



ANNEX B3.3.1

SEA

This document has been written in line with the requirements of the RAPID gate two guidance and to comply with the regulatory process pursuant to Severn Trent Water's and Affinity Water's statutory duties. The information presented relates to material or data which is still in the course of completion. Should the solution presented in this document be taken forward, Severn Trent Water and Affinity Water will be subject to the statutory duties pursuant to the necessary consenting process, including environmental assessment and consultation as required. This document should be read with those duties in mind.



Grand Union Canal Strategic Resource Option

Strategic Environmental Assessment

June 2022

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1 Introduction

1.1 Background

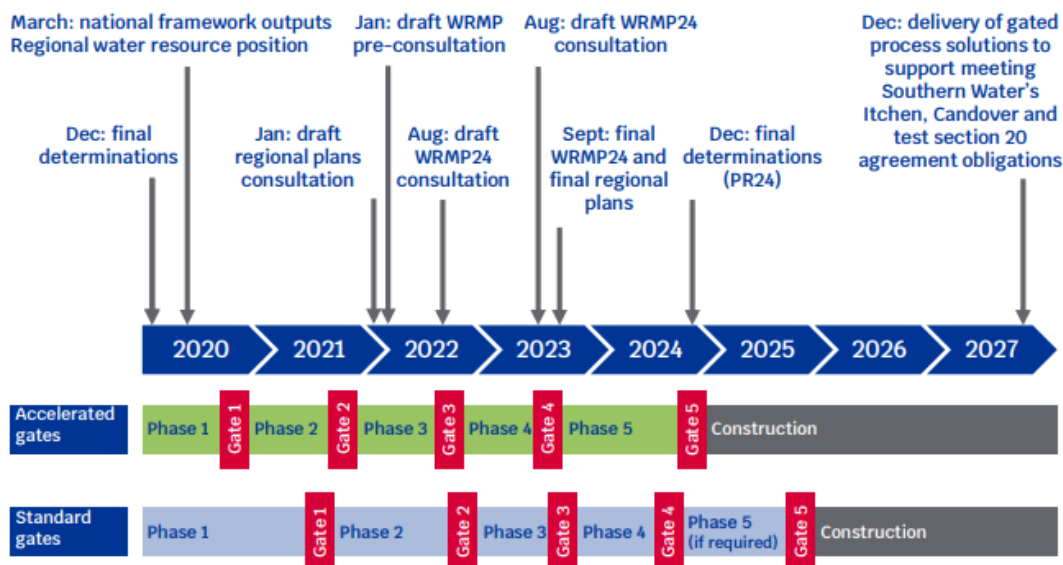
Ofwat, the economic regulator for the water and sewerage sectors in England and Wales, has identified the potential for water companies to jointly deliver strategic water resource schemes to secure long-term water supply resilience while protecting the environment.

To support the progression of these Strategic Resource Options (SROs), the Regulatory Alliance for Progressing Infrastructure Development (RAPID) has been established, comprised of representatives from Ofwat, the Environment Agency and the Drinking Water Inspectorate. RAPID has produced guidance for progressing each SRO which is aligned to a formal gated process to ensure that at each gate:

- Companies are progressing strategic water resource solutions that have been allocated funding at PR19 or have subsequently joined the programme.
- Costs incurred in doing so are efficient.
- Solutions merit continued investigation and development during the period 2020 to 2025.

The timelines for the assessment gates are shown in Figure 1.1 below; the Grand Union Canal (GUC) SRO is on the standard gate timeline and is currently at Gate 2.

Figure 1.1: Gated process for potential strategic regional water resource solutions¹



1.2 Grand Union Canal SRO

The GUC SRO has been jointly developed in partnership between Severn Trent Water (STW), Affinity Water (AW) and the Canal and River Trust (the Trust). At the start of Gate 1 a long-list of sub-option routes were derived for the GUC SRO. The discharge options were then shortlisted to three route options by the start of Gate 2 based on the following criteria: environmental and societal impacts; operational flexibility and resilience; operational and embedded carbon; and cost. Of these, Option Route 3 was selected. Optioneering was also undertaken with regards to

¹ Source: Regulators' Alliance for Progressing Infrastructure Development, Forward programme 2021-22, March 2021, available online at https://www.ofwat.gov.uk/wp-content/uploads/2021/03/RAPID-Forward-programme-2021_22.pdf, accessed 07/03/2022.

abstraction locations. A site at Leighton Buzzard was ultimately selected. Further detail on the options selection process is presented in Annex A1, Engineering CDR (WSP, 2022).

The single solution assessed at Gate 2 includes the pipeline from Minworth to Atherstone (Route 3), the canal transfer to Leighton Buzzard and the abstraction and treatment works at this location (hereafter referred to as 'the scheme').

The scheme has undergone environmental assessment as required by the RAPID Gate 2 guidance, Section 6. An Environmental Appraisal Report (EAR) (Annex B3.3.5) has been produced as an overarching document summarising and bringing together the various technical environmental assessments including:

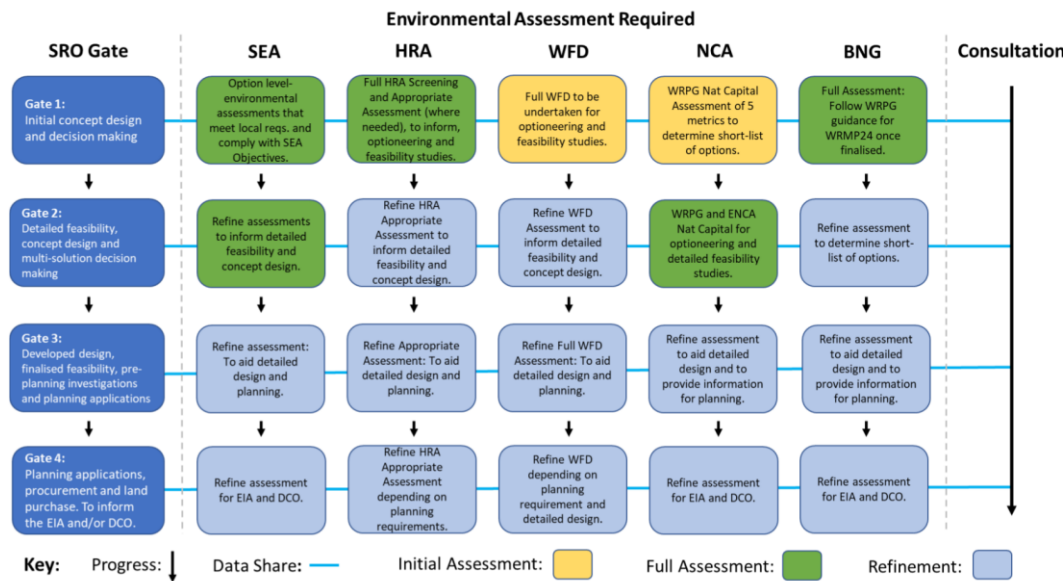
- Natural Capital and Biodiversity Net Gain (BNG) (Annex B3.3.2)
- Fish survey report (Annex B3.2.3)
- Habitats and protected species desk study (Annex B3.2.6)
- Habitats Regulations Assessment (HRA) (Annex B3.3.3)
- Invasive and non-native species (INNS) survey report (Annex B3.2.4)
- Sediment report (Annex B3.2.5)
- Strategic Environmental Assessment (SEA) (Annex B3.3.1, this document)
- Waterbody connections report (Annex B3.2.1)
- Water Framework Directive (WFD) Assessment (Annex B3.3.4)

This report forms the SEA option assessment update for Gate 2. The GUC SEA is not a formal SEA under the 2004 Regulations as it is a project not a plan or programme and is therefore, outside the scope of the SEA Regulations. The principles and assessment methodology for SEA has been applied to the GUC option as best practice and to enable results to be fed back into the WRSE Regional Plan SEA and WRMP24 SEA. This Annex is not an Environmental Report under the Regulations and therefore, doesn't contain all of the information as set out in Schedule 2. Compliant Environmental Reports will be produced for the Regional Plan and WRMP24.

