Cambridge Waste Water Treatment Plant Relocation Project
Anglian Water Services Limited

Site Selection Report

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MOTT MACDONALD

Cambridge Waste Water Treatment Plant Relocation Project

Site Selection Technical Summary

2 July 2020

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Cambridge Waste Water Treatment Plant Relocation Project

Site Selection Technical Summary

2 July 2020

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Contents

Glossary

CWWTPR	Cambridge Waste Water Treatment Plant Relocation
DEFRA	Department for Environment, Food and Rural Affairs
DCO	Development Consent Order
Green Belt	Land designated as Green Belt under policies intended to prevent urban sprawl by keeping land permanently open
HGV	Heavy Goods Vehicle
HIF	Housing Infrastructure Fund
NPS	National Policy Statement for Waste Water
NSIP	Nationally Significant Infrastructure Project
PRoW	Public right of way
RAG	Red-Amber-Green
SoCC	Statement of Community Consultation
SoS	Secretary of State
SSSI	Site of Special Scientific Interest
WFD	Water Framework Directive
WWTP	Waste Water Treatment Plant

1 The Cambridge Waste Water Treatment Plant Relocation ('CWWTPR') Project

1.1 Purpose of this document

1.1.1 This document aims to provide a technical summary of the site selection study conducted for the CWWTPR project.

1.1.2 Detailed technical information for each stage of the site selection process can be found in the individual site selection reports, listed below.

- Initial Options Appraisal
- Stage 1 – Initial Site Selection
- Stage 2 – Coarse Screening
- Carbon Assessment
- Stage 3 – Fine Screening

1.1.3 These documents are available on the project website at [redacted]

1.2 Relocation project introduction

1.2.1 Cambridge City Council and South Cambridgeshire District Council are leading the regeneration of North East Cambridge (NEC). The principle of regeneration for this area was established in the recently adopted Cambridge Local Plan[1] and the South Cambridgeshire Local Plan[2]. An Area Action Plan (AAP) for development of this area is in preparation. A Regulation 18 version of the AAP is due to be published for public consultation in July 2020 and a Regulation 19 version of the AAP is due to be prepared by Summer 2021.

1.2.2 The existing Cambridge Wastewater Treatment Plant (WWTP), which provides waste water treatment for the residents and businesses of Greater Cambridge as well as sludge treatment for communities over a wider area around Cambridge, lies within NEC and occupies a significant part of the area designated for regeneration.

1.2.3 The CWWTPR project proposes to relocate and construct a new waste water treatment plant, thereby unlocking the regeneration of NEC, which could provide more than 5600 new homes (subject to planning).

1.2.4 To facilitate the regeneration of NEC, the Cambridge and Peterborough Combined Authority applied for funding from the Housing Infrastructure Fund (HIF), which is administered by Homes England. The funding will enable the relocation of Cambridge WWTP which is owned and operated by Anglian Water Services Limited (Anglian Water).

1.2.5 The government announced in March 2019 that funding would be granted for the relocation of Cambridge WWTP, which is one of the last remaining large brownfield sites suitable for regeneration in Cambridge.

[1] Cambridge City Council, 2018. Cambridge Local Plan https://www.cambridge.gov.uk/media/6890/local-plan-2018.pdf

[2] South Cambridgeshire District Council, 2018a. South Cambridgeshire Local Plan https://www.scambs.gov.uk/media/12740/south-cambridgeshire-adopted-local-plan-270918_sml.pdf

1.2.6 The relocation project will allow Anglian Water to continue to provide critical waste water treatment and recycling services to residents in Cambridge and Greater Cambridge in a modern, low-carbon facility designed in collaboration with stakeholders and the community.

1.2.7 Adjacent to the drainage catchment served by the existing Cambridge WWTP is the drainage catchment served by the existing Waterbeach WWTP. Due to development of Waterbeach New Town (subject to planning), the existing Waterbeach WWTP site will be redeveloped. Consequently, capacity will need to be provided elsewhere to treat the existing and future waste water flows from the Waterbeach drainage catchment area. Anglian Water decided that the relocation project will address this requirement by treating the flows from both the Cambridge and Waterbeach drainage catchment areas in a single new WWTP, in effect combining the two drainage catchment areas. Treating the waste water flows from both drainage catchment areas at a single larger WWTP rather than two smaller WWTPs is more efficient in terms of both capital and operating cost and will also have lower embodied and operational carbon emissions.

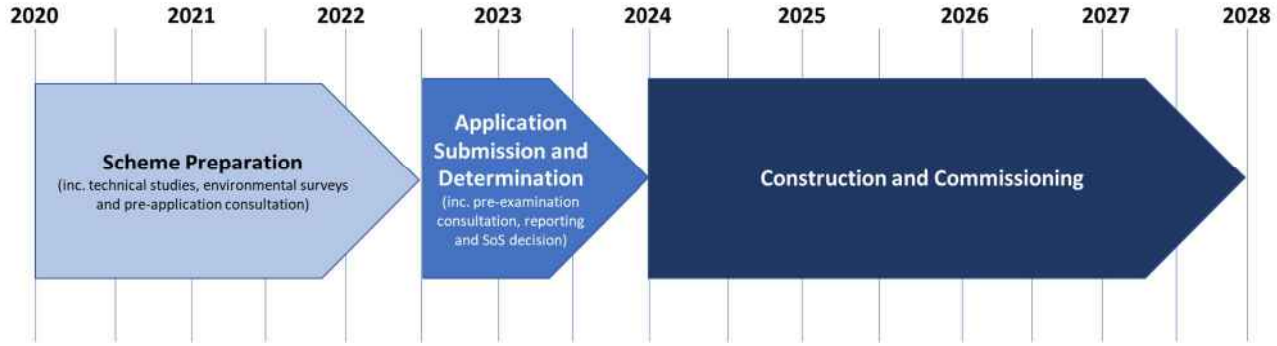
1.2.8 The relocation project will deliver benefits of national significance and regional and local importance and is a project that is complex in its nature and scale. As the capacity of the proposed new WWTP meets the thresholds prescribed by section 14(1)(o) and section 29 of the Planning Act 2008, it is classified as a Nationally Significant Infrastructure Project (NSIP). Therefore, in order for the development to be authorised, Anglian Water must make an application to the Secretary of State for Environment, Food and Rural Affairs (DEFRA) for a Development Consent Order (DCO). This application will be examined by the Planning Inspectorate, the agency responsible for managing the examination process for DCOs, which will make a recommendation to the Secretary of State.

1.2.9 As part of the DCO application and related Environmental Impact Assessment (EIA) process, Anglian Water will demonstrate the robust process it has undertaken to identify a suitable location for the new WWTP.

1.2.10 Anglian Water commissioned a detailed site selection study, to investigate and assess potential locations for the new WWTP, which is the subject of this technical summary. The potential locations identified at the end of the study will then be taken forward for stakeholder and community consultation, which will help Anglian Water to identify a proposed location for the new WWTP.

1.2.11 The expected timeline for the entire project from the site selection phase through to commissioning the new WWTP is shown in Figure 1.1.

Figure 1.1: Indicative project timeline



1.3 The Cambridge Waste Water Treatment Plant – history and function

1.3.1 The existing Cambridge WWTP site located on Cowley Road in north-eastern Cambridge, was established in 1895 to receive the waste water from Cambridge. Waste water was pumped from the old pumping station (now the Museum of Technology) in the centre of the city to the site, where it was spread across the land. Since then, the site has been serving the growing needs of Cambridge by taking used water from people's homes, cleaning it and returning it to the environment.

1.3.2 In the 1980s, a tunnel was constructed through Cambridge, to improve the collection and transport of waste water and storm flows to the treatment site. The site plays a vital role storing and treating storm flows during heavy rainfall before discharging to the River Cam and provides a material contribution to the levels and flow within the River Cam during dry weather.

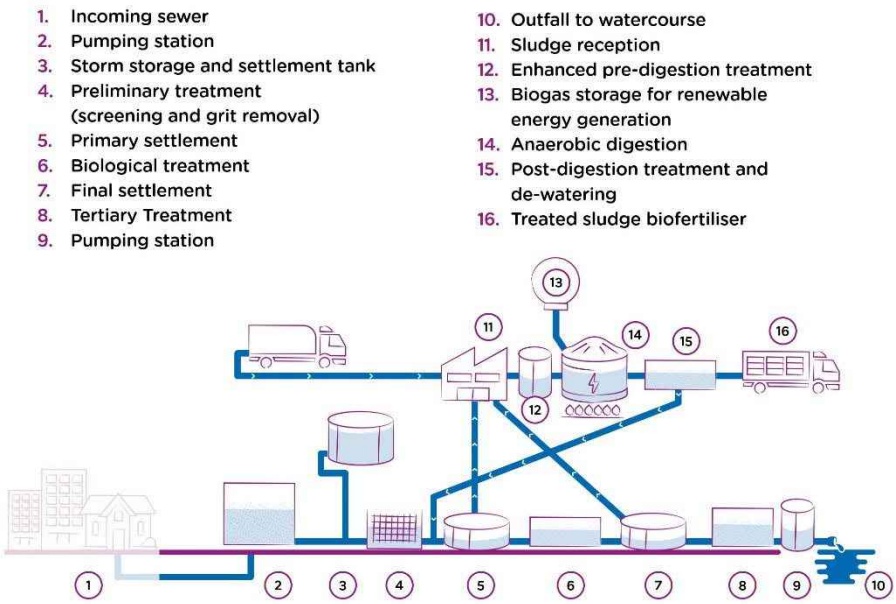
1.3.3 Cambridge is one of Anglian Water's largest WWTPs, serving the whole city and the surrounding area. On average, the site treats 1,300 litres of used water each second, which is enough water to fill 44 Olympic size swimming pools every day.

1.3.4 The first part of the treatment process involves all the waste water being pumped into the treatment site. The water then goes through a number of processes including screening, settlement and biological treatment before the treated waste water is ready to be returned to the River Cam.

1.3.5 The current site includes a sludge treatment plant, which treats all of the solids removed during the water treatment process and received at the WWTP from smaller WWTPs in the wider area. The solids are passed through the sludge treatment process (anaerobic digestion), enabling the generation of green energy, which helps to power the site. The process also produces a sustainable biosolids used by local farmers as a soil conditioner and source of essential nutrients.

1.3.6 The main components of the existing Cambridge WWTP is shown in Figure 1.2.

Figure 1.2: Components of the existing Cambridge waste water treatment plant



Note: Not to scale and for indicative purposes only.

2 Site Selection Process

2.1.1 A number of detailed appraisal steps were developed to identify site areas that are suitable for the relocated waste water treatment plant.

2.1.2 This appraisal process assessed site areas against planning, operational, community impact, environmental and, in the final stages, economic criteria. This iterative process was devised to comply with relevant legislation and national and local planning policy including the National Policy Statement for Waste Water[3] (NPS) and EIA Regulations[4] in relation to considering alternative options. During the development of the appraisal process, relevant host authorities were invited to comment on the site selection methodology and their feedback was incorporated into the process.

2.1.3 Figure 2.1 illustrates the sequence of studies leading to the identification of the best performing site areas.

2.1.4 The first stage, the Statement of Requirement, provided the following information:

- Background to the project and funding via the Government's Housing Infrastructure Fund (HIF)
- The need for the relocation project
- A description of the project objectives and high-level elements, such as the treatment processes for the relocated WWTP
- The requirement for a detailed site selection study to identify suitable site areas

2.1.5 All the above is summarised in Section 1 of this document.

2.1.6 The next stage, the Initial Options Appraisal, examined the strategic issues to be considered in investigating relocation options and identified the most appropriate study area to search for new waste water treatment plant sites.

2.1.7 Once the study area was identified, subsequent study stages (Stage 1 Initial Site Selection, Stage 2 Coarse Screening and Stage 3 Fine Screening) were used to assess location options in increasing levels of detail, building on the findings of the previous stages and eliminating less suitable options at each stage until only the best performing site areas remained.

2.1.8 The initial options appraisal and screening stages 1-3 are described in more detail in the following sections.

2.1.9 Stage 4, the final stage in the site selection process, will take place following the first phase of public consultation and environmental baseline surveys.

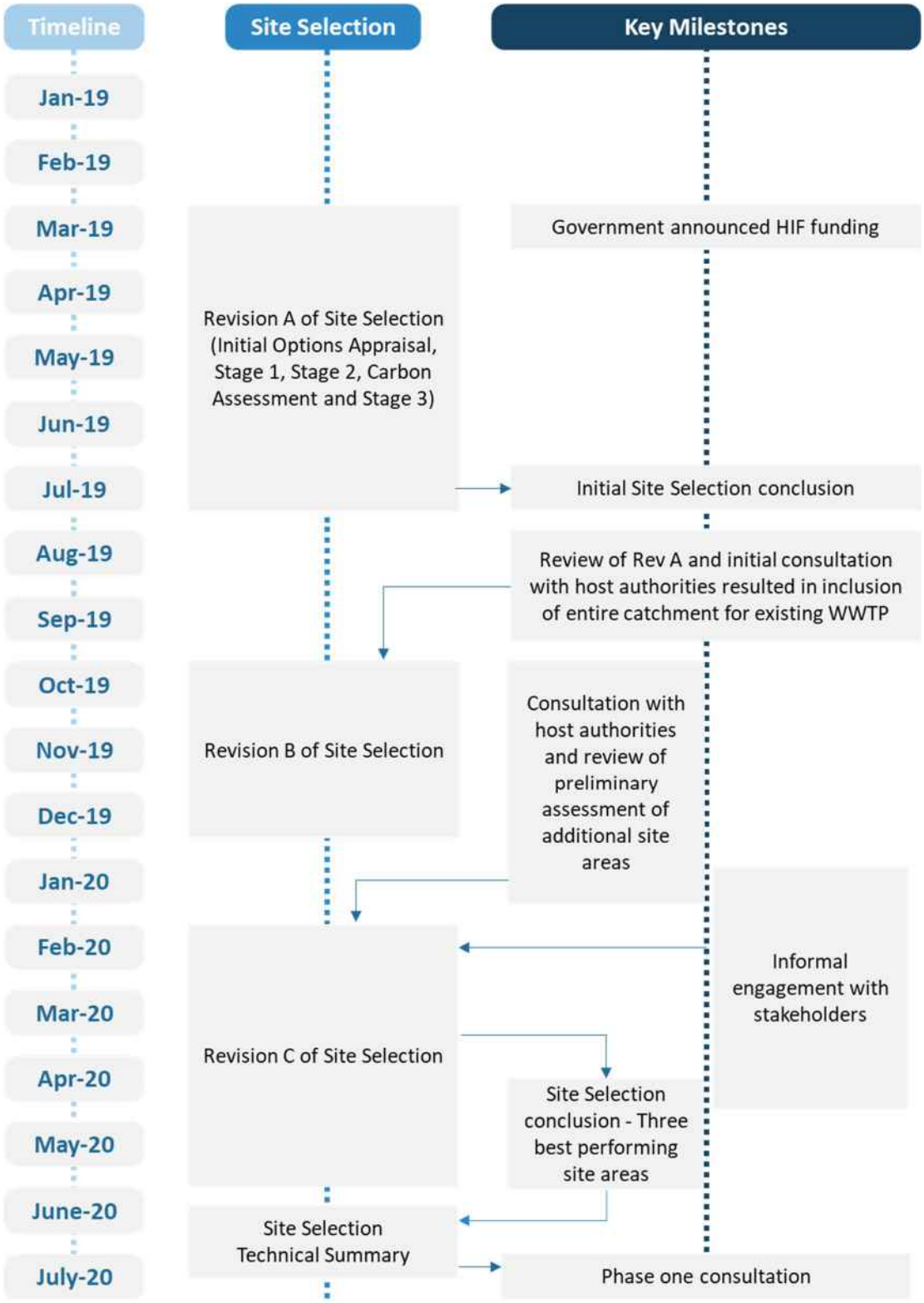
2.1.10 A timeline for the site selection process, including key milestones (external reviews and formal consultations with host authorities), is provided in Figure 2.2.

[3] Department for Environment Food and Rural Affairs, 2012, National Policy Statement for Waste Water https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69505/pb13709-waste-water-nps.pdf

[4] Her Majesty's Stationery Office, 2017, The Infrastructure Planning (Environmental Impact Assessment) Regulations http://www.legislation.gov.uk/uksi/2017/572/contents/made

Figure 2.1: Summary of Site Selection process

Figure 2.2: Site selection timeline (Stages 1-3)



3 Initial Options Appraisal

3.1 Introduction

3.1.1 The approach used in the Initial Options Appraisal included the following:

1. **Options identification,** taking into account the project background, the existing drainage catchment boundaries and infrastructure, as well as policy, strategic and technical considerations.
2. **Assessment of options,** against appropriate criteria using a RAG (Red-Amber-Green) assessment approach in order to identify the best performing option(s) and the study area for further site selection studies.

