Cambridge Waste Water Treatment Plant Relocation Project
Anglian Water Services Limited

Appendix 3.5: Final Site Selection

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MOTT MACDONALD

Cambridge Waste Water Treatment Plant Relocation

Stage 4 - Final Site Selection

January 2021

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Glossary

AAP	Area Action Plan
AQMA	Air Quality Management Area
BGS	British Geological Survey
BNG	Biodiversity Net Gain
CAPEX	Capital expenditure
CEMP	Construction Environmental Management Plan
CWWTPR	Cambridge Waste Water Treatment Plant Relocation
CWS	County Wildlife Site
DCO	Development Consent Order
DEVEX	Development expenditure
EPR	Environmental Permitting (England and Wales) Regulations 2016
EIA	Environmental Impact Assessment
ES	Environmental Statement
GI	Ground investigation(s)
ha	hectare
HIA	Hydrogeological Impact Assessment
HIF	Housing Infrastructure Fund
HRA	Habitat Regulations Assessment
LNR	Local Nature Reserve
LWS	Local Wildlife Site
mAOD	metres above Ordnance Datum
NEC	North East Cambridge
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
NPS	National Policy Statement for Waste Water
NSIP	Nationally Significant Infrastructure Project
OPEX	Operational expenditure
OS	Ordnance Survey
Q95	Flow in a watercourse exceeded 95% of the time
RAG	Red, Amber and Green assessment
RBMP	River Basin Management Plan
SPA	Special Protection Area
SPZ	Source Protection Zone
SAC	Special Area of Conservation
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage System
WFD	Water Framework Directive
WLC	Whole Life Carbon
WWTP	Waste Water Treatment Plant

Foreword

Anglian Water is committed to bringing environmental and social prosperity to the region we serve. As a purpose-led business, we recognise we have a huge opportunity - and responsibility - to contribute to the environmental and social wellbeing of the communities within which we operate.

The relocation project provides a once-in-a-lifetime opportunity to deliver a modern, net zero carbon waste water treatment plant that will continue to provide vital services for the community and the environment, recycling water and nutrients, producing green energy, and helping to enable Greater Cambridge to grow sustainably.

1. South Cambridgeshire District Council and Cambridge City Council recently consulted on a draft Area Action Plan for a new low-carbon city district in North East Cambridge, which could create 8,000 homes and 20,000 jobs over the next 20 years. Achieving this vision relies on the relocation of Anglian Water's Cambridge Waste Water Treatment Plant, and we are working in partnership with them to unlock the development potential of the area, which has great walking, cycling and public transport links, including the new Cambridge North Station, making it a highly sustainable location for new homes.

2. Between July and September 2020, we held our Phase One consultation and asked for feedback on three potential locations for our new waste water treatment plant. In November we published a report summarising the feedback received and how this was being considered in our site selection and early design processes. This is available on our website (www.cwwtpr.com).

3. We received a great level of feedback from residents and stakeholders and we recognise that many people feel very passionately about the issues raised during consultation and we entirely understand the strength of feeling. We have very carefully considered all responses alongside our environmental, community, planning, operational, economic and programme assessments. It has been a challenging decision to make; however, we have now concluded our site selection process and identified the site we will be taking into our Phase Two consultation later this year.

4. This document is a full technical report of the Cambridge Waste Water Treatment Plant Relocation Stage 4 Final Site Selection. It explains how the four-stage site selection process has identified and assessed potential site areas against planning, operational, community impact, environmental, economic and programme criteria, progressing from initial options appraisal through to the selection of Anglian Water's preferred site.

5. This iterative process has been aligned with relevant legislation and national and local planning policy including the National Policy Statement for Waste Water to ensure that the consideration of alternatives will provide a strong evidence base for the future application for a Development Consent Order (DCO). During the development of the appraisal process, the local planning authorities were invited to comment on the site selection methodology and their feedback has been incorporated into the process.

6. The assessments outlined in this report have been carried out by a team of subject matter experts advising Anglian Water, alongside our own operational, design and engineering colleagues, from Mott MacDonald, Savills, Eversheds Sutherland, Counter Context, Lucent Energy and Anglian Water's @one Alliance.

7. Anglian Water's ambition for this considerable engineering endeavour goes beyond just building a new plant. It isn't about simply moving the old facility to a new location. Our vision is to create a state-of-the-art, carbon neutral facility that will turn Greater Cambridge's waste water into a valuable source of renewable energy that will power the plant and may also heat homes before returning cleaned water to the River Cam.

8. We will also protect and enhance the surrounding environment, deliver improved habitats for wildlife and create increased access and connectivity so that people can enjoy the Greater Cambridge countryside, providing a lasting positive legacy.

9. Before our statutory Phase Two Consultation on more detailed proposals for the new facility opens later this year, we will be forming a series of technical and community working groups to begin to explore these ideas in more detail. This input will help us to develop our vision for the plant in collaboration with local communities and other stakeholders, before undertaking a wider public consultation on the detail of the proposals.

10. We will soon be undertaking site investigations and surveys to inform the Environmental Impact Assessment (EIA) for the relocation project and we will shortly be submitting our initial EIA Scoping Report to the Planning Inspectorate (PINS).

11. Ahead of the next two statutory phases of consultation we will be inviting further input to help shape and develop our vision for how the plant design evolves and hope we will continue to receive the great level of engagement we have already seen.

Mark Malcolm

Anglian Water

Programme Director Major Infrastructure

1 Introduction

1.1 The Cambridge Waste Water Treatment Plant Relocation project

1.1.1 Cambridge City Council and South Cambridgeshire District Council are leading the regeneration of North East Cambridge (NEC). The combined planning service for these councils (Greater Cambridge Shared Planning) are proposing to deliver a new low-carbon city district, which could create 8,000 homes and 20,000 jobs over the next 20 years. The principle of regeneration for this area was established in the 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 was published for public consultation in summer 2020.

1.1.2 The existing Cambridge Waste Water 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.

1.1.3 The Cambridge WWTP relocation project (CWWTPR) proposes to relocate and construct a new waste water treatment plant, thereby unlocking the regeneration of NEC, which could provide more than 5,600 new homes (subject to planning).

1.1.4 In 2019 Cambridge City Council submitted a bid on behalf of their partnership with Anglian Water which, prioritised by the Cambridgeshire and Peterborough Combined Authority and supported by all the local authorities within the Combined Authority's area, applied for and secured 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).

1.1.5 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.

1.1.6 A Statement of Requirement was produced by Anglian Water, which explained the background to the project and established the requirement for a site selection study to identify a suitable site for the relocation of Cambridge WWTP.

1.1.7 Anglian Water then commissioned a detailed site selection study, to investigate and assess potential locations for the new WWTP. This report represents the final stage in the site selection study to identify a proposed location for the new WWTP.

1.1.8 The Secretary of State for Environment, Food and Rural Affairs has made a direction under section 35 of the Planning Act 2008 confirming that the CWWTPR is to be treated as a development of national significance for which development consent under that Act is required. Anglian Water will therefore in due course submit an application for a development consent order for the CWWTPR.

[1] Cambridge City Council, 2018. Cambridge Local Plan [redacted]

[2] South Cambridgeshire District Council, 2018a. South Cambridgeshire Local Plan [redacted]

1.2 Site selection process

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

1.2.2 This appraisal process assessed site areas against planning, operational, community impact, environmental and, in the final stages, economic and programme criteria. This iterative process was aligned with the requirements of relevant legislation and national and local planning policy including the National Policy Statement for Waste Water[3] (NPS) and Environmental Impact Assessment (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.

1.2.3 Figure 1.1 below illustrates the sequence of studies leading to the selection of the site area for CWWTPR.

1.2.4 Following the Initial Options Appraisal, the selection exercise has progressed through four stages, which are:

A. Stage 1 – Initial Site Selection
B. Stage 2 – Coarse Screening and Carbon Assessment
C. Stage 3 – Fine Screening
D. Stage 4 – Final Site Selection

1.2.5 The documents listed above are provided in the document library on the project website at https://cwwtpr.com/.

1.2.6 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. 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.

1.2.7 The sites areas shortlisted in Stage 3 – Fine Screening were I, J and L, which are referred to as site areas 1, 2 and 3, respectively, from this point onwards.

1.2.8 Stage 4 Final Site Selection, was the last stage of the site selection process and the subject of this report. Stage 4 applied the finest grain of screening to the three remaining shortlisted site areas and associated infrastructure requirements.

1.2.9 The Stage 4 assessment used the information collated during the first four stages of the site selection process combined with the results of further technical feasibility assessments, initial environment walkover surveys and phase one non-statutory public consultation to assess each of the site area options against one another.

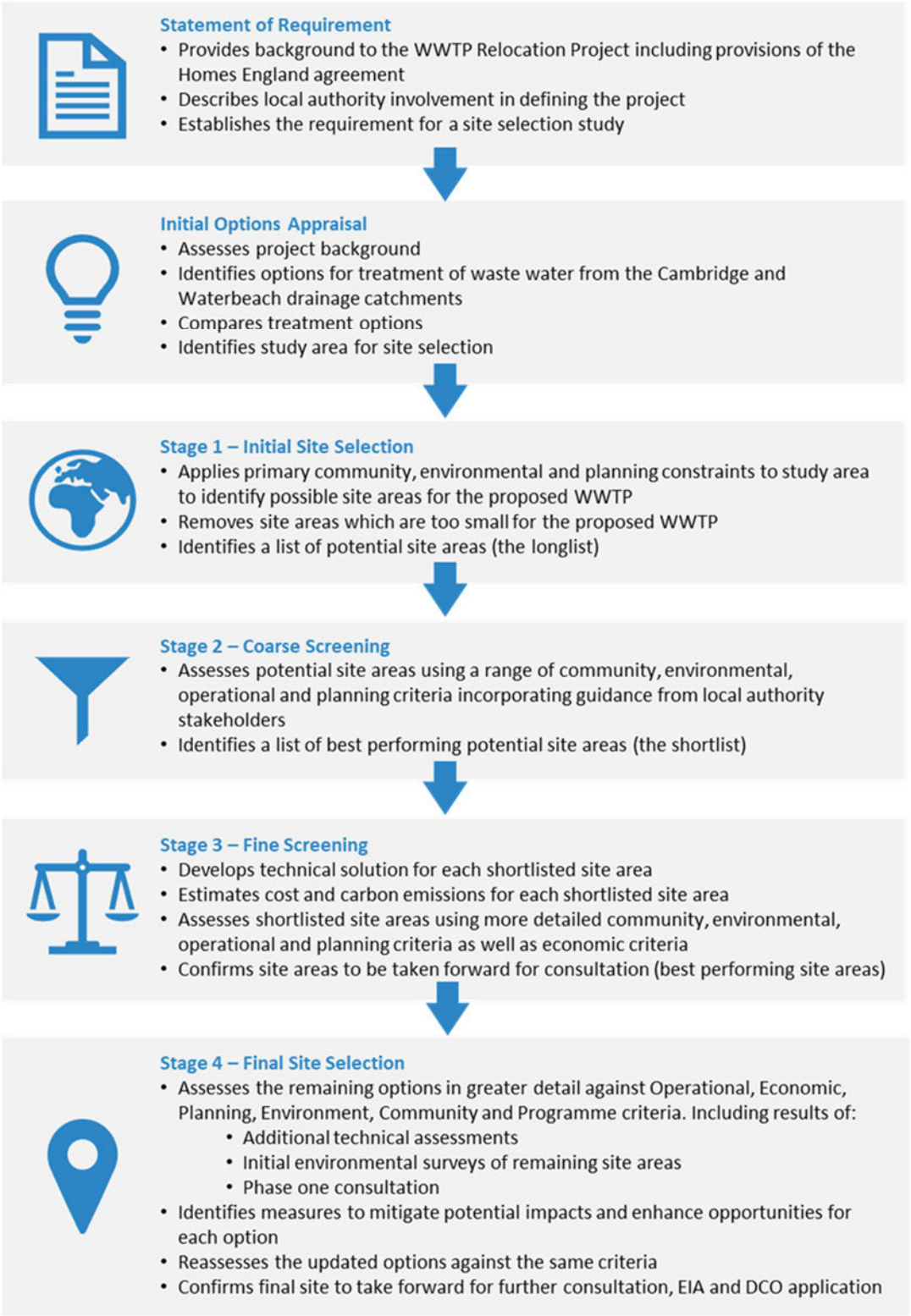
1.2.10 Phase one of the non-statutory public consultation introduced the community to the early stage proposals for CWWTPR and the site selection process up to Stage 3 – Fine Screening. This first

[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

phase of non-statutory consultation aimed to gather local knowledge to inform Stage 4 – Final Site Selection as well as helping to develop and refine our proposals.

Figure 1.1: Summary of Site Selection process



1.3 Options assessed at Stage 4 – Final Site Selection

1.3.1 The main options assessed are for a new WWTP within site areas 1, 2 and 3. Each option includes the following infrastructure requirements, which were assessed alongside each of the shortlisted site areas in Stage 4, all of which are shown in Figure 1.2 below.

- Waste water transfer tunnel from the existing WWTP to the new WWTP
- Treated effluent transfer tunnel or pipeline from the new WWTP to the River Cam
- Indicative waste water transfer pipeline from Waterbeach drainage catchment
- Diversions of the existing waste water transfer network from other outlying villages
- Access to the WWTP site via the existing road network and any new private access roads required.

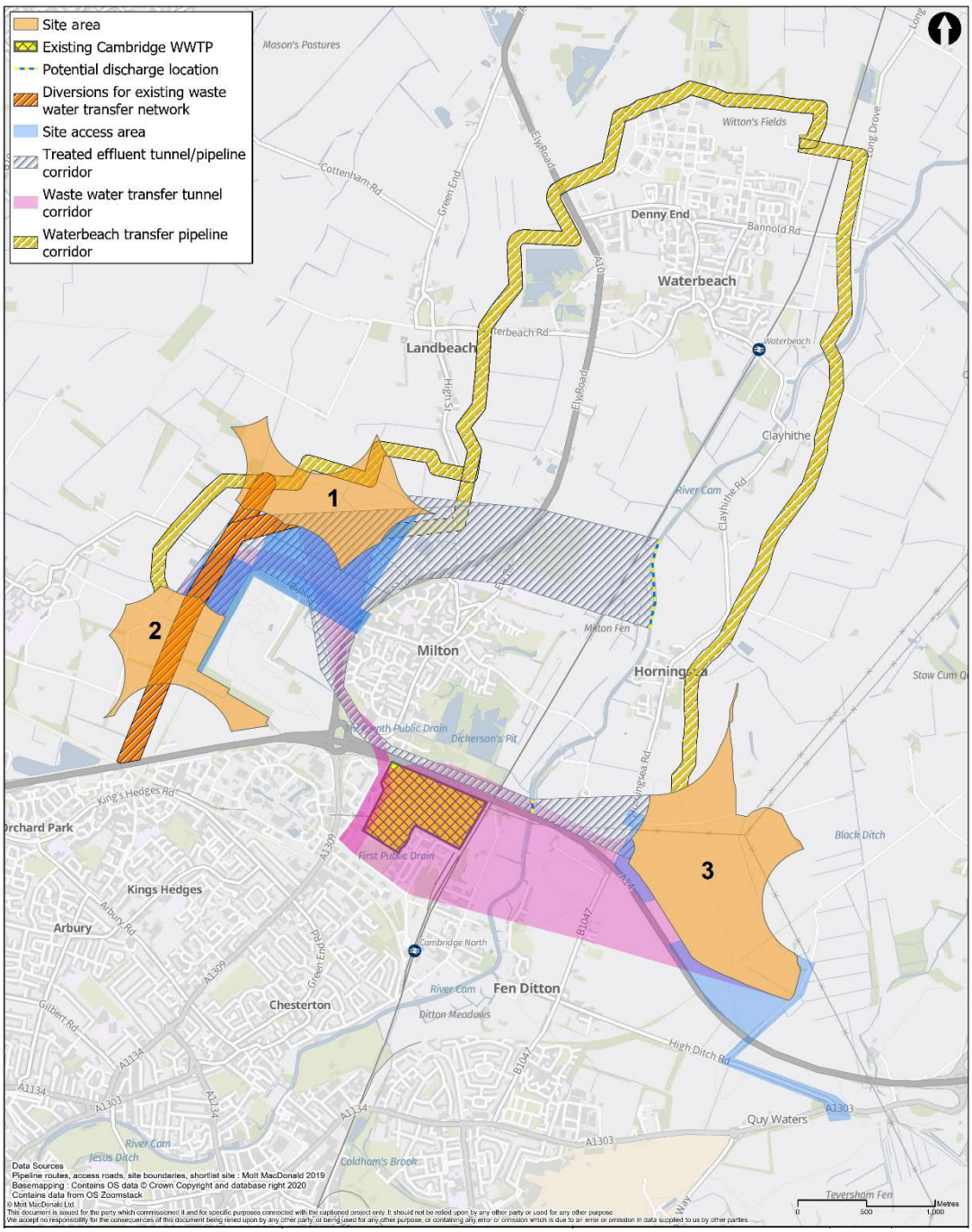
1.3.2 There are different transfer infrastructure sub-options associated with each site area based on the treated effluent transfer corridor alignment and infrastructure type (particularly, whether the treated effluent returns to the River Cam in tunnel or dual pipeline). The transfer pipeline and tunnel sub-options have different cost, carbon and environmental impacts even for the same site area option and these differences are be material in comparing the three site areas.

1.3.3 Thus the proposed options and sub-options assessed are as follows:

- Site area 1
  - 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 1.5km 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 1.5km 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

1.3.4 Individual maps illustrating each site area option and the associated infrastructure corridors are provided in Drawings 409071-MMD-00-XX-GIS-Y-0450 to 0454 in Appendix A.

Figure 1.2: Site areas and infrastructure corridors



1.4 Assessment criteria

1.4.1 The criteria assessed fall into six broad categories, which are as follows.

- Environmental – What likely significant environmental effects could each option give rise to?
- Community – What likely significant effects could each option have on local communities?
- Operational – How well does each option perform against Anglian Water's operational requirements?

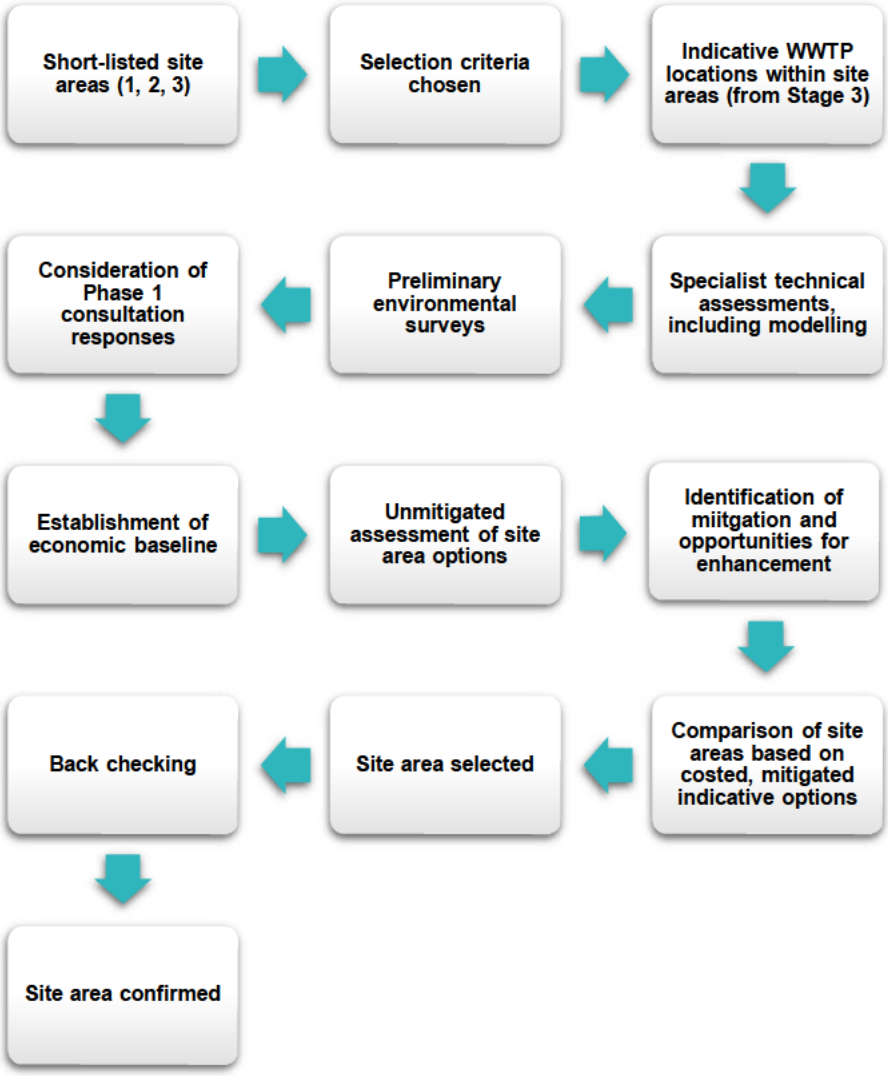
- Planning – How does each option perform against planning policy?
- Economic – What are the capital and whole life costs of each option?
- Programme – Are there significant programme risks associated with implementing the option (either pre-construction or during construction)?

1.4.2 The criteria assessed within these broad categories are explained in detail in Section 2.

1.5 Assessment methodology

1.5.1 The assessment of the options comprises a number of steps as shown in Figure 1.3.

Figure 1.3: Stage 4 assessment summary



1.5.2 The site area options were assessed against the criteria using either qualitative analysis or RAG scoring systems, the appropriate method for assessing each criterion was defined in collaboration with the specialists in each field. The detailed accounts of these assessments are provided in Appendices B to G. The findings of the assessments were used to inform summaries of results for each site area option and the comparison of results, which are

provided in this report. The main sections of this report focus on the assessment of the mitigated scenarios for all of the site options.

1.5.3 Site area options were assessed against the criteria based on the information collected during the previous stages of site selection and the results of the following:

- Additional technical assessments including transport access and odour impacts
- Additional environmental assessment including preliminary environmental walkover surveys of the three shortlisted site areas and, where possible within the required timeframe, the corridors and areas for the associated infrastructure
- Additional community criteria assessment
- Phase one non-statutory consultation with communities, statutory stakeholders and local interest groups.
- Additional planning assessment including a separate Green Belt study
- Land acquisition and compensation assessment
- Operational assessment
- Emerging findings of the Hydrogeological Impact Assessment

1.5.4 When assessing the unmitigated scenario, a realistic worst-case scenario has been considered, which assumes the conditions described below. This approach is consistent with the *Institute of Environmental Management and Assessment Environmental Impact Assessment Guide to Shaping Quality Development*[5], in relation to establishing mitigation measures.

- Standard construction management controls will be implemented through a Construction Environmental Management Plan or similar document, details of which will be subject to submission and approval through the DCO process.
- The operation of the WWTP would be subject to emission controls to meet the requirements of the Industrial Emissions Directive, and environmental permits to meet the requirements of the Urban Waste Water Treatment Directive and Water Framework Directive. These actions would occur with or without input from the EIA into the design process and the WWTP would not be able to operate without these permits in place.

EU directives

1.5.5 Where this report refers to EU Directives, it is not at the time of writing envisaged that related assessments are affected by the UK's withdrawal from the EU and the end of the implementation period. Sections 2 and 3 European Union (Withdrawal) Act 2018, as amended by the European Union (Withdrawal) Act 2020, came into force on 31 December 2020. In broad terms these provide that direct EU legislation, and EU-derived domestic legislation, as they have effect in domestic law immediately before the implementation period completion day (31 December 2020), will continue to have effect in domestic law on and after that day unless later modified by UK law.

[5] Institute of Environmental Management and Assessment, Environmental Impact Assessment Guide to Shaping Quality Development, November 2015. Available at:

[redacted]

[redacted]b.pdf

1.6 Report contents

1.6.1 This report details the final site selection assessment to identify the best performing site area option to take forward to EIA, further stages of statutory public consultation and DCO application. The purpose of the sections of this report are detailed below.

Main report

2. Assessment criteria - Explanation of each criterion used in the assessment of the site area options.
3. Site area 1 assessment - Summary of the assessment results across all criteria for site area 1 and associated options.
4. Site area 2 assessment - Summary of the assessment results across all criteria for site area 2 and associated options.
5. Site area 3 assessment - Summary of the assessment results across all criteria for site area 3 and associated options.
6. Comparison of results – Comparison of the assessment results for the site area options and rejection on unsuitable options.
7. Back checking – Review of previously rejected sites taking account of the Stage 4 assessment results and feedback from non-statutory community and stakeholder consultation.
8. Conclusion – Confirmation of the site area option to take forward to EIA and DCO application.
9. References

Appendices

- Appendix A contains maps and drawings referred to within the main report.
- Appendices B to G contain the detailed assessments for all of the criteria described in Section 2.
- Appendices H to M contain data tables, additional studies and reports referenced in the main report and detailed assessment in appendices B to G.
- Appendix N contains an addendum to the Stage 2 – Coarse Screening and Stage 3 – Fine Screening reports in relation to an update of the nature conservation and biodiversity assessments.

2 Assessment Criteria

2.1.1 This section provides an explanation of the criteria assessed within each of the six broad categories. The detailed assessments and their associated methodologies are provided in Appendices B to G this report.

2.1.2 Competent experts in relevant subject areas have developed the methodology and completed the assessment for each criterion described in the following sections.

2.2 Environmental

Nature conservation and biodiversity

2.2.1 This assessment considered the potential impacts of the WWTP development on nature conservation and biodiversity within and around each of the shortlisted site areas and the associated infrastructure corridors. The assessment comprised a further desk study that built on previous stages of site selection, as well as Phase 1 habitat surveys of the shortlisted site areas, and focussed on potential impacts on designated sites, habitats and protected/notable species.

2.2.2 The methodology for assessing the potential impacts on nature conservation and biodiversity was informed by the Chartered Institute of Ecology and Environmental Management's (CIEEM) *Guidelines for Preliminary Ecological Appraisal*[6]

2.2.3 The nature conservation and biodiversity assessment is provided in Appendix B.1.

Landscape and visual amenity

2.2.4 This assessment considered the potential impacts upon landscape character and visual amenity of the unmitigated options for the three site areas and their associated infrastructure.

2.2.5 The assessment was based on a high-level desk based review of the options together with an initial baseline field survey to appraise opportunities and constraints within the local landscape, including existing local features that may offer screening opportunities.

2.2.6 The methodology for the assessment was informed by guidance in the *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition[7].

2.2.7 Preliminary landscape mitigation measures were identified for each of the site area options to minimise, where possible, the potential impacts on the landscape and visual amenity. The potential impacts of each site area option, with landscape mitigation in place, were then assessed.

2.2.8 The landscape and visual amenity assessment is provided in Appendix B.2.

[6] CIEEM Guidelines for Preliminary Ecological Appraisal, second edition, December 2017 [redacted]

[7] *: Landscape Institute and Institute of Environmental Management and Assessment (2013*)

Historic environment

2.2.9 This assessment considered the potential impacts upon the historic environment of the WWTP development at the three site areas and their associated infrastructure. A detailed methodology for this assessment is provided in the Historic Environment Report in Appendix L.

2.2.10 The assessment provides a more detailed assessment of the three shortlisted site areas than was provided in Stage 3, including development of a more detailed baseline in relation to designated and non-designated heritage assets and a rapid site walkover of each of the three site areas and key heritage assets relating to them.

2.2.11 Recommendations were made for mitigation at each of the proposed site area options and a reassessment of the likely impact on the historic environment if all mitigation is undertaken.

2.2.12 The assessment methodology was informed by the following legislation and planning policy.

- *Planning (Listed Building and Conservation Areas) Act*[8]
- *Ancient Monuments and Archaeological Areas Act*[9]
- *National Policy Statement for Waste Water*[10]
- *South Cambridgeshire Local Plan , Policy NH/14: Heritage Assets*[11]

2.2.13 The historic environment assessment is provided in Appendix B.3.

Land and water quality

2.2.14 This assessment considered the potential impacts upon the water environment, including both groundwater and surface water impacts, and the risks from contaminated land to the environment and human health. The assessment included the proposed site area options and associated infrastructure.

2.2.15 The assessment examined the following aspects.

- Contaminated land including:
  - Contamination risks below the WWTP and along the routes of associated infrastructure (tunnels, pipelines and shafts)
- Groundwater impacts including:
  - Risks to groundwater (flows, levels or quality) as a result of construction and operation of the site
  - Risks to Water Framework Directive (WFD) classified groundwater bodies
  - Risks to groundwater dependent ecosystems
- Surface water impacts including:
  - Risks to WFD classified surface waterbodies[12] (flows and quality) during construction and operation of the site and associated infrastructure

[8] Planning (Listed Building and Conservation Areas) Act 1990. Available at: https://www.legislation.gov.uk/ukpga/1990/9/contents

[9] Ancient Monuments and Archaeological Areas Act 1979. Available at: https://www.legislation.gov.uk/ukpga/1979/46

[10] DEFRA, National Policy Statement for Waste Water, 2012 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69505/pb13709-waste-water-nps.pdf

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

[12] It should be noted that risks to natural surface water drainage patterns in and around the new WWTP site and associated infrastructure would be accommodated in the design, possibly by inclusion of SuDS measures within the site. Since impacts are likely to be minimal, these have not been considered as part of the assessment as it would be unlikely to have an effect on the site selection.

- Risks to surface water dependent ecosystems

2.2.16 The assessment was informed by the following guidance and legislation:

- *Land contamination risk management*[13]
- *Hydrogeological impact appraisal for groundwater abstractions*[14]
- *Groundwater risk assessment for your environmental permit*[15]
- *The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017*[16]

2.2.17 The land and water quality assessment is provided in Appendix B.4.

Carbon emissions

2.2.18 This assessment considered the differences in estimated carbon emissions for the three site area options (and sub-options) and hence which option would be more aligned with UK government carbon reduction targets as well as the water industry's public commitment to net zero carbon emissions by 2030. A whole life carbon assessment of embodied and operational carbon was carried out for each of the site area options and sub-options. The assessment focussed on significant connecting infrastructure to and from the new WWTP as this varies for each site area. In contrast the carbon emissions for the WWTP itself would not vary significantly between site areas and hence the WWTP carbon emissions were not included in the analysis.

2.2.19 The most significant connection infrastructure is for the transfer of waste water to the new WWTP and return of treated effluent to the River Cam. However, other significant connecting infrastructure for the new WWTP include waste water transfer from Waterbeach, road access and connection to the power grid.

2.2.20 The assessment methodology was developed in accordance with the following guidance.

- A framework for accounting for embodied carbon in water industry assets (UK Water Industry Research, A framework for accounting for embodied carbon in water industry assets, 2012)
- Workbook for Estimating Operational GHG emissions (UK Water Industry Research, 2019)
- PAS 2080:2016 Carbon Management in Infrastructure (British Standards Institute, PAS 2080:2016 Carbon Management in Infrastructure , 2016)

2.2.21 The carbon emissions assessment is provided in Appendix B.5.

Noise

2.2.22 A preliminary assessment was undertaken to identify potential noise and vibration impacts on sensitive receptors and receptor groups to the proposed options. The assessment considered noise and vibration impacts during construction and operation phases.

2.2.23 Assessment of construction noise and vibration assessment refers to methodology and guidance of BS 5228-1&2:2009+A1:2014 (British Standards Institute, 2008). Potential noise and

[13] Environment Agency, Land contamina ion risk management, October 2020. Available at: https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm

[14] Environment Agency, Hydrogeological impact appraisal for groundwater abstractions, April 2007. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291083/scho0407bmah-e-e.pdf

[15] Environment Agency and Department for Environment, Food & Rural Affairs, Groundwater risk assessment for your environmental permit guidance, February 2016. Available at: https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit

[16] The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Available at: https://www.legislation.gov.uk/uksi/2017/407/contents/made

vibration impacts during construction are a function of a number of factors including: the magnitude of impacts, sensitivity of receptors and duration of impacts.

2.2.24 Therefore, a qualitative assessment of potential impacts was carried out based on indicative site area locations and potential works with respect to sensitive receptors.

2.2.25 The noise assessment is provided in Appendix B.6.

Air Quality

2.2.26 A High-level assessment was undertaken to identify potential air quality impacts on sensitive receptors from the proposed site areas and their associated transfer corridors and access routes during construction and operation. The assessment comprised the following elements:

- Identification of whether baseline air quality conditions exceed national air quality objectives
- Comparison of estimated construction and operational vehicle movements with air quality assessment thresholds within relevant guidance:
  - Institute of Air Quality Management's (IAQM) 'Guidance on the assessment of dust from demolition and construction'[17]
  - Environmental Protection United Kingdom (EPUK) and IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality"[18]
- Qualitative assessment of potential impacts in relation to dust and vehicle emissions based on indicative site area locations and potential works with respect to locations of sensitive receptors

2.2.27 The air quality assessment is provided in Appendix B.7.

Odour (environmental impacts)

2.2.28 A preliminary odour study was used to identify the potential odour impacts on receptors in proximity to the proposed site areas. The preliminary study estimated odour emissions from an indicative WWTP footprint within each site area, which was carried out in accordance with the Institute of Air Quality Management's (IAQM) *Guidance for the assessment of odour for planning* (Institute of Air Quality Management, 2018).

2.2.29 The outputs from the study were used to assess the potential impacts on sensitive receptors in proximity to a new WWTP at each of the site areas.

2.2.30 The odour assessment is provided in Appendix B.8 and the preliminary odour study is provided in Appendix M.

2.3 Community

2.3.1 The community assessment considered the impact on local residents, businesses and communities from the construction and operation of the different options. This is related to the possible impacts from the construction and operation of a WWTP in the area of each potential site, the waste water transfer tunnel, the treated effluent discharge pipeline, the Waterbeach transfer pipeline, the diversion of the existing waste water transfer networks, the access roads and potential location of shafts.

[17] Institute of Air Quality Management (2014) Guidance on the assessment of dust from demolition and construction [redacted]

[18] Environmental Protection UK and Institute of Air Quality Management (January 2017) Land-Use Planning and Development Control: Planning for Air Quality (version 1.2) [redacted]

2.3.2 The community criterion is comprised of three separate assessments described in the following sections.

The assessment methodology was informed by the *National Policy Statement for Waste Water* (Department for Environment Food and Rural Affairs, 2012) and was developed using the professional judgement of competent experts drawing on experience of other large infrastructure projects, in particular those with NSIP status.

The community assessment is provided in Appendix C.

Land use, property and business viability

2.3.3 This criterion comprises assessment of the following:

- The land and property requirements of both construction and operation in terms of land take (both permanent and temporary).
- The impacts on access to community receptors (private property, businesses, community assets and areas of open space and recreation).
- The impact on resource viability from land take, changes in access, or other factors, based on information currently available. This includes factors such as reduction in footfall as a result of, for example, changes to the layout of the built environment or access arrangements, which may impact on the operation of a community receptor or employment numbers.

Amenity

2.3.4 The introduction of construction works and the operation of the WWTP has the potential to impact on amenity. Changes in the amenity primarily affect residents, businesses, and users of community and recreational resources.

