

Cambridge Waste Water Treatment Plant Relocation Project
Anglian Water Services Limited

Environmental Statement

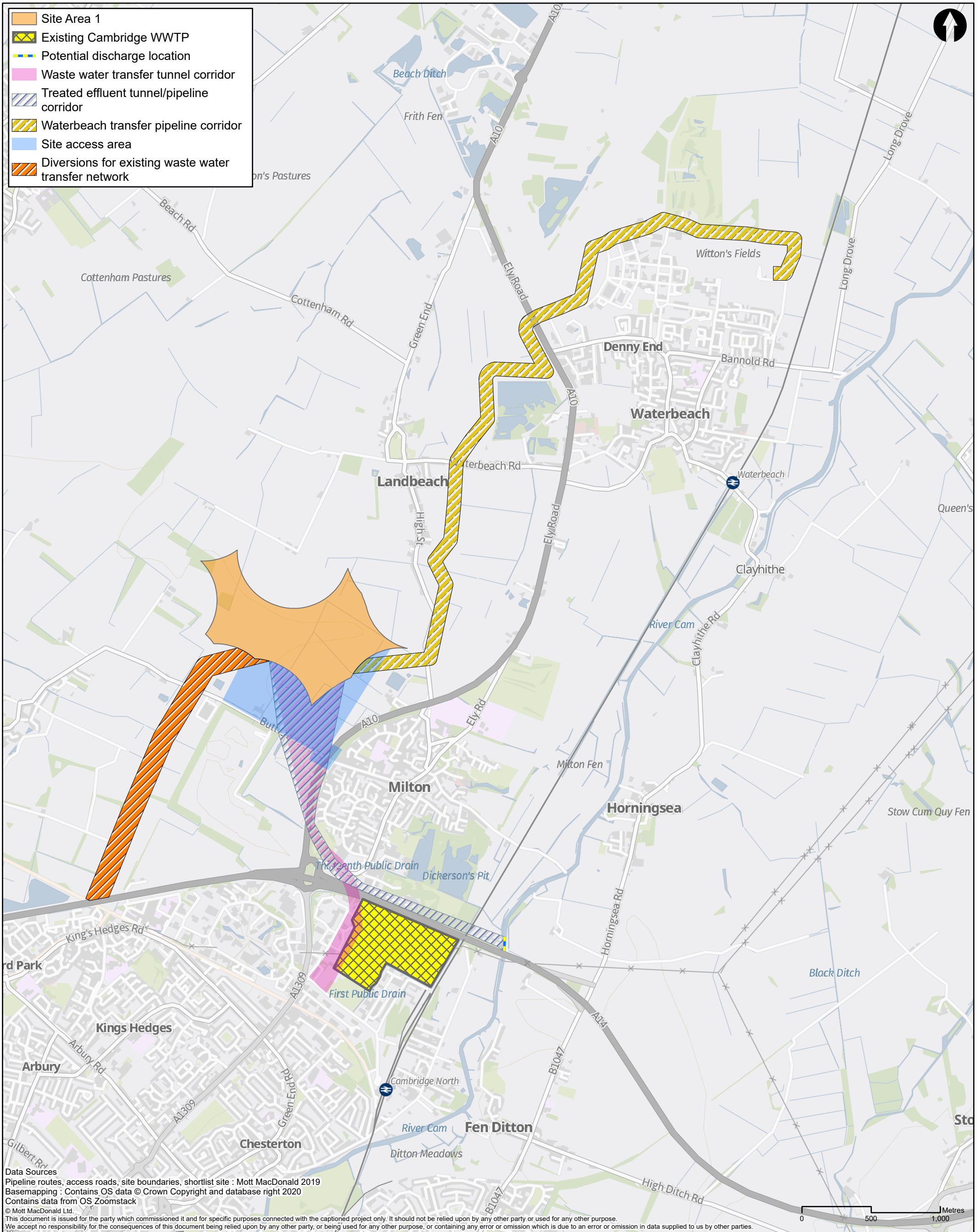
Appendix 3.5: Final Site Selection Appendices A to H

Application Document Reference: 5.4.3.5

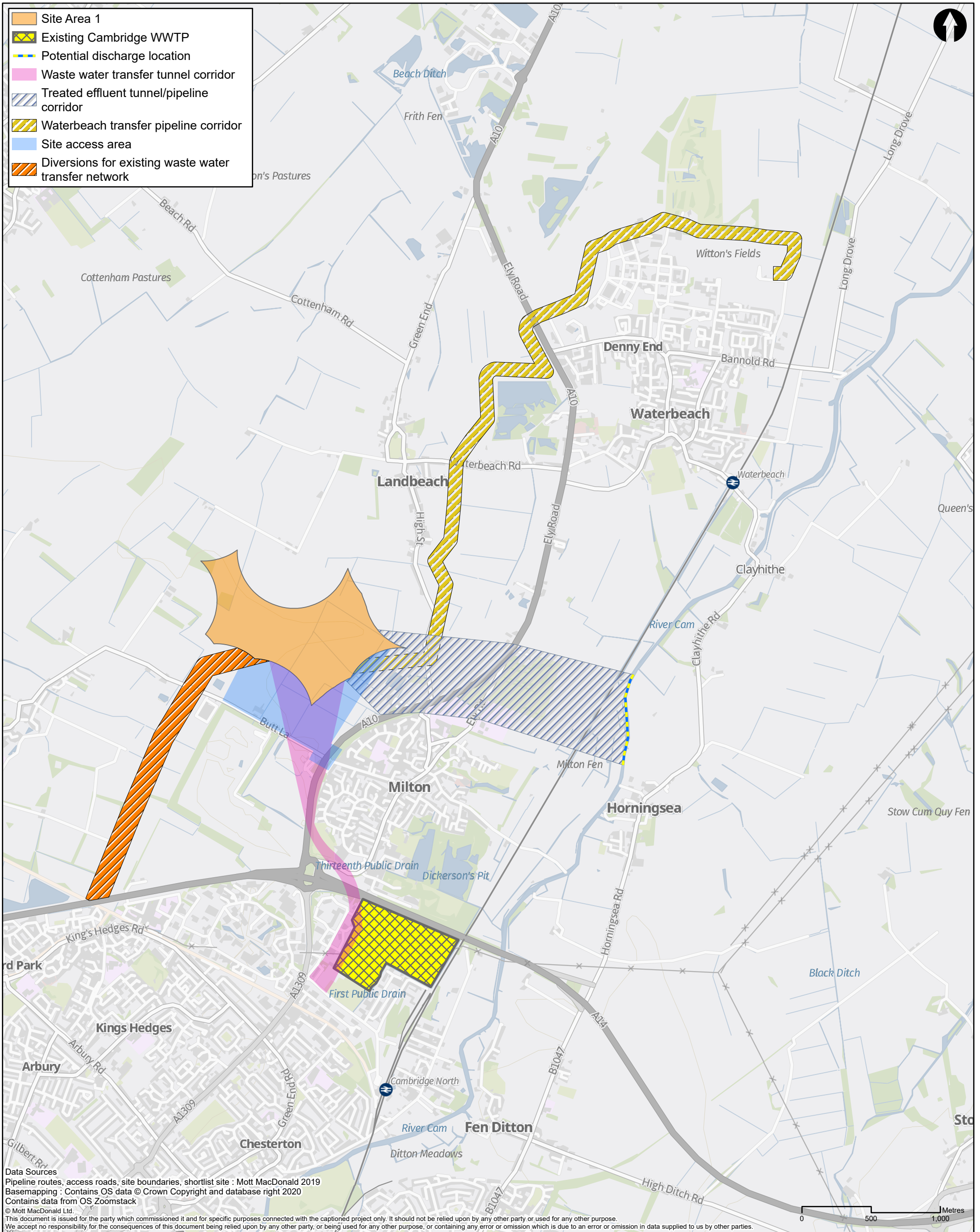
PINS Project Reference: WW010003

APFP Regulation No. 5(2)a

A. Drawings

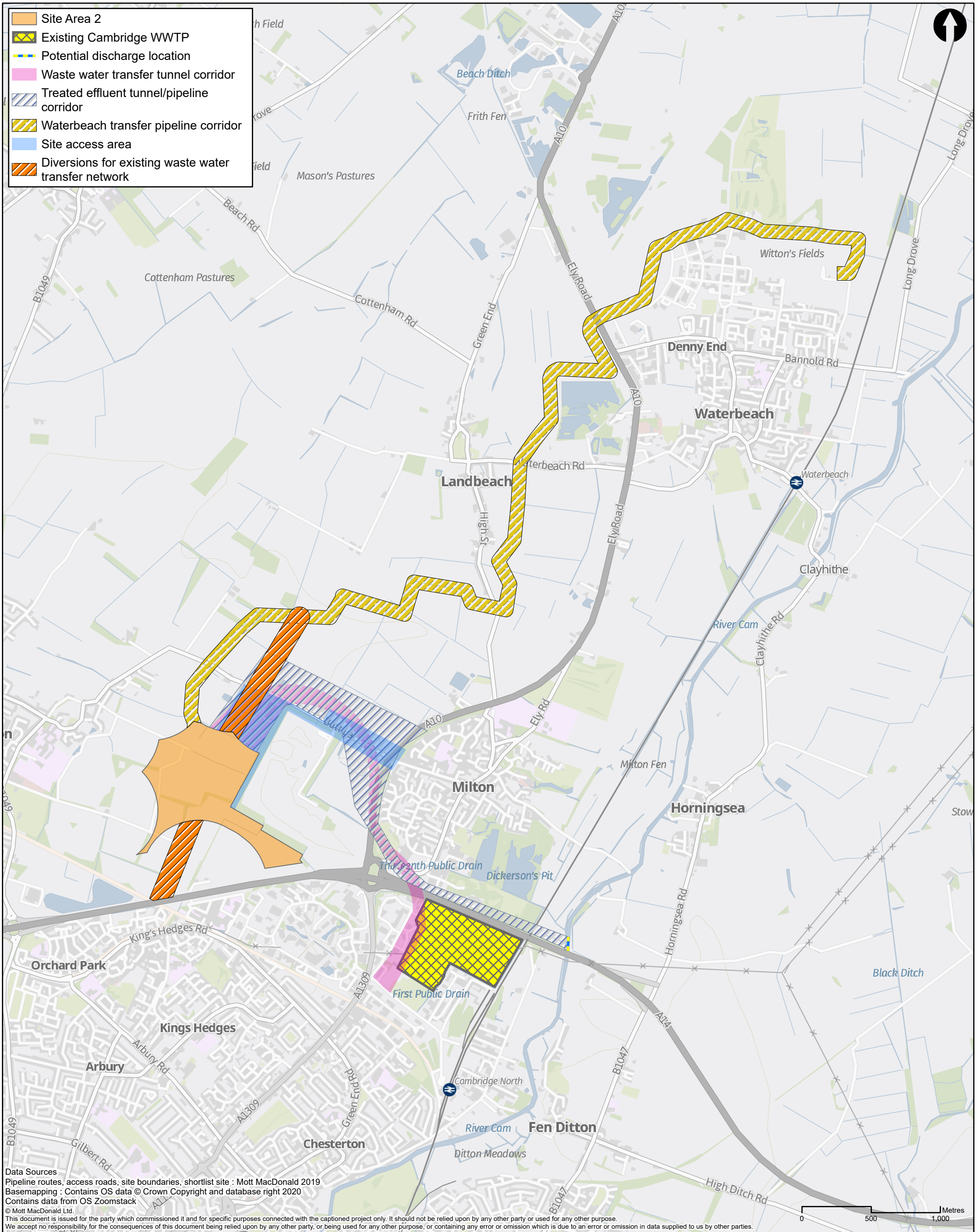


<p>MOTT MACDONALD</p> <p>22 Station Road Cambridge CB1 2JD United Kingdom</p> <p>T +44 (0)20 8774 2000 F +44 (0)20 8681 5706 W mottmac.com</p>	<p>Client</p>					<p>Title</p> <p>CWWTPR Project Stage 4 - Final Site Selection Site Area 1 - Option A</p>			Drawn	N Critten													
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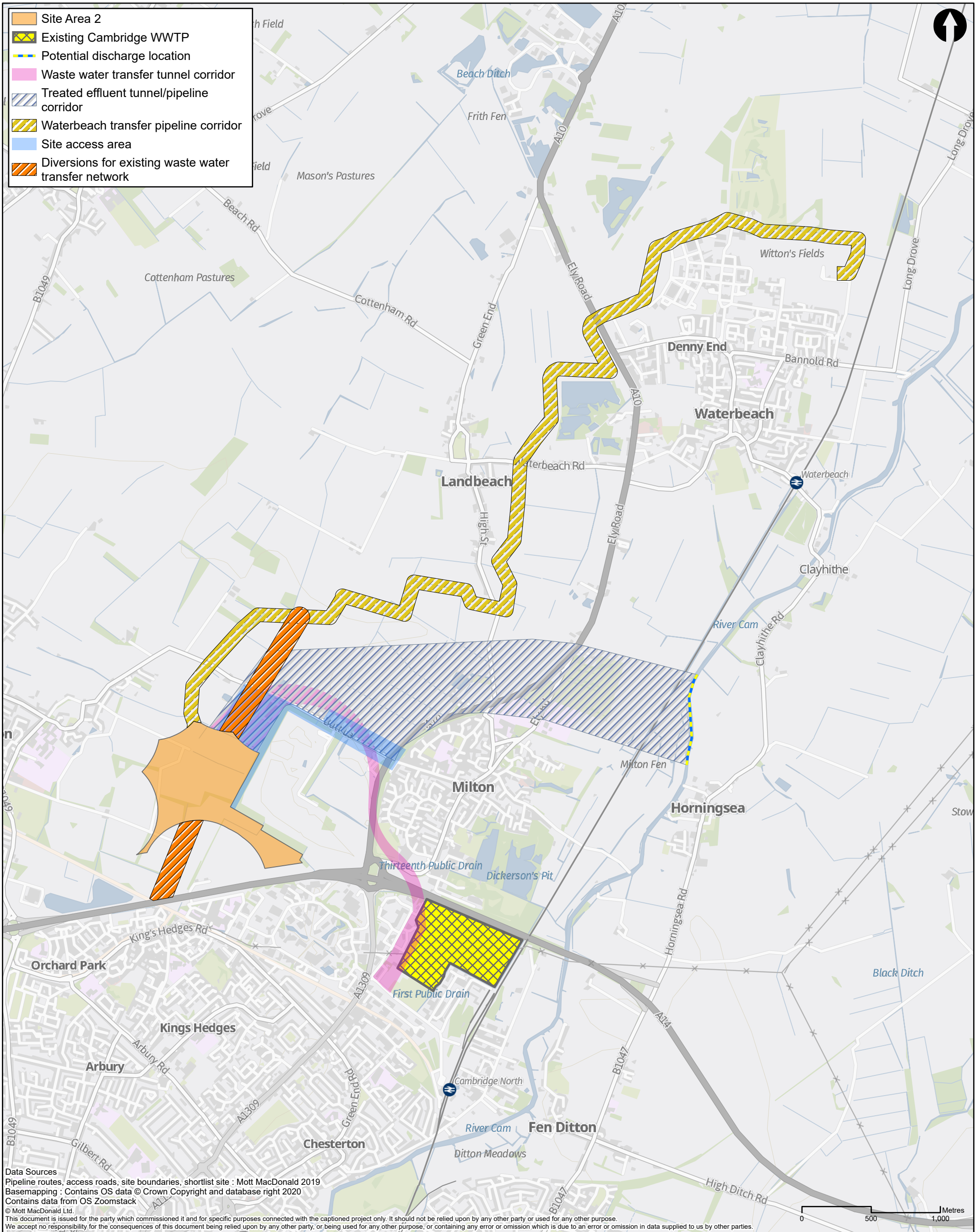


Data Sources
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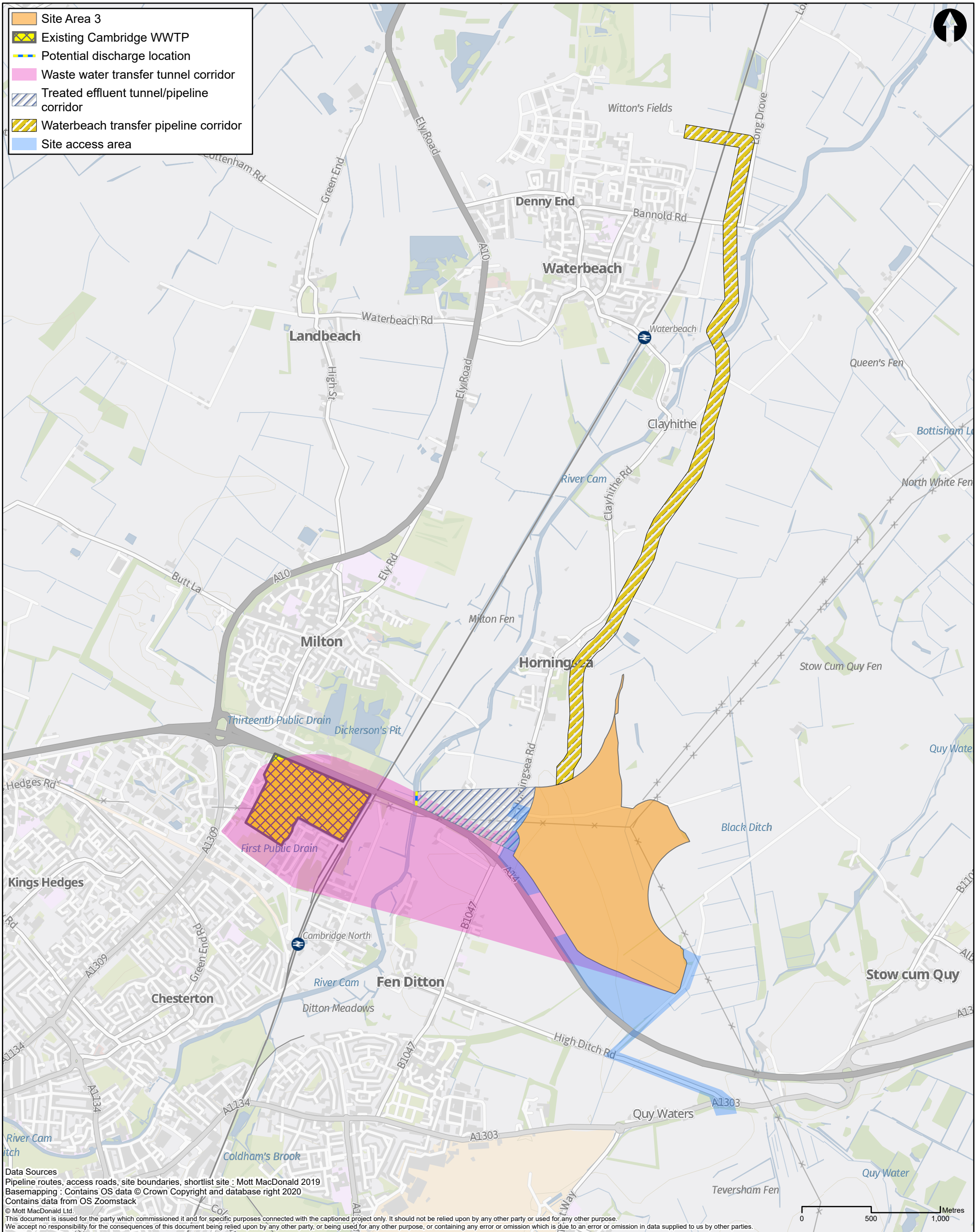
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B. Environmental assessment

This appendix comprises the assessments for the following environmental criteria:

- B.1 Nature Conservation and Biodiversity
- B.2 Landscape and visual amenity
- B.3 Historic Environment
- B.4 Land and Water Quality
- B.5 Carbon emissions
- B.6 Noise
- B.7 Air Quality
- B.8 Odour

B.1 Nature Conservation and Biodiversity

Assessment methodology

- B.1.1 For Stage 4 – Final Site Selection, an assessment was carried out to identify the potential impacts of the WWTP development on nature conservation and biodiversity within and around each of the shortlisted site areas and the corridors for the treated effluent transfer tunnel or pipeline, waste water transfer tunnel, Waterbeach transfer pipeline, potential discharge location, diversions of the existing waste water transfer network, and site access areas.
- B.1.2 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 Appraisal³⁰
- B.1.3 The following constraints were assessed:
- Ordnance survey (OS) maps, aerial imagery, and designated site citations were used to identify potential impact pathways during the construction and operation of each proposed site area and their associated corridors and access areas on:
 - all statutory designated sites within 10km Ecological Zone of Influence (EZol); and
 - all non-statutory designated sites within a 5km EZol.
- B.1.4 Pathways identified were generally natural routes for wildlife migration, such as hedgerows, woodland or watercourses, but also included a review of potential hydrological and air quality connections. Sites of Special Scientific Interest (SSSI) impact risk zones³¹ were also reviewed. Where the designated site is within 500m of the WWTP development, it was considered that increased levels of noise, vibration, light and vehicular movement during construction could lead to habitat disruption and species displacement (i.e. potential for impact and effects due to proximity despite lack of physical pathway).
- Use of aerial imagery, Master Map (OS high detail base mapping to determine Phase 1 habitats), and Natural England's open source data set for Priority Habitat Inventory³² to assess broad habitat types and to identify the presence of Habitats of Principal Importance (HPI; listed under Section 41 of the Natural Environment & Rural Communities (NERC) Act 2006), local Biodiversity Action Plan (LBAP) habitats³³, and ancient woodland inventories within each of the indicative proposed site areas and their associated corridors and access areas.
 - Use of the extended Phase 1 habitat survey data, which mapped and identified broad habitat types in accordance with the Joint Nature Conservation Committee (JNCC) Handbook for Phase 1 Habitat Survey³⁴ within 100m of the scheme extent. The Phase 1 habitat survey was undertaken between July and November 2020. The October and November 2020

³⁰ CIEEM Guidelines for Preliminary Ecological Appraisal, second edition, December 2017, <https://cieem.net/wp-content/uploads/2019/02/Guidelines-for-Preliminary-Ecological-Appraisal-Jan2018-1.pdf>

³¹ Natural England (2019) Natural England's Impact Risk Zones for Sites of Special Scientific Interest, (For use by Local Planning Authorities to assess planning applications for likely impacts on SSSIs/SACs/SPAs & Ramsar sites and determine when to consult Natural England), The Impact Risk Zones (IRZs) are a GIS tool developed by Natural England to make a rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts. The IRZs also cover the interest features and sensitivities of European sites, which are underpinned by the SSSI designation and "Compensation Sites", which have been secured as compensation for impacts on European/Ramsar sites. Available online: https://magic.defra.gov.uk/Metadata_for_magic/SSSI%20IRZ%20User%20Guidance%20MAGIC.pdf

³² <https://data.gov.uk/dataset/4b6ddab7-6c0f-4407-946e-d6499f19fcde/priority-habitat-inventory-england>

³³ Cambridgeshire and Peterborough Biodiversity Group, (2020). Priority Species and Habitats. Available online: <http://www.cbiodiversity.org.uk/habitats>

³⁴ JNCC (2010) Handbook for Phase 1 Habitat Survey, A Technique for Environmental Audit. Available online: <https://data.jncc.gov.uk/data/9578d07b-e018-4c66-9c1b-47110f14df2a/Handbook-Phase1-HabitatSurvey-Revised-2016.pdf>

habitat surveys were completed outside the recommended season for Phase 1 habitat surveys, which is April to September (in accordance with the JNCC Handbook for Phase 1 Habitat Survey). However, most of the survey coverage was completed during the optimal season (July-September) and sub-optimal surveys were completed when vegetation was still visible to undertake an assessment of habitat types and a suitable species list was recorded.

- Protected and notable species recorded within a 5km EZoI around each of the proposed site areas. Data³⁵ provided by Anglian Water were used to identify species (flora and fauna) with one or more of the following designations, records are provided in Appendix H. The desk study records were considered historic if they are more than 10 years old and unlikely to provide relevant information to inform the baseline for the assessment:
 - Species of Principal Importance (SPI) in England for the Conservation of Biodiversity listed under Section 41 of the Natural Environment & Rural Communities (NERC) Act 2006;
 - LBAP species; Cambridgeshire and Peterborough Biodiversity Partnership, have developed their own local list of SPI, which are selected based upon the National Biodiversity Action Plan which is now known as the "UK Priority Habitats and Species" and the LBAP list of species available from the Cambridgeshire and Peterborough Biodiversity Group website³.
 - Species listed on the schedules of the Wildlife and Countryside Act, 1981 (as amended);
 - Red List species that are designated as "Nationally rare" (i.e. occurring in 15 or fewer hectads in Great Britain) or "Nationally scarce" (i.e. occurring in 16-100 hectads in Great Britain), excluding rare species qualifying under main IUCN criteria.
- Data collected during the extended Phase 1 habitat survey, which covered features of potential significance for protected or notable species and were recorded as target notes. These included habitats of potential significance to support protected species and or evidence of presence such as field signs.
- Use of Defra's MAGIC website to review historical European Protected Species (EPS) licence applications within 5km of the site areas (see Appendix H).
- The review of great crested newt (GCN) environmental DNA (eDNA) pond surveys for district level licensing, and GCN Class licence survey returns within a 0.5km EZoI around each of the proposed site areas and their associated corridors and access areas. This assessment was conducted because there is Natural England open source data for GCN unlike for other EPS. This included, where required an assessment of the likelihood of GCN being present within a 0.5km EZoI around each of the proposed site areas and their associated corridors and access areas if records were absent. Ordnance Survey maps and aerial imagery were used to assess the extent of potential GCN habitats within 0.25km of the indicative site areas and their associated corridors and access areas.
- Green infrastructure strategies or initiatives and other biodiversity opportunities were also reviewed.

B.1.5 The RAG definitions provided in Table B.1 were defined to assess the potential ecological constraints for each of the three shortlisted site areas (1, 2 and 3).

B.1.6 Finally, the RAG scores for the individual components of the Stage 4 Final Site Selection were combined to provide an overall assessment of the potential ecological constraints at each of the proposed site areas. The overall RAG rating corresponds to the highest level of risk across the components of the assessment.

³⁵ This data was limited to 5km around the site area boundaries only.

Table B.1: Nature conservation and biodiversity RAG definitions

Potential ecological constraint	Green	Amber	Red
<p>Impact pathways between proposed site areas, their associated corridors and access areas and statutory / non-statutory designated sites</p> <ul style="list-style-type: none"> – all statutory designated sites within 10km EZol; – all non-statutory designated sites within a 5km EZol. 	<p>No national, regional or local designations likely to be adversely affected, or effect likely to be positive. i.e. no pathways from proposed site areas and their associated corridors and access areas.</p>	<p>Designation of regional or local importance likely to be adversely affected, i.e. a pathway from the proposed site areas and their associated corridors and access areas was identified e.g. County Wildlife Sites and City Wildlife Sites (CWS). Site option within SSSI impact risk zone for a relevant construction category and there is potential for a likely significant effect. If effects are judged likely or uncertainty exists at this stage without further work and or consultation, a precautionary approach will be applied.</p>	<p>National and/or international designated sites likely to be significantly adversely affected, i.e. potential impact pathway from indicative proposed site areas and their associated corridors and access areas e.g. Ramsar, Special Area Conservation (SAC), SSSIs, Local Nature Reserves (LNRs). Site option within SSSI impact risk zone for a relevant construction category and there is likely to be a significant effect. If effects are judged likely or uncertainty exists at this stage without further work and or consultation, a precautionary approach will be applied.</p>
Habitat types	<p>No Habitats of Principal Importance (HPI) within the proposed site areas. HPI within associated corridors and access areas. Habitats present considered unlikely to support protected species. Potentially suitable habitat and or evidence of protected species found within the associated corridors and access areas.</p>	<p>HPI within site areas, including the indicative WWTP footprint. Ancient woodland (AW) within 5km of the proposed site areas and their associated corridors and access areas. Potentially suitable habitat and or evidence of protected species found within the site areas.</p>	<p>Ancient woodland within the site area and their associated corridors and access areas.</p>
Protected and notable species recorded within 5km of the shortlisted site areas EZol	<p>Confirmed records of notable species without specific legal protection (e.g. nationally rare or nationally scarce) recorded within indicative WWTP boundary or within a 0.5km EZol of the site areas; and/or Confirmed records of EPS within 1.0km – 5.0km of the site areas.</p>	<p>Confirmed records of protected species (e.g. SPI and species listed on the Wildlife and Countryside Act 1981) within a 5.0km EZol of the indicative WWTP boundary; Confirmed presence of badger setts outside of the indicative WWTP footprint, but inside the site area; Confirmed records of EPS species within 0.5km – 1.0 km of the indicative WWTP boundary.</p>	<p>Confirmed records of protected species (e.g. SPI and species listed on the Wildlife and Countryside Act 1981) within the site area; Confirmed presence of badger setts within the indicative WWTP footprint; Confirmed records of EPS species within the site area, associated corridors and access areas or within a 0.5km EZol of the indicative WWTP boundary.</p>

Potential ecological constraint	Green	Amber	Red
Records of GCN and potential for site areas and their associated corridors and access areas to support GCN	<p>No GCN recorded within the site areas and their associated corridors and access areas or within a 0.5km EZoI; and</p> <p>Lack of suitable GCN habitat within the site areas and their associated corridors and access areas or within 0.5km.</p>	<p>GCN recorded between 0.25km and 0.5km of the indicative corridors and access areas EZoI; and</p> <p>Identification of habitat within the indicative proposed site areas and their associated corridors and access areas or within a 0.5km EZoI that has the potential to support GCN (e.g. ponds, ditches, drainage network).</p>	<p>GCN recorded within the site areas and their associated corridors and access areas or within a 0.25km EZoI.</p>
Landscape scale initiatives (green infrastructure strategies or initiatives)	<p>No proposed or confirmed green infrastructure strategies or initiatives within the proposed site areas and their associated corridors and access areas.</p>	<p>Proposed or confirmed green infrastructure strategies or initiatives adjacent to the proposed site areas and their associated corridors and access areas and or within the associate corridors and access areas.</p> <p>Proposed green infrastructure strategies or initiatives within the proposed site areas and their associated corridors and access areas.</p>	<p>Confirmed green infrastructure strategies or initiatives within the proposed site areas and their associated corridors and access areas.</p>

Assessment of unmitigated options

- B.1.7 A summary of the unmitigated assessments for nature conservation and biodiversity and the resulting RAG scores for each option are provided below. The full assessment tables are provided in Appendix H.
- B.1.8 Maps of the features discussed in the following assessment are provided in the Drawings section at the rear of Appendix B.1. These are as follows:
- 409071-MMD-00-XX-GIS-Y-0455 Statutory designated nature conservation sites considered within the assessment
 - 409071-MMD-00-XX-GIS-Y-0456 Non-statutory designated nature conservation sites considered within the assessment
 - 409071-MMD-00-XX-GIS-Y-0457 – Legend for Phase 1 habitat survey maps, listed below
 - 409071-MMD-00-XX-GIS-Y-0458 Results of the extended Phase 1 habitat survey for site area 1 and associated infrastructure corridors
 - 409071-MMD-00-XX-GIS-Y-0459 Results of the extended Phase 1 habitat survey for site area 2 and associated infrastructure corridors
 - 409071-MMD-00-XX-GIS-Y-0460 Results of the extended Phase 1 habitat survey for site area 3 and associated infrastructure corridors
 - 409071-MMD-00-XX-GIS-Y-0461 All ponds and water bodies within 250m of the site areas and associated infrastructure corridors

Site area 1

Designated sites

- B.1.9 There are two statutory designated sites of international importance that are relevant to the assessment. Site area 1 is within 10km of Wicken Fen Ramsar site and Fenland SAC. The Ramsar and SAC share the same site boundary and are also designated as a SSSI and NNR (under the name Wicken Fen). The following potential impact pathways have been identified and will be subject to a Stage 1 Screening Habitat Regulations Assessment (HRA) for the Ramsar and SAC to determine likely significant effects (LSE):
- Discharge³⁶: no discharge risk is anticipated from site area 1 during operation as there will be no waste water discharged to ground or surface water; it will be treated and transferred to the discharge point on the river. Potential impacts during operation of the WWTP development, for example due to excessive variations in discharge, or discharge of effluent of an unacceptable quality to the River Cam, will be controlled by engineering features and operational practices included in the design and management of the scheme. An improvement in the quality of the effluent discharge is foreseen as a consequence of operating the new WWTP, although inclusion of the effluent discharge from the WWTP at Waterbeach would increase the proportion of effluent in the river upstream of Waterbeach. Overall, however, an improvement in water quality is anticipated throughout the River Cam

³⁶ Includes discharge of treated effluent and waste of more than 20m³/day to surface water of the River Cam. Any discharge of water or liquid waste that is discharged to ground (i.e. to seep away) or to surface water, such as a beck or stream (NB This does not include discharges to mains sewer which are unlikely to pose a risk at this location) - Description may vary to specify volume thresholds for discharges or to include discharges to main sewer. Most foul water is removed from a development site by a mains sewer. Where this is not the case, foul water is usually treated on site and then discharged either to ground to filter away from the site, or into a nearby watercourse. If the treated water flows towards a SSSI, it has the potential to impact on water quality sensitive features.

downstream of the outfall from the existing WWTP. As a result, no special mitigation measures are likely to be needed for these downstream sites.

- All general combustion processes³⁷: potential for air quality impact on designated site qualifying features. The WWTP development will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby ecological receptors. The WWTP will comply with environmental permitting regulations, as required, and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect.

B.1.10 Site area 1 falls within the impact risk zones of seven SSSIs, one NNR (Wicken Fen), and one LNR (Worts Meadow) that are of potential relevance to the assessment. However, there are no anticipated LSE from either construction of the WWTP or associated infrastructure and this is detailed in Appendix H. Potential impacts from discharge and combustion will be controlled as detailed in the two bullet points above under Section B.1.9. Consideration was given to the SSSIs downstream of the potential discharge locations at Options A and B. For example, the Cam Washes SSSI, which is approximately 7.1km from Option A and 5.6km from Option B. The Cam Washes SSSI is highly dependent on surface water and is subject to winter flooding. During construction, there is potential for pollution or discharge of sediment-laden water to the River Cam, which could affect downstream sites. During operation, treated water that flows towards the SSSI has the potential to impact on water quality sensitive features. However, any significant adverse impacts will be avoided either by standard mitigation measures included in a Construction Environmental Management Plan (CEMP) or in the scheme design. Potential impacts during operation of the scheme, for example due to excessive variations in discharge, or discharge of effluent of an unacceptable quality, will be controlled by engineering features and operational practices included in the design and management of the scheme. An improvement in the quality of the effluent discharge is foreseen as a consequence of operating the new WWTP, although inclusion of the effluent discharge from the WWTP at Waterbeach would increase the proportion of effluent in the river upstream of Waterbeach. Overall, however, an improvement in water quality is anticipated throughout the River Cam downstream of the outfall from the existing WWTP. Comparison of existing river quality with the prediction of quality resulting from operation of the new WWTP will be the subject of a separate assessment. As a result, no special mitigation measures are likely to be needed for this downstream site. Furthermore, the effluent outfall and any watercourse crossings will be designed to maintain flows at current levels and have no significant impact on flooding.

B.1.11 There is the potential for impact on three non-statutory designated sites, referred to as CWSs:

- Cottenham Moat CWS: although there is no obvious direct surface water connection evident from OS mapping and the moat is shown by British Geological Survey (BGS) to be located on Kimmeridge Clay, the CWS is adjacent to the contact with the aquifer known as lower Greensand outcrop, which overlies the Kimmeridge Clay. It is possible, therefore, that a connection might exist between the moat and the lower Greensand aquifer. Potential impacts of temporary dewatering in the lower Greensand aquifer during shaft construction may need to be considered at this CWS, which supports GCN.
- Milton Road Hedgerows City Wildlife Site (CWS): this site is on the boundary of the waste water transfer tunnel. There is potential for habitat loss from construction.