Figure 1.2 below shows the integration of the statutory assessment reports (i.e. SEA, HRA, WFD, NCA/BNG) with the RAPID gated process. This schematic is taken from the All Companies Working Group (ACWG) guidance that was released in Gate 1. While this is still largely relevant and followed, it has been somewhat superseded by the RAPID Gate 2 guidance², which the Gate 2 assessments have followed.

² Strategic regional water resource solutions guidance for gate two, Regulators' Alliance for Progressing Infrastructure Development, February 2022, available online at https://www.ofwat.gov.uk/wp-content/uploads/2022/02/Strategic-regional-water-resource-solutions-guidance-for-gate-two_Feb_2022.pdf, accessed 09/02/2022.

Figure 1.2: Environmental Assessment Integration with SRO Gates³



1.3 Scheme Description

The scheme is shown below in Figure 1.3 and described in detail in the WSP Engineering Report, [Annex A1, Engineering CDR (WSP, 2022)]. It will comprise of a transfer rising from Minworth Wastewater Treatment Works (WwTW) to the Coventry Canal at the top of Atherstone lock flight. Once outside the Minworth site, and past the M42 and HS2 corridors, the rising main will pass through agricultural land until reaching the outskirts of Atherstone, a small market town within North Warwickshire. The rising main will discharge to the canal side at Coleshill Road, via a new discharge structure sized to avoid deleterious flow velocities and shears.

Transferred water will then progress along the Coventry Canal by gravity into the Oxford Canal at Hawkesbury Lock. Flows will need to bypass the Hawkesbury lock via a low lift pumping station.

The Oxford Canal will then convey the water to the Grand Union Canal at Braunston. The majority of the flow along the Oxford Canal will be by gravity, however a pumping station will be required to bypass the locks at Hillmorton.

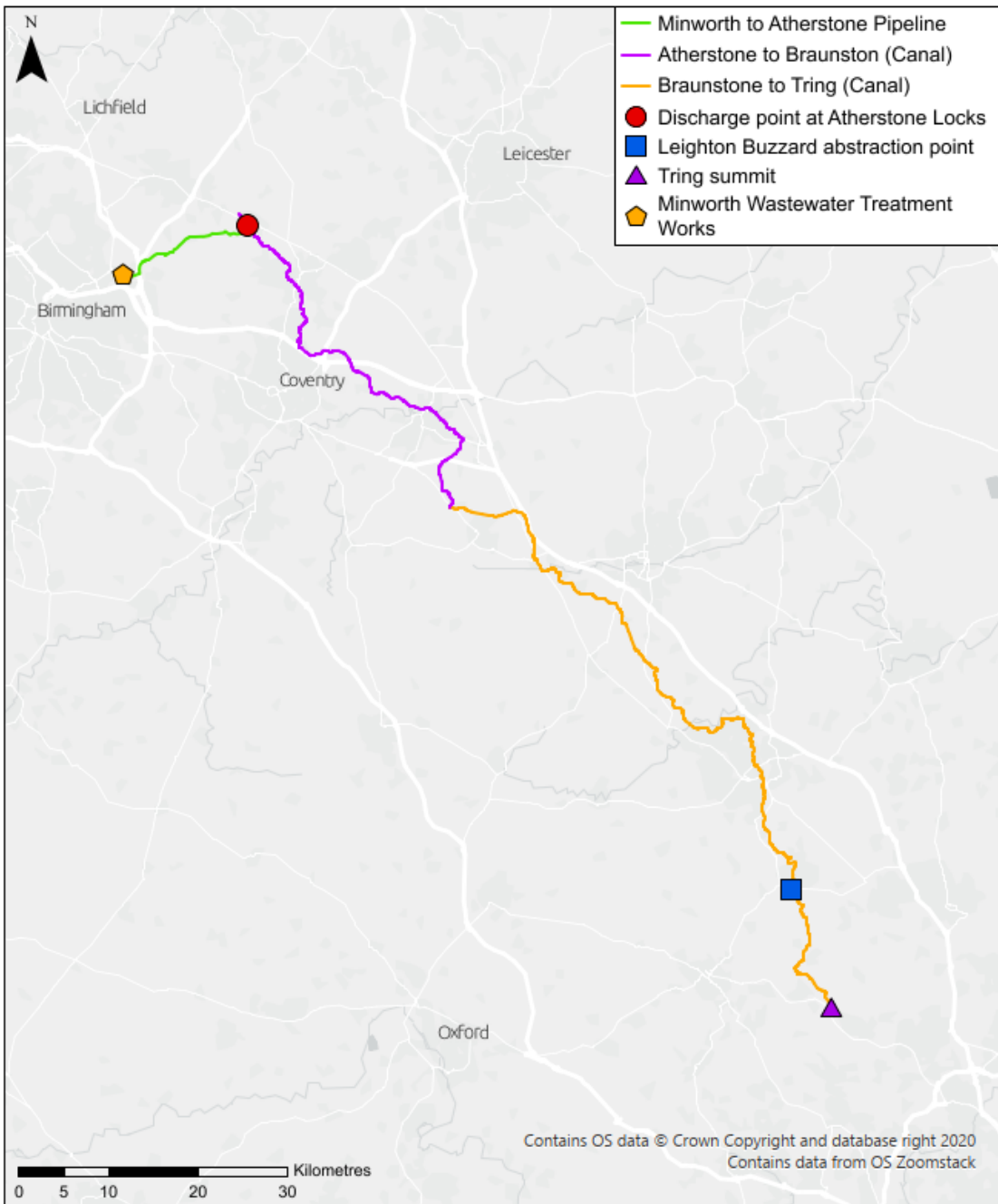
At Braunston a bypass pumping station will be required to lift flows from near Braunston Marina to the top lock just before Braunston Tunnel. From Braunston to the abstraction and treatment site at Leighton Buzzard, four additional lock bypass pumping stations will be required south of Milton Keynes at Fenny Stratford, Stoke Hammond, Three Locks and Leighton. The Grand Union Canal section will also require eight gravity bypasses around “downflow” locks at the Wilton Marine Lock Flight, Stoke Bruerne Lock Flight and Cosgrove Lock.

Flow will be abstracted from the Grand Union Canal just south of the A4146 bridge, after the River Ouzel. The site currently proposed at Gate 2 for the treatment works is on relatively flat land slightly raised from the river and canal, although further investigations will be carried out at Gate 2/3 to determine the precise location. Flow will therefore need to cross the River Ouzel within a new, short pipeline and be pumped into an operational raw water storage reservoir before gravitating into the first stage of treatment. Additional interstage pumping in the treatment works will be required with final high lift pumps transferring potable treated water to a new clean water holding tank at the existing Chaul End Water Supply Reservoir (WSR).

³ Source: All Companies Working Group, WRMP environmental assessment guidance and applicability with SROs, Mott MacDonald, October 2020

During the option selection process, it was determined this option would have the least overall cost, lowest environmental impact and greatest opportunity for net gain and public benefit. The slightly higher operational cost when compared to Route 1, due to longer transfer from Minworth to Atherstone, can be partially offset by energy recovery from the break tank to outfall.