2.3.5 Potential changes in amenity arise as a result of impacts (air quality, odour, noise, landscape and visual, and traffic) combining to affect a receptor in a location. Amenity effects arise in addition to the individual environmental effects. This combination of effect has been assessed to determine whether there is a change in amenity for each of the sites.

Traffic

2.3.6 The assessment criterion considered the potential traffic impacts of the site area options on residents, businesses and communities in relation to congestion and road safety.

2.3.7 The assessment consisted of a high-level desktop review of the access routes to each proposed site and analysed the relevant traffic related impacts along the route, during both the construction and operation phase of development.

2.3.8 Assessment for each traffic related impact during both construction and operation began at the nearest appropriate junction with the A14 and terminated at the site location itself.

2.4 Operational

Delivery of Anglian Water's strategic corporate commitments

2.4.1 Anglian Water is the statutory sewerage undertaker for much of the East of England including Cambridgeshire. It is therefore subject to a statutory duty under section 94(1) Water Industry Act 1991 which requires it to provide an effective system of public sewers to collect domestic and

commercial waste water and transfer the contents for treatment to a waste water recycling centre before ultimately discharging it to a receiving water body.

2.4.2 In fulfilling this duty Anglian Water must comply with the requirements of all relevant Environmental legislation and the Urban Waste Water Treatment Regulations 1994. The fulfilment of this duty is essential to the protection of the environment and the maintenance of public health.

2.4.3 This assessment criterion considered whether the proposed site area would contribute to delivery of Anglian Water's strategic corporate commitments to achieving net zero carbon emissions by 2030 as well as other sustainability commitments including net gain in biodiversity.

2.4.4 The assessment of the delivery of Anglian Water's strategic corporate commitments is provided in Appendix D.1.

Odour (operational)

2.4.5 This assessment criterion considered the operational stage implications of any measures required to reduce the potential odour impact to negligible.

2.4.6 The assessment of operational odour control is provided in Appendix D.1.

Future urban growth

2.4.7 This assessment criterion considered the implications for the site area option of the likelihood of any new development proposals coming forward which might be frustrated by CWWTPR or itself threaten the resilience and future scope for growth of the WWTP beyond its current design life. The adverse impacts of future urban growth would include encroachment by other developments in the near- to medium future which may potentially give rise to operational conflicts such as odour or traffic.

2.4.8 The assessment of future urban growth is provided in Appendix D.1.

Future operational needs

2.4.9 Anglian Water supports sustainable economic and housing growth and has a statutory duty as a water utility company to provide effective drainage and treatment of waste water. The long term ability to accommodate the scale of growth anticipated in the catchment, alongside future trends in demand and climate impacts, has been fully considered in the development of Anglian Water's proposals. While the development proposals are based on a robust assessment of future demand to 2050 it is considered desirable to consider the future potential for improvement or modifications of the plant in the very long term, owing to population or regulatory changes, particularly if it is remembered that the current site first started operating over a century ago. It would be prudent to assume a similar lifespan for activities at any new site. Hence, this assessment criterion considered the long term ability of a site area option to accommodate the future potential for improvement or modification of the plant in the very long term (after 2050).

2.4.10 The assessment of future operational needs is provided in Appendix D.1.

Access

2.4.11 This assessment criterion considered the operational stage constraints of each site, in terms of the ability to access each site and achieve the required vehicle movements during operation of the new WWTP.

2.4.12 A high-level desktop review was undertaken of the access routes to each proposed site area from the strategic road network. The nearest appropriate junction to each proposed site area was used, i.e. a junction that allows access to, and egress from, the A14.

2.4.13 The access assessment is provided in Appendix D.2.

Flood risk

2.4.14 This assessment criterion considered the risk of flooding at the shortlisted site areas. A screening process was undertaken to identify the existing flood risk to each of the site areas. Where climate change data have been provided by the Environment Agency, flood risk over the lifetime of the development has additionally been considered.

2.4.15 The risk of flooding in relation to the treated effluent discharge arrangements are not included in this screening assessment and are dealt with in the surface water assessment.

2.4.16 The following sources of flooding have been considered in the context of site topographic elevations and underlying geology, where appropriate, with consideration also given to historic flooding.

- Fluvial/tidal (existing and future, including climate change)
- Surface water
- Groundwater
- Sewer
- Residual risk (reservoirs, defence breach, overtopping)

2.4.17 The flood risk assessment is provided in Appendix D.3

2.5 Economic

2.5.1 The CWWTPR project will be publicly funded through a government grant from the HIF to facilitate the regeneration of the existing WWTP site. Without the HIF funding the relocation would not be feasible. The HIF grant is finite, and subject to a capped maximum amount. In addition, Anglian Water is required to use the grant as efficiently as possible.

2.5.2 The economic assessment comprised the calculation of whole life costs for each of the site area options (including sub-options) building on the costs developed during Stage 3 – Fine Screening. The economic assessment was carried out by experienced construction professionals using recent cost data from a range of similar wastewater projects in the UK.

2.5.3 Initially an unmitigated cost for each options was established, which comprised the development of the scheme at each of the three sites and the associated infrastructure, assuming standard industry design approaches and assumptions which would be required across all three site areas, such as compliance with air and water quality related regulations and permits. This approach established the baseline site area option against which all other site area options are compared.

2.5.4 The calculation of the whole life costs included both capital costs (including DEVEX, CAPEX and Capital Maintenance) and operational costs (OPEX) for the new WWTP and associated infrastructure. The Capital Maintenance and OPEX included in the whole life cost estimates were forecast over a 20-year period.

2.5.5 Following the formation of the baseline cost estimates, the mitigation and enhancement measures established in the environmental and operational assessments were used to revise

the whole life cost estimates for each of the site area options. The revised 'with mitigation' cost estimates were then compared to establish the lowest cost mitigated site area option.

2.5.6 The economic assessment is provided in Appendix E.

2.6 Planning

2.6.1 The planning assessment looked at how each option performs against planning policy and considered whether each option is capable of being granted consent in the context of the requirements of national policy having taking into account the scope for mitigation (so far as possible within the confines of what is needed to deliver CWWTPR).

2.6.2 For the purposes of a Nationally Significant Infrastructure Project (NSIP) for waste water, relevant planning policy is set out in the National Policy Statement for Waste Water (March 2012)[19] (the 'NPS').

2.6.3 Part 4 of the NPS sets out policies that are relevant to particular physical impacts of the construction and operation of waste water NSIPs, under a heading of "Generic Impacts". The NPS provides guidance on what should be included in the applicant's assessment, the principal considerations for decision making, and a framework of possible mitigation measures. This guidance therefore provides a useful framework for the planning assessment.

2.6.4 The only NPS criterion which remains to be assessed outside the Operational, Economic, Environment and Community assessment criteria, is NPS criterion 7 'impact on land use'. Before assessing how each site option performs overall against planning policy and the extent to which each option is capable of being granted consent in the context of the requirements of national policy, therefore, an assessment of each option against NPS criterion 7 'land use impacts' was undertaken.

2.6.5 Assessment of each site and corridor option under NPS criterion 7 was addressed in the Planning Assessment having regard to the following matters:

- Policy designations
- Description of surrounding land uses and activities and their sensitivity
- Function and value of site in land use terms (including Green Belt)
- Potential impacts of CWWTPR development on
  - Green Belt purposes
  - Other policy designations
  - Surrounding land uses (existing, committed and proposed)

2.6.6 The planning assessment is provided in Appendix F.

2.7 Programme

2.7.1 This assessment considered whether there would be significant programme risks associated with implementing any of the site area options either pre-construction or during construction.

2.7.2 As the project is funded by the UK Government (through Homes England) the project needs to be delivered in accordance with binding milestones for the start/completion of defined stages. Therefore, an assessment of the risks of not achieving the defined programme is important to

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

identify if any of the proposed options would be impossible to complete in the required timescales.

2.7.3 The programme assessment drew on the experience of the competent experts involved in the assessment of the operational, environmental and planning criteria in order to consider what effect the potential impacts and constraints identified in these assessments could have on the programme.

2.7.4 The Programme assessment is provided in Appendix G.

2.7.5 The following sections summarise the assessments of the mitigated scenarios for each of the site area options. The full assessments including the unmitigated scenarios and identification of mitigation measures are provided in Appendices B to G.

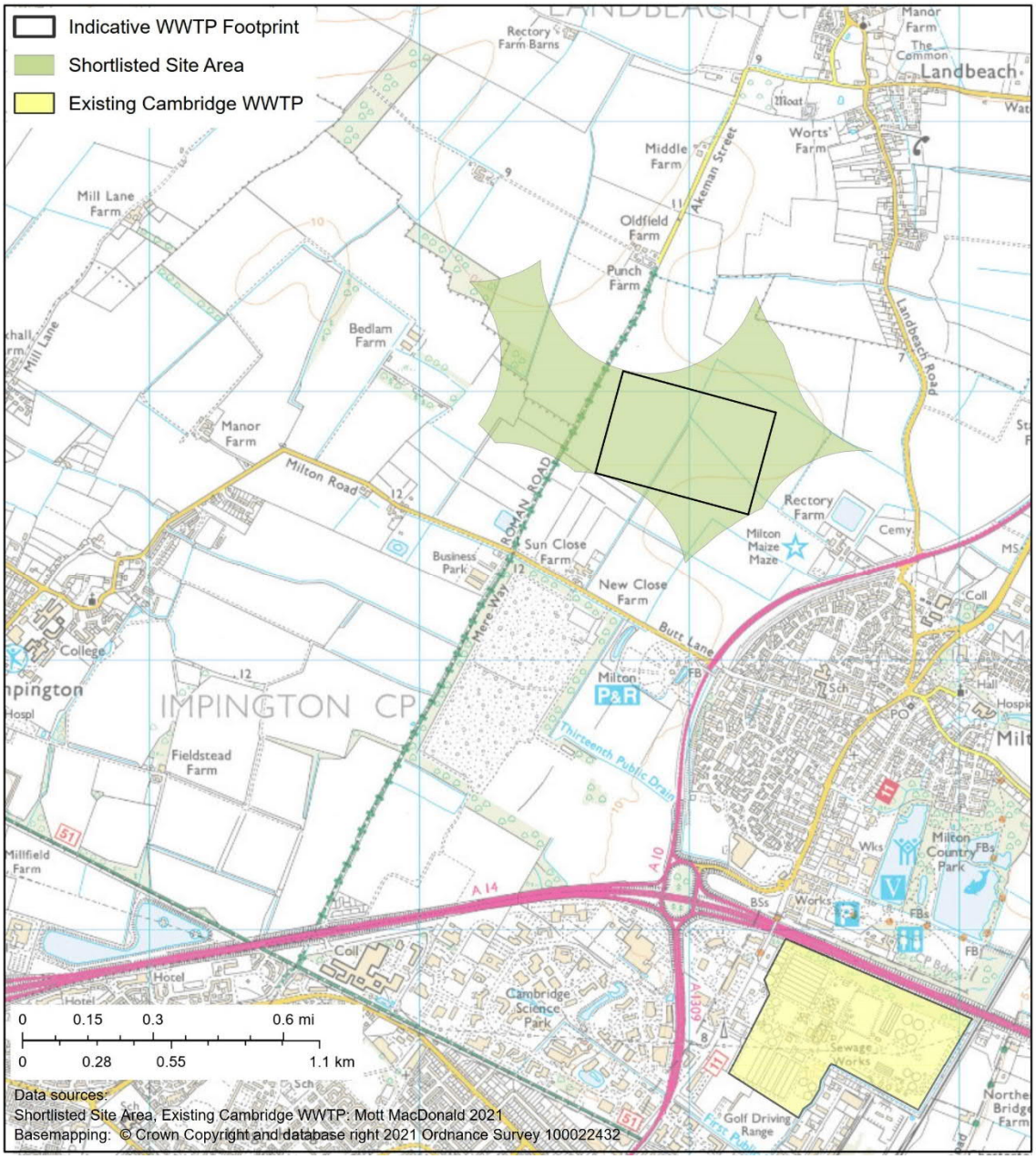
3 Site Area 1 assessment

3.1 Introduction

Site area

3.1.1 Site area 1, shown on Figure 3.1, is located approximately 1.5km to the north of the existing WWTP site within the administrative boundary of South Cambridgeshire District. The site area covers a total area of 68ha.

Figure 3.1: Site area 1 location map



3.1.2 The site area lies between the villages of Milton to the south east, Landbeach to the north east and Histon and Impington to the south west. The boundary of the site area is surrounded on all sides by agricultural land. North and north west of the site area, open agricultural land extends towards the village of Cottenham. The A10 road is located between the site area and Milton village, which connects to Milton interchange (Junction 33 of the A14) approximately 1km south. Butt Lane is located to the south of the site area and joins the A10 to the south of the site area. To the west of the site area, Butt Lane becomes Milton Road and leads to Impington village. To the east of the site area, Landbeach Road connects Landbeach village to the A10.

3.1.3 To the south on the opposite side of Butt Lane to the site area lies the Milton Landfill, household waste recycling centre and the Milton Park & Ride. To the south east between the site area and the A10 is the Milton Maize Maze attraction and Milton cemetery.

3.1.4 The site area itself is open farmland with mainly arable fields of varying size, defined by ditches and hedges with trees. The western end of the site area includes a small area of woodland. Mere Way, a former Roman road crosses the site area from north to south and is a public byway, which leads from Akeman Street in the north to the A14 in the south. The landform is mostly level and at 9-10m AOD. Mere Way is lined with trees on both sides within the site area.

3.1.5 The site area was defined by the baseline constraints established in Stage 1 – Initial Site Selection (Mott MacDonald Ltd, 2020b) and is mainly defined by the 400m buffers around residential properties located on Butt Lane to the south, the edges of the villages of Milton (south east) and Landbeach (north east) as well as a number of isolated farms to the north and east of the site area. The north east boundary of the site area is also defined by the 500m buffer around Landbeach Baptist Church, which is a Grade II listed building.

Infrastructure corridors

3.1.6 The relocation of the WWTP will require the construction of a number of tunnels and pipelines to connect to the existing waste water network at the existing WWTP, deliver waste water to the new WWTP from surrounding villages and deliver treated effluent from the new WWTP to the River Cam. Corridors for this infrastructure have been established for the purpose of site selection, the routes and extents of the infrastructure corridors for site area 1 are described below and illustrated on Drawings 409071-MMD-00-XX-GIS-Y-0450 to 0451 in Appendix A.

3.1.7 The waste water transfer tunnel corridor extends north from the southern end of the existing WWTP parallel to Cowley Road, it crosses the A14 at the cycle bridge and then turns north east to navigate around the edge of Milton, it then follows the A10 north before crossing Milton Park & Ride and Butt Lane as it extends to the southern end of site area 1.

3.1.8 There are two proposed treated effluent pipeline corridors for site area 1. Option A runs south-east following a similar route to the waste water transfer corridor around the edge of Milton, it then extends parallel to the A14 to a short section of the River Cam directly north of the A14 bridge. Option B comprises a wide corridor extending east from the site area, north of Milton to a section of the River Cam north of Horningsea and south west of Clayhithe.

3.1.9 The indicative Waterbeach waste water transfer pipeline corridor starts at the existing Waterbeach WWTP and extends west around the edge of Waterbeach village to where is crosses the A10, it then extends south between Landbeach and the lakes associated with Waterbeach angling club before crossing Waterbeach Road. From here, the corridor extends south parallel with the boundary of Landbeach, it then crosses Landbeach Road and enters the eastern side of site area 1.

Assessment summaries

3.1.10 A summary of the environmental, community, economic, planning, operational and programme assessments completed for the site area 1 options is provided in the following sections. The summaries focus on the results of the mitigated scenario assessments. Detailed technical accounts of the unmitigated scenario assessments, the identification of mitigation measures and subsequent assessment of the mitigated scenarios are provided in appendices B to G.

3.2 Environmental assessment

3.2.1 This section summarises the environmental assessment of site area 1 mitigated options. The detailed accounts of the assessments are provided in Appendix B.

3.2.2 Overall, the main environmental sensitives related to this site area comprise landscape and visual amenity, archaeological potential and the potential groundwater impacts.

Nature conservation and biodiversity

3.2.3 The nature conservation and biodiversity assessment concluded that there are no anticipated likely significant effects on any statutory designated sites from construction of the WWTP or associated infrastructure.

3.2.4 Construction of the WWTP at site area 1 has the potential to indirectly impact a County Wildlife Site (CWS). Potential impacts of temporary dewatering in the lower Greensand aquifer during shaft construction could affect the water supply to Cottenham Moat CWS, which is known to support great crested newts. Additional temporary water supply may be required to restore water levels should they fall below those required to sustain the ecological habitats (specifically those which support great crested newts).

3.2.5 The habitats identified within the site area, infrastructure corridors and access areas have the potential to support protected species. It is considered that impact on all protected species can be mitigated through avoidance and compensation.

3.2.6 To achieve a Biodiversity Net Gain (BNG), habitats lost within the site area would need to be compensated for by the creation and enhancement of new and existing habitats. Generally, the loss of broadleaved woodland and trees, which could occur in site area 1, will require larger areas of land for new habitat creation in order to achieve BNG.

3.2.7 A section of the Cambridgeshire Strategic Green Infrastructure Network partially falls within the proposed site area and associated corridors. However, the initiative is not well defined in this area.

Landscape and visual amenity

3.2.8 Site area 1 lies within an area of low landscape character sensitivity, as assessed in the Green Belt Study provided in Appendix J. A large-scale new infrastructure development on site area 1 would change the character of the landscape, extending built development on the outskirts of Cambridge northward into open farmland. Visual receptors in Landbeach, on Butt Lane, at the isolated farms surrounding the site area and on Mere Way would have clear views of the new structures. Residents in Milton, Impington and Histon would mainly see the taller elements above intervening vegetation.

3.2.9 Mitigation planting would screen much of the new WWTP after 15 years of operation and would be most effective where it is closest to receptors. The taller new structures would remain visible above the planting for most receptor within 1km of the WWTP.

3.2.10 Overall, the proposed landscape mitigation would gradually integrate the new development into its surroundings, but the planting would reduce the openness of the existing landscape. The WWTP would remain an uncharacteristic addition to the landscape and views.

Historic environment

3.2.11 There is very high archaeological potential for Roman and Iron Age remains within site area 1, potential late prehistoric and Roman archaeology within the treated effluent corridors and potential for remains across multiple periods along the corridor for the Waterbeach waste water transfer. If remains are located, then this may result in a likelihood of moderate to major impact on archaeological remains which may be of low to moderate value. However, the proposed archaeological mitigation would reduce harm to the historic environment and comply with the requirements of planning policy.

3.2.12 There is potential for impact on the setting of the grade I listed Parish Church of All Saints in Landbeach, which is likely to result in minor impact on a designated heritage asset of high value. Additionally, there is potential for minor impact on the grade II listed Baptist Chapel from change within its setting. In accordance with the NPS, this amounts to less than substantial harm to designated heritage assets.

Land and water quality

3.2.13 The risk of contamination is considered to be low within site area 1. There is potential for contamination to be encountered along the waste water transfer tunnel and the effluent transfer tunnel/pipeline for Option A. However, the buffer established from Milton Landfill and the ability to adjust the routes is considered to reduce the risk of encountering contamination.

3.2.14 There is potential for temporary impacts on water levels within the Lower Greensand aquifer during dewatering for shaft construction at the new WWTP, which could have an adverse impact on private water supplies in the area. However, mitigation would be put in place to maintain the private water supplies or provide alternate supply. This is supported by the preliminary results of a Hydrogeological Impact Assessment (HIA), which was requested by the Environment Agency in its response to consultation, to provide further assessment of the potential impact on groundwater and the groundwater-dependent environment. The HIA will be made available following review by the Environment Agency.

3.2.15 The risk of impact on Water Framework Directive (WFD) surface water bodies is considered to be low. The only risk that would not be mitigated is the potential changes to flow and stage height/water level in the River Cam, including a reduction in flow in the reach downstream of the A14, in the event that the downstream outfall location (Option B) is chosen. The loss of flow (and reduction in stage height/water level) might, however, be compensated for to some extent by an improvement in water quality in the reach as a result of the removal of the treated effluent discharge contribution from the existing WWTP.

Carbon emissions

3.2.16 The whole life carbon emissions (WLC) for the waste water infrastructure and transport access associated with site area 1 are shown in Table 3.1. Whole life carbon emissions include both construction (embodied carbon emissions) and 20 years of operation (operational carbon emissions).

3.2.17 In comparison with the lowest carbon option (Option 3Aii), the carbon emissions of all site area 1 options are higher due to the longer lengths of waste water and treated effluent transfers (tunnel and pipeline) and deeper tunnel shafts required (embodied carbon emissions), which

also increases the amount of energy needed for pumping flows into and from the new WWTP (adding to operational carbon emissions). The lowest carbon option for site area 1 would be Option 1Bii (108% of the carbon emissions for Option 3Aii) which returns treated effluent to the River Cam using a pipeline whilst the highest carbon option would be Option 1Ai which returns treated effluent using a tunnel (135% of the carbon emissions for Option 3Aii).

3.2.18 Overall, the higher whole life carbon emissions for site area 1 options compared with lowest carbon option (Option 3Aii) equate to an additional 3,500 to 15,600 tonnes of CO_2e. This is equivalent to the annual carbon footprint of 440 to 1960 average UK households.

Table 3.1: Whole life carbon emissions for site area 1 options

Site area option	Return option	Outfall Location	WLC tCO2e - 20yrs	% compared to lowest carbon option (Option 3Aii)
1Ai	Tunnel	Existing	60,400	135%
1Bi	Tunnel	New	57,800	129%
1Aii	Pipeline	Existing	49,800	111%
1Bii	Pipeline	New	48,300	108%

Noise

3.2.19 The assessment concluded that noise and vibration from construction works for site area 1 and the associated infrastructure would not exceed significant adverse effect level thresholds, derived from BS 5228-1&2:2009+A1:2014 (British Standards Institute, 2008), for extended periods at receptor locations. Design of the WWTP would include appropriate measures such that operational noise from fixed plant or changes in road traffic would not result in significant changes to baseline noise conditions or significant adverse effects.

Air Quality

3.2.20 The assessment concluded that existing baseline conditions do not exceed the national air quality objectives. Dust deposition effects during construction at closest receptors to the site area and pipeline corridors would be negated with appropriate dust control measures. Mitigation is anticipated to reduce the likely air quality impacts to negligible.

3.2.21 The potential impacts of construction and operational traffic on the A14 Air Quality Management Area (AQMA), an air quality sensitive area designated by South Cambridgeshire District Council (SCDC)[20], may need further assessment. However, this is consistent across all site area options.

Odour (environmental impacts)

3.2.22 The preliminary odour assessment for site area 1 indicated that a few dwellings in Landbeach and at Punch and Oldfield Farms may experience an odour impact and that users of Mere Way would also experience odour exposure.

3.2.23 Given that the residential properties constitute high sensitivity receptors it was concluded that mitigation, such as installing covers on additional process units, orientation and design of the WWTP such that process units would be further away from receptors, would be required to

[20] Cambridge City Council, Huntingdonshire District Council & South Cambridgeshire District Council (2009) Air Quality Action Plan for the Cambridgeshire Growth Areas. https://www.scambs.gov.uk/media/6727/air-quality-action-plan.pdf

reduce the level of impact to negligible[21] in accordance with the Institute of Air Quality Management's (IAQM) *Guidance for the assessment of odour for planning* (Institute of Air Quality Management, 2018).

3.3 Community assessment

Land take, property and business viability

3.3.1 The construction of the WWTP is likely to compromise the viability of the fruit farm due to the permanent land take required for the WWTP and the close proximity of the WWTP to the remainder of the farm. There is also likely to be a significant loss of employment as the business is unlikely to be able to operate.

3.3.2 There is potential for impact on the business operations of Milton Maize Maze (Rectory Farm) both during the construction and operation of the WWTP. This is due to a potential reduction in amenity which may impact on people's use and enjoyment of the activities which the business provides, which may subsequently impact on their future business operations.

Amenity

3.3.3 Businesses on Butt Lane may experience a potential reduction in amenity from a combination of landscape and visual effects and traffic effects, as a result of construction and operational activity. The reduction in amenity for the businesses on Butt Lane is only a minor change from the baseline position as the area already contains activities which affect the amenity of the environment, including the recycling facility and the Milton Park and Ride.

Traffic

3.3.4 There is the potential for adverse impacts on traffic during construction due to compounding effects of operational traffic accessing the existing WWTP and construction traffic for the new WWTP all using the Milton interchange (Junction 33 of the A14). During operation there is not anticipated to be an impact on the Milton interchange but there are potential impacts on the A10 and the junction with Butt Lane, as they are operating at capacity including flows from committed developments. However, the operational flows associated with the new WWTP are considered to be relatively low in comparison with flows associated with committed developments such as Waterbeach New Town.

3.4 Economic assessment

CAPEX and whole life costs

3.4.1 The 'with mitigation' CAPEX and whole life costs in comparison with the lowest cost option (Option 3Aii) are shown in Table 3.2.

3.4.2 The main reasons for the higher CAPEX for the construction of the WWTP at site area 1 are as follows.

- The longer length of waste water transfer tunnel and greater requirement for tunnel lining associated with interaction with the Lower Greensand aquifer

[21] Negligible impact is defined as an odour exposure level of <1.5 C_{98} OUE/m^3 for high sensitivity receptors (residential properties), see Appendix M for further details and odour exposure levels for lower sensitivity receptors

- The longer length of the treated effluent transfer, with route Option A, utilising a tunnel, representing the greatest cost difference and route Option B, utilising a pipeline, the lowest cost difference
- The need for additional odour mitigation measures to reduce odour impacts to negligible at all sensitive receptors during normal operation
- Higher land acquisition and compensation costs

3.4.3 Although the CAPEX costs are greater overall there are some elements of the scheme at site area 1 that would incur lower CAPEX than the lowest cost option, such as transport access arrangements and grid power connection.

3.4.4 Table 3.2 shows that the difference in whole life costs is less than that for CAPEX. This is due to the fact that operational costs over a 20-year operation period are similar across all site area 1 options as the WWTPs are identical and the only differences are in transferring waste water and treated effluent, which are minimal. Therefore, the difference in CAPEX makes up the majority of the difference in whole life cost.

Table 3.2: Comparison of 'with mitigation' cost estimates for site area 1 options

Site area option	% compared to lowest cost option (CAPEX)	% compared to lowest cost option (whole life cost)
1Ai	111%	105%
1Bi	109%	104%
1Aii	109%	104%
1Bii	107%	103%

3.4.5 The cost estimate includes land acquisition and compensation costs based on current estimates of land value. However, there are some uncertainties about future land values and compensation, which are discussed in the following section.

Land acquisition and compensation

3.4.6 The following assessment of land acquisition and compensation has been conducted by suitably qualified and experienced experts within the Savills property team.

Land use

3.4.7 Site area 1, which is within the Green Belt and covers a total area of 68ha, is made up of arable fields and part of a fruit farm growing soft fruit in plastic covered tunnels. Mere Way, which is a public right of way, dissects the site area, two thirds to the east and one third to the west. Immediately to the east of the site area is Milton Maize Maze and a farm shop, which form part of the business farming the arable land to the east of Mere Way. The fruit farm is around 100 acres and has its own small shop. There are a number of mobile homes on the fruit farm site which are understood to accommodate temporary seasonal workers. The planning status of these mobile homes is unclear, but the amenity of their occupiers would potentially be directly affected by development of site area 1. Close to the fruit farm is a small industrial estate with around five small businesses operating from it. There are a few houses north and south of Butt Lane, but these are over 400m from the site area. There are farm buildings to the west of the site area and a farm to the north. The access route would be within the arable farming area to the north of Butt Lane.

Land owners and occupiers

3.4.8 Most of the land is owned by institutions and let to the occupiers. The area within the indicative WWTP footprint shown on Figure 3.1 straddles two land ownerships and two occupiers: one arable farmer and fruit farmer. Acquisition of the arable land is likely to have a moderate impact on the farm business. The acquisition of the fruit farm land is likely to have a significant impact on its business but, the close proximity of the WWTP to the remainder of the farm is likely to have a high impact, possibly leading to the need to relocate the farm or compensate for total extinguishment.

3.5 Planning assessment

3.5.1 This site area lies within the Cambridge Green Belt in an area of flat and exposed open countryside identified as a Mineral Safeguarding Area (Sand and Gravel). The site area comprises land classified as grade 2 or 3 best and most versatile agricultural land. The landscape character is assessed as being of low sensitivity. The centre of the site area lies approximately 600m from the western edge of Milton and south western edge of Landbeach and is particularly visible from Landbeach, Histon and Impington. The pipeline corridors are within 100m of the Landbeach Conservation Area and the Milton Conservation Area. The pipeline also runs under a Protected Village Amenity Area at the southern end of Milton. A fruit farm is located partly within Site area 1.

3.5.2 There is one live planning application for a new police station south of the park and ride site area off Butt Lane where the tunnel and pipeline corridor options run. The site area lies within an area immediately to the north of the Cambridge northern fringe which is the focus of a number of projects in the early stages of promotion:

- Cambridge Autonomous Metro which will have a route to Waterbeach - still to be determined
- Waterbeach to Cambridge Better Public Transport and Active Travel project is a proposed sustainable pedestrian/cycle route between Waterbeach and Cambridge – preferred route to be determined
- A10 improvement – one of four route options (Option D) encompasses Site 1A and 1B

3.5.3 Land comprising Rectory Farm has been promoted on behalf of Gonville & Caius College for commercial development. This proposal directly affects a significant portion of the eastern part of site area 1 and may affect the diversion for the existing waste water transfer network. An area of land to the west of site area 1 has also been promoted by Chivers Farms Ltd for additional commercial development in the recent Greater Cambridge Local Plan Call for Sites. Three additional sites have been promoted to the north of Milton for employment and residential development. None of the submissions under this call for sites has any planning weight at the time of writing. However, if allocated they have the potential to affect delivery of CWWTPR and the discharge corridor route to the River Cam.

3.5.4 Further sites have been promoted to the south west of site area 1 for residential development and to the south of Waterbeach for commercial development which has the potential to affect the Waterbeach pumping main route. There are also a number of small sites around Landbeach that have been submitted for residential use which may also affect the Waterbeach main route.

3.5.5 A site has also been submitted for substantial commercial development comprising the extension of the Cambridge Science Park north of the A14 which may affect the diversion of the existing waste water transfer network.

3.5.6 The Green Belt Study (See Appendix I) considers the potential overall scale of impact from development of CWWTPR on this site area. The report assessed that the overall site area performance of site area 1 against Green Belt purpose is 'Fair':

> *"Development on Site 1, in a landscape of medium-low sensitivity, would extend the existing developed area south of Butt Lane into open farmland. It would reduce the openness of the Green Belt in this location. It would detract from the setting of Landbeach and would reduce the landscape gap between Milton and Landbeach. The development would have little effect on the landscape setting of Cambridge. It would be visible in the open landscape from isolated properties on Akeman Street, close to the site, and from Landbeach."*

3.5.7 In planning policy terms development of this site area for CWWTPR would represent *'inappropriate development'*[22] within the Green Belt. Actual harm to Green Belt may partially be tempered by the present somewhat compromised performance of this area in Green Belt purpose terms. The development will be highly visible in the landscape and from surrounding properties (particularly in Landbeach) and will require significant landscape mitigation. Proximity of more sensitive land uses, even with the separation distance allowed in the site selection process, is likely to give rise to amenity concerns and could result in complaints. Traffic generated by the development should be contained on the A10 but will need to utilize the congested A10/A14 junction and may be subject to (at very least) temporary disruption if the network infrastructure projects referenced above are progressed. In the event that development of any of the sites in the immediate vicinity of site area 1 promoted in the recent call for sites is realised, that development may affect the long term resilience of CWWTPR.

3.5.8 The characteristics and proximity of site area 1 to Milton and Landbeach, given surrounding development and the promotion of additional infrastructure and development in the vicinity, restricts the opportunities for this site area to deliver new habitat and improved connectivity.

3.6 Operational assessment

Delivery of Anglian Water's strategic corporate commitments

3.6.1 Site area 1 presents a number of opportunities to deliver Anglian Water's strategic corporate commitments. The site area provides a good opportunity to develop a modern carbon efficient plant with embedded renewable energy generation, contributing to climate change and sustainability commitments.

3.6.2 Anglian Water has an industry-leading track record of successfully working with stakeholders to create high levels of environmental and amenity value around its major essential infrastructure assets (such as treatment plants and reservoirs). The site area would be developed to deliver a net gain in biodiversity, providing a high level of habitat enhancement in place of arable farmland.

Odour (operational)

3.6.3 The mitigation required to reduce the potential odour impact to negligible would likely include installing covers on additional process units. In Anglian Water's experience this has been

[22] As defined in: Ministry of Housing, Communities & Local Government, Na ional Planning Policy Framework, 2019. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf and;

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

operationally challenging due to health and safety concerns (working in confined spaces) and because corrosive atmospheres within those spaces can give rise to equipment or structural failures.

Future urban growth

3.6.4 As part of the process of identifying a final site area we have considered the implications should any new development, including proposals identified through the emerging Greater Cambridge Local Plan, come forward in the vicinity of the site area. Site area 1 may be adversely affected by future urban growth. The risk of encroachment of other development proposals on the area in the future may potentially give rise to operational conflicts such as odour or traffic. The site area sits close to a potential future transport corridor and development here may therefore impede Cambridge's future economic growth.

Future operational needs

3.6.5 While the development proposals are based on a robust assessment of future demand to 2050 it is considered desirable to consider the future potential for improvement or modifications of the plant in the very long term due to population or regulatory changes. Site area 1 being situated on the urban fringe may suffer encroachment from other forms of development in the future, impacting on operational effectiveness and resilience.

Access

3.6.6 With mitigation in place there are residual risks to the access to site area 1 due to the potential constraints posed by the A10/Butt Lane junction and access through the Park & Ride site, which could impact on the ability to access the site area during normal operation.

3.7 Programme assessment

3.7.1 The main areas of programme risk associated with site area 1 options are as follows.

3.7.2 There is a risk of delay to the submission of the DCO application in relation to the development of additional enhancement and mitigation measures following subsequent consultation on the proposals. This is due to residual risks associated with landscape and visual impacts, and the contribution of this area to Green Belt purposes. This could also pose a risk of delay to the start of construction as DCO approval could stipulate that the measures need to be in place prior to commencing construction on site area.

3.7.3 The conflicting land interests with the Fruit Farm within the site area may result in significant delays to the project development process. If any of the sites promoted through the call for sites are allocated in the emerging local plan then this may result in the need for CWWTPR to adapt its construction programme to address potential cumulative effects including construction traffic.

3.7.4 The Environment Agency (EA) has indicated they have significant concerns about the potential impacts of dewatering on the Lower Greensand Aquifer and that any water removed from the aquifer during dewatering would need to be recharged to the aquifer. Therefore, it is likely that extensive investigation would be required to satisfy the EA that the potential impacts can be mitigated and also in determining a satisfactory method for recharging the aquifer. Dewatering and subsequent recharging is likely to require relatively complicated engineering operations, therefore, putting these operations in place could have a significant impact on the construction programme.