³⁷ Includes: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/combustion - Description may vary to specify thresholds for energy input. Emissions from combustion can cause air pollution affecting the habitats and species on SSSIs. More than 500m away from a SSSI, only combustion processes over a certain minimum size are likely to have an impact. A very large project and could cause air pollution on SSSIs up to 10km away.

- River Cam CWS: there is potential for habitat loss on the banks of the River Cam due to the treated effluent transfer tunnel or pipeline and discharge location.

Habitats

- B.1.12 There are no HPI within the indicative WWTP footprint. There are HPI within site area 1 and its associated infrastructure corridors and access areas. These include deciduous woodland HPI (c 1.5ha is within the site area, with other stands falling within the treated effluent transfer tunnel or pipeline and waste water transfer tunnel), floodplain grazing marsh HPI (which fall within the treated effluent transfer tunnel or pipeline and Waterbeach transfer pipeline), and traditional orchard HPI (a stand is present within the treated effluent transfer tunnel or pipeline and waste water transfer tunnel).
- B.1.13 There is more deciduous woodland HPI within site area 1 Option A (6.4ha) than Option B (3ha), whereas there is more floodplain grazing marsh HPI within site area 1 Option B (9.8ha) than Option A (3.5ha).
- B.1.14 There is 2.5km species-rich hedgerow (0.4km is present within the site area 1) and 7.9km species-poor hedgerows (1km within the site area 1, of which 0.4km falls within the indicative WWTP footprint) in site area 1 Option A. Whereas, the total length of hedgerows in site area 1 Option B includes 4km species-rich hedgerow and 8.8km species-poor hedgerow.
- B.1.15 Habitats recorded from the extended Phase 1 habitat survey were dominated by arable land within site area 1 (55.8ha). The arable land was used for polytunnels, which were positioned over entire fields. However, habitats also included 1.5ha of broadleaved plantation woodland (falls within the same area as the deciduous woodland HPI referenced above), 3km line of scattered broadleaved trees, 7.4ha semi-improved grassland, 2km of dry ditch, as well as small areas of improved grassland and amenity grassland within the site area 1. Within the indicative WWTP footprint there is 19.3ha of arable land, 2.7ha of semi-improved grassland, small areas of amenity grassland and hardstanding, and 1.7km line of scattered broadleaved trees, and a small section of dry ditch with a larger length of 0.7km standing water within a wet ditch.
- B.1.16 The habitats within the site area, infrastructure corridors and access areas have the potential to support protected species including bats, badgers, barn owls, breeding birds, terrestrial invertebrates for woodland habitats; breeding birds and reptiles for grassland habitats; water voles, otters, GCN, aquatic invertebrates, spined loach for wetland habitats. Ecological site walkover surveys including Phase 1 habitat surveys and scoping surveys to identify the potential for protected species are ongoing and the results will be provided in a Preliminary Ecological Appraisal report.

Protected and notable species

- B.1.17 There are GCN records within 0.25km of the Waterbeach transfer pipeline and the diversion of the existing waste water transfer network. There are no records within the site area or within 0.5km of the boundary.
- B.1.18 There are 13 waterbodies (ditches) within site area 1, of those three are within the indicative WWTP footprint. Five of the 13 ditches had some standing water present at the time of the survey visit in August 2020 and will require further surveys to determine the presence or likely absence of GCNs. It is possible that the eight ditches recorded as dry at the time of the survey visit in August 2020 may be wet during the spring months. There are no ponds within site area 1 and only two within 0.25km of site area 1 Option A. These two ponds will require further surveys to determine the presence or likely absence of GCNs. There is suitable terrestrial habitat for GCN within site area 1.

- B.1.19 Ecological site walkover surveys including Habitat Suitability Index (HSI) assessment surveys to identify the potential for waterbodies to support GCN are ongoing and the results will be provided in a Preliminary Ecological Appraisal report.
- B.1.20 No badger setts were recorded within the indicative WWTP footprint. However, there is a possible outlier and subsidiary badger sett in site area 1. There is one active main badger sett (bedding, footprints and spoil present) adjacent to the site area 1. Further detailed badger surveys will be required to survey for additional setts and to inform the requirement for avoidance and mitigation strategies.
- B.1.21 The indicative WWTP footprint has potential to support reptiles on the boundary of the site due to the grassland habitats and the presence of suitable refugia. All three common species of reptile have been recorded within 5km of the scheme boundary.
- B.1.22 Site area 1 has the potential to support breeding birds in the hedgerows and scattered broadleaved tree line such as SPI farmland bird species and Schedule 1 bird species (e.g. quail, red kite, hobby, and barn owl). The tree line may have potential roosting features for barn owl, which have been recorded within 5km of the scheme boundary. Other Schedule 1 bird species have also been recorded within 5km of the scheme boundary, such as hobby. These habitats are also of high suitability for commuting and foraging bats and may provide potential roosts within the trees. Breeding bird surveys will be required to survey for evidence of Schedule 1 breeding bird species and notable and rare breeding bird species. Bat surveys required will comprise preliminary bat roost assessment surveys and bat activity transect surveys.
- B.1.23 Habitats such as hedgerows and broadleaved plantation woodland (although limited in area and connectivity) across the site area 1 have the potential to support hazel dormouse. However, no records were returned within 5km of the site area 1 boundary and, therefore have been scoped out of further assessment.
- B.1.24 Further invertebrate surveys will be required along the hedgerows on Mere Way, which falls within site area 1, and the diversions of the existing waste water transfer network. Two Nationally Scarce species of flea beetles (*Podagrica fuscipes* and *Longitarsus ballotae*) along the hedgerow on Mere Way were recorded during a site visit in September 2020. Further terrestrial invertebrate surveys are also recommended for the northern extent of the Waterbeach transfer pipeline; a pond west of Milton Cemetery, Landbeach Road, a hedgerow east of the Cambridge FootGolf Centre, Ely Road, within the Option B treated effluent tunnel or pipeline; and the woodland south-west of the landfill, which is within the diversion of the existing waste water transfer network. Further invertebrate surveys will be required at site area 1 and its associated corridors³⁸.
- B.1.25 Where there is physical disturbance of the ditches to the west of the railway line within the treated effluent corridor for the site area 1 option B, and there is potential for negative impact to these habitats and aquatic species populations. Therefore, it is recommended that further surveys for fish, aquatic invertebrates, macrophytes and white clawed crayfish be required, to undertake an impact assessment and recommend suitable mitigation measures for the works.

³⁸ Please refer to the Steve Lane (2020) Scoping Survey (Invertebrates) Relocation of Waste Water Treatment Plan, Cambridge, September 2020 Report.

Landscape scale initiatives (green infrastructure strategies or initiatives)

- B.1.26 The proposed site area and associated corridors for site area 1 partially fall within the Cambridgeshire Strategic Green Infrastructure Network³⁹ (strategic network area 6 Cambridge and Surrounding Areas).
- B.1.27 The Natural England Network Enhancement Zone 1⁴⁰ falls within the Waterbeach transfer pipeline. Therefore, there are opportunities to incorporate the network enhancement zone into the landscape and ecology post-construction enhancement/habitat creation and restoration proposals. However, the Natural England Network Enhancement Zone 1 appears to relate to traditional orchard HPI west of the Waterbeach transfer pipeline. The Waterbeach transfer pipeline is likely to be restored to the baseline habitat recorded and returned to its original land use following construction. Therefore, creation of orchards within the pipeline area itself is likely to be unsuitable. However, opportunities to plant orchards within the WWTP site could be explored.

Site area 2

Designated sites

- B.1.28 Site area 2 is over 10km from Wicken Fen Ramsar and Fenland SAC and there are unlikely to be any LSE on the qualifying features from the site area 2 as a result of construction and operational activities. However, the potential impact pathway from the discharge to the River Cam is the same as site area 1 and will be subject to a Stage 1 Screening HRA to determine LSE. In addition the Waterbeach transfer pipeline and treated effluent transfer tunnel or pipeline associated with site area 2 are within 10km of the above designated sites and will be subject to a Stage 1 Screening HRA to determine LSE.
- B.1.29 Site area 2 falls within the impact risk zones of seven SSSIs, one NNR (Wicken Fen), and one LNR (2.2km from Worts Meadow) that are of potential relevance to the assessment. However, there are no anticipated LSE from either construction or operation of the WWTP or associated infrastructure.
- B.1.30 The same CWSs would be potentially affected as for site area 1 as detailed in Section B.1.11.

Habitats

- B.1.31 There are no HPI within the indicative WWTP footprint. There are HPI within site area 2 and its associated infrastructure corridors and access areas. These include deciduous woodland (of

³⁹ Cambridgeshire's Green Infrastructure Strategy has four objectives: 1. Reverse the decline in biodiversity, 2. Mitigate and adapt to climate change, 3. Promote sustainable growth and economic development, 4. Support healthy living and wellbeing. These four objectives were agreed by the Cambridgeshire Green Infrastructure Forum and supported through public consultation. They also reflect country-wide priorities as set out in 'Cambridgeshire's Vision 2007 – 2021 and the 'Cambridgeshire Quality Charter for Growth'. The Strategy is designed to assist in shaping and co-ordinating the delivery of Green Infrastructure in the County. Available online at: <https://www.cambridge.gov.uk/media/2557/green-infrastructure-strategy.pdf>
<https://www.cambridge.gov.uk/cambridgeshire-green-infrastructure-strategy#:~:text=The%20Cambridgeshire%20Green%20Infrastructure%20Strategy.now%20and%20in%20the%20future.&text=To%20promote%20sustainable%20growth%20and%20economic%20development>

⁴⁰ From a spatial dataset that describes the geographic extent and location of Habitat Networks for 18 priority habitats based primarily, but not exclusively, on the priority habitat inventory with additional data added in relation to habitat restoration-creation, restorable habitat, plus fragmentation action, and network enhancement and expansion zones. The maps are created following a standardised process that incorporates a range of data layers and identifies specific locations for a range of actions to help improve the ecological resilience for each of the habitats/habitat networks. This is the combined habita network map. The Habitat Networks (England) comprise a series of 23 individual habitat network maps for England plus a single 'Combined Habitat Networks Map' and 3 'Grouped Habitat Networks Map'. The habitat network maps seek to apply the best evidence and principles and to use the best available nationally consistent spatial data. The habitat network maps are developed around 4 distinct habitat components sets and include 4 distinct network zones where action may be undertaken to build greater ecological resilience. Land within close proximity to the existing habitat components that are more likely to be suitable for habitat re-creation for the particular habitat. These areas are primarily based on soils but in many cases has been refined by also using other data such as hydrology, altitude and proximity to the coast. This is termed the 'Network Enhancement Zone 1'. Information available at [https://naturalengland-defra.opendata.arcgis.com/datasets/fceb93850462454ab3fb5acce2be35b_0?geometry=-29.930%2C48.013%2C25.573%2C57.298](https://naturalengland.defra.opendata.arcgis.com/datasets/fceb93850462454ab3fb5acce2be35b_0?geometry=-29.930%2C48.013%2C25.573%2C57.298)

which 0.2ha is within the site area, with other stands falling within the treated effluent transfer tunnel or pipeline, waste water transfer tunnel, and site access areas), floodplain grazing marsh (which fall within the within the treated effluent transfer tunnel or pipeline and Waterbeach transfer pipeline) and traditional orchard (a stand is present within the treated effluent transfer tunnel or pipeline and waste water transfer tunnel).

- B.1.32 There is more deciduous woodland within site area 2 Option A (c 10.1ha) than Option B (c 6.2ha), whereas there is more floodplain grazing marsh within site area 2 Option B (c 9.8ha) than Option A (c 3.5ha).
- B.1.33 There is 2.7km species-rich hedgerow and (0.1km is present within the site area, of which 0.04km within the indicative WWTP footprint) and 11.3km species-poor hedgerow (1.8km within the site area, of which 0.5km within the indicative WWTP footprint) in site area 2 Option A. Whereas, the total length of hedgerows in site area 2 Option B includes 12.5km species-poor hedgerow and 4.2km species-rich hedgerow.
- B.1.34 Habitats recorded from the extended Phase 1 habitat survey were dominated by arable land within site area 2 (45.3ha). However, habitats also included 1.9ha of woodland (which included a mix of semi-natural and plantation broadleaved woodland and mixed semi-natural woodland), 4.1ha improved grassland, 3.3ha of poor semi-improved grassland, 1.1km of dry ditch, as well as small areas of scattered broadleaved trees, dense and scattered scrub, semi-improved calcareous grassland, amenity grassland, and hard standing within the site area. Within the indicative WWTP footprint there is 21ha of arable land, 0.9ha of broadleaved woodland (comprising both semi-natural and plantation and likely to be an HPI), 0.5ha of poor semi-improved grassland and 0.4km length of dry ditch.
- B.1.35 The habitats within the site area, infrastructure corridors and access areas have the potential to support protected species including bats, badgers, barn owls, breeding birds, terrestrial invertebrates for woodland habitats; breeding birds and reptiles for grassland habitats; water voles, otters, GCN, aquatic invertebrates, spined loach for wetland habitats. Ecological site walkover surveys including Phase 1 habitat surveys and scoping surveys to identify the potential for protected species are ongoing and the results will be provided in a Preliminary Ecological Appraisal report.

Protected and notable species

- B.1.36 There is a GCN record within the site area (50m east of the indicative WWTP footprint⁴¹) and within 0.25km of the Waterbeach transfer pipeline. However, there are only seven waterbodies (ditches) within site area 2, of those two are within the indicative WWTP footprint. The seven waterbodies were dry at the time of the site visit in August 2020 and, therefore unlikely to be suitable for GCN. It is possible that the seven ditches recorded as dry at the time of the survey visit in August 2020 may be wet during the spring months.
- B.1.37 There are no ponds within site area 2 and only one within 0.25km of site area 2. The pond will require further surveys to determine the presence or likely absence of GCNs. There is suitable terrestrial habitat for GCN within site area 2. site area 2 is potentially the most constrained by recorded GCN presence, although as noted in footnote 17 the record does not appear to be linked to a waterbody or pond and, therefore, if further surveys do not identify presence of GCN, it will need to be discounted based on up to date survey data. If GCN are recorded as present

⁴¹ The record is from Natural England's Open Source data set GCN Class Licence Survey Returns. However, the grid reference and X and Y coordinates do not link to a waterbody or pond and therefore it is unknown what this positive record may relate to. During the extended Phase 1 habitat surveys there were no waterbodies with standing water recorded and no ponds.

within ponds or waterbodies, mitigation and compensation for ponds or waterbodies lost due to construction as well as the potential replacement of terrestrial habitat may be required.

- B.1.38 Ecological site walkover surveys including HSI assessment surveys to identify the potential for waterbodies to support GCN are ongoing and the results will be provided in a Preliminary Ecological Appraisal report.
- B.1.39 Within the indicative WWTP footprint there are two badger setts (likely to be a main sett and an outlier sett). There is also a potential outlier sett and subsidiary badger sett within site area 2, but these are outside of the WWTP footprint. Further detailed badger surveys will be required to survey for additional setts and to inform the requirement for avoidance and mitigation strategies.
- B.1.40 The indicative WWTP footprint has the potential to support reptiles on the boundary of the site due to the grassland habitats and the presence of suitable refugia. All three common species of reptile have been recorded within 5km of the scheme boundary.
- B.1.41 Site area 2 has the potential to support breeding birds in the hedgerows, woodland and arable farmland habitats such as SPI farmland bird species and Schedule 1 bird species (e.g. quail, red kite, hobby, and barn owl). The woodland may have trees with potential roosting features for barn owl, which have been recorded within 5km of the scheme boundary. Other Schedule 1 bird species have also been recorded within 5km of the scheme boundary, such as hobby. Breeding bird surveys will be required to survey for evidence of Schedule 1 breeding bird species and notable and rare breeding bird species.
- B.1.42 There are trees within the hedgerows and woodland that have potential roosting features (PRFs), which could support roosting bats. Some of the trees are dead and others have woodpecker holes, which are likely to have high potential to support roosting bats. These habitats are also of high suitability for commuting and foraging bats. Preliminary bat roost assessments of the trees will be required to identify PRFs and determine the actual or potential presence of bats and the need for further survey and/or mitigation as well as bat activity transect surveys.
- B.1.43 Site area 2 is potentially the most suitable of the three site areas for terrestrial invertebrates due to the presence of the woodland, south-west of the landfill. However, further invertebrate surveys are required to evaluate the significance of the woodland for invertebrates.
- B.1.44 Habitats such as hedgerows and broadleaved woodland across the site area 2 have the potential to support hazel dormouse. However, no records were returned within 5km of the site area 2 boundary and, therefore have been scoped out of further assessment.
- B.1.45 Further invertebrate surveys will be required at site area 2 and its associated corridors. Further surveys will be required within the woodland, which extends west from the south-western corner of the landfill and is within the WWTP footprint and the diversion of the existing waste water transfer network. Further terrestrial invertebrate surveys are also recommended for Site 2 along the hedgerows on Mere's Way which falls within site 2 Waterbeach transfer pipeline, land within the northern extent of the Waterbeach transfer pipeline (MoD land); a pond west of Milton Cemetery, Landbeach Road, a hedgerow east of the Cambridge FootGolf Centre, Ely Road, within the Option B treated effluent tunnel or pipeline.
- B.1.46 Where there is physical disturbance of the ditches to the west of the railway line within the treated effluent corridor for the site area 2 option B, and there is potential for negative impact to these habitats and aquatic species populations. Therefore, it is recommended that further surveys for fish, aquatic invertebrates, macrophytes and white clawed crayfish be required, to undertake an impact assessment and recommend suitable mitigation measures for the works.

Landscape scale initiatives (green infrastructure strategies or initiatives)

- B.1.47 The proposed site area and associated corridors for site area 2 partially falls within the Cambridgeshire Strategic Green Infrastructure Network (strategic network area 6 Cambridge and Surrounding Areas).
- B.1.48 The Natural England Network Enhancement Zone 118 falls within the Waterbeach transfer pipeline. Therefore, there are opportunities to incorporate the network enhancement zone into the landscape and ecology post-construction enhancement/habitat creation and restoration proposals. However, the Natural England Network Enhancement Zone 1 appears to relate to traditional orchard HPI west of the Waterbeach transfer pipeline. The Waterbeach transfer pipeline is likely to be restored to the baseline habitat recorded and returned to its original land use following construction. Therefore, the creation of orchards within the pipeline area is likely to be unsuitable. However, opportunities to plant orchards within the WWTP site could be explored.

Site area 3

Designated sites

- B.1.49 Site area 3 is within 10km of three statutory designated sites of international importance that are relevant to the assessment (Wicken Fen Ramsar and Fenland SAC) as detailed in the sections above for site areas 1 and 2 (Sections B.1.9 and B.1.28) and Devils Dyke SAC. In addition to the potential impact pathways identified for site area 1 in Section B.1.9 onwards, site area 3 option includes the crossing of the River Cam for the Waterbeach transfer pipeline. Although there are unlikely to be any LSE on the qualifying features, the development proposals will also be subject to a Stage 1 Screening HRA to determine LSE. The crossing of the River Cam by the proposed Waterbeach transfer pipeline is approximately 4.7km south from Wicken Fen Ramsar and Fenland SAC.
- B.1.50 Site area 3 is also within 10km of Devils Dyke SAC with a potential air quality impact pathway, as described for Fenland SAC in relation to site area 1 in Section B.1.9. This will be subject to a Stage 1 Screening HRA to determine LSE.
- B.1.51 Site area 3 falls within eight SSSI impact risk zones. Unlike site area 1 and 2, there are two SSSIs (Stow-cum-Quy Fen SSSI and Wilbraham Fens SSSI) within 1.4km of site area 3 and further assessment is required for these two SSSIs.
- B.1.52 Stow-cum-Quy Fen is the closest SSSI at approximately 1.1km north-east of site area 3 (1.5km from the indicative WWTP footprint). Black Ditch (an ordinary watercourse) is directly connected to the one of the water bodies within Stow-cum-Quy Fen SSSI. As a result, there is potential, without mitigation, for surface water and potentially groundwater impacts at the SSSI during construction and operation at site area 3 due to surface water or possibly seepages originating from groundwater underlying site area 3, which may discharge to Black Ditch. As a result, the discharge from site area 3 may reach at least one of the water bodies in Stow-cum-Quy Fen. However, standard mitigation measures included within a CEMP will reduce any potential surface water impact at Stow-cum-Quy Fen SSSI to a negligible level. The permanent site drainage will be designed to avoid any discharge of pollutants to Black Ditch during operation of the scheme. As a result, Stow-cum-Quy Fen SSSI should not be adversely affected by surface water discharge from the site.
- B.1.53 Consideration has also been given to the potential impacts during operation of the WWTP, due to leakage of waste water from the treatment plant, leading to contamination of groundwater in the chalk aquifer at site area 3, which could adversely affect Stow-cum-Quy Fen SSSI. Leakage of waste water from the treatment plant might result from:

- an operational failure giving rise to the short term discharge of waste water to the ground in or surrounding the WWTP; or,
- long term operation leading to deterioration and minor, undetected failures of the integrity of the plant, giving rise to leakages to drainage and groundwater.

- B.1.54 Either mechanism could result in the contamination of groundwater in the Chalk aquifer at site area 3. However, these risks would be taken into account fully in the robust design, protection measures and operational procedures for the WWTP. In addition, monitoring of groundwater and drainage in the area within and surrounding the WWTP could be implemented prior to and during the construction of the works, which is detailed in the mitigation section of this report (Section B.1.79). A Hydrogeological Impact Assessment⁴² (HIA) has been undertaken to further assess the potential impacts on the water 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.
- B.1.55 Wilbraham Fens SSSI is approximately 1.3km south-east from site area 3. Operational traffic may require further assessment as the vehicle movements exceed the assessment thresholds within the Environmental Protection UK and Institute of Air Quality Management guidance 'Land-Use Planning and Development Control: Planning for Air Quality' (2017). Wilbraham Fens SSSI, is within 200m of the A1303, which may be used by operational traffic and therefore further assessment may be needed to determine likely effects from vehicle emissions at this site. 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%. According to the Institute of Air Quality Management (IAQM) guidance *A guide to the assessment of air quality impacts on designated nature conservation sites*⁴³, where the change in concentration is less than 1%, the effects can be deemed to be insignificant.
- B.1.56 There are no anticipated LSE from either construction of the WWTP or associated infrastructure and this is detailed in Appendix H for the SSSIs. Potential impacts from discharge and combustion will be controlled as detailed in the two bullet points under Section B.1.9. Consideration was given to the SSSIs downstream of the potential discharge location for site 3. For example, Cam Washes SSSI, which is approximately 7.2km from the potential discharge location for site 3 and the same approach has been taken as detailed for site area 1 Option A and B (which is also the same for site area 2) in Section B.1.10.
- B.1.57 There is potential for impact on four CWSs. There is potential for habitat loss to Low Fen Drove Way Grasslands and Hedges CWS as the CWS falls partially within site area 3 and the site access areas. The potential impacts on Milton Road CWS and River Cam CWS due to the waste water transfer tunnel and treated effluent tunnel or pipeline/discharge location, respectively are the same as reported for site areas 1 and 2 in Section B.1.11. Furthermore, the Waterbeach transfer pipeline will also cross the River Cam CWS, unlike for site areas 1 and 2 where the Waterbeach transfer pipeline will not cross the River Cam.

⁴² 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

⁴³ Holman *et al* (2019) A guide to the assessment of air quality impacts on designated nature conservation sites – version 1.0, Institute of Air Quality Management, London. Available online at: www.iaqm.co.uk/text/guidance/airquality-impacts-on-nature-sites-2019.pdf

B.1.58 Impacts have also been considered on Allicky Farm Pond CWS, which is 0.6km north-east of site area 3. Like Stow-cum-Quy Fen SSSI, Black Ditch could be connected to Allicky Farm Pond, the CWS is also within Flood Zone 3 along the ditch. As a result, there is potential, without mitigation, for surface water and potentially groundwater impacts at the CWS during construction and operation at site area 3 due to surface water or possibly seepages originating from groundwater underlying site area 3, which may discharge to Black Ditch. As a result, the discharge from site area 3 may drain through the channels and affect the CWS. However, standard mitigation measures included within a CEMP will reduce any potential surface water impact at Stow-cum-Quy Fen SSSI to a negligible level. The permanent site drainage will be designed to avoid any discharge of pollutants to Black Ditch during operation of the scheme. As a result, Allicky Farm Pond CWS should not be adversely affected by surface water discharge from the site. A Hydrogeological Impact Assessment⁴⁴ (HIA) has been undertaken to further assess the potential impacts on the water environment including on Allicky Farm Pond CWS 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 Allicky Farm Pond CWS.

Habitats

B.1.59 There are no HPI within the indicative WWTP footprint or within site area 3. However, there are HPI within the infrastructure corridors and access areas associated with site area 3. These include deciduous woodland (11.7ha) within the site access areas and waste water transfer tunnel and floodplain grazing marsh (20.6ha), which falls within the waste water transfer tunnel and waterbeach transfer pipeline.

B.1.60 There is 4.4km species-rich hedgerow (the majority of which is a hedge with trees) within site area 3 (2.3km is present within the site area, of which 0.6km is within the indicative WWTP footprint) and 12.9km species-poor hedgerow within site area 3 (3.6km within the site area, of which 1.3km is within the indicative WWTP footprint).

B.1.61 Habitats recorded from the extended Phase 1 habitat survey were dominated by arable land within site area 3 (124.5ha). However, habitats also included 0.7ha of broadleaved semi-natural woodland, 1.2ha poor semi-improved grassland, 0.2ha semi-improved neutral grassland, 0.2ha improved grassland, 0.6ha amenity grassland, 4.3km of dry ditch, as well as small areas of scattered scrub, ephemeral short perennial vegetation, hardstanding, and buildings. Within the indicative WWTP footprint there is 22ha of arable land, 24m² of broadleaved semi-natural woodland, 0.1ha of amenity grassland, 0.02ha hardstanding and 1.3km length of dry ditch.

B.1.62 The habitats within the site area, infrastructure corridors and access areas have the potential to support protected species including bats, badgers, barn owls, breeding birds, terrestrial invertebrates for woodland habitats; breeding birds and reptiles for grassland habitats; water voles, otters, GCN, aquatic invertebrates, spined loach for wetland habitats. Ecological site walkover surveys including Phase 1 habitat surveys and scoping surveys to identify the potential for protected species are ongoing and the results will be provided in a Preliminary Ecological Appraisal report.

⁴⁴ 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

Protected and notable species

- B.1.63 There is a GCN record approximately 350m north of the Waterbeach transfer pipeline. There are no GCN records within the site area or within 0.5km of the boundary. There are only five waterbodies (ditches) within site area 3, none of these are within the indicative WWTP footprint. The five waterbodies were dry at the time of the site visit in August 2020 and, therefore unlikely to be suitable for GCN. It is possible that the five ditches recorded as dry at the time of the survey visit in August 2020 may be wet during the spring months. There are no ponds within site area 3 and only three within 0.25km of site area 3. The ponds will require further surveys to determine the presence or likely absence of GCN. There is suitable terrestrial habitat for GCN within site area 3, although this is limited to hedgerows and the small areas of woodland.
- B.1.64 Ecological site walkover surveys HSI assessment surveys to identify the potential for waterbodies to support GCN are ongoing and the results will be provided in a Preliminary Ecological Appraisal report.
- B.1.65 No badger setts were recorded within the indicative WWTP footprint. However, within site area 3, there is a potential subsidiary sett and outlier badger sett. Further detailed badger surveys will be required to survey for additional setts and to inform the requirement for avoidance and mitigation strategies.
- B.1.66 The indicative WWTP footprint has the potential to support reptiles on the boundary of the site due to patches of grassland and scrub, and vegetated dry ditches, and the presence of suitable refugia. All three common species of reptile have been recorded within 5km of the scheme boundary.
- B.1.67 The site has the potential to support breeding birds in the hedgerows, woodland and arable farmland habitats such as SPI farmland bird species and Schedule 1 bird species (e.g. quail, red kite, hobby, and barn owl). There is a mature tree within a hedgerow in the centre of the indicative WWTP footprint and a derelict farm outbuilding in the north-east of site area 3, which has the potential to support barn owl. Breeding bird surveys will be required to survey for evidence of Schedule 1 breeding bird species and notable and rare breeding bird species.
- B.1.68 Within the indicative WWTP footprint there are trees within the hedgerows and small woodland copse that have PRFs, which could support roosting bats. These habitats are also of high suitability for commuting and foraging bats. Preliminary bat roost assessments of the trees will be required to identify PRFs and determine the actual or potential presence of bats and the needs for further survey and/or mitigation as well as bat activity transect surveys.
- B.1.69 Habitats such as hedgerows and broadleaved woodland (although limited in site area 3) across the site area 3 have the potential to support hazel dormouse. However, no records were returned within 5km of the site area 3 boundary and, therefore have been scoped out of further assessment.
- B.1.70 Roe deer were recorded in the site area 3 during the extended Phase 1 habitat surveys and were also mentioned in the public consultation response. Roe deer are not a species of conservation concern and the construction of the WWTP will not result in a negative impact on these species. Habitat creation as part of the landscape plan will allow deer to disperse around the WWTP into the wider landscape. Therefore, deer have been scoped out of further assessment.
- B.1.71 Further invertebrate surveys will be required at site area 3 and its associated corridors. Further surveys will be required within the hedgerows which form part of the dismantled railway and Low Fen Drove Way Grassland and Hedges CWS within site area 3 and access areas and the small copse and improved grassland in the south-eastern corner of site area 3 and access

areas. The Nationally Scarce species of flea beetle *Longitarsus ballotae* was recorded at the Low Fen Drove Way Grassland and Hedges CWS. Further surveys will also be required along at least two sections of the Waterbeach transfer pipeline, that includes a section of hedge with standing dead elms and a small elm copse.

- B.1.72 Where there is physical disturbance of the River Cam CWS from the Waterbeach pipeline route and where the corridor passes through a ditch (WB 141) within site area 3, and there is potential for negative impact to these habitats and aquatic species populations. Therefore, it is recommended that further surveys for fish, aquatic invertebrates, macrophytes and white clawed crayfish be required, to undertake an impact assessment and recommend suitable mitigation measures for the works.

Landscape scale initiatives (green infrastructure strategies or initiatives)

- B.1.73 The proposed site area and associated corridors for site area 3 fall within the Cambridgeshire Strategic Green Infrastructure Network (strategic network area 6 Cambridge and Surrounding Areas) and site area 3 also falls within the National Trust's Wicken Fen Vision area⁴⁵ Target area 6.2 of the Cambridgeshire Green Infrastructure Strategy focuses on Wicken Fen and Anglesey Abbey, with one of the key objectives to "create a range of habitats, providing new sustainable opportunities for rare fenland species, securing the essential resource of water and protecting peat soils".
- B.1.74 The Natural England Network Enhancement Zone⁴⁶ falls within the waste water transfer tunnel. The Natural England Network Enhancement Zone is land that is within relatively close proximity to the Network Enhancement Zones 1 and 2, which are more likely to be suitable for habitat creation for the particular habitat (which appears to be lowland fens, lowland calcareous grassland) and helps to identify possible locations for connecting and linking up networks across a landscape. Therefore, there are opportunities to incorporate the network enhancement zone into the landscape and ecology enhancement/habitat creation and restoration proposals. However, because the waste water transfer tunnel will be underground, there will be limited impact on land above ground, except for where shafts will be constructed, which may result in areas of habitat loss.
- B.1.75 A Network Enhancement Zone is also adjacent to the north-eastern boundary of site area 3. The zone is associated with Stow-cum-Quy Fen SSSI and its lowland calcareous grassland habitats. There is an opportunity for the site area 3 post-construction habitat creation proposals to create habitats, which support the National Trust's Wicken Fen Vision and creating a green corridor through the development proposals to link with existing habitats outside of the proposed construction boundary.

Nature conservation and biodiversity unmitigated assessment

- B.1.76 Table B.2 provides a summary of the unmitigated assessment for nature conservation and biodiversity.

⁴⁵ Wicken Fen Vision area: <https://nt.global.ssl.fastly.net/wicken-fen-nature-reserve/documents/wicken-fen-vision-strategy-document.pdf>

⁴⁶ Land within relatively close proximity to the Network Enhancement Zones 1 & 2 that are more likely to be suitable for habitat creation for the particular habitat and identifying possible locations for connecting and linking up networks across a landscape. This is termed the 'Network Expansion Zone'. Information available at [https://naturalengland-defra.opendata.arcgis.com/datasets/fceb93850462454ab3fb5acce2be35b_0?geometry=-29.930%2C48.013%2C25.573%2C57.298](https://naturalengland.defra.opendata.arcgis.com/datasets/fceb93850462454ab3fb5acce2be35b_0?geometry=-29.930%2C48.013%2C25.573%2C57.298)

Table B.2: Nature conservation and biodiversity unmitigated RAG assessment results

Site area	Statutory designated sites	Non-statutory designated sites	Habitats	Protected species	GCN	Landscape scale initiatives	Overall
1	Amber	Amber	Amber	Amber	Red	Amber	Red
2	Amber	Amber	Amber	Red	Red	Amber	Red
3	Amber	Amber	Amber	Amber	Amber	Amber	Amber

Mitigation identification

Site area 1

- B.1.77 Good practice is to apply the mitigation hierarchy. That is to first avoid, mitigate and finally as the last option compensate for biodiversity losses. If compensating for losses within the development footprint is not possible or does not generate the most benefits for nature conservation, then biodiversity losses can be offset by providing gains elsewhere. This is the first principle in the Biodiversity Net Gain Good Practice Principles for Development⁴⁷
- B.1.78 The following measures are the potential avoidance, mitigation, and compensation measures that could be implemented to address the potential impacts for a WWTP development at site area 1:
- B.1.79 Statutory designated sites:
- Wicken Fen Ramsar and Fenland SAC are within 10km of site area 1. No hydrological or air quality impacts are anticipated during construction or operation. Construction activities will be controlled under a CEMP as noted in Section 1.5. During operation, there will be no waste water discharged to ground or surface water, it will be treated and transferred to the discharge point on the river. The operation of the WWTP would be subject to emission controls to meet the requirements of the Industrial Emissions Directive and an environmental permit to meet the requirements of the Urban Waste Water Treatment Directive. Therefore, following mitigation in a CEMP and permits, the WWTP is highly unlikely to result in an adverse significant effect. However, a Stage 1 Screening HRA will be completed to determine LSE. If no effect is likely, a no significant effect can be reported. If effects are likely, a Stage 2 Appropriate Assessment will be required. This will include additional scoping work including the collation of further information and mitigation measures. The scope and methods should be agreed with Natural England, and development proposals should be considered in combination with other plans and programmes. The effect on the integrity of the site will be considered and whether effects can be avoided by changes to the development, including development of mitigation measures (as required).
 - Construction activities will be controlled under a CEMP as noted in Section 1.5 to ensure there are no impacts on SSSIs, NNR, and LNRs.
- B.1.80 Non-statutory designated sites:
- Proceed with a further detailed review on the potential hydrological impact on Cottenham Moat CWS and ensure that the temporary dewatering in the lower Greensand aquifer during

⁴⁷ CIEEM, CIRIA, IEMA (2016) *Biodiversity Net Gain: Good Practice Principles for Development*. Available online: <https://cieem.net/wp-content/uploads/2019/02/Biodiversity-Net-Gain-Principles.pdf>

shaft construction does not impact on the integrity of the CWS. Depending on the source of water in the Moat and an assessment of likely impacts, mitigation may include providing an alternative water supply to the moat during dewatering but only if the assessed impact will be significant. Mitigation will therefore include ground investigation to determine if the Moat is connected to the Lower Greensand and what the source of water is, assessing the point at which a decline in water levels may adversely impact the habitat (specifically for GCN) and provide a temporary alternative water supply to the moat when levels approach a critical level.