Figure 1.3: The Scheme



1.4 Assumptions and Limitations

The following assumptions have been used within the assessment:

- The design assumptions stated in the WSP Gate 2 Position Paper - Route Selection technical note⁴ can be applied to the Gate 2 Environmental Assessments, including assumption that >50mm depth change requires towpath raising is valid.
- The assessment is based on a 'worst-case' 100% utilisation of the SRO.
- Tring represents the southeast limit of influence of the SRO.
- The volume of water passing northwest (after discharging from pipeline) due to the locks opening at Atherstone is deemed to be of minimal change.
- The risk of fish and INNS travelling northwest of Atherstone is not increased due to the scheme.
- The SEA has used desk-based GIS information and has been informed by the results of the other environmental assessments.
- There is limited data on what priority habitats are present along the affected route as well as area and condition of the habitat.
- The pipeline route between the treatment plant at Minworth and the outflow at Atherstone has not been confirmed yet.
- The pipeline between the abstraction at Leighton Buzzard and the Affinity treatment works has not been confirmed yet.
- Limited understanding of the hydrological connectivity of the GUC to Nene Valley Gravel Pits SPA and Ramsar.

These limitations will be addressed at Gate 3 and included as part of the Gate 3 assessments.

⁴ Gate 2 Position Paper - Route Selection, WSP Technical Note, 25 January 2022

2 GUC Option Assessment

The GUC option has been assessed using the SEA assessment method and SEA objectives as developed for the WRSE Regional Plan and Affinity Water WRMP24 (see WRSE SEA Scoping Report, Mott MacDonald, September 2020⁵). Each SEA objective has a set of defined datasets and a defined scoring system using a qualitative scale of minor, moderate, major positive and minor, moderate, major negative, and neutral as summarised in Table 2.1. The effects of the GUC option were assessed using this scale and a narrative justification. The datasets and scoring definitions are presented in full in Appendix A.

Table 2.1: Scoring key

Effect	Description
+++	Major Positive
++	Moderate Positive
+	Minor Positive
0	Neutral
-	Minor Negative
--	Moderate Negative
---	Major Negative
?	Uncertain

Table 2.2 presents the assessment results. The assessment has been informed by the other environmental assessments undertaken for GUC as set out in section 1.2. The HRA, fish survey, habitats and protected species desk study, Natural Capital and BNG assessment, and INNS assessment have informed the SEA objective on biodiversity and the WFD assessment has informed the SEA objective on water quality.

The SEA assessment looks at the pre-mitigation and residual construction and operational effects of the GUC option. Pre-mitigation effects are before any additional mitigation measures such as construction best practice, further surveys or additional landscaping proposals but includes measures that are embedded (already part of) the design. Residual effects are the effects predicted after the identified additional mitigation measures have been implemented.

⁵ The WRSE Scoping Report is available at: <https://www.wrse.org.uk/media/51vdwyw0/wrse-regional-plan-strategic-environmental-assessment-scoping-report.pdf>

Table 2.2: GUC – SEA Option Assessment

SEA Topic	SEA Objective	Construction Effects		Operational Effects		Comment	Mitigation	Residual Construction Effects		Residual Operational Effects	
		+	-	+	-			+	-	+	-
Biodiversity, flora and fauna	Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)	0	---	0	-	<p>The proposed pipeline between Minworth and Atherstone is within 500m of Bentley Park Wood SSSI (100 % Favourable) which supports a sizeable bird community and is one of three localities in the county for breeding redstart; no direct impacts are anticipated, however, there is potential for construction effects resulting from noise and air pollution with potential to impact on the bird communities. The scheme proposes gravity transfer of water via the Coventry and Oxford Canal. The required pumping stations are located at points of existing development with relatively simple access, existing local power supplies and utilities. These have sufficient space without significant risk of development blight and have relatively easy bypass pipe routes apparently available. There may also be opportunities to improve environmental and biodiversity status local to the pumping stations.</p> <p>Upgrades to the Coventry and Oxford Canal have potential for construction to have disturbance impacts on Newbold Quarry Park LNR which is immediately adjacent to the canal and has a white claw crayfish population which may be affected by the scheme (as identified in the Habitats and Species Desk Study (Annex B3.2.6).⁶ Wyken Slough LNR, Ashlawn Cutting LNR, Swift Valley LNR and Linnell Road LNR which are within 500m of the Canal. No operation impact anticipated.</p> <p>There are several SSSIs located within 1km of the option including Boon's Quarry SSSI, Woodlands Quarry SSSI, Griff Hill Quarry SSSI, Blisworth Rectory Farm Quarry SSSI, Nares Gladley Marsh SSSI, Mill Crook SSSI. Construction works including upgrades to the canal embankments may have temporary disturbance effects on these designated sites and their qualifying species. HRA stage 1 screening identified potential uncertain effects on the following designated sites: Upper Nene Valley Gravel Pits SPA and Ramsar site, Upper Nene Gravel Pits SSSI (Favourable - 1.49%, Unfavourable - Recovering - 48.48%, Unfavourable - No change - 50.03%, Unfavourable - Declining - 0.00%) due to potential hydrological connection from the GUC downstream along Wilton Brook/River Nene. HRA stage 1 also identified uncertain effects on Chiltern Beechwoods SAC and Ashridge Commons and Woods SSSI: (Favourable - 86.33%, Unfavourable - Recovering - 13.67%, Unfavourable - No change - 0.00%, Unfavourable - Declining - 0.00%) due to the proximity to the Tring intake, although there is no hydrological connection. However, the preferred option includes an intake at Leighton Buzzard approximately 10km away from the SAC and therefore, effects are no longer anticipated and no pathways identified through which the designated site can be affected. Both Chiltern Beechwoods SAC and the Upper Nene Valley Gravel Pits SPA have an air quality conservation objective. A HRA Appropriate Assessment (Annex B3.3.3)⁷ was undertaken that concluded there is unlikely to be significant effects on the designated sites.</p> <p>Various areas of ancient woodland and priority habitats including deciduous woodland and good quality semi-improved grasslands are also found within close proximity to the option. The pipeline goes round the boundary of Gallops Hill Wood ancient woodland area and a small section of the Oxford Canal is adjacent to All Oaks Wood ancient woodland. Construction may cause disruption to flora and fauna. The Minworth to Atherstone pipeline crosses an area of priority habitat (Deciduous woodland) at location 52.546421 lat, -1.695347 long and a lake. This area is known as Lea Marston Depot and is a historic landfill site. The purification lakes at this site have helped to clean the River Tame for decades and were dredged to remove harmful silts from upstream that settled in the lakes. The site has been left to rewild naturally and is now at SSSI standard due to the varied habitat mosaic. The lakes offer overwintering bird habitat. are part of the Tame Valley Wetlands Landscape and are a Nature Improvement Area. There would be disturbance and direct loss of habitat from this area under the current pipeline route. Construction effects may impact on habitat condition, making affected habitats less resilient to climate change. There are no designated sites or GWDTE (groundwater dependent terrestrial ecosystems) in close proximity to the proposed abstraction site at Leighton Buzzard, nor in proximity to the proposed treatment works site. There are however areas of priority habitat (deciduous wood land) which, depending on the exact location of the works, may be permanently lost during construction. There are no designated sites or GWDTE along the proposed connection to Chaul End. There are pockets of woodland just outside the proposed works area but these will not be directly affected. The results of the fish eDNA surveys⁸ indicate that fish communities represented in the study area are composed mostly of cyprinid species. Results indicated the bullhead (<i>Cottus gobio</i>) and minnow (<i>Phoxinus phoxinus</i>), are the most abundant and frequent species within the study area, followed by stone loach (<i>Barbatula Barbatula</i>) and to less extent roach (<i>Rutilus rutilus</i>). Electrofishing will be undertaken in June 2022 which will inform assessment of effects on fish communities. For much of its length, the canal provides suitable habitat for otters to commute and forage. The canal corridor, and adjacent land parcels, often contain suitable habitat for otters to create and maintain holts and laying up sites. Impacts on otters are likely to be dependent on the extents of the works, the construction methodologies, and on how much bank is affected in any otter territory at any one time. The canal corridor is of mixed suitability for water voles. They are far less mobile than otters, and so in areas where habitat is suitable, there are likely to be more per unit length of bank than otter. Water voles are present on the Coventry Canal which forms an important corridor for a regionally important meta population in the Midlands and have the potential to be affected by the scheme. Further information on habitats and species is presented in the Habitats and Protected Species Desk Study (Annex B3.2.6)⁹. The Natural Capital and BNG assessment¹⁰ concluded that the scheme would cause temporary loss of natural capital stocks and</p>	Ecological survey conducted prior to construction. Implementation of habitat compensation and relocation where required. A number of mitigation measures are assumed in the HRA, and these should be implemented as part of the GUC works. Recommendations for additional surveys are presented in the Habitats and Protected Species Desk Study. The INNS Risk Assessment recommends further field surveys and incorporation of biosecurity measures into the transfer design and operational protocol. Gate 3 to review pipeline route to avoid the Lea Marston Depot site. Gate 3 to review pipeline route to avoid loss of ancient woodland and traditional orchards. Natural capital and BNG mitigation and enhancement opportunities for the scheme are suggested within Section 4 of Annex B3.3.2, which can work in tandem to reduce the loss of BNG and introducing net gain. It identified opportunities for BNG unit purchase, and the various habitat creation possibilities both on-site and off-site. It is highly recommended that these should be developed further during Gate 3, as well as exploring wider partnerships with landowners, conservation groups and other organisations to help deliver opportunities for biodiversity enhancement.	0	-	0	-