3.2 Options identification

3.2.1 In order to identify options for replacing the existing Cambridge WWTP, it was necessary to consider various strategic and technical considerations. These are summarised below.

3.2.1 **Need for the relocation project –** The relocation project is required to support sustainable growth in and around Cambridge. It will unlock the regeneration of NEC as the existing WWTP occupies a significant part of the area. Although it may be technically feasible to consolidate the existing treatment assets and occupy a smaller area of the existing site this is not appropriate for the following reasons:

- The funding from the HIF is predicated on moving the whole WWTP to enable regeneration of the entire site. A partial release of land would not provide a sufficient business case to justify the HIF funding.
- It would be contrary to Anglian Water's Asset Encroachment Policy[5], which is used to minimise the potential risk to proposed developments in proximity to existing WWTPs, primarily in relation to potential odour impacts. Therefore, consolidation of the existing WWTP and development of the remaining area would present a potential risk to the amenity of the development and could constrain Anglian Water's ability to operate its plant efficiently.
- In addition, local waste planning strategy stipulates that a new WWTP within 400m of properties normally occupied by people would require an odour assessment demonstrating that the proposal is acceptable, together with appropriate mitigation measures[6].

3.2.2 **Type of treatment technology –** Different treatment technology types have widely varying characteristics including significant differences in operational complexity, energy usage (and hence carbon emissions), economics and land area required. When investigating different types of treatment technology, the following broad technology categories can be considered:

- Type 1: Low energy and larger footprint – typically based on biological filters but can also include constructed wetlands or lagoon technologies
- Type 2: Balancing energy use and footprint – standard approach in the UK for WWTPs of the size required for Cambridge, typically based on activated sludge processes
- Type 3: High energy and smaller footprint – processes that can require significantly greater energy input, due to additional aeration or pumping requirements, as well as increased

[5] Asset Encroachment Policy, Anglian Water, 2019

[6] Cambridgeshire and Peterborough Minerals and Waste Development Plan Core Strategy, Cambridge County Council and Peterborough City Council, 2011

operational complexity, in order to achieve more compact treatment processes. Examples include replacement of the gravity settlement phase (in the standard treatment approach) by a more energy intensive but compact membrane filtration phase.

3.2.3 Type 2 treatment processes are the process type currently in use at the existing Cambridge WWTP and are likely to be the most appropriate treatment type for the new Cambridge WWTP. Therefore, for this initial options appraisal and subsequent site selection stages, it was assumed that the options would all use a Type 2 treatment process.

3.2.4 **WWTP location: national planning policy** – An important policy consideration for waste water treatment is the *proximity principle*[7], which highlights a need to treat and dispose of waste water in reasonable proximity to its point of generation. The principle seeks to minimise the environmental impact of waste water transport and treatment and makes communities responsible for the wastes that they generate.

3.2.5 **WWTP location: economic and environmental factors** - Locating the new WWTP near to the source of waste water reduces both construction costs (for waste water transfer infrastructure such as tunnels and pipelines) and operating costs (due to the pumping of large volumes of waste water). Reduced construction and energy usage also bring environmental benefits including lower carbon emissions.

3.2.6 **Single large WWTP versus several smaller WWTPs in different locations** – There are advantages and disadvantages of these two approaches. The benefits of a single WWTP, the current approach for the Cambridge drainage catchment area, include greater economies of scale, resulting in higher operational efficiency and lower costs to customers. The NPS for Waste Water indicates that for cities of the scale that might generate an NSIP, such as Cambridge, it will be more cost effective to centralise treatment at a single large treatment works[8]. Although a single site requires a large area of land in one location, using several small sites to provide the same treatment capacity is usually less efficient and is likely to occupy more land overall.

Potential options

3.2.7 The following options were identified based on the above considerations:

3. Single new WWTP in the existing Cambridge and Waterbeach drainage catchment areas, north of the existing WWTP
4. Single new WWTP in the existing Cambridge drainage catchment area, south of the existing WWTP
5. Single new WWTP (or expansion of an existing WWTP) outside of the existing Cambridge and Waterbeach drainage catchment areas
6. Several new WWTPs (or expansion of existing WWTPs), in various locations in or near the existing Cambridge and Waterbeach drainage catchment areas.

3.2.8 The extents of the Cambridge and Waterbeach drainage catchment areas are shown in Figure 3.1.

[7] EU Waste Framework Directive (2008/98/EC), 2008 and National Planning Policy Guidance for Waste, Ministry of Housing, Communities & Local Government, 2015

[8] Department for Environment Food and Rural Affairs, 2012, National Policy Statement for Waste Water - Paragraph 2.4.14 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69505/pb13709-waste-water-nps.pdf

3.3 Assessment of options

3.3.1 Options were evaluated against assessment criteria using a Red, Amber or Green system (RAG), where Green is the most desirable and Red is least desirable. The requirements assessed for each RAG level for each criterion were carefully defined to ensure the options were compared on a consistent basis and the relative advantages and disadvantages of each option were clear.

3.3.2 The criteria we believed to be the most important to consider at the options appraisal stage were as follows:

- **Proximity principle** – The need to treat and/or dispose of waste water in reasonable proximity to the point of generation.
- **Potential environmental impact of effluent discharge location** – whether a change of discharge location would be required and how this might affect the receiving watercourse
- **Impacts on local communities** – high-level assessment of key factors such as traffic, odour, noise and visual amenity
- **Carbon emissions** – qualitative comparison based on the potential magnitude of carbon emissions for each option
- **Construction complexity** – the level of construction difficulty and impact during the construction stage, mainly relating to the transfer of waste water to the new site or sites and the return of treated effluent to the discharge location
- **Relative cost impact** – qualitative cost comparison based on the potential magnitude of costs for each option.

3.4 Conclusions of the Initial Options Appraisal

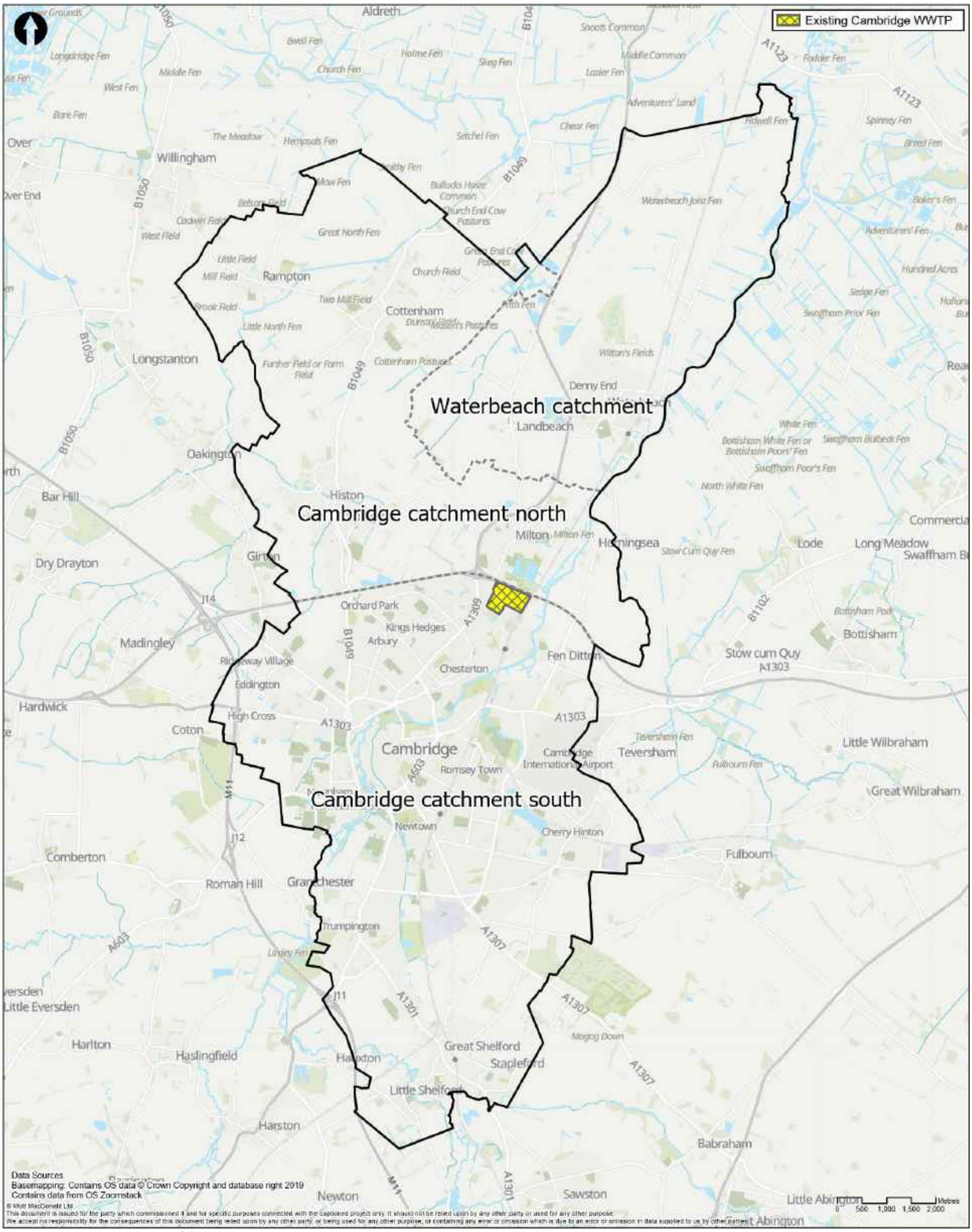
3.4.1 The RAG assessment showed that Option 1, a single WWTP located in the north of the combined Cambridge and Waterbeach drainage catchment area, was the best performing of the various options. This was mainly related to its location within the drainage catchment but outside of the urban area, the proximity to the existing discharge location on the River Cam and relatively lower carbon emissions and cost.

3.4.2 Option 2, a single WWTP located in the south of the Cambridge drainage catchment, although not as favourable as Option 1, performed sufficiently well (for similar criteria) for it to be carried forward for further consideration in the next stage of the site selection process.

3.4.3 Options 3 and 4 performed poorly due to longer waste water transfers to locations outside of the Cambridge and Waterbeach drainage catchments and the use of more than one WWTP in relation to Option 4.

3.4.4 Therefore, both Options 1 and 2 were taken forward resulting in a final study area for Stage 1 – Initial Site Selection comprising the whole of the Cambridge drainage catchment area, north and south of the A14, together with the Waterbeach drainage catchment area, as shown on Figure 3.1.

Figure 3.1: Cambridge and Waterbeach drainage catchment areas



Source: Mott MacDonald

4 Stage 1 – Initial Site Selection

4.1 Stage 1 objectives and approach

4.1.1 The objective of Stage 1 was to identify a 'longlist' of potential site areas for the new WWTP, which could then be taken forward for more in-depth screening of their suitability in the Stage 2 – Coarse Screening assessment.

4.1.2 The approach for Stage 1 was to establish a set of primary operational, environmental and community constraints. These were then applied to a map of the study area in order to identify the areas where a new WWTP could not be located as well as areas free of constraints and therefore potential locations for a new WWTP. The areas free of constraints are referred to as 'unconstrained' areas.

4.1.3 The unconstrained areas were then reviewed to determine if they would be large enough to accommodate a new WWTP. The site areas that were large enough were classified as the 'longlist' of potential site areas.

4.1.4 Green Belt was identified as an important planning constraint that must be considered when selecting suitable sites for the new WWTP. However, it was considered that Green Belt should not be used as a primary constraint at the initial stage of site selection for the following reasons:

- The Cambridge Green Belt covers a large proportion of the Study Area (approximately 50%) and the remaining area comprises the Cambridge urban area and rural areas relatively distant from the existing WWTP, as shown in Figure 4.1.
- As the Green Belt designation is a non-statutory planning policy designation, development within it may be acceptable if certain very special circumstances exist. For example, if no feasible alternatives could be identified this could contribute to the very special circumstances to justify development of a site area within the Cambridge Green Belt.

4.2 Primary constraints

4.2.1 The relevant national, regional and local policies were reviewed to identify the primary constraints and, where appropriate, apply buffer zones around them. The use of buffers ensured that any unconstrained areas would be away from residential properties, protected and statutory designated sites and existing important infrastructure in order to limit any potential impacts on them. The criteria, the buffers applied, and the relevant policies are provided in Table 4.1.

4.2.2 It is noted that the NPS for Waste Water does not refer to prescribed buffer zones for any of the criteria.

4.2.3 The communities buffer was defined to comply with Anglian Water's asset encroachment policy and the policies relating to potential odour impacts on residential amenity specified in the Cambridgeshire and Peterborough Minerals and Waste Core Strategy. The potential odour impacts beyond this buffer were not assessed in the further stages of site selection (Stage 2 – Coarse Screening and Stage 3 – Fine Screening) as it was considered that odour control measures, in accordance with industry best practice, would be employed at the new WWTP site. However, an odour impact assessment will form part of the Environmental Impact Assessment (EIA) for the site area identified to take forward in the DCO application.