- Avoid direct impact (i.e. habitat loss) on Milton Road Hedgerow CWS during construction by ensuring that the waste water transfer tunnel works, including the shaft positioning, are not within the CWS as well as being outside the hedgerow root protection area (RPA). If this is not possible, translocate the length of hedgerow that will be lost as a result of construction (if suitable), replant, enhance existing hedgerows and or create/plant new hedgerows.
- Avoid direct impact (i.e. habitat loss) to the habitats on the banks of the River Cam due to the treated effluent transfer tunnel or pipeline and discharge location. If this is not possible ensure the area lost is replaced through re-planting.

B.1.81 Habitats:

- The indicative WWTP footprint is positioned largely on arable land, which is also used for polytunnel farming (19.3ha). However, where possible the indicative WWTP footprint should be reconfigured to avoid the loss of the 0.3km species-poor hedge and 1.7km broadleaved scattered trees (tree line wind break on the edge of the existing polytunnel fields). If this is not possible, translocate the length of hedgerow that will be lost as a result of construction, replant, enhance existing hedgerows and or create/plant new hedgerows. Trees should be retained and protected where possible, otherwise trees must be re-planted to avoid the severance of the hedgerows and tree line. Ensure the reconfigured WWTP footprint avoids the broadleaved plantation woodland in the north-west corner of site area 1.
- Re-configure the indicative WWTP footprint to avoid the loss and severance of standing water/ditches. Any ditches crossed by the scheme should continue to provide habitat connectivity for species, which may use them. Therefore, mammal ledges may be required in culverts; if this is not possible, a separate dry passage may be required.
- Site area 1 is dominated by arable fields, which is also used for polytunnel farming (55.8ha) and semi improved grassland (7.4ha). Where possible, the indicative WWTP footprint should avoid the semi-improved grassland. Where this is not possible the landscape and ecology habitat creation plan should include the creation of species-rich grassland.
- Propose a tunnel rather than a pipeline for the treated effluent transfer to avoid and reduce the loss of deciduous woodland HPI (Option A (woodland adjacent to the A10 and A14) will result in the greater loss of woodland compared to Option B), traditional orchard HPI, and floodplain grazing marsh HPI. The floodplain grazing marsh HPI is adjacent to the River Cam in both Options A and B. A greater area is recorded in Option B, but this is because the corridor is wider than Option A. Further botanical surveys will be required to ascertain the presence of this HPI because the fields were mapped as poor semi-improved grassland in Option A and Option B as well as arable in Option B. The habitat will need to be assessed against the JNCC Coastal and Floodplain Grazing Marsh HPI description and criteria⁴⁸. The poor semi-improved grassland in Option B does appear to be grazed by sheep, it is

⁴⁸ Grazing marsh is defined as periodically inundated pasture, or meadow with ditches which maintain the water levels, containing standing brackish or fresh water. The ditches are especially rich in plants and invertebrates. Almost all areas are grazed and some are cut for hay or silage. Sites may contain seasonal water-filled hollows and permanent ponds with emergent swamp communities, but not extensive areas of tall fen species like reeds; although they may abut with fen and reed swamp communities. Habitat description available online at: <http://data.jncc.gov.uk/data/82b0a167-d19a-4a89-b987-9dba73be1272/UKBAP-BAPHabitats-07-CoastFloodGrazingMarsh.pdf>

surrounded by ditches and is also within Flood Zone 3 (having a high probability of flooding) and, therefore is likely to fall under HPI. Whereas, the field in Option A is in Flood Zone 1 (low probability of flooding). Ensure shafts are located in areas of negligible or low ecological value (i.e. avoid woodland, floodplain grazing marsh, good quality semi-improved grassland, and waterbodies).

- Translocate floodplain grazing marsh habitat and good quality semi-improved grassland in the Waterbeach transfer pipeline and re-plant post construction in the original footprint, if possible.
- Translocate species-rich hedgerows lost due to construction and plant as part of the landscape and ecology habitat creation proposals. Avoid severance and fragmentation of hedgerows and habitats. If translocation is not suitable, then the planting of new species-rich hedgerows will be required.
- Enhance and improve existing hedgerows by increasing species diversity through planting and 'planting up' defunct/gappy hedgerows.
- Locate pipelines to avoid loss of trees within hedgerows.
- Ensure planting proposals provide a biodiversity net gain (BNG) by setting aside space for habitat creation within the site area and associated infrastructure corridors. Undertake biodiversity net gain calculations following baseline habitat information collected to determine the area required for BNG. Explore further opportunities for offsite planting with landowners to strengthen mitigation.
- Habitat translocation should be the last resort and habitats should be maintained in situ as evidence shows the condition of habitats is often not retained after translocation. Translocation should not be seen as a mitigation for loss through development and may only offer partial compensation⁴⁹.

B.1.82 Protected and notable species:

- There are no ponds within site area 1 and there are no GCN records within 5km of site area 1. However, there are 13 waterbodies (ditches) within site area 1, five of which had standing water present at the time of the survey visit in August 2020. Three of the ditches are present in the indicative WWTP footprint, their HSI score varied from poor (<0.5), to below average (0.5-0.59), to average (0.6-0.69). Generally, where a HSI score of less than 0.5 (rating poor) is achieved, and inspection of the waterbody suggests that it is unlikely to support great crested newt, the waterbody can be scoped out from further surveys.
- Where possible the design should avoid the loss of ditches with standing water. Complete presence-absence surveys for GCN of suitable waterbodies (including ponds and ditches) within 250m of the WWTP development and which achieved a higher HSI rating than poor. Apply for a Natural England European Protected Species Mitigation (EPSM) licence for GCN if confirmed breeding ponds and suitable terrestrial habitat will be lost due to construction. Mitigate through the creation of new ecological ponds and terrestrial habitat creation, and the trapping, relocation and exclusion of GCN, where required to maintain the favourable conservation status (FCS) of the affected population. Where ponds supporting GCN are lost they will need to be compensated for by the creation of two ponds for each pond lost. This approach can also be used even when GCN are not recorded as biodiversity enhancement measures. The scheme is generally positioned in arable and pasture fields that are sub-optimal habitat for GCN. Therefore, it is generally considered that GCN habitat losses associated with waterbodies more than 250m from the scheme is unlikely to be significant.

⁴⁹ JNCC (2003) *A habitats Translocation Policy for Britain*. Available online at: <https://sblpublicinquiry.files.wordpress.com/2014/01/5-21-a-habitats-translocation-policy-for-britain-2003.pdf>

- Within site area 1, but outside of the indicative WWTP footprint are two potential outlier and subsidiary badger sett and one main sett outside site area 1. Further detailed badger surveys will be required to survey for additional setts and determine overall activity. Providing the indicative WWTP footprint, access roads, pipelines and or tunnels avoids the sett and there is a sufficient buffer (e.g. 30m between the development works and setts) a Natural England badger development licence is unlikely to be required. However, compensation for the loss of foraging habitat (grassland) may be required if large areas are affected by the proposal and movement around the site will need to be maintained so that badgers can disperse and continue to use setts within their territory. If the sett cannot be avoided a Natural England badger development licence will be required to legally close and destroy the sett.
- Subject to detailed water vole surveys along the stretch of the River Cam and ditches identified as having potential to support water voles, where necessary, identify the requirement for mitigation and enhancement.
- Subject to detailed otter surveys along the stretch of the River Cam, where necessary, avoid loss of holts and couches and consider disturbance impacts. Enhancement measures could include the creation of new holt.
- The hedgerows and tree line provide commuting and foraging habitat for bats. Bat activity transect surveys and static bat detector surveys will be required to determine bat activity levels, species present, how bats may be using the site, temporal distribution, and how habitats used on site are connected to habitats in the surrounding area. There will be a requirement for the provision of new hedgerows and trees to replace the loss of those within the footprint and ensure that connectivity with the surrounding network of hedgerows is maintained.
- The indicative WWTP footprint has the potential to support reptiles on the boundary of the site due to the grassland habitats and the presence of refugia. Reptile surveys will be required where there will be a significant loss of suitable habitat. If a reptile population is recorded, the translocation of reptiles may be required in areas where habitat loss cannot be avoided in order to sustain and protect the population. Translocation and mitigation would need to be covered under a method statement and agreed with the local planning authority ecologist. An on-site receptor area would be required to accommodate reptiles, otherwise an off-site receptor site would be required. If only small areas of suitable reptile habitat will be affected, it may be possible to complete the early works using habitat manipulation by progressively making the habitat unsuitable and encouraging reptiles to disperse out of the proposed works area. The creation of new species-rich grassland, ponds, mixed patchy vegetation (coarse grasses and scrub) and the provision of refuge such as log piles and hibernaculum in the new landscape and ecology proposals will provide compensation and enhancement for loss of habitat and features within the site area.
- The hedgerows, trees and field margins within site area 1 are suitable for breeding birds. Breeding bird surveys will be required. Habitat creation will need to consider these species habitat requirements, which can be partly compensated for by the planting of new hedgerows and woodlands. However, grassland habitat creation may also be required.
- Further invertebrate surveys will be required at site area 1 and its associated corridors. Further surveys will be required along the hedgerows on Mere Way, which falls within site area 1, and the diversions of the existing waste water transfer network. The invertebrate scoping visit completed in September 2020 recorded two Nationally Scarce species of flea beetles (*Podagrica fuscipes* and *Longitarsus ballotae*) along the hedgerow on Mere Way. Further terrestrial invertebrate surveys are also recommended for the northern extent of the Waterbeach transfer pipeline; a pond west of Milton Cemetery, Landbeach Road, a hedgerow east of the Cambridge FootGolf Centre, Ely Road, within the Option B treated

effluent tunnel or pipeline; and the woodland south-west of the landfill, which is within the diversion of the waste water transfer network. The following mitigation/compensation measures are recommended to maintain invertebrate communities at site area 1; avoid loss of the Mere Way hedgerow and species rich grassland. If avoidance of hedgerows at this site wasn't possible, the scheme should retain and translocate key hedgerows, dead wood and mature tree stumps into new areas of woodland habitat creation to provide habitat for terrestrial invertebrates. The habitat creation should include new pond creation, the use a combination of a tree, shrub and wildflower plant-mix to benefit invertebrates with areas of bare ground and low-fertile soil to create a species-rich sward, and open mosaic habitat.

B.1.83 Landscape scale initiatives (green infrastructure strategies or initiatives):

- The proposed site area and associated corridors fall partially within the proposed Cambridgeshire Strategic Green Infrastructure Network (strategic network area 6 Cambridge and Surrounding Areas). The Natural England Network Enhancement Zone 1 falls within the Waterbeach transfer pipeline. Therefore, there are opportunities to incorporate the network enhancement zone into the landscape and ecology post-construction enhancement/habitat creation and restoration proposals. However, the Natural England Network Enhancement Zone 1 appears to relate to traditional orchard HPI west of the Waterbeach transfer pipeline. The Waterbeach transfer pipeline is likely to be restored to the baseline habitat recorded and returned to its original land use following construction. Therefore, the creation of orchards within the pipeline area may be unsuitable. However, opportunities to plant orchards within the site area 1 proposals can be explored. Stakeholder engagement and reference to planning policy to develop green infrastructure, which benefits biodiversity will be encouraged during project development.

Site area 2

B.1.84 As detailed in Paragraph B.1.77 the mitigation hierarchy should be applied to site area 2. The following measures are the potential avoidance, mitigation, and compensation measures that could be implemented to address the potential impacts for a WWTP development at site area 2:

B.1.85 Statutory designated sites:

- Wicken Fen Ramsar and Fenland SAC are within 10km of the treated effluent transfer tunnel or pipeline and potential discharge location and Waterbeach transfer pipeline associated with site area 2. They are not within 10km of site area 2 itself. No hydrological or air quality impacts are anticipated during construction or operation. Construction activities will be controlled under a CEMP as noted in Section 1.5. During operation there will be no waste water discharged to ground or surface water, it will be treated and transferred to the discharge point on the river. The operation of the WWTP would be subject to emission controls to meet the requirements of the Industrial Emissions Directive and an environmental permit to meet the requirements of the Urban Waste Water Treatment Directive. Therefore, following mitigation in the CEMP and permits, the WWTP is highly unlikely to result in an adverse significant effect. However, a Stage 1 Screening Habitat Regulations Assessment (HRA) will be completed to determine likely significant effect. If no effect is likely, a no significant effect can be reported. If effects are likely, a Stage 2 Appropriate Assessment will be required. This will include additional scoping work including the collation of further information. The scope and methods should be agreed with Natural England, and development proposals should be considered in combination with other plans and programmes, the effect on the integrity of the site will be considered and whether effects can be avoided by changes to the development, including development of mitigation measures (if required).

B.1.86 Non-statutory designated sites:

- Proceed with a further review on the potential hydrological impact on Cottenham Moat CWS and ensure that the temporary dewatering in the lower Greensand aquifer during shaft construction does not impact on the integrity of the CWS. Depending on the source of water in the Moat and an assessment of likely impacts, mitigation may include providing an alternative water supply to the moat during dewatering, but only if the assessed impact will be significant. Mitigation will therefore include ground investigation to determine if the Moat is connected to the Lower Greensand and what the source of water is, assessing the point at which a decline in water levels may adversely impact the habitat (specifically for GCN) and provide a temporary alternative water supply to the moat when levels approach a critical level.
- Avoid direct impact (i.e. habitat loss) on Milton Road Hedgerow CWS during construction by ensuring that the waste water transfer tunnel works including shaft positioning is not within the CWS as well as being outside the hedgerow RPA. If this is not possible, translocate the length of hedgerow that will be lost as a result of construction, replant, enhance existing hedgerows and or create/plant new hedgerows.
- Avoid direct impact (i.e. habitat loss) to the habitats on the banks of the River Cam due to the treated effluent transfer tunnel or pipeline and discharge location. If this is not possible ensure the area lost is replaced through re-planting.

B.1.87 Habitats:

- The indicative WWTP footprint is positioned largely on arable land (21ha). However, the WWTP footprint should be re-configured to avoid the loss of the 0.9ha broadleaved woodland (woodland band, which extends west from the south-western corner of the landfill and provides habitat connectivity with the surrounding landscape and is likely to be a HPI) and 0.5km of species-poor hedge with trees. If this is not possible, translocate the length of hedgerow that will be lost as a result of construction, replant, enhance existing hedgerows and or create/plant new hedgerows. If woodland is lost due to construction, a larger area of woodland habitat creation should be proposed to mitigate for the loss.
- There are strips of poor semi-improved grassland around the edges of the arable fields within the WWTP footprint. This type of grassland can be more diverse, therefore where possible the grassland edge should be retained and managed to enhance species diversity around the footprint of the proposed WWTP.
- Ensure the proposed site access area avoids the loss and encroachment into 4.7ha of the deciduous woodland HPI on the boundary of the landfill site. Retaining this woodland and the woodland band, which extends west from the south-eastern corner of the landfill will also provide visual screening and maintain habitat connectivity.
- Propose a tunnel rather than a pipeline for the treated effluent transfer to avoid and reduce the loss of deciduous woodland HPI (Option A (woodland adjacent to the A10 and A14) will result in the greater loss of woodland compared to Option B), traditional orchard HPI, and floodplain grazing marsh HPI. The floodplain grazing marsh HPI is adjacent to the River Cam in both Options A and B. A greater area is recorded in Option B, but this is because the corridor is wider than Option A. Further botanical surveys will be required to ascertain the presence of this HPI because the fields were mapped as poor semi-improved grassland in Option A and Option B as well as arable in Option B. The habitat will need to be assessed against the JNCC Coastal and Floodplain Grazing Marsh HPI description and criteria. The poor semi-improved grassland in Option B does appear to be grazed by sheep, it is surrounded by ditches and is also within Flood Zone 3 (having a high probability of flooding) and, therefore is likely to fall under HPI. Whereas, the field in Option A is in Flood Zone 1

(low probability of flooding). Ensure shafts are located in areas of negligible or low ecological value (i.e. avoid woodland, floodplain grazing marsh, good quality semi-improved grassland, and waterbodies).

- Translocate floodplain grazing marsh habitat and good quality semi-improved grassland in the Waterbeach transfer pipeline and re-plant post construction in the original footprint, if possible.
- Translocate species-rich hedgerows lost due to construction and plant as part of the landscape and ecology habitat creation proposals. Avoid severance and fragmentation of hedgerows and habitats.
- Enhance and improve existing hedgerows by increasing species diversity through planting and ‘planting up’ defunct/gappy hedgerows.
- Locate pipelines to avoid loss of trees within hedgerows.
- Ensure planting proposals provide a biodiversity net gain (BNG) by setting aside space for habitat creation within the site area and associated infrastructure corridors. Undertake biodiversity net gain calculations following baseline habitat information collected to determine the area required for BNG. Explore further opportunities for offsite planting with landowners to strengthen mitigation.
- Habitat translocation should be the last resort and habitats should be maintained in situ as evidence shows the condition of habitats is often not retained after translocation. Translocation should not be seen as a mitigation for loss through development, and may only offer partial compensation⁵⁰.

B.1.88 Protected and notable species:

- There is a GCN record from Natural England’s Open Source Data Set for GCN Class Licence Survey Returns 50m east of the indicative WWTP footprint. It is unknown what pond or waterbody this record is linked to. There are seven waterbodies (ditches) within the site area 2, but they were dry at the time of the site visit in August 2020, and therefore unlikely to be suitable for GCN. There are no ponds within site area 2 and only one within 250m of the site area 2 boundary, which will require further survey. However, there is suitable terrestrial habitat on site for GCN including the woodland and hedgerows. Where possible the design should avoid the loss of suitable terrestrial habitat.
- Complete presence-absence surveys for GCN of suitable waterbodies (including ponds and ditches) within 250m of the WWTP development. Apply for a Natural England EPSM licence for GCN if confirmed breeding ponds and suitable terrestrial habitat will be lost due to construction. Mitigate through the creation of new ecological ponds and terrestrial habitat creation, and the trapping, relocation and exclusion of GCN, where required to maintain the FCS of the affected population. Where ponds supporting GCN are lost they will need to be compensated for by the creation of two ponds for each pond lost. This approach can also be used even when GCN are not recorded as biodiversity enhancement measures.
- Within the indicative WWTP footprint there are two badger setts (one potential main sett and one active outlier). There is also a potential outlier sett and subsidiary badger sett within site area 2, but these are outside of the WWTP footprint. Further detailed badger surveys will be required to survey for additional setts and determine overall activity. The indicative WWTP footprint should be reconfigured to avoid the loss of these two setts or at the very least the main sett. Licensable activities can vary depending on the machinery and development methods proposed. A licence is not required if development works (use of heavy tracked

⁵⁰ JNCC (2003) *A habitats Translocation Policy for Britain*. Available online at: <https://sblpublicinquiry.files.wordpress.com/2014/01/5-21-a-habitats-translocation-policy-for-britain-2003.pdf>

machinery) are 30m from the sett, therefore there is scope to undertake the works if a suitable buffer is provided between the development footprint and the sett. However, compensation for the loss of foraging habitat (grassland) may be required if large areas are affected by the proposal and movement around the site will need to be maintained so that badgers can disperse and continue to use setts within their territory. If the badger setts cannot be avoided a Natural England badger development licence will be required to legally close and destroy the setts. If the main sett cannot be retained, the creation of an artificial badger sett is likely to be required. If the artificial sett cannot be created adjacent to the existing main sett (or obviously within the badger clans territory), bait marking surveys may be required. Bait marking surveys is a group-based method for determining the number and arrangement of badger territories and will help determine territory exclusivity and overlap to identify where the artificial badger sett should be located.

- Subject to detailed water vole surveys along the stretch of the River Cam and ditches identified as having potential to support water voles, where necessary, identify the requirement for mitigation and enhancement.
- Subject to detailed otter surveys along the stretch of the River Cam, where necessary, avoid loss of holts and couches and consider disturbance impacts. Enhancement measures could include the creation of new holt.
- The hedgerows and woodland provide commuting and foraging habitat for bats. Bat activity transect surveys and static bat detector surveys will be required to determine bat activity levels, species present, how bats may be using the site, temporal distribution, and how habitats used on site are connected to habitats in the surrounding area. There will be a requirement for the provision of additional hedgerows and woodland to replace the loss of those within the footprint and ensure that connectivity with the surrounding network of hedgerows and woodland is maintained.
- There are trees within the hedgerows and woodland that have PRFs, which could support roosting bats. Some of the trees are dead and others have woodpecker holes, which are likely to have high potential to support roosting bats. Preliminary bat roost assessments of the trees will be required to identify PRFs and to determine the actual or potential presence of bats, and the need for further survey and/or mitigation. Mitigation and compensation will include the provision of alternative roosting habitat for bats, such as bat boxes on trees and or bat boxes on posts (dependent on roost type recorded).
- The indicative WWTP footprint has the potential to support reptiles on the boundary of the site due to the grassland habitats and the presence of refugia. Reptile surveys will be required where there will be a significant loss of suitable habitat. If a reptile population is recorded, the translocation of reptiles may be required in areas where habitat loss cannot be avoided in order to sustain and protect the population. Translocation and mitigation would need to be covered under a method statement and agreed with the local planning authority ecologist. An on-site receptor area would be required to accommodate reptiles, otherwise an off-site receptor site would be required. If only small areas of suitable reptile habitat will be affected, it may be possible to complete the early works using habitat manipulation by progressively making the habitat unsuitable and encouraging reptiles to disperse out of the proposed works area. The creation of new species-rich grassland, ponds, mixed patchy vegetation (coarse grasses and scrub) and the provision of refuge such as log piles and hibernaculum in the new landscape and ecology proposals will provide compensation and enhancement for loss of habitat and features within the site area.
- The hedgerows, woodland and field margins within site area 2 are suitable for breeding birds. Breeding bird surveys will be required. Habitat creation will need to consider these species habitat requirements, which can be partly compensated for by the planting of new hedgerows and woodlands. However, grassland habitat creation may also be required.

- Further invertebrate surveys will be required at site area 2 and its associated corridors. Further surveys will be required within the woodland, which extends west from the south-western corner of the landfill and is within the WWTP footprint and the diversion of the existing waste water transfer network. Further terrestrial invertebrate surveys are also recommended for Site 2 along the hedgerows on Mere's Way which falls within site 2 Waterbeach transfer pipeline, land within the northern extent of the Waterbeach transfer pipeline (MoD land); a pond west of Milton Cemetery, Landbeach Road, a hedgerow east of the Cambridge FootGolf Centre, Ely Road, within the Option B treated effluent tunnel or pipeline. The following mitigation/compensation measures are recommended to maintain invertebrate communities at site area 1; avoid loss of the woodland within site area 2 and Mere's Way hedgerow and species rich grassland. If avoidance of hedgerows at this site wasn't possible, the scheme should retain and translocate key hedgerows, dead wood and mature tree stumps into new areas of woodland habitat creation to provide habitat for terrestrial invertebrates. Replant woodland and ensure the habitat creation also includes new pond creation, the use a combination of a tree, shrub and wildflower plant-mix to benefit invertebrates with areas of bare ground and low-fertile soil to create a species-rich sward, and open mosaic habitat.

B.1.89 Landscape scale initiatives (green infrastructure strategies or initiatives):

B.1.90 The proposed site area and associated corridors fall partially within the proposed Cambridgeshire Strategic Green Infrastructure Network (strategic network area 6 Cambridge and Surrounding Areas). The Natural England Network Enhancement Zone 1 falls within the Waterbeach transfer pipeline. Therefore, there are opportunities to incorporate the network enhancement zone into the landscape and ecology post-construction enhancement/habitat creation and restoration proposals. However, the Natural England Network Enhancement Zone 1 appears to relate to traditional orchard HPI west of the Waterbeach transfer pipeline. The Waterbeach transfer pipeline is likely to be restored to the baseline habitat recorded and returned to its original land use following construction. Therefore, the creation of orchards within the pipeline area may be unsuitable. However, opportunities to plant orchards within the site area 1 proposals can be explored. Stakeholder engagement and reference to planning policy to develop green infrastructure, which benefits biodiversity will be encouraged during project development.

Site area 3

B.1.91 As detailed in Paragraph B.1.77 the mitigation hierarchy should be applied to site area 3. The following measures are the potential avoidance, mitigation, and compensation measures that could be implemented to address the potential impacts for a WWTP development at site area 3:

B.1.92 Statutory designated sites:

- Wicken Fen Ramsar, Fenland SAC, and Devils Dyke SAC are within 10km of site area 3. No hydrological or air quality impacts are anticipated during construction or operation. Construction activities will be controlled under a CEMP as noted in Section 1.5. During operation there will be no waste water discharged to ground or surface water, it will be treated and transferred to the discharge point on the river. The operation of the WWTP would be subject to emission controls to meet the requirements of the Industrial Emissions Directive and an environmental permit to meet the requirements of the Urban Waste Water Treatment Directive. Therefore, following mitigation in the CEMP and permits, the WWTP is highly unlikely to result in an adverse significant effect. However, a Stage 1 Screening Habitat Regulations Assessment (HRA) will be completed to determine likely significant effect. If no effect is likely, a no significant effect can be reported. If effects are likely, a Stage

2 Appropriate Assessment will be required. This will include additional scoping work including the collation of further information. The scope and methods should be agreed with Natural England, and development proposals should be considered in combination with other plans and programmes, the effect on the integrity of the site will be considered and whether effects can be avoided by changes to the development, including development mitigation measures (if required).

- Black Ditch is directly connected to one of the water bodies at Stow-cum-Quy Fen SSSI. Standard mitigation measures included within the CEMP will reduce any potential surface water and groundwater impact at Stow-cum-Quy Fen SSSI to a negligible level. The permanent site drainage will be designed to avoid any discharge of pollutants to Black Ditch during operation of the scheme. As a result, Stow-cum-Quy Fen SSSI should not be adversely affected by surface water discharge from the site. Consideration has also been given to the potential impacts during operation of the WWTP, due to leakage of waste water from the treatment plant, leading to contamination of groundwater in the chalk aquifer at site 3, which could adversely affect Stow-cum-Quy Fen SSSI. However, these risks would be taken into account fully in the robust design, protection measures and operational procedures for the WWTP. In addition, monitoring of groundwater and drainage in the area within and surrounding the WWTP could be implemented prior to and during the construction of the works. A water quality sampling programme to monitor for potential contaminants would then be agreed with the Environment Agency and implemented during the operation of the site. The sampling programme may be reviewed during the early years of monitoring in connection with the operation of the plant. However, any subsequent changes to the monitoring programme would only be made with the agreement of the Environment Agency. If any significant contamination of groundwater was detected, an immediate clean up programme would be implemented.
- Wilbraham Fens SSSI is approximately 1.3km from site area 3. 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%. Where the change in concentration is less than 1%, the effects can be deemed to be insignificant.
- Construction activities will be controlled under a CEMP as noted in Section 1.5 to ensure there are no impacts on SSSIs, NNR, and LNRs.

B.1.93 Non-statutory designated sites:

- Avoid direct (i.e. habitat loss and severance) and indirect impacts to Low Fen Drove Way Grasslands and Hedges CWS by ensuring that:
 - A sufficient habitat buffer (e.g. woodland and species-rich grassland habitat creation) is created between the WWTP footprint and CWS, and that construction works areas avoid the CWS.
 - The site access area is moved to avoid the loss of the CWS. If this is not possible, the section of hedge and grassland should be translocated and connected to the existing stretch of the CWS and or compensated for through the creation of new habitat. The access road should be positioned to run through existing gaps in the hedge and avoid trees and their RPAs to minimise the loss of trees within the hedgerow.
- Avoid direct impact (i.e. habitat loss) on Milton Road Hedgerow CWS during construction by ensuring that the waste water transfer tunnel works including shaft positioning is not within the CWS as well as being outside the hedgerow RPA. If this is not possible, translocate the

length of hedgerow that will be lost as a result of construction, replant, enhance existing hedgerows and or create/plant new hedgerows.

- Avoid direct impact (i.e. habitat loss) to the habitats on the banks of the River Cam due to the treated effluent transfer tunnel or pipeline and discharge location. If this is not possible ensure the area lost is replaced through re-planting.
- Avoid direct impact (i.e. habitat loss) to the habitats on the banks of the River Cam due to the Waterbeach transfer pipeline by tunnelling underneath the River Cam and ensuring a sufficient buffer is proposed to avoid loss of trees. If this is not possible ensure the area lost is replaced through re-planting.
- Black Ditch could be connected to the pond within Allicky Farm Pond CWS. Standard mitigation measures included within the CEMP will reduce any potential surface water and groundwater impact to a negligible level.

B.1.94 Habitats:

- The indicative WWTP footprint for site area 3 generally falls within land of low ecological value including arable land (22ha), amenity grassland (0.1ha) and hardstanding. However, the footprint could be re-configured to avoid and reduce the loss of 1.9km hedgerows (1.3km species-poor and 0.6km species-rich, which includes hedge with trees). If this is not possible, translocate the length of hedgerow (targeting species-rich) that will be lost as a result of construction, replant, enhance existing hedgerows and or create/plant new hedgerows.
- Re-configure the indicative WWTP footprint to avoid a small copse (24m²) of semi-natural broadleaved woodland in the east of the footprint. The woodland should be replanted as the last resort.
- Propose a tunnel rather than a pipeline for the treated effluent transfer to avoid and reduce the loss of hedgerows and scattered broadleaved trees. Ensure shafts are located in areas of negligible or low ecological value (i.e. avoid woodland, good quality semi-improved grassland, waterbodies).
- Ensure that the waste water transfer tunnel works including shaft positioning are located in areas of negligible or low ecological value (i.e. avoid HPI woodland, HPI floodplain grazing marsh, good quality semi-improved grassland, waterbodies).
- Translocate floodplain grazing marsh habitat and good quality semi-improved grassland in the Waterbeach transfer pipeline and re-plant post construction in the original footprint, if possible.
- Translocate species-rich hedgerows lost due to construction and plant as part of the landscape and ecology habitat creation proposals. Avoid severance and fragmentation of hedgerows and habitats.
- Enhance and improve existing hedgerows by increasing species diversity through planting on species-poor and ‘planting up’ defunct/gappy hedgerows.
- Locate pipelines to avoid loss of trees within hedgerows.
- Ensure planting proposals provide a biodiversity net gain (BNG) by setting aside space for habitat creation within the site area and associated infrastructure corridors. Undertake biodiversity net gain calculations following baseline habitat information collected to determine the area required for BNG. Explore further opportunities for offsite planting with landowners to strengthen mitigation.
- Habitat translocation should be the last resort and habitats should be maintained in situ as evidence shows the condition of habitats is often not retained after translocation.

Translocation should not be seen as a mitigation for loss through development, and may only offer partial compensation⁵¹.

B.1.95 Protected and notable species

- There are no ponds within site area 3 and there are no GCN records within 5km of site area 3. However, there are five waterbodies (ditches) within the site area 3, although none are within the indicative WWTP footprint. The five waterbodies were dry at the time of the site visit in August 2020 and, therefore unlikely to be suitable for GCN.
- There are five ponds within 250m of site area 3. Complete presence-absence surveys for GCN of suitable waterbodies (including ponds and ditches) within 250m of the WWTP development. Apply for a Natural England European Protected Species licence for GCN if confirmed breeding ponds and suitable terrestrial habitat will be lost due to construction. Mitigate through the creation of new ecological ponds and terrestrial habitat creation, and the trapping, relocation and exclusion of GCN, where required to maintain the favourable conservation status (FCS) of the affected population. Where ponds supporting GCN are lost they will need to be compensated for by the creation of two ponds for each pond lost. This approach can also be used even when GCN are not recorded as biodiversity enhancement measures.
- Within site area 3, but outside of the indicative WWTP footprint are two active badger setts that are likely to be a subsidiary and outlier sett. Further detailed badger surveys will be required to survey for additional setts and determine overall activity. Providing the indicative WWTP footprint and access roads avoids these setts and ensures there is a sufficient buffer (e.g. 30m between the development works and setts) a Natural England badger development licence is unlikely to be required. However, compensation for the loss of foraging habitat (grassland) may be required if large areas are affected by the proposal and movement around the site will need to be maintained so that badgers can disperse and continue to use setts within their territory. If the two badger setts cannot be avoided a Natural England badger development licence will be required to legally close and destroy the setts. Further surveys will be required to locate the main sett to help inform whether the creation of an artificial badger sett is likely to be required if the subsidiary sett is closed and destroyed. Bait marking surveys may be required.
- Subject to detailed water vole surveys along the stretch of the River Cam and ditches identified as having potential to support water voles, where necessary, identify the requirement for mitigation and enhancement.
- Subject to detailed otter surveys along the stretch of the River Cam, where necessary, avoid loss of holts and couches and consider disturbance impacts. Enhancement measures could include the creation of new holt.
- The hedgerows provide commuting and foraging habitat for bats. Bat activity transect surveys and static bat detector surveys will be required to determine bat activity levels, species present, how bats may be using the site, temporal distribution, and how habitats used on site are connected to habitats in the surrounding area. There will be a requirement for the provision of additional hedgerows and trees to replace the loss of those within the footprint and ensure that connectivity with the surrounding network of hedgerows is maintained.
- There are trees within the hedgerows and woodland that have PRFs, which could support roosting bats. Some of the trees are dead and others have woodpecker holes, which are likely to have high potential to support roosting bats. Preliminary bat roost assessments of

⁵¹ JNCC (2003) *A habitats Translocation Policy for Britain*. Available online at: <https://sblpublicinquiry.files.wordpress.com/2014/01/5-21-a-habitats-translocation-policy-for-britain-2003.pdf>

the trees will be required to identify PRFs and determine the actual or potential presence of bats and the need for further survey and/or mitigation. Mitigation and compensation will include the provision of alternative roosting habitat for bats, such as bat boxes on trees and or bat boxes on posts.

- The indicative WWTP footprint has the potential to support reptiles on the boundary of the site due to the grassland habitats and the presence of refugia. Reptile surveys will be required where there will be a significant loss of suitable habitat. If a reptile population is recorded, the translocation of reptiles may be required in areas where habitat loss cannot be avoided in order to sustain and protect the population. Translocation and mitigation would need to be covered under a method statement and agreed with the local planning authority ecologist. An on-site receptor area would be required to accommodate reptiles, otherwise an off-site receptor site would be required. If only small areas of suitable reptile habitat will be affected, it may be possible to complete the early works using habitat manipulation by progressively making the habitat unsuitable and encouraging reptiles to disperse out of the proposed works area. The creation of new species-rich grassland, ponds, mixed patchy vegetation (coarse grasses and scrub) and the provision of refuge such as log piles and hibernaculum in the new landscape and ecology proposals will provide compensation and enhancement for loss of habitat and features within the site area.
- The hedgerows, woodland and field margins within site area 3 are suitable for breeding birds. There is a mature tree within a hedgerow in the centre of the indicative WWTP footprint and a derelict farm outbuilding in the north-east of site area 3, which has the potential to support barn owl. Breeding bird surveys will be required. Habitat creation will need to consider these species habitat requirements, which can be partly compensated for by the planting of new hedgerows and woodlands. However, grassland habitat creation may also be required.
- Further invertebrate surveys will be required at site area 3 and its associated corridors. Further surveys will be required within the hedgerows which form part of the dismantled railway and Low Fen Drove Way Grassland and Hedges CWS within site area 3 and access areas and the small copse and improved grassland in the south-eastern corner of site area 3 and access areas. The Nationally Scarce species of flea beetle *Longitarsus ballotae* was recorded at the Low Fen Drove Way Grassland and Hedges CWS. Further surveys will also be required along at least two sections of the Waterbeach transfer pipeline, that includes a section of hedge with standing dead elms and a small elm copse. The following mitigation/compensation measures are recommended to maintain invertebrate communities at site area 3; avoid loss of the Low Fen Drove Way Grassland and Hedges CWS and small woodland copse within site area 3 and its access areas. If avoidance of hedgerows at this site wasn't possible, the scheme should retain and translocate key hedgerows, dead wood and mature tree stumps into new areas of woodland habitat creation to provide habitat for terrestrial invertebrates. Replant woodland and ensure the habitat creation also includes new pond creation, and a combination of a tree, shrub and wildflower plant-mix to benefit invertebrates with areas of bare ground and low-fertile soil to create a species-rich sward, and open mosaic habitat.