⁶ Annex B3.2.6 Habitats – Study and Assessment of Environmental Impact (May 2022)
⁷ Annex B3.3.3 Statutory Environmental Assessments – Habitats Regulations Assessment (May 2022)
⁸ Annex B3.2.2 E-Fishing Report (May 2022)
⁹ Annex B3.2.6 Habitats – Study and Assessment of Environmental Impact (May 2022)
¹⁰ Annex B3.3.2 Statutory Environmental Assessments – Natural Capital and Biodiversity Net Gain

SEA Topic	SEA Objective	Construction Effects		Operational Effects		Comment	Mitigation	Residual Construction Effects		Residual Operational Effects	
		+	-	+	-			+	-	+	-
						potential permanent loss of ancient woodland and traditional orchards, and that there would be a net loss of BNG habitat units. The INNS Risk Assessment (Annes B3.2.4) ¹¹ that concluded the scheme will not introduce a new hydrological connection between previously isolated catchments; the proposed canal transfer route and hydrologically connected waterbodies within an approximately 1km radius already host a range of aquatic INNS, including a number of High Impact species; although the addition of treated water from a WwTW will not introduce new INNS to the canal network, the resulting increase in flows may facilitate the downstream spread of INNS already present in the receiving waterbody.					
Soil	Protect and enhance the functionality, quantity and quality of soils	0	--	0	0	Loss of grade 3 agricultural land at location of treatment works at Leighton Buzzard is likely. The option pipeline and canal upgrade works intersect Grade 1, 2 and 3 agricultural land and the connection to Chaul End is within Grade 3 agricultural land. The pipelines will cause disruption during construction but should be reinstated on completion. Numerous authorised and historic landfill sites are also intersected or close by. Any construction may result in localised contamination of soils, especially during construction of the pipeline between Minworth and Atherstone. The Leighton Buzzard WTW is on a historic landfill site and the connection to Chaul End also goes through a historic landfill site (Grovebury Quarry).	Best construction practices and pollution prevention and control measures. Reinstatement of agricultural land over pipelines.	0	-	0	0
Water	Increase resilience and reduce flood risk	0	-	0	0	Potential flood risk during construction of pipeline. Parts of the scheme lie within flood zones 2 and 3. Transfer of water may increase canal volumes, posing potential increased flood risk.	Best practice mitigation measures will likely be implemented to minimise effects during construction to ensure minimal risk of flooding events.	0	-	0	0

¹¹ Annex B3.2.4 Invasive Non-Native Species Assessment (May 2022)

SEA Topic	SEA Objective	Construction Effects		Operational Effects		Comment	Mitigation	Residual Construction Effects		Residual Operational Effects	
		+	-	+	-			+	-	+	-
	Protect and enhance the quality of the water environment and water resources	0	-	0	--	WFD groundwater bodies intersected. Areas of the scheme also lie within groundwater Source Protection Zones. The WFD Assessment (Mott MacDonald, March 2022) ¹² states that the scheme is not anticipated to significantly affect groundwater bodies and therefore, they are not considered further in the WFD Level 2 assessment. Changes to canal levels and flow could affect chemistry and aquatic communities. Watercourses are intersected by the option with potential for impact to water quality during construction and operation. The WFD Assessment Level 1 and Level 2 (Mott MacDonald, March 2022) ¹³ has been undertaken which indicated that there are potential WFD compliance risks associated with the operational stage of the option and recommends that further WFD assessment would be required for future work on the design at Gate 3 and beyond, to improve the confidence and certainty levels of WFD impacts and compliance risk outlined in the Gate 2 WFD Level 2 assessments.	Monitoring of water quality and water levels. Pollution prevention and control measures implemented during construction. See Gate 2 WFD Assessment (Mott MacDonald, March 2022) for further mitigation details. Further WFD assessment required as design progresses through Gate 3.	0	0	0	--
	Deliver reliable and resilient water supplies	0	0	++	0	The scheme presents a large-scale transfer, improving water availability and resilience across the region.	N/A	0	0	++	0
Air	Reduce and minimise air emissions	0	-	0	0	The scheme will intersect three air quality management areas. Increases in air emissions are likely during construction of the pipeline and other built assets. Pumping during operation will be required which could affect air quality, particularly in the AQMAs (depending on pump station locations). The pipeline route currently goes over hills between Minworth and Atherstone which will require pumping and generate associated emissions.	Best construction practices to be implemented. Investigate innovations for pumping stations and use of low zero carbon technologies/power sources.	0	-	0	0
Climatic Factors	Reduce embodied and operational carbon emissions	0	-	0	-	The scheme will likely generate carbon emissions due to material use, construction traffic and construction activities. Carbon will also be generated during operation from abstraction pumps. The pipeline route currently goes over hills between Minworth and Atherstone which will require pumping and generate associated carbon emissions. Carbon data tbc.	Design to consider measures to reduce embodied carbon. Investigate use of renewable energy for construction and operation.	0	-	0	-
	Reduce vulnerability to climate change risks and hazards	0	0	+	0	The scheme will improve regional transfers, increasing resilience of the natural environment during potential future drought scenarios.	N/A	0	0	+	0
Landscape	Conserve, protect and enhance landscape, townscape and seascape character and visual amenity	0	--	+	0	Improvements to canal will increase visual amenity and enhance character around the canal. The scheme will intersect several national landscape character areas. Some areas of the scheme also lie within Green Belt land. Largest disruption will be where pipeline will be constructed. Some permanent above ground structures will be present such as pumping station, treatment works and outfalls and adjustments to existing canal infrastructure.	Construction management plan and temporary screening during construction. Permanent screening and restoration to original landscape character where possible once construction is complete.	0	-	+	0