Figure 4.1: Green Belt

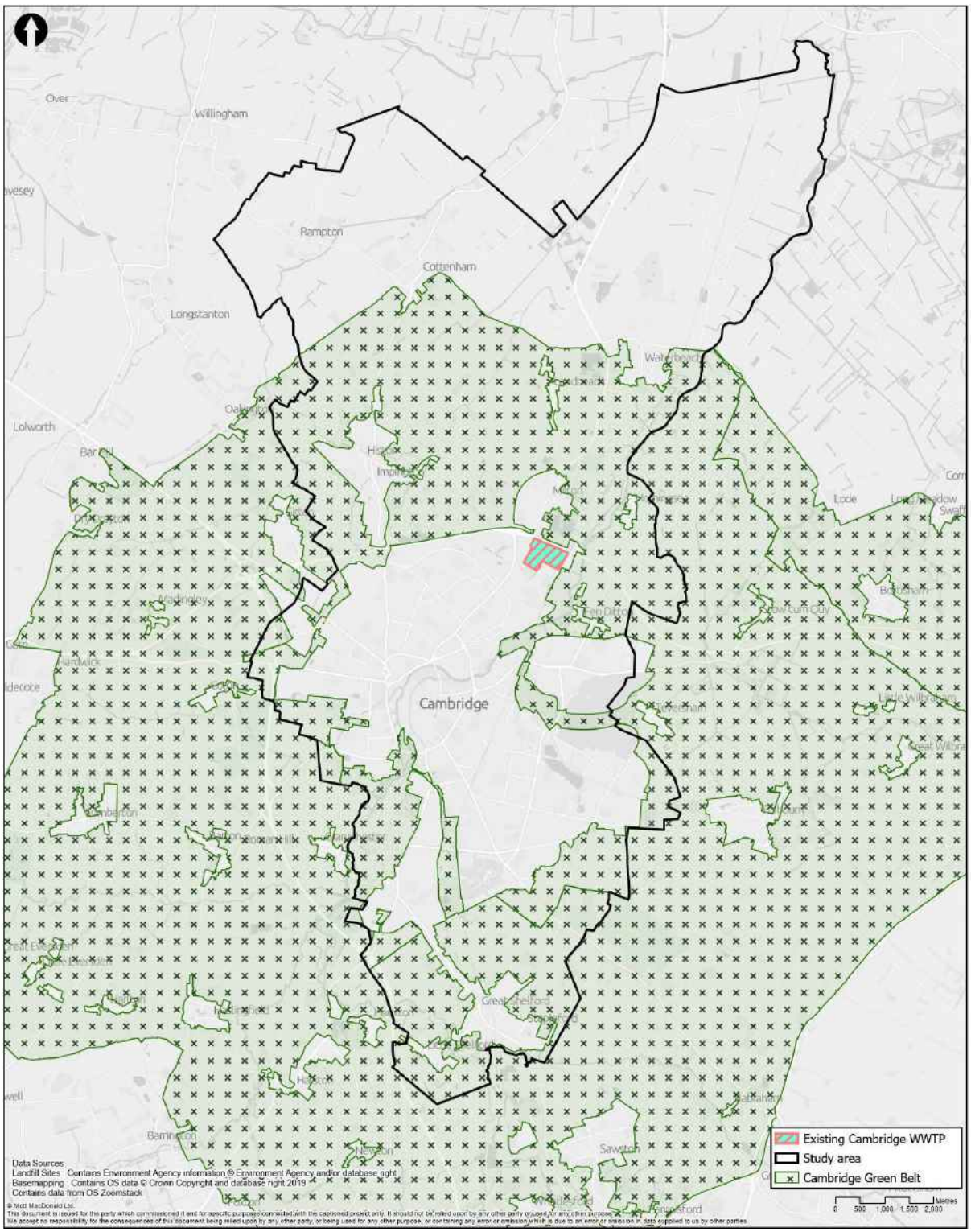


Table 4.1: Stage 1 Baseline Constraints

Category	Criteria	Definitions	Relevant Policy	Justification
Operational	Airfields and Runways	Applied extent of Cambridge Airport without buffers.	Guidance on Safeguarding of Aerodromes from the Civil Aviation Authority[1]. Cambridge Local Plan[2]	There are two air safeguarding zones around the airport that relate to potential wildlife hazards and heights of structures. Neither of these have been employed as baseline constraints for the following reasons: Zone for potential Wildlife Hazards is a 13km radius around the airport, which would cover entire study area. Air safeguarding zones have been designated around the airport and Cambridge Airport would need to be consulted if proposed developments included structures above specified heights in these zones. These 'referral' heights include 15m across much of the city and increase to 90m at approximately 5.5km from the airport runway. The relocated WWTP is l kely to include a small number of structures (such as anaerobic digester tanks) which would be higher than 15m and hence, depending on site location, the airport would need to be consulted. However, this is a consultation requirement and does not imply that permission for such structures within this area would be refused. Hence, it was not deemed appropriate to use air safeguarding zones to discount areas at this stage of the site selection.
	Major Infrastructure	100m buffer applied around A roads, B roads, railways and other significant transport routes. 20m buffer applied around C roads.	None	The transport infrastructure buffer widths were chosen using professional judgement to encompass the likely width of the road/railway, all roadside/rail side infrastructure as well as landscaping.
	Oil & Gas Pipelines, Major Electrical Transmission Routes	100m buffer applied around National Grid infrastructure.	None	The buffer widths were chosen using professional judgement to ensure that the proposed site and associated infrastructure would not be in proximity to nationally significant transmission routes.
Environmental	Flood Zones	Environment Agency Flood Zones 2 and 3 applied without buffers.	National Policy Statement for Waste Water Cambridgeshire and Peterborough Minerals and Waste Core Strategy	The floods zones were employed as constraints to satisfy the Sequential Test defined in the NPS, which specifies that preference should be given to locating projects in Flood Zone 1 and only if there is no reasonably available site in Flood Zone 1, can projects be located in Flood Zone 2.
	Landfill Sites	Current and historic landfill sites applied without buffers.	None	Professional judgment used in order to avoid potentially contaminated land. No buffer was applied around these sites as it is considered that the risk of excavating or building on contaminated land adjacent to these sites could be mitigated.

Category	Criteria	Definitions	Relevant Policy	Justification
Environmental (cont.)	Protected and Statutory Designated Sites[3]	500m buffer applied around Areas of Outstanding Natural Beauty, Ancient Woodland, Local Nature Reserves, National Parks, Ramsar sites, Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Interest, World Heritage sites, Scheduled Ancient Monuments, Listed Buildings, Registered Parks and Gardens and Registered Battlefields.	National Policy Statement for Waste Water	The NPS for Waste Water does not prescr be buffers around protected and designated sites but states that development should aim to avoid significant harm to biodiversity and geological conservation interests and that there should be a presumption in favour of the conservation of designated heritage assets. Therefore, using professional judgement, the 500m buffer was considered an appropriate offset to minimise the potential impacts of a WWTP scheme on the protected and statutory designated sites listed above.
	Watercourses	100m buffer applied around main rivers designated by the Environment Agency.	National Policy Statement for Waste Water Water Framework Directive	Using professional judgement, a 100m buffer was applied around the watercourses identified as a 'Main River' by the Environment Agency, to avoid the risk of environmental and ecological deterioration at these locations. The 'Main Rivers' classification includes both natural and modified watercourses.
Community	Communities	400m buffer applied around all residential properties.	Anglian Water Asset Encroachment Policy National Policy Statement for Waste Water Cambridgeshire and Peterborough Minerals and Waste Core Strategy	The buffer was defined to comply with the assessment methodology in Anglian Water asset encroachment policy, which assesses the potential risk of proposed development in proximity to existing WWTPs primarily in relation to odour impacts and states that developments within 400m of a WWTP are at a high risk of potential impact. It is considered that the policy is also relevant to siting of new WWTPs. Therefore, Anglian Water considers that situating the new WWTP within 400m of any existing residential properties would result in unacceptable risks to the local community and the operation of the plant.

Note:
1. Airports Operation Association, Safeguarding of Aerodromes Advice Note 3 Wildlife Hazards around Aerodromes, 2016.
2. Cambridge City Council, Cambridge Local Plan – Policy 37 :Cambridge Airport Public Safety Zone and Air Safeguarding Zones, 2018.
3. Not all types of Protected and Statutory Designated Sites are found in the study area but they are listed here as their locations were reviewed.

4.3 Stage 1 results

4.3.1 All of the constraints and their buffers detailed above, with the exception of Green Belt, were combined and mapped onto the Study Area in order to identify remaining unconstrained land parcels, as shown in the Figure 4.2.

4.3.2 The total footprint area required for the new WWTP site is expected to be 22ha. This is based on the use of similar technologies to those recently implemented at the existing WWTP and allows for growth. However, the 22ha does not include the area that may be required for landscape impact mitigation. This footprint area was used in order to identify the potentially feasible site areas from the unconstrained areas.

4.3.3 Using the defined footprint, the unconstrained areas were reviewed and those under 22ha were discarded from further assessment. The 14 remaining unconstrained areas greater than, or equal to, 22ha represented the longlist of potential site areas, as shown on Figure 4.3.

Figure 4.2: Stage 1 Baseline Constraints

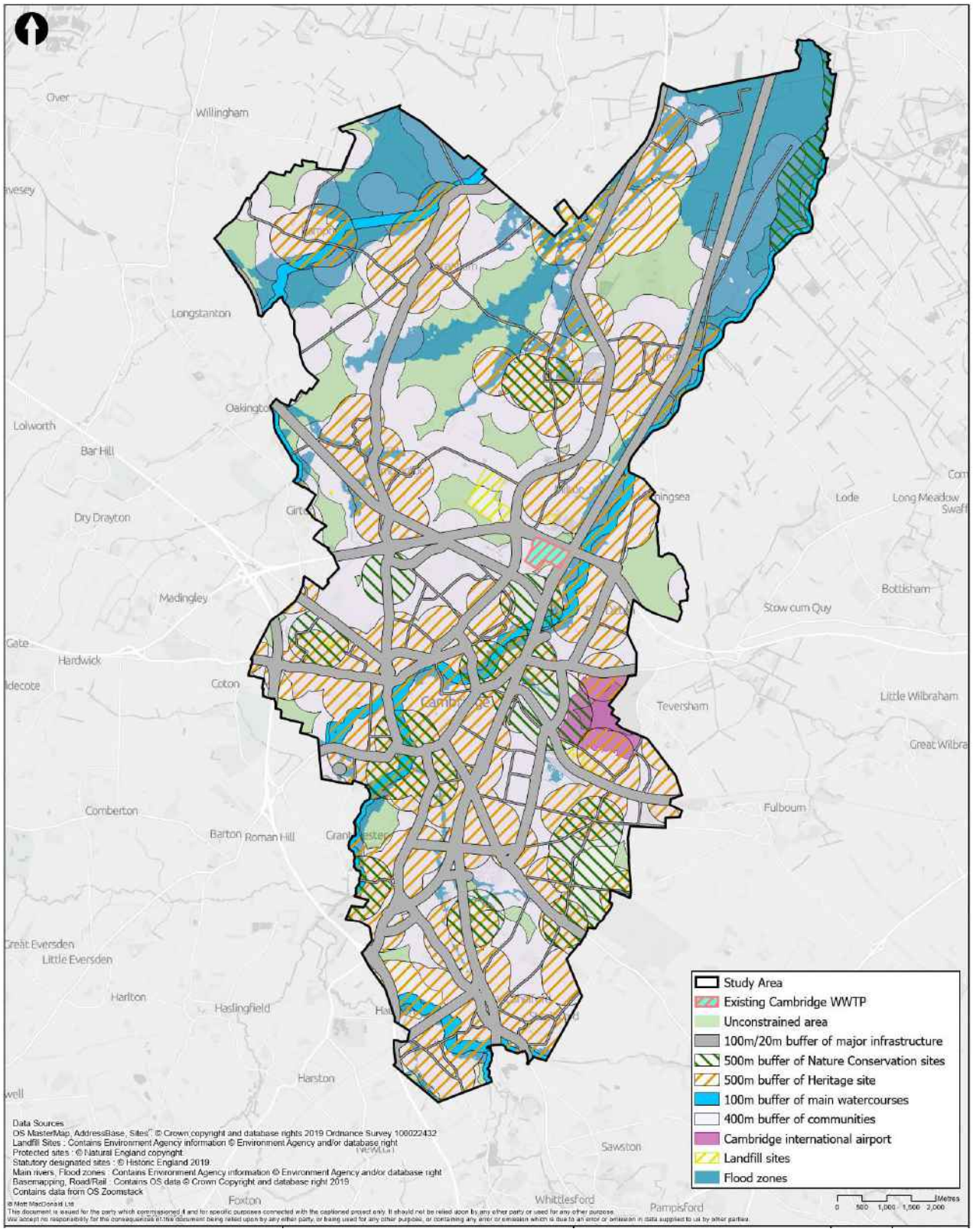
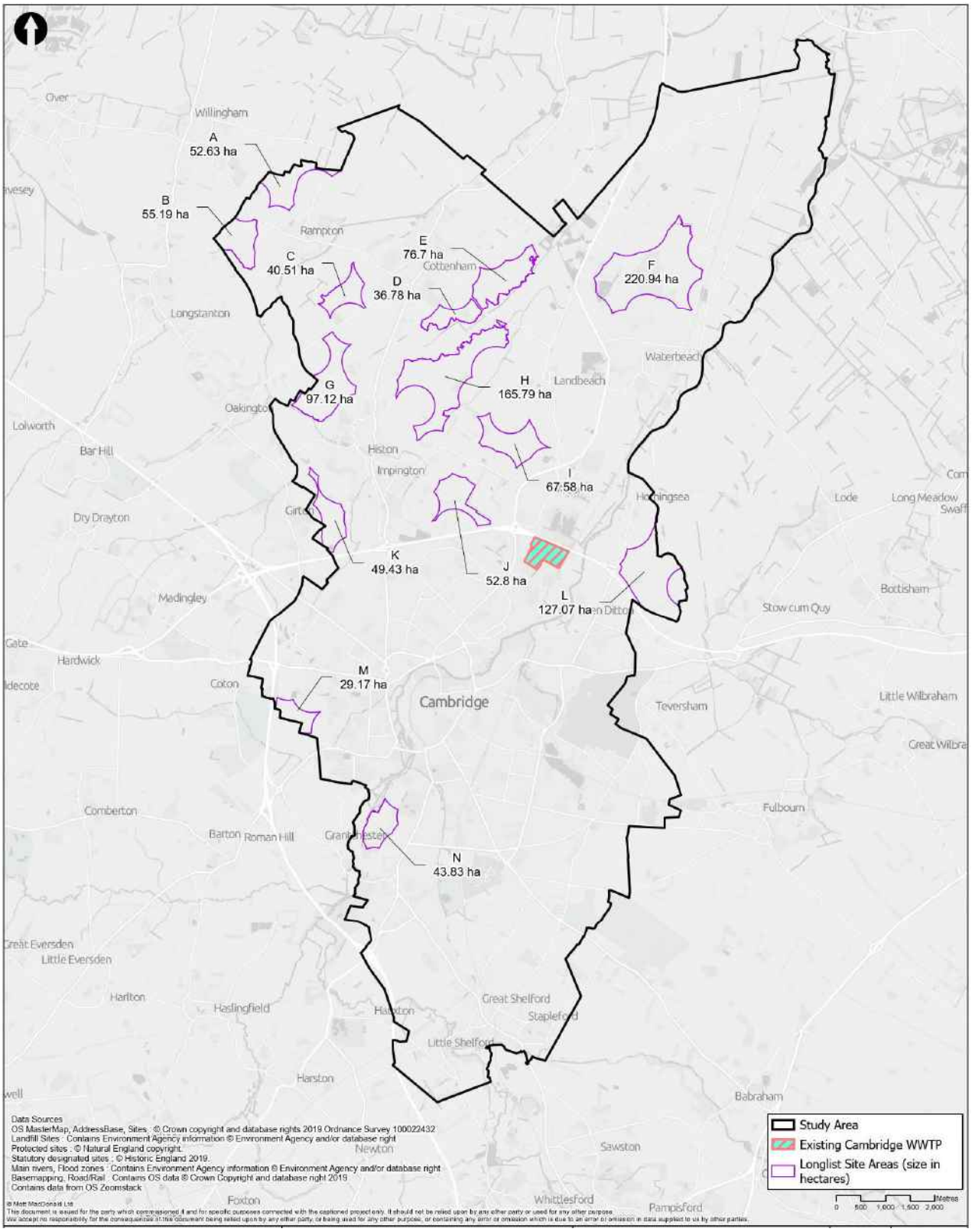


Figure 4.3: Stage 1 Longlisted Site Areas



5 Stage 2 – Coarse Screening Assessment

5.1 Stage 2 objectives and approach

5.1.1 The objective of Stage 2 was to shortlist site areas based on their cumulative performance against a range of local community, environmental, operational and planning criteria.

5.1.2 Each site area was evaluated against the criteria by means of a RAG assessment system. The RAG classifications were used to highlight the potential significance of the assessment criteria for each site area. It is important to clarify that none of the assessments were exclusionary i.e. a red result for a single criterion did not indicate that a site area should be excluded from further consideration.

5.1.3 The RAG assessments for each site area were compared on a qualitative basis and the best performing site areas were selected to form the 'shortlist' of site areas, which were taken forward for detailed analysis at Stage 3 – Fine Screening. Where site areas clearly performed poorly compared to other site areas these were removed from further assessment.