Landscape scale initiatives (green infrastructure strategies or initiatives)

B.1.96 Site area 3 and its associated corridors fall within the following green infrastructure initiatives:

- The National Trust's Wicken Fen Vision area.
- The proposed Cambridgeshire Strategic Green Infrastructure Network (strategic network area 6 Cambridge and Surrounding Areas).

- The Natural England Network Enhancement Zone falls within the waste water transfer tunnel. Therefore, there are opportunities to incorporate the network enhancement zone into the landscape and ecology post-construction enhancement/habitat creation and restoration proposals. However, because the waste water transfer tunnel will be underground, there will be limited impact on land above ground, except for where the shafts will be construction, which may result in areas of habitat loss.
- A Network Enhancement Zone is also adjacent to the north-eastern boundary of site area 3. The zone is associated with Stow-cum-Quy Fen SSSI and its lowland calcareous grassland habitats. There is an opportunity for the site area 3 post-construction habitat creation proposals to create habitats, which support the National Trust's Wicken Fen Vision and creating a green corridor through the development proposals to link with existing habitats outside of the proposed construction boundary.

B.1.97 Stakeholder engagement for the Wicken Fen Vision area to link habitat creation proposals and reference to planning policy and Natural England's Network Enhancement Zones to develop green infrastructure, which benefits biodiversity will be encouraged during project development.

Assessment of mitigated options

Designated sites

- B.1.98 Site areas 1 and 3 are within 10km of Wicken Fen Ramsar and Fenland SAC (site area 2 is just over 10km from these two designated sites). However, for all three of the sites, the associated infrastructure would be within 10km. Site area 3 is also within 10km of a second SAC, Devils Dyke. The production of the CEMP, the design, and the use of controls and permits should prevent any LSE on these statutory designated sites. However, a Stage 1 Screening HRA for the Ramsar and SAC to determine LSE will be undertaken to assess the potential impacts from combustion and discharge.
- B.1.99 Site area 3 is also approximately 1.1km from Stow-cum-Quy Fen. Black Ditch is connected to one of the water bodies at Stow-cum-Quy Fen SSSI. As a result, there is potential, without mitigation, for surface water and groundwater impacts at the SSSI during construction at site area 3, due to the drainage feature connections. However, standard mitigation measures included within the CEMP will reduce any potential surface water and groundwater impact at Stow-cum-Quy Fen SSSI to a negligible level. The permanent site drainage will be designed to avoid any discharge of pollutants to Black Ditch during operation of the scheme. As a result, Stow-cum-Quy Fen SSSI should not be adversely affected by surface water discharge from the site. Consideration has also been given to the potential impacts during operation of the WWTP, due to leakage of waste water from the treatment plant, leading to contamination of groundwater in the chalk aquifer at site 3, which could adversely affect Stow-cum-Quy Fen SSSI. However, these risks would be taken into account fully in the robust design, protection measures and operational procedures for the WWTP. In addition, monitoring of groundwater and drainage in the area within and surrounding the WWTP could be implemented prior to and during the construction of the works. However, the risk of such contamination moving towards the boundary, or away from any of the sites, is considered to be low. A Hydrogeological Impact Assessment⁵² (HIA) has been undertaken to further assess the potential impacts outlined in the Water Resources Statement (Mott MacDonald, 2020) 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.
- B.1.100 Site area 3 is approximately 1.3km from Wilbraham Fens SSSI. Operational traffic may require further assessment as the vehicle movements exceed the assessment thresholds within the Environmental Protection UK and Institute of Air Quality Management guidance 'Land-Use Planning and Development Control: Planning for Air Quality' (2017). Wilbraham Fens SSSI, is within 200m of the A1303, which may be used by operational traffic and therefore further assessment may be needed to determine likely effects from vehicle emissions at this site. 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%. According to the Institute of Air Quality Management (IAQM) guidance A guide to the assessment of air quality impacts on designated nature conservation sites, where the change in concentration is less than 1%, the effects can be deemed to be insignificant.

⁵² Further assessment of the potential impacts on the water 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

- B.1.101 Site areas 1 and 2 have the potential to impact three non-statutory designated sites (Cottenham Moat CWS, Milton Road Hedgerows CWS, and the River Cam CWS (at one location)). Whereas, site area 3 has the potential to impact on four CWSs (Low Fen Drove Way Grasslands and Hedges CWS, Milton Road Hedgerows CWS, the River Cam CWS (at two locations and Allicky Farm Pond CWS).
- B.1.102 Site areas 1 and 2 will require GI and assessment to determine the source of water in Cottenham Moat CWS and the point at which water levels impact ecological habitats. Additional temporary water supply may be required to restore water levels should they fall below those required to sustain the waterbody which supports great crested newts (GCN).
- B.1.103 Site areas 1, 2, and 3 waste water transfer tunnel works and shaft positioning should avoid the Milton Road Hedgerow CWS to avoid habitat loss and the requirement to translocate or replant the hedgerow as compensation.
- B.1.104 Site areas 1, 2, and 3 treated effluent transfer tunnel or pipeline and discharge location should avoid the loss of habitats associated with the River Cam CWS, if this is not possible habitats will need to be replanted post construction. This will also apply to Site 3 Waterbeach transfer pipeline, which should be undertaken at a distance from the River Cam's banks to avoid disturbance to the river and its associated habitats.
- B.1.105 Low Fen Drove Way Grasslands and Hedges CWS is within site area 3, mitigation to avoid indirect impacts could include the creation of a habitat buffer between the indicative WWTP footprint and the CWS and the landscape and ecology planting proposals could explore enhancing habitat connectivity between the CWS and existing habitats. The access road should be positioned to run through existing gaps in the hedge and avoid trees and their RPAs. If this is not possible, the section of hedge and grassland should be translocated and connected to the existing stretch of the CWS and / or compensated for through the creation of new habitat.
- B.1.106 For site area 3 similarly to Stow-cum-Quy Fen SSSI, Black Ditch could be connected to the Allicky Farm Pond CWS. As a result, there is potential, without mitigation, for surface water impacts at the CWS during construction at site area 3, due to the drainage feature connections. However, standard mitigation measures included within a CEMP will reduce any potential surface water impact to a negligible level. However, as discussed in B.1.99 the HIA concluded 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 Allicky Farm CWS.

Habitats

- B.1.107 This assessment considered that overall, a development on site area 3 would experience the fewest ecological effects owing to the presence of larger areas of low ecological valuable habitats such as arable land. Although there is Low Fen Drove Way Grasslands and Hedges CWS within site area 3, which supports habitats of value, the indicative WWTP footprint should avoid this CWS. Compared to site area 1, which includes areas of poor semi-improved grassland, broadleaved plantation woodland, stretches of broadleaved scattered trees (mature tree lines that appear to be wind breaks/shelter belts) and dry and wet ditches, and site area 2, which includes a mature band of semi-natural broadleaved woodland, broadleaved plantation woodland, poor semi-improved and improved grassland, and dry ditches. Hedgerows are present within all sites and it is likely that there will be a loss in hedgerows. However, hedgerows can be translocated and or re-planted to ensure there is no net loss in length and maintain habitat connectivity around the site areas. Whereas the loss of mature trees and

woodlands would result in the loss of a valuable ecological resource, which cannot be as readily replaced.

- B.1.108 Option B for site areas 1 and 2 is likely to result in less impact on HPI (deciduous woodland and floodplain grazing marsh) compared with option A. The treated effluent tunnel or pipeline for site 3 does not fall within HPI, whereas its associated waste water transfer tunnel does. However, loss to the floodplain grazing marsh should be avoided via tunnelling and locating the shafts in habitat of negligible ecological value.
- B.1.109 Waterbeach transfer pipeline options for sites 1, 2, and 3 have the potential to result in the temporary loss of floodplain grazing marsh HPI. Waterbeach transfer pipeline for option site 2 will likely result in the loss and temporary severance of a greater number of hedgerows, the potential removal of more trees, and impacts on ditches, compared to the Waterbeach transfer pipeline options for sites 1 and 3.
- B.1.110 To achieve a BNG, habitats lost within the site areas 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 would occur in site area 1 and 2 (to a greater extent compared with site area 3) will require larger areas of land for new habitat creation in order to achieve BNG.

Protected and notable species

- B.1.111 All site area options have potential for GCN in proximity to the Waterbeach pipeline routes and site area 2 has a record of a GCN licence within the site area. site area 1 was found to have ditches with standing water in, whereas, the ditches in site areas 2 and 3 were all dry at the time of the August 2020 survey visit. However, each site area has at least one pond within 250m of the site area boundary, which will require further survey. It is considered that the risks to GCN can be mitigated by avoiding the loss of waterbodies and suitable terrestrial habitat and where this is not possible providing new ecological ponds and terrestrial habitat creation, trapping, translocation and exclusion, where required to maintain the FCS of the affected population. Completing further surveys in the form of presence-absence surveys of suitable waterbodies as identified during the extended Phase 1 habitat survey will identify the requirement for a Natural England GCN EPSM licence, mitigation and compensation
- B.1.112 Two badger setts are present within the indicative WWTP footprint for site area 2. Avoidance measures will be required to retain and not disturb the setts, otherwise mitigation and compensation measures will be required such as a Natural England badger disturbance licence and the creation of an artificial badger sett. This will require further surveys and land to locate the new sett within. One and two badger setts are also present within site area 1 and 3, respectively. However, they are outside the indicative WWTP footprints and through avoidance measures could be retained and protected. If this is not possible, a Natural England badger disturbance licence will be required.
- B.1.113 All site area options have potential to support common species of reptiles and breeding birds including Schedule 1 species (e.g. barn owl). Mitigation can be provided by planting new habitats as part of the landscape and ecology planting proposals. Reptile surveys will be required where there will be a significant loss of suitable habitat. If a reptile population is recorded, the translocation of reptiles may be required in areas where habitat loss cannot be avoided. Translocation and mitigation would need to be covered under a method statement. An on-site receptor area would be required to accommodate reptiles, otherwise an off-site receptor site would be required. If only small areas of suitable reptile habitat will be affected, it may be possible to complete the early works using habitat manipulation.

B.1.114 All site area options have the potential to support commuting and foraging bats. However, the woodland within site area 2 has more PRFs for bats compared to sites 1 and 3, which only include standalone trees within hedgerows and a small copse (which should be avoided) in site area 3 and within the tree line for site area 1. Woodland and trees should be avoided, where possible. Further surveys will be required to determine the presence or likely absence of bats and the need for mitigation and compensation. If bat roosts are identified, a Natural England EPSM licence will be required and the provision of new bat roosting alternatives. Mitigation can also be provided by planting new habitats as part of the landscape and ecology planting proposals to ensure that habitat connectivity around the site and the existing landscape is maintained.

B.1.115 All site areas are within areas of Green infrastructure initiatives. The initiative associated with site area 1 and 2 is not well defined. Whereas site area 3 is within the Wicken Fen vision area, which is a specific and has a well-established plan.

Table B.3: Mitigation RAG assessment for nature conservation and biodiversity

Site	Unmitigated RAG score	Mitigated RAG score
1	Red	Green
2	Red	Green
3	Amber	Green

Incorporating feedback

B.1.116 Phase one non-statutory consultation was held in order to share the proposals for relocating the WWTP with the public and stakeholders. This section provides a summary of the feedback received from the public in relation to nature conservation and biodiversity and how the concerns, issues and opportunities raised have been considered within the assessment criteria for Stage 4 final site selection.

Table B.4: Feedback for nature conservation and biodiversity

Sub-Theme	Site (if specific)	Comment Summary	CWWTPR Response
	General	Comment that any damage to greenbelt will have a negative effect on local wildlife, and that all locations run close to Fen Edge ditches which are unique habitats for various species.	Further ecological surveys will be undertaken to assess the habitats and their potential to support protected species. Further targeted species surveys will also be undertaken, where required. Where possible the mitigation hierarchy will be applied to avoid impacts in the first instance, and then mitigate, compensate, and offset. The project will aim for a biodiversity net gain.
	Site 1	Respondents described the site as a large green area with diverse variety of trees & shrubs which support small insects, animals, and birds.	Site area 1 does include hedgerows and lines of trees, which are likely to support terrestrial invertebrates and birds. Further ecological surveys will be undertaken to determine the presence or absence of protected and notable species and the requirement for mitigation and compensation. The design will aim to minimise the loss of trees and hedgerows.
		Comment that relocation to this site would impact the conservation area of Landbeach Woods established in 1991, which is an important habitat for nature.	It is assumed that Landbeach Woods refers to the area of woodland within Worts Meadow LNR is approximately 0.7km from site area 1. This woodland was planted in 1992 and named Bourne Wood. It is highly unlikely that the development will impact on the qualifying features of the LNR and result in an adverse significant effect.
Wildlife	Site 2	Comment that, although the landfill site is located near, the surrounding farmland and mature trees are home to Little Owls, Tawny Owls, and badgers among other animals.	Site area 1 does include hedgerows, trees and woodland, which are likely to support birds and badgers. Further ecological surveys will be undertaken to determine the presence or absence of protected and notable species and the requirement for mitigation and compensation. The design will aim to minimise the loss of trees, woodland and hedgerows, and therefore the impact on these species. Mitigation and compensation measures will otherwise be provided to protect badgers and other species. The project will aim for a biodiversity net gain.
	Site 3	Respondents who oppose site 3 have frequently mentioned impacts to the Wicken Fen Vision. Comments have also noted that Quy Fen is an SSSI, and biodiversity value of the River Cam.	The Wicken Fen Vision aims to create a range of habitats for a wide number of species, including many which are rare and threatened, as well as mitigating wider problems created by climate change through measures such as carbon capture and storage in wetlands and sustainable drainage systems to allow water to percolate into soils and replenish ground water. The CWWTP team will engage with stakeholders to incorporate the aims of the Wicken Fen Vision in the design of the scheme. The scheme will take a landscape scale approach when it comes to green infrastructure and will include habitat creation proposals that will work with the Wicken Fen Vision. AW propose to achieve biodiversity net gain. AW will follow the mitigation hierarchy to avoid impacts in the first instance (i.e. safeguard high quality habitats such as woodland, mature trees), followed by mitigation, compensation, and offsetting if required. An ecological and landscape habitat creation proposal will be developed which will look to target priority habitats in the vicinity and local biodiversity action plan habitats.

Sub-Theme	Site (if specific)	Comment Summary	CWWTPR Response
			<p>Habitat creation will be designed to provide green corridors linking to existing blocks of habitat and non-statutory designated sites as well as providing a buffer to these habitats. Site area 3 lies between the Wicken Fen Vision area and the Cambridge Fens (part of the Potential Nature Recovery Network) and could play a role in linking these habitats.</p> <p>Stow-cum-Quy Fen SSSI is approximately 1.1km east of the site area 3. Design and mitigation measures will be put in place to prevent impacts on the qualifying features of the SSSI. Further hydrological assessments will be undertaken to ascertain the presence of hydrological links between site area 3 and the SSSI and, therefore inform design, mitigation and monitoring requirements, if required.</p> <p>Further ecological surveys will be undertaken on stretches of the River Cam (which is noted as a CWS), mitigation measures will ensure that the biodiversity of the River Cam is not affected.</p>
		<p>Respondents have also referenced the local species of Roe Deer, bees, bats, badgers, and more which will be affected by the relocation. The area apparently has over 9300 different species.</p>	<p>The site includes hedgerows, trees and a small woodland copse, which are likely to support birds, bats, badgers, invertebrates and other mammals. Further ecological surveys will be undertaken to determine the presence or absence of protected and notable species and the requirement for mitigation and compensation. The design will aim to minimise the loss of trees and hedgerows. The project will aim for a biodiversity net gain.</p>

Summary of results

- B.1.117 When comparing site areas there is little differentiation with regards to designated nature conservation sites. However, site area 3s rating has been classified as amber compared to site area 1 and 2, which is green for statutory designated nature conservation sites and dependent on mitigation and embedded design. Site area 3 is closer to two SSSIs (Wilbraham Fens SSSI and Stow-cum-Quy Fen SSSI) compared with site area 1 and 2 and rated as amber due to the requirement for further assessment relating to Stow-cum-Quy Fen SSSI.
- B.1.118 Site area 3 is approximately 1.1km from Stow-cum-Quy Fen SSSI. Black Ditch is connected to one of the water bodies at Stow-cum-Quy Fen SSSI. As a result, there is potential, without mitigation, for surface water and groundwater impacts at the SSSI during construction at site area 3, due to the drainage feature connections. However, standard mitigation measures included within a CEMP should reduce any potential surface water and groundwater impact at Stow-cum-Quy Fen SSSI to a negligible level and the permanent site drainage will be designed to avoid any discharge of pollutants to Black Ditch during operation of the scheme. In addition, monitoring of groundwater and drainage in the area within and surrounding the WWTP could be implemented prior to and during the construction of the works. The risk of such contamination moving towards the boundary, or away from any of the sites, is considered to be low. A Hydrogeological Impact Assessment⁵³ (HIA) has been undertaken to further assess the potential impacts 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 HIA concluded 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. This approach also applies to the CWS Allicky Farm Pond 0.6km north-west of site area 3.
- B.1.119 For Wilbraham Fens SSSI, which is approximately 1.3km from the site area, 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.
- B.1.120 There is one CWS (Low Fen Drove Way Grasslands and Hedges CWS) within site area 3 and its associated access areas, therefore, there could be direct loss of the CWS hedgerow and grassland habitats if it is not avoided. The indicative WWTP footprint should avoid this CWS and habitat creation can provide a buffer between the footprint and CWS. The access road should be positioned to run through existing gaps in the hedge and avoid trees and their RPAs. If this is not possible, the section of hedge and grassland should be translocated and connected to the existing stretch of the CWS and / or compensated for through the creation of new habitat.
- B.1.121 Sites 1 and 2 do not have CWSs within their site areas or access areas, however, there are two CWSs within or adjacent to the treated effluent tunnel or pipeline, potential discharge location, and waste water transfer tunnel. This includes Milton Road Hedgerow CWS and the River Cam CWS. These two CWSs also fall within the treated effluent tunnel or pipeline, potential discharge location, waste water transfer tunnel, and Waterbeach transfer pipeline associated

⁵³ Further assessment of the potential impacts on the 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

with site area 3. Without avoidance measures there is potential for direct loss of the two CWSs by all three site options.

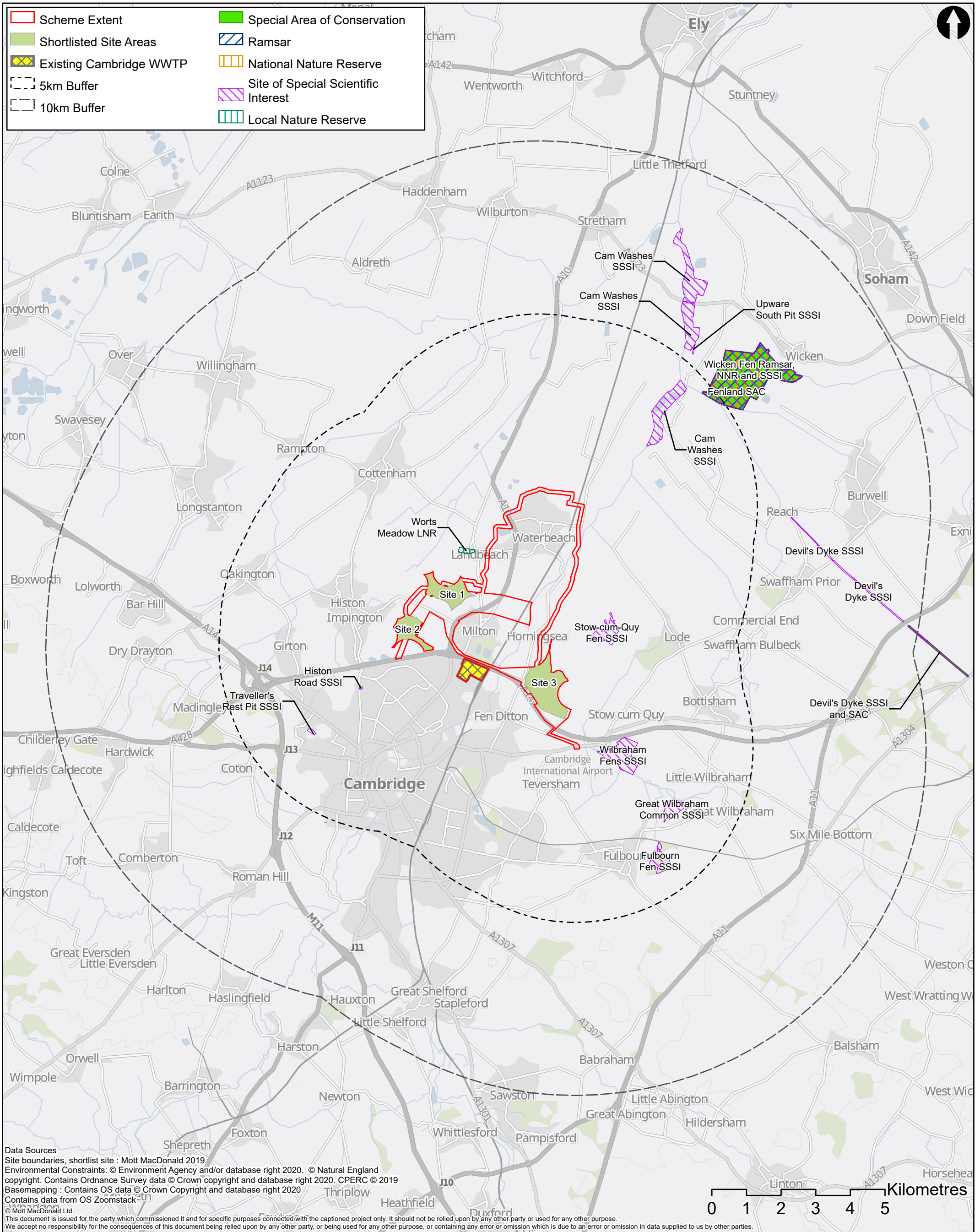
- B.1.122 Whilst there are no CWSs within site area 1 and 2, their location could have an indirect impact on Cottenham Moat CWS during construction. Further assessment, including GI, is required to determine the source of water in Cottenham Moat CWS and the point at which water levels impact ecological habitats. 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 GCN).
- B.1.123 This assessment considered that a development on site area 3 would experience the fewest direct ecological effects on habitats and the potential presence of protected species owing to the presence of larger areas of low ecological valuable habitats such as arable land. This is compared to site area 1, which includes areas of poor semi-improved grassland, broadleaved scattered trees (mature tree lines) and dry ditches, and site area 2, which includes a mature band of broadleaved woodland, poor semi-improved grassland and dry ditches. Hedgerows are present within all sites and it is likely that there will be a loss in hedgerows due to construction. However, hedgerows can be translocated and or re-planted to ensure there is no net loss in length and maintain habitat connectivity around the site areas. Whereas, the loss of mature trees and woodlands are valuable ecological features that cannot be as readily replaced.
- B.1.124 Loss of habitats will be greater for site 1 and 2 treated effluent tunnel or pipeline, compared to site 3. Option B for site area 1 and 2 is likely to result in less impact on HPI (deciduous woodland and floodplain grazing marsh) compared with option A for site area 1 and 2. The treated effluent tunnel or pipeline for site 3 does not fall within HPI, whereas its associated waste water transfer tunnel does, but loss to the floodplain grazing marsh should be avoided via tunnelling and locating the shafts in habitat of negligible ecological value. Waterbeach transfer pipeline options for sites 1, 2, and 3 have the potential to result in the temporary loss of floodplain grazing marsh HPI. Waterbeach transfer pipeline for option site 2 will likely result in the loss and temporary severance of a greater number of hedgerows, the potential removal of more trees, and impacts on ditches, compared to the Waterbeach transfer pipeline options for sites 1 and 3.
- B.1.125 All three site areas have limited differentiation with regards to habitats and their potential to support protected species such as bats, great crested newts, birds, reptiles and badgers. However, based on the extended Phase 1 habitat survey, site area 2 has the potential to be the most constrained by the presence of protected and notable species.
- B.1.126 Two badger setts (a main and an outlier) were recorded in the indicative WWTP footprint for site area 2, which will require avoidance and mitigation measures, and compensation if the main sett cannot be retained. There is also a potential outlier sett and subsidiary badger sett within site area 2, but these are outside of the WWTP footprint. Within site area 1 there are two badger setts (likely outlier and subsidiary) and one main sett outside site area 1 and two within site area 3 (likely outlier and subsidiary), but these outside the WWTP footprint. Provided these setts are avoided by access roads, construction compounds, the indicative WWTP footprint, tunnels, pipelines, and will not be disturbed by construction, the setts are unlikely to pose a constraint.
- B.1.127 Site area 2 is potentially the most constrained by recorded great crested newt presence, therefore requiring mitigation and compensation where ponds or waterbodies are lost due to construction. There is a great crested newt record within the site area 2 (50m east of the

indicative WWTP footprint⁵⁴) and within 0.25km of the Waterbeach transfer pipeline (which also applies to site 1). However, there are only seven waterbodies (ditches) within site area 2, of those two are within the indicative WWTP footprint. The seven waterbodies were dry at the time of the site visit and, therefore unlikely to be suitable for great crested newt. There is suitable terrestrial habitat for great crested newts within site areas 1, 2 and 3.

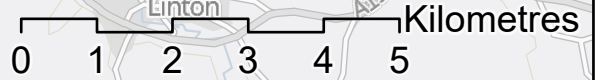
- B.1.128 There are trees and or woodland present in all three sites, which may support bat roosts, although site area 2 has the highest potential due to the greater area of woodland.
- B.1.129 All site areas are within Green infrastructure initiatives. The initiative associated with site area 1 and 2 is not well defined. Whereas, site area 3 is within the Wicken Fen vision area, which is a specific and has a well-established plan and, therefore would likely require more extensive stakeholder consultation.

Drawings

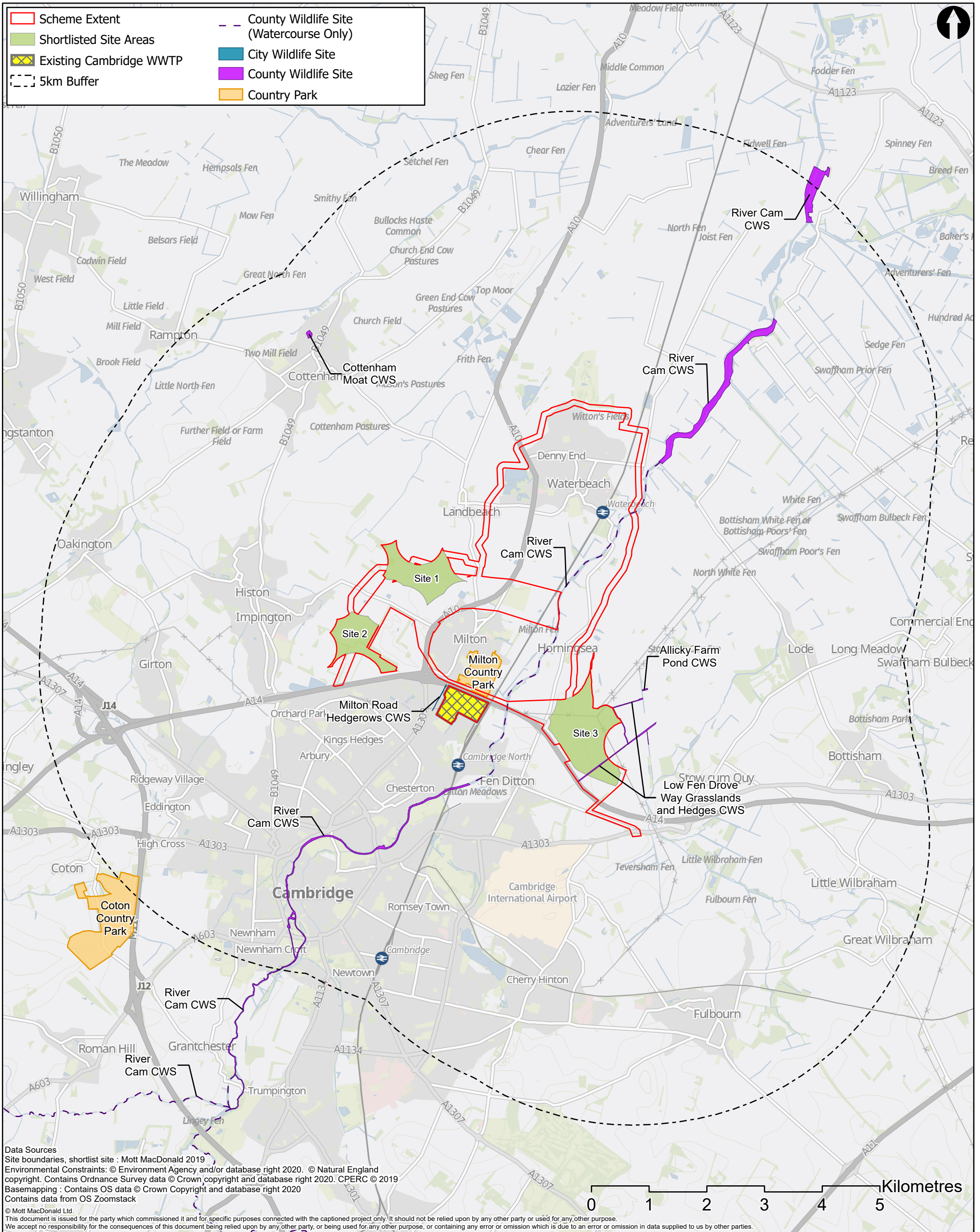
⁵⁴ The record is from Natural England's Open Source data set GCN Class Licence Survey Returns. However, the grid reference and X and Y coordinates do not link to a waterbody or pond and therefore it is unknown what this positive record may relate to. During the extended Phase 1 habitat surveys there were no waterbodies with standing water recorded and no ponds.



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						CWWTPR Project Stage 4 Final Site Selection Statutory designated sites location plan			Checked	S White			
									Approved	T Cook			
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G	01/21	NC	Final	SW	TC													

Habitat Point

- ✕ A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered trees

Habitat Line



- ✕✕ A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.2 - Coniferous parkland/scattered trees
- A3.3 - Mixed parkland/scattered trees
- C2 - Upland species-rich ledges
- F2.1 - Marginal and inundation - marginal vegetation
- G2 - Running water
- E— G2.1 - Running water - eutrophic
- M— G2.2 - Running water - mesotrophic
- O— G2.3 - Running water - oligotrophic
- D— G2.4 - Running water - dystrophic
- C— G2.5 - Running water - marl
- B— G2.6 - Running water - brackish
- |||| H2.3 - Saltmarsh/dune interface
- |||| H8.1 - Hard cliff
- ∩∩ H8.2 - Soft cliff
- ∩∩ I1.1 - Inland cliff
- ✕✕ I1.2 - Scree
- ∩∩ J2.1.1 - Intact hedge - native species-rich
- J2.1.2 - Intact hedge - species-poor
- ∩∩ J2.2.1 - Defunct hedge - native species-rich
- - J2.2.2 - Defunct hedge - species-poor
- ∩∩ J2.3.1 - Hedge with trees - native species-rich
- |||| J2.3.2 - Hedge with trees - species-poor
- |||| J2.4 - Fence
- J2.5 - Wall
- - J2.6 - Dry ditch
- ✕✕ J2.7 - Boundary removed

●●● J2.8 - Earth bank

||||| J3.5 - Artificial sea wall

Habitat Polygon

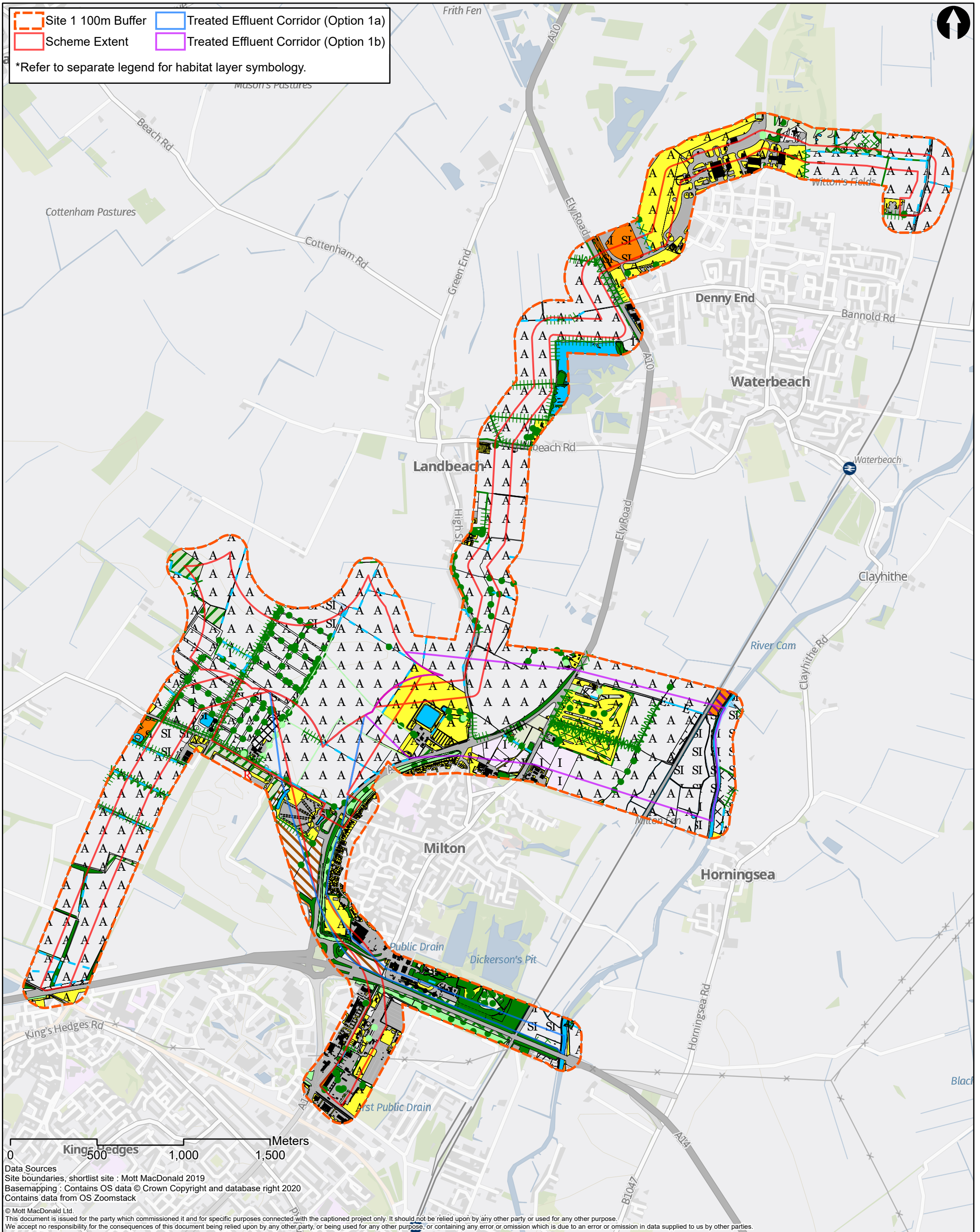
- A1.1.1 - Broadleaved woodland - semi-natural
- ▨ A1.1.2 - Broadleaved woodland - plantation
- A1.2.1 - Coniferous woodland - semi-natural
- ▨ A1.2.2 - Coniferous woodland - plantation
- A1.3.1 - Mixed woodland - semi-natural
- ▨ A1.3.2 - Mixed woodland - plantation
- ✕✕ A2.1 - Scrub - dense/continuous
- ✕✕ A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- A3.3 - Mixed parkland/scattered trees
- SI B2.2 - Neutral grassland - semi-improved
- SI B3.2 - Calcareous grassland - semi-improved
- I I B4 - Improved grassland
- B5 - Marsh/marshy grassland
- SI B6 - Poor semi-improved grassland
- C3.1 - Other tall herb and fern - ruderal
- G1 - Standing water
- G2 - Running water
- R F I2.4 - Refuse-tip
- A A J1.1 - Cultivated/disturbed land - arable
- J1.2 - Cultivated/disturbed land - amenity grassland
- ✕✕ J1.3 - Cultivated/disturbed land - ephemeral/short perennial
- J1.4 - Introduced shrub
- J2.1.2 - Intact hedge - species-poor
- J2.6 - Dry ditch
- J3.4 - Caravan site
- J3.6 - Buildings
- J4 - Bare ground
- J5 - Other habitat
- J5 - Hardstanding

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						CWWTPR Project Stage 4 Final Site Selection Phase 1 Habitat Survey Legend			Checked	S White	
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Site 1 100m Buffer Treated Effluent Corridor (Option 1a)
 Scheme Extent Treated Effluent Corridor (Option 1b)

*Refer to separate legend for habitat layer symbology.