¹² Annex 3.3.4 Statutory Environmental Assessments – Water Framework Directive (May 2022)

¹³ Annex 3.3.4 Statutory Environmental Assessments – Water Framework Directive (May 2022)

SEA Topic	SEA Objective	Construction Effects		Operational Effects		Comment	Mitigation	Residual Construction Effects		Residual Operational Effects	
		+	-	+	-			+	-	+	-
Historic Environment	Conserve, protect and enhance the historic environment, including archaeology	0	--	0	0	Numerous Listed Buildings are found in close proximity to the scheme both along the proposed pipeline route and the canals. Construction may affect the setting of Listed Buildings but they are unlikely to be directly impacted. The pipeline follows Coleshill Road which is adjacent to the south side of the boundary of Merevale Park Registered Park and Garden which also contains the Merevale Abbey Scheduled Monument. Construction works may have permanent impacts to buried archaeology. There are several Scheduled Monuments and Registered Parks and Gardens within 500m of the canal. Upgrade works to the canal may affect the setting during construction but they are unlikely to be directly impacted. In particular the canals run adjacent to the following Scheduled Monuments: Shrunken Medieval Village, Woughton on the Green; Great Linford Brickworks; Motte and bailey castle, deserted village and monastic grange at Old Wolverton; Roman villa SE of Cosgrove Hall; Braunstonbury deserted medieval village, moat and fishpond. The Grand Union Canal runs through Campbell Park, Milton Keynes Registered Park and Garden, therefore, any upgrade works may affect the Registered Park and Garden. The connection to Chaul End is approx. 1.8km from Ascott House Registered Park and Garden, therefore, no effects are anticipated.	Construction management plan and temporary screening during construction. Reinstatement of dug materials where possible.	0	-	0	0
Population and Human Health	Maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing	0	-	+	0	Potential effects on community assets but use of existing canals suggests minimal disruption along the majority of the route due to only small changes to existing canal infrastructure required. Disturbance most likely in areas surrounding above ground structures and pipeline that require construction. Once operational, communities will benefit from greater water availability. The proposed WTW is opposite an operational sand quarry, there may be temporary impacts to the operation of the quarry during construction works.	Construction management plan including traffic management. Best construction practices such as use of plant silencers. Use of directional drilling for pipeline to minimise disturbance to existing infrastructure.	0	-	+	0
	Maintain and enhance tourism and recreation	0	-	+	0	Several national trails and national cycle networks, as well as sports facilities and golf courses are intersected by, or in close proximity to, the scheme. Due to the option using existing stretches of canals, effects on tourism and recreational activities are likely to be minimal, confined to areas of canals that require changes to existing infrastructure and areas of construction such as the pipeline between Minworth and Atherstone, abstraction points and outfalls. Given the location of the proposed WTW is unlikely to cause permanent or temporary impacts to tourism or recreation. Works to upgrade the canal may cause disruption to recreational users of the canal and navigation uses. However, the upgrade should provide improvements to the canal infrastructure.	Construction management plan including traffic management. Best construction practices such as use of plant silencers, appropriate diversions and signage. Use of directional drilling for pipeline to minimise disturbance to existing infrastructure.	0	-	+	0
Material Assets	Minimise resource use and waste production	0	-	0	0	Construction is likely to require resources for pipeline construction, abstraction points and outfalls, and amendments to existing canal infrastructure. Waste material likely to be produced during construction.	Source materials locally and reinstate dug materials where possible.	0	-	0	0
	Avoid negative effects on built assets and infrastructure	0	-	+	0	Numerous small roads as well as the M42/M6 Toll and A446 are intersected by the proposed pipeline, temporary impacts to roads such as diversions may be required. Use of existing canals suggests minimal disruption along the majority of the route due to only small changes to existing canal infrastructure required. Disturbance most likely in areas surrounding above ground structures and pipeline that require construction. Opportunities to improve existing canal infrastructure. Potential disruption for navigation on the canals during construction.	Best construction practices including traffic management planning to be implemented. Potential for directional drilling where necessary e.g. under motorways.	0	-	+	0

3 In-Combination Effects

3.1 Approach to In-Combination Effects

An initial in-combination effects assessment has been undertaken as part of the SEA update for the Gate 2 submission for the scheme. It is understood that if the scheme is selected as an option in the WRSE Regional Plan and Affinity WRMP24 it will be subject to further in-combination effects assessment with the other selected options, neighbouring water companies plans and neighbouring regional plans. Until the WRSE Best Value Regional Plan has been developed and agreed, it is not known when the scheme would be implemented, and therefore, which other developments it could act in-combination with it. Therefore, for the purposes of this in-combination effects assessment it has been assumed that the scheme would be implemented at the same time as the other developments considered.

The following plans, programmes and projects have been considered within this in-combination effects assessment:

- **Other SROs** - Abingdon reservoir, London effluent reuse, South Lincolnshire reservoir, Fawley desalination, River Itchen effluent reuse, Vyrnwy reservoir, Minworth effluent reuse source, United Utilities sources, West Country south sources (and associated transfers), Severn Trent Water sources, West Country north sources (and associated transfers), River Severn to River Thames transfer Joint solution, Thames Water – Southern Water transfer.
- **Development Consent Order (DCO) Schemes** (Within 10km buffer, based on HRA ZoI, information taken from National Infrastructure Planning website¹⁴) - M42 Junction 6 Improvement, Daventry International Rail Freight Terminal, Northampton Gateway Rail Freight Interchange.
- **Hybrid Bills** – High Speed Two (HS2).
- **Local Development Frameworks** – North Warwickshire Local Plan, Birmingham Development Plan, Solihull Local Development Plan, Aylesbury Value Local Plan, Central Bedfordshire Local Plan, Dacorum Local Plan.

Other proposed schemes and developments, including non-DCO schemes such as the Bedford and Milton Keynes Waterway Park under development by the Environment Agency and Water Resource East (WRE), will not be included within this in-combination assessment. As set out in section 3.1, until the WRSE Best Value Regional Plan has been developed and agreed, it is not known when the scheme would be implemented, and therefore, which other developments could act in-combination with it. The in-combination assessment has therefore been limited to the above large developments; a more detailed assessment including smaller developments will be carried out during further assessment to be carried out at later Gates.

3.2 In-Combination Effects Assessment

3.2.1 Other SROs

Abingdon reservoir, London Reuse, Fawley desalination, South Lincolnshire reservoir, River Itchen effluent reuse, Vyrnwy reservoir, United Utilities sources, West Country south sources (and associated transfers), Severn Trent Water sources, West Country north sources (and associated transfers), Thames Water – Southern Water transfer are unlikely to have in-combination construction effects with the scheme due to the distance between the schemes. It is also unlikely that there would be operational effects as the scheme will use treated effluent from Minworth WwTW and will not share source or discharge locations with the above SROs.

¹⁴ [National Infrastructure Planning \(planninginspectorate.gov.uk\)](https://planninginspectorate.gov.uk), date accessed 3rd March 2022.

However, this should be confirmed with the other SRO schemes during the assessment to be carried out at later Gates.