5.2 Stage 2 assessment criteria

5.2.1 A list of the Stage 2 criteria and the assessment objectives for each is provided in Table 5.1.

Table 5.1: Stage 2 Assessment criteria

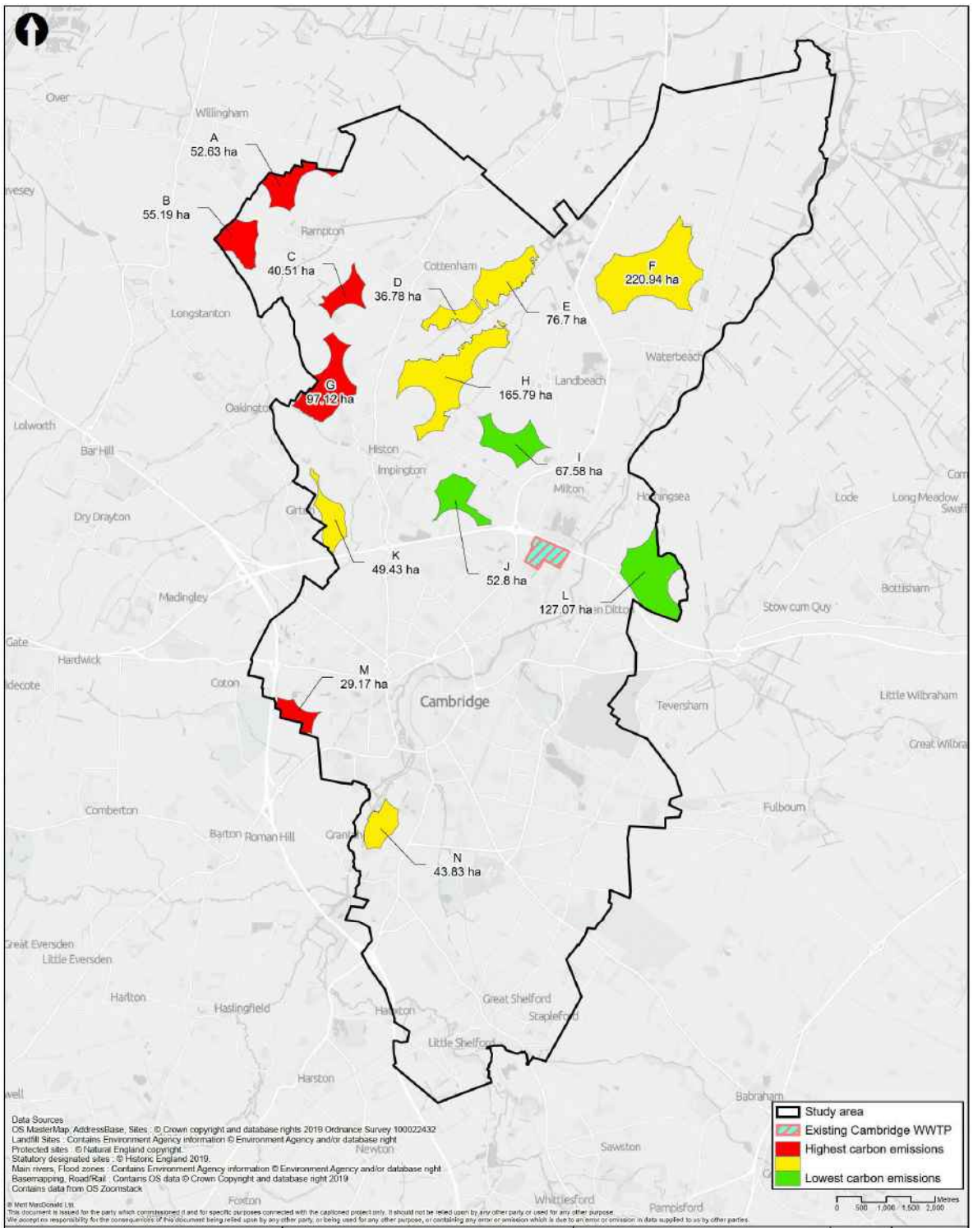
Category	Criteria Name	Objectives of Assessment
Operational	Shape of site area	Whether the shape of the site area is suitable for the typical layout of the new WWTP
	Ease of site access during construction and operation	Is the site area located in close proximity to a major road transport route to enable delivery of construction materials and are likely access roads suitable for future operational traffic?
	Waste water transfer infrastructure	Would the construction of the necessary waste water transfer infrastructure (tunnels and pipelines) be complex and also have higher carbon emissions?
Environmental	Contaminated land	Is the site area located on or in proximity to any historical or operational landfills or land likely to be contaminated due to historical land use?
	Groundwater	Would there be potential adverse impacts on aquifers below the site area? Layers of rock below the ground that hold water (groundwater) are called aquifers. The Environment Agency designates sensitive aquifers that are used for drinking water supply, support flow in rivers or sustain groundwater dependant habitats (e.g. wetlands). Below the CWWPTR study area there are two separate layers of rock that are designated as a Principal Aquifers by the Environment Agency; these are the Lower Greensand Group and the Grey Chalk Subgroup.
	Surface water	Would there be potential adverse impacts on rivers and other surface water bodies?
	Nature conservation and biodiversity	Is the site area located on a pathway used by wildlife to travel to/from a statutory or non-statutory designated site (e.g. Site of Special Scientific Interest or Local Nature Reserve)?
	Landscape and visual sensitivity	Would the proposed development impact the character of any statutory landscape designations or the visual amenity of surrounding communities?
	Historic environment	Would the development impact on adjacent national heritage designations? Are significant local heritage designations present at the site area?
	Agricultural land classification	Would the WWTP be built on 'Best and Most Versatile Agricultural Land'?
Planning	Development constraints: - Policy, site allocation and planning permissions - Sensitivity of neighbouring land	Is the site area or immediate area allocated for significant development or does it have significant policy constraints? Are neighbouring land uses sensitive to the development of a WWTP?
	Green Belt	Is the site area within the Green Belt?
Community	Impacts on local communities	Would construction and operation of the WWTP impact local communities? Would there be a loss of local amenity (i.e. recreational sites and Public Rights of Way (PRoW))?

5.3 Carbon assessment

5.3.1 A separate carbon study was undertaken to assess the carbon emissions of the waste water transfer infrastructure (tunnels and pipelines) for each of the site areas, which fed into the Stage 2 – Coarse Screening assessment described above. The assessment concluded that the site areas furthest from the existing WWTP (site areas A and B) had the highest estimated carbon emissions, whilst site areas which are closer to the existing WWTP (i.e. site areas I, J and L) had the lowest carbon emissions. This is due to the site areas further away from the existing WWTP requiring longer tunnels and pipelines than the closer site areas.

5.3.2 In terms of scale, the results indicated that the carbon emissions of site areas I, J and L were all less than 50% of the carbon emissions of site areas A and B. This is demonstrated in the map below, which illustrates the RAG rating of the carbon emissions for the potential site areas.

Figure 5.1: Carbon emissions RAG rating



5.4 Stage 2 results

5.4.1 Following the completion of the RAG assessments, the results for each site area were compared with one another on a qualitative basis to identify the best performing site areas to be included in the shortlist.

5.4.2 Although the results were assessed holistically, there are certain criteria that were considered to be of greater importance in the context of the WWTP development. A list of these criteria in order of importance is provided below:

- Impacts on local communities – The purpose of the relocation is to facilitate the regeneration of NEC for Cambridge's continued growth and the prosperity of the local community. For the relocation to be a success, any impacts on the local community due to the new WWTP should be minimised.
- Shape of land parcel and construction complexity – The shape of the site area is important as some shapes are sub-optimal and would constrain the layout of the WWTP and increase the operational complexity. The construction complexity is an indication of how difficult the scheme would be to build, both in terms of affordability and duration. In addition, the complexity is an indication of the potential for impact on some sensitive receptors (e.g. Principal Aquifers).
- Green Belt policy – As indicated during Stage 1, Green Belt policy dictates that approval for development within the Green Belt would only be granted in 'very special circumstances'.
- Policy, site allocation and planning permissions – Site areas that have already been allocated for development or have active planning applications are not likely to be an appropriate location for a new WWTP.
- Carbon emissions – Anglian Water has set an ambitious target for net-zero carbon emissions by 2030 and the potential carbon emissions of a scheme of this magnitude will be an important contributor to this goal. Therefore, the carbon emissions of constructing and operating the new WWTP should be considered in the selection of suitable site areas.

5.4.3 The remaining criteria, whilst still considered important, either did not add to the differentiation of the potential site areas e.g. Agricultural Grade of Land or, where potential impacts were identified, mitigation can be achieved using reasonable technical means e.g. contaminated land management. However, where possible the results of these criteria were used to aid the differentiation between site areas that perform similarly for the criteria of greater importance.

Site areas removed from further assessment

5.4.4 There are several site areas that are clearly inferior when compared with all others as they performed poorly against all the criteria of greater importance, these were G, K, M and N. The main reasons why these site areas performed poorly are as follows:

- The potential impact on local communities is high due to the following reasons:
  - Construction and operational traffic would have to travel though residential areas to reach site areas G, K and N
  - Site areas M and N present risks of amenity impact during construction and operation due to the prevailing wind direction towards nearby residential areas and an education facility in proximity to site area M. Site area N is also partly within a recreational facility
  - Public Rights of Way cross or border site areas G, K and M and would likely be impacted by the WWTP development
- The construction complexity is high due to:

  - The long length of transfer tunnels and interaction with a Principal Aquifer on the routes to site areas G, K and M
  - The long length of transfer tunnel and return pipelines for site area N would also pose construction risks although to a lesser degree due to the lack of interaction with a Principal Aquifer.
- The length of the transfer tunnel and return pipelines or tunnel for all four site areas would result in high carbon emissions.

5.4.5 For these reasons it was considered reasonable to removes site areas G, K, M and N from further assessment.

5.4.6 There are also several site areas that performed poorly for one or two of the criteria of greater importance but also had other constraints that were considered to be difficult to overcome. These were site areas D, E and F. The main reasons these site areas performed poorly are as follows:

- Site D presents challenges with regard to its shape, which is not ideal for locating a new WWTP of the required size and layout. A WWTP on this site area would require more interstage pumping within and across the site, which would be less efficient and more complex to operate. Furthermore, there are development constraints associated with the site area as there is a planning application included in its area.
- Site area E has the constraint that it includes the Cottenham Point to Point Racecourse, which is an important community facility and it is considered that it would not be possible to overcome this constraint without a significant impact on the local community.
- Site area F is constrained under a number of criteria, but particularly as it encompasses the proposed Waterbeach New Town development. The proposed development is at an advanced stage of planning and hence it is assumed that it would not be possible to overcome this constraint.

5.4.7 Based on the reasons above, site areas D, E and F were excluded from further assessment.

Shortlist of site areas

5.4.8 The remaining site areas fell into two groups, each group containing site areas with similar overall performance for the criteria of greater importance. Both groups have constraints that would need to be overcome but performed better overall than the site areas removed from further assessment (described above).

5.4.9 The two groups are as follows:

- Site areas A, B and C, which are located outside of the Green Belt but have the disadvantages of high potential impacts on local communities as well as greater construction risks, carbon emissions and risk of impacts to Principal Aquifers associated with longer transfer tunnels and return pipelines.
- Site areas H, I, J and L which, in contrast, perform better for potential impacts on local communities and have shorter tunnels and pipelines, resulting in lower construction risks, carbon emissions and risk of impacts to Principal Aquifers, but are within the Green Belt.

5.4.10 It was not considered appropriate to differentiate between the two groups at the coarse screening stage because both groups have constraints that are potentially difficult to overcome.

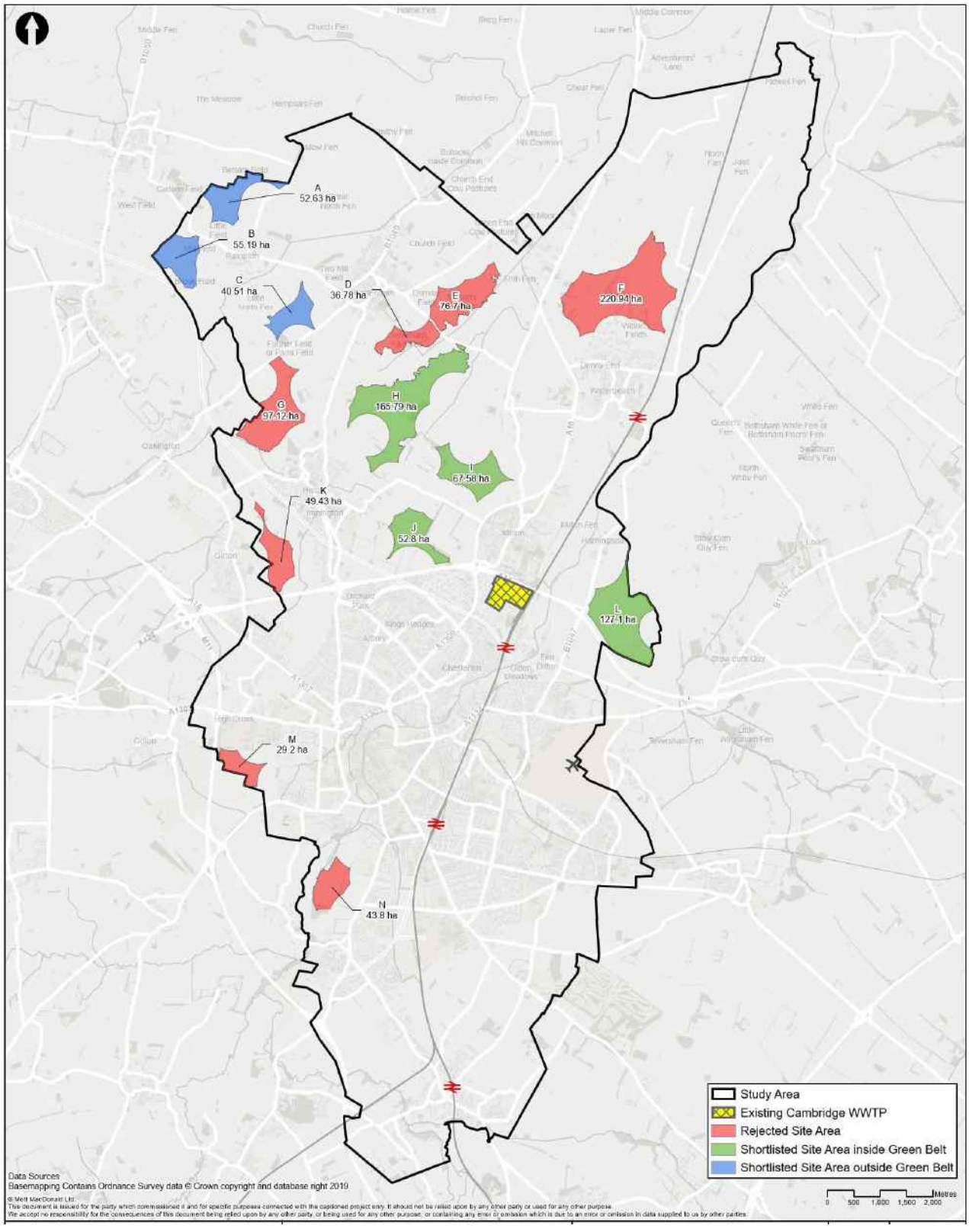
5.4.11 Development within Green Belt may be acceptable if certain ‘very special circumstances’ exist including, for example, there being no feasible alternatives. Therefore, further investigation was needed to confirm whether site areas outside of the Green Belt are feasible or not.

5.4.12 In addition, within these two groups, the assessment results for the remaining criteria are relatively similar and it was not possible to differentiate between the individual site areas during the coarse screening stage.

5.4.13 Therefore, it was considered that there was reasonable justification to carry all seven site areas forward to Stage 3 – Fine Screening and to undertake a more detailed assessment of the potential impacts at each site area, in order to differentiate between the site areas and identify those that are considered to be more suitable.

5.4.14 A map showing the locations of the shortlist site areas and those that were rejected at this stage is provided in Figure 5.2.

Figure 5.2: Stage 2 – Coarse Screening results



6 Stage 3 – Fine Screening Assessment

6.1 Stage 3 approach

6.1.1 The Stage 3 – Fine Screening Assessment included the development of the infrastructure requirements for each of the shortlisted site areas. The objective of Stage 3 was to carry out a more detailed assessment of the remaining shortlisted site areas and their infrastructure requirements, against further community impact, environmental, planning and operational criteria. Then, based on their cumulative performance, identify the best performing site areas to take forward to public consultation.

6.1.2 The Stage 3 assessment included producing specific appraisals for landscape, nature conservation and biodiversity, archaeology and historic environment and contaminated land, as well as expanded specific criteria for impacts on the local community. These appraisals provided a more detailed and focussed assessment of the sites than previously undertaken during Stage 2 – Coarse Screening. Affordability and whole life carbon emissions were also included as explicit criteria in Stage 3, for the first time in the site selection process.

6.1.3 Each shortlisted site area was evaluated against the identified criteria by means of a RAG assessment system.

6.1.4 It is noted that all the potential site areas in the southern section of the Study Area (south of the A14) were removed from further assessment in Stage 2 – Coarse Screening. Therefore, Stage 3 – Fine Screening focussed on the northern section of the Study Area only.

6.2 Site infrastructure requirements

6.2.1 A consistent conceptual layout for the WWTP was located within each of the shortlisted site areas. In addition, the associated infrastructure that differed for each site area and hence could influence site selection was defined, which is predominantly tunnels, pipelines and waste water pumping stations but also the road transport requirements for each site area.

6.2.2 The following elements comprised the site infrastructure requirements for the Stage 3 – Fine Screening assessment:

- Indicative WWTP position within the shortlisted site areas
- New private access roads between the adopted highway network and the new WWTP
- Waste water transfer tunnel from the existing Cambridge WWTP to the new WWTP
- Treated effluent discharge pipeline or tunnel taking treated flows from the new WWTP to the River Cam
- Estimation of construction and operational vehicle movements as well as transport routes to each site area from the strategic road network

6.2.3 For the purpose of Fine Screening, it was assumed that treated effluent and stormwater would be taken to the River Cam via buried pipelines as this represents the worst case in terms of surface disruption along the route. It is also possible that the treated effluent could be taken to the River Cam using a tunnel, and this would be expected to have a smaller impact along the route. However, the choice between a pipeline or tunnel option was not considered to have a material effect on the differentiation between the site areas. The options for waste water transfer infrastructure will be developed further during subsequent design of the project.