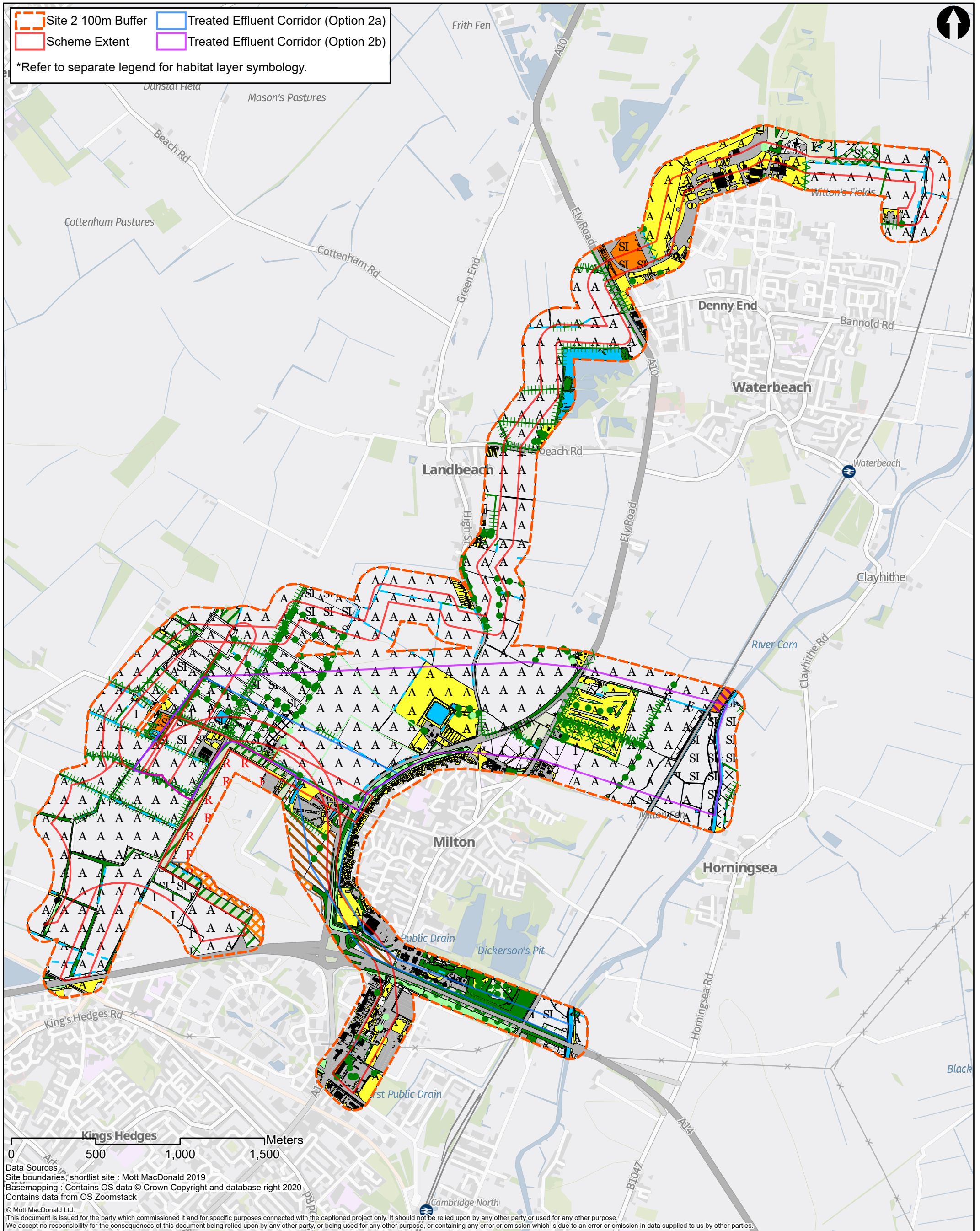


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Site 2 100m Buffer Treated Effluent Corridor (Option 2a)
 Scheme Extent Treated Effluent Corridor (Option 2b)
 *Refer to separate legend for habitat layer symbology.

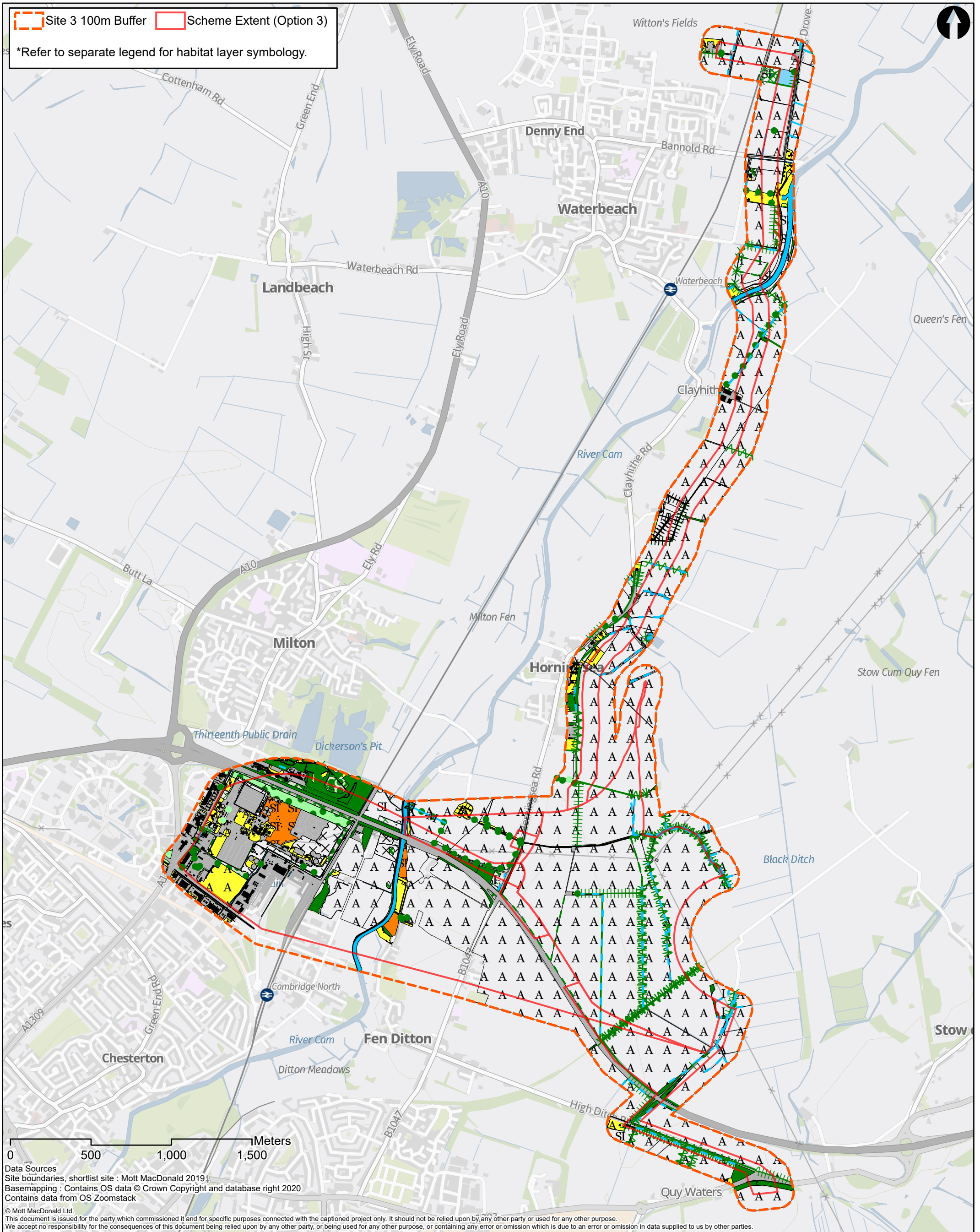


Kings Hedges
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Site 3 100m Buffer Scheme Extent (Option 3)

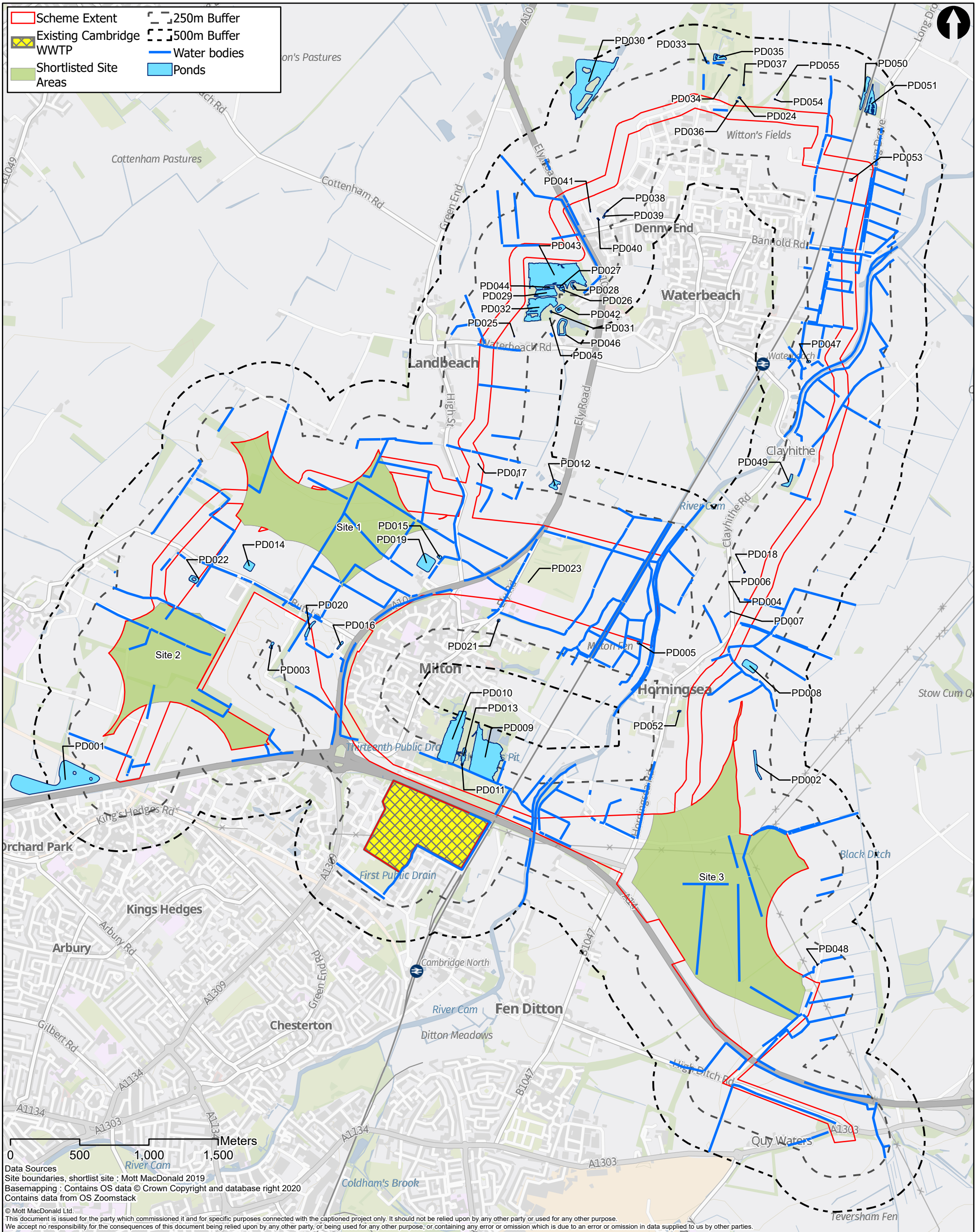
*Refer to separate legend for habitat layer symbology.



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B.2 Landscape and visual amenity

Assessment methodology

- B.2.1 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.
- B.2.2 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.
- B.2.3 The methodology for the assessment was informed by guidance in the Guidelines for Landscape and Visual Impact Assessment, 3rd Edition⁵⁵. The assessment has been developed and completed by competent Landscape Architects.
- B.2.4 Aerial imagery, OS mapping, a review of Cambridgeshire County Council's 'My Cambridgeshire' interactive map, and Zone of Theoretical Visibility (ZTV) mapping were used to consider the following:
- The sensitivity of the local landscape character areas
 - The number of sensitive visual receptor locations within the ZTV
 - Existing vegetation and the opportunity to utilise existing vegetation to provide screening of site features

The study area

- B.2.5 The extent of the study area was initially determined by digitally mapping the ZTV of the three site options to determine the area from which the infrastructure could theoretically be visible at any location within a 10 km radius of the sites.
- B.2.6 To determine a worst-case scenario, the ZTVs were modelled assuming the highest structures on the new WWTP would be the digestors, at 26m high. The viewer height was assumed to be 1.6m high. An indicative WWTP site footprint was developed for each site area, however, the layout of the WWTP within the footprint will not be developed until later design stages.
- B.2.7 The ZTVs were created using a digital surface model from LiDar data that included the heights of surface features such as buildings and vegetation. These ZTVs are shown on Drawings 409071-MMD-00-XX-GIS-Y-0462 to 0464. They illustrate the relatively minor role of the local topography in screening the proposed works.
- B.2.8 It should be noted that ZTV mapping is a tool for indicating the theoretical extent of the visual influence of a development and that it tends to overestimate the visibility of a development because the data used does not fully register the screening effects of existing vegetation or built development. In addition, it does not reflect how visual impacts diminish with distance from a development, so that the further a receptor is from the new structure, the less prominent it is in the view. The mapping shows that the scheme would be most visible to the north, west and east of the three site area options, but largely screened from the city of Cambridge and the south by the A14 and built development. The ZTVs indicate that visibility of the scheme would decline beyond the outer boundary of the Green Belt in the north, west and east. Consequently, the study area for the Stage 4 assessment is focused on the area where the potential effects of the new WWTP are most likely, within approximately 5km of the three site area options, to the north and north-east of Cambridge.

⁵⁵ *Landscape Institute and Institute of Environmental Management and Assessment (2013)*

Local character assessment

B.2.9 A number of landscape character assessments have been produced for Cambridge and its surroundings including the most recent, the Cambridge Inner Green Belt Study, 2015⁵⁶. The Stage 4 assessment uses the landscape character areas (LCA) identified in the 2015 study to allow comparison between the Stage 4 assessment and the Cambridge Inner Green Belt studies. The sensitivity of the LCAs was evaluated by considering the existing value of the landscape and its susceptibility to the type of change arising from the proposed development. The value of each LCA was evaluated in accordance with the criteria set out in the table below.

Table B.5: Landscape value

Value	Criteria for assessing landscape value
High	Designated landscape (such as National Park, AONB). Landscape of high scenic quality with a distinctive combination of features, elements and characteristics, outstanding views and a strong sense of place. A scarce or fragile landscape with cultural, historic or ecological elements which make a major contribution to landscape character. No or very few landscape detractors. Has components which are difficult to replace (such as mature trees). A tranquil landscape in good condition, largely intact, with an unspoilt character.
Medium	Landscape locally designated (such as conservation area, regional park) or locally valued (for its recreational facilities and footpath networks for instance). Some scenic quality and a moderate sense of place. A landscape with some distinctive features, elements and characteristics. Some cultural, historic or ecological elements which contribute to landscape character. Some high use areas, but overall medium tranquillity. Few landscape detractors.
Low	Undesignated landscape, not valued for its scenic quality, with a disparate combination of features, elements and characteristics and a weak sense of place. Mainly common features and few or no cultural, historic or ecological elements that contribute to landscape character. Many landscape detractors. A landscape of low tranquillity.

Source: Criteria based on guidance in the Guidelines for Landscape and Visual Impact Assessment. 3rd edition (LI and IEMA, 2013)

B.2.10 The susceptibility of each LCA to change was evaluated in accordance with the criteria set out in the table below.

Table B.6: Landscape susceptibility to change

Susceptibility	Criteria for assessing landscape susceptibility
High	The overall character and the valued landscape characteristics, elements and features have a low ability to tolerate the nature and scale of the change resulting from the proposed development without permanent serious adverse change to the baseline situation.
Medium	The overall character and the valued landscape characteristics, elements and features have a moderate ability to tolerate the nature and scale of the change resulting from the proposed development, with some adverse changes to the baseline situation.
Low	The overall character and the valued landscape characteristics, elements and features have a high ability to tolerate the nature and scale of the change resulting from the proposed development, with limited adverse changes to the baseline situation.

B.2.11 The sensitivity of each LCA was then evaluated in accordance with the criteria set out in the table below.

⁵⁶ https://www.scams.gov.uk/media/6596/a-cambridge-inner-green-belt-boundary-study_-main-report.pdf

Table B.7: Landscape sensitivity

Sensitivity	Criteria for assessing landscape sensitivity
High	Landscape of high national importance, rarity and value with distinctive features/elements with limited ability to accommodate change without incurring substantial loss/gain (i.e. designated areas, registered parks and gardens, country parks and strong sense of place). A high susceptibility to change due to the type of development proposed.
Medium	Landscape of medium value and local or regional recognition of importance, able to accommodate some change (i.e. with features worthy of conservation, some sense of place or value through use of perception). A medium susceptibility to change due to the type of development proposed.
Low	Undesignated landscape of low value, low to medium ability to accommodate change (i.e. non-designated or designated areas of local recognition or areas with little sense of place). A low susceptibility to change due to the type of development proposed.

Source: Insert Notes or Source Source: Criteria based on guidance in the Guidelines for Landscape and Visual Impact Assessment. 3rd edition (LI and IEMA, 2013)

Visual amenity

B.2.12

The ZTVs for the site options show the potential visibility of the scheme to people in the study area. Visual receptors vary in their sensitivity to changes in the view. This was evaluated by considering the value receptors attach to specific views and their susceptibility to changes to views and visual amenity. The value attached to a view could derive from a planning designation, an association with a heritage asset or a view from a landscape famed for its views. The susceptibility to change depends on the occupation or activity of the receptor and the extent to which their attention is focused on the view and visual amenity. The assessment focusses on visual receptors within 1km of the site as being most likely to experience significant visual effects.

Table B.8: View value

View value	Criteria for assessing view value
High	A view in which attractive features are dominant or include attractive focal points and/or skyline features. Visual detractors may be present but are not strongly apparent in the composition of the view. A view in a high quality landscape such as an Area of Outstanding Natural Beauty, designated or identified as of value in a guide book or tourist literature. A view where the composition is a fundamental aspect of the design or function of a heritage asset and is integral to its setting.
Medium	An unremarkable view where neither attractive or discordant elements are dominant or form a clearly apparent part of its composition. A view that is undesignated and undocumented.
Low	A view where discordant or unattractive features are dominant or prevalent and/or where such features are focal points and/or skyline features. These views may contain some attractive features but these are not strongly apparent in the composition of the view. A view that is undesignated and undocumented.

Table B.9: Visual receptor susceptibility to change

Susceptibility	Criteria for assessing visual receptor susceptibility
High	Occupiers of residential properties, users of public rights of way, visitors to places whose attention is focussed on the landscape.
Medium	People working in or travelling through rural areas whose attention is partially on the landscape. People walking or cycling through urban areas whose views are partially focussed on their surroundings. Users of publicly accessible outdoor open space including cemeteries.
Low	People at work, at school and engaging in formal sport. People walking or cycling through urban areas whose attention is focussed on their destination rather than enjoying the scenery they are passing through. People travelling at high speed on roads or railways.

B.2.13

The evaluation of sensitivity was based on the criteria set out in the table below.

Table B.10: Visual receptor sensitivity

Receptor	Sensitivity
Occupiers of residential properties, PRow users, visitors to heritage assets. Views with few detractors, is designated, is within a scenic area or is important to the setting of a heritage asset.	High
People working in or travelling through rural areas, and walking or cycling through urban areas and visiting outdoor publicly accessible open space. Views where neither attractive or discordant elements are dominant and are undesignated and undocumented.	Medium
People at work, at school, engaging in formal sport, commuting in urban areas and travelling at high speed on roads or railways. Views with predominantly discordant or unattractive and are undesignated and undocumented.	Low

Source: Criteria based on guidance Guidelines for Landscape and Visual Impact Assessment. 3rd edition (LI and IEMA, 2013)

RAG definitions

B.2.14 The RAG definitions adopted for the assessment of impact upon landscape character and visual amenity, follow those set out in the Stage 3 assessment and are provided in Table B.11.

Table B.11: Landscape and visual amenity RAG criteria

Criterion	Green	Amber	Red
Landscape character sensitivity	Located within a landscape character area of low sensitivity with existing landscape detractors	Located within a landscape character area of low - medium sensitivity with few landscape detractors	Located within a landscape character area of medium - high sensitivity with very few or no landscape detractors
Visual sensitivity	Fewer than 50 sensitive receptors within 1km of the site.	Between 50 and 100 sensitive receptors within 1km of the site.	More than 100 sensitive receptors within 1km of the site.
Opportunity to utilise existing features for screening	Vegetation adjacent to the site boundary screening greater than 50% of the site	Vegetation adjacent to the site boundary screening up to 50% of the site	No vegetation providing screening opportunities

Assessment of unmitigated options

Landscape designations

B.2.15 There are no statutory landscape designations within the study area. There are a number of nature conservation and heritage designations within the study area including registered parks and gardens, conservation areas, sites of special scientific interest and scheduled monuments. Where relevant, these are referred to in the local landscape character area descriptions in the section below. Descriptions of the other designations within the study area can be found in the nature conservation and historic environment assessments.

B.2.16 The study area includes part of the National Trust's Wicken Fen Vision area. The 100 year vision aims to restore habitats and create a landscape-scale space for people and wildlife between Cambridge and the Wicken Fen Nature Reserve. The vision is a strategic element of green infrastructure in the adopted development plans for both South Cambridgeshire District

Council (adopted 2018)⁵⁷ and East Cambridgeshire District Council (adopted 2015)⁵⁸. The study area also includes part of the proposed Cambridgeshire Strategic Green Infrastructure Network (Strategic Network Area 6: Cambridge and Surrounding Areas).

Registered Parks and Gardens

- B.2.17 The gardens of Anglesey Abbey and Swaffham Prior House are on the Historic England's register of Historic Parks and Gardens of special historic interest.

Landscape character

National character assessment

- B.2.18 The study area is located across two National Character Areas⁵⁹ (NCA), NCA 88: Bedford and Cambridgeshire Claylands and NCA 46 The Fens. Site areas 1 and 2 are located within NCA 88 Bedford and Cambridgeshire Claylands. site area 3 is located within NCA 46 The Fens. site area 3 is close to the boundary with NCA 87: East Anglian Chalk.

Local character assessment

- B.2.19 Site areas 1 and 2 lie in the Western Fen Edge LCA. site area 3 lies in the Eastern Fen Edge LCA. The Waterbeach Lode Fen LCA lies between the two. Brief descriptions of the three LCAs are given below. Drawing 409071-MMD-00-XX-GIS-Y-0602 in Appendix J shows the location of all the LCAs within the study area.

Western Fen Edge LCA

- B.2.20 The Western Fen Edge LCA is relatively low lying. Land uses include arable and pastoral agriculture, roads, industrial and commercial development and settlement. The A14 severs Cambridge from the fen edge landscape to the north. The LCA includes large-scale infrastructure including the Milton Park and Ride and Milton Recycling Centre just off the A10 Milton Road, the land fill site, the guided busway and small industrial estates and units in Impington and Milton.
- B.2.21 The LCA includes the villages of Impington, Histon, Milton and Landbeach. Apart from Landbeach, they have expanded substantially in the 20th and 21st centuries with mainly housing. There is a hospital and large secondary school at Impington and development is ongoing, with the expansion of Waterbeach on the former barracks site. The historic centres of Impington, Histon, Milton and Landbeach are designated as conservation areas but they lack the historic character of the villages in the Eastern Fen Edge LCA which has undergone less change. Impington and Milton are joined to Cambridge via a narrow corridor of development which runs up to the A14 on both sides. Otherwise, the villages largely retain a rural setting, with the urban edge meeting farmland in most directions. Land between the villages comprises flat open fields separated by drainage ditches and hedgerows. It becomes more wooded, with tree belts and tree lined field boundaries near to Impington. The open countryside extends to the outskirts of Cambridge in gaps between the villages that rings the city boundary.
- B.2.22 Milton Country Park is a valued local outdoor recreational facility and there are a small number of public rights of way in the area. Traffic generated by the larger villages, science parks in Cambridge (south of the LCA), the A14, the Milton Park and Ride and Milton Recycling Centre

⁵⁷ South Cambridgeshire District Council, South Cambridgeshire Local Plan, 2018. https://www.scambs.gov.uk/media/12740/south-cambridgeshire-adopted-local-plan-270918_sml.pdf

⁵⁸ East Cambridgeshire District Council, East Cambridgeshire Local Plan, 2015. <https://www.eastcambs.gov.uk/local-development-framework/east-cambridgeshire-local-plan-2015>

⁵⁹ <https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles#ncas-in-the-east-of-england>

result in relatively low levels of tranquillity in Histon, Impington and Milton. Away from the main roads, especially around Horningsea and Stow cum Quy, the landscape is more tranquil. According to the CPRE light pollution and dark skies map⁶⁰, the area immediately north of Cambridge is not generally dark at night. This is due to street lighting in settlements and along roads.

- B.2.23 The landscape of the LCA is not designated and there are many detracting features along the A14 corridor. It lacks distinctive features that would contribute to a distinctive sense of place. The villages all contain historic cores with conservation area status but overall, they lack a strong historic character and the LCA has a low value. The LCA has a low susceptibility to change due to the type of development proposed owing to the presence of large-scale infrastructure in the area. The overall sensitivity of the area is low.

Waterbeach-Lode Fen LCA

- B.2.24 The key characteristics of the Waterbeach-Lode Fen LCA stem from the flatness of the low-lying landform and the modifications to the pattern and features of the landscape made over the centuries to convert former wetland into farmland. It is a regular landscape, with straight roads, ditches, shelter belts and field boundaries. The dark brown peat soils support intensive arable agriculture. Lines of willows and poplars mark the course of the River Cam and subsidiary watercourses. Settlement is dispersed and on the higher land, along roads. There are many 'islands' which rise above the fen, ranging from the Isle of Ely, at 20m above the adjacent peat fens, to much smaller features only a metre or two above the surrounding farmland. These islands are often occupied by settlements or farmsteads which, with their associated tree cover, increases their prominence. Most buildings are of brick construction and date from the draining of the land in the 18th and 19th centuries.

- B.2.25 There are few views to Cambridge, but the hangars of the airport are visible from the southern end of the LCA. Green links to the city are along the River Cam and through Ditton Meadows. There is an extensive public rights of way network between Horningsea, Stow cum Quy and Lode. This includes the Fen Rivers Way, along the River Cam, and the Harcamlow Way. The LCA is tranquil away from the A14 and, according to the CPRE light pollution and dark skies map, is relatively dark at night. Skyglow above Cambridge is apparent.

- B.2.26 The LCA includes three conservation areas: Baits Bite Lock, Waterbeach and Horningsea Conservation Areas. Stow cum Quy Fen is a SSSI. The LCA includes the majority of the National Trust's Wicken Fen Vision area. The 100 year vision aims to restore habitats and create a landscape-scale space for people and wildlife between Cambridge and the Wicken Fen Nature Reserve. The vision is a strategic element of green infrastructure in the adopted development plans for both South Cambridgeshire District Council (adopted 2018) and East Cambridgeshire District Council (adopted 2015).

- B.2.27 The landscape is important for recreation and wildlife, providing a continuous green link between Cambridge and the countryside. It has distinctive elements and features that contribute to its moderately strong sense of place. These factors combine to give the LCA a medium value. The LCA has a medium susceptibility to change due to the type of development proposed owing to the absence of large-scale infrastructure in the area. The overall sensitivity of the area is medium.

Eastern Fen Edge LCA

- B.2.28 The Eastern Fen Edge is a transitional landscape between the Fenlands LCA to the west and the Chalklands LCA to the south and east. The area is relatively low lying, appearing generally

⁶⁰ Campaign to Protect Rural England: England's Light Pollution and Dark Skies <https://www.nightblight.cpre.org.uk/maps/>

flat, and containing a variety of land uses, including arable and pastoral farmland, roads and settlement. The fen edge has traditionally been an important location for settlement, being above the fen floodplain but close to the lower lying farmland along rivers and watercourses. The A14 has severed the link between Cambridge and the landscape to the north. Fen edge villages such as Swaffham Prior and Bottisham were in the past wealthy and contain fine medieval churches. Building materials traditionally used in the fen edge villages include gault brick, render, and thatch. There are distant views of the centre of Cambridge from higher ground to the east and south and views of the larger structures at Cambridge Airport from around Teversham.

B.2.29 The villages in the LCA, including Horningsea, Lode, Stow cum Quy, Landbeach and Bottisham, largely retain a rural setting, with the urban edge meeting farmland in most directions. Land between these villages comprises flat open fields separated by drainage ditches and hedgerows. Fen Ditton is on the southern side of the A14 and there is continuous urban development along Ditton Lane between Cambridge and Fen Ditton, but overall there is a clear landscape separation between the village and the city provided by the grazing land south of the village and Ditton Meadows, on the River Cam. Around the villages, the landscape is more wooded.

B.2.30 There is a good public rights of way network in the LCA, including the Harcamlow Way Trail and a registered park and garden at the National Trust's Anglesey Abbey. The centres of Horningsea, Waterbeach and Fen Ditton are conservation areas. The LCA includes the southern end of the National Trusts' Wicken Fen Vision area. The area is relatively tranquil, especially away from the A14, which generates traffic and noise along its corridor. traffic generated by these elements and by the science parks south of the A14 and the A14 junctions result in relatively low levels of tranquillity in Histon, Impington, Milton and Waterbeach and the landscape along the A14 and A10. Away from the main roads, especially around Horningsea and Stow cum Quy, the landscape is more tranquil. The villages are lit at night, but the minor roads in rural areas are not lit and consequently the landscape is relatively dark at night, though skyglow above Cambridge is apparent. There are few detractors from the rural character of the landscape.

B.2.31 The landscape of the LCA is not designated but the presence of the registered park and garden, conservation areas and many buildings of historic interest in the villages and the opportunities for recreation in the countryside give the LCA a medium value. The LCA has a medium susceptibility to change due to the type of development proposed owing to the lack of large-scale infrastructure in the area. The overall sensitivity of the area therefore is medium.

Visual amenity

B.2.32 A number of the Cambridge Strategic Viewpoints fall within the ZTVs. However, of the viewpoints within the ZTVs, only the one from Red Meadow Hill, Barton looks towards the site options and, due to the distance (over 9km) and the intervening built environment, the scheme options are unlikely to be discernible from this location.

B.2.33 The tables below list potential sensitive visual receptors, their location and distance from the three option sites. Sensitive receptors are taken as those receptors with a high or medium sensitivity, based on the criteria in Table B.14, receptors with low sensitivity are not considered to be sensitive for the purposes of this assessment.

B.2.34 From interpretation of the ZTV, site survey and use of mapping and aerial photography, it was determined that visual receptors within 1km of the site options could potentially have clear, filtered or partially screened views of a development on the sites and therefore might experience

significant visual effects. More distant visual receptors would be unlikely to experience significant visual effects due to intervening screening by vegetation or built structures and their distance from the scheme. Drawing 409071-MMD-00-XX-GIS-Y-0603 in Appendix J shows the location of visual receptors within 1km of the site options. The below tables list these potential visual receptors.

Table B.12: Visual receptors within 1km of the site options (potential significant effects)

Receptor	Sensitivity	Minimum distance
Site area 1		
Residents of Rectory Farm (A10) looking west (one property)	High	0.4km
Residents in properties on Butt Lane looking north (two properties)	High	0.4km
Residents in properties on Milton Road looking north (four properties)	High	0.7km
Residents on High Street and Midway, Landbeach looking south-west (approximately 48 properties)	High	0.5km
Residents on Akeman Street, Landbeach looking south-east (three properties)	High	0.9km
Residents at Oldfield Farm Barn looking south-east (one property)	High	0.9km
Residents at Bedlam Farm looking east (two properties)	High	0.8km
Visitors to Milton Cemetery looking west	Medium	0.5km
Users of Byway 162/3 and permissive paths 31/PF01 and 31/PF02 looking east (Mere Way)	Medium	0.1km
Users on A10 Ely Road looking west	Medium	0.3km
Site area 2		
Residents in properties on Milton Road looking south (four properties)	High	0.4km
Residents adjacent to Fieldstead Farm looking east (two properties)	High	0.5km
Residents of the Blackwell Caravan Site looking north (15 properties)	High	0.4km
Residents of St Andrew's Way, Impington looking east (approximately 11 properties)	High	0.7km
Residents of St George's Way, Impington looking east (approximately 15 properties)	High	0.7km
Residents of Woodcock Close, Impington looking east (approximately 17 properties)	High	0.7km
Residents of Percheron Close, Impington looking east (approximately 11 properties)	High	0.7km
Users of Byway 162/3 (Mere Way) looking west	Medium	0km
Users of Bridleway 135/6 looking north	Medium	0.7km
Site area 3		
Residents of High St, Horningsea looking south (approximately six properties)	High	0.8km
Residents at Biggin Abbey Cottages looking south-east (approximately six properties) looking south-east	High	0.8km
Residents of Horningsea Road, Fen Ditton looking south-east (approximately 17 properties)	High	0.5km
Residents of High Ditch Road, Fen Ditton looking north (approximately 29 properties)	High	0.8km
Residents of the Marleigh Development (under construction) looking north	High	0.9km

Receptor	Sensitivity	Minimum distance
Residents in property on Low Fen Drove Way (one property)	High	0.4km
Users of Footpath 85/5 and Byway 130/3 (Field Lane) looking north-east	Medium	0.8km
Users Byway 85/14 looking west	Medium	0.5km
Users of Footpath 85/8 looking east	Medium	0.7km
Users of Byway 130/1 (Harcamlow Way and Fen Rivers Way) looking south-east	Medium	0.8km
Users of Footpath 130/2 looking east	Medium	0.7km

Landscape and visual effects during construction

- B.2.35 The ZTVs for each site option show the potential visibility of structures during operation. The construction works would have similar ZTVs, although scaffolding and cranes would be taller than the 26m high digesters used in the model. Construction on all three sites would temporarily introduce new elements into the existing rural landscape and views over farmland. Effects would arise from the presence of construction activity and machinery, construction traffic on local roads, earthworks, lighting, fencing and site accommodation. Trees and hedgerows would be removed for the construction of the WWTP, the waste water and treated effluent transfer tunnels, the Waterbeach pipeline and discharge location and the works to the existing waste water transfer network. Tranquillity would be reduced by the increase in noise, activity and movement in the area. On all sites, effects of construction works would be limited to an area within 5km of the sites.
- B.2.36 Site area 1 lies in the Western Fen Edge LCA which is of low sensitivity. A large-scale construction site would be introduced into open farmland on the outskirts of Cambridge.
- B.2.37 Visual receptors at Landbeach, Rectory Farm, Oldfield Farm, Bedlam Farm, on Butt Lane and Akeman Street and on nearby PRoW would have clear views of the works on site area 1. Views from Milton Cemetery would be largely screened by the intervening farm reservoir and vegetation. Residents in Milton, Impington and Histon would mainly see the taller elements such as cranes, above intervening vegetation.
- B.2.38 Site area 2 also lies in the Western Fen Edge LCA. A large-scale construction site would be introduced into a partly agricultural and partly developed landscape close to the A14.
- B.2.39 Existing tree belts and blocks of woodland provide mature screening vegetation around much of the site. Visual receptors on Butt Lane, in cul-de-sacs off Milton Road (Impington), on the Blackwell caravan site and on nearby PRoW would have clear and partially filtered views of the works on site area 2. Residents in Milton and Histon would mainly see the taller elements such as cranes, above intervening vegetation. Views from St Andrew’s Church, Impington would be screened by intervening vegetation.
- B.2.40 Site area 3 lies in the Eastern Fen Edge LCA which is of medium sensitivity. It is also situated on the boundary between the Eastern Fen Edge LCA and the Waterbeach – Lode Fen LCA, also of medium sensitivity. A large-scale construction site would be introduced into the countryside. The landscape is open in this location with large fields separated by ditches and low hedgerows and expansive views. Built development in the area is small scale and there is little screening vegetation to the east, south of west.
- B.2.41 Visual receptors in Stow cum Quy, Horningsea, at Biggin Abbey, on Horningsea Road (Fen Ditton) and on the many PRoW in the area would have clear or partially filtered views of the works on site area 3. Views from the Marleigh development, 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.