Minworth effluent reuse source and River Severn to River Thames transfer Joint solution could potentially interact with GUC at Minworth. Therefore, there are potential for in-combination construction effects if the schemes are implemented together such as construction traffic, noise, dust and visual intrusion. There are potential for in-combination operational effects with these options which need to be further investigated at Gate 3 as the SRO designs progress.

3.2.2 DCO Schemes

The M42 Junction 6 improvement scheme is not situated along the GUC route, however, the new pipeline between Minworth and Atherstone crosses the M42/M6 Toll at junction 9. Assuming that directional drilling is used under the motorway there would be no disruption effects to the M42. The two projects could result in more construction traffic on the same roads in the area. If the GUC SRO construction traffic uses the M42, then the junction 6 improvements may cause delays.

The proposed Daventry International Rail Freight Terminal is approximately 2.6km north-east of the Oxford canal. It is unlikely that the canal improvement works would have in-combination effects with the freight terminal construction, although the two projects could result in more construction traffic on roads in the area. Operational effects are also unlikely, however, if the freight terminal is already operational during the scheme works then there is an opportunity for rail transport of materials if required.

The proposed Northampton Gateway Rail Freight Interchange is approximately 2.3km north-east of the Grand Union Canal. It is unlikely that the canal improvement works would have in-combination effects with the freight terminal construction, although the two projects could result in more construction traffic on roads in the area. Operational effects are also unlikely, however, if the freight terminal is already operational during the scheme works, then there is an opportunity for rail transport of materials if required.

3.2.3 Hybrid Bills

The HS2 route intersects the proposed Minworth to Atherstone pipeline near the Minworth end, around the M42 junction 9. Whitacre Heath SSSI is approximately 1.4km from the HS2 route and 2km from the GUC Minworth to Atherstone pipeline route at this point. In-combination construction effects could cause disturbance effects for the SSSI and for local residents from construction noise, traffic, dust and visual intrusion. No operational cumulative effects are anticipated.

3.2.4 Local Development Frameworks

The Local Development Framework (LDF) for the local authorities that the GUC option covers have been reviewed and the Local Plan policy maps used where available to identify potential in-combination effects with LDF proposals.

Atherstone and most of the proposed pipeline route fall under the North Warwickshire Local Plan (September 2021)¹⁵ and the pipeline is within green belt land but no in-combination effects with LDF proposals were identified.

Minworth is within the Birmingham Development Plan (January 2017)¹⁶ area. Under the Development Plan Minworth falls within a Policy TP19 core employment area. To the northeast

¹⁵ North Warwickshire Borough Council (September 2021) Adopted Local Plan 2021. Available online at: https://www.northwaricks.gov.uk/downloads/download/2682/adopted_local_plan_2021, accessed 11/03/2022

¹⁶ Birmingham City Council (January 2017) Adopted Birmingham Development Plan. Available online at: https://www.birmingham.gov.uk/info/20054/planning_strategies_and_policies/78/birmingham_development_plan, accessed 11/03/2022

is Policy GA6 Peddimore (71 ha of new employment land B1(b)(c), B2 and B8). No in-combination effects are anticipated.

The Leighton Buzzard pipeline and WTW is within the Central Bedfordshire Local Plan (July 2021)¹⁷ area. Nearby policies/designations include Green Belt, Conservation Area, Outdoor Sport, Leisure & Open Space Sites, and Greensand Ridge Nature Improvement Area. However, in-combination effects with these policies/designations are not anticipated.

The GUC option is unlikely to have in-combination effects with the other LDFs as it is not within or close to any planned housing and employment allocation sites or other policies/designations and is largely existing canal.

¹⁷ Central Bedfordshire Council (July 2021) Local Plan 2015 to 2035. Available online at: <https://www.centralbedfordshire.gov.uk/localplan/>, accessed 11/03/2022

A. Assessment Scoring Criteria

SEA Objective	Datasets/Key Themes	Effect	Description
Biodiversity, Flora, Fauna: ● Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)	<ul style="list-style-type: none"> ● SPA ● SAC ● Ramsar site ● SSSIs ● MPA ● MCZ ● NNR ● LNR ● Priority habitats and species ● Non-designated sites ● Terrestrial, aquatic and marine habitats, species and protected sites ● Green networks and corridors (e.g. foraging areas and commuting routes, migration routes, hibernation areas etc. at all scales) 	+++	Major Positive The option would result in a major enhancement on the quality of designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat quality and availability. The option would result in a major increase in the population of a priority species. Effects could be caused by beneficial changes in water flows/water quality, or large amounts of creation or enhancement of habitat, promoting a major increase in ecosystem structure and function. The option would result in a major reduction or management of INNS.
		++	Moderate Positive The option would result in a moderate enhancement on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat creation and enhancement measures. The option would result in a moderate increase in the population of a priority species. Effects could be caused by beneficial changes in water flows/water quality, or moderate amounts of creation or enhancement of habitat, promoting a moderate increase in ecosystem structure and function. The option would result in a moderate reduction or management of INNS.
		+	Minor Positive The option would result in a minor enhancement of the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat creation and enhancement measures. The option would result in a minor increase in the population of a priority species. Effects could be caused by beneficial changes in water flows/water quality, or small amounts of creation or enhancement of habitat, promoting a minor increase in ecosystem structure and function. The option would result in a minor reduction or management of INNS.

SEA Objective	Datasets/Key Themes	Effect	Description
		0	<p>Neutral</p> <p>The option would not result in any effects on designated or non-designated sites including habitats and/or species). It will not have an effect on INNS.</p>
		-	<p>Minor Negative</p> <p>The option would result in a minor negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation.</p> <p>The option would result in a minor decrease in the population of a priority species.</p> <p>Effects could be caused by detrimental changes in flows/water quality, or small losses or degradation of habitat leading to a minor loss of ecosystem structure and function.</p> <p>The option would result in a minor increase or spread of INNS.</p>
		--	<p>Moderate Negative</p> <p>The option would result in a moderate negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation.</p> <p>The option would result in a moderate decrease in the population of a priority species.</p> <p>Effects could be caused by detrimental changes in flows/water quality, or moderate loss or degradation of habitat leading to a moderate loss of ecosystem structure and function.</p> <p>The options would result in a moderate increase or spread of INNS.</p>
		---	<p>Major Negative</p> <p>The option would result in a major negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation.</p> <p>HRA results indicate potential for Likely Significance Effects</p> <p>The option would result in a major decrease in the population of a priority species.</p> <p>Effects could be caused by detrimental changes in flows/water quality, or large losses or degradation of habitat leading to a major loss of ecosystem structure and function.</p> <p>The option would result in a major increase or spread of INNS.</p>
		?	<p>Uncertain</p> <p>From the level of information available the effect that the option would have on this objective is uncertain</p>

SEA Objective	Datasets/Key Themes	Effect	Description
Soil: <ul style="list-style-type: none"> Protect and enhance the functionality, quantity and quality of soils 	<ul style="list-style-type: none"> Agricultural Land Classification Landfill sites – authorised and historic 	+++	Major Positive The option would result in a major enhancement on the quality of soils through the implementation of catchment approaches, remediation or other measures.
		++	Moderate Positive The option would result in a moderate enhancement on the quality of soils through the implementation of catchment approaches, remediation or other measures.
		+	Minor Positive The option is located on a brownfield site and has no effect on soils or existing land use. The option results in the remediation of contaminated land.
		0	Neutral The option would not result in any effects on soils or land use.
		-	Minor Negative The option is not located on a brownfield site and/or results in a minor loss of best and most versatile agricultural land or is in conflict with existing land use. The option results in land contamination.
		--	Moderate Negative The option will result in a moderate loss of best and most versatile agricultural land or is in substantial conflict with existing land use. The option is partially overlying mineral resources leading to partial mineral sterilisation.
		---	Major Negative The option will result in a major loss of best and most versatile agricultural land or is in substantial conflict with existing land use. The option results in land contamination. The option is directly overlying mineral resources leading to mineral sterilisation.
		?	Uncertain From the level of information available the effect that the option would have on this objective is uncertain
Water: <ul style="list-style-type: none"> Increase resilience and reduce flood risk 	<ul style="list-style-type: none"> Environment Agency Flood Defences 	+++	Major Positive The option results in addressing failure of WFD Good Ecological Status / Good Ecological Potential. The option would result in a major improvement to flood risk. The option would result in a major improvements in water efficiency, reduces demand and improves resilience.