3.7.5 The risks of archaeological finds across the scheme area present a moderate risk of delay to the start of construction. Archaeological investigation may allow for the targeting of building and

service locations to reduce impact on buried archaeology. However, there remains a risk of unexpected finds during construction, which would potentially have a significant impact on the construction programme.

3.7.6 There are constraints associated with the treated effluent transfer Option A route, which could impact on the construction programme, as the route corridor is relatively narrow there is limited opportunity to alter the route to avoid these constraints. It is considered that the risk would be highest if the transfer were to be constructed as a pipeline. Route Option B presents greater opportunity to avoid potential constraints, it is considered that constructing the transfer as a tunnel along this route would present the lowest risk to the construction programme.

3.7.7 The relatively short length of the waste water transfer tunnel allows some flexibility in the construction programme in case of other delays.

3.7.8 Therefore, the combination of risks results in a moderate risk of impact on the overall programme.

3.8 Phase one non-statutory consultation feedback

Public consultation

3.8.1 The majority of feedback received during phase one consultation was provided through the digital engagement platform and hard copy feedback form. Respondents using these channels were asked to identify which site area they thought was most suitable for the relocation project. Respondents were also asked to identify the topic areas most relevant to their feedback. For site area 1, a significant amount of feedback was received covering all topic areas. Comments in opposition to site area 1 were often considered to also apply to site area 2, and vice versa, given their proximity to one another.

3.8.2 The most frequently commented topic area for site area 1 was ‘Air, quality, noise and vibration’, within which perceived odour impacts to nearby communities, facilities and amenities was a major concern. The proximity of site area 1 to nearby residential communities, such as Milton, Landbeach and Impington was frequently noted, with concern raised that significant odour impacts would be experienced by residents of those areas. Local amenities, businesses, and facilities, such as Mere Way, the Milton Maize Maze, and Milton cemetery, were also referenced with similar concern.

3.8.3 ‘Traffic and access’ was also frequently commented on for site area 1. Feedback revealed concern regarding potential negative impacts to congestion, noise and air quality experienced in the local area caused by increased site traffic during both construction and operation. This was considered a risk of exacerbating existing issues, with comments citing potential cumulative impacts from the A10 improvement works and existing usage of the A10, Butt Lane, and Landbeach Road, for example.

3.8.4 In addition to this, feedback on traffic demonstrated concern that a relocation of the plant to site area 1 could discourage the use of sustainable transport routes, such as pedestrian and cycle paths around Mere Way and Landbeach Woods.

3.8.5 Feedback demonstrating opposition to site area 1 being selected was also received for all other topic areas, ranging from perceived impacts to the area’s ecology and heritage, to a perceived increase of flood risk in the Milton area being exacerbated.

3.8.6 Some feedback did support site area 1 as being suitable for the relocation. Many of those in favour commented that relocating the plant to site area 1 would result in lower relative impacts

to the local area given the existing infrastructure and nearby land use. Examples given included the recycling and household waste centres off Butt Lane and existing major roads such as the A10.

3.8.7 It was also noted that site area 1 may present a lower risk of groundwater contamination (relative to site area 3) as it is on the Gault Clay.

Technical stakeholders

3.8.8 The following is a summary of the most pertinent comments from technical stakeholders where they were made in specific reference to site 1.

Environmental

3.8.9 The Environment Agency (EA) confirmed that the proposed discharge points for site area 1 are accepted in principle. The EA state that they "*have not identified any major fluvial flood risks to the preferred sites in question*" but indicate that a flood risk assessment will be needed to investigate the risks and opportunities for overall risk reduction. The EA recommend that the final design solution "*avoids requiring penetration of the confined Lower Greensand principal aquifer*". This recommendation arises from the "*significant reservations about the indicative proposals for sites 1 and 2 as outlined in the fine screening report, since these specify the installation of waste water transfer tunnels and drive shafts into the Lower Greensand aquifer*". The EA has also indicated that "*It is very likely that any de-watering water would need to be returned to the aquifer*". The EA has suggested that a detailed Hydrogeological Risk Assessment (HIA) should support the final site selection.

3.8.10 The EA also commented that a detailed hydrological assessment of the river Cam must be undertaken in relation to the discharge pipeline and outfall and the EA also expects to see Biodiversity Net Gain options if site area 1 is progressed.

3.8.11 Cambridgeshire County Council (CCC) provided the following comments:

- That a detailed hydrological assessment of the river Cam is undertaken in relation to the discharge pipeline and outfall and that the waste water transfer tunnel is included in the nature conservation and biodiversity appraisal and potential impact on Milton Road Hedge City Wildlife Site.
- In reference to the transfer tunnels and pipelines, CCC commented that Anglian Water should demonstrate to the satisfaction of the Minerals & Waste Planning Authority that the proposed waste water transfer connections "*would not prejudice the Milton Landfill site*".
- *"Provision should be made to retain the route of Byway 162/3 through the site if at all possible".*
- "*The site is located in an area of high archaeological potential*".
- "*The scheme is likely to adversely impact local wildlife sites (River Cam County Wildlife Site, River Great Ouse and Hedges and Milton Road Hedge City Wildlife Site) and protected species*".

3.8.12 Natural England recommended that Anglian Water applies Natural England's Impact Risk Zones (IRZs) to screen all options and development proposals. This would, in its opinion, provide more appropriate and robust identification of risk to SSSIs and Special Areas of Conservation.

3.8.13 Natural England identified that it a wishes to be included in permit standards discussions with the EA and expect to see delivery of significant biodiversity net gain.

3.8.14 The Wildlife Trust considered that site area 1 is likely to have less impact on the proposed "Nature Network" and for this reason is preferable.

3.8.15 Cambridge Past Present and Future considered site area 1 is in very open countryside with little natural screening. It expressed a concern that any development will impact local businesses and Mere Way.

3.8.16 Historic England wished to have a further assessment of the impact on designated and undesignated heritage assets and stated its primary concern is the archaeological potential of the farmland within and to the south west of site area 1.

Transport and access

3.8.17 Highways England acknowledged that the focus on transport criteria has been to minimise the impact on the local road network.

3.8.18 Site area 1, however, will affect junction 33 of the A14 which is almost at capacity. Defined transport or access routes will be sought by Highways England in due course, along with transport assessments for construction and operation periods.

3.8.19 In addition, there are anticipated upgrades to the A10 which Highways England stated would affect the cumulative capacity at Junction 33 and may cause particularly heavy traffic during construction phases.

3.8.20 The Cambridge Local Access Forum identified potential impacts on the rights of way offered by Mere Way for site 1.

3.8.21 The Ministry of Defence (MOD) identified that site area 1 falls within the statutory safeguarding Aerodrome Height (45.7m), technical and bird strike zones surrounding Cambridge Airport. The MOD requires precise details of design, elevations and landscaping proposals to carry out an assessment of impact.

Police Station

3.8.22 The consultation response received from the Police and Crime Commissioner Cambridgeshire and Peterborough identified a concern about the impact of site area 1 and the tunnel corridors and pipelines on the proposed new police station development.

Urban and Civic (U&C)

3.8.23 U&C has an interest in the CWWTPR proposals as it is promoting the development of Waterbeach New Town.

3.8.24 The response from U&C mentioned that site area 1 may impact on Mere Way and the proposed cycle way between Waterbeach and Cambridge, and the proposed tunnel corridors appear to impact on the Park and Ride. U&C also recognised that site area 1 presents a greater distance to the River Cam and as a result a greater impact on ecology for the final effluent pipeline.

Utilities

3.8.25 Comments from Cadent and UK Power Networks identified where connection points to the gas and power networks would be possible. South Staffs/Cambridge Water has identified the route of the water pipeline to service the new Waterbeach New town development and that discussion is necessary with Anglian Water if site area 1 is progressed.

Land

3.8.26 The owner and occupier of the majority of site area 1 have made representations against site area 1 being selected as the preferred site. The main owner, Gonville and Caius College has made comments regarding the lack of justification for the relocation, the need for a joined up approach with other strategic projects and the site assessment criteria. The College's tenant did not respond to the consultation. The Harrold family, which runs Sun Close Farm (the fruit farming business) also submitted a response to the consultation, saying the project will have a significant impact on the business and could lead to its extinguishment. The representations stated the impact could include: additional costs, business interruption, lost investment, lost sales revenue, the loss of jobs and health and safety risks during construction.

3.9 Summary of results

3.9.1 Table 3.3 presents a summary of the assessment results for site area 1.

Table 3.3: Summary of results for site area 1

Criteria	Assessment results
Environmental	• Potential for protected species within the WWTP development area, a larger area would be required for biodiversity net gain and there is potential temporary impact on a County Wildlife Site (Cottenham Moat) • Potential change to landscape character of area and visual impacts on local residents in Landbeach • High archaeological potential across scheme area • Potential for temporary impacts on water levels within the Lower Greensand aquifer during dewatering for shaft construction at the new WWTP, which could have an adverse impact on private water supplies in the area, but can be mitigated • Whole life carbon emissions for site area 1 options compared with lowest carbon option (Option 3Aii) equate to an additional 3,500 to 15,600 tonnes of CO2e • Noise and vibration from construction works for site area 1 and the associated infrastructure would not exceed significant adverse effect level thresholds for extended periods at receptor locations • Mitigation is anticipated to reduce the likely air quality impacts to negligible. • Risk of potential odour impact on some high sensitivity receptors. Therefore, additional mitigation is required to reduce odour impacts to negligible
Community	• Potential extinguishment of fruit farm, potential impact on operation of Milton Maize Maze • Potential amenity impacts on businesses on Butt Lane due to combination effect of potential traffic and visual impacts • Potential traffic impacts during construction and operation at Butt Lane & A10 junction and junction 33 of A14
Operational	• Opportunities to develop a modern carbon efficient plant. Site area would be developed to deliver a net gain in biodiversity • Odour mitigation presents significant operational challenge, health and safety and mechanical operation • Site sits close to a potential future transport corridor, development here may impede Cambridge's future economic growth • Operational access could be affected by constraints at A10/Butt Lane junction and A14 junction 33 (almost at capacity)

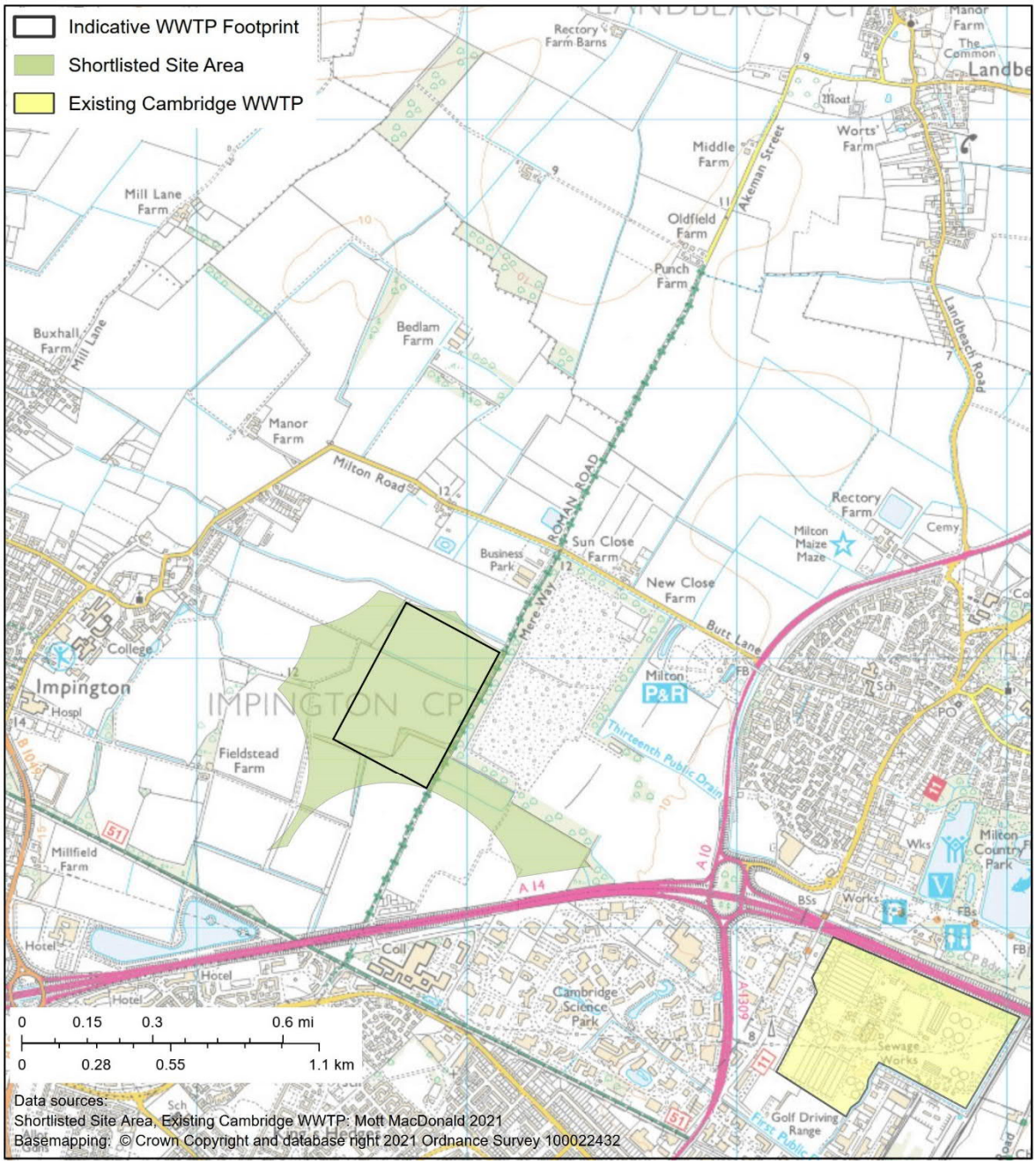
Criteria	Assessment results
Phase one non-statutory consultation feedback	• Main concerns from public relate to air quality, noise and vibration and traffic impacts on community amenity, businesses and facilities • Environment Agency has significant reservations about interaction with Lower Greensand aquifer and concerns about contamination associated with Landfill and waste water transfer tunnel • Cambridgeshire County Council and Highways England concerns over capacity of access routes (A 14 junction 33) • Developer and community concerns over conflicting and cumulative impact on proposed developments (police station, Waterbeach New Town transport routes, A10)
Planning	• Overall site area performance of site area 1 against Green Belt purpose is 'Fair'. Harm to Green Belt may be partially tempered by the present somewhat compromised performance of this area in Green Belt purpose terms • Potential conflicts with/ disruption from new transport infrastructure in terms of future growth (Cambridge Autonomous Metro, A10, Waterbeach to Cambridge Better Public Transport and Active Travel project) • Promoted development may affect long term resilience of CWWTPR • The characteristics and proximity of site area 1 to Milton and Landbeach, given surrounding development and the promotion of additional infrastructure and development in the vicinity, restricts the opportunities for this site area to deliver new habitat and improved connectivity
Programme	• Development of additional enhancement and mitigation measures following consultation on the proposals presents risk of delay to the submission of the DCO application • Due to the conflicting land interests with the Fruit Farm within the site area, this may result in significant delays to the project development process • Engineering operations for dewatering and recharging could have a significant impact on the construction programme • Risks of archaeological finds across the scheme area present a moderate risk of delay to the start of construction • Potential constraints along effluent transfer option A (pipeline worst case) could impact on the construction programme • Relatively short length of tunnel allows some flexibility in construction programme, but uncertainty in design and mitigation measures required to address landscape and visual risks
Economic	• Higher CAPEX (107-111%) and WLC (103-105%) than lowest cost option. Longer waste water transfer infrastructure and greater lining requirements due to interaction with Lower Greensand aquifer • Will require compensation to Fruit Farm and the business at Rectory Farm, over and above land value

4 Site Area 2 assessment

4.1 Introduction

4.1.1 Site area 2, shown in Figure 4.1, is located approximately 1km to the north west of the existing WWTP site within the administrative boundary of South Cambridgeshire District. The site area covers a total area of 53ha.

Figure 4.1: Site area 2 location map



4.1.2 The site area lies between the villages of Milton to the east, Histon and Impington to the west and Landbeach further to the north east. Directly east of the site area is Milton Landfill, the edge of which forms the boundary of the site area. Butt Lane lies along the northern side of the site area and a business park is located between the site area and Butt Lane. To the north west of the site area, Butt Lane becomes Milton Road and leads to Impington village. South of the site area is the A14 and a travellers' site is located just north of the A14, 400m from the site area. The A10 road is located between the site area and Milton village, which connects to Milton interchange (Junction 33 of the A14) approximately 1km south.

4.1.3 The site area is farmland with arable fields of varying sizes defined by ditches, tree belts and hedges with trees, the southern half of the site area includes a number of woodland belts. The landform is mostly level at 11-12m AOD, rising slightly towards the south. Two small farm access roads cross the site area east to west. Mere Way, a former Roman road and public byway runs parallel to the eastern boundary with Milton Landfill and crosses the southern section of the site area. Mere Way is lined with trees on both sides.

4.1.4 The site area was defined by the baseline constraints established in Stage 1 – Initial Site Selection (Mott MacDonald Ltd, 2020b) and is constrained by:

- The 400m buffers around residential properties located on Butt Lane/Milton Road to the north, the edge of Impington to the west, the Blackwell travellers' site to the south and an isolated farm and nursery to the south west
- The boundary of Milton Landfill to the east
- The 100m buffer along the alignment of the A14 to the south

Infrastructure corridors

4.1.5 The routes and extents of the infrastructure corridors for site area 2 are described below and illustrated on Drawings 409071-MMD-00-XX-GIS-Y-0452 to 0453 in Appendix A.

4.1.6 The waste water transfer tunnel corridor extends north from the southern end of the existing WWTP parallel to Cowley Road, it crosses the A14 at the cycle bridge and then turns north east to navigate around the edge of Milton, it then follows the A10 north to Milton Park & Ride and Butt Lane where it turns to the east and arcs around the Milton Landfill to its finish at the northern end of site area 2.

4.1.7 There are two proposed treated effluent pipeline corridors for site area 2. Option A extends around the edge of Milton Landfill before turning south-east following a similar route to the waste water transfer corridor around the edge of Milton, it then extends parallel to the A14 to a short section of the River Cam directly north of the A14 bridge. Option B follows the same route to the edge of Milton but also extends in a wide corridor the north of Butt Lane before extending east around the northern edge of Milton to a section of the River Cam north of Horningsea and south west of Clayhithe.

4.1.8 The indicative Waterbeach waste water transfer pipeline corridor starts at the existing Waterbeach WWTP and extends west around the edge of Waterbeach village to where is crosses the A10, it then extends south between Landbeach and the lakes associated with Waterbeach angling club, before crossing Waterbeach Road. From here, the corridor extends south parallel with the boundary of Landbeach, it then crosses Landbeach Road at the southern extent of the village and extends east through farmland before turning south to cross Milton Road and enter the north east of site area 2.

Assessment summaries

4.1.9 A summary of the environmental, community, economic, planning and operational assessments completed for the site area 2 options is provided in the following sections. The summaries focus on the results of the mitigated scenario assessments. Detailed technical accounts of the unmitigated scenario assessments, the identification of mitigation measures and subsequent assessment of the mitigated scenarios are provided in appendices B to G.

4.2 Environmental assessment

4.2.1 This section summarises the environmental assessment of site area 2 mitigated options. The detailed accounts of the assessments are provided in Appendix B.

Nature conservation and biodiversity

4.2.2 The nature conservation and biodiversity assessment concluded that there are no anticipated likely significant effects on any statutory designated sites from construction of the WWTP or associated infrastructure for site area 2.

4.2.3 Construction of the WWTP at site area 2 has the potential to indirectly impact a County Wildlife Site (CWS). Potential impacts of temporary dewatering in the lower Greensand aquifer during shaft construction could affect the water supply to Cottenham Moat CWS, which is known to support great crested newts. Additional temporary water supply may be required to restore water levels should they fall below those required to sustain the ecological habitats (specifically those which support great crested newts).

4.2.4 The habitats identified within the site area, infrastructure corridors and access areas have the potential to support protected species. Both badgers and great crested newts have been recorded within the site area and therefore it is likely that mitigation and compensation measures will be required.

4.2.5 To achieve a Biodiversity Net Gain (BNG), habitats lost within the site area would need to be compensated for by the creation and enhancement of new and existing habitats. Generally, the loss of broadleaved woodland and trees, of which there are large areas within site area 2, will require larger areas of land for new habitat creation in order to achieve BNG.

4.2.6 A section of the Cambridgeshire Strategic Green Infrastructure Network partially falls within the proposed site area and associated corridors. However, the initiative is not well defined in this area.

Landscape and visual amenity

4.2.7 Site area 2 lies within an area of low landscape character sensitivity, as assessed in the Green Belt Study provided in Appendix J. The rural character of the area around site area 2 has already been eroded by the presence of the A14, the landfill site, the recycling centre and business units. A large-scale new infrastructure development on site area 2 would further extend this existing built development west onto farmland.

4.2.8 Existing tree belts and woodland blocks would provide mature screening that would limit most views from Impington, with just the tallest elements visible above the trees. Residents in Milton and Histon may see the taller elements above intervening vegetation. Visual receptors on Butt Lane, in cul-de-sacs off Milton Road (Impington), on the Blackwell caravan site and on Mere Way would have clear or filtered views of the new structures.

4.2.9 Mitigation planting would screen much of the new WWTP after 15 years of operation and would be most effective where it is closest to receptors. The taller new structures would remain visible above the planting to receptors on Milton Road, in the northern end of Impington and on Mere Way.

4.2.10 Overall, the proposed landscape mitigation would gradually integrate the development into its surroundings, effectively blending it in to the existing wooded character of the landscape at the southern half site area 2.

Historic environment

4.2.11 There is very high archaeological potential for Roman and Iron Age remains within site area 2, potential late prehistoric and Roman archaeology with the treated effluent corridors and potential for remains across multiple periods along the corridor for the Waterbeach waste water transfer. If remains are located, then this may result in a likelihood of moderate to major impact on archaeological remains which may be of low to moderate value. However, the proposed archaeological mitigation would reduce harm to the historic environment and comply with the requirements of planning policy.

Land and water quality

4.2.12 The location of Milton Landfill adjacent to the site area and the historical land use of part of the site area (barracks and brick works) presents potential risks of encountering contamination during construction of the new WWTP, if contamination is encountered remediation and mitigation measures, such as gas protection measures, may be required.

4.2.13 There is potential for contamination to be encountered along the waste water transfer tunnel and the effluent transfer tunnel/pipeline due to the potential contamination sources present on and adjacent to the site area. However, the buffer established from Milton Landfill and the ability to adjust the routes is considered to decrease the risk of encountering contamination.

4.2.14 There is potential for temporary impacts on water levels within the Lower Greensand aquifer during dewatering for shaft construction at the new WWTP, which could have an adverse impact on private water supplies in the area. However, mitigation would be put in place to maintain the private water supplies or provide alternate supply. This is supported by the preliminary results of a Hydrogeological Impact Assessment (HIA), which was requested by the Environment Agency in its response to consultation, to provide further assessment of the potential impact on groundwater and the groundwater-dependent environment. The HIA will be made available following review by the Environment Agency.

4.2.15 The risk of impact on WFD surface water bodies is considered to be low. The only risk that would not be mitigated is the potential changes to flow and stage height/water level in the River Cam, including a reduction in flow in the reach downstream of the A14, in the event that the downstream outfall location (Option B) is chosen. The loss of flow (and reduction in stage height/water level) might, however, be compensated for to some extent by an improvement in water quality in the reach as a result of the removal of the treated effluent discharge contribution from the existing WWTP.

Carbon emissions

4.2.16 The whole life carbon emissions (WLC) for the waste water infrastructure and transport access associated with site area 2 are shown in Table 4.1. Whole life carbon emissions include both construction (embodied carbon emissions) and 20 years of operation (operational carbon emissions).

4.2.17 In comparison with the lowest carbon option (Option 3Aii), the carbon emissions of all site area 2 options are higher due to the longer lengths of waste water and treated effluent transfers (tunnel and pipeline) and deeper tunnel shafts required (embodied carbon emissions), which also increases the amount of energy needed for pumping flows into and from the new WWTP (adding to operational carbon emissions). The lowest carbon option for site area 2 would be Option 2Bii (129% of the carbon emissions for Option 3Aii) which returns treated effluent to the River Cam using a pipeline whilst the highest carbon option would be Option 2Ai which returns treated effluent using a tunnel (156% of the carbon emissions for Option 3Aii).

4.2.18 Overall, the higher whole life carbon emissions for site area 2 options compared with lowest carbon option (Option 3Aii) equate to an additional 13,000 to 25,300 tonnes of CO_2e. This is equivalent to the annual carbon footprint of 1630 to 3160 average UK households.

Table 4.1: Whole life carbon emissions for site area 2 options

Site area option	Return option	Outfall Location	WLC tCO2e - 20yrs	% compared to lowest carbon option (Option 3Aii)
2Ai	Tunnel	Existing	70,100	156%
2Bi	Tunnel	New	70,100	156%
2Aii	Pipeline	Existing	57,800	129%
2Bii	Pipeline	New	57,800	129%

Noise

4.2.19 The assessment concluded that noise and vibration from construction works for site area 2 and the associated infrastructure would not exceed significant adverse effect level thresholds, derived from BS 5228-1&2:2009+A1:2014 (British Standards Institute, 2008), for extended periods at receptor locations. Design of the WWTP would include appropriate measures such that operational noise from fixed plant or changes in road traffic would not result in significant changes to baseline noise conditions or significant adverse effects.

Air Quality

4.2.20 The assessment concluded that existing baseline conditions do not exceed the national air quality objectives. Dust deposition effects at closest receptors to the site area and pipeline corridors would be negated with appropriate dust control measures. Mitigation is anticipated to reduce the likely air quality impacts to negligible.

4.2.21 The potential impacts of construction and operational traffic on the A14 AQMA an air quality sensitive area designated by South Cambridgeshire District Council (SCDC)[23], may need further assessment. However, this is consistent across all site area options.

Odour (environmental impacts)

4.2.22 A preliminary odour assessment demonstrated that a new WWTP at site area 2 would result in negligible[24] odour impact for all receptors in accordance with the Institute of Air Quality Management's (IAQM) *Guidance for the assessment of odour for planning* (Institute of Air

[23] Cambridge City Council, Huntingdonshire District Council & South Cambridgeshire District Council (2009) Air Quality Action Plan for the Cambridgeshire Growth Areas. https://www.scambs.gov.uk/media/6727/air-quality-action-plan.pdf

[24] Negligible impact is defined as an odour exposure level of <1.5 C_{98} OUE/m^3 for high sensitivity receptors (residential properties), see Appendix M for further details and odour exposure levels for lower sensitivity receptors

Quality Management, 2018). Therefore, no additional odour mitigation measures would be required for a new WWTP at site area 2.

4.3 Community assessment

Land take, property and business viability

4.3.1 The permanent land take required for construction of the WWTP has the potential to partially impact the viability of the businesses farming the land. However, the loss of the land is not expected to result in the inability to operate businesses.

4.3.2 The construction and operation of the WWTP is not anticipated to affect the viability of any other businesses in the area.

Amenity

4.3.3 Businesses on Butt Lane may experience a potential reduction in amenity from a combination of landscape and visual effects and traffic effects, as a result of construction and operational activity. The reduction in amenity for the businesses on Butt Lane is only a minor change from the baseline position as the area already contains activities which affect the amenity of the environment, including the recycling facility and the Milton Park and Ride.

4.3.4 The Evolution Business Park and users of Mere Way are likely to experience a reduction in amenity during operation of the WWTP from a combination of landscape and visual effects and odour impact. It is noted that the odour impact is classified as negligible at these receptors due to the level of sensitivity. However, combined with the landscape and visual effect this results in a reduction in amenity.

Traffic

4.3.5 There is the potential for adverse impacts on traffic during construction due to compounding effects of operational traffic accessing the existing WWTP and construction traffic for the new WWTP all using the Milton interchange (Junction 33 of the A14). During operation there is not anticipated to be an impact on the Milton interchange but there are potential impacts on the A10 and the junction with Butt Lane, as they are operating at capacity including flows from committed developments. However, the operational flows associated with the new WWTP are considered to be relatively low in comparison with flows associated with committed developments such as Waterbeach New Town.

4.4 Economic assessment

CAPEX and whole life costs

4.4.1 The ‘with mitigation’ CAPEX and whole life costs in comparison with the lowest cost option (Option 3Aii) are shown in Table 4.2.

4.4.2 The main reasons for the higher CAPEX for the construction of the WWTP at site area 2 are as follows.

- The longer length of waste water transfer tunnel and greater requirement for tunnel lining associated with interaction with the Lower Greensand aquifer
- The longer length of the treated effluent transfer, with route Option A, utilising a tunnel, representing the greatest cost difference and route Option B, utilising a pipeline, the lowest cost difference

- Higher land acquisition and compensation costs

4.4.3 Although the CAPEX costs are greater overall there are some elements of the scheme at site area 2 that would incur lower CAPEX than the lowest cost option, such as transport access arrangements and grid power connection.

4.4.4 Table 4.2 shows that the difference in whole life costs is less than that for CAPEX. This is due to the fact that operational costs over a 20-year operation period are similar across all site area 2 options as the WWTPs are identical and the only differences are in transferring waste water and treated effluent, which are minimal. Therefore, the difference in CAPEX makes up the majority of the difference in whole life cost.

Table 4.2: Comparison of 'with mitigation' cost estimates for site area 2 options

Site area option	% compared to lowest cost option (CAPEX)	% compared to lowest cost option (whole life cost)
2Ai	116%	107%
2Bi	116%	107%
2Aii	113%	105%
2Bii	113%	105%

4.4.5 The cost estimate includes land acquisition and compensation costs based on current estimates of land value. However, there are some uncertainties about future land values and compensation, which are discussed in the following section.

Land acquisition and compensation

4.4.6 The following assessment of land acquisition and compensation has been conducted by suitably qualified and experienced experts within the Savills property team.

Site description

4.4.7 Site area 2 covers a total area of 53ha, which is made up of arable fields and is in the Green Belt. To the north is the Evolution Business Park, owned by Cambridgeshire County Council and occupied by a number of technology/research and development tenants. Mere Way runs to the east of the site area. To the south west is a children's nursery (over 400m from the site area boundary). To the west is the village of Impington, including a village college and a private hospital. To the north west is a site being promoted for affordable housing. There are a small number of houses along Butt Lane, all of which are 400m, or further, from the site area's boundary.

Land owners and occupiers

4.4.8 All of the land to the west of Mere Way is owned by a farming family, and is partly farmed by the family and partly by a tenant. The land to the east of Mere Way is owned by a small company for its long term development potential, and let for horse grazing. The access route off Butt Lane is also privately owned.

4.4.9 The land to the west of Mere Way, and all the way to the edge of Impington Village, is being promoted through the emerging Greater Cambridge Local Plan process, in conjunction with Trinity College Cambridge. The proposed use is an extension to the Cambridge Science Park of 1.5 million square feet of employment space and 220 acres of park land for public use. This promotion is early in the planning process and would require a significant release of the Green Belt. Due to this promotion, the value of the land is likely to increase. The range in the potential land values is commercially sensitive. The likely increase represents a significant change that

could undermine the viability of the CWWTPR project. See Section 4.8.27 for consultation responses from the promoters of this development.

4.5 Planning assessment

4.5.1 This site area lies within the Cambridge Green Belt in an area of flat open countryside. The site area comprises land classified as grade 2 or 3 best and most versatile agricultural land. The landscape character is assessed as being of low sensitivity. The centre of the site area lies approximately 500m from the eastern edge of Impington and is particularly visible from Impington and the existing properties along Butt Lane. The site area is visually less exposed from distant views from the south and west by mature tree planting and land form. The existing development along Butt Lane is already visible in more distant views from the north. The pipeline corridors are within 100m of the Landbeach Conservation Area and the Milton Conservation Area. The pipeline also runs under a Protected Village Amenity Area at the southern end of Milton.

4.5.2 This site area is situated in an area generally surrounded by existing development including a landfill site, a commercial business park, a travellers' site, a nursery (the 'Wendy House') and the Milton Park and Ride site. A site immediately to the south of the existing Park and Ride site where the tunnel and pipeline corridor options run is currently the subject of a planning application for a new police station.

4.5.3 The site area lies within an area immediately to the north of the Cambridge northern fringe which is the focus of a number of other projects in the early stages of promotion:

- Cambridge Autonomous Metro which will have a route to Waterbeach - still to be determined
- Waterbeach to Cambridge Better Public Transport and Active Travel project is a route between Waterbeach and Cambridge – preferred route to be determined
- A10 improvement – one of four route options (Option D) runs close to site area 2A and 2B

4.5.4 Site area 2 is the subject of proposals for an extension to the Cambridge Science Park currently being promoted through the emerging Greater Cambridge Local Plan process. This proposal directly affects a significant portion of site area 2. At this time, this proposal has no planning weight. However, it is considered to be a credible promotion by a strategic landowner (Trinity College Cambridge) compatible with growth aspirations for Greater Cambridge for technology related development and the Government's growth prospectus for the OxCam Arc "key economic priority" area. Overlaying site area 2 with this promotion land and accounting for the asset encroachment/safeguarding area, development of a new WWTP here could therefore impede the future strategic growth of Cambridge by prejudicing or, at worse, obstructing alternative economic development proposals which are likely to be brought forward in the near to medium future.

4.5.5 A number of other sites, including a site to the north west of site area 2, have been promoted in the recent Greater Cambridge Local Plan Call for Sites for residential development. In the event that development of any of the sites in the immediate vicinity of site area 2 is realised, that development may affect the long term resilience of CWWTPR. The risk of encroachment of other development proposals on the area in the future may potentially give rise to operational conflicts such as odour or traffic.

4.5.6 A further site has been submitted to the south of Waterbeach for commercial development which has the potential to affect the Waterbeach pumping main route.

4.5.7 The Green Belt Study (See Appendix J) considers the potential overall scale of impact from development of CWWTPR on this site area. The report assessed that the overall site performance of site area 2 against Green Belt purpose is Fair:

> *"Development on site area 2, in a landscape of existing medium-low sensitivity, would extend the existing developed area south of Butt Lane towards the A14. It would reduce the landscape gap between Milton and Impington. It would further reduce the openness of the Green Belt, though there is existing built development nearby. The development would have little effect on the landscape setting of Cambridge. The taller elements of the development would be visible from Impington, above intervening vegetation. The development would be visible from the PRoW along Mere Way."*

4.5.8 In planning policy terms development of this site area for CWWTPR would represent *'inappropriate development'*[25] within the Green Belt. Actual harm to Green Belt may partially be tempered by the present somewhat compromised performance of this area in Green Belt purpose terms. The development will be highly visible in views from properties to the west and will require significant landscape mitigation. Proximity of more sensitive land uses, particularly to the north west and south west, even with the separation distance allowed in the site selection process, is likely to give rise to amenity concerns. This could also result in complaints and could impact negatively on businesses immediately to the north. Traffic generated by the development should be contained on the A10 but will need to utilize the congested A10/A14 junction and may be subject to (at very least) temporary disruption if the network infrastructure projects referenced above are progressed.