6.3 Stage 3 assessment criteria

6.3.1 The criteria and assessment approaches adopted at Stage 3 are described below.

Table 6.1: Stage 3 Assessment criteria

Category	Criteria Name	Objectives of Assessment
Operational	Ease of access	Assessment of suitability of road/interconnecting road access: particularly for Heavy Goods Vehicles/abnormal indivisible loads and sensitivity of access route
Economic	Affordability	Assessment of whether development of a new WWTP would be achievable within the limits of the HIF funding.
Environmental	Carbon emissions	Assessment of the whole-life carbon emissions for the transfer infrastructure for each of the shortlisted options, including tunnels, shafts, pipelines and pumps.
	Landscape and visual amenity	Assess whether there would be any impact on landscape context and visual amenity from development at each of the site areas.
	Nature Conservation and Biodiversity	Assess the potential impact on designated sites, habitats and protected species.
	Historic Environment	Identify the potential heritage risks and constraints.
	Contaminated Land	Assess the potential sources of contamination within and in proximity to each shortlisted site area and assess potential risk of locating the WWTP development on contaminated land.
	Groundwater impacts	Assess the potential impact of the WWTP development and conveyance infrastructure (tunnel and shafts) on groundwater below the study area.
	Surface water impacts	Consider the extent to which impacts on WFD surface waterbodies identified at Stage 2 can be mitigated.
Planning	Green Belt	Assessment of whether development would be within the Cambridge Green Belt.
	Risk to aviation	Assessment of the potential impacts of the WWTP development on aviation, in relation to proximity to Cambridge Airport.
Community	Non-traffic impact of construction on local communities	Assessment of potential impacts on residents in terms of noise, dust and disruption.
	Traffic impact of construction on local communities	Assessment of potential traffic impacts on residents in relation to congestion, air quality, noise and road safety
	Impact on Public Rights of Way	Assessment of potential impacts on public rights of way.

6.4 Stage 3 results

6.4.1 The screening assessment results were used to assign a RAG assessment score for each site area option against each of the assessment criteria. A relative comparison of the RAG assessment for each site area was then used to identify the best performing site areas for further consultation and those that should be removed from any further assessment.

Importance of criteria

6.4.2 For the fine screening assessment of the shortlisted site areas there were several criteria considered to be of greater importance than others. These criteria, in order of importance, are as follows:

- Affordability – The CWWTPR project will be funded by a grant from the HIF to facilitate the regeneration of the existing WWTP site. Without the HIF funding the relocation would not be

feasible. The funding is finite, and it would not be possible to exceed it. If relocating to one of the potential site areas would cost more than is available from the grant then the project would no longer be feasible at that site area.

- Impact on local communities – The purpose of the relocation is to facilitate the regeneration of the existing WWTP site for Cambridge's continued growth and the prosperity of the local community. For the relocation to be a success, any impacts on the local community due to the new WWTP should be minimised.
- Green Belt – Green Belt policy states that approval for development within the Green Belt would only be granted in very special circumstances.
- Carbon – Anglian Water has set an ambitious target for net-zero carbon emissions by 2030, therefore the potential carbon emissions (embodied and operational) of a scheme of this magnitude will be an important contributor to this goal.

6.4.3 The remaining criteria were still important in defining the potential impact of each shortlisted site area. However, they either did not add to the differentiation of the site areas, such as historic environment or, where potential impacts were identified, they were possible to mitigate by reasonable technical means, such as contaminated land and impacts on Public Rights of Way.

6.4.4 Overall, site areas I, J and L performed better than all of the other site areas in the Fine Screening assessment. This was mainly due to their proximity to the strategic road network and the existing WWTP, when compared with all the other site areas. The main areas of differentiation between the site areas in relation to the criteria of greater importance are discussed below.

Affordability

6.4.5 The relatively short length of the tunnel to each site area from the existing WWTP and the return pipeline or tunnel to the river, was the key factor enabling site areas I, J and L to perform better than all other site areas for this criterion. The reduced tunnel and pipeline lengths reduced the overall cost of developing a new WWTP at these locations to below the HIF grant limit.

6.4.6 In comparison, the development of site areas A, B and C would require longer lengths of transfer tunnel, two or more intermediate shafts, longer lengths of return pipelines or tunnels, as well as greater interaction with the Lower Greensand, which is classified as a Principal Aquifer. These factors significantly increase the overall costs for the development of a WWTP at site areas A, B, and C to a level that would not be affordable within the limits of the HIF funding.

6.4.7 The longer lengths of tunnel, intermediate shafts, return pipeline or tunnels, for site area H also result in higher costs in comparison with site areas I, J and L. However, the cost to develop a new WWTP at site area H would still be achievable within the limits of the HIF funding.

Potential impacts on local communities

6.4.8 The road transport routes from the strategic road network for site areas I and J are short, do not pass through the centre of any villages and the only potentially sensitive receptors to traffic on the route from the A14 are a small number of residents along Butt Lane (the most likely access route for these site areas).

6.4.9 The route for site area L is similar to that for site areas I and J in that it does not pass through the centre of any villages and passes relatively few sensitive receptors including several isolated residential properties (four in total) and a cycle crossing on the route.

6.4.10 The routes for all other site areas pass through the centre of at least one village, pass other sensitive receptors, such as schools and nurseries, and include other potential safety concerns such as pedestrian and cycle crossings (site areas A, B and C) and cycle lanes (site area H).

6.4.11 In addition, with the exception of site area J, all of the site areas were considered to have a moderate landscape and visual sensitivity. This indicated that development of a WWTP at these site areas is more likely to have an adverse impact on the visual amenity of local communities and visitors to the area. Due to the existing vegetation in place in the area and the location adjacent to the landfill, development at site area J was considered to present a lower risk of adverse impact on visual amenity.

Carbon emissions

6.4.12 The closest site areas to the existing WWTP and the River Cam, i.e. site areas I, J and L, had the lowest carbon emissions for waste water transfer infrastructure (tunnels, pipelines and pumping stations).

6.4.13 In contrast, site areas A, B and C had the highest estimated carbon emissions, which were all more than 200% of the site areas with the lowest estimated carbon emissions (site areas I, J and L).

6.4.14 The estimated carbon emissions for site area H were less than for site areas A, B and C but still 140% of the lowest estimated carbon emissions.

Green Belt

6.4.15 Site areas I, J, H and L are within the Green Belt, and as such very special circumstances would need to be demonstrated to promote one of these site areas for development. Site areas A, B and C are outside of the Green Belt and would not need to demonstrate such circumstances.

Removal of site areas from further assessment

6.4.16 As discussed above, development at site areas A, B and C is considered to be unaffordable, would have a greater impact on the local community, and would result in higher carbon emissions. These factors are considered to outweigh the potential suitability in planning policy terms. As a result, it is considered that these site areas are not feasible options for development of a new WWTP.

6.4.17 Therefore, based on criteria used to assess the site areas in this site selection process the only potentially feasible site areas are H, I, J and L. The absence of any suitable and feasible alternative sites outside of the Green Belt is a relevant factor in the consideration of whether there are very special circumstances to justify development within the Green Belt.

6.4.18 Although site areas H, I, J and L are all within the Green Belt, development of site area H presents a greater impact on the local community, higher carbon emissions and greater risk of impact on a Principal Aquifer in comparison to I, J and L. Therefore, the weaknesses of site area H are considered to provide justification for its removal from further assessment.

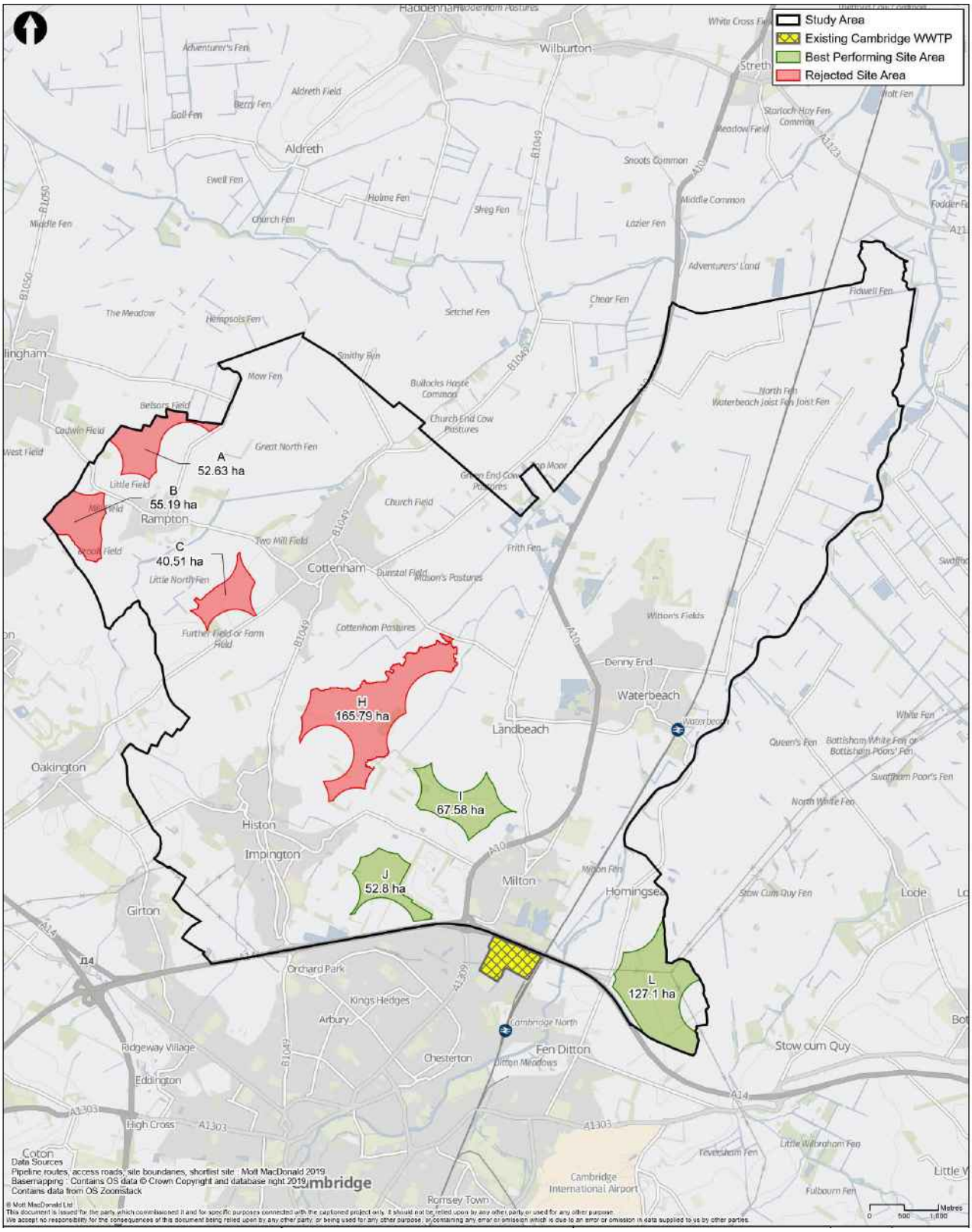
Best performing site areas

6.4.1 Site areas I, J and L were assessed to be the best performing site areas, however, it was not considered possible to differentiate between the assessments for these site areas at the fine screening stage of the site selection. Site areas I and J perform marginally better than Site L, due to the proximity of site L to Cambridge Airport and sensitive watercourses. However, it was considered that the potential impacts could be mitigated by readily available technical solutions

and it would not be appropriate to discount site area L based on these criteria at the Fine Screening stage.

6.4.2 Therefore, it was concluded that site areas I, J and L should be taken forward for further option development and stakeholder engagement in order to identify a single site area. The results of the Stage 3 Fine Screening assessment are illustrated on Figure 6.1.

Figure 6.1: Stage 3 – Fine Screening results



7 Next Steps

7.1 Final site selection – Stage 4

7.1.1 The Stage 4 – Final Site Selection assessment will apply the finest grain of screening to the three remaining shortlisted site areas and associated infrastructure requirements. The Stage 4 assessment will use the information collated during the first five stages of the site selection process combined with the results of further technical feasibility assessments, initial environmental walkover surveys and phase one consultation to assess each of the site area options against one another.

7.1.2 The remaining shortlisted sites areas to be assessed are I, J and L, which will be referred to as site areas 1, 2 and 3, respectively, in all future documentation.

Options to be assessed

7.1.3 The main options to be assessed will be site areas 1, 2 and 3. However, there are different transfer infrastructure sub-options associated with the site areas. These sub-options relate to the type of infrastructure and route corridors for the transfer of treated effluent to a discharge location on the River Cam. The transfer sub-options have different cost, carbon and environmental impacts and these differences may be material in comparing the three site areas.

7.1.4 The sub-options will be assessed at Stage 4 to determine the sensitivity of the site area selection to the different transfer infrastructure assumptions. However, the type of transfer infrastructure to be used will be assessed during the early stages of the subsequent project design and EIA, once a final site area has been selected, and will be included in the phase two consultation. The options to be assessed at Stage 4 are:

- Site area 1
  - Option A – Treated effluent and stormwater discharge corridor to discharge location directly north of the A14 bridge on the west bank of the River Cam.
    - Sub-option (i) – Tunnel
    - Sub-option (ii) – Pipeline
  - Option B - Treated effluent and stormwater discharge tunnel/pipeline to discharge location approximately 2km downstream of the A14 bridge on the west bank of the River Cam.
    - Sub-option (i) – Tunnel
    - Sub-option (ii) – Pipeline
- Site area 2
  - Option A – Treated effluent and stormwater discharge tunnel/pipeline to discharge location directly north of the A14 bridge on the west bank of the River Cam.
    - Sub-option (i) – Tunnel
    - Sub-option (ii) – Pipeline
  - Option B - Treated effluent and stormwater discharge tunnel/pipeline to discharge location approximately 2km downstream of the A14 bridge on the west bank of the River Cam.
    - Sub-option (i) – Tunnel
    - Sub-option (ii) – Pipeline

- Site area 3
  - Option A – Treated effluent and stormwater discharge tunnel/pipeline to discharge location directly north of the A14 bridge on the east bank of the River Cam.
    - Sub-option (i) – Tunnel
    - Sub-option (ii) – Pipeline

7.1.5 In addition to the options listed above, the following infrastructure requirements will also be assessed alongside each of the shortlisted site areas in Stage 4.

- An indicative WWTP location within the shortlisted site area
- Waste water transfer tunnel from the existing WWTP to the new WWTP
- Waste water transfer pipeline from the Waterbeach drainage catchment area
- Diversions of existing rising mains from other outlying villages
- Access to the WWTP site via the existing road network and any new private access roads required.

Criteria

7.1.6 The criteria used in the assessment fall into six broad categories as shown below. This is consistent with the criteria used throughout site selection, with the exception of programme, which is assessed for the first time at Stage 4.

- Environmental – What environmental effects could each option give rise to?
- Community – What effects could each option have on local communities?
- Economic – What is the whole life cost of each option?
- Operational – How well does each option perform against Anglian Water's operational requirements?
- Planning – How does each option perform against planning policy?
- Programme – Are there significant programme risks associated with implementing the option (either pre-construction or during construction)?

Assessment methodology

7.1.7 The assessment of the options will comprise a number of steps as follows.

1. Calculate the levelised cost for an unmitigated version of each of the site area options and identify the most economically advantageous site area option. This becomes the baseline (preferred) site area option against which all other site area options are compared.
2. Assess the site area options/sub-options in unmitigated form against the criteria detailed above to identify the potential adverse impacts and opportunities.
3. Compare the results to identify how the unmitigated options perform against the baseline option.
4. Identify the measures to mitigate potential adverse impacts and opportunities for enhancement for each of the options including the baseline option.
5. Re-calculate the levelised cost of all options including the required mitigation for each option.
6. Assess the site area options in mitigated form against the criteria detailed above to identify any remaining potential constraints, impacts and opportunities.
7. Compare the results to identify how the mitigated options perform against the baseline option.

8. Carry out back checking in light of any new information (including potential alternative site locations) revealed during phase one consultation and the previous steps
9. Select the best performing mitigated option to take forward to DCO application.