SEA Objective	Datasets/Key Themes	Effect	Description	
<ul style="list-style-type: none"> • Protect and enhance the quality of the water environment and water resources • Deliver reliable and resilient water supplies 	<ul style="list-style-type: none"> • Environment Agency Main Rivers • Flood Zones 2 and 3 • Surface Water Features • WFD River Waterbody Catchments • WFD River Waterbodies Cycle 2 • Bathing Waters (for desal options) • Shellfish Waters (desal options) • Source Protection Zones • WFD Groundwater bodies 		Additional MI/d capacity over 50MI/d	
		++	Moderate Positive	<p>The option achieves savings through demand management and does not require abstraction to achieve yield.</p> <p>The option contributes to addressing failure of WFD Good Ecological Status / Good Ecological Potential.</p> <p>The option would result in a moderate improvement to flood risk.</p> <p>The option would result in a moderate improvements in water efficiency, reduces demand and improves resilience.</p> <p>Additional MI/d capacity between 25.1 and 50 MI/d</p>
		+	Minor Positive	<p>The option achieves savings through demand management and does not require abstraction to achieve yield.</p> <p>The option would result in a minor improvement to flood risk.</p> <p>The option would result in a minor improvements in water efficiency, reduces demand and improves resilience.</p> <p>Additional MI/d capacity between 0.1 and 25 MI/d</p>
		0	Neutral	The option would have no discernible effect on river flows or surface/coastal water quality or on groundwater quality or levels. The option would not have an effect on or be affected by flood risk.
		-	Minor Negative	<p>The option would result in minor decreases in river flows. River and/or coastal water quality may be affected and lead to short term or intermittent effects on receptors (e.g. designated habitats, protected species or recreational users of rivers and the coastline) that could not be avoided but could be mitigated.</p> <p>The option would result in minor decreases in groundwater quality or levels.</p> <p>The option is located in Flood Zone 2.</p> <p>The option would result in minor decreases in water efficiency, increases demand and reduces resilience.</p>

SEA Objective	Datasets/Key Themes	Effect	Description
		--	<p>Moderate Negative</p> <p>The option would result in moderate decreases in river flows. River and/or coastal water quality may be affected and lead to long term or continuous effects on receptors (e.g. designated habitats, protected species or recreational users of rivers and the coastline) that could not reasonably be mitigated.</p> <p>The option results in the likely deterioration of WFD classification.</p> <p>The option would result in moderate decreases in groundwater quality or levels.</p> <p>The option is located in Flood Zone 3.</p> <p>The option would result in moderate decreases in water efficiency, increases demand and reduces resilience.</p>
		---	<p>Major Negative</p> <p>The option would result in major decreases in river flows. River and/or coastal water quality may be affected and lead to long term or continuous effects on receptors (e.g. designated habitats, protected species or recreational users of rivers and the coastline) that could not reasonably be mitigated.</p> <p>The option results in the deterioration of WFD classification.</p> <p>The option would result in major decreases in groundwater quality or levels.</p> <p>The option is located in Flood Zone 3 and further contributes to flood risk.</p> <p>The option would result in major decreases in water efficiency, increases demand and reduces resilience.</p>
		?	<p>Uncertain</p> <p>From the level of information available the effect that the option would have on this objective is uncertain.</p>
<p>Air:</p> <ul style="list-style-type: none"> ● Reduce and minimise air emissions 	<ul style="list-style-type: none"> ● Air Quality Management Zones ● Air quality monitoring sites 	+++	<p>Major Positive</p> <p>The option would result in a major enhancement of the air quality within one or more AQMAs.</p>
		++	<p>Moderate Positive</p> <p>The option would result in a moderate enhancement of the air quality within one or more AQMAs.</p>
		+	<p>Minor Positive</p> <p>The option would result in an enhancement of the air quality.</p>
		0	<p>Neutral</p> <p>The option would not result in any effects on Air Quality and AQMAs.</p>

SEA Objective	Datasets/Key Themes	Effect	Description
		-	Minor Negative The option would result in a decrease of the air quality.
		--	Moderate Negative The option would result in a decrease of the air quality within one or more AQMAs.
		---	Major Negative The option would result in a major decrease in the air quality within one or more AQMAs.
		?	Uncertain From the level of information available the effect that the option would have on this objective is uncertain.
Climate Factors: ● Reduce embodied and operational carbon emissions ● Reduce vulnerability to climate change risks and hazards	Option Carbon data UKCP18 climate data Sea level rise projections	+++	Major Positive The option will generate significant additional zero carbon energy that can be fed back into the grid/reduce carbon emissions (see carbon scale) The option will result in a major increase in carbon sequestration. The option will increase resilience/decrease vulnerability to climate change effects.
		++	Moderate Positive The option will increase resilience/decrease vulnerability to climate change effects. The option will result in a moderate increase in carbon sequestration. The option will generate moderate additional zero carbon energy that can be fed back into the grid/reduce carbon emissions (see carbon scale)
		+	Minor Positive The option will increase resilience/decrease vulnerability to climate change effects. The option will result in a minor increase in carbon sequestration. The option will generate minor additional zero carbon energy that can be fed back into the grid/reduce carbon emissions (see carbon scale)
		0	Neutral The option would have no discernible effect on greenhouse gas emissions, nor would the option increase resilience/decrease vulnerability to climate change effects.
		-	Minor Negative The option will have a minor impact on resilience/decrease vulnerability to climate change effects. The option will generate minor construction and/or operational carbon emissions (see carbon scale).

SEA Objective	Datasets/Key Themes	Effect	Description
		--	Moderate Negative The option will have a moderate impact on resilience/significantly decrease vulnerability to climate change effects. The option will generate moderate construction and/or operational carbon emissions (see carbon scale). The option will result in a moderate release of previously sequestered carbon.
		---	Major Negative The option will have a major impact on resilience/significantly decrease vulnerability to climate change effects. The option will generate significant construction and/or operational carbon emissions (see carbon scale). The option will result in a major release of previously sequestered carbon.
		?	Uncertain From the level of information available the effect that the option would have on this objective is uncertain.
Landscape: ● Conserve, protect and enhance landscape, townscape and seascape character and visual amenity	<ul style="list-style-type: none"> ● Areas of Outstanding Natural Beauty ● National Character Areas ● Green Belt land ● National Park 	+++	Major Positive The option would have a major positive contribution to designated landscape (AONB or National Park) management plan objectives The option results in new, above ground infrastructure that significantly enhances the local landscape, townscape or seascape.
		++	Moderate Positive The option would have a moderate positive contribution to designated landscape management plan objectives The option results in new, above ground infrastructure that has a moderate positive effect on the local landscape, townscape or seascape.
		+	Minor Positive The option results in new, above ground infrastructure that has a minor positive effect on the local landscape, townscape or seascape.
		0	Neutral The option would not result in any effects on the local landscape, townscape or seascape.
		-	Minor Negative The option results in new, above ground infrastructure that has a minor negative effect on the local landscape, townscape or seascape.