4.5.9 The relatively constrained characteristics and position of site area 2 between Milton and Impington, given surrounding development and the promotion of additional infrastructure and development in the vicinity, restricts the opportunities for this site area to deliver new habitat and improved connectivity.

4.6 Operational assessment

Delivery of Anglian Water's strategic corporate commitments

4.6.1 Site area 2 presents a number of opportunities to deliver Anglian Water's strategic corporate commitments. The site area provides a good opportunity to develop a modern carbon efficient plant with embedded renewable energy generation, contributing to climate change and sustainability commitments.

4.6.2 Anglian Water has an industry-leading track record of successfully working with stakeholders to create high levels of environmental and amenity value around its major essential infrastructure assets (such as treatment plants and reservoirs). The site would be developed to deliver a net gain in biodiversity, providing a high level of habitat enhancement in place of arable farmland however due to the higher likelihood of alternative land use proposals and proximity to the urban fringe such enhancement opportunities may be limited.

[25] As defined in: Ministry of Housing, Communities & Local Government, Na ional Planning Policy Framework, 2019. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf and;

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

Odour (operational)

4.6.3 Site area 2 is in relatively close proximity to Impington and Milton. However, preliminary modelling indicates that residential properties (constituting high sensitivity receptors) would experience a negligible odour impact in accordance with the Institute of Air Quality Management's (IAQM) *Guidance for the assessment of odour for planning* (Institute of Air Quality Management, 2018), reflecting the improved operation of a modern plant compared with that at the current Milton site. The Evolution Business Park (considered to be of medium sensitivity) would likewise experience only a negligible odour impact. Therefore, additional odour mitigation would not be required for site area 2, which would provide significant health and safety and operational benefits.

Future urban growth

4.6.4 Site area 2 sits a potential future transport corridor and is the subject of proposals currently being promoted through the emerging Greater Cambridge Local Plan process for technology related development. Development of a new WWTP here could therefore impede the future strategic growth of Cambridge by prejudicing or at worse obstructing alternative economic development proposals which are likely to be brought forward in the near to medium future. It also considered that even if the current promotion of the site was not successful, withinfuture urban growth and development pressures are likely to affect the long term resilience of this site for CWWTP due to the close proximity to the Cambridge urban fringe. The risk of encroachment of additional development proposals on the area in the future may potentially give rise to operational conflicts such as odour or traffic.

Future operational needs

4.6.5 While the development proposals are based on a robust assessment of future demand to 2050 it is considered desirable to consider the future potential for improvement or modifications of the plant in the very long term due to population or regulatory changes, particularly if it is remembered that the current site first started operating over a century ago. It would be prudent to assume a similar lifespan for activities at any new site. Site area 2, being situated on the urban fringe is more likely to suffer encroachment from other forms of development impacting on operational effectiveness and resilience.

Access

4.6.6 With mitigation in place there are residual risks to the access to site area 2 due to the potential constraints posed by the A10/Butt Lane junction and access through the Park & Ride site, which could impact on the ability to access the site during normal operation.

4.7 Programme assessment

4.7.1 The main areas of programme risk associated with site area 2 options are as follows.

4.7.2 Due to the conflicted land interests with the promotion of the extension to the Cambridge Science Park, this may result in significant delays to the project development process. If any of the sites promoted through the call for sites are allocated in the emerging local plan then this may result in the need for CWWTPR to adapt its construction programme to address potential cumulative effects including construction traffic.

4.7.3 The Environment Agency (EA) has indicated it has significant concerns about the potential impacts of dewatering on the Lower Greensand Aquifer and that any water removed from the aquifer during dewatering would need to be recharged to the aquifer. Therefore, it is likely that

extensive investigation would be required to satisfy the EA that the potential impacts can be mitigated and also in determining a satisfactory method for recharging the aquifer. Dewatering and subsequent recharging is likely to require relatively complicated engineering operations, therefore, putting these operations in place could have a significant impact on the construction programme.

4.7.4 The risks of archaeological finds across the scheme area present a moderate risk of delay to the start of construction. Archaeological investigation may allow for the targeting of building and service locations to reduce impact on buried archaeology. However, there remains a risk of unexpected finds during construction, which would potentially have a significant impact on the construction programme.

4.7.5 There are constraints associated with the treated effluent transfer Option A route, which could impact on the construction programme, as the route corridor is relatively narrow there is limited opportunity to alter the route to avoid these constraints. It is considered that the risk would be highest if the transfer were to be constructed as a pipeline. Route Option B presents greater opportunity to avoid potential constraints, it is considered that constructing the transfer as a tunnel along this route would present the lowest risk to the construction programme.

4.7.6 The construction programme for site area 2 is already constrained due to the relatively long length of the waste water transfer tunnel, therefore, there is limited flexibility in the event of delays due to other factors. However, the risk of additional mitigation measures in relation to the integration of the WWTP into the landscape is considered to be relatively low.

4.7.7 The combination of risks results in a high risk of impact on the overall programme.

4.8 Phase one non-statutory consultation feedback

Public consultation

4.8.1 The majority of feedback received during phase one consultation was provided through the digital engagement platform and hard copy feedback form. Respondents using these channels were asked to identify which site they thought was most suitable for the relocation project.

4.8.2 Respondents were also asked to identify the topic areas most relevant to their feedback. For site area 2, a significant amount of feedback was received covering all topic areas.

4.8.3 Comments in opposition to site area 2 were often considered to also apply to site area 1, and vice versa, given their proximity to one another.

4.8.4 As with site area 1, the most frequently commented topic area for site area 2 was ‘Air, quality, noise and vibration’, within which perceived odour impacts to nearby communities, facilities and amenities was a major concern. The proximity of site area 2 to nearby residential communities, such as Blackwell travellers’ site, Histon, Impington, Milton, and Orchard Park, was frequently noted, with concern raised that significant odour impacts would be experienced by residents of those areas. Local amenities, businesses, and facilities, such as Mere Way, Wendyhouse Nursery, Impington Village College, and local agricultural businesses, were also referenced with similar concern. Odour experienced from the current CWWTPR was often cited.

4.8.5 Feedback revealed specific concern regarding potential impacts to Mere Way, with comments regarding its importance to connectivity and heritage for the local area. There is concern that a relocation of the plant would compromise this value and discourage use of Mere Way as a local sustainable transport route for walking and cycling. Aspirations for Mere Way to be a ‘greenway’ and provide connectivity between Cambridge and Waterbeach were noted.

4.8.6 'Traffic and access' was also a frequently commented on topic area for site area 2. Feedback demonstrated concern regarding the potential for construction routes to exacerbate perceived existing problems with local roads such as the A10 and A14. Congestion, noise, and air quality were all raised as traffic-related concerns. Concern also raised for the safety of schoolchildren in the area using local cycling routes.

4.8.7 Feedback demonstrated varying levels of opposition to site area 2 being selected in regard to all other topic areas as well. Comments ranged from concern that the relocation would increase flood risk in the local area to information on the ecology present on the site with concern that this would be negatively impacted.

4.8.8 Some feedback supported site area 2 as being suitable for the relocation, primarily through consideration that impacts to the local area would be lower (relative to site area 3) given the existing infrastructure and nearby land use. Examples given included the recycling and household waste centres off Butt Lane and existing major roads such as the A10.

Technical stakeholders

4.8.9 The following is a summary of the most pertinent comments from technical stakeholders where they are made in specific reference to site 2.

Environmental

4.8.10 The Environment Agency (EA) confirmed that the proposed discharge point for site area 2 is accepted in principle. The EA state that they "*have not identified any major fluvial flood risks to the preferred sites in question*" but indicate that a flood risk assessment will be needed to investigate the risks and opportunities for overall risk reduction. The EA recommended that the final design solution "*avoids requiring penetration of the confined Lower Greensand principal aquifer*". This recommendation arises from the "*significant reservations about the indicative proposals for sites 1 and 2 as outlined in the fine screening report, since these specify the installation of waste water transfer tunnels and drive shafts into the Lower Greensand aquifer*". The EA has also indicated that "*It is very likely that any de-watering water would need to be returned to the aquifer*". The EA suggested that a detailed Hydrogeological Risk Assessment (HIA) should support the final site selection.

4.8.11 Cambridgeshire County Council (CCC) provided the following comments:

- A detailed hydrological assessment of the river Cam must be undertaken in relation to the discharge pipeline and outfall.
- In reference to the transfer tunnels and pipelines the CCC commented that Anglian Water should demonstrate to the satisfaction of the Minerals & Waste Planning Authority that the proposed connections "*would not prejudice the Milton Landfill site"*.
- CCC also commented that part of the site runs parallel to Byway 162/3 Milton and suggest that the effluent tunnel will affect the byway route 162/1 Milton and a permissive footpath. "*Provision should be made to retain Byway 162/3 Milton through the site if possible and screening should be provided"*.
- "*The site is located in an area of high archaeological potential*".
- "*The scheme is likely to adversely impact local wildlife sites (River Cam County Wildlife Site, River Great Ouse and Hedges and Milton Road Hedge City Wildlife Site) and protected species*".

4.8.12 Natural England was keen that Anglian Water should apply Natural England's Impact Risk Zones (IRZs) to screen all options and development proposals. This would, in their opinion,

provide more appropriate and robust identification of risk to SSSIs and special areas of conservation.

4.8.13 Natural England also wished to be included in permit standards discussions with the EA and expected to see delivery of significant biodiversity net gain.

4.8.14 The Wildlife Trust identified that site area 2 may have significantly less impact on the proposed Nature Network and for this reason it is preferable.

4.8.15 Cambridge Past Present and Future considered site area 2 may have an option to consolidate methane collection from the landfill site. It also comment that site area 2 has significant other proposed development in the same area of the Green Belt, such as the new police station, A10 and metro, and it is likely to have the greatest odour impact.

4.8.16 Historic England wished to have a further assessment of impact on designated and undesignated heritage assets and identified as a primary concern i land west of Milton recycling centre.

Transport and access

4.8.17 Highways England acknowledged that the focus on transport criteria has been to minimise the impact on the local road network.

4.8.18 Site area 2, however, will affect junction 33 of the A14 which is almost at capacity. Defined transport or access routes will be sought in due course, along with transport assessments for construction and operation periods.

4.8.19 In addition, there are the anticipated upgrades to the A10 which Highways England stated would affect the cumulative capacity at Junction 33 and may cause heavy traffic during both construction phases.

4.8.20 The Cambridge Local Access Forum identified potential impacts on the rights of way offered by Mere Way for site 2.

4.8.21 The Ministry of Defence (MOD) identified that site area 2 falls within the statutory safeguarding Aerodrome Height (45.7m) and bird strike zones surrounding Cambridge Airport. The MOD would require precise details of design, elevations and landscaping proposals to carry out an assessment of impact.

Police Station

4.8.22 The consultation response received from the Police and Crime Commissioner Cambridgeshire and Peterborough identified a concern about the impact of site area 2 and the tunnel corridors and pipelines on the proposed new police station development.

Urban and Civic (U&C)

4.8.23 U&C has an interest in the CWWTPR proposals as it is promoting the development of Waterbeach New Town.

4.8.24 The response from U&C mentioned that site area 2 may impact on Mere Way and the proposed cycle way between Waterbeach and Cambridge, and the proposed tunnel corridors appear to impact on the Park and Ride. U&C also recognised that site area 2 presents a greater distance to the River Cam and as a result a greater impact on ecology for the final effluent pipeline.

Utilities

4.8.25 Comments from Cadent and UK Power Networks identified where connection points to the gas and power networks would be possible. South Staffs/Cambridge Water has identified the route of the water pipeline to service the new Waterbeach New town development and that discussion is necessary with Anglian Water if site area 2 is progressed.

Land stakeholders

4.8.26 The main land owner of site area 2, Chivers Farms, made representations against site area 2 being selected as the preferred site. These included a number of comments regarding the impact of land acquisition on its own business and the presence of CWWTPR on other existing local businesses (including a children's nursery), as a result of odour/pollution, construction activity and the impact of additional traffic on local routes. Reference was also made to proposals to bring forward the land for development (see below).

4.8.27 Representations were also made by Trinity College, Cambridge regarding its proposed use of the site (plus additional land to the west and south) as an extension to the existing Cambridge Science Park and other related uses. These would include the provision of 220 acres of parkland for public use between the Science Park extension and Impington, a relocated Park and Ride Facility and stations for the Cambridge Automated Metro (if implemented).

4.9 Summary of results

4.9.1 Table 4.3 presents a summary of the assessment results for site area 2.

Table 4.3: Summary of results for site area 2

Criteria	Summary of assessment
Environmental	• Presence of Badgers and Great Crested Newts has been recorded on site, a larger area would be required for biodiversity net gain within site footprint, potential temporary impact on Cottenham Moat CWS • Landscape character of area already diminished, some visual impacts, site could integrate into landscape • High archaeological potential across the area • Potential risk of encountering/mobilising contamination at new WWTP and along waste water transfer tunnel due to proximity to Landfill, but can be mitigated • Potential for temporary impacts on water levels within the Lower Greensand aquifer during dewatering for shaft construction at the new WWTP, which could have an adverse impact on private water supplies in the area, but can be mitigated • Whole life carbon emissions for site area 2 options compared with lowest carbon option (Option 3Aii) equate to an additional 13,000 to 25,300 tonnes of CO2e • Noise and vibration from construction works for site area 2 and the associated infrastructure would not exceed significant adverse effect level thresholds for extended periods at receptor locations • Mitigation is anticipated to reduce the likely air quality impacts to negligible. • New WWTP at site area 2 would result in negligible odour impact for all receptors. Therefore, no additional mitigation would be required for odour control
Community	• Potential partial impact on viability of farming business, not expected to result in the inability to operate any of the businesses • Amenity impacts on businesses on Butt Lane due to combined effects of potential traffic and visual impacts and on Evolution Business Park and Mere Way due to combined effects of potential odour and visual impacts • Traffic impacts during construction and operation at Butt Lane/A10 and junction 33 of A14
Operational	• Opportunities to develop a modern carbon efficient plant. Site area would be developed to deliver a net gain in biodiversity, however, enhancement opportunities may be limited • No additional odour mitigation required • Site area being situated on the urban fringe is more likely to suffer encroachment from other forms of development impacting on operational effectiveness and resilience • Operational access could be affected by constraints at A10/Butt Lane junction and A14 junction 33 (almost at capacity)
Phase one non-statutory consultation feedback	• Main concerns from public: odour, traffic impacts on community amenity, businesses and facilities and compromising Mere Way • Environment Agency has significant reservations about interaction with Lower Greensand aquifer and concerns about contamination associated with landfill and waste water transfer tunnel

Criteria	Summary of assessment
	• Cambridgeshire County Council and Highways England concerns over capacity of access routes (A14 junction 33) • Developer and community concerns over conflicting and cumulative impact on proposed developments (science park, police station, Waterbeach New Town transport routes, A10)
Planning	• Overall site area performance of site area 2 against Green Belt purpose is 'Fair', harm to Green Belt may be partially tempered by the present somewhat compromised performance of this area in Green Belt purpose terms • Site area 2 is the subject of proposals by a strategic landowner (Trinity College Cambridge) compatible with growth aspirations for Greater Cambridge for technology related development and the Government's growth prospectus for the OxCam Arc "key economic priority" area. Development of CWWTPR at site area 2 could impede the future strategic growth of Cambridge by prejudicing or at worse obstructing alternative economic development proposals which are likely to be brought forward in the near- to medium future • In the event that development of any of the sites in the immediate vicinity of site area 2 is realised, that development may affect the long term resilience of CWWTPR. The risk of encroachment of other development proposals on the area in the future may potentially give rise to operational conflicts such as odour or traffic • The relatively constrained characteristics and position of site area 2 between Milton and Impington, given surrounding development and the promotion of additional infrastructure and development in the vicinity, restricts the opportunities for this site area to deliver new habitat and improved connectivity
Programme	• Due to the conflicted land interests with the promotion of the extension to the Cambridge Science Park, this may result in significant delays to the project development process. • Engineering operations for dewatering and recharging could have a significant impact on the construction programme • Risks of archaeological finds across the scheme area present a moderate risk of delay to the start of construction • Technically more complex route for effluent transfer option A (pipeline worst case) could impact on the construction programme • Construction duration for long waste water transfer tunnel limits the flexibility in case of other delays
Economic	• Higher CAPEX (113-116%) and WLC (105-107%) than site area 3 (and higher than site area 1). Longer waste water transfer infrastructure and greater lining requirements • Site promoted for development, greater potential for higher land acquisition and compensation costs

5 Site Area 3 assessment

5.1 Introduction to site area 3

5.1.1 Site area 3, shown in Figure 5.1, is located 1km to the east of the existing WWTP, within the administrative boundary of South Cambridgeshire District. The site area covers a total area of 127ha.

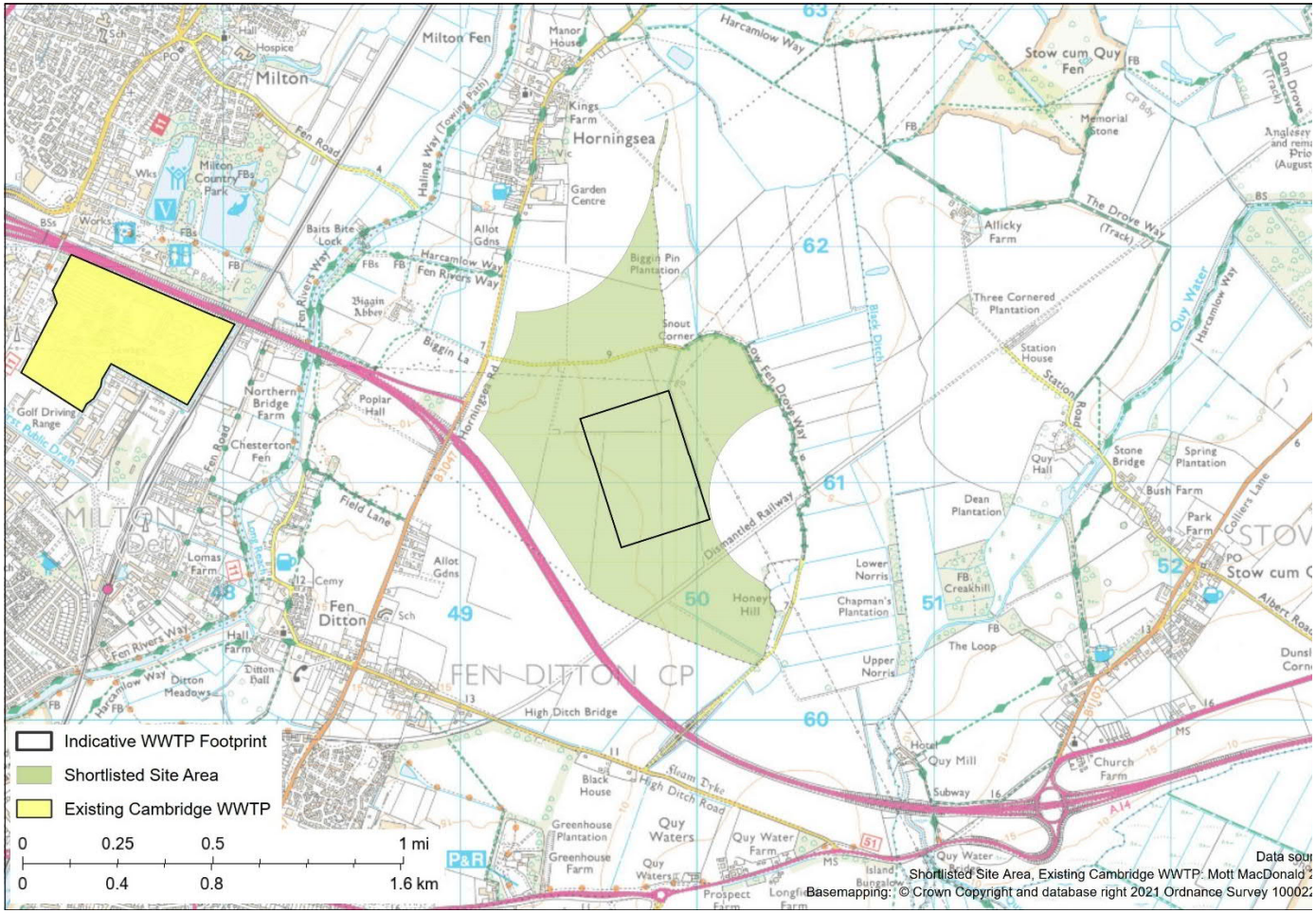
5.1.2 Site area 3 lies between the villages of Horningsea to the north, Stow Cum Quy to the east and Fen Ditton to the south east. The A14 extends along the south western boundary of the site and Low Fen Drove Way, an unclassified road and public byway follows parts of the eastern and north eastern boundary of the site area. Beyond Low Fen Drove Way, the open farmland extends to the north east towards and beyond Stow Cum Quy Fen, and to the east, towards Stow Cum Quy village. To the west of site area 3 lies Junction 34 of the A14, a junction intersected by Horningsea Road which extends north, parallel to the western boundary of the site area. Horningsea Road connects Fen Ditton to the south with the village of Horningsea in the north.

5.1.3 The site area itself is open farmland with large arable fields defined by boundary hedges and ditches. The topography is mostly level, at 5-10m AOD, rising towards the west. A dismantled railway, also designated as CWS, crosses the southern end of the site area and overhead powerlines cross the northern section and include six transmission towers within the site area.

5.1.4 The site area was defined by the baseline constraints established in Stage 1 – Initial Site Selection (Mott MacDonald Ltd, 2020b) and is constrained by:

- The 500m buffer around listed buildings in Horningsea village to the north east and Biggin Abbey to the east
- The site selection Study Area to the north and east
- 400m buffer around an isolated residential property located on Low Fen Drove Way
- The 100m buffer along the alignment of the A14 to the south west

Figure 5.1: Site area 3 location map



Infrastructure corridors

5.1.5 The routes and extents of the infrastructure corridors for site area 3 are described below and illustrated on Drawing 409071-MMD-00-XX-GIS-Y-0454 in Appendix A.

5.1.6 The waste water transfer tunnel corridor is wide area extending south east from the western boundary of the existing WWTP to the western and southern edges of site area 3. The northern boundary of the tunnel corridor extends parallel to the A14, albeit slightly further north and culminates to the east of Junction 34 and Horningsea Road. The southern boundary of the corridor follows Cowley Road south east, then turns slightly north as it crosses the railway line, the River Cam and Horningsea Road before crossing the A14 and entering site area 3.

5.1.7 The treated effluent pipeline corridors for site area 3 extends west from the boundary of the site area crossing Horningsea Road and running parallel to the A14 to a section of the River Cam directly north of the A14 bridge. The northern extent of the corridor covers the driveway to Biggin Abbey cottages.

5.1.8 The indicative Waterbeach waste water transfer pipeline corridor starts at the existing Waterbeach WWTP and extends east to cross the Ely to Cambridge railway line, the corridor then turns south and extends parallel to Long Drove and the River Cam until it crosses the river to the east of Waterbeach railway station. The corridor then extends south through farmland running relatively parallel to Clayhithe Road and then passes to east of Horningsea village before entering the northern boundary of the site area.

Assessment summaries

5.1.9 A summary of the environmental, community, economic, planning, operational and programme assessments completed for the site area 3 options is provided in the following sections. The summaries focus on the results of the mitigated scenario assessments. Detailed technical accounts of the unmitigated scenario assessments, the identification of mitigation measures and subsequent assessment of the mitigated scenarios are provided in appendices B to G.

5.2 Environmental assessment

5.2.1 This section summarises the environmental assessment of site area 3 mitigated options. The detailed accounts of the assessments are provided in Appendix B.

5.2.2 Overall, the main environmental sensitives related to this site area comprise landscape and visual amenity, archaeological potential, setting of heritage assets and nature conservation and biodiversity.

Nature conservation and biodiversity

5.2.3 The nature conservation and biodiversity assessment concluded that there are no anticipated likely significant effects on any statutory designated sites from construction of the WWTP or associated infrastructure. However, site area 3 is in relative proximity two SSSIs, Wilbraham Fens and Stow-cum-Quy Fen.

5.2.4 Surface water and groundwater drainage from site area 3 is likely to discharge to the Black Ditch, which is connected to one of the ponds within Stow-cum-Quy Fen SSSI. Due to the considerable distance between site area 3 and the point at which the Black Ditch connects with the SSSI, the risk of any adverse impacts on the SSSI are considered to be low. However, mitigation measures would be required during construction, and the permanent site drainage would need to be robustly designed, to prevent discharge of any pollutants to the Black Ditch

and ensure the SSSI would not be impacted. A Hydrogeological Impact Assessment[26] (HIA) has been undertaken to further assess the potential impacts on groundwater and the groundwater-dependent environment including on Stow-cum-Quy Fen SSSI as discussed above. The HIA modelled the potential migration of contamination in shallow groundwater to the Black Ditch in the unlikely event of a release of contaminants during construction or operation of a WWTP at site area 3. The preliminary conclusions of the HIA indicate that with appropriate construction design, management and operational management, including protection measures, it is unlikely that significant concentrations of potential contaminants will reach Black Ditch within 1,000 years and therefore, it is unlikely that there will be an adverse impact on Stow-cum-Quy Fen SSSI.

5.2.5 Wilbraham Fens SSSI, is approximately 1.3km from the site area, but is upstream of the site area and therefore will not be affected by site drainage. However, the route for operational access to site area passes the SSSI. Therefore, operational traffic may require further assessment as the vehicle movements exceed the assessment thresholds. However, although further assessment is recommended it is considered that the change in pollutant concentration as a percentage of the relevant critical level or load is likely to be less than 1% and the effects insignificant.

5.2.6 Construction of the WWTP at site area 3 has the potential to impact a County Wildlife Site (CWS). Low Fen Drove Way Grasslands and Hedges CWS is within site area 3 and the new access road to the WWTP will cross the CWS. Ecological mitigation and compensation measures, such as the creation of a habitat buffer between the WWTP and the CWS will minimise the potential impact on this site and the habitats within it.

5.2.7 Other than the CWS, site area 3 is comprised mainly of arable fields, which are considered to be of low ecological value. Whilst, there are still areas of habitat within the site area, infrastructure corridors and access areas that have the potential to support protected species, it is considered that impact on all protected species can be mitigated through avoidance and habitat compensation.

5.2.8 To achieve a Biodiversity Net Gain (BNG), habitats lost within the site area would need to be compensated for by the creation and enhancement of new and existing habitats. Achieving BNG would require relatively little land for site area 3 as the development would not result in the loss of large areas of broadleaved woodland and trees.

5.2.9 Site area 3 is located at the south western end of Wicken Fen vision area, which is a long term landscape scale green infrastructure ambition established by the National Trust, which extends from its Wicken Fen nature reserve to the outskirts of Cambridge. Site area 3 is located in a part of the vision area that could function as a ‘gateway’, connecting the urban area to the countryside. BNG provides an opportunity to support the biodiversity elements of this vision.

Landscape and visual amenity

5.2.10 Site area 3 lies within an area of medium landscape character sensitivity, as assessed in the Green Belt Study provided in Appendix J. A large-scale new infrastructure development on site area 3 would result in a substantial change to the character of the rural landscape in this location.

5.2.11 Visual receptors in Horningsea, at Biggin Abbey, on Horningsea Road (Fen Ditton) and on the many PRoWs in the area would have at least partially filtered views of the WWTP. Views from

[26] Further assessment of the potential impacts on groundwater and the groundwater-dependent environment has been undertaken in a Hydrogeological Impact Assessment (HIA) as requested by the Environment Agency in their response to consultation. The HIA will be made available once it has been reviewed the Environment Agency

the Marleigh development (approximately 650m from Site 3, to the south of the A14), which is under construction south of High Ditch Road, would be screened at lower levels by an existing belt of vegetation, but there would be views from upper storeys.

5.2.12 Mitigation planting would screen the lower structures on the site after 15 years of operation and would be most effective where it is closest to receptors in Horningsea and Biggin Abbey Cottages. The new structures may remain visible from more distant receptors.

5.2.13 Overall, the proposed landscape mitigation would gradually integrate the new development into its surroundings, but the planting would reduce the openness of the existing landscape. The WWTP would remain an uncharacteristic addition to the landscape and views.

Historic environment

5.2.14 There is very high archaeological potential for Roman remains within site area 3, the access area from High Ditch Road has high potential for early medieval remains relating to the presence of Fleam Dyke, and the Waterbeach transfer pipeline corridor has high potential for Roman archaeological remains. If remains are located, then this may result in a likelihood of moderate to major impact on archaeological remains which may be of low to moderate value. However, the proposed archaeological mitigation would reduce harm to the historic environment and comply with the requirements of planning policy.

5.2.15 There is potential for moderate impact on the significance of Biggin Abbey, a grade II* listed building, from the development of a WWTP within site area 3, this amounts to less than substantial harm in accordance with the NPS. Planting and landscape mitigation measures may reduce the impact. Mitigation measures including reducing the height and massing of structures and positioning of the tallest structures would have the greatest effect on reducing potential for impact.

5.2.16 Immediately south of High Ditch Road, is a section of Fleam Dyke, designated elsewhere, but at this location is a non-designated asset of potentially moderate value. Highways improvements on High Ditch Road could potentially result in moderate to major impact to this asset. However, it is currently assumed that any widening would be carried out on the northern side of the road and hence would not affect Fleam Dyke.

Land and water quality

5.2.17 The risk of contamination is considered to be low within site area 3 and the associated infrastructure corridors.

5.2.18 Site area 3 is located on an area of outcrop of the Grey Chalk, which is designated as a principal aquifer. However, the nature of the chalk in this area is such that groundwater yields or natural discharges from this section of the aquifer are likely to be very low. Therefore, it is considered that construction of the WWTP and associated infrastructure presents a low risk of impact on the principal aquifer, seepages to overlying superficial deposits or any groundwater abstractions. This is supported by the preliminary results of a Hydrogeological Impact Assessment (HIA), which was requested by the Environment Agency in its response to consultation, to provide further assessment of the potential impact on groundwater and the groundwater-dependent environment. The HIA will be made available following review by the Environment Agency.

5.2.19 The risk of impact on WFD surface water bodies is considered to be low. The crossing of the River Cam for the Waterbeach transfer pipeline would be constructed such that it would not adversely impact on the river.

Carbon emissions

5.2.20 The whole life carbon emissions (WLC) for the waste water infrastructure and transport access associated with site area 3 are shown in Table 5.1. Whole life carbon emissions include both construction (embodied carbon emissions) and 20 years of operation (operational carbon emissions).

5.2.21 Utilising a pipeline for the transfer of treated effluent from site area 3 to the River Cam represents the lowest whole life carbon emissions of all site area options. Using a tunnel for the treated effluent transfer presents greater whole life carbon emissions due to increased embodied carbon from construction of the tunnel and higher operational carbon emissions due to the additional pumping energy required.

5.2.22 Overall, the higher whole life carbon emissions for the treated effluent tunnel option compared with pipeline option equate to an additional 9,300 tonnes of CO_2e. This is equivalent to the carbon footprint of 1160 average UK households.

Table 5.1: Whole life carbon emissions for site area 3 options

Site area option	Return option	Outfall Location	WLC tCO2e - 20yrs	% compared to lowest carbon option
3Ai	Tunnel	Existing	54,100	121%
3Aii	Pipeline	Existing	44,800	100%

Noise

5.2.23 The assessment concluded that noise and vibration from construction works for site area 3 and the associated infrastructure would not exceed significant adverse effect level thresholds, derived from BS 5228-1&2:2009+A1:2014 (British Standards Institute, 2008), for extended periods at receptor locations. Design of the WWTP would include appropriate measures such that operational noise from fixed plant or changes in road traffic would not result in significant changes to baseline noise conditions or significant adverse effects.

Air Quality

5.2.24 The assessment concluded that existing baseline conditions do not exceed the national air quality objectives. Dust deposition effects during construction at the closest receptors to the site area and pipeline corridors would be negated with appropriate dust control measures. Mitigation is anticipated to reduce the likely air quality impacts to negligible.

5.2.25 The potential impacts of construction and operational traffic on the A14 AQMA an air quality sensitive area designated by South Cambridgeshire District Council (SCDC)[27], may need further assessment. However, this is consistent across all site area options.

Odour (environmental impacts)

5.2.26 The preliminary odour assessment showed that a new WWTP at site area 3 would result in negligible[28] odour impacts for all receptors in accordance with the Institute of Air Quality Management's (IAQM) *Guidance for the assessment of odour for planning* (Institute of Air

[27] Cambridge City Council, Huntingdonshire District Council & South Cambridgeshire District Council (2009) Air Quality Action Plan for the Cambridgeshire Growth Areas. https://www.scambs.gov.uk/media/6727/air-quality-action-plan.pdf

[28] Negligible impact is defined as an odour exposure level of <1.5 C_{98} OUE/m^3 for high sensitivity receptors (residential properties), see Appendix M for further details and odour exposure levels for lower sensitivity receptors

Quality Management, 2018). No additional odour mitigation measures would be required for a new WWTP at site area 3.

5.2.27 It is noted that the isolated residential property (Gate House) located on Low Fen Drove Way 400m east of site area 3 is outside of the area at risk of odour impacts based on the preliminary odour assessment.

5.3 Community assessment

Land take, property and business viability

5.3.1 The permanent land take required for construction of the WWTP has the potential to partially impact the viability of the businesses farming the land. However, the loss of the land is not expected to result in the inability to operate the businesses.

5.3.2 The construction and operation of the WWTP is not anticipated to affect the viability of any other businesses in the area.

Amenity

5.3.3 There is a potential for amenity impacts on users of the Low Fen Drove Way public byway during construction due to the combination of visual and traffic impacts and during operation due to the combination of visual, odour and traffic impacts. However, there are no other sensitive receptors that would experience amenity impacts.

Traffic

5.3.4 Construction access to site area 3 via Horningsea Road presents potential issues in relation to use of the west only junction on the A14 (Junction 34). However, appropriate measures for sourcing materials and vehicle routing would limit the need for U-turn manoeuvres at the Milton Interchange or Histon Interchange. A temporary speed reduction along Horningsea Road would potentially be required and construction of the access routes would have a temporary impact on access to the Low Fen Drove Way public byway.

5.3.5 Operational access to Site 3 via High Ditch Road and Low Fen Drove Way is likely to have only a minor impact on traffic along the route from the A14 and existing weight restrictions are not considered to pose an issue for access to the new WWTP. The access route would potentially have a moderate negative impact upon Low Fen Drove Way public byway and the proposed pedestrian access from the Marleigh development. However, access can be maintained by incorporating appropriate mitigation into the design of the improvements to the bridge over the A14 on Low Fen Drove Way.

5.4 Economic assessment

CAPEX and WLC

5.4.1 The ‘with mitigation’ CAPEX and whole life costs in comparison with the lowest cost option (Option 3Aii) are shown in Table 5.2.

5.4.2 The options for site area 3 are the lowest cost of all options for both CAPEX and whole life costs. The main reasons for the lower CAPEX for the construction of the WWTP at site area 3 are as follows.