7.2 Phase one consultation

7.2.1 Anglian Water will be seeking feedback on all aspects of the relocation project through three phases of consultation. The phase one consultation will be non-statutory, while phases two and three will be statutory consultations. During the first phase of consultation, Anglian Water will be asking the local community for feedback on:

- The three shortlisted site areas;
- Proposed tunnel and/or pipeline routes for each of the three site areas – this will include tunnels to take waste water to the site for treatment and tunnels or pipelines to take treated waste water away from the site, to the River Cam;
- The criteria local communities consider to be most important in selecting a final site; and
- The consultation process.

7.2.2 A leaflet will be published explaining how Anglian Water intends to consult with the local community and other stakeholders during the first non-statutory phase.

7.2.3 Anglian Water recognises that consultation will be vital to the development of its proposals, and this will be undertaken in accordance with section 47 of the Planning Act 2008. A document, known as a Statement of Community Consultation (SoCC) will be published prior to the start of statutory consultation (phase two) outlining the opportunities available for community involvement throughout the statutory consultation process.

7.2.4 As well as community consultation, Anglian Water will be discussing the project with a range of statutory consultees, in accordance with the Planning Act 2008, including:

- Owners, tenants and occupiers of the land included within the DCO application;
- Elected representatives, including parish councillors in whose area the proposals are sited and those in adjoining councils, county councillors, local authority elected members and MPs;
- Statutory consultees such as Natural England, the Environment Agency, highway authorities and bodies such as the Internal Drainage Board (IDB); and
- Local interest groups, residents' associations, and organisations such as Bedfordshire, Cambridgeshire and Northamptonshire Wildlife Trust.

love every drop

anglianwater

Cambridge Waste Water Treatment Plant Relocation Project

Non-technical Site Selection Summary Report For The Cambridge Waste Water Treatment Plant Relocation (CWWTPR) Project

July 2020

1. Introduction

Glossary

CWWTPR	Cambridge Waste Water Treatment Plant Relocation
DCO	Development Consent Order
EIA	Environmental Impact Assessment
Green Belt	Land designated as Green Belt in the local development plan
HGV	Heavy Goods Vehicle
HIF	Housing Infrastructure Fund
PRoW	Public Right of Way
RAG	Red-Amber-Green
SSSI	Site of Special Scientific Interest
WWTP	Waste Water Treatment Plant

1.1 Purpose of this document

Anglian Water has undertaken a detailed study to identify a suitable site for the relocation of its Cambridge Waste Water Treatment Plant. This document provides a non-technical summary of the study we carried out to identify the three site area options we are taking forward for consultation for the proposed Cambridge Waste Water Treatment Plant Relocation (CWWTPR) project (referred to as the 'relocation project' in this document).

Our full suite of site selection reports, including a technical summary, are available on our project website: www.cwwtpr.com

1.2 Summary of the relocation project

Anglian Water is proposing to relocate its Cambridge Waste Water Treatment Plant to support sustainable growth in the city, unlocking potential for thousands of new homes and employment opportunities in a new low carbon city district planned for North East Cambridge.

The shared planning service for Cambridge City and South Cambridgeshire Councils has recently published early proposals for the district near Cambridge North station. Those plans will be outlined in the draft North East Cambridge Area Action Plan, which will be published for consultation by the Greater Cambridge Shared Planning Service in summer 2020. Regeneration of the area requires our Cambridge Waste Water Treatment Plant to be relocated. The project forms part of the Government's Housing Infrastructure Fund (HIF) which helps to deliver homes in areas of high demand.

The new, relocated facility will continue to provide vital services to Cambridge and the surrounding area including Waterbeach in a modern, carbon-efficient treatment plant, to be developed in collaboration with the community.

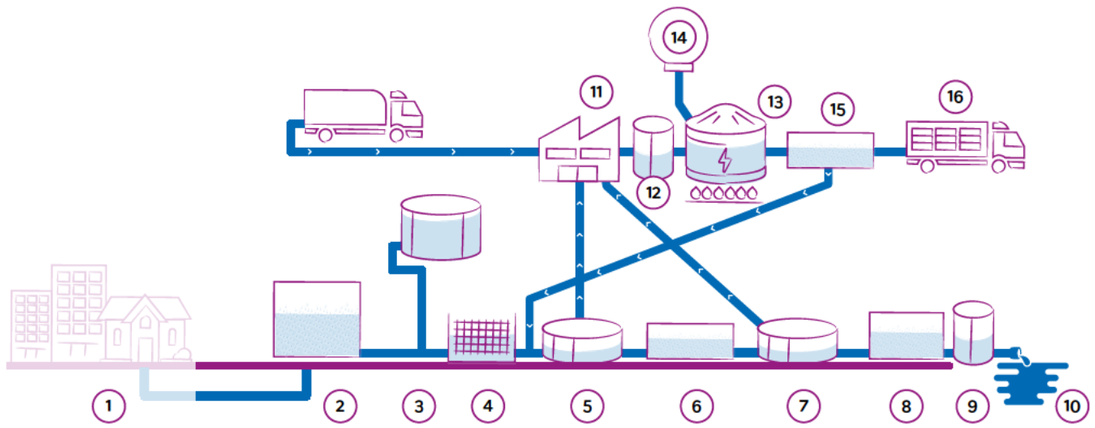
The proposals for the relocation project are at an early stage. We have identified three possible site areas within which the new waste water treatment plant ("WWTP") could be located. We want to hear your views on these site areas to help us to decide on a final site.

Since 1895, the current site on Cowley Road has been serving the needs of Cambridge and Greater Cambridge by receiving waste water from people's homes and businesses, treating it and returning it to the environment.

The site also plays a vital role in storing and treating storm flows during heavy rainfall, before discharging to the River Cam. On average the site treats 1,300 litres of used water a second — that's equivalent to more than 9 million toilet flushes a day or enough water to fill 44 Olympic size swimming pools!

Components of a typical waste water and sludge treatment plant

1. Incoming sewer
2. Pumping station
3. Storm storage tank
4. Preliminary treatment (screening and grit removal)
5. Primary settlement
6. Biological treatment
7. Final settlement
8. Tertiary treatment
9. Pumping station
10. Outfall to watercourse
11. Sludge reception
12. Enhanced pre-digestion treatment
13. Biogas storage for renewable energy generation
14. Anaerobic digestion
15. Post-digestion treatment and de-watering
16. Treated sludge biofertiliser



Note: Not to scale and for indicative purposes only.

2. Our site selection process

2.1 Introduction to our site selection process

Anglian Water is undertaking a detailed site selection study to identify a suitable location for the relocated Cambridge Waste Water Treatment Plant. The aim has been to identify locations that are technically and operationally feasible, minimise environmental and community impacts and comply with national and local legal, regulatory and planning frameworks for waste water treatment plants.

The study involves a 'sieving' approach and comprises stages to exclude areas of land where the plant could not be relocated (taking account of, for example, flood zones and proximity to protected and statutory designated sites). The process resulted in an initial longlist of 14 site areas which were then assessed for their performance against environmental, community, operational, planning and economic criteria. Figure 1 provides an overview of this step by step process.

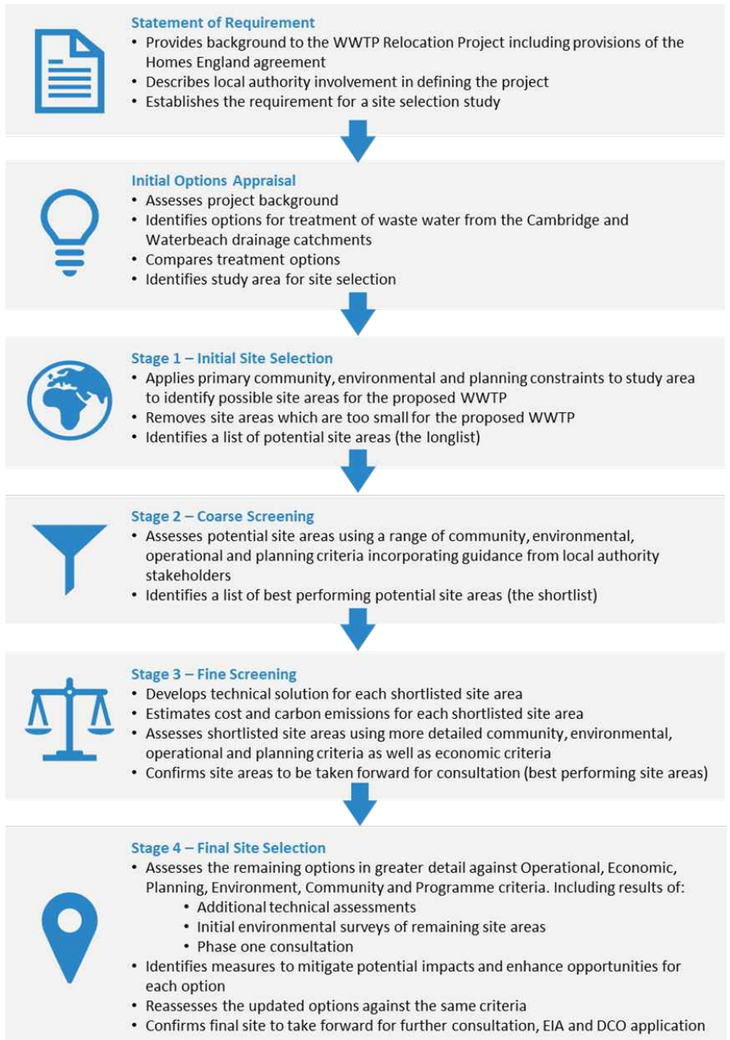


Figure 1 (step by step process of site selection)

3. How we identified our initial options

3.1 Overview of our initial options appraisal

Our initial options appraisal considered the project background, the existing plant's catchment areas (see figure 2), infrastructure, policy requirements, and other strategic and technical factors. These included:

- The need for the relocation project – the relocation project is required to support sustainable growth in and around Cambridge. It will unlock the regeneration of North East Cambridge as the existing WWTP occupies a significant part of the area
- Types of waste water treatment technology – different treatment technology types have widely varying characteristics including significant differences in operational complexity, energy usage (and hence carbon emissions), economics and space needed
- National and local planning and waste policies – such as the 'proximity principle' (see below), minimising the impact transporting it would have on the wider environment
- Economic and environmental factors – how to minimise construction costs, environmental impacts and carbon emissions
- The number of WWTPs required – with one larger WWTP being more efficient than several smaller ones, needing less space overall and providing lower costs to customers

After considering the different factors above, we identified several possible options for the relocation project that included: a single new WWTP in the existing Cambridge and Waterbeach drainage catchment areas, north or south of the existing WWTP; a single new WWTP (or expansion of an existing WWTP) outside of the existing Cambridge and Waterbeach drainage catchment areas; or several new WWTPs (or expansion of existing WWTPs), in various locations in or near the existing Cambridge and Waterbeach drainage catchment areas. A "drainage catchment" is the area within which waste water from the connected Anglian Water sewerage network drains a locality, typically, to the nearest WWTP for treatment. It also refers to any currently unconnected localities within this area, which might as a result of growth or an application for first time sewerage, also become part of the sewerage network and drain to this WWTP.

The drainage catchment areas are shown in figure 2.

3.2 How we evaluated our initial options

The initial options outlined above were evaluated against assessment criteria using a Red, Amber or Green system (RAG), where Green is the best and Red is the worst. The things we considered were most important to assess as part of our evaluation were:

- Proximity principle – a need to treat and/or dispose of wastes in close proximity to their point of generation
- Potential environmental impact of disposing of the water – how close the new waste water treatment plant would be to the source of the water and whether a change of discharge location would be needed
- Impacts on local communities – from factors such as traffic, odour, noise and visual impacts
- Carbon emissions – comparison based on the potential scale of carbon emissions for each option
- Construction – how difficult the WWTP would be to construct and the level of impact construction could have
- Value for money – comparison of the potential scale of the lifetime costs for each option

3.3 Our conclusions

Our RAG assessment showed that the best performing option was for a single WWTP located in the north of the combined Cambridge and Waterbeach drainage catchment area. However, we also thought the option of a single WWTP located in the south of the Cambridge drainage catchment area was a possible alternative which should be considered further.

Therefore, both options were taken forward for further investigation, meaning the area which we took forward for site selection included the whole of the Cambridge drainage catchment area, north and south of the A14, together with the Waterbeach drainage catchment area, as shown in figure 2.

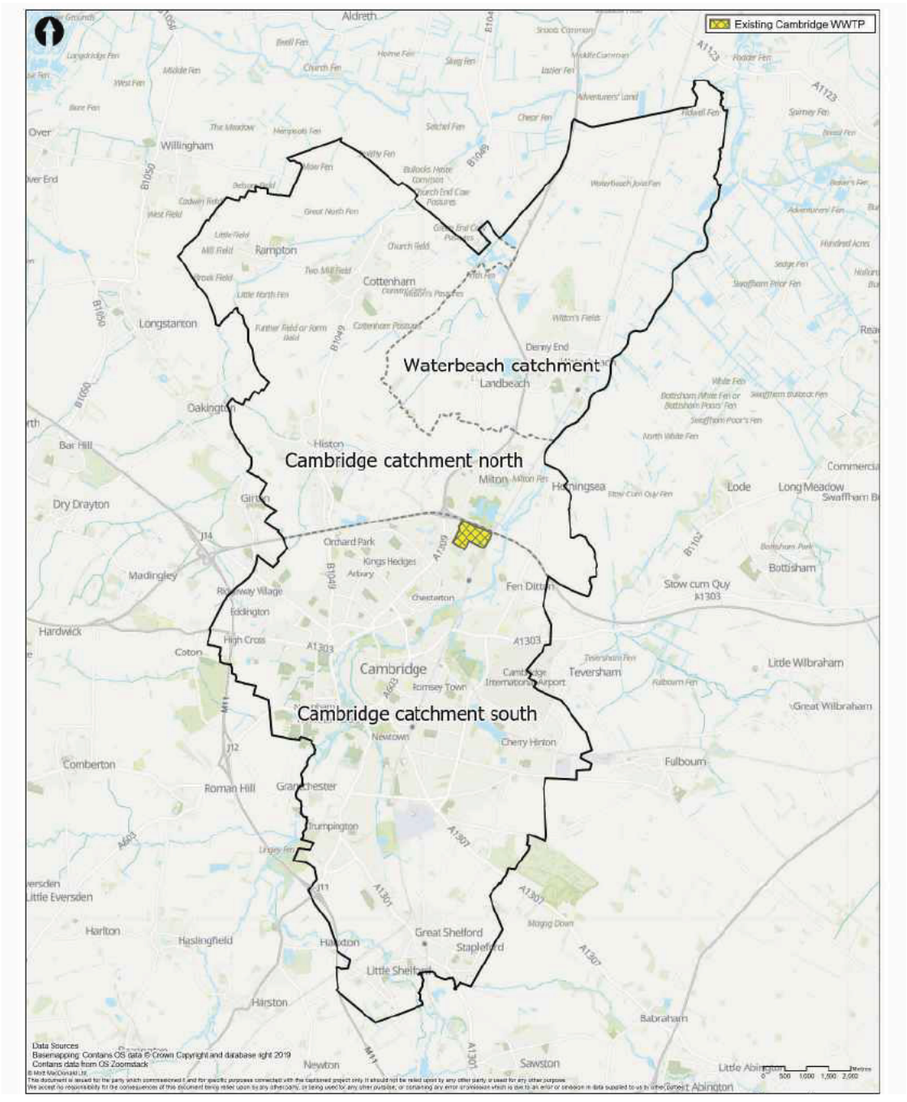


Figure 2 (showing drainage catchment areas)

4. Stage 1. How we identified a longlist of potential site areas

4.1 Objectives of Stage 1

The objective of Stage 1 was to identify a 'longlist' of potential site areas for the new WWTP which could then be taken forward for more in-depth assessment in Stage 2.

We mapped environmental, community and operational constraints in the area to see where a new WWTP could not be appropriately located. We then reviewed the remaining 'unconstrained areas' to identify the locations that would be large enough for the relocation project, which, taking into account different technology types, would require an area of around 22ha (around half the size of the existing WWTP).

The Green Belt was also identified as an important planning constraint that must be considered when selecting suitable sites for the new WWTP. However, it was considered that the Green Belt should not be used as a primary constraint at the initial stage of site selection for the following reasons:

- The Cambridge Green Belt covers a large proportion of the Study Area (approximately 50%) and the remaining area comprises the Cambridge urban area and rural areas relatively distant from the existing WWTP;
- As the Green Belt designation is a non-statutory planning policy designation, development within it may be acceptable if very special circumstances exist.