SEA Objective	Datasets/Key Themes	Effect	Description
		--	Moderate Negative The option would have a moderate negative effect on a designated landscape or feature (i.e. significant visually intrusive infrastructure) whose effects could not be reasonably mitigated. The option results in new, above ground infrastructure that has a moderate negative effect on the local landscape, townscape or seascape.
		---	Major Negative The option would have a negative effect on a designated landscape or feature (i.e. significant visually intrusive infrastructure) whose effects could not be reasonably mitigated. The option results in new, above ground infrastructure that has a major negative effect on the local landscape, townscape or seascape.
		?	Uncertain From the level of information available the effect that the option would have on this objective is uncertain.
Historic Environment ● Conserve, protect and enhance the historic environment, including archaeology	<ul style="list-style-type: none"> ● Listed buildings: <ul style="list-style-type: none"> - Grade I listed structures - Grade II* listed structures - Grade II listed structures ● Registered Parks and Gardens: <ul style="list-style-type: none"> - Grade I Registered Parks and Gardens - Grade II* Registered Parks and Gardens - Grade II Registered Parks and Gardens 	+++	Major Positive The option will result in enhancements to designated heritage assets and/or their setting, fully realising the significance and value of the asset, such as: <ul style="list-style-type: none"> ● Securing repairs or improvements to heritage assets, especially those identified in the Historic England Buildings/Monuments at Risk Register; ● Improving interpretation and public access to important heritage assets.
		++	Moderate Positive The option will result in enhancements to designated heritage assets and/or their setting. Improving interpretation and public access to important heritage assets.
		+	Minor Positive The option will result in enhancements to non-designated heritage assets and/or their setting.
		0	Neutral The option will have no effect on cultural heritage assets or archaeology.
		-	Minor Negative The option will result in the loss of significance of undesignated heritage assets and/or their setting, notwithstanding remedial recording of any elements affected. There will be limited damage to known, undesignated archaeology important sites with a consequent loss of significance only partly mitigated by archaeological investigation.
		--	Moderate Negative The option will result in the loss of significance of undesignated heritage assets and/or their setting, notwithstanding remedial recording of any elements affected.

SEA Objective	Datasets/Key Themes	Effect	Description
	<ul style="list-style-type: none"> Protected Wreck Registered Battlefields Scheduled Monuments Conservation Areas World Heritage Sites 		The option will diminish of significance of designated heritage assets and/or their setting, notwithstanding remedial recording of any elements affected.
		---	Major Negative The option will diminish the significance of designated heritage assets and/or their setting such as: <ul style="list-style-type: none"> Demolition or further deterioration in the condition of designated heritage assets especially those identified in the Historic England Buildings/Monuments at Risk Register. Loss of public access to important heritage assets and lack of appropriate interpretation. There will be major damage to known, designated archaeology important sites with a consequent loss of significance only partly mitigated by archaeological investigation.
		?	Uncertain
Population, Human Health <ul style="list-style-type: none"> Maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing Maintain and enhance tourism and recreation 	<ul style="list-style-type: none"> Noise action important area Indices of Multiple Deprivation 2015 Functional site: <ul style="list-style-type: none"> Schools Medical facilities OS Greenspace dataset: <ul style="list-style-type: none"> Allotments Bowling green Cemetery Golf course Sports facility Play space Playing field 	+++	Major Positive The option leads to major positive effect on the health of local communities and will ensure that surface water and bathing water quality is maintained within statutory limits. The option creates new, and significantly enhances existing, recreational facilities, publicly accessible greenspace and/or tourism within the operational area.
		++	Moderate Positive The option leads to positive effect on the health of local communities and will ensure that surface water and bathing water quality is maintained within statutory limits. The option enhances existing, recreational facilities, publicly accessible greenspace and/or tourism within the operational area
		+	Minor Positive The option has a temporary positive effect on the health of local communities and will ensure that surface water and bathing water quality is maintained within statutory limits
		0	Neutral The option would not result in any effects on human health and existing recreational facilities and/or tourism.
		-	Minor Negative The option has a temporary effect on human health (e.g. noise or air quality). The option reduces the availability and quality of existing recreational facilities and/or tourism within the operational area.

SEA Objective	Datasets/Key Themes	Effect	Description
	<ul style="list-style-type: none"> - Public park or garden - Religious grounds - Tennis courts ● Natural England - Country Parks ● National Parks ● Section 15 open access areas ● CRow S4 Conclusive Registered Common Land 	--	Moderate Negative The option results in the permanent removal of existing recreational facilities, publicly accessible greenspace and/or tourism within the operational area
		---	Major Negative The option has a significant long-term effect on human health (e.g. noise or air quality). The option results in the removal of existing recreational facilities, publicly accessible greenspace and/or tourism within the operational area.
		?	Uncertain From the level of information available the effect that the option would have on this objective is uncertain.
Material Assets <ul style="list-style-type: none"> ● Minimise resource use and waste production ● Avoid negative effects on built assets and infrastructure 	<ul style="list-style-type: none"> ● Transport: <ul style="list-style-type: none"> - Major roads – A roads - Major roads motorway - Railway line - National cycle route - National trails 	+++	Major Positive The option will re-use or recycle substantial quantities of waste materials and any new infrastructure will incorporate substantial sustainable design measures and materials. There will be no increase in energy consumption or energy will be from 100% renewable sources. The option improves national cycle routes or national trails.
		++	Moderate Positive The option will re-use or recycle moderate quantities of waste materials and any new infrastructure will incorporate some sustainable design measures and materials. There will be no increase in energy consumption or energy will be from 90% renewable sources. The option improves national cycle routes or national trails.
		+	Minor Positive The option will re-use or recycle a limited quantity of waste materials and any new infrastructure will incorporate some limited sustainable design measures and materials. There will be no increase in energy consumption or energy will be from 80% renewable sources. The option improves national cycle routes or national trails.
		0	Neutral The option would not result in any effects on material assets.

SEA Objective	Datasets/Key Themes	Effect	Description
		-	<p>Minor Negative</p> <p>The option will require new infrastructure with only limited opportunities for the re-use or recycling of waste materials. There are limited opportunities for sustainable design or the use of sustainable materials.</p> <p>The option results in a minor increase in energy consumption with no renewable energy options.</p> <p>The option results in a minor disruption on built assets and infrastructure, including transport.</p>
		--	<p>Moderate Negative</p> <p>The option will require new infrastructure with only limited opportunities for the re-use or recycling of waste materials.</p> <p>The option results in a moderate increase in energy consumption with no renewable energy options.</p> <p>The option results in a moderate disruption on built assets and infrastructure, including transport links.</p>
		---	<p>Major Negative</p> <p>The option will require significant new infrastructure that cannot be provided through the re-use or recycling of waste materials. There are no opportunities for sustainable design or the use of sustainable materials.</p> <p>The option results in a major increase in energy consumption with no renewable energy options.</p> <p>The option results in a major distribution on built assets and infrastructure, including transport links.</p>
		?	<p>Uncertain</p> <p>From the level of information available the effect that the option would have on this objective is uncertain.</p>