- Shortest length for waste water transfer tunnel and limited interaction with the chalk aquifer resulting low risk of requiring secondary lining

- Shortest length for treated effluent transfer, the CAPEX is lower than all other site area options whether it is constructed as a pipeline or tunnel.
- No additional mitigation measures are required for odour control at site area 3
- Low expected land acquisition and compensation costs

5.4.3 Although the CAPEX costs are lowest overall there are some elements of the scheme at site area 3 that would incur greater CAPEX than the other options, such as transport access arrangements and grid power connection.

5.4.4 Table 5.2 shows that the percentage difference in whole life costs is less than that for CAPEX. Operational costs over a 20-year operation period are similar across both site area 3 options as the WWTPs are identical and the only difference is related to the pumping requirements in transferring waste water and treated effluent, which comprise a small proportion of the overall operational cost of the WWTP. Therefore, the difference in CAPEX makes up the majority of the difference in whole life cost.

Table 5.2: Comparison of 'with mitigation' cost estimates for site area 3 options

Site area option	% compared to lowest cost option (CAPEX)	% compared to lowest cost option (whole life cost)
3Ai	102%	101%
3Aii	100%	100%

5.4.5 The cost estimate includes land acquisition and compensation costs for the WWTP footprint based on current estimates of land value, which are discussed in the following section.

Land acquisition and compensation

5.4.6 The following assessment of land acquisition and compensation has been conducted by suitably qualified and experienced experts within the Savills property team.

Site description

5.4.7 Site area 3 covers a total area of 127ha, which is made up of arable fields and is in the Green Belt. The edge of Horningsea is approximately 850m north of the indicative WWTP footprint, and the A14 is approximately 300m to the south west. One residential property (Gate House) is located 400m to the east. Low Fen Drove Way provides an unadopted access road off Horningsea Road to the west and an access bridge over the A14 to the south. There are a few houses along High Ditch Road, to the west of the junction of the bridge over the A14 and High Ditch Road.

Land owners and occupiers

5.4.8 The vast majority of the site area is owned by either an individual or St John's College, Cambridge. Both owners let their land to local farming businesses. The acquisition of the land from either owner, together with the acquisition of any severed land, is unlikely to have a significant impact on those parties. It is also unlikely to have an impact on the businesses of the tenants farming the land. At the time of writing, the absence of emerging development proposals provides greater certainty in the estimation of land acquisition costs for the WWTP within site area 3. The nearest development promotion is on land between the A14 and High Ditch Road south of site area 3, which is being promoted for residential development.

5.5 Planning assessment

5.5.1 This site area lies within the Cambridge Green Belt in an area of flat open countryside. The site area comprises agricultural land and is classified as grade 2 best and most versatile agricultural land. The site area is quite isolated from other development with no other developments or land uses in close proximity.

5.5.2 The landscape character is assessed as being of medium sensitivity. This site area is in an exposed and prominent location in visual terms and is also located within the Wicken Fen vision area which is an ambition of the National Trust. Development of 'Marleigh', part of the Eastern Gateway urban expansion of Cambridge, is ongoing approximately 650m to the south west of the site area on the opposite side of the A14. Biggin Abbey, a grade II* listed building approximately 500m away from the site area to the west, is within the 'treated effluent tunnel/pipeline corridor' for Option 3A. Anglesey Abbey (grade I Abbey and Grade II* registered park and garden) is located approximately 2.5km to the east. The 'waste water transfer tunnel corridor' and 'treated effluent tunnel/pipeline corridor' runs directly under the Fen Ditton Conservation Area.

5.5.3 The site area and its immediate surroundings are not the subject of committed development proposals or any current planning applications. None of the sites promoted through the recent Greater Cambridge Local Plan Call for Sites directly affect the location of site area 3. However, on the south side of the A14 a large residential site has been promoted. There is also a submitted residential site west of Ditton Lane which may affect the wastewater transfer tunnel corridor.

5.5.4 The Green Belt Study (See Appendix J) considers the potential overall scale of impact from development of CWWTPR on this site area. The report assessed that the overall site performance of site area 3 against Green Belt purpose is Good:

> *"Development on site area 3, in a landscape of existing medium-high sensitivity, would introduce large-scale development into a rural area, contributing to the extension of sprawl of large built-up areas and a reduction in the openness of the Green Belt, due to the absence of existing built development nearby.*
>
> *Development on site area 3 would be clearly visible in the open landscape from the A14. The taller elements of the scheme would be apparent from Stow cum Quy, Lode, Horningsea and Fen Ditton, detracting from the rural setting of the villages. It would not detract from the setting of Cambridge."*

5.5.5 In planning policy terms, development of this site area for CWWTPR would represent *'inappropriate development'*[29] within the Green Belt. The exposed nature of the site area will result in development being highly visible in views from surrounding properties and viewpoints will require significant landscape mitigation. The relative isolation of the site area and absence of sensitive land uses in closer proximity is likely to limit amenity concerns and the potential for nuisance and blight. Traffic generated by the development would avoid the congested A10/A14 junction and potential disruption from network infrastructure projects but access to the site area would require more extensive works including to the existing local road network which may cause temporary disruption and amenity impacts.

[29] As defined in: Ministry of Housing, Communities & Local Government, Na ional Planning Policy Framework, 2019. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf and;

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

5.5.6 As the boundary of site area 3 is beyond 400m from the nearest part of the Marleigh development on the opposite side of the A14, it is considered unlikely that the CWWTPR development will give rise to greater than a negligible odour impact on sensitive receptors in the Marleigh development or give rise to particular amenity concerns to new residents. No part of site area 3 is the subject of any development promotion which could directly impact on the delivery and long term resilience of CWWTPR. Whilst at this time any such proposal has no planning weight, development of the land between the south side of the A14 and High Ditch Road as promoted in the recent call for sites to the emerging Greater Cambridge Local Plan process would result in encroachment within 400m of the boundary of site area 3. However, based on the site 3 indicative development area, the opportunity for micro-siting of particular infrastructure within this area and the inevitable need on the promoted development for some separation between any new housing and the A14 carriageway, it is considered reasonable to presume that development of CWWTPR at site 3 and housing on the promoted development land south of the A14 would not be mutually exclusive and should be able to avoid the encroachment/safeguarding area. This indicates greater potential long term resilience of CWWTPR on this site.

5.5.7 Site area 3 provides a good contribution to Green Belt purposes due to the openness of the area and lack of other development. The development of a new WWTP within site area 3 will impact on this contribution. It will need significant mitigation in terms of landscape, biodiversity and heritage. Development of CWWTPR on the site could compromise the achievement of the Wicken Fen vision. However, based on ongoing dialogue with the National Trust and other environmental bodies aimed at ensuring that development aligns with the aspirations for the wider area, the relatively unconstrained characteristics and position of site area 3 between the 'Eastern Gateway' urban expansion area of Cambridge and the Wicken Fen vision area present opportunities to deliver significant enhancements to the environment and to the connectivity of this area consistent with a number of the aspirations of the Wicken Fen vision, the Cambridgeshire Green Infrastructure Strategy 2011 and the adopted South Cambridgeshire Local Plan 2018.

5.5.8 As all pipeline/tunnel corridors would be underground it is considered unlikely that they will materially affect the setting of any heritage designation long-term, although a temporary adverse impact on heritage and archaeological remains may occur.

5.6 Operational assessment

Delivery of Anglian Water's strategic corporate commitments

5.6.1 Site area 3 provides the most significant potential for a project to contribute towards Anglian Water's corporate and environmental strategic ambitions of the three site areas. The site area provides an excellent opportunity to develop a modern carbon efficient plant with embedded renewable energy generation, contributing to climate change and sustainability commitments. Greater opportunities to provide environmental enhancements partly because of the size of the site area, its landscape structure and relationship to its surroundings.

5.6.2 Anglian Water has an industry-leading track record of successfully working with stakeholders to create high levels of environmental and amenity value around its major essential infrastructure assets (such as treatment plants and reservoirs). Site area 3 provides an opportunity to enhance recreational opportunities and biodiversity habitat through a landscape approach, aligned with local environmental ambitions. The development of the site area would deliver a net gain in biodiversity, providing a high level of habitat enhancement in place of arable farmland.

Odour (operational)

5.6.3 Preliminary odour modelling indicates that all receptors would experience negligible odour impact from a new WWTP at site area 3, mainly due to the limited receptors in proximity to the site area particularly in the prevailing wind direction. Therefore, additional odour mitigation would not be required for site area 2, which would provide significant health and safety and operational benefits.

Future urban growth

5.6.4 Site area 3 is considered unlikely to be central to plans for the future development of Greater Cambridge. It is not the subject of alternative development proposals and does not sit within a potentially strategic transport corridor. The presence of a well-delivered project, sensitively integrated into the landscape in proximity to the A14 could additionally act as a buffer against future development The relative isolation of the site area and absence of any committed or currently promoted development in close proximity suggest that the resilience of the site area is less likely to be compromised by surrounding development pressures in the future.

Future operational needs

5.6.5 While the development proposals are based on a robust assessment of future demand to 2050 it is considered desirable to consider the future potential for improvement or modifications of the plant in the very long term due to population or regulatory changes, particularly if it is remembered that the current site first started operating over a century ago. It would be prudent to assume a similar lifespan for activities at any new site. Site area 3 is not constrained by potential encroachment or other forms of development which would prevent it from being able to respond to changing regulatory requirements or compromise its operational resilience.

Access

5.6.6 The mitigated option for site area 3 provides routing for operational traffic from Junction 35 of the A14, the Quy Interchange, via High Ditch Road and Low Fen Drove Way. With the proposed highway improvement measures put in place it is considered that this access route would be capable of accommodating the predicted number of HGV movements.

5.7 Programme assessment

5.7.1 The main areas of programme risk associated with site area 3 options are as follows.

5.7.2 There is a significant risk of delay to the submission of the DCO application in relation to the potential need to develop additional enhancement and mitigation measures following subsequent consultation on the proposals. This is due to residual risks associated with the contribution of this area to Green Belt purposes, landscape and visual impacts, the setting of heritage assets and potential conflicts with alternative environmental visions for the area. The need for greater enhancement and mitigation measures could also pose a risk of delay to the start of construction.

5.7.3 If any of the sites promoted through the call for sites are allocated in the emerging local plan then this may result in the need for CWWTPR to adapt its construction programme to address potential cumulative effects including construction traffic.

5.7.4 Due to the hydrological connection between site area 3 and part of Stow Cum Quy Fen SSSI, it is possible that extensive and long term monitoring will be required to further investigate the hydrological regime and demonstrate the SSSI would not be affected by the new WWTP; this could potentially delay commencement of construction on the site.

5.7.5 The risks of archaeological finds across the scheme area present a moderate risk of delay to the start of construction. Archaeological investigation may allow for micro-siting infrastructure to reduce impact on buried archaeology. However, there remains a risk of unexpected finds during construction, which would potentially have a significant impact on the construction programme. There is also a specific concern around the location of Fleam Dyke in relation to potential highways improvements required on High Ditch Road and the need to incorporate appropriate mitigation in relation to archaeological remains.

5.7.6 The need for different access routes for construction and operation and the extensive highways improvements required for the operational access routes present a moderate risk of delay to the start of construction and extension of the construction programme.

5.7.7 The short length of the waste water transfer tunnel allows some flexibility in construction programme in case of other delays.

5.7.8 Therefore, the combination of risks results in a high risk of impact on the overall programme.

5.8 Phase one non-statutory consultation feedback

Public consultation

5.8.1 The majority of feedback received during phase one consultation was provided through the digital engagement platform and hard copy feedback form. Respondents using these channels were asked to identify which site area they thought was most suitable for the relocation project.

5.8.2 Feedback on site area 3 revealed significant concern regarding potential impacts to ecology and biodiversity. Responses referenced a variety of wildlife present on the site. There is concern that a relocation of the plant to site area 3 would impact these habitats and therefore significantly impact the ecological value of the area.

5.8.3 Related to this, feedback also demonstrated concern for wider ecology and biodiversity impacts in that a relocation to site area 3 could compromise the Wicken Fen vision and the quality of important local areas such as Quy Fen SSSI and the ‘Green Corridor’ flanking the River Cam. These impacts are perceived to be caused through construction, air quality, noise and visual impacts.

5.8.4 When commenting on the Green Belt designation of all three site area options, feedback received generally considered this to be most significant for site area 3. Concerns in this regards cited the character of the area and surrounding land usage as providing a valuable open and green space to local communities.

5.8.5 Feedback also revealed concern regarding a perceived risk of groundwater contamination at site area 3, primarily via the Chalk aquifer, with reference made to DEFRA’s MAGIC map presenting a high risk for groundwater vulnerability for the site. It was commented that contaminated groundwater would impact the protected rights of local well users, other parts of the surface drainage network, and Stow cum Quy Fen SSSI and wetland ecosystem.

5.8.6 Further concern was raised regarding impacts to local conservation areas (Horningsea and Fen Ditton), nearby archeological sites and historic areas (e.g. Fleam Dyke and Roman Villa) and that potential future finds would be compromised.

5.8.7 Comments on traffic and access revealed concern regarding the suitability and safety of local roads for construction and site traffic, in particular High Ditch Road.

5.8.8 However, those in favour of site area 3 cited access provided by the A14 as being preferable to other site area options using the A10.

5.8.9 Other comments in favour of site area 3 noted the increased distance to residential communities in comparison to site areas 1 and 2, with a view that impacts would therefore be lower.

5.8.10 It was also commented that tunnel and pipeline corridors for site area 3 could be less impactful, with proximity to the River Cam allowing for a more efficient discharge of treated effluent.

Technical stakeholders

5.8.11 The following are the combined comments from technical stakeholders where they are made in specific reference to site 3.

Environmental

5.8.12 The Environment Agency (EA) has no preference for any of the sites and the proposed discharge point for site 3 is accepted in principle. The EA expects to see further flood risk assessment and referencing to consideration of the waste hierarchy within the site selection process. They indicated that "*It is very likely that any de-watering water would need to be returned to the aquifer*". They have suggested that a detailed Hydrogeological Risk Assessment (HIA) should support the final site selection.

5.8.13 The EA expects to see Biodiversity Net Gain options if site 3 is progressed.

5.8.14 Cambridgeshire County Council (CCC) raised the following comments:

- A detailed hydrological assessment of the river Cam should be undertaken in relation to the discharge pipeline and outfall.
- CCC welcomed the inclusion of Nature Conservation and Biodiversity Appraisal as part of stage 3 fine screening and noted the high archaeological potential for site area 3 and the corridor that passes to the south of Biggin Abbey. Site area 3 is rural and open in aspect requiring landscaping mitigation and careful consideration of the impact on the Wicken Fen vision.
- The site could adversely impact SSSI Stow Cum Quy Fen, River Cam County Wildlife Site, Low Fen Drove Way, Grasslands County Wildlife Site and Hedges and Milton Road Hedge City Wildlife Site and protected/notable species. Site area 3 should only be taken forward if it can be designed to avoid all impacts to statutory and non statutory designated sites based on detailed ecological survey work.

5.8.15 The National Trust commented that site area 3 and the associated infrastructure could compromise the achievement of the Wicken Fen Vision and the environmental and social benefits it seeks to provide to existing and future communities in Cambridge and the surrounding Districts.

5.8.16 The development of site area 3 is contrary to the objectives of recently adopted Local Plan Policy and Cambridgeshire Green Infrastructure Strategy 2012. The National Trust also considered there would be adverse impacts to County Wildlife sites where the construction of the Waterbeach pipeline goes beneath the River Cam and the final effluent pipe through Baits Bite Lock conservation area.

5.8.17 Natural England suggested there is a potential pathway for impact on Stow Cum Quy Fen SSSI with site area 3 due to possible hydrological connectivity. Evidence is needed to identify if there is a pathway for impact. Natural England wished to be included in permit standards discussions with the EA. They also expect to see delivery of significant biodiversity net gain.

5.8.18 Historic England requested further assessment of the impact on designated and undesignated heritage assets and to comment on impact and setting. Historic England's primary area of concern is land east of B1047 Horningsea Road.

5.8.19 The Wildlife Trust identified that site area 3 is within the Wicken Fen Vision area which is a priority for green infrastructure and habitat creation.

5.8.20 Cambridge Past Present and Future invited Anglian Water to consider a "state of the art" facility that is sustainability and environmentally friendly. They suggested that there is a risk that site area 3 could compromise the Green Belt and impact on the development of the Wicken Fen Vision and the Nature Network. They identified that site area 3 has the least expected risk of odour impact.

5.8.21 The Quy Fen Trustees commented that they are against site area 3. They have concerns about the underlying chalk aquifer and groundwater contamination and endangering a SSSI. The development of site area 3 is in their view an inappropriate use of the Green Belt and detrimental to the green lung of Cambridge and to nature reserves.

Transport and access

5.8.22 Highways England acknowledged that the focus on transport criteria has been to minimise the impact on the local road network.

5.8.23 However, Highways England noted that if the access to site area 3 is from Junction 34 of the A14 then the lack of an east facing slip road would cause westbound traffic to the site to use the Milton Junction 33 in order to return to Junction 33 and access site area 3. Hence, this would increase traffic on Junction 33.

5.8.24 The Ministry of Defence (MOD) identified that site area 3 falls within the statutory safeguarding Aerodrome Height (15.2 m) and bird strike zone surrounding Cambridge Airport. The MOD would require precise details of design, elevations and landscaping proposals to carry out an assessment of impact.

Police Station

5.8.25 The Police and Crime Commissioner Cambridgeshire and Peterborough confirm that there is a preference for site area 3 to avoid any impact on the new police station development.

Urban and Civic (U&C)

5.8.26 U&C has an interest in the CWWTPR proposals as it is promoting the development of Waterbeach New Town.

5.8.27 U&C confirmed that site area 3 does not conflict with its existing or planned future infrastructure for the Waterbeach New Town development. There is also less impact from associated infrastructure such as tunnelling.

Utilities

5.8.28 Comments from Cadent and UK Power Networks identified where connection points to the gas and power networks would be possible.

Land stakeholders

5.8.29 The land owner of the majority of site area 3 has made representations against site area 3 being selected as the preferred site. The owner, a private individual, made the representation jointly

with the owner of the land to the south of the section of the A14 which is immediately to the south of site area 3. The key comments were as follows:

- The land owner considers the early stage screening process has been inconsistent and therefore the site selection process resulting in the three proposed site options is not supported. They suggest that better sites may be available outside of the Cambridge Green Belt.
- In terms of identifying a preferred site for CWWTPR this should be conducted under the statutory Minerals and Waste Local Plan.
- There is a concern that development of site area 3 will sterilise other potential developments. Of the three sites subject to consultation, the land owner considered that site area 3 is the least preferable given the impact on local ecology and biodiversity, local landscape and local heritage assets, the lack of suitable access and the potential risk to aviation.

5.9 Summary of results

5.9.1 Table 5.3 presents a summary of the assessment results for site area 3.

Table 5.3: Summary of results for site area 3

Criteria	Assessment results
Environmental	• Site area 3 has relatively low ecological potential, although there is some potential for protected species. Site area is in proximity to two SSSIs (Quy Fen and Wilbraham Fen) although risks of adverse impacts are considered to be low, potential for direct impact on a County Wildlife Site within the site area and potential conflict with Wicken Fen vision area, although biodiversity net gain and other opportunities for enhancement in relation to integration with vision • Significant change to landscape character (higher sensitivity than site areas 1 or 2), visual impacts on residents in Horningsea and Fen Ditton • Impact on setting of Biggin Abbey (Grade II* listed building), potential impact on Fleam Dyke (highways improvements) • High archaeological potential across area • Site area 3 is located on an area of outcrop of the Grey Chalk, which is designated as a principal aquifer. However, it is considered that construction of the WWTP and associated infrastructure presents a low risk of impact on the principal aquifer, seepages to overlying superficial deposits or any groundwater abstractions • Lowest whole life carbon emissions of all site areas. • Noise and vibration from construction works for site area 3 and the associated infrastructure would not exceed significant adverse effect level thresholds for extended periods at receptor locations • Mitigation is anticipated to reduce the likely air quality impacts to negligible. • New WWTP at site area 3 would result in negligible odour impact for all receptors. Therefore, no additional mitigation would be required for odour control
Community	• Potential partial impact on viability of farming business, not expected to result in the inability to operate any of the businesses • Amenity impacts on users of Low Fen Drove Way byway during construction and operation • Impact of operational traffic on users of Low Fen Drove Way byway during construction and operation
Operational	• Best performing for future operational needs and for odour, no additional mitigation required, prevailing wind direction and distance to highest sensitivity receptors • Significant potential to contribute to strategic ambitions in relation to climate change, biodiversity and sustainability commitments. Better than sites 1 and 2 for carbon commitments. Opportunity for high level of habitat enhancement and links with wider initiatives • With the proposed highway improvement measures put in place it is considered that access from Junction 35 of the A14, the Quy Interchange, via High Ditch Road and Low Fen Drove Way would be capable of accommodating the predicted number of HGV movements
Phase one non-statutory consultation feedback	• Main concerns relate to potential impacts to ecology and biodiversity, Green Belt, Wicken Fen vision, conservation areas, traffic and access. • National Trust and Cambridge Past, Present and Future (CPPF) concerns over conflict with Wicken Fen vision • Highway England has concerns in relation to site access via A14 junction 34 (Horningsea) • CPRE the countryside charity and Local Access forums concerned about protection of Low Fen Drove Way pedestrian access

Criteria	Assessment results
Planning	• Site area 3 provides a good contribution to Green Belt purposes due to the openness of the area and lack of other development. The development of a new WWTP within site area 3 will impact on this contribution • No conflicts with promoted development and therefore greater potential long term resilience of the new WWTP • The relatively unconstrained characteristics and position of site area 3 between the 'Eastern Gateway' urban expansion area of Cambridge and the Wicken Fen vision area present opportunities to deliver significant enhancements to the environment and to the connectivity of this area consistent with a number of the aspirations
Programme	• Development and delivery of enhancement vision (potential additional consultation and need to deliver enhancement prior to starting on site) could also pose a risk of delay to the start of construction • High archaeological potential and investigation required to determine archaeological risks in relation to highways improvements and potential risk of delays due to presence of Fleam Dyke • It is possible that extensive and long term monitoring will be required to further investigate the hydrological regime and demonstrate Stow Cum Quy Fen SSSI will not be affected by the new WWTP; this could potentially delay commencement of construction on the site • Need for different access routes for construction and operation and significant highways improvements for operational access present a moderate risk of delay to the start of construction and extension of the construction programme • Short length of waste water transfer tunnel allows flexibility in construction programme
Economic	• Lowest CAPEX and WLC • Lowest land acquisition and compensation costs

6 Comparison of Results

6.1 Graphical representation of Stage 4 assessment

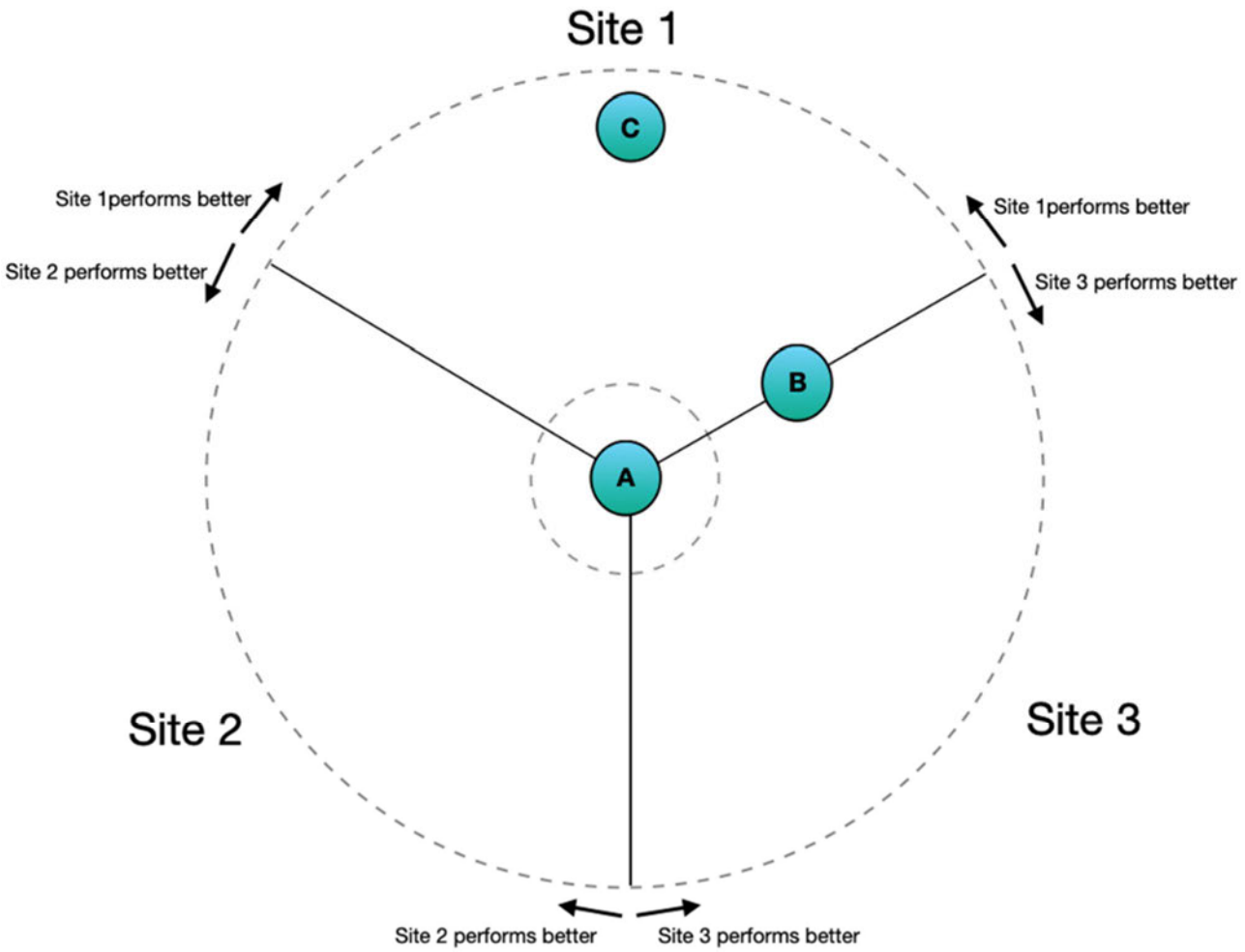
6.1.1 Due to the complexity of the Stage 4 final selection assessment and the considerable volume of information for the various criteria a graphical representation of the results was developed in order to facilitate the comparison of the three site area options. This method is used to illustrate the performance of each site area option against others and collectively against all the assessment criteria. This enables a holistic view of the Stage 4 final site selection assessment in order to aid the selection of the best performing site area to take forward.

6.1.2 Figure 6.1 illustrates the method of comparison applied to the criteria and the site areas. Each criterion is represented by a separate circular icon, with the position of the icon denoting the comparative performance of the criterion across the site areas. The size of the icon represents the importance of the criterion to the Anglian Water development team (drawing on their professional judgment), the prominence of the criterion in consultation feedback and guidance in planning policy, i.e. the larger the icon the more important the criterion is perceived to be. All of the criteria discussed are considered to be of importance, however, some are more important than others which is explained in the following sections.

6.1.3 The examples shown in Figure 6.1 are described below:

A. This criterion is not a distinguishing factor between any site i.e. all site areas perform equally.
B. This criterion is a moderately distinguishing factor (radial location is halfway between centre and edge of circle), with performance favouring site areas 1 and 3, i.e. site areas 1 and 3 perform equally but better than site area 2.
C. This criterion is a strongly distinguishing factor (radial location is close to edge of circle), with performance favouring Site 1, i.e. site area 1 performs better than both site areas 2 and 3, which perform equally to one another.

Figure 6.1: Graphical comparison method



6.1.4 The following sections present the comparative assessment of the site areas for each assessment criterion in turn, some of which have been grouped due to their relatively similarities or separated out due to distinct differences, as described in the bullet points below. The individual comparisons gradually build the holistic comparison and the assessment culminates in an overall comparison of the sites in order to select the best performing site area option.

- Because the original “amenity” criterion was based on considerations of the cumulative effect of other factors it did not need to be carried into the multi-factor analysis, which automatically assessed cumulative issues.
- The traffic and access criteria have been combined to reflect the potential impacts of mitigated operational access to the site areas by heavy goods vehicles and the mitigation measures required to address traffic and access issues has been separated into it’s own circular icon “Highways upgrades” to reflect the significant differences in the proposed highway upgrades required for each site area.
- The “historic environment” criterion was split in to two criteria to reflect the different considerations and risk profiles relating to the potential for future archaeological finds

("Archaeology") and the legal protections afforded to designated heritage assets ("Heritage Assets").

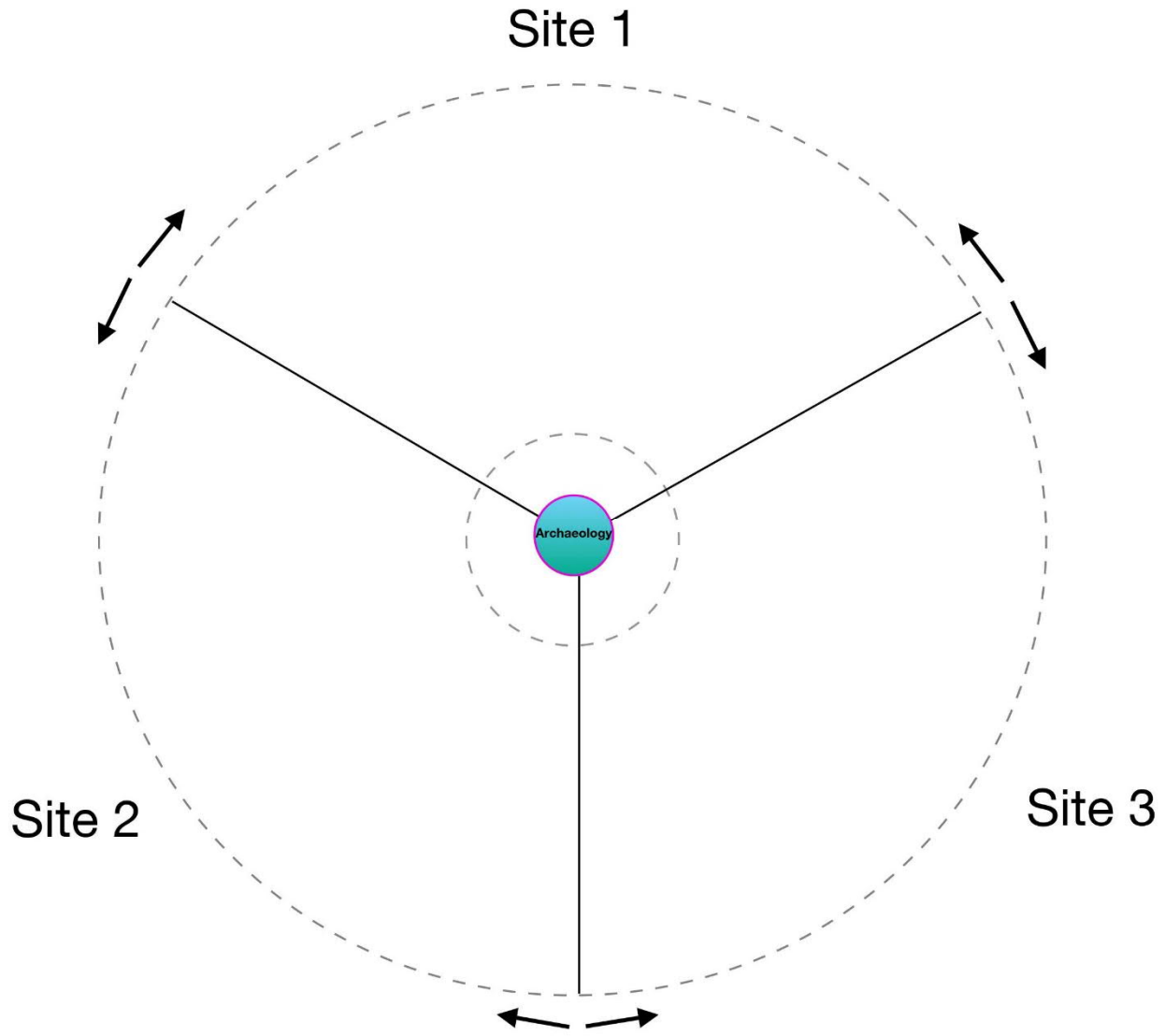
- The "Land and water quality" criterion was split to reflect the differing issues of land contamination and groundwater impacts highlighted by the environmental assessments.
- The criterion "Anglian Water's Strategic Commitments" was considered as part of the assessments around carbon and biodiversity and therefore, to avoid double counting, was not taken through to the multi-factor analysis.
- The assessment of the "planning" criterion largely reflected the findings of the environmental assessment and therefore to avoid double counting it was not taken through to the multi-factor analysis. However, one issue, Green Belt, was considered to represent a particularly important aspect of the planning assessment and, because it is a policy rather than an environmental designation, was not fully reflected in the environmental criteria. Therefore, "Green Belt" was taken forward as an additional criterion into the multi-factor analysis. The "Competing land use" criteria incorporates the remaining significant elements of the planning assessment.

6.1.5 In undertaking this comparison exercise Anglian Water has had regard to the factors raised in, and the substance of, the responses during the phase one non-statutory consultation. In particular, Anglian Water has used the consultation feedback to check the information included in the assessment of each criteria is accurate and complete. For example:

- The Environment Agency raised a number of concerns about potential impacts on groundwater and the groundwater-dependent environment and suggested that a detailed Hydrogeological Impact Assessment (HIA) should support the final site selection (See Sections 3.8, 4.8 and 5.8). Therefore, a preliminary HIA has been produced and the results incorporated into the Stage 4 – Final Site Selection assessment. The HIA will be made available following review by the Environment Agency.
- Natural England raised potential hydrological connectivity with Quy Fen SSSI (see Section 5.8), the potential impacts on the SSSI has been investigated in the preliminary HIA described above.
- The public response to consultation indicated that recreational amenity was of particular importance i.e. access to PROWs. Therefore, this aspect of the community assessment has been discussed separately in this comparison section (See Section 6.10).

