlife site. Land in the rural sections of the corridor includes predominantly grade 2 and 3 agricultural land.<br>The sections of pipeline constructed close to rural communities and properties have the potential to cause some disruption during construction. The sections of in road construction, and construction along the guided busway corridor through Dunstable and Houghton Regis would lead to | Parts of the route corridor are designated within the Chilterns National Landscape, and also intersect with Green Belt, and Minerals Safeguarding Areas. There are other local planning designations near to or affecting parts of the corridor, including conservation areas and public open space.<br>Some areas of land south of Dunstable and Houghton Regis are being promoted by landowners/developers as potential future development sites through the emerging local plan, and there are planning applications and permissions for development within parts of the corridor. | Whilst engagement with landowners and land referencing has not yet been undertaken for this pipeline corridor option, there are areas of land including public open space that will be special category land within the pipeline corridor. |

| Transfer Option | Engineering Assessment Summary | Environment Assessment Summary | Planning Assessment Summary | Land Assessment Summary |
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| | through the Dunstable and Houghton Regis urban area, crossing the A505 and then in the A5065 road corridor before routeing south to Chaul End.<br>The route requires a significant length of pipeline construction proposed either in road, within the guided busway corridor, or within the disused railway line, each of which represents engineering risks and challenges relating to existing buried services and traffic and associated impacts on local communities. The availability of land for temporary construction compounds within the urban area is a further constraint. | significant traffic and other impacts on the local communities, with a very significant number of residential and community receptors potentially affected. | | |

Grand Union Canal Transfer

Moving water together

## Speak to the team

If you would like to ask any questions about the scheme, please feel free to get in touch with our engagement team:

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