B.2.42 Overall, construction on site area 2 would result in the least widespread landscape and visual effects owing to the presence of existing development and screening vegetation in the area. Construction on site area 3, being more open and undeveloped, would result in the most widespread landscape and visual effects.

B.2.43

Table B.13: Summary of landscape and visual effects (construction)

Criteria	Site area 1	Site area 2	Site area 3
Landscape character sensitivity	Site within a landscape character area of low overall sensitivity, on open farmland with few landscape detractors.	Site within a landscape character area of overall low sensitivity, on farmland adjacent to existing built development which detracts from local landscape character.	Site within an area of medium sensitivity, on open farmland with few landscape detractors.
Visual sensitivity	Between 50 and 100 sensitive receptors within 1km of the site.	Between 50 and 100 sensitive receptors within 1km of the site.	Between 50 and 100 sensitive receptors within 1km of the site.
Opportunity to utilise existing features for screening	No significant areas of vegetation adjacent to the site.	Significant area of vegetation running along the eastern and southern site boundaries, with additional vegetation to the east and south of the site. Former landfill site, recycling centre and business units on Butt Lane screen the site from the south, east and north.	No significant areas of vegetation adjacent to the site.
Stage 3 assessment	Amber	Green	Amber
Summary of Stage 4 assessment	Site located on farmland, in an area of low landscape sensitivity with little screening vegetation around the site and on the urban edge of Cambridge. Between 50 and 100 sensitive receptor locations within 1km of the site.	Site located in an area of low landscape sensitivity with extensive screening vegetation close to the site, adjacent to existing development and on the urban edge of Cambridge. Between 50 and 100 sensitive receptor locations within 1km of the site.	Site located on farmland, in an area of medium landscape sensitivity with no screening vegetation around the site. Existing development in the area is small scale and domestic. Between 50 and 100 sensitive receptor locations within 1km of the site.

Landscape and visual effects during operation

B.2.44 On all three site areas, effects would arise from the introduction of a new WWTP, with large-scale structures up to 26m high, access roads, hard standing, fencing and lighting, into the rural landscape and existing views over farmland. Hedgerows removed during construction of the waste water and treated effluent transfer tunnels, the Waterbeach pipeline and the works to the existing waste water transfer network would be replanted. However, an easement would prevent the replanting of trees along the tunnel and pipeline corridors. Tranquillity would be reduced by

the increase in noise, activity and movement in the area. Effects of the development in operation would be largely limited to an area within 5km of the sites.

- B.2.45 A large-scale new infrastructure development on site area 1 would change the character of the area. The scale and industrial appearance of the structures would be uncharacteristic of the existing farmed landscape and would extend built development on the outskirts of Cambridge north, into open farmland. The character of the landscape around site area 1 contains urban elements, with the villages of Landbeach, Milton, Impington and Histon, but it forms the southern end of a stretch of open countryside that extends north into the Fens. Lighting on the site would introduce a large lit area into what are currently unlit fields (though the nearby settlements are lit). Trees would be permanently lost from Milton Country Park, south of Butt Lane, adjacent to the A14 junction and the existing WWTP and along the Waterbeach pipeline corridor. Tranquillity in the area would be further reduced by increased activity and traffic generated by the operation of the site.
- B.2.46 Visual receptors at Landbeach, at Rectory Farm, Oldfield Farm, Bedlam Farm, on Butt Lane and Akeman Street and on nearby PRow would have clear views of the new structures on site area 1. Views from Milton Cemetery would be largely screened by the intervening farm reservoir and vegetation. Residents in Milton, Impington and Histon would mainly see the taller elements above intervening vegetation.
- B.2.47 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. Lighting on the site would introduce a large lit area into currently unlit farmland (though the nearby settlements are lit). Trees would be permanently lost from Milton Country Park, south of Butt Lane, adjacent to the A14 junction and the existing WWTP and along the Waterbeach pipeline corridor. Tranquillity in the area would be further reduced by increased activity and traffic generated by the operation of the site.
- B.2.48 Existing tree belts and woodland blocks would provide mature screening that would limit most views of site area 2 from Impington, with just the tallest elements visible above the trees. Residents in Milton and Histon might 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 nearby PRow would have clear or filtered views of the new structures.
- B.2.49 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. Effects would be experienced in the Eastern Fen Edge LCA and the Waterbeach – Lode Fen LCA, both of medium sensitivity. This area is open, with little screening vegetation and is part of the open countryside which stretches into fenland and chalkland landscapes to the north and east respectively. The scale and industrial appearance of the structures would be wholly uncharacteristic of the existing built development in an area which currently comprises small villages and isolated farmhouses. Trees would be permanently lost either from the Milton Country Park or the River Cam and farmland south of the A14, depending on the route of the wastewater transfer corridor. They would also be lost along the Waterbeach pipeline corridor and Low Fen Drove Way which would be partly widened for a site access. The WWTP would lie in the National Trust's Wicken Fen Vision area and would detract from the aims of the vision, a strategic element of green infrastructure in South Cambridge District Council and East Cambridge District Council's development plans. Lighting on the site would introduce a large lit area into an unlit area. Tranquillity in the area would be further reduced by increased activity and traffic generated by the operation of the site.

B.2.50 Visual receptors in Stow cum Quy, Horningsea, at Biggin Abbey, on Horningsea Road (Fen Ditton) and on the many PRoW in the area would have clear or partially filtered views of the new structures.

B.2.51 Overall, a development on site area 2 could be accommodated with the least widespread landscape and visual effects of the three site areas owing to the presence of existing development and screening vegetation in the area. A development on site area 3 would result in the most widespread landscape and visual effects owing to the site location being in open and undeveloped countryside.

Table B.14: Summary of landscape and visual effects

Criteria	Site area 1	Site area 2	Site area 3
Landscape character sensitivity	Site within a landscape character area of low overall sensitivity, on open farmland with few landscape detractors.	Site within a landscape character area of overall low sensitivity, on farmland adjacent to existing built development which detracts from local landscape character.	Site within an area of medium sensitivity, on open farmland with few landscape detractors.
Visual sensitivity	Between 50 and 100 sensitive receptors within 1km of the site.	Between 50 and 100 sensitive receptors within 1km of the site.	Between 50 and 100 sensitive receptors within 1km of the site.
Opportunity to utilise existing features for screening	No significant areas of vegetation adjacent to the site.	Significant area of vegetation running along the eastern and southern site boundaries, with additional vegetation to the east and south of the site. Former landfill site, recycling centre and business units on Butt Lane screen the site from the south, east and north.	No significant areas of vegetation adjacent to the site.
Stage 3 assessment	Amber	Green	Amber
Summary of Stage 4 assessment	Site located on farmland, in an area of low landscape sensitivity with little screening vegetation around the site and on the urban edge of Cambridge. Between 50 and 100 sensitive receptor locations within 1km of the site.	Site located in an area of low landscape sensitivity with extensive screening vegetation close to the site, adjacent to existing development and on the urban edge of Cambridge. Between 50 and 100 sensitive receptor locations within 1km of the site.	Site located in rural area of farmland, in an area of medium landscape sensitivity with no screening vegetation around the site. Sloping site will require large-scale modifications to landform. Existing development in the area is small scale and domestic. Between 50 and 100 sensitive receptor locations within 1km of the site.

Mitigation identification

Site area 1

B.2.52 The proposed landscape mitigation is illustrated on drawing 409071-MMD-00-XX-GIS-Y-0465. On site area 1, mitigation opportunities include the following:

- woodland planting in severed land no longer suitable for agriculture and around the site boundary to provide long term screening of views from nearby visual receptors and landscape integration;
- strengthening of existing vegetation along Mere Way, with additional tree and hedgerow planting;
- new hedgerows with trees along field boundaries close to visual receptors. This will provide screening more quickly than the site boundary perimeter planting and will strengthen the existing landscape pattern of fields and hedgerows;
- new hedgerow with trees along both sides of the site access road to screen the road, break up views of the site and provide landscape integration;
- exploration of further opportunities for offsite planting to strengthen landscape mitigation;
- use of surplus material excavated during construction to form landscape bunding for screening;
- minimising land take and areas of hard standing through efficient design;
- use of graduated colours for the cladding and paint finishes on taller elements of the WWTP to minimise the prominence of the scheme when viewed against a backdrop of land or sky;
- design of new buildings to be informed by design of existing barns and large farm buildings in the area to improve integration into the farmed landscape; and
- building massing and roof profiles varied to prevent large buildings from appearing as monolithic structures in the landscape.

Site area 2

B.2.53 The proposed landscape mitigation is illustrated on drawing 409071-MMD-00-XX-GIS-Y-0466. On site area 2, mitigation opportunities include the following:

- woodland planting on the western boundary of the site to screen views from Impington to and other nearby visual receptors;
- tree and hedgerow planting along field boundaries to strengthen the existing landscape pattern of fields and hedgerows;
- hedgerow with trees along the access road to screen the road, break up views of the site and provide landscape integration;
- exploration of further opportunities for offsite planting to strengthen landscape mitigation;
- use of surplus material excavated during construction to form landscape bunding for screening;
- minimising land take and areas of hard standing through efficient design;
- use of graduated colours for the cladding and paint finishes on taller elements of the WWTP to minimise the prominence of the scheme when viewed against a backdrop of land or sky;
- design of new buildings to be informed by design of existing barns and large farm buildings in the area to improve integration into the farmed landscape; and
- building massing and roof profiles varied to prevent large buildings from appearing as monolithic structures in the landscape.

Site area 3

B.2.54 The proposed landscape mitigation is illustrated on drawing 409071-MMD-00-XX-GIS-Y-0467. On site area 3, mitigation opportunities include the following:

- woodland planting around the site to screen views from Horningsea, Stow cum Quy and Fen Ditton and in severed fields no longer suitable for agriculture;
- tree and hedge planting along field boundaries to strengthen the existing landscape pattern of fields and hedgerows;
- hedgerow with trees along the access road to screen the road, break up views of the site and provide landscape integration;
- exploration of further opportunities for offsite planting with landowners to strengthen mitigation;
- WWTP to sit as low in the landscape as possible;
- use of surplus material excavated during construction to form landscape bunding for screening;
- minimising land take and areas of hard standing through efficient design;
- use of graduated colours for the cladding and paint finishes on taller elements of the WWTP to minimise the prominence of the scheme when viewed against a backdrop of land or sky;
- design of new buildings to be informed by design of existing barns and large farm buildings in the area to improve integration into the farmed landscape; and
- building massing and roof profiles varied to prevent large buildings from appearing as monolithic structures in the landscape.

Assessment of mitigated options

Site area 1

- B.2.55 Mitigation during construction would concentrate on minimising the loss of existing vegetation and construction light spill. The large scale of the construction works and the openness of the landscape setting means that the works would be visible from Landbeach, Impington and the farms and other residential properties within 1km of the site and Byway 162/3.
- B.2.56 In year 1 of operation, the landscape mitigation planting would not be sufficiently mature to provide any screening effect. Hedgerows removed in construction along the tunnel and pipeline corridors would be replaced but as this is not classed as mitigation, they are described in the assessment of unmitigated options. Trees would not be replaced along the tunnel or pipeline corridors for operational reasons.
- B.2.57 It is assumed that the proposed trees and woodland mitigation planting would be 7.5m high after 15 years, with hedgerows reaching a height of 3m. The planting would screen much of the new WWTP by year 15 year of operation. The mitigation planting would be most effective where it is closest to receptors, along Mere Way, close to Landbeach and Rectory Farm and along the access road to the site. The taller new structures, including the digesters, would remain visible above the vegetation from Landbeach, Impington and the farms and other nearby residential properties and the byway. In time, the proposed landscape mitigation would gradually integrate the new development into its surroundings, but the planting would reduce the openness of the existing view. The WWTP would remain an uncharacteristic addition to the landscape and views.
- B.2.58 Screening vegetation could be partly planted on landscape bunds, reducing the time taken for it to become effective as mitigation. Offsite planting close to receptors would require agreement with landowners.

Site area 2

- B.2.59 Mitigation during construction would concentrate on minimising the loss of existing vegetation and construction light spill. The existing mature vegetation south and west of the site and the former landfill site, recycling centre and business units will screen most views of construction from the north, south and west but the construction activity will be visible from the northern end of Impington, Milton Road, Byway162/3 and Bridleway135/6.
- B.2.60 In year 1 of operation, the landscape mitigation planting would be insufficiently mature to provide any screening effect. Hedgerows removed in construction along the tunnel and pipeline corridors would be replaced but as this is not classed as mitigation, they are described in the assessment of unmitigated options. Trees would not be replaced along the tunnel or pipeline corridors for operational reasons.
- B.2.61 Tree and woodland mitigation planting at 7.5m high by year 15 of operation would screen the lower structures on the site. The mitigation planting would be most effective where it is closest to receptor along Mere Way, but the tallest structures, including the digesters, would remain visible to receptors on Milton Road, Impington and on nearby PRow. In time, the proposed landscape mitigation would gradually integrate the development into its surroundings, effectively blending it in to the existing wooded character of the landscape of the southern half of site area 2.
- B.2.62 Screening vegetation could be partly planted on landscape bunds, reducing the time taken for it to become effective as mitigation. Offsite planting close to receptors would require agreement with landowners.

Site area 3

- B.2.63 Mitigation during construction would concentrate on minimising the loss of existing vegetation and construction light spill. The large scale of the construction works and the openness of the landscape means that the works will be visible from Stow cum Quy, Horningsea, Fen Ditton, Biggin Abbey Cottages and PRow in the area (including the Harcamlow Way).
- B.2.64 In year 1 of operation, the landscape mitigation planting would be insufficiently mature to provide any landscape mitigation or screening effect. Hedgerows removed in construction along the tunnel and pipeline corridors would be replaced but as this is not classed as mitigation, they are described in the assessment of unmitigated options. Trees would not be replaced along the tunnel or pipeline corridors for operational reasons.
- B.2.65 Tree and woodland mitigation planting at 7.5m high by year 15 of operation would screen the lower structures on the site. The mitigation planting would be most effective where it is closest to receptors in Stow cum Quy, Horningsea and Biggin Abbey Cottages, but the tallest structures, including the digesters, would remain visible from Stow cum Quy, Horningsea, Fen Ditton, Biggin Abbey Cottages and nearby PRow. In time, the proposed landscape mitigation would gradually integrate the new development into its surroundings, but the planting would reduce the openness of the existing view. The WWTP would remain an uncharacteristic addition to the landscape and views.
- B.2.66 Screening vegetation could be partly planted on landscape bunds, reducing the time taken for it to become effective as mitigation. Offsite planting close to receptors would require agreement with landowners.

Table B.15: Summary mitigated landscape and visual effects in construction

Criteria	Site area 1	Site area 2	Site area 3
Landscape character sensitivity	Site within a landscape character area of low overall sensitivity, on open farmland with few landscape detractors.	Site within a landscape character area of overall low sensitivity, on farmland adjacent to existing built development which detracts from local landscape character.	Site within an area of medium sensitivity, on open farmland with few landscape detractors.
Visual sensitivity	Between 50 and 100 sensitive receptors within 1km of the site.	Between 50 and 100 sensitive receptors within 1km of the site.	Between 50 and 100 sensitive receptors within 1km of the site.
Opportunity to utilise existing features for screening	No significant areas of vegetation adjacent to the site.	Significant area of vegetation running along the eastern and southern site boundaries, with additional vegetation to the east and south of the site. Former landfill site, recycling centre and business units on Butt Lane screen the site from the south, east and north.	No significant areas of vegetation adjacent to the site.
Stage 3 assessment	Amber	Green	Amber
Summary of Stage 4 assessment	Site located on farmland, in an area of low landscape sensitivity with little screening vegetation around the site and on the urban edge of Cambridge. Between 50 and 100 sensitive receptors locations within 1km of the site.	Site located in an area of low landscape sensitivity with extensive screening vegetation close to the site, adjacent to existing development and on the urban edge of Cambridge. Between 50 and 100 sensitive receptor locations within 1km of the site.	Site located in rural area of farmland, in an area of medium landscape sensitivity with no screening vegetation around the site. Sloping site will require large-scale modifications to landform. Existing development in the area is small scale and domestic. Between 50 and 100 sensitive receptor locations within 1km of the site.

Table B.16: Summary of mitigated landscape and visual effects in operation (year 15)

Criteria	Site area 1	Site area 2	Site area 3
Landscape character sensitivity	Site within a landscape character area of low overall sensitivity, on open farmland with few landscape detractors.	Site within a landscape character area of overall low sensitivity, on farmland adjacent to existing built development which detracts from local landscape character.	Site within an area of medium sensitivity, on open farmland with few landscape detractors.
Visual sensitivity	Between 50 and 100 sensitive receptors within 1km of the site.	Between 50 and 100 sensitive receptors within 1km of the site.	Between 50 and 100 sensitive receptors within 1km of the site.
Opportunity to utilise existing features for screening	No significant areas of vegetation adjacent to the site.	Significant area of vegetation running along the eastern and southern site boundaries, with additional vegetation to the east and south of the site. Former landfill site, recycling centre and business units on Butt Lane screen the site from the south, east and north.	No significant areas of vegetation adjacent to the site.
Stage 3 assessment	Amber	Green	Amber
Summary of Stage 4 assessment	Site located on farmland, in an area of low landscape sensitivity with little screening vegetation around the site and on the urban edge of Cambridge. Between 50 and 100 sensitive receptor locations within 1km of the site. Landscape mitigations will in time integrate the structures into the landscape but owing to their large-scale, they cannot be wholly screened.	Site located in an area of low landscape sensitivity with extensive screening vegetation close to the site, adjacent to existing development and on the urban edge of Cambridge. Between 50 and 100 sensitive receptor locations within 1km of the site. Landscape mitigations will in time integrate the structures into the landscape but owing to their large-scale, they cannot be wholly screened.	Site located in rural area of farmland, in an area of medium landscape sensitivity with no screening vegetation around the site. Sloping site will require large-scale modifications to landform. Existing development in the area is small scale and domestic. Between 50 and 100 sensitive receptor locations within 1km of the site. Landscape mitigations will in time integrate the structures into the landscape but owing to their large-scale, they cannot be wholly screened.

Incorporating feedback

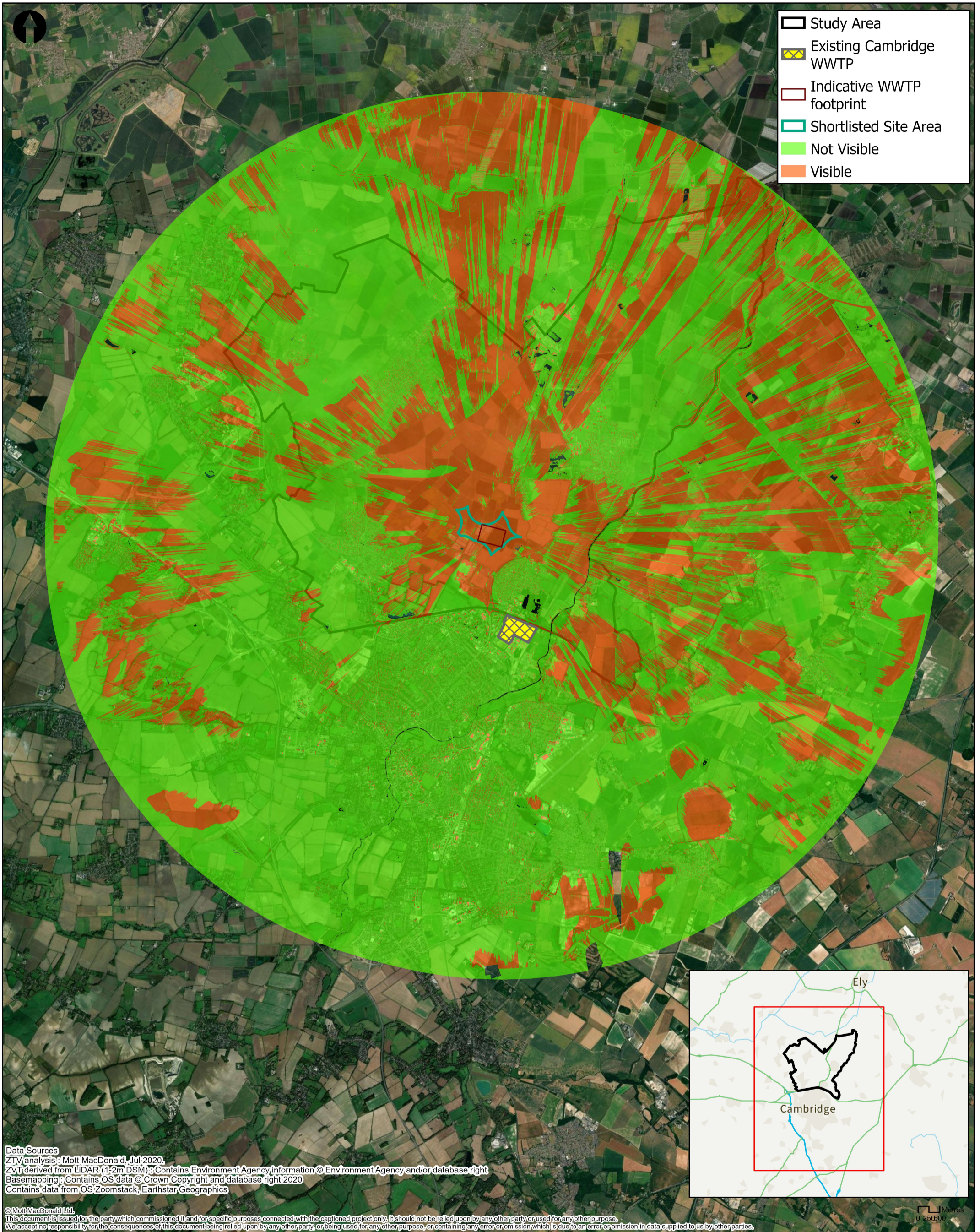
B.2.67 Phase one non-statutory consultation was held in order to share the proposals for relocating the WWTP with the public and stakeholders. This section provides a summary of the feedback received from the public in relation to landscape and visual amenity and how the concerns, issues and opportunities raised have been considered within the assessment criteria for Stage 4 final site selection.

Table B.17: Landscape and visual amenity feedback

Sub-Theme	Site (if specific)	Comment Summary	CWWTPR Response
Public Wellbeing from greenbelt.	General	The importance of open greenspace at all sites has been mentioned by contributors with concerns that if this space is lost/damaged so will the physical/mental benefits that it brings to many people in the local villages and Cambridge City.	This is acknowledged in the landscape and visual assessment of the report. It is a concern on all sites, but especially site areas 1 and 3. The proximity of local amenities to construction and operation of the WWTP were taken into consideration within the individual environmental assessments which were used to establish amenity effects. The potential effects that were taken into consideration were air quality, odour, noise, landscape and visual and traffic.
		Other comments have also asked for the site not to be relocated because of this and just reduce the size of the current site.	Although reducing the size of the current site would result in the fewest landscape and visual impacts, this option was ruled out in the Initial Options Appraisal.
Height and buildings	General	Many comments have also been made regarding the height of the plant, with concern that it will negatively impact countryside views. Respondents have asked for information on how tree screening could be utilised to prevent this.	Details of the landscape mitigation proposals for each site are provided in Appendix B.2. Tree screening is effective soonest when closest to the receptor – the landscape design proposed includes tree belts and hedgerow close to residential receptors. In the long term, woodland planting on earth bunding will also be effective in screening all but the tallest structures on the site (7.5m high after 15 years).
		Other comments suggested overcoming visual impacts by designing a plant with a lower height. It was suggested this could be achieved by having multiple smaller digesters and gas holders, rather than singular tall structures.	Reducing the height of the structures will allow the landscape mitigation to screen the site more quickly.
	Site 1	Comment that viewpoints to Landbeach from Butt Lane and A10 would be negatively impacted by Site 1, as well as concern regarding impact to Mere Way and hedges.	Views from Landbeach and Butt Lane have been considered in the Stage 4 assessment. The view from the A10 has been included in the assessment.
	Site 2	Some respondents commented that the landscape surrounding Site 2 would not be impacted as significantly by the relocation given to the proposed nearby police station and current landfill site.	This is supported by the results of the landscape and visual assessment, which indicated that a WWTP at site area 2 would result in the least widespread landscape and visual effects owing to the presence of existing development and screening vegetation in the area.

Sub-Theme	Site (if specific)	Comment Summary	CWWTPR Response
	Site 3	Comment that the Flat Fen landscape, which can be seen from Honey Hill, would be impacted.	This is consistent with the landscape and visual assessment, which reported that 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.
	General	Concern that the construction of new tunnel and pipelines will have the same effect on reducing spaces in the greenbelt (and subsequent impacts on local communities' physical and mental health) albeit temporarily.	If pipe routes are tunnelled there would be little permanent impact on the openness of the Green Belt, unless large scale earth bunding is required to dispose of tunnelled materials on site. There would be temporary impacts from excavated pipe routes due to the presence of construction compounds, and plant in the Green Belt.
Tunnel & Pipeline impacts	Site 1 & 2	Comment that the proposed tunnel and pipeline routes could interfere with \ belt of trees located near Milton housing estate, adjacent to A10.	If the treated effluent pipe routes for site areas 1 and 2 are tunnelled, there should be no impact on the trees between the Milton Housing estate and the A10 or on the Sycamores playing fields. This is important existing woodland screening and would be retained. If the treated effluent corridor is a pipeline, there may be a loss of vegetation along the route, but the route would be designed to minimise this. The likelihood is that the pipeline would be tunnelled under the A10, protecting the trees at the same time.
		Concern regarding potential permanent damage to playing fields in the Sycamores.	
	Site 3	Some respondents have suggested that as this would require less infrastructure, is furthest from residential housing and contains large numbers of pylons, then it will be less of an impact on the landscape if relocated here.	Site area 3 has the most landscape impacts due to being in open countryside with little development. The pylons do detract from the landscape value, but not as much as the adjacent development on site area 2.

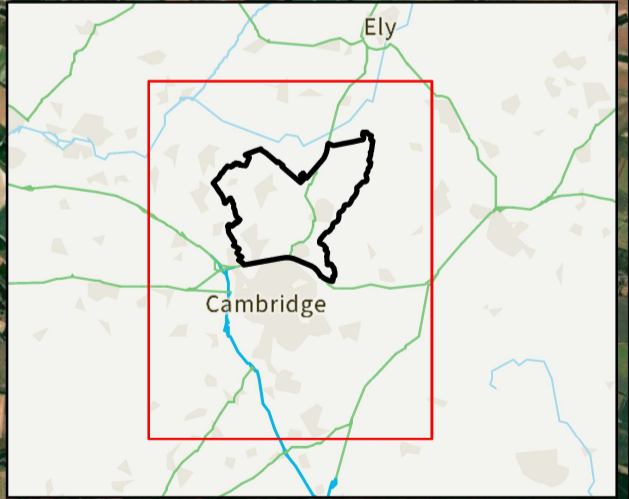
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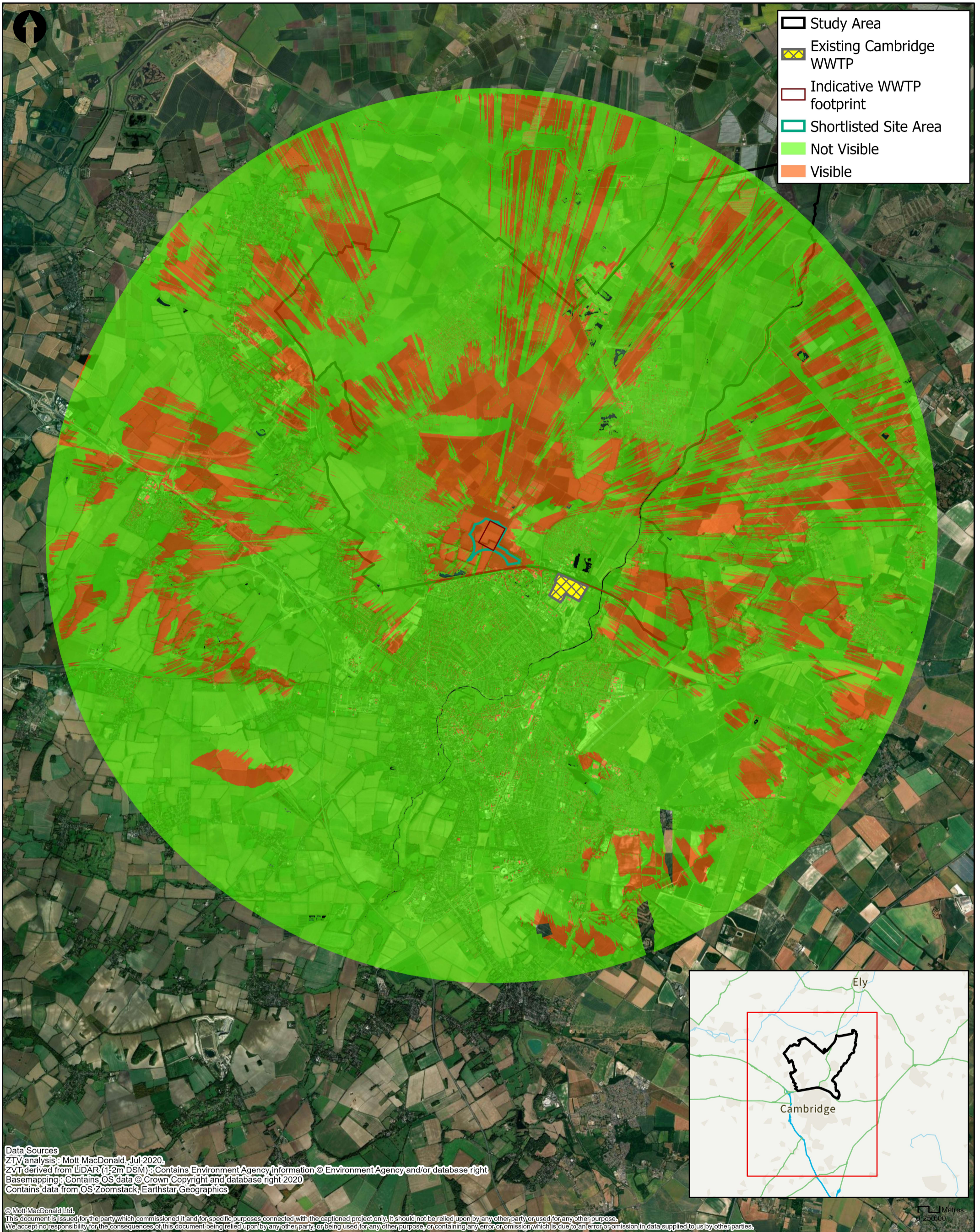
- Study Area
- Existing Cambridge WWTP
- Indicative WWTP footprint
- Shortlisted Site Area
- Not Visible
- Visible