6.2 Archaeology

Figure 6.2: Archaeology comparison



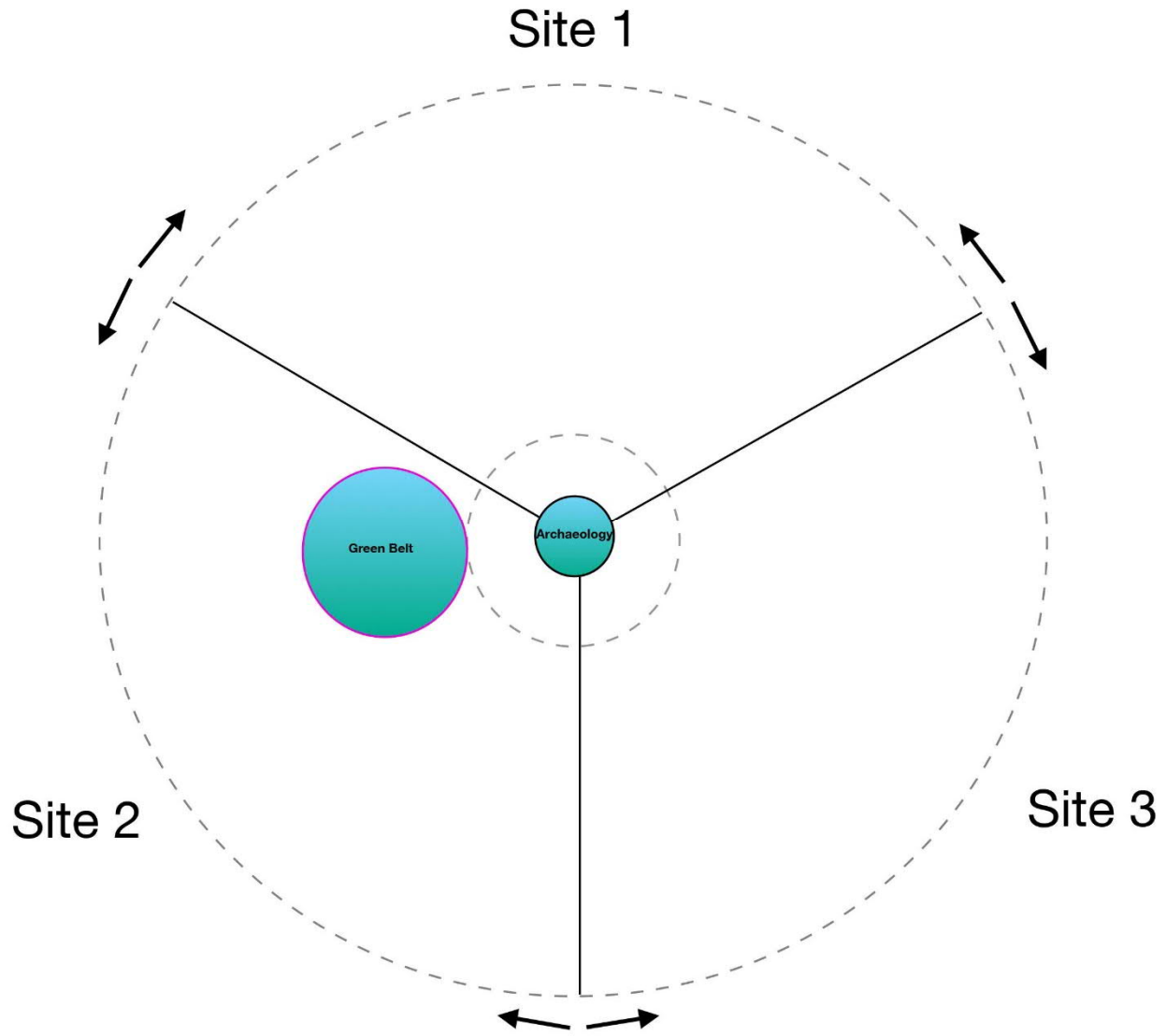
6.2.1 In this comparison the historic environment assessment has been divided into two parts, impact on buried archaeology and impact on heritage assets as the assessment of these elements are distinctly different from one another. The comparison of the impact on heritage assets is discussed in Section 6.6.

6.2.2 Buried archaeology is important as there is a high potential for undiscovered archaeological remains across the study area. However, this results in the potential impact on archaeology being relatively equal across all of the three of the site area options and therefore, this does not represent a differentiating factor in the selection of a final site, as illustrated in the position of the icon in Figure 6.2.

6.3 Planning

Green Belt

Figure 6.3: Green Belt comparison



6.3.1 Although Green Belt is not a discrete assessment criterion it is considered to represent one of the most important aspects of the planning assessment as it has a very strong policy protection and development of a new WWTP anywhere within the Green Belt would require very special circumstances to be met. Therefore, it is considered separately in this comparison and has a high importance as denoted by the size of the highlighted icon in Figure 6.3.

6.3.2 Although all three site areas are within Green Belt there is differentiation in the contribution to the local and national purposes of Green Belt that each site area currently presents as illustrated by the position of the icon in Figure 6.3.

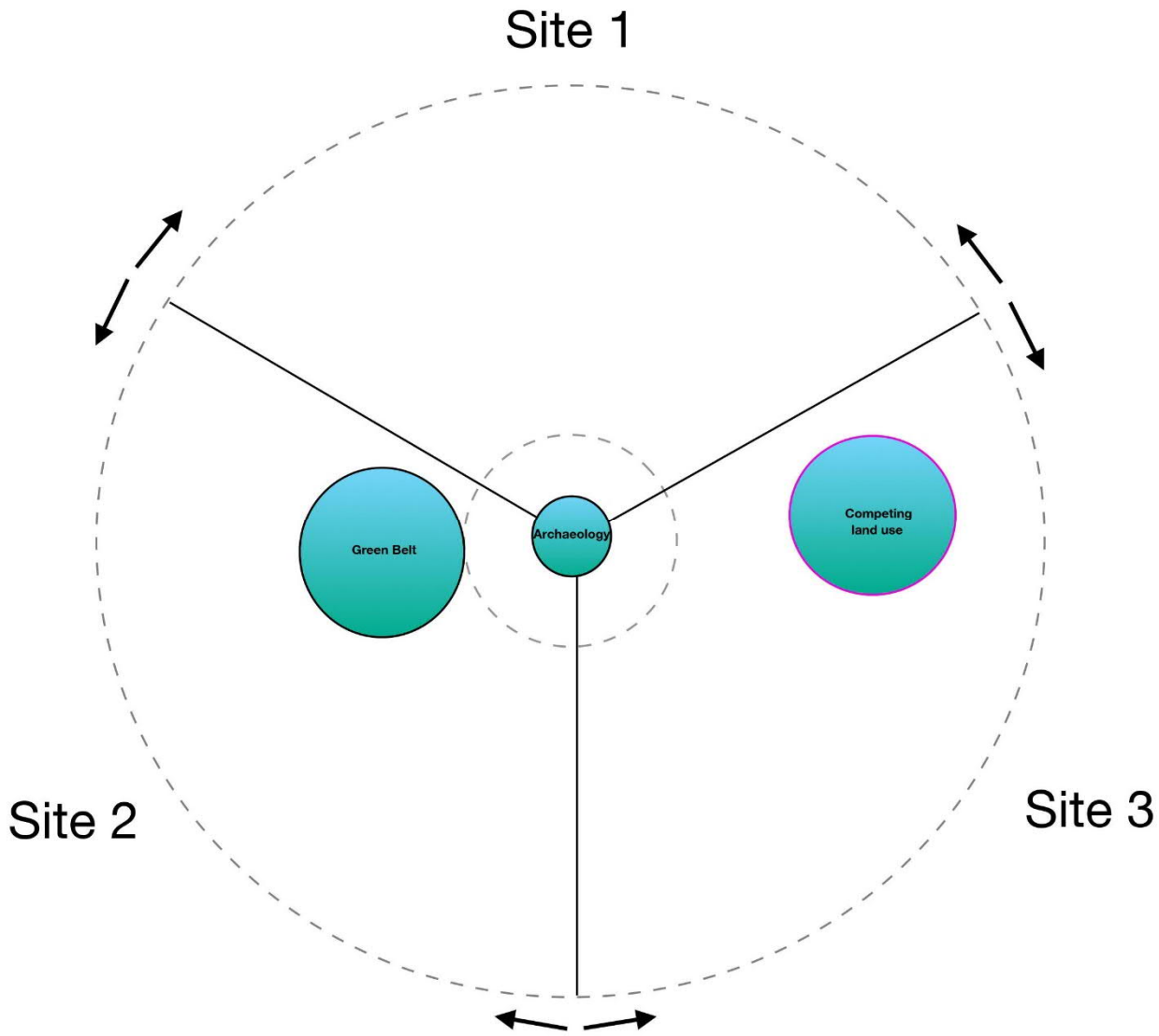
6.3.3 Site area 1, is considered to provide a lower contribution to Green Belt than site area 3 but does present issues in relation to the openness of the area and therefore performs worse than site area 2.

6.3.4 Site area 2 is considered to provide the lowest contribution to Green Belt purposes due to the current compromised performance of this area, as described in the Green Belt Study (see Appendix J). Therefore, a new WWTP on this site area presents the lowest potential harm to the Green Belt.

6.3.5 Site area 3 is considered to provide the highest contribution to Green Belt purposes of the three site areas due to the openness of the area and lack of other development and therefore presents the greatest potential harm to the Green Belt.

Competing land use

Figure 6.4: Competing land use comparison



6.3.6 Competing land use is another highly important consideration, which incorporates competing plans for the site areas from the planning assessment as well as the land take, property and business viability aspects of the community assessment. These aspects represent programme and other risks, which could result in significant delays to the project. In addition, there are potential socioeconomic impacts in relation to the land take for the scheme. This importance is

illustrated by the size of the highlighted icon in Figure 6.4. The differentiation between the site area is discussed below.

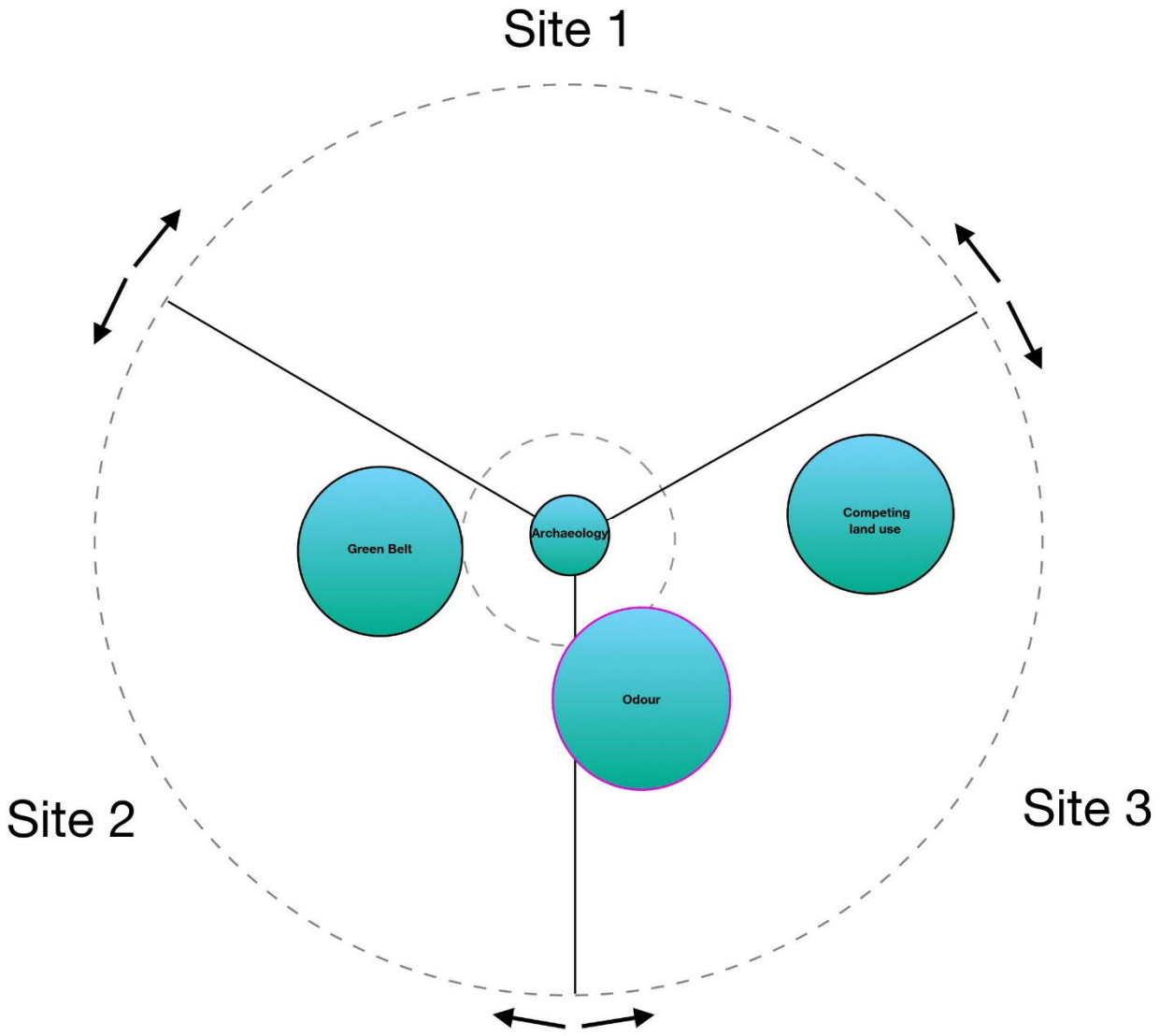
6.3.7 Site area 1 performs better than site area 2 as there are no large scale developments competing for the site. However, it performs worse than site area 3 due to the potential impact on a fruit farm, which is partially located within the site area, and the likelihood that the business would not be able to operate if a new WWTP was located at site area 1. This is likely to result in a loss of employment affecting a substantial proportion of existing employees. There is also potential for impact on the business operations of Milton Maize Maze (Rectory Farm) due to a reduction in amenity at this site which may impact on people's use and enjoyment of the activities which the business provides. In addition, site area 1 is located in a potential transport corridor including several schemes that potentially overlap with the site area, which could result in competition for the land.

6.3.8 Site area 2 performs the worst for this criterion primarily due to the competing plans for the entire site area (Science Park extension promotion). In addition, development at site area 2 would have a partial impact on the viability of the businesses that currently farm the land.

6.3.9 Site area 3 performs the best as there are no competing plans for development of the site area, although, similar to site area 2, there is the potential for a partial impact on the viability of the businesses that currently farm the land.

6.4 Odour

Figure 6.5: Odour comparison



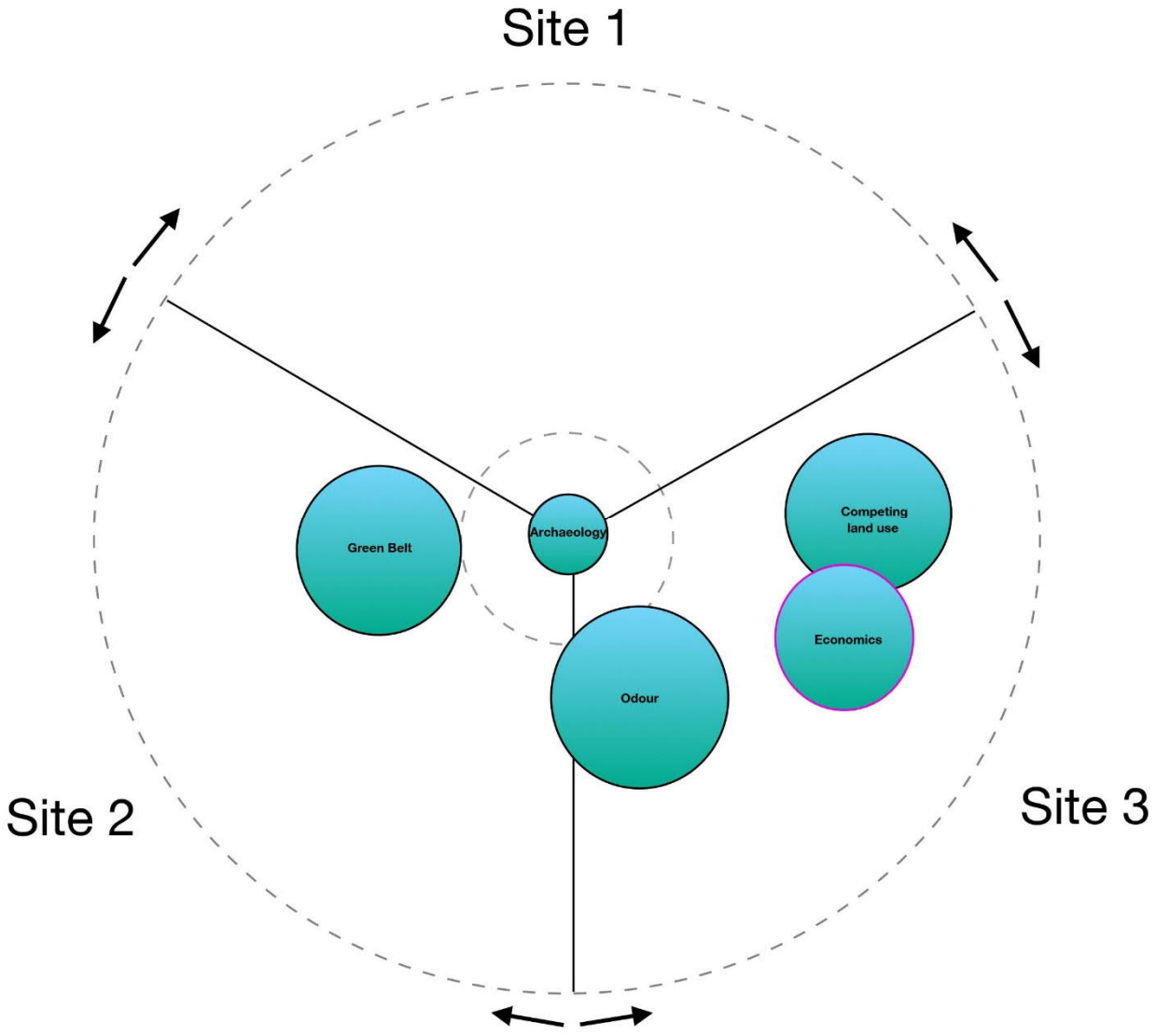
6.4.1 This section combines both the environmental and operational assessments of odour. The risk of odour impacts is highly important due to the potential impact odour has on the local community but also the potential increase in operational and health and safety challenges, which additional mitigation might present. The importance of this criterion is illustrated by the size of the highlighted icon in Figure 6.5.

6.4.2 There is differentiation in the performance of the site areas in terms of potential odour impacts. Site area 1 performs the worst as it presents the greatest potential for odour impacts on high sensitivity receptors. Additional odour control measures could be required to mitigate the risk of odour impact at the nearest high sensitivity receptors, which would likely include installing covers on additional process units. In Anglian Water's experience this has been operationally challenging due to health and safety concerns (working in confined spaces) and because corrosive atmospheres within those spaces can give rise to equipment or structural failures.

6.4.3 Site areas 2 and 3 perform similar as no high sensitivity receptors are at risk of odour impact and therefore no additional odour mitigation would be required. However, site area 2 presents a potential risk to more lower sensitivity receptors than site area 3. Therefore, site area 3 performs best overall in relation to potential odour impacts as shown by the location of the icon in Figure 6.5.

6.5 Economics

Figure 6.6: Economics comparison



6.5.1 Economics are of high importance as CWWTPR is a publicly funded project with a fixed grant and savings must be made where possible. This importance is illustrated by the size of the highlighted icon in Figure 6.6. There is definite differentiation between the economics of delivery for each of the site areas.

6.5.2 Site area 2 presents the highest delivery cost, which includes land acquisition costs based on the current estimate of land value. There is some uncertainty in the future land acquisition costs due to the promotion of the area for development. The likely increase in land value would represent a significant increase in the cost of delivery, which could undermine the viability of the

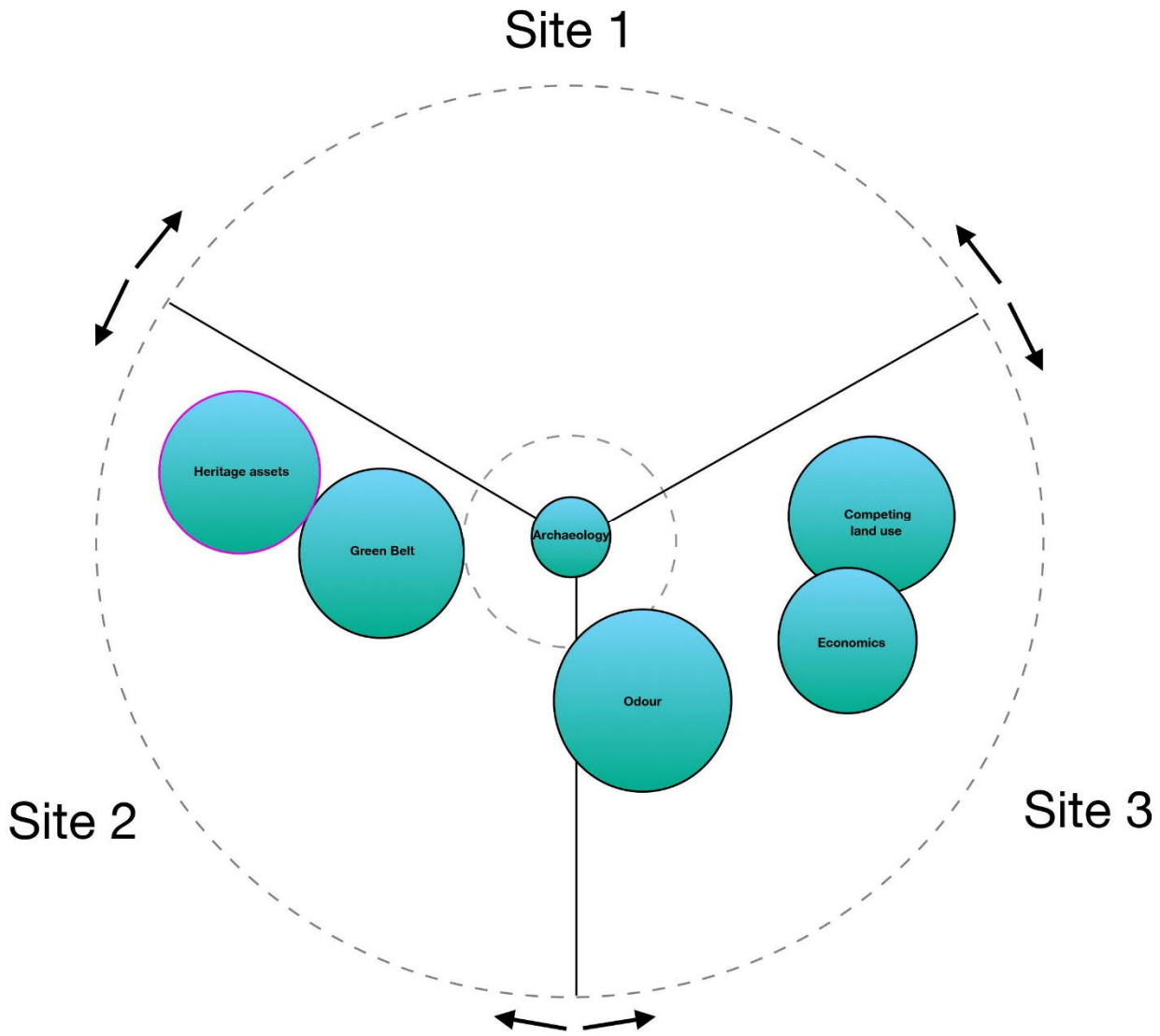
CWWTPR project. However, this site area does have the potential advantage of a more conventional plan for landscape mitigation.

6.5.3 Site area 3, presents the lowest delivery costs and low land acquisition cost. However, there is some uncertainty around the cost of appropriate mitigation measures for a scheme at site area 3.

6.5.4 Site area 1, presents a higher delivery and land acquisition cost than site area 3 but lower than site area 2. There is some uncertainty in the land acquisition costs due to the potential need to relocate, or compensate for the total extinguishment of, the fruit farm located at the site area. There is also uncertainty around the cost of appropriate mitigation measures for a scheme at this site area. Overall the expected variation in these mitigation measures is unlikely to have a material impact on the total cost differential between the site area options.

6.6 Heritage assets

Figure 6.7: Heritage assets comparison

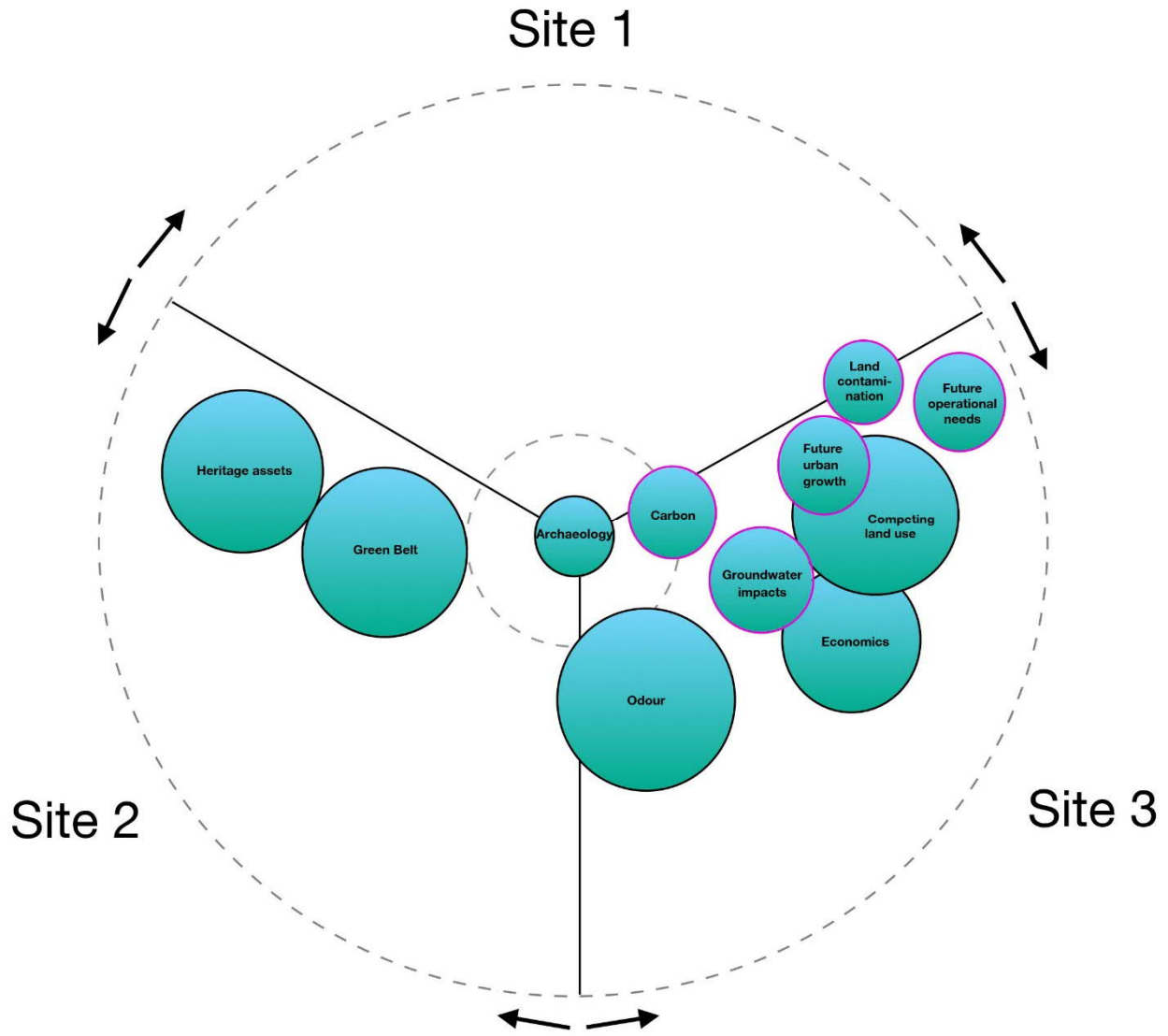


6.6.1 The potential impact on designated heritage assets is important as they have strong policy and legal protection and this presents potential consenting risk to the project, which is illustrated by the size of the highlighted icon in Figure 6.7.

6.6.2 Site area 3 presents the greatest risk of impact on designated heritage assets due to the potential impact on the setting of Biggin Abbey and to a lesser degree of Anglesey Abbey. There is also a potential for impact on Fleam Dyke, which is a non-designated asset of moderate importance, in relation to the highways improvement required for the operational access to the new WWTP. In contrast, no impacts on heritage assets are considered likely for a scheme at site area 2. For a scheme at site area 1 there is potential for limited impacts on the setting of two churches in Landbeach. This differentiation is illustrated on Figure 6.7.

6.7 Construction and operational considerations

Figure 6.8: Operational comparison



6.7.1 This section combines all of the construction and operational aspects which are considered to be of similar importance to the project, these are carbon emissions, groundwater impacts, future

urban growth, land contamination and future works expansion potential, as shown on Figure 6.8.

6.7.2 All of these aspects are important to the Anglian Water development team but to a lesser degree compared to the aspects discussed previously, the reasons for this and the differentiation between the sites for each criterion are described below.

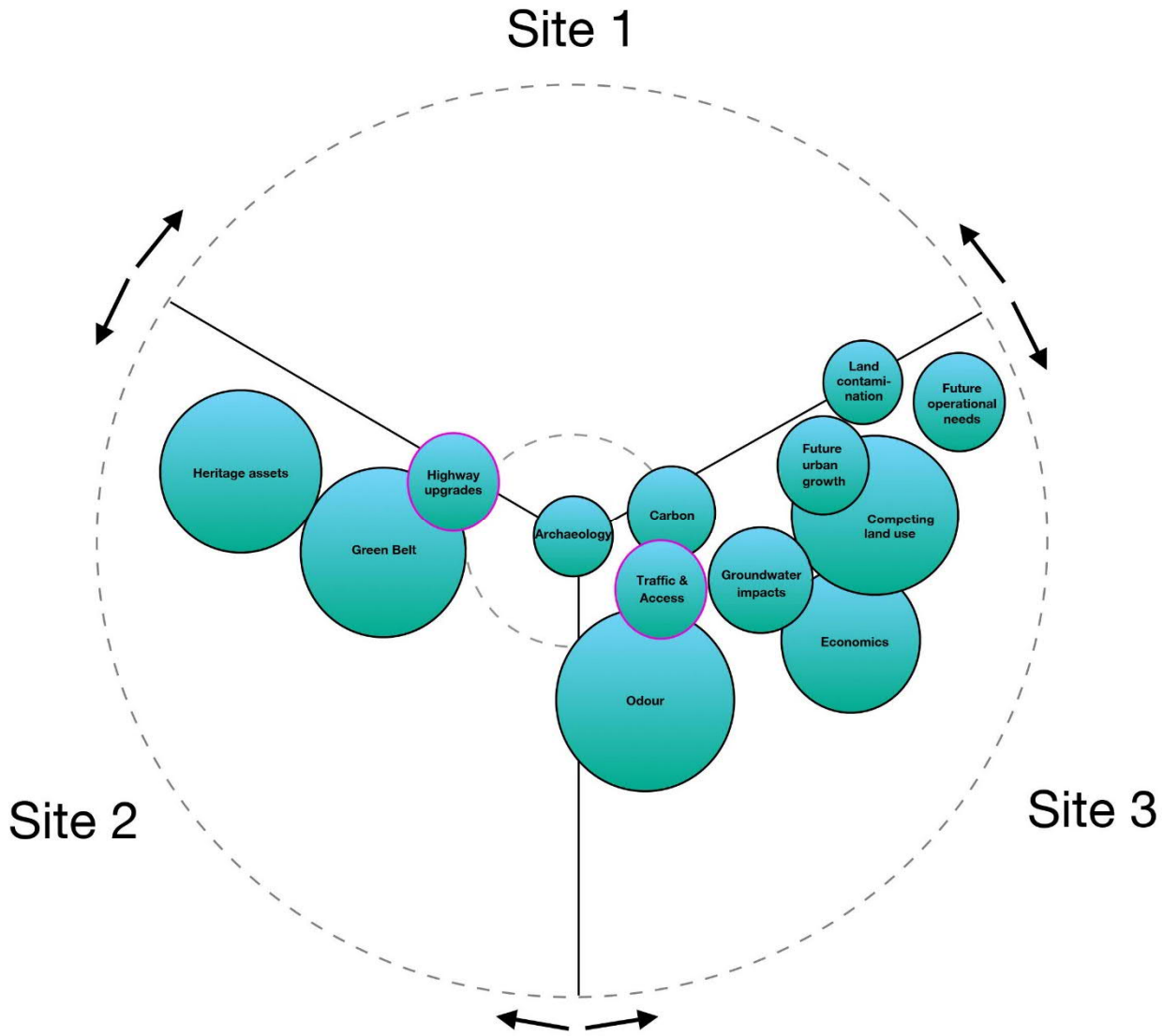
- Carbon
  - This is of lower importance as previous stages of site selection have removed all but the lowest carbon emissions options.
  - There is relatively little differentiation in the carbon emissions for the site areas. However, site area 2 has the highest and site area 3 the lowest carbon emissions.
- Future urban growth
  - This is of lower importance as the area surrounding the new WWTP would be safeguarded by planning policy supported by Anglian Water's asset encroachment policy, the location and scale of urban growth is uncertain and all sites are afforded protection due to their location within Green Belt.
  - However, it is considered that site area 2 is at the greatest risk of encroachment in the future due to it being closest to the urban fringe of Cambridge, the existing development and infrastructure in the surrounding area and recent promotions for development in the area.
  - Site area 3 presents the lowest risk of encroachment in the future due to distance from the Cambridge urban fringe.
  - Site area 1 presents less risk of encroachment than site area 2 but is within an area associated with several transport infrastructure proposals, which could encroach on the site in the future.
- Future works expansion
  - This is of lower importance as the specification for the capacity of the new WWTP includes robustly modelled growth up to 2050. However, given the existing plant has been in place for more than 100 years there is a need to consider potential regulatory changes and population growth beyond 2050 that could result in the need to expand the site in the future in order to avoid the need to relocate again.
  - Site area 2 presents the lowest opportunity for expansion restricted by the size of the site area and the location of surrounding receptors, which could restrict the land available for expansion of the WWTP and the enhancements/mitigation required.
  - Site area 1 has adequate potential for expansion in the future as the site area is larger than site area 2 and the land surrounding the site area is less constrained.
  - Site area 3 presents the greatest opportunity for future expansion due to the larger size of the site area and the limited existing development surrounding the site area.
- Groundwater impacts and land contamination
  - The lower importance of these criteria relates to the consideration that the potential impacts on the groundwater environment and the risk of land contamination can be adequately mitigated for all site areas. However, there are some differences in the potential risks.
  - Site area 2 presents the highest risk of encountering contamination and impact on the Lower Greensand aquifer below the site. This is due to the proximity to Milton Landfill and the interaction of the waste water transfer tunnel and shaft with the aquifer. The Environment Agency has indicated it has significant reservations in relation to the tunnels

and shafts penetrating the Lower Greensand aquifer below site area 2. In addition, the Environment Agency has indicated that any de-watering water would need to be returned to the aquifer, which is likely to result in the need for complicated engineering procedures during construction.

- Site area 1 presents similar risk to site area 2 although to a lesser degree as the site area is further from the landfill and the shorter length and depth of the waste water transfer tunnel presents less likelihood of interaction with the Lower Greensand aquifer. The Environment Agency has the same concerns for site area 1 as for site area 2 and returning de-watering to the aquifer would be likely to result in the need for complicated engineering procedures during construction at site area 1.
- Site area 3 is considered to pose the lowest risk of encountering contamination and the risk of potential impacts on the Grey Chalk principal aquifer below the site area is considered to be low. This is due to the lack of potential contamination sources in proximity to the site area and along the tunnel corridors and the hydrogeological properties of the Chalk in this area (low permeability with no significant aquifer horizons likely to be present). The Environment Agency has stated it would normally require that any de-watering water be returned to an aquifer, however due to the hydrogeology of the Chalk below site area 3 this is unlikely to be necessary in this case.