4.2 The constraints we assessed at Stage 1

The relevant national, regional and local policies were reviewed to identify the primary constraints and, where appropriate, buffer zones were applied around them. The use of buffers ensured that any unconstrained areas would be away from residential properties, protected and statutory designated sites and existing important infrastructure in order to limit any potential impacts on them.

We mapped the following constraints to identify 'unconstrained areas' that may be suitable for the relocation project:

Environmental constraints, including:
- Flood zones
- Landfill sites
- 500m buffer around protected and statutory designated sites e.g. Sites of Special Scientific Interest (SSSI)
- 100m buffer around watercourses

Community constraints:
- 400m buffer around all residential properties to reduce the risk of potential odour impacts

Operational constraints, including:
- Airfields and runways e.g. Cambridge Airport
- Major transport infrastructure e.g. buffers around A, B roads and railways
- Buffer around oil, gas and electrical infrastructure in the area

4.3 Our conclusions of Stage 1

All of the constraints and buffer zones were placed onto the Study Area map (as shown in figure 3) in order to identify the remaining unconstrained areas. The total footprint for the new WWTP site is considered to be around 22 hectares (ha). Using this footprint, the unconstrained areas were reviewed and those under 22ha were removed. The 14 remaining unconstrained areas equal to, or greater than, 22ha then became the longlist of potential site areas (site options A-N, as shown in figure 4).

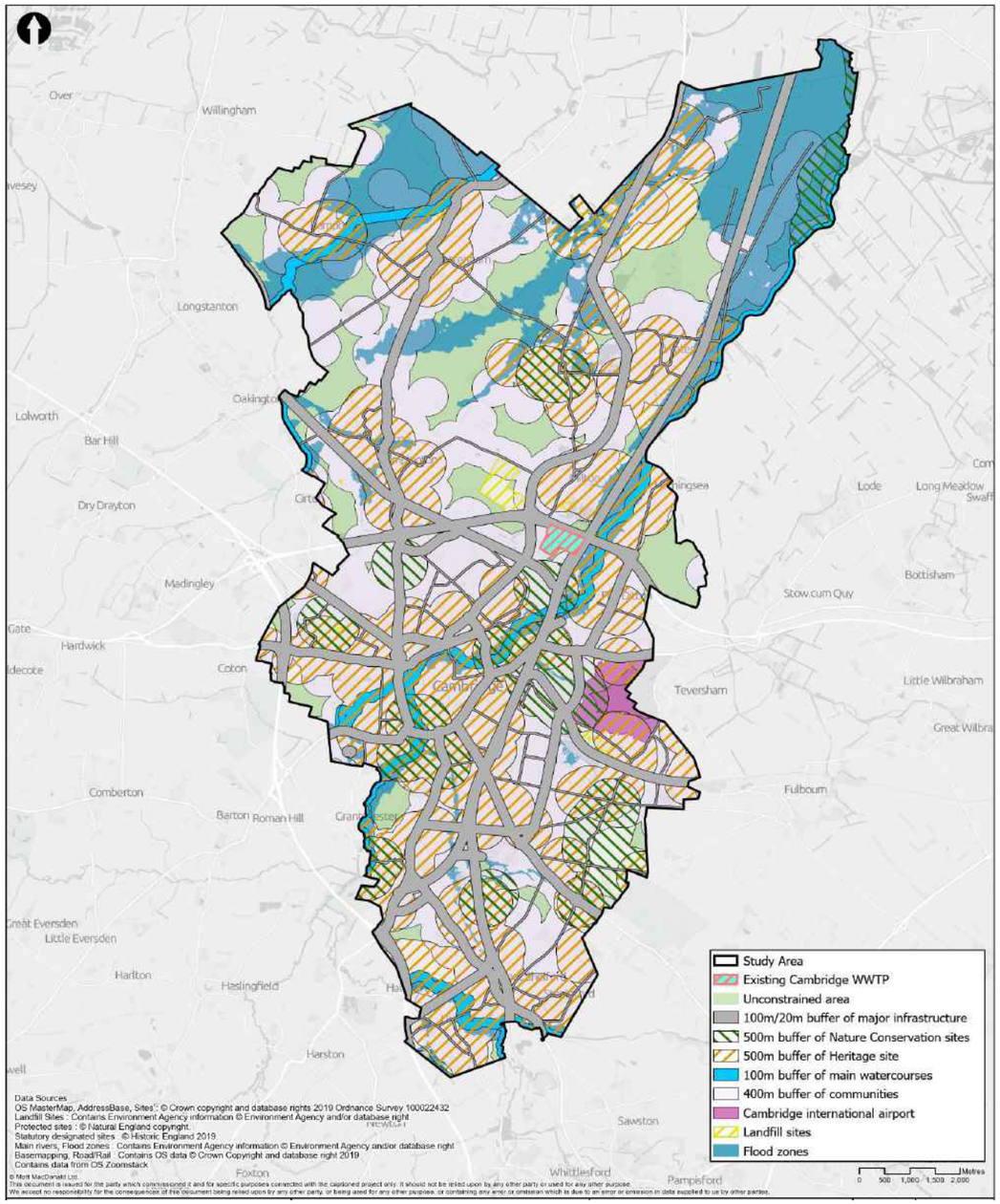


Figure 3 (showing application of constraints)

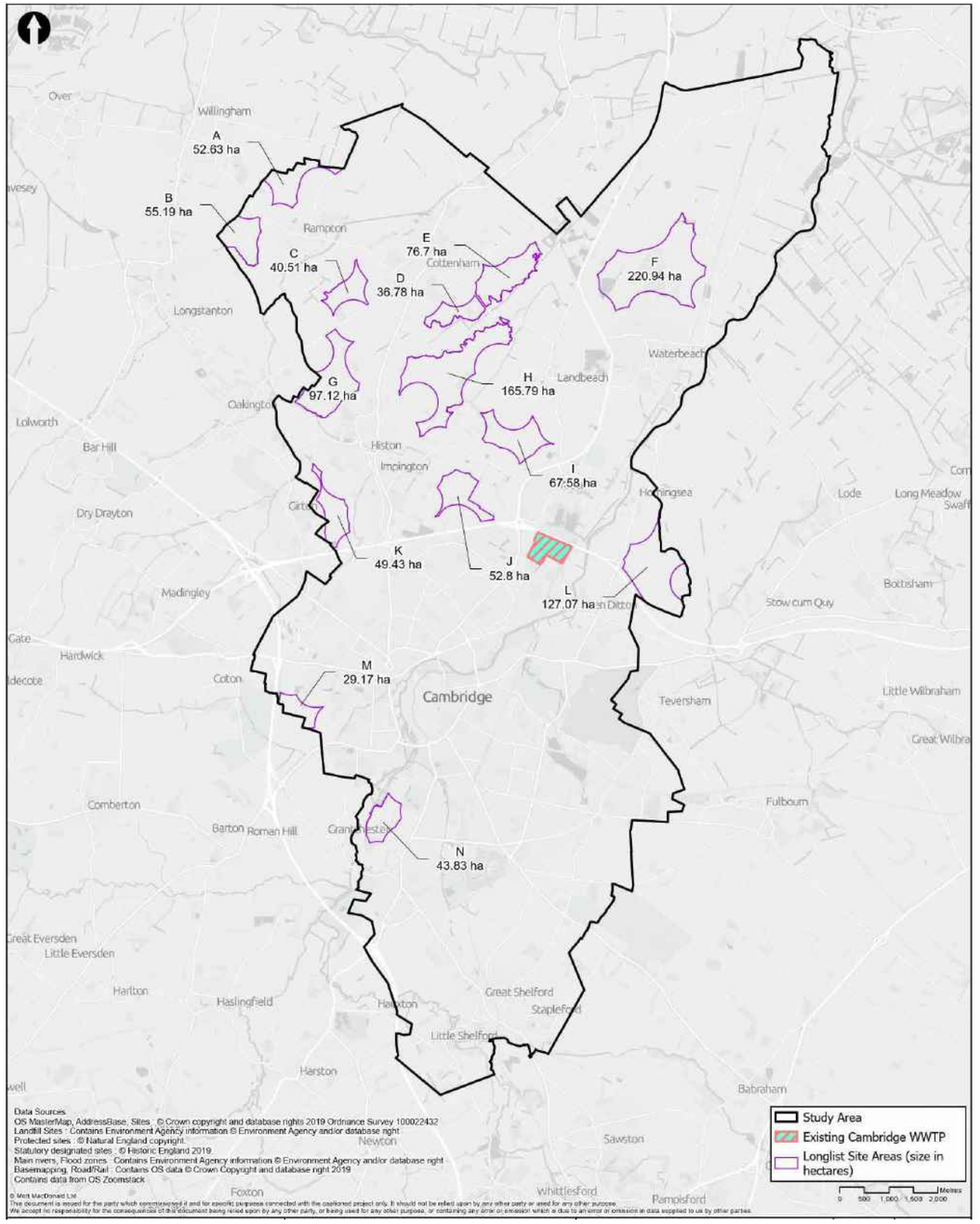


Figure 4 (showing longlist of sites)

5. Stage 2. How we identified a shortlist of potential site areas

5.1 Objectives of Stage 2

Stage 2 involved a 'sieving' approach to reduce the longlist to a shortlist of possible site areas after our initial Stage 1 assessment.

Each site area was evaluated against several different criteria using our Red, Amber, Green (RAG) assessment system. The results of the RAG assessment for each site were compared against each other to identify a shortlist of the best performing sites.

5.2 What we assessed at Stage 2

Impacts on the environment, including:

- Risk of building on contaminated land
- Potential risks to groundwater aquifers and watercourses
- Potential impacts on sites designated for nature conservation
- Potential impacts on the historic environment, for example on the setting of listed buildings or on archaeological remains
- Potential landscape and visual effects, including on Public Rights of Way (PRoWs) and communities
- Consideration of the agricultural land classification and the extent of high-grade agricultural land within the site areas.

Impacts on the community, including:

- Traffic impact e.g. throughout construction and operation (including spoil removal during tunneling)
- Noise and air quality during construction
- Local residents' amenity (i.e. recreational and rights of ways) during construction and operation of the scheme
- Impacts on community facilities and businesses in the local area

Operational constraints, including:

- Whether the shape of the site area would be suitable for a WWTP
- How easy it would be for heavy goods vehicles (HGVs) to access the site
- The length of tunnels and pipelines required, how difficult they would be to construct and also the scale of the carbon emissions resulting from construction.

Planning constraints, including:

- Policy, site allocation and planning permissions
- Sensitivity of neighbouring land uses
- Whether the site lies within the Green Belt

Anglian Water's goal is to be a net zero carbon business by 2030

A separate carbon study was undertaken to assess the carbon emissions of the relocation project. The assessment concluded that the site areas furthest from the existing WWTP (site areas A and B) had the highest estimated carbon emissions, whilst site areas which are closer to the existing WWTP (i.e. site areas I, J and L) had the lowest carbon emissions. This is due to the site areas further away from the existing WWTP requiring longer tunnels and pipelines than the closer site areas.

In terms of scale, the results indicated that the carbon emissions of site areas I, J and L were all less than half of the carbon emissions of site areas A and B. This is demonstrated in figure 5, which illustrates the RAG rating of the carbon emissions for the potential site areas.

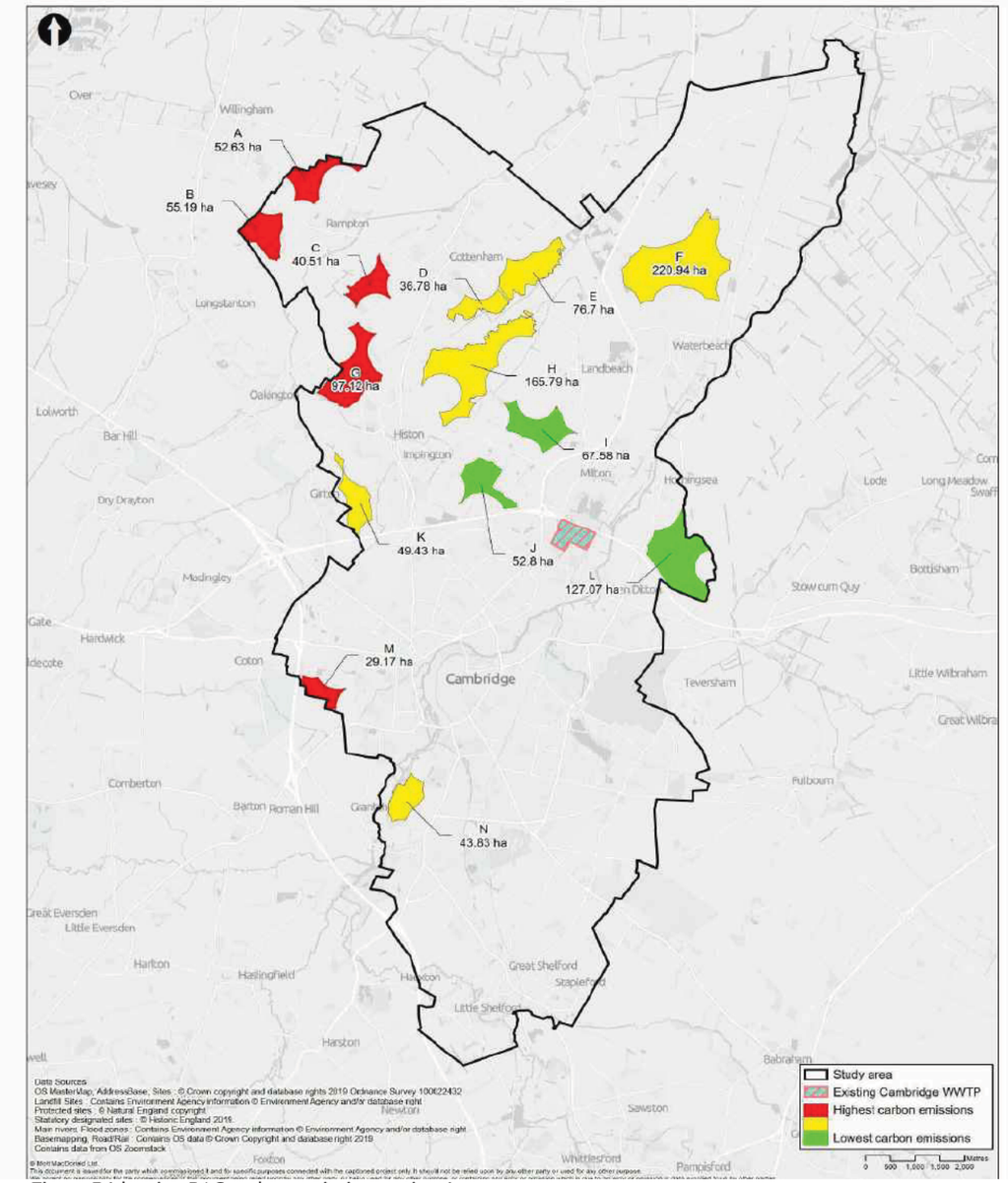


Figure 5 (showing RAG carbon emissions ratings)

5.3 Our Stage 2 conclusions

Following the completion of the RAG assessments, the results for each site area were compared with one another to identify the best performing site areas to be included in the shortlist.

There were several site areas which performed poorly against a range of important criteria and these sites were removed from further consideration. The remaining site areas (A, B, C, H, I, J and L) all had the constraints that would need to be overcome, but otherwise performed better overall than the site areas removed from further assessment.

The remaining site areas fell into two groups (site areas A, B and C and site areas H, I, J and L). Site areas A, B and C benefit from being located outside of the Green Belt but had the disadvantage of high potential impacts on local communities, as well as greater construction risks (for example due to tunneling complexity), higher carbon emissions and the risk of impacts to groundwater.

Site areas H, I, J and L are located within the Green Belt but all performed better in terms of minimising potential impacts on local communities and, as they needed shorter tunnels and pipelines to transport the waste water, they also have lower construction impacts, carbon emissions and less risk of impacts to groundwater.

These seven sites formed the shortlist of sites taken into Stage 3 of the site selection.