Data Sources
 ZTV analysis: Mott MacDonald, Jul 2020.
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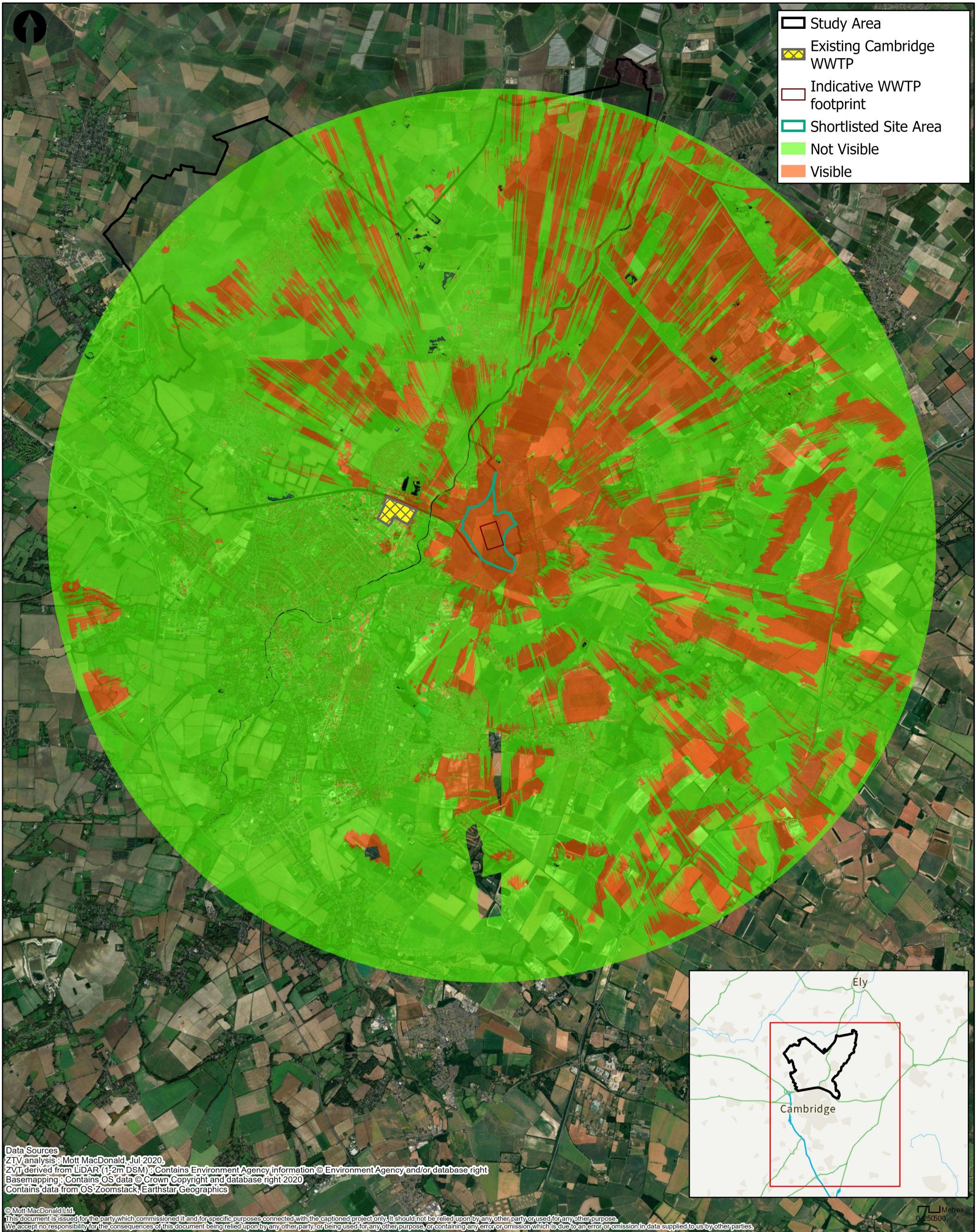
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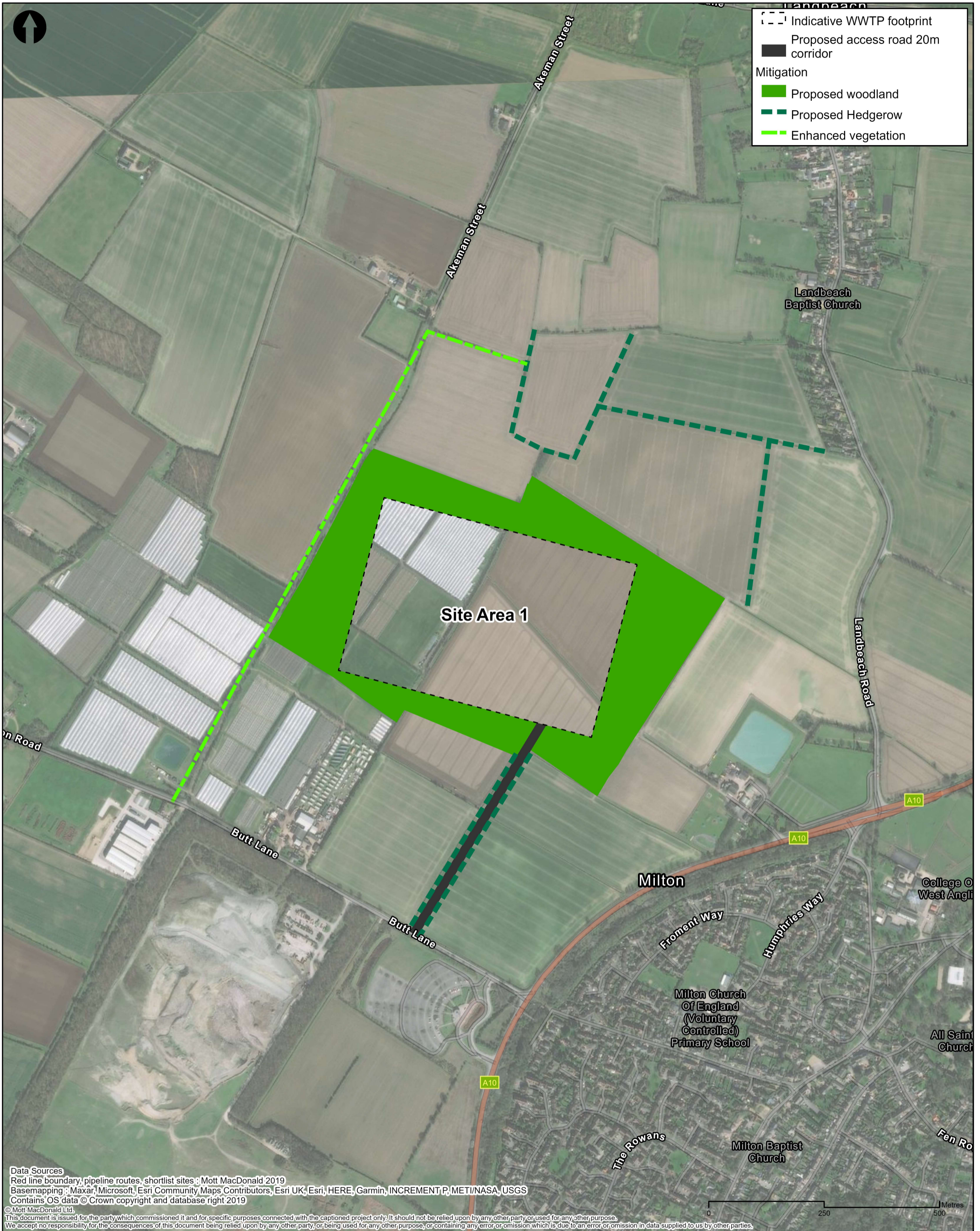
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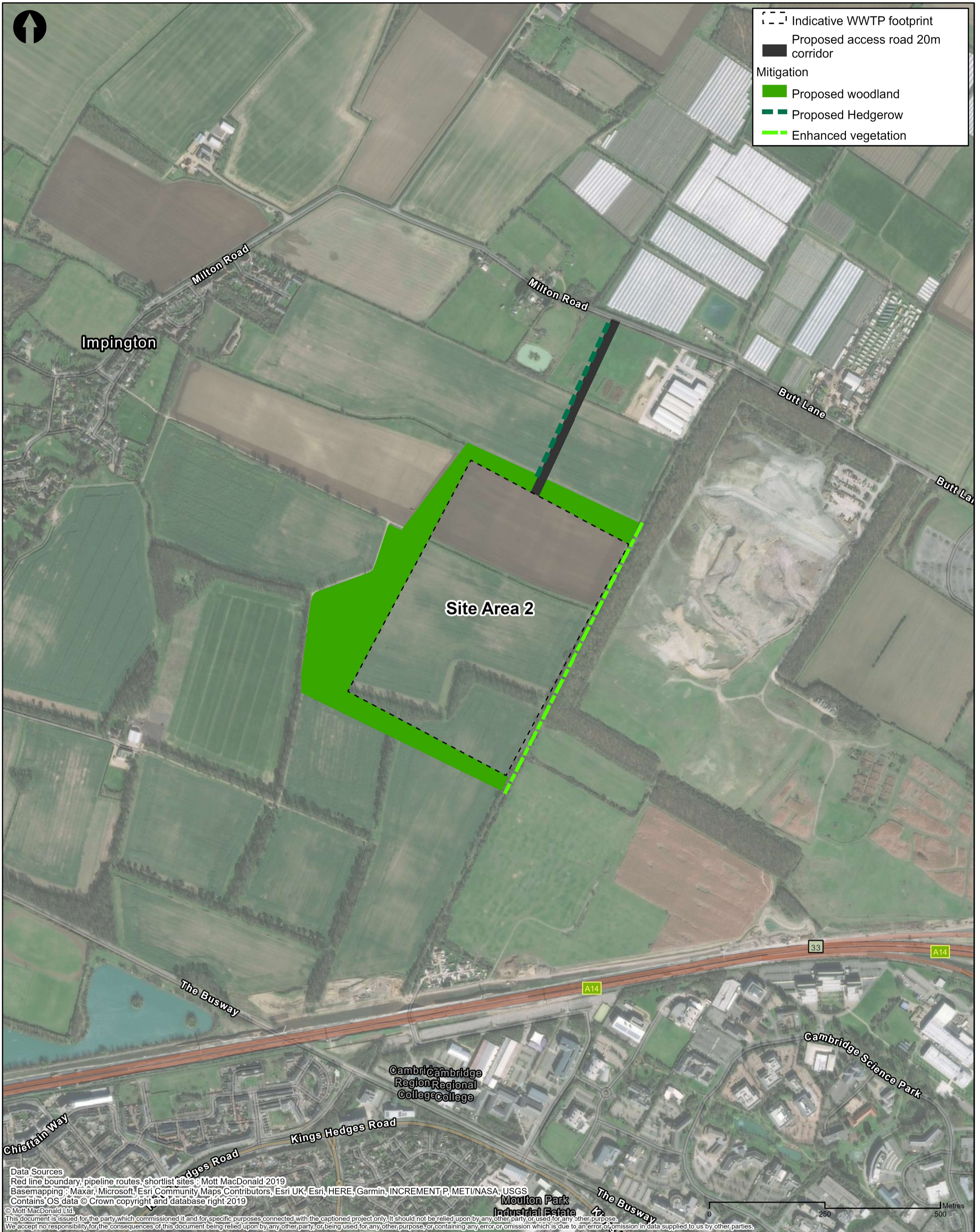
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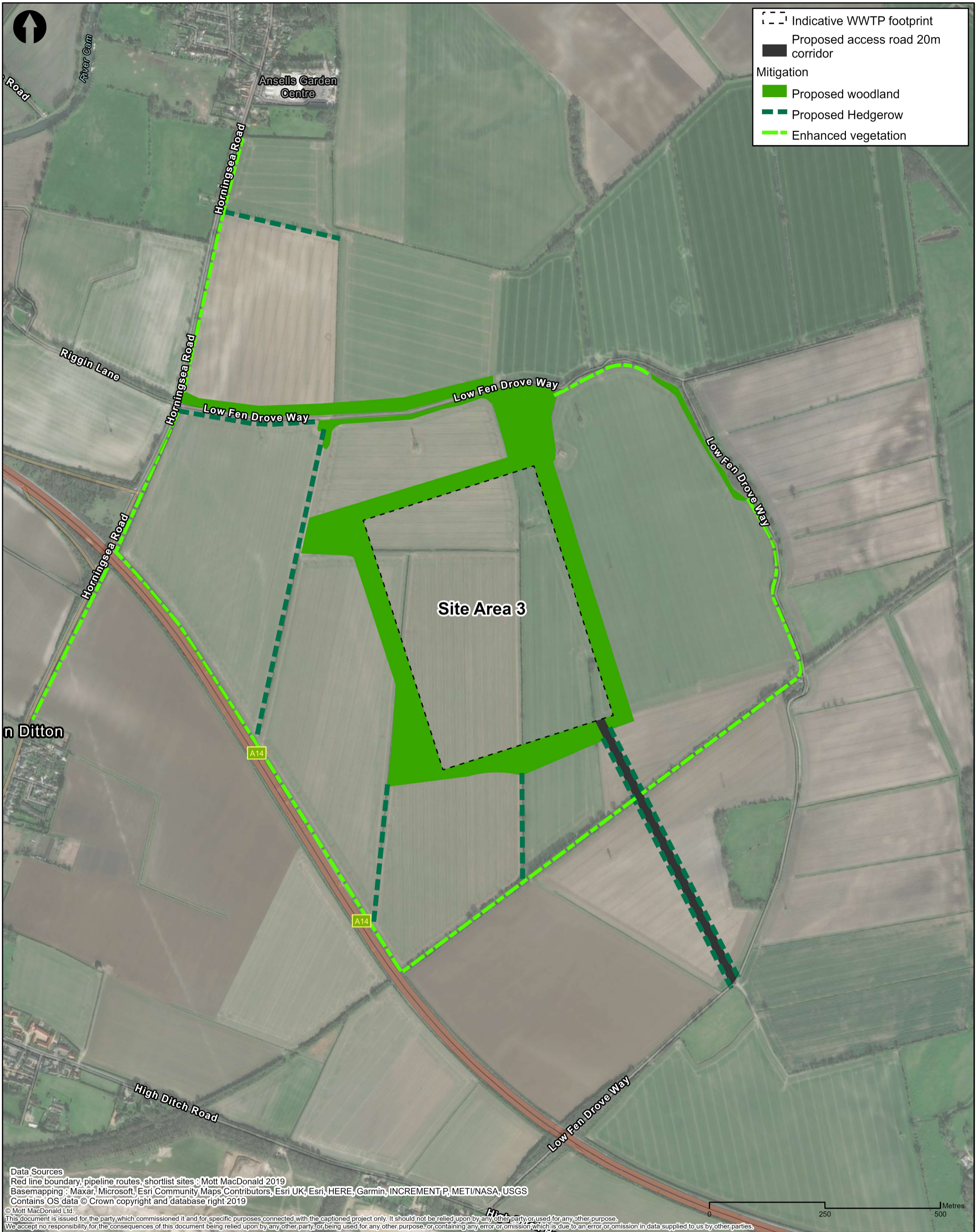
<p>MOTT MACDONALD</p> <p>22 Station Road Cambridge CB1 2JD United Kingdom</p> <p>T +44 (0)20 8774 2000 F +44 (0)20 8681 5706 W mottmac.com</p>	Client					Title			Drawn	A Briggs															
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Indicative WWTP footprint
 Proposed access road 20m corridor
Mitigation
 Proposed woodland
 Proposed Hedgerow
 Enhanced vegetation

Data Sources
 Red line boundary, pipeline routes, shortlist sites : Mott MacDonald 2019
 Basemapping : Maxar, Microsoft, Esri Community Maps Contributors, Esri UK, Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS
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 Indicative WWTP footprint
 Proposed access road 20m corridor
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B.3 Historic Environment

Assessment methodology

- B.3.1 This assessment considered the potential impacts upon the historic environment of the unmitigated options for the three site areas and their associated infrastructure.
- B.3.2 The assessment provides a more detailed assessment of the three shortlisted site areas than was provided in stage 3, including; a more detailed baseline, a site walkover, and potential impacts on designated heritage assets identified within the 10km ZTV described in section B.2.6.
- B.3.3 The methodology for the historic environment assessment is provided in the full historic environment impact appraisal report in Appendix L.
- B.3.4 An overall Red/Amber/Green (RAG) assessment was given to each of the Stage 4 site area options. The criteria for the defining the overall score are provided in Table B.18.

Table B.18: Historic RAG definitions

Green	Amber	Red
<p>No anticipated impact on non-designated and designated heritage assets.</p> <p>Potential negligible to moderate impact on non-designated assets of low value.</p> <p>Potential negligible to minor impacts on non-designated and designated assets of moderate value.</p>	<p>Potential major impact on non-designated asset of low value.</p> <p>Potential moderate to major impact on non-designated and designated assets of moderate value.</p> <p>Potential negligible to minor impacts on designated and non-designated assets of high value.</p>	<p>Potential for moderate to major impact on non-designated and designated assets of high value.</p>

- B.3.5 Comment is made within the assessment of unmitigated options section of this report as to how this assessment relates to the planning terminology of no harm, less than substantial harm and substantial harm. This is intended to inform how this assessment relates to planning context. It should be noted that this terminology may not always provide a useful representation of anticipated impact due to broad categories, and should be understood in the context of the assessment, rather than taken alone.

Assessment of unmitigated options

- B.3.6 The historic environment impact appraisal for each of the site areas is provided in Appendix L. A summary of the assessments and the resulting RAG evaluation, before mitigation, are provided below.
- B.3.7 Based on the criteria described in section B.3.4 and the impact appraisal described in Appendix L, the RAG outcome for the WWTP development at site area 1 is **AMBER**.
- B.3.8 The primary reason for the Amber rating for site area 1 is the high archaeological potential for Roman and Iron Age remains. This results in a likelihood of moderate to major impact to archaeological remains which may be of low to moderate value, which amounts to substantial harm in accordance with the NPS.
- B.3.9 In addition, the pipeline to Waterbeach encounters remains identified in the CHER with potentially moderate value and would result in a moderate to major impact to these. Therefore, the excavation for the pipeline to Waterbeach is anticipated to result in substantial harm to assets of low to moderate value.

- B.3.10 In addition, potential for impact to the grade I listed Parish Church of All Saints contributes to the RAG outcome. The change within its setting is likely to result in minor impact to a designated heritage asset of high value. Additionally, minor impact to the grade II listed Baptist Chapel from change within its setting contributes to this outcome. In accordance with the NPS, this amounts to less than substantial harm to designated heritage assets.
- B.3.11 Based on the criteria described in section B.3.4 and the impact appraisal described in Appendix L, the RAG outcome for the WWTP development at site area 2 is **AMBER**.
- B.3.12 In accordance with the NPS, this amounts to less than substantial harm to all built heritage assets. There is potential for the development of the CWWTP at site area 2 to result in substantial harm to buried archaeology of low and moderate value.
- B.3.13 The outcome of the RAG assessment on site area 2 relates to the archaeological potential for Roman and prehistoric remains. The relocation of CWWTP to site area 2 would result in moderate to major impact to archaeological remains of potentially moderate value. The pipeline to Waterbeach encounters remains identified in the HER with potentially moderate value and would result in moderate to major harm to these. In both instances this amounts to substantial harm to assets of low and moderate value, in accordance with the NPS.
- B.3.14 Based on the criteria described in section B.3.4 and the impact appraisal described in Appendix L, the RAG outcome for the WWTP development at site area 3 is **RED**.
- B.3.15 The reason for the RAG outcome is the potential for impact to Biggin Abbey as a result of change within its setting. Without mitigation this may amount to moderate harm to the significance of the asset, this amounts to less than substantial harm in accordance with the NPS but constitutes a red rating within the RAG criteria for this report.
- B.3.16 Without this element the site would receive an amber rating due to the potential for impact on buried archaeological remains and lesser impact on Anglesey Abbey. The pipeline to Waterbeach would also likely result in moderate to major impact to archaeological remains of moderate value, if present. This may amount to substantial harm in accordance with the NPS.
- B.3.17 There is also potential for impact to the grade II listed Wildfowl Cottage from change within its setting. The access route from Horningsea Road contains Roman archaeological remains of potentially moderate value and has high potential for associated archaeology. These impacts amount to less than substantial harm.

Mitigation identification

Site area 1

- B.3.18 Design considerations should aim to minimise change within the setting of designated heritage assets, with particular consideration to the grade I listed Parish Church of All Saints and the grade II listed Baptist Chapel. Strategic planting and other landscaping between the WWTP and these designated assets may soften the visual impact, especially in conjunction with design measures for the buildings. Buildings and structures over 10m, including the digesters should be designed to be the minimal feasible height, to further reduce impact on the setting of heritage assets. The exterior of tall elements should be designed to retreat into the landscape, for example by using gradated painting.
- B.3.19 Archaeological investigation would be required if site area 1 is selected. The extent of this investigation would be dependent on the results of further assessment and site survey, as well as consultation with the relevant stakeholders. This is likely to include geophysical survey and archaeological trial trenching as a minimum. Archaeological investigation, importantly, does not

amount to mitigation as the remains would still be removed by the WWTP development; the potential for impact to the buried archaeological remains is therefore the same. However, this does not undermine the importance of undertaking archaeological investigation.

- B.3.20 Geophysical survey, trial trenching and/or other survey may identify areas of greater archaeological potential or specific remains of moderate value within the site area. This may allow for the targeting of building and service locations to reduce impact on buried archaeology. However, as the landscape contains a high density of remains and the historic environment is not the only factor of consideration in the scheme design, this is unlikely to materially reduce the potential for impact.

Site area 2

- B.3.21 Archaeological investigation would be required if site area 2 is selected. The extent of this investigation would be dependent on the results of initial surveys but is likely to include geophysical survey and archaeological trial trenching as a minimum. This does not amount to mitigation, as discussed for site area 1.
- B.3.22 Geophysical survey, trial trenching and/or other survey may identify areas of greater archaeological potential or specific remains of moderate value within the site area. This may allow for the targeting of building and service locations to reduce impact on buried archaeology. However, as the landscape contains a high density of remains and the historic environment is not the only factor of consideration in the scheme design this is unlikely to materially reduce the potential for impact, as for site area 1.
- B.3.23 Strategic planting and other landscaping may reduce the impact of the proposed development on heritage assets, by reducing the change within their setting. However, as the impact on built heritage does not make substantial contribution to the amber outcome for site area 2 this would not reduce its mitigated RAG rating.

Site area 3

- B.3.24 The potential for impact on Biggin Abbey, grade II* listed, and its associated grounds and archaeology can be reduced through mitigation. Some strategic planting close to the asset may be achievable to reduce impact, however the landscape is open and excessive planting may have adverse effect on its character. Bunds may help reduce the visual impact on the landscape and landscaping design proposed may contribute to reducing this impact. The visual impact should be softened as much as possible by introducing landscaping features. However, the mitigation factor which will have the greatest effect on reducing potential for impact is the design, height and massing of the WWTP. Reducing the massing and using materials which aid in fading the digester into the skyline, for example gradated painting, would also contribute to reducing impact. The location of the digesters within the footprint will also influence the extent of impact, they should be placed on the far side of the area from the abbey. The height of the digester should be reduced by the greatest feasible amount. A reduction in potential impact to height is likely to directly correlate to reducing the impact to Biggin Abbey. Other buildings and structures over 10m should also be reduced in height and mass wherever possible.
- B.3.25 The use of the access route from Horningsea Road is slightly preferable when considering potential impact to the historic environment; both routes contain archaeological remains of potentially moderate value and Horningsea Road has potential impact to the setting of Biggin Abbey, however only the High Ditch Road access route contains a designated heritage asset (a listed milestone located in the centre of the junction at the terminus of Fen Drove). If Horningsea Road is used, the entrance should be offset so that line of sight down the avenue from Biggin Abbey is not directed into site area 3. Landscaping should be used to soften elements in the

north-east corner, so they do not dominate views outwards down the avenue entrance. This would reduce the impact from change in setting for the designated asset. Archaeological investigation is also likely to be required for this route.

- B.3.26 If High Ditch Road is used for access to site area 3, the listed milestone should only be removed if absolutely necessary for the WWTP development or necessary to protect the asset from harm. Following construction, it should be returned to its original setting, reducing negative impact to the asset from moderate to minor.
- B.3.27 The access area from High Ditch Road has high potential for early medieval remains, relating to the presence of Fleam Dyke and other assets of this period recorded in the HER. Other sections of the length of Fleam Dyke are scheduled, however desk-based research and initial findings of this report indicate that the section adjacent to High Ditch Road may not be of schedulable quality.
- B.3.28 Fleam dyke, a potentially moderate value asset, is located north and south of the road for which widening may be required for use by construction vehicles if site area 3 is selected, crossing the road along its length. The road should not be widened unless absolutely necessary. Currently the road widening is proposed for the northern side of High Ditch Road, therefore it is assumed that based on the current information there is no anticipated impact on Fleam Dyke. If any widening of the road to the south was required, this would result in moderate to major impact to an asset of moderate value. If the road must be widened this should aim to avoid Fleam Dyke rather than focus on widening on only one side of the road. Archaeological investigation is likely to be required for this route and may be required to determine the route of Fleam Dyke to aid in avoiding the asset. In addition, human inhumations have been identified near Fleam Dyke (CHER: 0603), and there is therefore the potential for human archaeological remains within this access area.
- B.3.29 Archaeological investigation would be required if site area 3 is selected. The extent of this investigation would be dependent on the results of initial surveys but is likely to include geophysical survey and some excavation at a minimum. This does not amount to mitigation, as discussed for site areas 1 and 2.
- B.3.30 Geophysical survey, trial trenching and/or other survey may identify areas of greater archaeological potential or specific remains of moderate value within the site area. This may allow for the targeting of building and service locations to reduce impact on buried archaeology. However, as the landscape contains a high density of remains and the historic environment is not the only factor of consideration in the scheme design this is unlikely to materially reduce the potential for impact, as for site areas 1 and 2.

Assessment of mitigated options

- B.3.31 The proposed mitigation would reduce potential impact on the setting of the grade II listed Baptist church and grade I listed Parish Church of All Saints. The proposed archaeological mitigation for site area 1 would reduce harm to the historic environment and comply with the requirements of planning policy, however this would not alter the impact on archaeology which results in the RAG rating for the site area. Therefore, even with mitigation in place, site area 1 would still receive an **AMBER** rating.
- B.3.32 The proposed mitigation for site area 2 would reduce harm to the historic environment and comply with the requirements of planning policy, however this would not alter the elements of the design which result in the RAG rating for the site area. Therefore, even with mitigation in place, site area 2 would still receive an **AMBER** rating.

- B.3.33 With the proposed mitigation for site area 3 imposed there is potential that the impact may be reduced. This will largely be dependent on the design of the buildings and structures on the site, including the digesters. If all the above mitigation is followed there is potential that the outcome may be reduced to **AMBER**.

Incorporating feedback

B.3.34 Phase one non-statutory consultation was held in order to share the proposals for relocating the WWTP with the public and stakeholders. This section provides a summary of the feedback received from the public in relation to the historic environment and how the concerns, issues and opportunities raised have been considered within the assessment criteria for Stage 4 final site selection.

Table B.19: Historic Environment feedback

Sub-topic	Site (if specific)	Comment Summary	CWWTPR Response
	Site areas 1 & 2	Respondents objectors to Sites 1 & 2 cited a number of local heritage locations such as Milton cemetery, Tithe Barn and other thatched buildings, Akeman street and Mere Way (Roman roads).	All local heritage assets within the study area are captured, as well as providing a brief baseline description of the area to capture local character. Key assets which may be of concern, such as the Cemetery and Roman Road are discussed in slightly greater depth and drawn out in the impact appraisal. (note: Akeman Street/Mere Way is one Roman Road not two, the route of a single Roman Road follows Mere Way before joining Akeman Street)
		Comment that the status of Horningsea and Fen Ditton as conservation area and that they also include the presence of nearby archaeological sites.	Conservation areas are considered along with other designated heritage assets which fall within the study area, including with regard to the ZTV as the potential importance of long views to conservation areas is recognised. Archaeological potential is considered for the study area for all three sites and captures archaeological potential related to these historic settlements where relevant.
Archaeology and Local Heritage	Site area 3	Respondents noted that High Ditch Road is on the Fleam Dyke, an ancient feature of great historic importance with a Roman villa site to the north of Honey Hill and near to recent discoveries of Roman, Iron and Bronze age settlements. Concerns raise that this archaeological heritage would be severely damaged.	The archaeological potential for Roman and Iron Age remains is identified and discussed in the historic environment impact appraisal (Appendix L), including appraising the potential extent of this impact and archaeological investigation which would be required. Fleam Dyke is drawn out and discussed individually due to its significance, with particular regard to the access area for site area 3; the potential impact on the asset is appraised and mitigation is recommended.
		Comment that the historic situation of small villages lying on slightly raised ground, close to water and where the land was easily cultivated, within the three Eastern Fen Edge landscape character areas is an important part of the setting and special character of East Cambridge and should be preserved. Comment that the main charm of these areas is their rural setting, which would be diminished.	The Eastern Fen Edge LCA, Waterbeach-Lode Fen LCA and River Cam Corridor LCA (as identified in previous Green Belt Studies) are important to the setting of eastern Cambridge and all have a rural character, with little large-scale development. The A14 and overhead powerlines are the only real detracting elements. This has been taken into account in the landscape and visual appraisal for the Stage 4 site selection and also in the Green Belt study (Appendix J). Where the setting described here contributes to the significance of heritage assets within the study area and has the potential to be altered by the relocated CWWTP, therefore potentially impacting the significance of heritage assets, this has been captured in the historic environment impact appraisal (Appendix L).

B.4 Land and Water Quality

Assessment methodology

B.4.1 This assessment considers 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 unmitigated proposed site options and associated infrastructure have been reviewed.

B.4.2 The assessment examines 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 WFD classified groundwater bodies
 - Risks to groundwater dependent ecosystems
- Surface water impacts including:
 - Risks to WFD classified surface waterbodies⁶¹ (flows and quality) during construction and operation of the site and associated infrastructure
 - Risks to surface water dependent ecosystems

9.1.1 The assessment was informed by the following guidance and legislation.

- *Land contamination risk management*⁶²
- *Hydrogeological impact appraisal for groundwater abstractions*⁶³
- *Groundwater risk assessment for your environmental permit*⁶⁴
- *The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017*⁶⁵

B.4.3 The RAG definitions adopted for the assessment of impact upon the water environment, including both groundwater and surface water impacts, and the risks from contaminated land are provided in Table B.20.

⁶¹ 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 RAG assessment as it would be unlikely to have an effect on the site selection.

⁶² Environment Agency, Land contamination risk management, October 2020. Available at: <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

⁶³ 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

⁶⁴ 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>

⁶⁵ The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Available at: <https://www.legislation.gov.uk/uksi/2017/407/contents/made>

Table B.20: Land and water quality RAG definitions

	Green	Amber	Red
Presence of potentially contaminated Land	Low risk of contamination for WWTP development; And low risk of contamination along pipeline and tunnel routes	Moderate risk of contamination for WWTP development; And/ or moderate risk of contamination along pipeline and tunnel routes	High risk of contamination for WWTP development; And/ or high risk of contamination along pipeline tunnel routes
Groundwater	Low risk to Principal aquifer in the short term and long term	Potential short term risk to Principal aquifer in terms of water quality, levels or flow from development of WWTP and associated infrastructure	Potential long term risk to Principal aquifer in terms of water quality, levels or flow from development of WWTP and associated infrastructure
Surface water	Low risk of adverse impact to a WFD surface waterbody from development of WWTP and associated infrastructure	Moderate risk of adverse impact to a WFD surface waterbody from development of WWTP and associated infrastructure	High risk of adverse impact to a WFD surface waterbody from development of WWTP and associated infrastructure

B.4.4 The Environment Agency provided a consultation response in relation to the project proposals shared in phase one non-statutory consultation. The response detailed a number of concerns in relation to the potential impact of the proposals on the water environment and indicated that a Hydrogeological Impact Assessment (HIA) should be carried out to support the selection of a final site for the relocation of Cambridge WWTP.

B.4.5 Therefore, Anglian Water commissioned the production of a HIA, which builds on a high-level assessment of the potential impacts on groundwater and the groundwater-dependent environment provided in the Water Resources Statement (Mott MacDonald Ltd, 2020e). The HIA was informed by a preliminary stage of Ground Investigation (GI), which was carried out to investigate the geological, hydrogeological and geotechnical conditions at all three sites and the treated effluent tunnel corridor from sites 1 and 2. Fieldwork was carried out between August and October 2020 and consisted of five investigation boreholes. Further details of the GI are provided in the HIA.

B.4.6 The assessment of groundwater and groundwater-dependent surface water impacts within the land and water quality assessment was informed by both the Water Resources Statement and the preliminary results of HIA. The HIA will be made available following review by the Environment Agency.

B.4.7 Maps of the features discussed in the following assessment are provided in the Drawings section at the rear of Appendix B.4. These are as follows:

- 409071-MMD-00-XX-GIS-Y-0468 - Land and water quality assessment study area
- 409071-MMD-00-XX-GIS-Y-0469 - Bedrock geology
- 409071-MMD-00-XX-GIS-Y-0470 - Superficial geology
- 409071-MMD-00-XX-GIS-Y-0471 - Flood zones and nature conservation sites

Assessment of unmitigated options

Contaminated land

- B.4.8 Contamination risks for the WWTP development were previously reviewed as part of the Stage 3 – Fine Screening Report (Mott MacDonald Ltd, 2020d). This determined that site areas 1 and 3 were at low risk of contamination and so were assessed as green in the RAG score. site area 2 was assessed as amber due to the presence of potential offsite sources (such as Milton Landfill) which could act as a source of ground gas and groundwater contamination at the site.
- B.4.9 Risks from the WWTP associated infrastructure (tunnels, pipelines and shafts) were not assessed at Stage 3 – Fine Screening. These have been assessed here based on reviewing the historical maps from Envirocheck Reports⁶⁶ and current available aerial imagery. However, it should be noted that the Envirocheck Reports do not cover the entire pipeline/tunnel routes. Maps and aerial imagery were used to determine whether there were potential sources of contamination present along the tunnel/pipeline routes and then whether there were pathways to controlled waters. For tunnels and pipelines, sensitive human health receptors are limited but include construction workers and residents adjacent to the routes. It is assumed that impacts to construction workers will be mitigated through health and safety risk assessments, method statements and personal protective equipment as required based on site investigation. Impacts to nearby residents would be mitigated through a CEMP which would ensure impacts from dust and runoff are minimised.
- B.4.10 As discussed within Section 1.3, there are several different options for each site, including whether the treated effluent and stormwater discharge will be constructed as tunnel or pipeline. Contamination risks will be dependent upon the location, method of construction and the aquifer designation. Site areas 1 and 2 overlie the Gault Formation which is classified by the Environment Agency as an unproductive aquifer (effectively a non-aquifer). site area 3 is underlain by the West Melbury Marly Chalk Formation. This formation is located towards the base of the Chalk (in the Grey Chalk Sub-group) and is considered to be a Principal aquifer. The Lower Greensand underlies the Gault in the areas of site areas 1, 2, and 3. This is also considered a Principal aquifer.
- B.4.11 Contamination risks are lower from tunnels, as these are generally deeper and do not interfere with shallow soils except at shaft locations. It is likely that the shafts associated with the waste water transfer tunnel could be excavated into (or in close proximity to) the Lower Greensand below the Gault Formation at site areas 1 and 2. In addition, if pipe-jacking is chosen as the method for tunnel construction, additional shafts close to site areas 1 and 2 may also be excavated through Gault Formation and into the Lower Greensand.
- B.4.12 For the treated effluent and stormwater pipelines, it was noted within the Stage 3 Fine Screening Report (Mott MacDonald Ltd, 2020d) that “all residential areas, gardens and land for recreational purposes have been avoided, where possible, and routing through open agricultural land maximised” and “Pipeline...crossings [of roads and railways] would be pipe jacked; which is a method of installing pipes below ground, that avoids surface disruption, by thrusting pipes through the ground as controlled excavation”.
- B.4.13 The Envirocheck report for site area 1 has identified limited potential for contamination across the majority of the study area. Rural land has been predominantly undeveloped and used as agricultural land and the village of Landbeach to the north east has seen limited industrial land

⁶⁶ Provided in Appendix F of the Cambridge WWTP Relocation Project Stage 3 Fine Screening Report, Mott MacDonald Ltd, 2020

use, with the majority of development comprising residential dwellings, with the presence of farms being the most likely sites to be acting as a source of contamination.

- B.4.14 Milton Landfill is present to the south of site area 1. However, a 50m buffer from Milton landfill was used when defining the potential tunnel corridor. In addition, there are “works” located north of the A14, alongside which the treated effluent and stormwater tunnel/pipeline will run adjacent to (Option A only). For Option B, the treated effluent and stormwater tunnel/pipeline is located north of Milton, potentially passing through a cemetery, although this will likely be avoided in the final design. These are potential contamination sources, particularly if the treated effluent is in pipeline within the shallow deposits. There is therefore potential for contamination (soils or groundwater) to be encountered during construction, particularly if the landfill dimensions are larger than records suggest. The potential for disturbing solid waste is low, particularly as the tunnel route passes adjacent to or underneath the A10, which is likely to pre-date the landfill. Despite this, there remains some potential for contamination to be encountered.
- B.4.15 The Envirocheck report for site area 2 has identified some potential for contamination within the study area. Rural land has been predominantly undeveloped and used as agricultural land and the town of Impington to the west has seen limited industrial land use, with the majority of development comprising residential dwellings. However, the presence of landfills and other waste facilities, historical barracks and brick works, as well as industrial land uses, such as those associated with Cambridge Science Park in the area could be acting as a source of contamination. Despite this, the majority of below ground works will be undertaken in Gault Clay which is an Unproductive aquifer and unlikely to facilitate significant mobilisation of contamination.
- B.4.16 In addition, there are “works” located north of the A14, alongside which the treated effluent and stormwater tunnel/pipeline will run adjacent to for Option A at site areas 1 and 2. For Option B, at both site areas 1 and 2, the treated effluent and stormwater tunnel/pipeline is located north of Milton, potentially passing through a cemetery, although this will likely be avoided in the final design. These are potential contamination sources. If the treated effluent is in pipeline within the shallow River Terrace Deposits, the pipeline could act as a pathway, mobilising existing contaminants to groundwater and the River Cam.
- B.4.17 The Envirocheck report review for site area 3 has identified limited potential for contamination within the study area. Rural land has been predominantly undeveloped and used as agricultural land, with the only development comprising a now dismantled railway and the current A14 (formerly A45). The areas of the treated effluent and stormwater tunnel/pipeline and wastewater transfer tunnel corridor are similarly largely undeveloped, with the exception of some farm and residential buildings.
- B.4.18 The indicative Waterbeach waste water transfer pipeline for site area 3 predominantly routes through undeveloped agricultural land, with the exception of some farm and residential buildings nearby.
- B.4.19 In regard to the indicative Waterbeach waste water transfer pipeline, site areas 1 and 2 have similar routes, leading from west of Milton towards the north of Waterbeach. This is mostly travelling through undeveloped agricultural land, with the exception of some farm and residential buildings nearby. However, this pipeline route also travels between Waterbeach Barracks (disused) and a disused airfield (RAF Waterbeach). This is a potential source of contamination. However, the potential impacts will be temporary during construction and due to the size of the pipeline it should be possible to adjust the route in order to avoid constraints and minimise the potential impacts of the pipelines.