6.8 Operational access

Figure 6.9: Operational access comparison



6.8.1 The operational access has been split into two elements for comparison ('traffic and access' - the potential traffic impacts of operational access to the site, and the 'highway upgrades' required to enable this access) as there are distinct differences for the sites for these two elements, as shown on Figure 6.9. These elements are important to the project as the highways improvements represent potential risks to programme and cost and the traffic impacts present potential risks to both the local community and operation of the site.

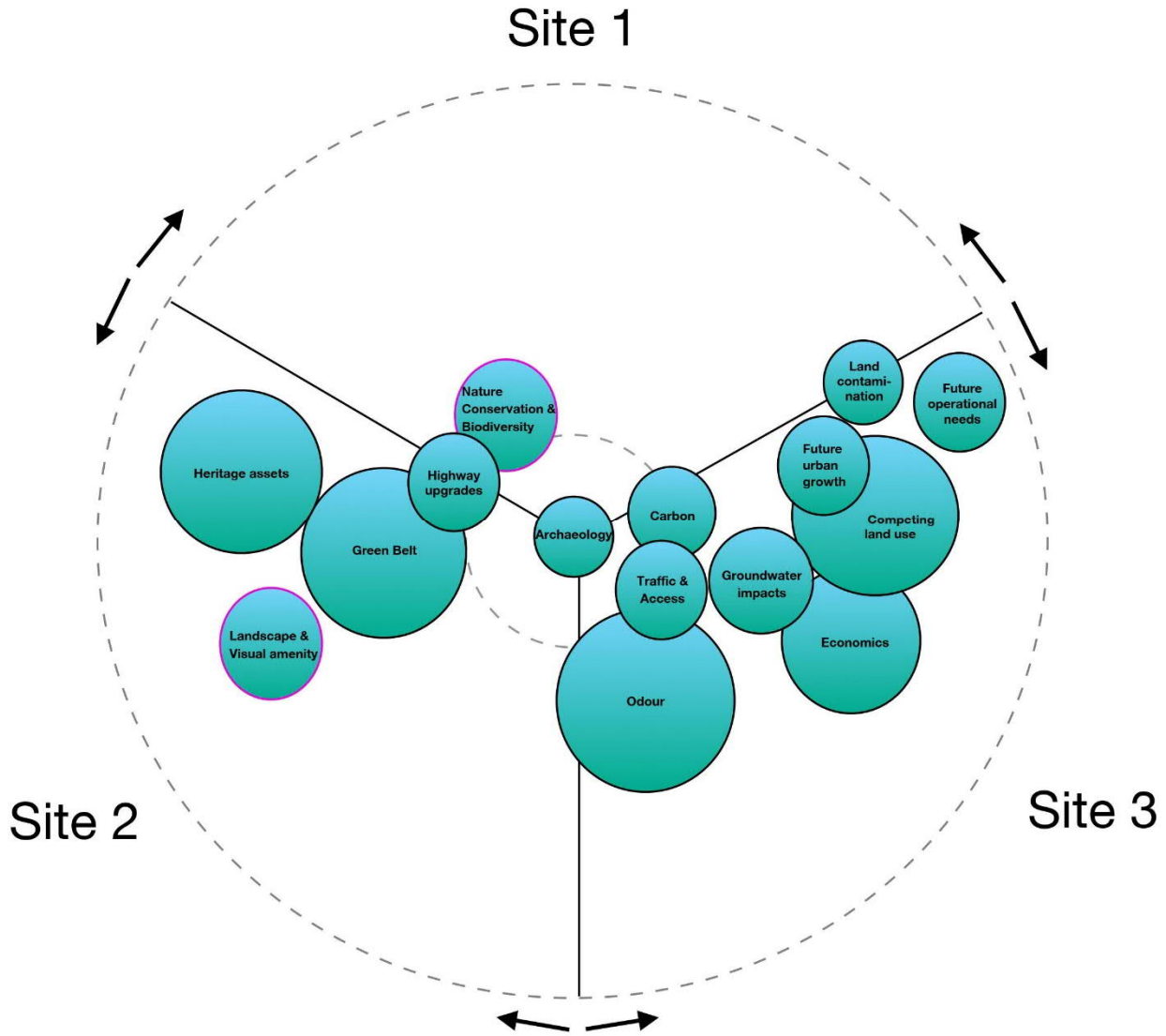
6.8.2 The access arrangements for site areas 1 and 2 are very similar and therefore score equally. They perform worse than site area 3 given the potential traffic impacts due to junction capacity issues at the A14 Milton interchange and potential constraints with the A10/Butt Lane junction. However, it is considered that the highways improvements required to allow operational access to the site area 1 and 2 would be limited.

6.8.3 In contrast, major improvements are required to the existing highway network in order to establish operational access to site area 3 via High Ditch Road and Low Fen Drove Way.

However, once these improvements are in place it is considered that the potential traffic impacts of operational access to the site would be minor.

6.9 Nature conservation and landscape

Figure 6.10: Nature conservation and landscape comparison



6.9.1 This section describes the comparison of the nature conservation and biodiversity assessment and the landscape and visual assessment. These aspects have been grouped together in this section as they are considered to be of similar importance to the project and their mitigation measures are linked with one another. Both of these aspects present potential consenting issues but are deemed to be manageable with enhancement and mitigation measures in place. However, there is still differentiation in the performance of the site areas against these assessments, as shown by the location of the relevant icons in Figure 6.10. The differentiation is explained below.

Nature conservation and biodiversity

6.9.2 Site 1 performs the best as there are no statutory designated sites likely to be directly impacted and the site area has a lower ecological potential than site area 2. However, there is a risk of potential temporary impacts on a locally designated wildlife site during construction (Cottenham Moat CWS)

6.9.3 Site area 2 has a high ecological potential in relation to the habitats within the site area and also the higher incidence of protected species (Great Crested Newts and Badgers recorded within the site area). Similarly to site area 1, there are no statutory designated sites likely to be directly impacted but there is a risk of potential temporary impacts on a locally designated wildlife site during construction (Cottenham Moat CWS).

6.9.4 Site area 3 is in proximity to two SSSIs (Stow Cum Quy Fen and Wilbraham Fen) although risks of adverse impacts are considered to be low. There is the potential for direct impact on a local wildlife site within the scheme boundary (Low Fen Drove Way CWS). However, apart from the CWS the site area is largely agricultural land with a low ecological value.

Landscape and visual amenity

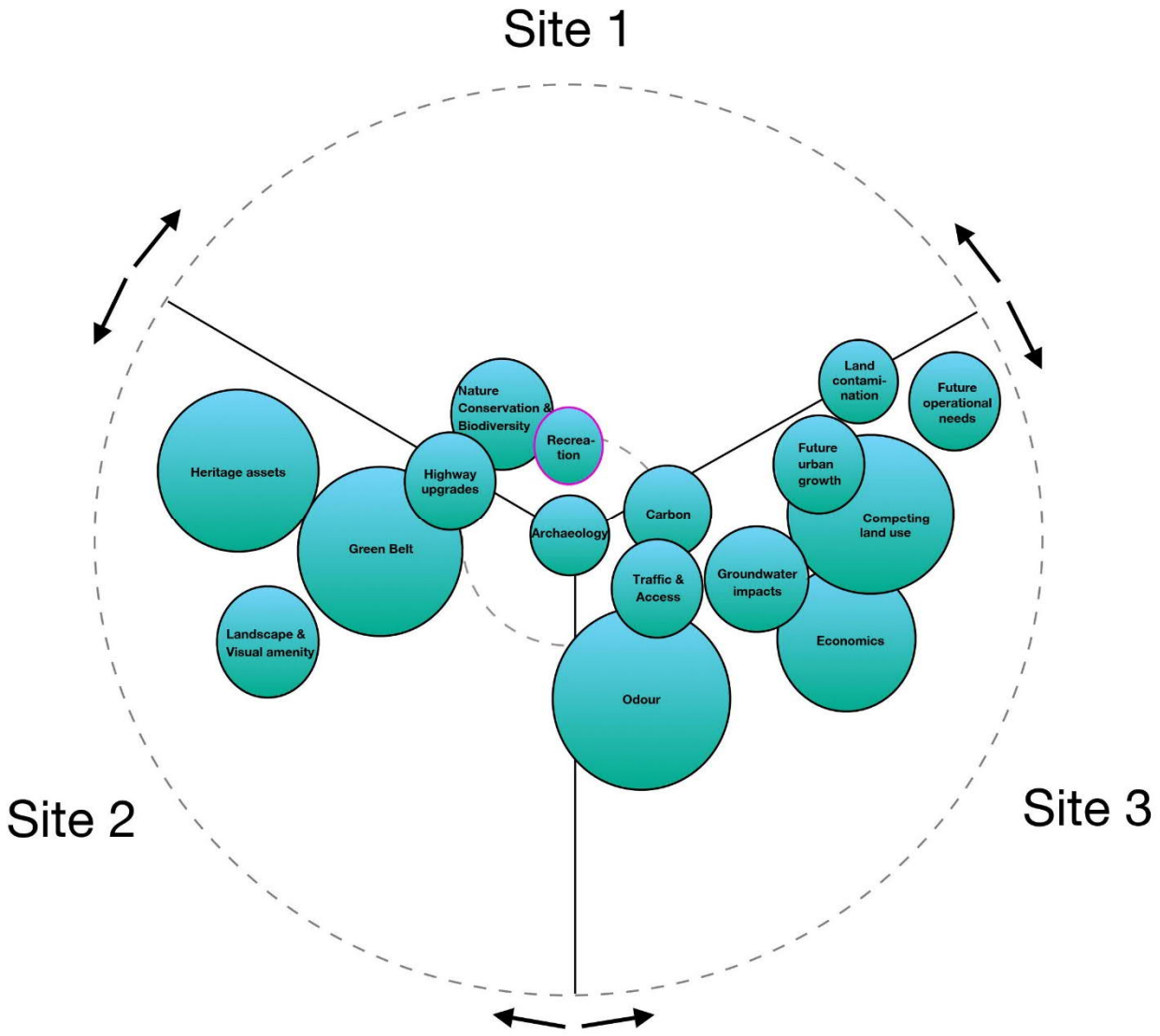
6.9.5 Site area 2 has the lowest landscape sensitivity due to the relatively compromised landscape on the urban fringe of Cambridge.

6.9.6 Site area 3 has the highest sensitivity due to character and openness of the area and would present the greatest impact on the landscape of all three site areas.

6.9.7 Site area 1 is in a lower landscape sensitivity area to site area 3. However, the openness of the area result in a similar overall impact on the landscape.

6.10 Recreational amenity assessment

Figure 6.11: Recreational amenity comparison



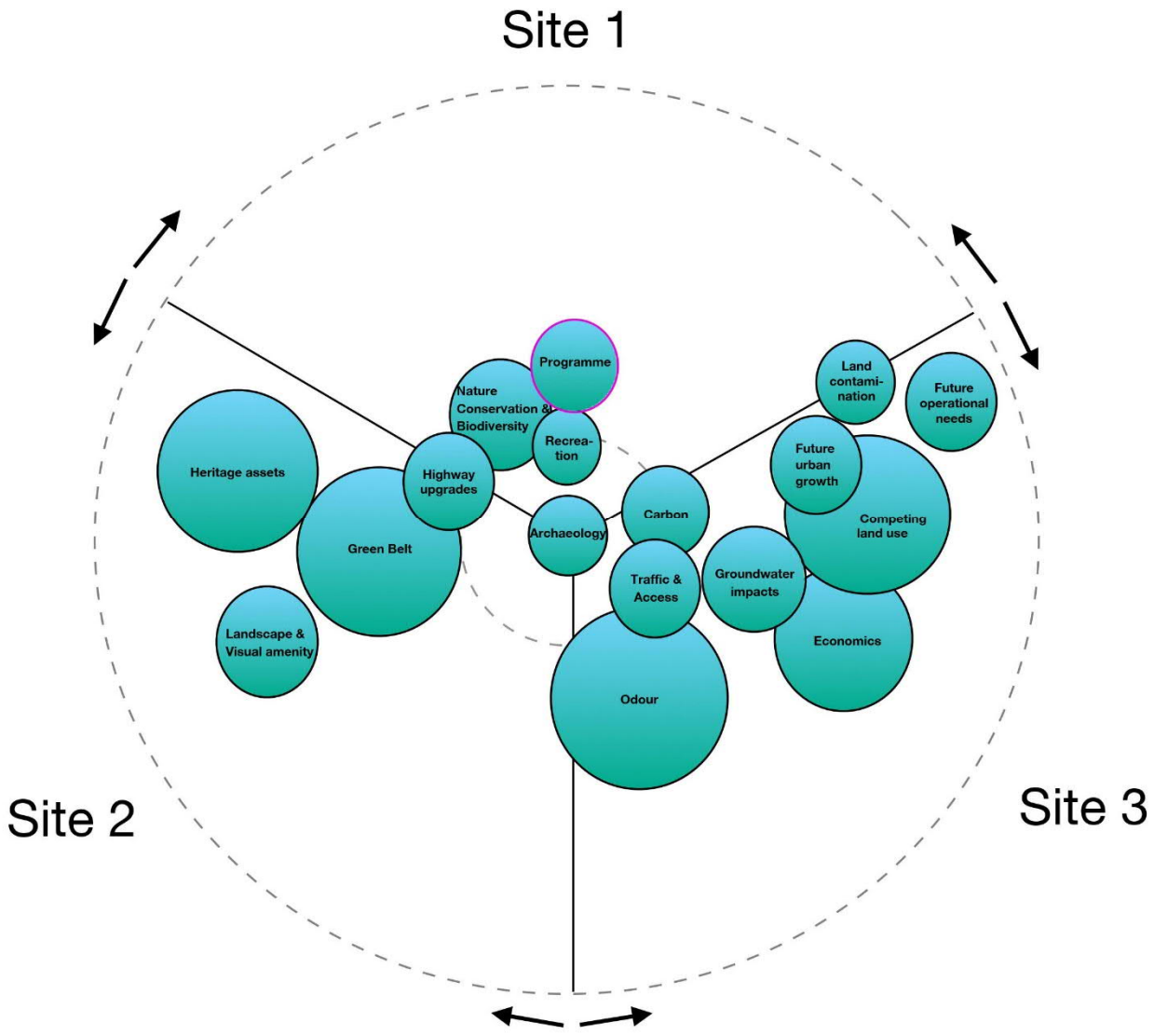
6.10.1 An important aspect of the community assessment that has been widely commented on during phase one non-statutory public consultation is the potential impact on recreational amenity, which differs between the site areas as shown in Figure 6.11. The differential is discussed below.

- Site area 1 performs the best for this element of the assessment, as although Mere Way byway passes through the site area, with mitigation in place, it is considered that the risk of an amenity impact on the user of the byway is low.
- Site areas 2 and 3 perform equally as they both have PRoW on the boundary of the site area (Mere Way east of site area 2 and Low Fen Drove Way north east of site area 3) and there is a potential risk of a reduction in amenity on users of these PRoW due to the combination of potential visual and odour impacts. The magnitude of these impacts is likely to be higher at site area 2 as Mere Way is directly adjacent to the boundary of the indicative WWTP footprint, whereas the Low Fen Drove byway is, at its closest, 180m from the boundary of the

site area 3 indicative WWTP footprint. However, the access route for site area 3 would potentially have an impact upon users of the Low Fen Drove Way public byway, which contributes to the amenity impact. Although, it is considered that the access can be maintained by incorporating appropriate mitigation into the design of the improvements to the bridge over the A14 on Low Fen Drove Way.

6.11 Programme

Figure 6.12: Programme comparison

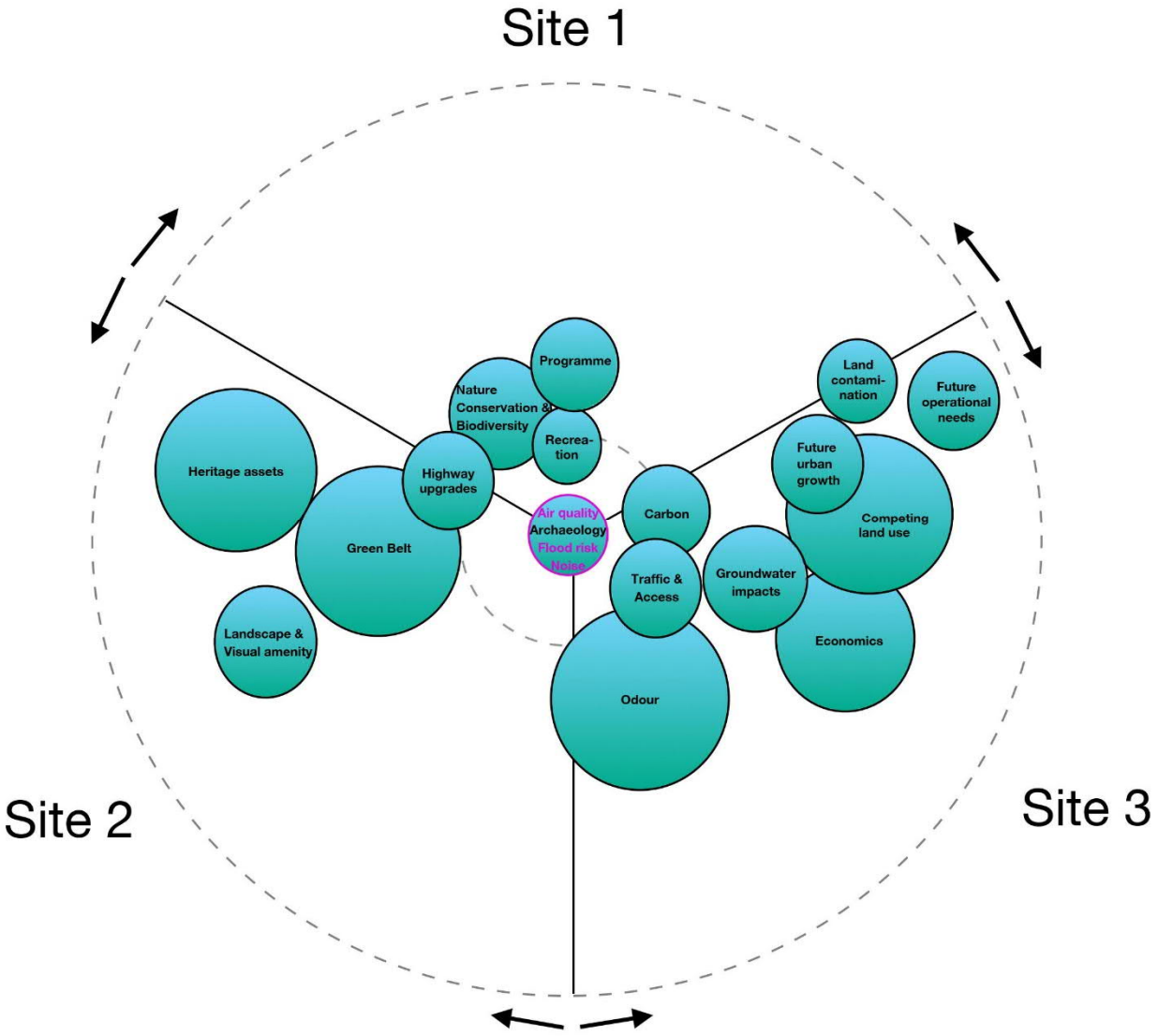


6.11.1 This section describes the comparison of the programme assessment. As the project is funded by the UK Government (through Homes England) the project needs to be delivered in accordance with binding milestones for the start/completion of defined stages. Therefore, the ability to meet these milestones is important to the Anglian Water development team. This importance is illustrated by the size of the highlighted icon in Figure 6.12. All of the site area options present significant programme risks. However, there is some differentiation in the potential programme risks between each of the site areas, which is discussed below.

- Site area 1 performs the best for this element of the assessment. There are significant programme risks in relation to the conflicting land use with the fruit farm, the potential requirement for development of additional enhancement and mitigation measures as well as the potential investigation and mitigation measures required in relation to groundwater impacts. However, the relatively short length of the waste water transfer tunnel allows some flexibility in the construction programme in case of other delays.
- Site areas 2 and 3 perform equally but worse than site area 1, as the combination of risks results in a high risk of impact on the overall programme.
  - The construction programme for site area 2 is already constrained due to the relatively long length of the waste water transfer tunnel, therefore, there is limited flexibility in the event of delays due to other factors. In addition, there are significant risks in relation conflicted land interests with the promotion of the extension to the Cambridge Science Park and the potential investigation and mitigation measures required in relation to groundwater impacts.
  - Site area 3 presents significant programme risks in relation to the potential need for greater enhancement and mitigation measures, the potential investigation required in relation to demonstrating that Quy Fen SSSI will not be affected by the new WWTP and the potential requirement for extensive highways improvements. However, as site area 3 requires the shortest length of waste water transfer tunnel of the three site areas, this allows some flexibility in construction programme in case of other delays.

6.12 Air quality, noise and flood risk

Figure 6.13: Air quality, noise and flood risk comparison

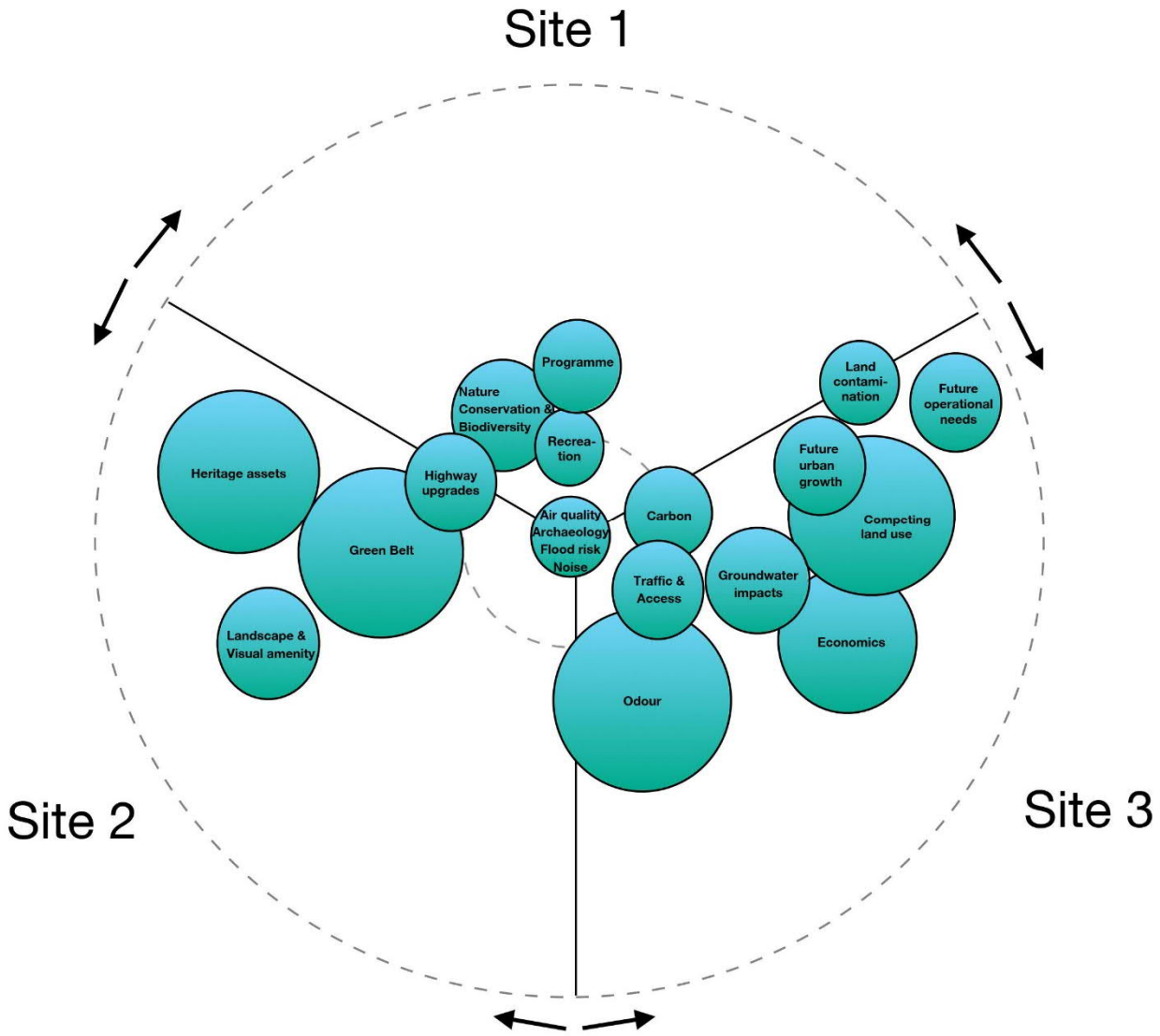


6.12.1 Air quality, noise and flood risk are important factors to the Anglian Water development team. However, the air quality and noise assessment concluded that there is a low risk of adverse impacts for all of the site area options and the flood risk assessment concluded that the overall risk of flooding is low for all three site areas. Therefore, they do not represent differentiating factors in the selection of a final site as illustrated in the position of the icon in Figure 6.13.

6.13 Overall comparison

6.13.1 The holistic comparison combining all the assessments discussed in the previous sections is shown in Figure 6.14.

Figure 6.14: Overall comparison



6.13.2 Overall Figure 6.14 demonstrates that in the majority of assessments, including the most important elements, site area 1 performs poorly in comparison with either site area 2 or 3.

6.13.3 Site area 1 is the compromise site is almost all aspects, with the exception of ecology and recreation, although the differences between all sites in these aspects are considered to be relatively minor. Site area 1 has weaker contribution to Green Belt purpose than site 3 so has a marginally lower consenting risk profile. However, it is in open landscape in close proximity to Landbeach and Milton and, unlike sites 2 and 3, additional odour control measures would be required to mitigate the risk of odour impact at the nearest high sensitivity receptors. Locating a WWTP at site area 1 would also have a significant impact on the fruit farming business within the site area, potentially resulting in extinguishment of the business and loss of employment which presents a significant socioeconomic impact. Like site area 2, there would be traffic

impacts at Butt Lane/A10 during construction and operation. Therefore, it is considered that site area 1 is not a preferable option.

6.13.4 This leaves the comparison between site areas 2 and 3, which present contrasting strengths and weaknesses for almost all assessments.

6.13.5 Site area 2 makes a lesser contribution to Green Belt purposes than site area 3, in an area more compromised and congested than the other sites, and has less risk of impact on heritage assets and the local landscape. However, it is relatively closer to multiple residential areas and carries significant risk of delays to the project programme due to the competing land use with a credible promotion by a strategic landowner (Trinity College Cambridge), which is compatible with growth aspirations for Greater Cambridge for technology related development and the Government's growth prospectus for the OxCam Arc "key economic priority" area.

6.13.6 It also considered that if the current promotion of the site was not successful, evenfuture urban growth and development pressures are likely to affect the long term resilience of this site for CWWTP due to the close proximity to the Cambridge urban fringe. Also, opportunities to deliver significant enhancements to the environment and to connectivity (e.g. footpaths) of the area are more restricted compared to site areas 1 and 3. It also represents the highest cost option and risk of increase in land acquisition costs to the extent that they might undermine the viability of the WWTP development.

6.13.7 Site area 3 makes a stronger contribution to Green Belt purposes than site area 2. Together, with the potential impacts on heritage assets and the local landscape, this site area has a higher consenting risk profile than site area 2. However, it is the best performing for future operational needs and performs equally with site area 2 for odour (no additional mitigation would be required) and distance to highest sensitivity receptors in the prevailing wind direction. It also presents the lowest cost option and lowest lifetime carbon emissions. It provides a greater long-term ability to accommodate growth and maintain suitable distance from residential properties, reducing risk of impact on amenity.

6.13.8 However, the potential environmental impacts at site area 3 could be appropriately mitigated and enhancement measures could improve the value of the area in terms of biodiversity and wider landscape and recreational connectivity. Site area 3 also offers a better opportunity to overcome Green Belt harm as a result of these mitigation and enhancement measures. Whereas the potential issues associated with site area 2, in relation to competing land uses and future resilience would be more difficult to overcome.

7 Back Checking

7.1 Introduction

7.1.1 This section provides a review of the previous stages of site selection based on comments received during the phase one non-statutory consultation as well as new information that has come to light since the completion of the Stage 3 – Fine Screening assessment. The review is structured as a set of questions that encompass the main themes of comments received in relation to the site selection study. All previous stages of site selection are considered, where appropriate, for each of the questions posed.

7.2 Was the study area appropriate?

7.2.1 A number of consultees commented on the Study Area used in the site selection including the definition of its boundary and whether potential sites outside of the Study Area should have been considered. This is discussed in the following sections

Potential sites outside of the Study Area

7.2.2 The purpose of the first stage of the site selection process, the Initial Options Appraisal (Mott MacDonald Ltd, 2020a), was to define the appropriate area to search for potential sites for a WWTP to treat the waste water from Cambridge. The appraisal considered options both within the existing drainage catchment (the Study Area) and outside it.

7.2.3 The appraisal concluded that treating waste water from Cambridge at a location outside of the existing drainage catchment was not favourable due to the need for longer tunnels and pipelines to transfer waste water from the existing WWTP to the new WWTP and to return treated effluent to the River Cam. The assessment considered that this would have implications in terms of the proximity principle as the site would be a considerable distance from Cambridge with higher costs, carbon emission and construction complexity than a site within the Study Area.

7.2.4 This conclusion is supported by the further stages of site selection that have concluded that the sites within the Study Area but furthest away from the existing WWTP and the River Cam are generally not feasible principally due to the longer waste water infrastructure requirements. It is therefore concluded that sites outside of the Study Area would not have been taken forward at previous stages of site selection for this reason.

Definition of the Study Area boundary

7.2.5 The Study Area boundary comprises the overall drainage catchments for the existing Cambridge and Waterbeach WWTPs.

7.2.6 The catchment area includes both currently connected and unconnected areas. ‘Connected’ areas are already connected to the Anglian Water sewerage network and drain to the existing WWTPs. An ‘unconnected’ area is an area that is currently without sewerage but has the potential to become connected to the existing sewerage network serving Cambridge or Waterbeach WWTP in the future via a successful application to the first time sewerage programme, (section 101A Water Industry Act 1991) or as a result of growth, because it would be the most logical connection to make from an operational perspective.

7.2.7 It has been commented that the Study Area boundary is arbitrary due to the need to pump waste water to the new WWTP regardless of where it is situated and that an engineering review of the catchment should have been carried out to identify a suitable buffer around this area based on topography.

7.2.8 It is considered that the inclusion of a buffer around the Study Area would not have identified additional sites that would perform better than those already being considered since the areas would be further away from the existing WWTP, thus increasing the distance for transferring waste water, which was an important factor in the selection of the shortlisted sites. In addition, a review based on topography would also result in an arbitrary buffer, as due to the generally low lying nature of the area, the influence of topography on pumping requirements is minor in comparison with the effect of increasing distance from the existing WWTP.

7.2.9 Therefore, it is considered that the existing drainage catchment represents the most appropriate Study Area for selecting a site for the relocation of Cambridge WWTP.

7.3 Was the scope of the assessments appropriate?

Initial options appraisal

7.3.1 Some phase one non-statutory consultation responses questioned why consolidating the WWTP on the existing site was excluded as an option in the Initial Options Appraisal and why a cost benefit analysis comparing the relocation against consolidation was not included.

7.3.2 It would not be possible to deliver level of development envisaged in the NEC AAP and HIF award, without relocation of Cambridge WWTP. The business case supporting the HIF funding application confirmed that although it would be technically feasible to consolidate the existing treatment assets and occupy a smaller area of the existing site, this would reduce the land available for development and the sanitary buffer around the consolidated WWTP would effectively prevent the development of any residential properties across the land available.

7.3.3 Therefore, it is concluded that consolidating the WWTP is not a viable option as it would negate the benefits of the relocation project.

7.3.4 Comments were also received in relation to the Initial Options Appraisal and questioned why consideration was not given to providing separate sites for waste water treatment and sludge treatment. It is considered that this would not be a feasible option for the following reason. Locating the sludge treatment centre (STC) away from the WWTP would result in a significant increase in traffic movements due to the need to transport large quantities of sludge from the WWTP to the STC and the residual liquor (which arises from sludge treatment) from the sludge treatment centre back to the WWTP for treatment. As well as an increase in the potential traffic-related impacts this would also significantly increase operational cost and carbon emissions compared to a single site. Assuming the sites were not too far apart it would be possible for both sludge and liquors to be transferred between sites via dedicated pipelines. However, such a solution would also result in a significant increase in cost (both capital and operating costs) as well as carbon emissions.

7.3.5 A number of other benefits of a single WWTP over multiple WWTPs are discussed in the Initial Options Appraisal (Mott MacDonald Ltd, 2020a), which are also relevant to the separation of the STC from the WWTP, such as more efficient deployment of operations and maintenance staff at a single site. Therefore, it is concluded that providing separate sites for waste water treatment and sludge treatment is not a viable option and would have greater overall environmental impacts.

Stage 1 – Initial Site Selection

7.3.6 Some phase one non-statutory consultation responses questioned whether the constraints mapping exercise used in Stage 1 – Initial Site Selection was appropriate to define a long list of sites and whether some degree of weighting of the constraints should have been included in the assessment.

7.3.7 The definition of baseline constraints and the application of buffers around them in order to map potential areas suitable for development is a standard approach for site selection. Therefore, it was deemed to be an appropriate method for defining the long list of potential sites for CWWTPR.

7.3.8 It is considered that the definition of the buffers themselves provided a degree of weighting to the constraints. The most important and highly sensitive receptors such as residential properties and statutory designated sites were assigned relatively large buffers, whereas less sensitive constraints such as transport infrastructure were assigned smaller buffers. It is considered that it would not have been appropriate to include any numerical weighting of the constraints as this would likely have further restricted the potential sites taken forward to Stage 2 – Coarse Screening, where the potential sites were assessed in more detail.

Stage 2 – Coarse Screening

7.3.9 Some phase one non-statutory consultation responses questioned why the Cambridge Green Belt and nature conservation and biodiversity criteria were not given more weight in the Stage 2 – Coarse Screening assessment.

7.3.10 Green Belt was considered as a criterion of importance in the Stage 2 – Coarse Screening assessment and contributed to the rejection of several potential sites that performed poorly against the other criteria of importance. However, it was not deemed appropriate to use Green Belt as the sole reason for rejecting potential sites that performed well against the other criteria of importance as it was considered that development within the Green Belt would be possible if very special circumstances could be met. It was considered that if the sites outside of the Green Belt did not prove to be feasible, this would contribute towards the very special circumstances required. Therefore, all of the seven shortlisted sites, located both in and outside of the Green Belt were carried forward for further assessment of their feasibility in Stage 3 – Fine Screening.