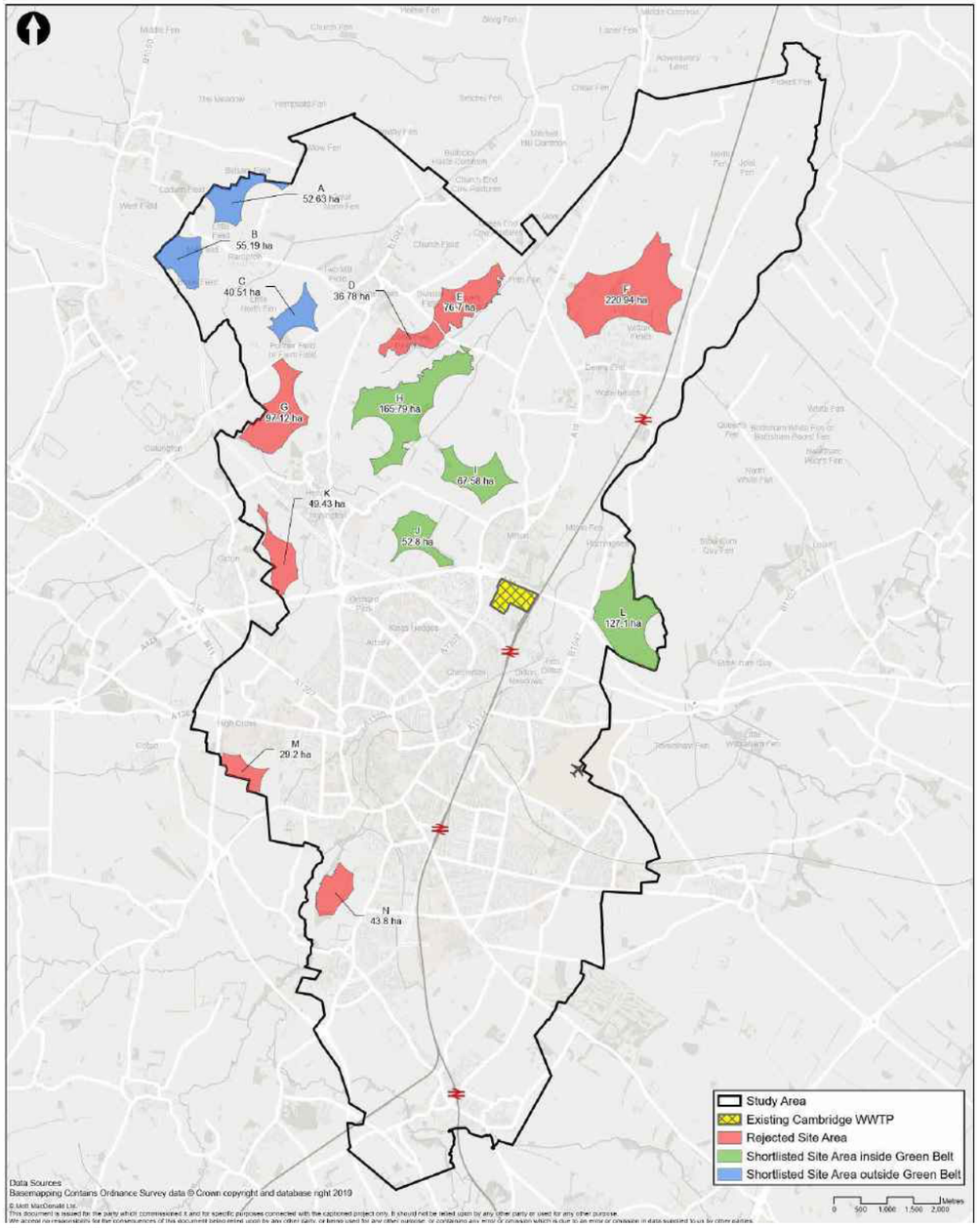


Figure 6 (Stage 2 results - shortlist of sites)

6. Stage 3. How we identified our final shortlist of site area options

6.1 The objectives of Stage 3

At Stage 3, we carried out a more detailed assessment of the remaining seven shortlisted site areas against environmental (including carbon), community, operational and planning criteria to identify the final site area options to take forward to public consultation. In addition, we also assessed economic criteria including the affordability of the sites. The proposed relocation will be funded by the Government's Housing Infrastructure Fund (HIF) which is an initiative to help deliver housing in areas of high demand.

6.2 What we assessed at Stage 3

Environmental

- Carbon emissions – for the tunnels, shafts, pipelines and pumps needed for each site over the lifetime of the project
- Landscape and visual sensitivity – potential impact on the landscape context and visual amenity for each site
- Nature conservation and biodiversity – potential impact on designated sites, habitats and protected species
- Historic environment – consideration of any potential heritage risks and constraints
- Contaminated land – assessment of the potential sources of contamination and the extent of the risk of this
- Groundwater – assessment of the potential negative impacts of the tunnels and shafts on groundwater
- Surface water – consideration of the extent to which the potential negative impacts on bodies of water such as rivers, ponds and lakes can be mitigated

Community

- Non-traffic impact of construction – assessment of potential construction impacts on noise, dust and disruption
- Traffic impact of construction – assessment of potential construction traffic impacts on congestion, air quality, noise and road safety
- Impact on Public Rights of Way – assessment of potential impacts on Public Rights of Way

Operational

- Ease of access – suitability of connecting road access for Heavy Goods Vehicles and other large or sensitive loads

Planning

- Green Belt – assessment of whether development would be within the Green Belt
- Risk to aviation – assessment of the potential impacts of development on aviation in relation to Cambridge Airport

Economic

- Affordability – would development of the new WWTP on the site be achievable and provide value for money within the limits of Government's HIF

6.3 Our Stage 3 conclusions

Site areas I, J, H and L are within the Green Belt. Very special circumstances need to be demonstrated to promote one of these site areas for development. Site areas A, B and C are outside of the Green Belt and would not need to demonstrate such circumstances.

The advantages to sites I, J and L include:

- They have the lowest carbon emissions for construction and operation of the waste water transfer infrastructures (tunnels, pipelines and pumping stations);
- The road transport routes from the main strategic road network to site areas I, J and L are also relatively shorter and would not pass through the centre of any villages. The routes for the 4 other site areas would all pass through the centre of at least one village or pass community facilities such as schools and nurseries. The relatively shorter length of the tunnel to each site area from the existing WWTP and the return pipeline or tunnel to the river, was a key factor meaning site areas I, J and L perform better than all other site areas for this criterion. Sites furthest away from the existing site (A, B, C) are significantly more costly requiring longer tunnels and pipelines.

Development at site areas A, B and C was considered to be unaffordable and not deliverable within the Government's HIF. They would also present a greater impact on the local community and would result in higher lifetime carbon emissions. As a result, it was considered that these site areas are not feasible options for development of the relocation project.

Therefore, based on criteria used to assess the site areas in this site selection process, the remaining suitable site areas in which to develop the relocation project under the Government's HIF were H, I, J and L.

Site area H presented a greater impact on the local community, higher carbon emissions and greater risk of impact on groundwater in comparison to site areas I, J and L. Therefore, we also removed site area H from further assessment.

Best performing site areas

Site areas I, J and L were assessed to be the best performing site areas. All three sites are suitable and feasible for the relocation project against the criteria assessed at this stage and will be taken forward for consultation in our phase one community consultation. They will also be subject to the final stage of site selection including environmental baseline surveys.

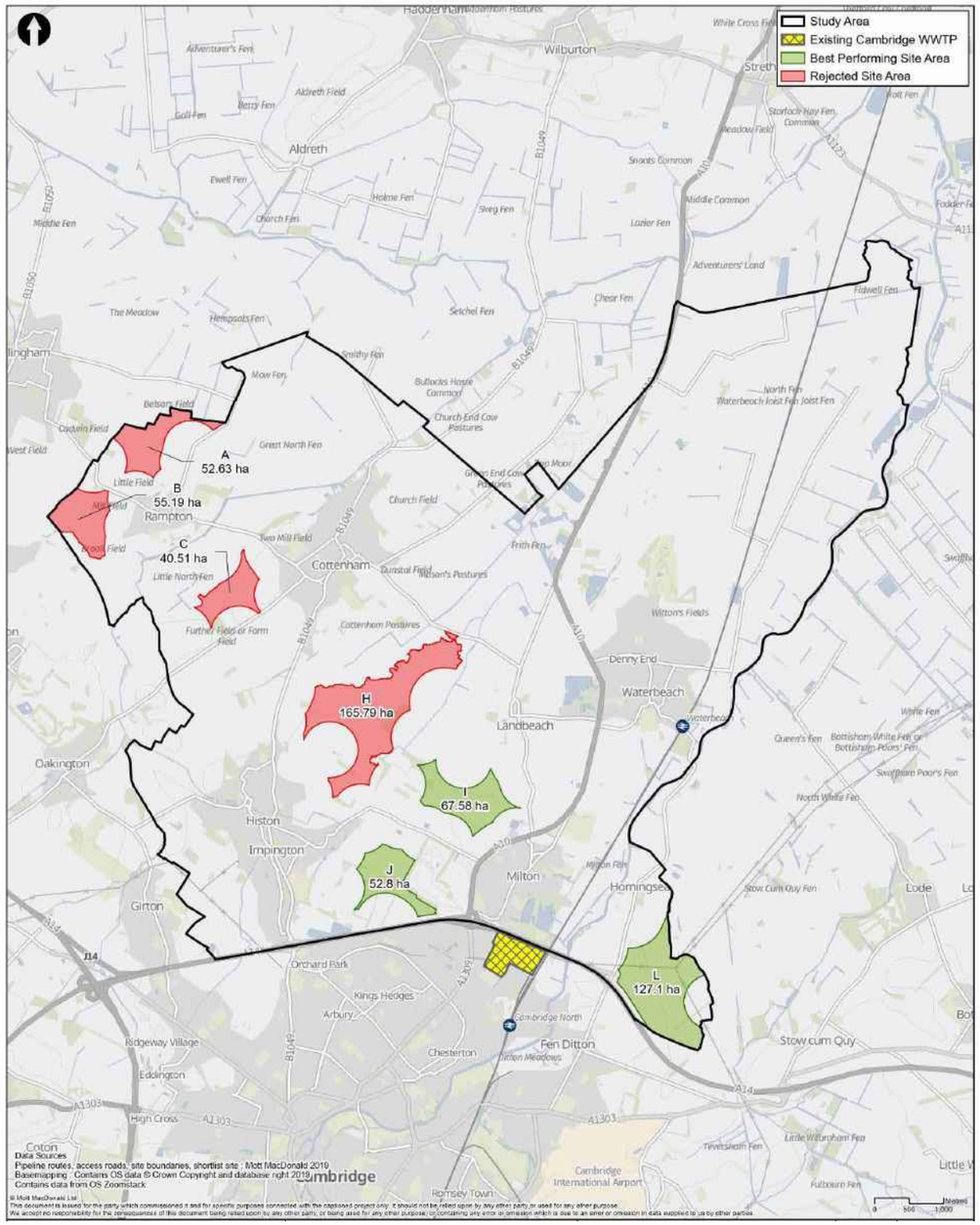


Figure 7 (Stage 3 results)

7. Next steps and how we will identify a final site

Our site selection study has identified three suitable site area options within which the Cambridge WWTP could be relocated, which we have renamed as Sites 1, 2 and 3. We will now be consulting with the community and stakeholders on which of the three site areas is most suitable for the proposed new plant.

We will be considering all feedback we receive on the three site area options during our phase one consultation. We will use this feedback together with a final assessment of the following criteria when identifying the final site to take forward into our phase two consultation:

Environmental – What are the possible impacts on the environment?
Community – What are the possible impacts on local communities?
Operational – How well does each site provide the vital service that Anglian Water needs to provide for its customers and future generations?
Planning – How well does each site meet the requirements of planning policies?
Economic – What is the cost of each option over the lifetime of the project?
Programme – Can the site area option be delivered on time?

As well as community consultation, Anglian Water will be discussing the project with a range of stakeholders, including:

- Landowners;
- Elected representatives, including parish councillors in whose area the proposals are sited and those in adjoining councils, county councillors, local authority elected members and MPs;
- Statutory consultees such as Natural England, the Environment Agency, highway authorities and bodies such as the Internal Drainage Board (IDB); and
- Local interest groups, residents' associations, and organisations such as Bedfordshire, Cambridgeshire and Northamptonshire Wildlife Trust.

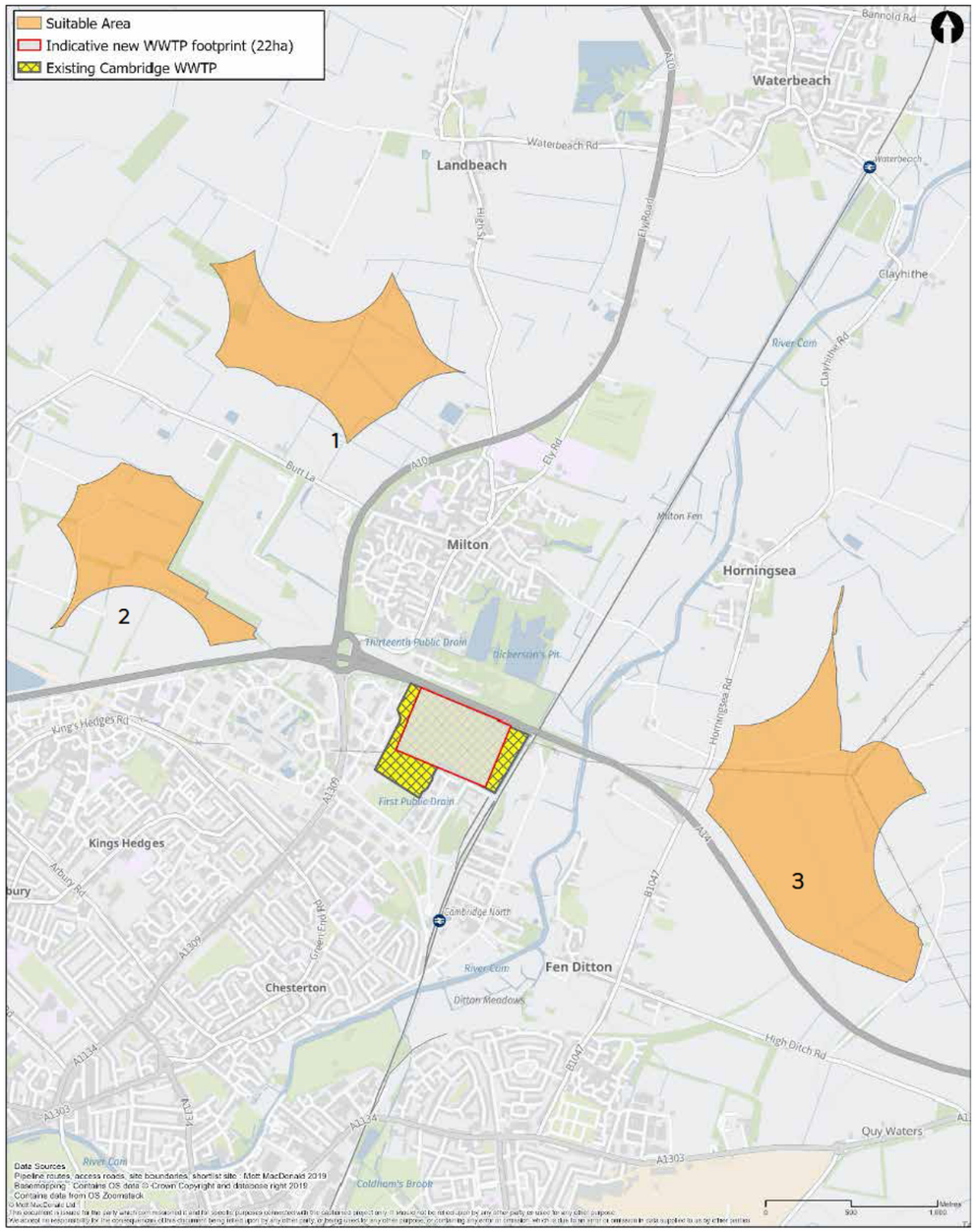


Figure 8 (three sites for consultation)

Contact us

Our consultation team is on hand to answer your questions and listen to your feedback on the proposals for the relocation project.

You can contact us by:

- Emailing at info@cwwtpr.com
- Calling our Freephone information line on 0808 196 1661
- Writing to us at Freepost: CWWTPR
- Visiting our website at [redacted]
- Following us on Twitter at @CWWTPR

If you would like this document in large print, audio or braille formats, please contact us using the details above.

love every drop
anglianwater

Get in touch

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Writing to us at **Freepost: CWWTPR**

Visiting our website at [redacted]

You can view all our DCO application documents and updates on the application on The Planning Inspectorate website:

https://infrastructure.planninginspectorate.gov.uk/projects/eastern/cambridge-waste-water-treatment-plant-relocation/