7.3.11 Nature conservation and biodiversity was not considered to be a criterion of importance at Stage 2 as substantial buffers had already been established during Stage 1 that resulted in all of the potential sites being at least 500m from statutory designated nature conservation sites, which was considered to reduce the likelihood of adverse impacts on these sites. In addition, the Stage 2 desk study only assessed if any statutory and non-statutory designated nature conservation sites were likely to be adversely affected in an unmitigated scenario by identifying potential impact pathways. It was considered that further investigation would be likely to show that impacts on these sites could be mitigated, which is supported by the assessment of mitigated scenarios in the Nature Conservation and Biodiversity assessment in Stage 4 – Final Site Selection.

7.3.12 Comments were received as to why sensitivity analysis of the constraints and buffers employed at Stage 1 – Initial Site Selection, in order to identify additional site areas for assessment, was not included in the Stage 2 – Coarse Screening assessment. It was not deemed necessary to carry out sensitivity testing at Stage 2 as the shortlisted site areas were all considered to represent feasible options at this stage with potential site areas both within and outside the Green Belt. However, it is considered that carrying out the sensitivity analysis at Stage 2 would not have affected site selection as the analysis carried out in Stage 3 – Fine Screening

demonstrated that there were no additional site areas that would have performed equally to, or better than, the site areas shortlisted in the Stage 2 – Coarse Screening assessment.

7.3.13 Some phase one non-statutory consultation responses also asked why green infrastructure policy was not considered during Stage 2 – Coarse Screening. It was not considered necessary to consider the local green infrastructure policy during Stage 2 as the policy covers large areas of land for aspirational improvements and therefore was not considered to aid the differentiation between potential sites at this stage of site selection. Green infrastructure policy has been considered during Stage 4 – Final Site Selection.

Stage 3 – Fine Screening

7.3.14 A significant number of comments were received in relation to the scope of the Stage 3 – Fine Screening assessment. The comments have been summarised and responses provided in Table 7.1.

Table 7.1: Responses to comments on scope of Stage 3 – Fine screening

Summary of comment	Response
Using affordability as a main factor outweighs environmental impact and should not be treated as an absolute restriction. In addition, the details of the affordability assessment were not provided.	Affordability of the project was a criterion of importance in the Stage 3 – Fine Screening assessment as, for the relocation to be viable, the cost of developing the WWTP, including design, enabling works, construction and commissioning, must be within the total HIF grant amount. The relocation of the existing WWTP is required to enable the regeneration of North East Cambridge and not for operational reasons. Therefore, it would not be appropriate for additional funding to be provided by Anglian Water's customers and thus the HIF grant must be considered as an absolute constraint when selecting a site for the relocation. Affordability was just one of the factors considered in the assessment of the performance of the shortlisted site areas, the conclusions in the Stage 3 – Fine Screening assessment were based on a holistic assessment of the site areas performance against all criteria. However, it should also be noted that increasing lengths of infrastructure can in some circumstances increase environmental impact e.g. longer tunnels can result in higher carbon emissions and greater interaction with principal aquifers. The financial details of the affordability assessment were not provided as they are commercially sensitive and are not necessary to explain the conclusions of the assessment.
Why was contribution to Green Belt purposes not included in the assessment and Green Belt not given more weight in site selection decision?	At Stage 3 – Fine Screening, potential sites both within and outside of the Green Belt were assessed. Therefore, it was not appropriate to assess the contr bution of each site to Green Belt purposes as this would not have been relevant to all sites and would not have aided the identification of the shortlist of sites. Green Belt was considered a criterion of importance at Stage 3 – Fine Screening and therefore was provided a higher importance. However, the sites located outside of the Green Belt were assessed as performing poorly in relation to the other criteria considered to be of high importance. Therefore, this was considered to outweigh their potential suitability in planning policy terms. An assessment of the contribution to Green Belt purposes has been made for each of the three sites assessed at Stage 4 – Final Site Selection.
Why didn't the finer grain of detail in the nature conservation and biodiversity assessment influence the shortlisting of the sites, and why were sites that were recorded as having potential impacts on SSSIs carried forward?	The nature conservation and biodiversity assessment at Stage 3 consisted of desk-based assessment of the potential unmitigated impacts of a new WWTP on each of the shortlisted site areas. Nature conservation and biodiversity was not considered as a significantly differentiating criterion at Stage 3 – Fine Screening for the following reasons. Firstly, the buffers employed at Stage 1 – Initial Site Selection had already ensured that any potential site would be greater than 500m from any statutory designated site, which reduced the risk of impact on these sites. Secondly, the potential impacts were assessed without mitigation at Stage 3 and therefore the impacts would reduce with mitigation in place, as is assessed in the Stage 4 – Final Site Selection assessment.

Summary of comment	Response
	During Stage 1 – Initial Site Selection we applied a 400m buffer applied around all residential properties. This buffer was defined to conform with Anglian Water's Asset Encroachment policy, which assesses the potential risk of proposed development in proximity to existing WWTPs, primarily in relation to odour impacts. It is considered that this policy is also relevant to the siting of new WWTPs and the potential risk this could pose to the local community. The buffer established in Stage 1 was put in place to ensure that the new WWTP would be located away from residents to reduce the risk of odour impacts.
Why wasn't an odour assessment carried out?	An assessment of the potential for odour impact on sensitive receptors at the three remaining site areas, drawing on site specific odour modelling, is including in Stage 4 – Final Site Selection, and the results of this assessment form a key consideration in the comparison of the three site areas and the selection of a final site. The results demonstrate that the 400m buffers are largely effective at ensuring that odour impacts would not be experienced by local residents even in the reasonable worst case assessed in the study. It is noted that a detailed odour impact assessment will form part of the EIA for the site area that will be taken forward in the DCO application. The risk of odour impacts from the new WWTP will be minimised in accordance with industry best practice.
Why wasn't an assessment of lighting, noise or air quality impacts included?	A high level assessment of the potential noise and air quality impacts of a WWTP at each site area was included in the non-traffic impact of construction on local residents and communities criterion at Stage 3 – Fine Screening. In addition, both noise and air quality have been assessed individually at Stage 4 – Final Site Selection including potential impacts on both the environment and the local community and the conclusions suggest that the risk of noise or air quality impacts are low for all sites. It is therefore considered that earlier, more detailed consideration of these impacts would not have changed the outcome of Stage 3. Lighting was not explicitly assessed at Stage 3 as lighting of the WWTP was not considered to represent a significant risk of impact to the local community or the environment given the buffers employed at Stage 1 – Initial Site Selection to ensure the WWTP would be a significant distance from all of the most highly sensitive receptors. Anglian Water will aim to minimise the lighting on site except where it is required for the health and safety of employees working on the site.
Why wasn't there an assessment of potential impact on ecology and hydrology of the upgrading of the access route, construction compounds, spoil heaps, construction noise or external lighting?	The potential impact of indicative new access roads from the existing highway network to an indicative WWTP footprint within each site area was considered in the nature conservation and biodiversity assessment at Stage 3 – Fine Screening. However, it was not considered necessary to assess temporary construction aspects or any upgrades to the existing road network at Stage 3 as it was considered that assessment of the location of the WWTP itself and major waste water transfer infrastructure represented the greatest potential risk, and assessing these aspects was sufficient for defining a shortlist of potential site areas. Potential impacts during construction have been considered within all relevant criteria at Stage 4 – Final Site Selection as detailed within this report.
Why was the Waterbeach pipeline not included in the assessment?	The waste water transfer from Waterbeach was not included in the RAG assessment of shortlisted site areas in Stage 3 – Fine Screening for the following reasons: • The length of pipeline required was relatively similar for all sites and therefore did not add to the differentiation of the site areas in terms of carbon emissions. • The pipeline will comprise a small diameter rising main (or dual mains), the potential impacts of which were considered to be minor in comparison to the waste water transfer infrastructure required for the relocation of the Cambridge WWTP, i.e. the waste water transfer tunnel to the new WWTP and treated effluent tunnel/pipeline to the River Cam. • The potential impacts will be temporary during construction and due to the size of the pipeline it should be poss ble to adjust the route in order to avoid constraints and minimise the potential impacts of the pipelines. It is noted that the Waterbeach pipeline has been assessed across all relevant criteria at Stage 4 – Final Site Selection.
There should have been further assessment to improve location of WWTP within site areas and local area	The buffers established at Stage 1 – Initial Site Selection are considered appropriate in order to ensure separation of the WWTP from the nearest sensitive receptors and the Study Area boundary is also considered to be appropriate as described above. Therefore, it would not be deemed appropriate to locate the WWTP outside of these areas. A high-level assessment of optimal location for an indicative WWTP footprint within the each of the site areas was carried out to aid site selection during Stage 3 – Fine Screening. However, the position and layout of the WWTP will be developed during the design stages following site selection, which will aim to minimise environmental impacts and optimise operation of the WWTP. The consideration of

Summary of comment	Response
	these alternatives will form part of the environmental impact assessment (EIA) for the final project.
Further sensitivity testing and assessment of the additional sites identified should be carried out	As the three best performing site areas taken forward from Stage 3 – Fine Screening are located in the Green Belt, it was deemed necessary to carry out a sensitivity analysis to test whether relaxing the constraints used in Stage 1 – Initial Site Selection would identify additional potential site areas or would change the outcomes of Stage 2 – Coarse Screening or Stage 3. The constraints and buffers used in Stage 1 were relaxed using professional judgement, however, this ultimately decreased the distance of the potential sites to sensitive receptors including individual residential properties, effectively increasing the potential impacts on these receptors. The potential additional sites identified in the sensitivity testing were reviewed in terms of the likely performance against the criteria considered in Stages 2 and 3. None of the additional sites identified performed better than the three site areas taken forward. Given the results of the Stage 4 – Final Site Selection assessment of the three shortlisted site areas on the local community and environment, it is considered that further sensitivity testing would only identify potential sites that would have a greater potential impact than those already being considered. Therefore, it is not deemed necessary to carry out any further sensitivity testing.
Why wasn't the impact on Best and Most Versatile agricultural land assessed?	During Stage 2 – Coarse Screening, the Agricultural Land Classification (ALC) mapping developed by Natural England was reviewed for the study area, and the extent of 'Best and Most Versatile Land' determined for each site area. This review showed that all the longlisted site areas comprised greater than 50% 'Best and Most Versatile Land'. Therefore, there was no clear differentiation between any of the site areas under this criterion and it was not deemed necessary to consider this criterion in further stages of site selection. A review of this criterion for the seven shortlisted site areas assessed at Stage 3 – Fine Screening shows that they are all comprised 'Best and Most Versatile Land'. Therefore, it considered that all sites would have an equal impact on 'Best and Most Versatile Land'.
Why was green infrastructure policy not considered in the assessment?	As per Stage 2 – Coarse Screening, it was not considered necessary to consider the local green infrastructure policy during Stage 3 – Fine Screening as the policy covers large areas of land for aspirational improvements and therefore was not considered to aid the differentiation between potential sites at this stage of site selection. Green infrastructure policy has been considered during Stage 4 – Final Site Selection.

7.4 Were the identified receptors appropriate?

Initial options appraisal

7.4.1 Some phase one non-statutory consultation responses asked why Green Belt was not considered earlier in the site selection process. The Initial Options Appraisal considered the options for locating a new WWTP at a strategic level and did not assess specific site locations. Therefore, it would not have been appropriate to assess the options against Green Belt policy as each of the options included areas both within and outside of the Cambridge Green Belt.

Stage 1 – Initial Site Selection

7.4.2 Several comments have been received questioning the validity of the constraints and buffers employed at Stage 1 – Initial Site Selection. The constraints and buffers used were defined in collaboration with the relevant technical experts for each topic considered. In the majority of cases there is no stipulation of specific buffers between developments and receptors in relevant planning policy. Therefore, professional judgement was employed to identify the most appropriate buffers to ensure any potential WWTP site would be located away from the most sensitive receptors and constraints.

7.4.3 The establishment of these buffers resulted in the definition of the longlist of site areas that were subsequently assessed in the following stages both in relation to potential impacts beyond the buffers employed at Stage 1 and also on other receptors that were not included in the Stage 1

constraints. Therefore, any potential impacts that were not mitigated by the establishment of the constraints and buffers in Stage 1 had been assessed in subsequent stages of the site selection.

7.4.4 A large number of the comments were in relation to the 400m buffer around all residential properties with some suggesting it should be smaller and others suggesting it should be increased. The odour study carried out to support Stage 4 – Final Site Selection (See Appendix M) has shown that the community buffers were largely effective at mitigating potential odour impacts at the sensitive receptors surrounding the site areas. It is noted that the study assessed a reasonable worst case scenario based on odour emissions estimates from the existing WWTP and that emissions would be improved at the new WWTP. Therefore, it is considered that this was an appropriate buffer to employ at the initial stage of site selection as a larger buffer would have only reduced the potential sites taken forward for more detailed assessment.

7.4.5 Comments have also been received questioning why the Green Belt was not included as an absolute constraint in Stage 1 – Initial Site Selection. As discussed in the Stage 1 report, 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. Therefore, excluding the Green Belt from the study area at this early stage of site selection would have severely limited the potential site areas for consideration.

7.4.6 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 required to propose development of a site within the Cambridge Green Belt. For these reasons it was not deemed appropriate to include the Green Belt as an absolute constraint at Stage 1 – Initial Site Selection.

Stage 2 – Coarse Screening and Stage 3 – Fine Screening

7.4.7 A number of receptors have been identified from responses to the phase one non-statutory consultation that were not specifically referenced in the Stage 2 – Coarse Screening and Stage 3 – Fine Screening assessments. Table 7.2 provides a list of these receptors and responses in relation to why these receptors were not included, and if they were, whether they would have had a material effect on site selection.

Table 7.2: Comments on receptors not included in Stage 2 – Coarse or Stage 3 – Fine Screening

Receptor	Response
Natural England has commented that their Impact Risk Zones (IRZs) were not utilised in the assessment of potential impacts on SSSIs.	A review of IRZs has been carried out for all of the longlisted site areas in order to identify if including IRZs in the assessment would have changed the nature conservation and biodiversity assessments at Stage 2 – Coarse Screening or Stage 3 – Fine Screening and the overall selection of site areas. This review is provided in Appendix N. The review concluded that including the IRZs in the assessment would downgrade the RAG rating of all the sites rated as green or amber due to their locations within relevant SSSI IRZs. Therefore, this in effect reduces the differentiation between the longlisted site areas in relation to nature conservation and biodiversity. It is considered that incorporating these changes into the overall Stage 2 and Stage 3 RAG assessment of the site areas would not have affected the selection of the shortlist of site areas.
Important natural habitats identified in the Histon and Impington Neighbourhood Plan	As the areas identified are neither statutory nor non-statutory designated conservation sites it would not have been appropriate to consider the potential impacts on these areas during Stage 2 – Coarse Screening or Stage 3 – Fine Screening, and it is considered that their inclusion would not have affected site

Receptor	Response
were not considered during site selection.	selection. It should be noted that records of protected and notable species within 5km of the indicative WWTP footprints were included in the Stage 3 – Fine Screening assessment and habitats within and surrounding the site areas have been surveyed and the potential impacts on them assessed as part of the nature conservation and biodiversity criterion in Stage 4 – Final Site Selection.
Consultees have identified the existence of specific species of wildlife in proximity to the site areas that they believe should have been considered during Stage 3 – Fine Screening, such as terrestrial invertebrates in proximity to site area 3 and common toads in proximity to site areas 1 and 2.	The nature conservation and biodiversity assessment conducted at Stage 3 – Fine Screening included identification of legally protected and notable species within 5km of each site area and a review of historical European Protected Species (EPS) licence applications within 5km of each of the proposed site areas, which was deemed appropriate for this stage of assessment. The nature conservation and biodiversity assessment at Stage 4 – Final Site Selection included terrestrial invertebrate scoping surveys as well as the identification of habitats capable of support other protected and notable species, and further surveys will be undertaken for the site that is taken forward. It is considered that had this information been available it would not have changed the nature conservation and biodiversity assessment as the potential for protected species was already rated as high for site areas 1, 2 and 3.
Comments have questioned the exclusion of Milton Road Hedge City Wildlife Site (CWS) in the Stage 3 – Fine Screening assessment	This CWS is located adjacent to the existing Cambridge WWTP and was not included in the nature conservation and biodiversity assessment as it is located within the waste water transfer corridors for all the shortlisted site areas. The transfer of waste water to the new site will be via a deep below ground tunnel and therefore it was assumed that there would be no direct impact on this CWS for all of the site areas. However, it is noted that there will be construction works on the existing WWTP related to the relocation that could potentially have an indirect impact on this CWS, regardless of which site area is chosen. This CWS has been considered in the nature conservation and biodiversity assessment for the Stage 4 – Final Site Selection and the potential impact on this CWS will be assessed in the EIA.
Consultees have identified individual businesses within and in proximity to the potential site areas and suggested that potential impacts on these businesses should have been considered	A high-level assessment of the potential impacts on businesses in proximity to the site areas was included in the impact on local communities assessment at Stage 2 – Coarse Screening and at Stage 3 – Fine Screening, and the potential impacts on businesses in relation to construction of the WWTP and associated infrastructure were assessed. The potential impact on the viability of individual business including those affected by land take for the WWTP development were not assessed at Stage 3 as the assessments were desk-based and did not include any consultation with land or business owners. Therefore, it was not deemed appropriate to assess the potential impact on the viability of individual businesses at this stage. However, further assessment and the results of phase one non-statutory consultation have been used for the Stage 4 – Final Site Selection assessment to assess the potential impacts on businesses within and in proximity to the site areas and associated infrastructure corridors. It is considered, however, that had this information been available at Stage 3 it would not have influenced the selection of the shortlisted site areas.
Consultees have identified community facilities in the local areas around the potential site areas and suggested that potential impacts on these facilities should have been considered	A high-level assessment of the potential impacts on sensitive community facilities was included in the impact on local communities assessment at Stage 2 – Coarse Screening and in relation to construction of the WWTP and traffic impacts during both construction and operation at Stage 3 – Fine Screening. Further assessment and the results of the phase one non-statutory consultation have been used in the Stage 4 – Final Site Selection assessment to assess the potential impacts on community facilities in relation to landscape and visual amenity, odour, noise, air quality as well as the combination effects of these aspects on amenity. It is considered that no sensitive community facilities have been identified during consultation that were not already considered in the assessment or discounted due to their location outside of the area considered to be at risk of impact. Therefore, the identification of these receptors would not have influenced the selection of the shortlisted site areas.

Receptor	Response
Consultees commented on the following heritage assets, which were not included in the Stage 2 or Stage 3 historic environment assessments: • Biggin Abbey • Quy Mill • Fleam Dyke • Conservation areas in proximity to the site areas	The potential for impact on the setting of designated heritage assets within a study area around the site areas was considered during Stage 2 – Coarse Screening. The assets potentially affected were not named in the assessment but for site area 3 (site L) potential impacts on the setting of both Biggin Abbey and Quy Mill were included. Further assessment of Biggin Abbey during Stage 3 – Fine Screening indicated its setting would be unlikely to be impacted by the scheme. However, following a site visit by specialists, further investigation on the setting of this asset and potential impact of the scheme carried out in the Stage 4 Historic Environment assessment (see Appendix L) has indicated that there is a higher risk of potential impact on this asset than previously assessed. However, it is considered that this potential impact would not have altered the results of Stage 3 – Fine Screening due to the performance of site area 3 for the other criteria considered in the overall comparison of results. Fleam Dyke was not identified in the Historic Environment assessment at Stage 2 or 3 as the access route to the site areas via the existing highways network was not part of the scheme elements being assessed at these stages. At these stages only an unmitigated scenario was being assessed, such that no improvements to the existing highways were included, therefore no impact on Fleam Dyke was identified. The potential impact on Fleam Dyke in relation to the access route to site area 3 is included in the Stage 4 Historic Environment assessment (see Appendix L). It is considered that had potential impact on Fleam Dyke been included at Stage 3 it would not have changed the assessment of site area 3 as it was already rated as amber due to a high archaeological potential within the site area. Conservation areas were not considered in either of the Stage 2 or Stage 3 historic environment assessments as it was considered that the 500m buffers established around statutory designated assets including all listed buildings at Stage 1 – Initial Site Selection was sufficient to mitigate any significant potential impact on these areas. However, the potential impact on conservation areas have been assessed in the Stage 4 Historic Environment assessment (see Appendix L), which has indicated potential impacts on conservation areas in proximity to all three sites. It is considered that assessment of potential impacts on conservation areas at either Stage 2 or 3 would not have changed the selection of site areas, as all of the longlisted sites are in similar proximity to at least one conservation area due to the buffers employed at Stage 1.
Consultees questioned why the impact on the following receptors was not considered in the Stage 3 landscape and visual amenity assessment: • Residential properties on the west side of High Street, Landbeach • Travellers on the A10 • Baits Bite Lock and Fen Ditton conservation areas	In the Stage 3 landscape and visual assessment, properties were grouped to form a single visual receptor, which is typical for an assessment of this scale. It was considered that the majority of properties on the west side of Landbeach High Street would be screened by existing vegetation along property boundaries. The Stage 4 landscape and visual amenity assessment includes residents on High Street and Midway, Landbeach and travellers on the A10. Inclusion of these receptors has not changed the overall RAG rating for site area 1. The conservation areas listed in the Stage 3 landscape and visual amenity assessment are those within the Study Area for the Stage 3 site selection (which comprises the northern section of the Cambridge drainage catchment and the Waterbeach drainage catchment). It is considered that inclusion of these conservation areas would not have changed the RAG assessments undertaken at Stage 3 – Fine Screening and they have been taken into account in the Stage 4 landscape and visual amenity assessment.
Consultees questioned why the impact on protected rights (local well users) was not considered at Stage 3	The potential impact on aquifers in relation to the construction of the WWTP and associated infrastructure was considered during both Stages 2 and 3. However, it was not considered appropriate during these stages to identify and assess the impact on individual protected rights. The potential impact on protected rights in relation to dewatering operations has been assessed during the Stage 4 land and water quality assessment. Protected rights potentially affected by the development at the chosen site area will be further investigated during the EIA.

7.5 Was the rejection of potential options appropriate?

Initial options appraisal

7.5.1 Consultees have commented on whether there was enough justification to discount the option for multiple WWTPs in the initial options appraisal, mainly in relation to why the Cambridge and Waterbeach must be relocated at a single site.

7.5.2 Anglian Water previously investigated a location for a new Waterbeach WWTP in proximity to the new town development. As part of the pre-planning process for this new WWTP, Cambridgeshire County Council stated that, at this stage, they would not support a planning application for a new WWTP at the proposed location. In addition, The Environment Agency expressed concerns about the feasibility of the proposed site within flood zone 3 and indicated a preference for flows to be diverted via a new rising main and treated at the existing Cambridge WWTP. Therefore, if CWWTRP were to progress the flows from Waterbeach would be diverted to the new WWTP. This solution presents operational and capital cost efficiencies as well as lower carbon emissions due to the economies of scale of one site over two smaller sites. This is also reflected in the footprint of the site area, as the new Cambridge WWTP would only be marginally smaller (20ha rather than 22ha) if the capacity to treat flows from the Waterbeach drainage catchment were removed, whereas a separate WWTP for Waterbeach would require a significantly larger footprint.

7.5.3 A question was also raised as to whether multiple smaller new WWTPs could be located around the Cambridge drainage catchment without impacting on the Green Belt. This is not considered to be feasible as a large proportion of the drainage catchment consists of the urban area of Cambridge, in which it would be very unlikely to find suitable sites for any WWTPs due to density of highly sensitive receptors and the general lack of available land. This is demonstrated by the absence of any suitable unconstrained areas of any size identified within the urban area in Stage 1 – Initial Site Selection. The remainder of the drainage catchment comprises Green Belt (greater than 50% of the total drainage catchment area) and the rural area north of the Green Belt. Hence, if the Cambridge urban area was to be served using multiple smaller WWTPs located within the drainage catchment then there would be a high likelihood that these would also need to be located within the Green Belt. Furthermore, extensive modifications to the sewer networks in the city would be required in order to divert waste water flows to multiple new WWTPs.

7.5.4 There are a number of other benefits of a single WWTP over multiple WWTPs, which are discussed in the Initial Options Appraisal (Mott MacDonald Ltd, 2020a).

Stage 1 – Initial Site Selection

7.5.5 Several consultees have questioned the use of the Environment Agency Flood Zones 2 and 3 as absolute constraints in Stage 1 – Initial Site Selection. Flood Zones were used as a constraint in Stage 1 as it was deemed appropriate to avoid potential sites in areas with a higher risk of flooding at this stage of site selection. The NPS for Waste Water (DEFRA, 2012) indicates that flood risk should be taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk.

7.5.6 The NPS specifies that in determining an application for development consent, the decision maker should be satisfied that the Sequential Test has been applied as part of site selection. The Sequential Test 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.

7.5.7 It is noted that within the Study Area the extent of Flood Zone 3 is largely similar to Flood Zone 2 and where it is more extensive the difference is minimal. Therefore, removing Flood Zone 3 from the Stage 1 flood zones constraint would not have any material effect on the identification of unconstrained areas.

7.5.8 Consultees have also questioned why the community constraint included buffers around all individual properties rather than groups of properties or settlements. It was considered that it would not be appropriate to locate a new WWTP in proximity to any residential properties (less than 400m) as this would either result in a significant risk of amenity impacts on the occupants or the need to acquire properties for the purpose of the relocation, both of which would have a significant impact on the local community. In addition, as demonstrated in the sensitivity testing carried out at Stage 3 – Fine Screening (Mott MacDonald Ltd, 2020d), relaxing the community constraint resulted in the unconstrained areas generally expanding closer to residential areas and other community receptors. Given the significant level of concern during consultation in relation to the proximity of site areas 1, 2 and 3 to the local community, and the results of the Stage 4 community assessment, it is considered that it would not be appropriate to consider any sites even closer to residential areas or sites that would require residents to leave their homes.

7.5.9 As part of the Stage 1 process, prior to conducting the constraints mapping exercise, a search was undertaken for previously developed land and sites within the Study Area that would be suitable for the new WWTP. The Cambridge City and South Cambridgeshire Brownfield Registers were examined to search for sites of a suitable size. There were no sites on the registers that were suitable or available for the new WWTP. As part of this back checking process the registers were revisited and this continues to be the case.

Stage 2 – Coarse Screening

7.5.10 Consultees have questioned the validity of the rejection of a number of the longlisted sites at Stage 2 – Coarse Screening. The summarised comments from consultation and the responses to these are provided in Table 7.3.

Table 7.3: Rejection of site areas at Stage 2

Summary of comment	Response
Rejection of site area E was not robust for the following reasons: • Potential impact on Cottenham Point to Point Racecourse is not a valid reason for rejection • Southern boundary of the site area could be expanded allowing the WWTP to be located alongside the Racecourse.	It is considered that the rejection of the site area was robust for the following reasons: • The southern boundary of the site area is defined by Flood Zone 2 and therefore it would not be appropriate to locate a new WWTP beyond this boundary. • The size and shape of the site area is such that a new WWTP located within it would result in the need to acquire a significant area of Cottenham Point to Point Racecourse, which is considered to be an important community and recreational receptor. • Even if the loss of land from the racecourse could be accommodated, a new WWTP would result in a significant risk of odour, noise and amenity impacts on the users of this important facility, which would require extensive mitigation measures increasing cost and operational complexity.
Rejection of site area F was not valid on the basis that it encompasses the Waterbeach new town development. A new WWTP within or adjacent to the new town development should have been considered.	Site area F encompasses a large part of the proposed Waterbeach new town development, which is at an advanced stage of planning. The relocation of the Cambridge WWTP is required to unlock the existing WWTP site for residential development. It is considered to be counterproductive to suggest relocating the WWTP to a location that would

Summary of comment	Response
	impact on another major residential development in the area. The reasons behind this are similar to why a partial release of land on the existing WWTP would not be feasible, as discussed in Section 7.3.2. In addition, no other unconstrained areas suitable for a new WWTP were identified to the north of the new town development during the Stage 1 – Initial Site Selection.
Rejection of site areas based on potential impacts on PRoW was not applied consistently, as Mere Way PRoW, dissects both site areas 1 and 2 and Low Fen Drove Way PRoW borders site area 3, yet these sites were taken forward.	As discussed in the Stage 2 – Coarse Screening report (Mott MacDonald Ltd, 2020c) none of the individual 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. Therefore, potential impact on PRoW was not the sole consideration for rejecting any site area. However, it did contribute to the potential impact on the local community. For example, site areas G, K and M were assessed as having a high potential traffic or amenity impacts as well as potential impacts on PRoW. In addition, these sites performed poorly against other criteria of importance. Whereas, at Stage 2 the potential impacts on the local community for site areas 1, 2 and 3 were considered to be lower and they performed well against a number of other criteria of importance.

Stage 3 – Fine Screening

7.5.11 Several consultees questioned the validity of the rejection of site area H in Stage 3 – Fine Screening. It was suggested that an access route via Butt Lane / Milton Road and alternative location for the WWTP within the site area, would have reduced the potential impacts such that it should be have been carried forward to phase one non-statutory consultation and Stage 4 – Final Site Selection.

7.5.12 As well as the potential impact on the local community, site area H was also rejected due to the greater risk of impact on a principal aquifer, higher costs and higher carbon emissions in comparison to site areas 1, 2 and 3.

7.5.13 There is considered to be higher risk of an adverse impact on the Lower Greensand principal aquifer for site area H due to longer length of waste water transfer tunnel that would penetrate the aquifer and the need for an intermediate shaft along the route of the tunnel, which is also likely to penetrate the aquifer. Given the Environment Agency's concerns with site areas 1 and 2, this is considered a valid contribution towards site area H's rejection at Stage 3.

7.5.14 The cost of development at site area H in an unmitigated scenario was established in the affordability assessment at Stage 3. This indicated that it would be affordable with the HIF grant but would lack flexibility in the event of increasing costs. Given the results of the Stage 4 economic assessment, and the increase in cost of the development at site areas 1 and 2 due to mitigating potential impacts, it is considered that the higher costs of site area H is also a valid reason for its rejection.

7.5.15 Had an access route via Milton Road been assessed it is likely that it would have reduced the potential impact on the local community, in line with the RAG assessment for site areas 1 and 2. However, it is not considered that this would not have been a sufficient reason to carry site area H through to Stage 4 due to reasons described above. In addition, given the results of

traffic impact and access assessments in Stage 4 – Final Site Selection for site areas 1 and 2, this access route has significant constraints.

7.6 Was there any additional information revealed following completion of Stage 3 – Fine Screening that would have been considered at earlier stages?

7.6.1 The following new information came to light during the latter stages of the site selection process. All of which has been considered in the Stage 4 assessment.

Protected water rights in Horningsea

7.6.2 Consultee indicated that there are a number of private groundwater abstractions, known as protected water rights, in Horningsea and the surrounding area. Information on all protected water rights in the area was requested from the relevant district councils and this information was used in the Hydrogeological Impact Assessment to determine any potential impacts on these water users for all of the shortlisted site areas. This information has informed the Stage 4 Land and water quality assessment (see Appendix B.4).

Proposed developments (including the Greater Cambridge Local Plan Call for Sites)

7.6.3 Consultees have identified a number of proposed developments within the study area that could be affected by relocating the WWTP. Table 7.4 provides a review of whether these developments have been considered in previous stages of site selection and if not, what effect they may have had on the assessments. It is noted that all of these developments have been considered in the Stage 4 – Final Site Selection planning assessment.

Table 7.4: Proposed developments

Identified development	Response
Waterbeach New Town – in relation to the planning obligation to use Mere Way as a new cycle route into Cambridge.	The potential impact on Mere Way was considered during both Stage 2 – Coarse Screening and Stage 3 – Fine Screening. It is considered that its potential use as a new sustainable transport corridor for the Waterbeach New Town development does not influence the site selection assessments. As this would still be a recreational and transport receptor, its sensitivity to the new WWTP would not change. In addition, it has been assumed throughout site selection that disruption to Mere Way would be avoided where possible through positioning of the WWTP within the site areas.
A10 improvements between Cambridge and Ely	Potential options for improvements on the A10 were published following completion of the Stage 3 – Fine Screening assessment and therefore were not considered as part of the assessment. At least one of the options conflicts with the potential WWTP location at site area 1. However, as this potential development is at an early stage of planning and there are multiple options being consulted on, it is not considered that including this development in the Stage 2 or 3 assessments would have influenced site selection.
Cambridge Autonomous Metro (CAM)	The CWWTPR project team has been aware of the plans for CAM since the beginning of site selection. However, this scheme is still at a very early stage of planning and the route beyond Cambridge North station is yet to be determined. Therefore, it was not considered necessary to include this scheme in either of the Stage 2 or 3 assessments.
Greater Cambridge Local Plan Call for Sites	A number of promoted developments that have the potential to affect the CWWTPR proposals were announced in the call for sites in September 2020. As these promotions were not available during the previous stages of site selection, it was not possible to assess the potential impacts on CWWTPR. However, it is considered that had this information been available during Stage 2 or 3 this would not have affected the selection of site areas.

Identified development	Response
Police accommodation	The planning application for operational police accommodation and ancillary functions at land off Butt Lane south of the existing park and ride site, was not considered during Stage 2 and 3 as the planning assessment focussed on the potential impacts on proposed developments located within and adjacent to the site areas. As this potential development is greater than 400m from the site areas it was not considered to be at significant risk from the development of a new WWTP. It is noted that the proposed development is within the waste water transfer corridors for site areas 1 and 2, if one of these site areas were progressed and planning permission for the police accommodation is granted for the current application and development proceeds, the potential interaction between the two developments would be assessed during the design and EIA stages of the CWWTPR project.
Cambridge Rowing Lakes	The planning application for this scheme was withdrawn in 2018 and therefore it was not a committed development at the time of the Stage 2 and 3 site selection assessment. As such, it was not considered necessary to assess the potential impacts of this development on CWWTPR. It is noted that the proposed development is within the treated effluent transfer corridors for site areas 1 and 2, if one of these site areas were progressed and planning permission was granted for the Cambridge Rowing Lakes and development proceeds, the potential interaction between the two developments would be assessed during the design and EIA stages of CWWTPR.
Waterbeach to Cambridge Better Public Transport and Active Travel project – consultation on detailed areas of interest	The proposed areas of interest for this transport project were not available at the time of writing the Stage 2 and 3 assessments. All of the areas of interest interact with elements of the CWWTPR scheme for site areas 1 and 2. However, as this potential development is at an early stage of planning and only areas of interest are being consulted on, it is considered that including this development in the Stage 2 or 3 assessments would not have influenced site selection.

8 Conclusion

8.1.1 Based on the Stage 4 – final site selection assessment, balancing all the risks and opportunities it is considered that site area 3 represents the best performing site area overall and the greatest opportunity to deliver CWWTPR.

8.1.2 Therefore, site area 3 is selected to take forward to EIA and DCO application. It is considered that site area 3 presents the greatest opportunity to deliver a scheme that includes wider benefits, rather than seeking to solely mitigate negative impacts, contributes to Anglian Water's corporate objectives and addresses the concerns posed by the local community and stakeholders.

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Appendices

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