B.4.20 Tunnels and pipelines have potential to mobilise contaminants by creating man-made pathways. As established above, site area 3 has low risk of contamination and therefore low risk of mobilising contaminants. At site areas 1 and 2 the tunnels will likely be within the Gault Formation which is an unproductive aquifer comprised of clay. This will likely form a seal around the tunnels and unlikely to create a pathway for contaminants. Pipelines will likely be at depths of 3-4mbgl and so will likely be within the Gault Formation for site areas 1 and 2, except where River Terrace Deposits are thicker than 3m (e.g. nearer the River Cam valley). Therefore, if the treated effluent is in pipeline, site area 1 (option A) and site area 2 (option A) have the potential to mobilise contaminants (if present) in superficial deposits towards the River Cam. Ground investigation will determine whether there are contaminants along the site area 1 and 2 (option A) treated effluent corridor.

Groundwater

B.4.21 This assessment considers the potential impact of the WWTP and waste water transfer infrastructure (tunnel and shafts) on groundwater below the study area.

B.4.22 Groundwater can be found below ground in both shallow superficial deposits as well as deeper bedrock formations.

B.4.23 The bedrock geology in the area of the three sites comprises the following sequence, listed from youngest to oldest formations:

- Grey Chalk, comprising:
 - Zig Zag Chalk Formation
 - Totternhoe Stone
 - West Melbury Marly Chalk Formation
- Gault Formation
- Lower Greensand (Woburn Sands Formation)
- Kimmeridge Clay Formation (underlain by the Ampthill Clay and West Walton Formations)

B.4.24 The Lower Greensand Group and the Grey Chalk Subgroup are designated as Principal Aquifers by the Environment Agency. Principal Aquifers are layers of rock or drift deposits that have high intergranular and/or fracture permeability, meaning they usually provide a high level of groundwater storage. They may support water supply and/or river base flow on a strategic scale.

B.4.25 Site area 3 is underlain by the West Melbury Marly Chalk Formation. This is classified as high in terms of groundwater vulnerability due to the formation being at outcrop with no low-permeability superficial deposits overlying the chalk. This formation is located towards the base of the Chalk (in the Grey Chalk Sub-group). No significant aquifer horizons would be expected in the marly chalk forming the West Melbury Marly Chalk Formation, as described in boreholes near site area 3 (Mott MacDonald Ltd, 2020f). Both the permeability of the marly chalk and the transmissivity of the formation are expected to be low. As a result, groundwater yields and any discharges from the West Melbury Marly Chalk Formation are also likely to be small.

B.4.26 In terms of WFD status, the Cam and Ely Ouse Chalk groundwater body, (WFD identification reference GB 40501 G 400500) was assessed in 2016 to have both poor quantitative status and poor chemical status. The issues resulting in poor quantitative status comprise changes to the natural flow and levels of water due to agriculture and industry, including the water industry. The issues resulting in poor chemical status include pollution from agriculture and urban areas, transport and waste water.

- B.4.27 Site areas 1 and 2 are underlain by the Gault Formation. The thickness of the Gault Formation in the area is between 20 – 27m based on the geological logs for the preliminary GI boreholes within the site areas (Mott MacDonald Ltd, 2020f). The Gault Formation is classified by the Environment Agency as an unproductive aquifer (effectively a non-aquifer) and as unproductive in terms of groundwater vulnerability.
- B.4.28 The Lower Greensand underlies the Gault in the areas of site areas 1, 2, and 3. Geological logs for the preliminary GI boreholes indicate the Lower Greensand is about 7 to 10m thick in the vicinity of site areas 1 and 2 (Mott MacDonald Ltd, 2020f). Test pumping of a borehole in the Lower Greensand at Sunclose Farm on Butt Lane, between site areas 1 and 2, produced a yield of 1.5 l/s with a drawdown of 12.3m over 24 hours, indicating that the formation is low yielding in the area.
- B.4.29 In terms of WFD status, the Cam and Ely Ouse Woburn Sands groundwater body, (WFD identification reference GB 40501 G 445700) was assessed in 2016 to have good quantitative status but poor chemical status. The issue resulting in poor chemical status comprises pollution from agriculture.
- B.4.30 There are no groundwater abstractions for public water supply within the study area. In addition, no part of the area in and around the sites is within an Environment Agency designated source protection zone (SPZ) for any public water supply groundwater abstraction. Details were obtained for licensed groundwater abstractions and unlicensed private groundwater supplies for the HIA (Mott MacDonald Ltd, 2020f), which established that there are numerous licenced and private groundwater supplies exploiting the Lower Greensand within the study area and as indicated above, records of test pumping of a borehole in the lower Greensand at Sunclose Farm on Butt Lane, between Sites 1 and 2, are available on the BGS website. The HIA established that there is only one unlicensed private groundwater supply and no licensed abstractions exploiting the West Melbury Marly Chalk Formation in proximity to site area 3.
- B.4.31 In addition to Principal Aquifers there are superficial deposits that overlay the bedrock geology in Study Area that are designated as Secondary Aquifers by the Environment Agency. These are permeable layers, typically with lower levels of groundwater storage, capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are designated as medium-low in terms of groundwater vulnerability.
- B.4.32 Superficial River Terrace Deposits, comprising sand and gravel, overlie the bedrock across most of site area 2, together with small areas of site areas 1 and 3. The river terrace deposits have a thickness of up to about 2.5 m in the area around Site 2, as indicated by logs for boreholes held by BGS. Otherwise the three sites are located directly over bedrock below the soil/sub-soil.
- B.4.33 BGS mapping indicates that alluvium, comprising clay, silt, sand and gravel, is present along the valley floor of the River Cam, with extensive River Terrace Deposits at a slightly higher elevation, particularly along the western flank of the valley. Borehole logs indicate that sandy clay and peat are present to a depth of 6 to 7 m in the valley floor at the A14 crossing, overlying sand and gravel to a depth of up to about 9 m. About 0.5 km further downstream, however, the superficial deposits have a depth of approximately 3.2 m, indicating that there is considerable variability in thickness (and composition) of superficial deposits along the valley. The river terrace deposits on the western side of the valley have a recorded depth of nearly 7 m at one location, but are more typically 2.5 to 4 m in depth. Peat is present in some areas to the east of Waterbeach.

B.4.34 River Terrace Deposits and alluvium are classified by the Environment Agency as Secondary A aquifers. Peat is classified as an unproductive aquifer.

B.4.35 There are several still water bodies at Milton Country Park, adjacent to the A14 Histon Interchange and Leyland Water north of Landbeach, which are located in areas of river terrace deposits underlain by Gault Formation. These water bodies have, presumably, resulted from, or been created by, excavation of River Terrace Deposits. They may be fed by groundwater which is perched in the superficial deposits above the Gault Formation, as well as direct rainfall and possibly some surface water flow.

WFD surface water bodies

B.4.36 Information available in the Catchment Data Explorer (Environment Agency, 2019) and Anglian RBMP (Department for Environment Food & Rural Affairs, Anglian river basin district River basin management plan, 2015) indicates that the following WFD surface water bodies are present in the area of the three sites:

- River Cam (WFD identification reference GB 10503304 2750), a heavily modified river with moderate overall WFD classification for 2016. The issues preventing the River Cam water body reaching good status comprise:
 - mainly physical modifications due to changes to the natural flow and levels of water together with modifications resulting from local and central government, recreation and urban and transport; but also,
 - pollution from waste water from the water industry.
- Bottisham Lode - Quy Water (WFD identification reference GB 10503304 2700), a heavily modified river with moderate overall WFD classification for 2016. The issues preventing the River Cam water body reaching good status comprise pollution due to waste water from the water industry.
- The Old West River (WFD identification reference GB 10503304 3375), a heavily modified river with moderate overall WFD classification for 2016. The issues preventing the Old West River water body reaching good status comprise:
 - changes to the natural flow and levels of water, together with pollution from rural areas, as a result of agriculture and rural land management; and,
 - pollution due to waste water from the water industry.

Surface and groundwater dependent nature conservation sites

B.4.37 Full details of the designated nature conservation sites which may be partly or wholly dependent on surface water and groundwater, and could, potentially, be affected by the construction or operation of the scheme are described within the Water Resources Statement (Mott MacDonald Ltd, 2020e). These include seven statutory designated sites and 13 non-statutory designated sites.

B.4.38 The potential impacts on designated sites are considered within the nature conservation and biodiversity assessment in Appendix B.1.

B.4.39 These will be further assessed within the Environmental Impact Assessment (EIA), once a final site has been chosen. However, it is likely that significant adverse impacts will be avoided by mitigation measures either included within a CEMP or within the scheme design. It is anticipated that no special mitigation measures are likely to be required.

Potential construction impacts

B.4.40 The potential impacts during construction include the following:

- Pollution of surface watercourses and groundwater due to poor construction practices and site drainage, including runoff from access roads. This could include contamination of watercourses with silt-laden runoff from construction areas, and pollution of groundwater or surface water by oils, fuels or chemicals used for site plant or in construction processes. The contamination could also lead to an impact on designated nature conservation sites which are linked to these watercourses.
- Mobilisation of contamination during construction.
- Temporary impacts to groundwater quality and flow during piling activities.
- Discharge of silt-laden water during dewatering of excavations, for example during shaft construction.
- Tunnelling works resulting in turbidity in groundwater or contamination with tunnelling fluids.
- Impediments to flow at watercourse crossings on access routes and during work at pipeline crossings.
- Temporary depletion of groundwater resources or impacts on licensed or private groundwater abstractions as a result of dewatering undertaken during shaft construction.
- Temporary impacts on groundwater dependent nature conservation sites, and surface water features or baseflows in watercourses which are dependent on groundwater resources, as a result of dewatering undertaken during shaft construction.
- Dewatering discharges affecting flood flow capacities and water quality in watercourses.

B.4.41 Concerns for contamination or pollution of surface watercourses and groundwater will be taken into account in a detailed CEMP to be produced as a separate document and implemented on site. A CEMP will include measures to ensure that the sediment content of site runoff and dewatering from excavations is at an acceptably low level when discharged to watercourses. Temporary sustainable drainage system (SuDS) measures may be employed at sites to control discharges in periods of high rainfall.

B.4.42 Shallow pipelines are likely to impact the groundwater in any superficial deposits, and significant dewatering may be required. Any silt-laden water from pipeline trenches would be contained or treated before discharge to local ditches or surface watercourses.

B.4.43 Piling for foundations at the WWTP could have potential temporary impacts on groundwater flow and quality during construction. Site areas 1 and 2 are underlain by RTD (only in north on site 1) (Secondary A aquifer) and the Gault Formation, which is an unproductive aquifer. The Lower Greensand (Principal Aquifer) underlies this. Only the most heavily loaded structures comprising the anaerobic digesters should have foundations, potentially to about 25m, that might go deep enough to encounter the lower Greensand. The presence of deep foundations may affect local flow paths within the upper part of the lower Greensand. However, taking into account the overall areal extent of the lower Greensand, the impact on the aquifer and groundwater flow would be negligible.

For Site 3, all piles will be constructed in or through the Grey Chalk. Taking into account the expected low permeability of the West Melbury Marly Chalk Formation, the impact on the aquifer and groundwater flow should be negligible. Some structures might also be installed to a depth below the water table at Site 3, which could alter the direction of shallow groundwater flow.

- B.4.44 Contamination risks from WWTP construction were only noted at site area 2, which is underlain by the River Terrace Deposits and Gault Formation. Piling construction methods would need to be designed to minimise risks piling through potential contamination and this would be included within a CEMP. Impacts to groundwater flow due to piling are likely to be insignificant since the River Terrace Deposits on site area 2 are laterally extensive, covering the majority of the WWTP footprint area, and so flows are likely to migrate around piles. There are potential short term impacts to groundwater quality as a result of turbidity during piling. However, the River Cam is located 2.5km east of the WWTP and so turbidity impacts within the river terrace deposits are unlikely to impact on the river quality. A Foundation Works Risk Assessment would be required to ensure any potential risks from piling within the river terrace deposits are mitigated.
- B.4.45 Shallow pipelines are likely to impact the groundwater in any superficial deposits, and significant dewatering may be required. Any silt-laden water from pipeline trenches would be contained or treated before discharge to local ditches or surface watercourses.
- B.4.46 The River Cam crossing for the pipeline from Waterbeach to Site 3 would be constructed beneath the river by pipe-jacking or micro-tunnelling. Construction activities at the location would be undertaken either side of the river and away from the river banks. As a result, the construction of the crossing would not be expected to disturb the river.
- B.4.47 It is likely that the shafts associated with the waste water transfer tunnel could be excavated into (or in close proximity to) the Lower Greensand below the Gault Formation at site areas 1 and 2. In addition, if pipe-jacking is chosen as the method for tunnel construction, additional shafts close to site areas 1 and 2 may also be excavated through Gault Formation and into the Lower Greensand. As a result, dewatering of the Lower Greensand could be required during the latter stages of excavation, and also lining and installation of the base slab in the shafts. If the base of a shaft is located in the Gault Formation but only a few metres above the Lower Greensand, dewatering may still be required to reduce the upward pressure and the potential for ground heave in the base of the shaft. As an approximate estimate, dewatering could be required for a period of four months during shaft construction.
- B.4.48 Shaft dewatering could have an impact on groundwater levels in the Lower Greensand, and on the water level in any abstraction boreholes, over an extensive area. There could be a substantial impact on the abstraction from the borehole at Sunclose Farm, located close to site areas 1 and 2. Theoretical approximations of the potential impact were carried for the HIA (Mott MacDonald Ltd, 2020f). These indicated that, in theory, the impact might be to reduce the water level in the outcrop area by 2 to 4m over a period of four months. The calculated impact is substantial because the aquifer is confined below the Gault Formation between the sites and the outcrop. As a result, piezometric changes are transmitted rapidly across the aquifer to the outcrop. This could have a significant temporary impact on any spring flows or groundwater seepages to local watercourses in the outcrop area. Some springs and watercourses are indicated in OS mapping on or close to the outcrop around Oakington.
- B.4.49 Due to the presence of Milton Landfill, located on the east side of Site 2, concerns have been raised by the Environment Agency that the temporary dewatering during shaft construction could have an impact on mobilising contaminants originating from the landfill. The contaminants could then pollute the dewatering discharge. This would be of greater concern if contaminants are known to have leached out from the landfill into the surrounding Gault Formation, although the likelihood of significant migration within the Gault Formation is considered to be very low, owing to the unproductive nature of the formation. The concern is principally in relation to Site 2, due to the proximity of the landfill to the proposed works, however a potential risk may also apply with temporary shaft dewatering for Site 1, which is located around 300m from Milton Landfill. Therefore, modelling was carried out in the HIA to understand the potential for

migration from the landfill through the Gault Formation. The preliminary results of the modelling indicated that contaminant migration within the Gault Formation is very slow, owing predominantly to the low hydraulic conductivity of the clay. This is a reason that the landfill was situated within the borrow pit initially, as leachates generated would be effectively contained within the confines of the pit and need to pass through over 10m of Gault Formation to reach the underlying aquifer in the Lower Greensand. The preliminary conclusion of the HIA indicated that through the implementation of the 50m standoff zone around the Landfill, an appropriate CoCP, and the use of EA approved drilling fluids, it is considered unlikely that there will be any impacts associated with contaminant transport from the landfill as a result of the proposed works at Sites 1 or 2.

- B.4.50 In contrast to the shafts, tunnelling, if required in the Lower Greensand, should have a negligible impact on groundwater flows. Tunnelling, if undertaken by closed-face methods, would require the injection of fluids to maintain pressure on the formation and hold back any potential groundwater inflows. Tunnel lining follows immediately behind the closed-face excavation. Bentonite and various polymers are used as fluids and would be of an acceptable quality standard for tunnelling works. Tunnelling in the Lower Greensand would not be expected to lead to significant turbidity in the aquifer as a result of fine grained nature of the Lower Greensand sediments.
- B.4.51 The potential alternative tunnel construction method of pipe-jacking does not have a requirement for dewatering and would not disrupt groundwater flows or be expected to lead to significant turbidity in the Lower Greensand aquifer.
- B.4.52 In contrast to site areas 1 and 2, shaft construction at site area 3 in the lowermost section of the Grey Chalk should require very limited dewatering which would have only a localised impact. Groundwater yields or natural discharges from this section in the West Melbury Marly Chalk Formation are likely to be very low. The preliminary results of the HIA indicate that the radius of influence of dewatering for shaft construction is unlikely to extend beyond the site area boundary. As a result, the impact on groundwater in the Grey Chalk aquifer, and any groundwater abstractions dependent on Chalk groundwater, would also be negligible. This should include a negligible impact on a private groundwater source identified in proximity to site area 3. If the ground investigation indicates that any significant aquifer horizons are present in the Melbury Marly Chalk Formation at site area 3, then test pumping may be required with monitoring of groundwater levels in observation boreholes to assess the potential impacts. However, such a requirement for test pumping is not anticipated.
- B.4.53 If a tunnel is designed to transfer the effluent from site areas 1 or 2 to the point of discharge in the River Cam, construction is not expected to require excavation in the Lower Greensand. The tunnel would be at a shallower depth than the waste water transfer tunnel. The shafts associated with the tunnel would be excavated to a slightly greater depth, although the base of all shafts would still be expected to be well within the Gault Formation. As a result, no dewatering is anticipated within the Lower Greensand. As with the shaft for the waste water transfer tunnel, only minor dewatering would be expected in the Grey Chalk during construction of a shaft for an effluent discharge tunnel at site area 3.
- B.4.54 Construction of shafts at site area 2, and possibly other sites, may require excavation below the sub-soil through a few metres of superficial deposits. Based on BGS mapping, the deposits are likely to comprise sands and gravel which would be saturated below the water table. It is unlikely, however, that any significant dewatering of superficial deposits would be undertaken. The topmost section of each shaft could be completed using a method such as secant piling, caissons or with a sheet pipe cofferdam to shut out any groundwater inflow from the superficial deposits to the excavation.

B.4.55 A summary and comparison of the potential construction impacts for each site can be seen in Table B.21. An 'x' indicates whether the potential impacts apply to the site.

Table B.21: Summary of potential construction impacts

Potential construction impacts	Site 1	Site 2	Site 3
Dewatering required for shallow pipelines within superficial deposits	x	x	x
Dewatering required for shafts which could impact Lower Greensand Formation (and the abstraction borehole at Sunclose Farm)	x	x	
Dewatering impacting Lower Greensand aquifer and, consequently, the Cottenham Moat County Wildlife Site	x	x	
Potential groundwater quality impacts as a result of piling through contaminated land		x	
Potential programme delays if contaminated land is encountered at WWTP		x	
Potential contaminant mobilisation along treated effluent transfer pipeline routes within superficial deposits	x (Option A only)	x (Option A only)	
Potential temporary impacts to superficial deposits during piling		x	

Potential operation impacts

B.4.56 The potential impacts during operation of the scheme include the following:

- Changes in natural surface water drainage patterns around the new WWTP site.
- 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 is chosen.
- Diversion of water from the Waterbeach WWTP might increase the flood risk in the reach between the new WWTP outfall and the original discharge point at Waterbeach.
- There could be changes in treated effluent discharge quality leading to changes in water quality in some reaches of the River Cam as a result of the discharge.
- The treated effluent outfall and any watercourse crossings might affect water levels and the potential for flooding in upstream reaches on the River Cam.
- Any tunnel section or shaft in the lower Greensand might be subject to leakage from the aquifer (infiltration), resulting in a loss to the groundwater resource. Alternatively, on occasions of high flow, when the tunnel is surcharged, waste water might leak from the tunnel (exfiltration), giving rise to pollution of the aquifer.
- Tunnels, pipelines, foundations or other below ground structures could interrupt groundwater flow.

B.4.57 Any significant changes in natural surface water drainage patterns, including drainage ditches, 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. This would ensure no significant impacts to water levels at sensitive sites (e.g. Stow-cum-Quy SSSI).

B.4.58 In the event that the downstream outfall location is chosen, it would not be possible to compensate for the loss of flow over a distance of about 2 km downstream of the A14. On

average, 1.3 m³/s of waste water is treated at the existing WWTP. This compares with a mean flow of about 2.8 m³/s at Jesus Lock in Cambridge and 3.6 m³/s at Bottisham, located respectively upstream and downstream of the A14 crossing, for the periods of record available (1959 to 1983 at Jesus Lock, 1936 to 1987 at Bottisham). The Q95 flows (flows exceeded 95% of the time) were approximately 0.7 m³/s at Jesus Lock and 0.9 m³/s at Bottisham. It is noted that there are no known surface water abstractions from the River Cam between the current outfall location and the potential downstream outfall location (Environment Agency, 2020) and so the loss of flow would not impact on any existing abstraction licences.

- B.4.59 Although, the WWTP discharge would have been significantly lower in the period of flow gauging station records, the flow statistics for the gauging stations indicate that the discharge from the existing WWTP is likely to form a substantial part of the current flow in the River Cam, downstream of the A14, particularly in dry conditions. 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.
- B.4.60 A new discharge licence will be required for the treated effluent outfall from the new WWTP. This will require approval by the Environment Agency to ensure no detrimental impacts to the River Cam as a result of flow changes or impacts as a result of discharge quality.
- B.4.61 The impact of the increase in flow between the outfall for the new WWTP and Waterbeach would be assessed in the flood modelling. If found to be critical to flood extents, flood storage compensation might be required and included in the scheme design.
- B.4.62 An improvement in the quality of the treated effluent discharge is foreseen as a consequence of operating the new WWTP, although inclusion of the effluent discharge from the WWTP at Waterbeach would increase the proportion of effluent in the river upstream of Waterbeach. Overall, however, an improvement in water quality is anticipated throughout the River Cam downstream of the outfall from the existing WWTP. Comparison of existing river quality with the prediction of quality resulting from operation of the new WWTP will be the subject of a separate assessment, following site selection.
- B.4.63 The treated effluent outfall and any watercourse crossings will be designed to maintain flows at current levels and have no significant impact on flooding.
- B.4.64 Potential impacts during operation of the scheme, for example due to excessive variations in discharge, or discharge of treated effluent of an unacceptable quality, will be controlled by engineering features, operational practices included in the design and management of the scheme, and by the discharge licence.
- B.4.65 Any tunnel sections (or shafts) in the Lower Greensand will be designed to minimise the likelihood of leakage to the aquifer during operation of the scheme. The tunnels and shaft sections in the Lower Greensand would replace a minimal part of the overall aquifer and would not be expected to have any significant impact on groundwater flow. In addition, piles may interrupt groundwater flow within the River Terrace Deposits at site 2. However, these are likely to be minimal and not have a significant impact on groundwater flow or hydraulic connectivity with the River Cam, which is located 2.5km east of the proposed WWTP at site 2.
- B.4.66 Some structures might also be installed to a depth below the water table at site area 3. It is possible that this could:
- give rise to a localised change in the direction of groundwater flow in the top of the Grey Chalk; or

- cause the groundwater to rise to the surface in the vicinity of the structure.

B.4.67

A summary and comparison of the potential operational impacts for each site can be seen in Table B.22. An 'x' indicates whether the potential impacts apply to the site.

Table B.22: Summary of potential operational impacts

Potential operational impacts	Site 1	Site 2	Site 3
Loss of flow in River Cam 2km downstream of the A14	x (Option B only)	x (Option B only)	
Potential need for flood storage compensation within the scheme design	x	x	x
Impacts on groundwater flow in the West Melbury Marly Chalk due to presence of below ground structures			x

RAG Assessment Tables

Table B.23: Contaminated land RAG assessment (pre-mitigation)

Site area	Stage 3 screening results (WWTP only)	Risk of contamination along Waterbeach pipeline corridor	Risk of contamination along treated effluent and stormwater discharge corridor (tunnel or pipeline)	Risk of contamination along wastewater transfer tunnel corridor	RAG rating
1 (Option A)	Green	<p>Low-</p> <p>Potential contamination associated with the Waterbeach Barracks (disused) and a disused airfield (RAF Waterbeach). However, it should be possible to adjust the route in order to avoid constraints and minimise the potential impacts of the pipelines. In addition, pipelines are likely to be within the Gault Formation and therefore not mobilise contaminants.</p>	<p>Tunnel:</p> <p>Low-</p> <p>Treated effluent and stormwater corridor runs past Milton landfill and adjacent to the A14, alongside which there are several “works” which may be contamination sources. However, tunnel will likely be within the Gault Formation and therefore not mobilise contaminants.</p>	<p>Low-</p> <p>Waste water transfer corridor runs past Milton landfill, which may be a contamination source. However, a 50m buffer around the landfill was utilised when defining the tunnel corridors in order to avoid potential contamination risks. Should contamination be encountered (solid or groundwater) the contamination may need to be removed if it poses a risk to other parts of the water environment</p>	Green
			<p>Pipeline:</p> <p>Moderate-</p> <p>Treated effluent and stormwater corridor runs past Milton landfill and adjacent to the A14, alongside which there are several “works” which may be contamination sources. Pipelines will potentially be within the RTD (Secondary A aquifer) and could cause mobilisation of contaminants, if present.</p>		Amber
1 (Option B)			<p>Low-</p> <p>Treated effluent and stormwater corridor runs north of Milton. There is a cemetery along the corridor but this will likely be avoided in the final route design.</p>		Green

Site area	Stage 3 screening results (WWTP only)	Risk of contamination along Waterbeach pipeline corridor	Risk of contamination along treated effluent and stormwater discharge corridor (tunnel or pipeline)	Risk of contamination along wastewater transfer tunnel corridor	RAG rating
2 (Option A)	Amber Potential groundwater and ground gas contamination associated with Milton Landfill (off site)	Low- Potential contamination associated with the Waterbeach Barracks (disused) and a disused airfield (RAF Waterbeach). However, it should be possible to adjust the route in order to avoid constraints and minimise the potential impacts of the pipelines. In addition, pipelines are likely to be within the Gault Formation and therefore not mobilise contaminants.	Tunnel: Low- Treated effluent and stormwater corridor runs past Milton landfill and adjacent to the A14, alongside which there are several “works” which may be contamination sources. However, tunnel will likely be within the Gault Formation and therefore not mobilise contaminants.	Low- Waste water transfer corridor runs past Milton landfill, which may be a contamination source. However 50m buffer around the landfill was utilised when defining the tunnel corridors in order to avoid potential contamination risks.	Amber
			Pipeline: Moderate- Treated effluent and stormwater corridor runs past Milton landfill and adjacent to the A14, alongside which there are several “works” which may be contamination sources. Pipelines will potentially be within the RTD (Secondary A aquifer) and could cause mobilisation of contaminants, if present.	Should contamination be encountered (solid or groundwater) the contamination may need to be removed if it poses a risk to other parts of the water environment.	
2 (Option B)			Low- Treated effluent and stormwater corridor runs north of Milton. There is a cemetery along the corridor but this will likely be avoided in the final route design.		Amber

Site area	Stage 3 screening results (WWTP only)	Risk of contamination along Waterbeach pipeline corridor	Risk of contamination along treated effluent and stormwater discharge corridor (tunnel or pipeline)	Risk of contamination along wastewater transfer tunnel corridor	RAG rating
3	Green	Low – predominantly through agricultural land.	Low- Treated effluent and stormwater corridor is in area which is largely undeveloped.	Low- Wastewater transfer corridor runs through undeveloped agricultural land.	Green

Table B.24: Groundwater RAG assessment (pre-mitigation)

Site area	Construction Impacts	Operational Impacts	RAG rating
1	<p>Dewatering of superficial deposits for pipework or shafts.</p> <p>Dewatering of the Lower Greensand (below the Gault) is likely required for the shafts associated with the waste water transfer tunnel. This will likely be required for a period of four months. This could have major impact on the groundwater levels in the Lower Greensand, the abstraction borehole at Sunclose Farm, springs, groundwater seepages and potentially the Cottenham Moat CWS. Dewatering activities will require the need to store and treat abstracted water prior to discharge. It is anticipated that discharge will be to surface drains. There is potential that abstracted groundwater will be of poor quality naturally or unnaturally and therefore may require storage and treatment. Storage may be in the form of an above ground storage tank or a settling pond above the lower permeability Gault Clay. Additional space will be required for the storage and treatment area. The magnitude and form of this is highly dependent on the results of monitoring data obtained during the ground investigation.</p>	<p>Any tunnel section or shaft in the Lower Greensand might be subject to leakage from the aquifer, resulting in a loss to the groundwater resource. Alternatively, on occasions of high flow, when the tunnel is surcharged, effluent might leak from the tunnel giving rise to pollution of the aquifer.</p> <p>Tunnels or pipelines could interrupt groundwater flow. However, any tunnel sections (or shafts) in the lower Greensand will be designed to minimise the likelihood of leakage to the aquifer during operation of the scheme. The tunnels and shaft sections in the lower Greensand would replace a minimal part of the overall aquifer and would not be expected to have any significant impact on groundwater flow.</p>	Amber
2	<p>Dewatering of superficial deposits for pipework or shafts.</p> <p>Dewatering of the lower Greensand (below the Gault) is likely required for the shafts associated with the waste water transfer tunnel. This will likely be required for a period of four months. This could have major impact on the groundwater levels in the lower Greensand, the abstraction borehole at Sunclose Farm, springs, groundwater seepages and potentially the Cottenham Moat CWS.</p> <p>Dewatering activities will require the need to store and treat abstracted water prior to discharge. It is anticipated that</p>	<p>Any tunnel section or shaft in the lower Greensand might be subject to leakage from the aquifer, resulting in a loss to the groundwater resource. Alternatively, on occasions of high flow, when the tunnel is surcharged, effluent might leak from the tunnel giving rise to pollution of the aquifer.</p> <p>Tunnels or pipelines could interrupt groundwater flow. However, any tunnel sections (or shafts) in the lower Greensand will be designed to minimise the likelihood of leakage to the aquifer during operation of the scheme. The tunnels and shaft sections in the lower Greensand would replace a minimal</p>	Amber

Site area	Construction Impacts	Operational Impacts	RAG rating
	<p>discharge will be to surface drains. There is potential that abstracted groundwater will be of poor quality naturally or unnaturally and therefore may require storage and treatment. Storage may be in the form of an above ground storage tank or a settling pond above the lower permeability Gault Clay. Additional space will be required for the storage and treatment area. The magnitude and form of this is highly dependent on the results of monitoring data obtained during the ground investigation.</p> <p>Piling activities will potentially impact the River Terrace Deposits. However, turbidity impacts will be short term and won't impact the River Cam which is located 2.5km east.</p>	<p>part of the overall aquifer and would not be expected to have any significant impact on groundwater flow.</p> <p>Piling will impact upon the River Terrace Deposits but are not considered to significantly impact groundwater flows since the River Terrace Deposits are laterally extensive across the site. It is anticipated that flows will migrate around the piles.</p>	
3	<p>Potential requirement for dewatering of superficial deposits for pipework or shafts.</p>	<p>Impacts to the aquifer (Grey Chalk Subgroup) from tunnels or shafts are unlikely since no significant aquifer horizons are anticipated in the marly chalk which forms the West Melbury Marly Chalk. Groundwater yields or discharges are likely to be low within this aquifer.</p> <p>Some structures might also be installed to a depth below the water table at site area 3. It is possible that this could:</p> <ul style="list-style-type: none"> • give rise to a localised change in the direction of groundwater flow in the top of the Grey Chalk; or • cause the groundwater to rise to the surface in the vicinity of the structure. 	Amber

Table B.25: WFD Surface water bodies RAG assessment (pre-mitigation)

Site area	Construction Impacts (from WWTP and associated infrastructure)	Operational Impacts (from WWTP and associated infrastructure)	RAG rating
1 (Option A)	Potential for temporary construction impacts to watercourses, as described in B.4.40, such as dewatering discharges impacting flow or water quality, if silt laden.	The effluent outfall and any watercourse crossings might affect water levels and the potential for flooding in upstream reaches on the River Cam. Potential increase in flood risk due to diversion of water from Waterbeach WWTP. There could be changes in effluent discharge quality leading to changes in water quality in some reaches of the River Cam as a result of the discharge.	Amber
1 (Option B)		As above; and Option B could cause changes to flow in the River Cam, including a reduction in flow, as a result of the outfall location being located downstream.	Amber
2 (Option A)	Potential for temporary construction impacts to watercourses, as described in B.4.40, such as dewatering discharges impacting flow or water quality, if silt laden.	The effluent outfall, and any watercourse crossings, might affect water levels and the potential for flooding in upstream reaches on the River Cam. Potential increase in flood risk due to diversion of water from Waterbeach WWTP.	Amber
2 (Option B)		As above. Additionally, Option B could cause changes to flow in the River Cam, including a reduction in flow, as a result of the outfall location being located downstream.	Amber
3	Potential for temporary construction impacts to watercourses, as described in B.4.40, such as dewatering discharges impacting flow or water quality, if silt laden.	The effluent outfall, and any watercourse crossings, might affect water levels and the potential for flooding in upstream reaches on the River Cam. Potential increase in flood risk due to diversion of water from Waterbeach WWTP. There could be changes in effluent discharge quality leading to changes in water quality in some reaches of the River Cam as a result of the discharge.	Amber

Mitigation identification

Site area 1

B.4.68 For site area 1, mitigation would include the following:

- Adjusting pipeline and tunnel routes in order to avoid potential contamination sources.
- Ground investigation would determine the risks of contamination. If contamination is encountered, remediation may be required.
- Use of a primary and secondary lining for tunnel sections and shafts passing through the Lower Greensand or Grey Chalk aquifers
- Pipeline crossings of roads and railways would be pipe-jacked to avoid surface disruption.
- Risks to surface waters could be mitigated through SuDS design, flood storage compensation, engineering features and WWTP operational practices.
- Test pumping during ground investigations will be required in order to assess potential impacts to the Lower Greensand aquifer. If the impacts of dewatering indicate that abstraction at the licensed rate (or the maximum abstraction rate required by the licensee, if less than the licensed rate) may not be possible during dewatering, then actions will be taken to ensure the required supply. Such actions could include:
 - Lowering the pump in the borehole, or combining this action with provision of a replacement pump, taking into account the higher head requirements;
 - constructing a replacement borehole to allow for increased drawdown; or,
 - providing an alternative water supply for the duration of dewatering and the period of subsequent groundwater level recovery.
- Providing mitigation for loss or reduction of spring discharges and flows in watercourses in the Lower Greensand outcrop is unlikely to be practicable in the event that test pumping indicates that dewatering could affect these features. The impact would, however, be temporary, for up to 12 months during dewatering, plus a subsequent period of aquifer recovery. Mitigation, if practicable, may need to be considered in the event that a significant reduction in water levels is predicted in the Cottenham Moat County Wildlife Site (CWS) as a result of dewatering in the lower Greensand.
- For option A, there is potential for mobilisation of contaminants (if present) along the treated effluent corridor (if in pipeline), through the River Terrace Deposits, towards the River Cam. If contamination is encountered, remediation may be required.

Site area 2

B.4.69 For site area 2, mitigation would include the following:

- Adjusting pipeline and tunnel routes in order to avoid potential contamination sources.
- Ground investigation would determine the risks of contamination. If contamination is encountered, remediation may be required.
- Use of a primary and secondary lining for tunnel sections and shafts passing through the Lower Greensand or Grey Chalk aquifers
- Pipeline crossings of roads and railways would be pipe-jacked to avoid surface disruption.
- Risks to surface waters could be mitigated through SuDS design, flood storage compensation, engineering features and WWTP operational practices.

- Test pumping during ground investigations will be required in order to assess potential impacts to the Lower Greensand aquifer and any licenced or private abstractions. If the impacts of dewatering indicate that abstraction at the licensed rate (or the maximum abstraction rate required by the licensee or private abstractor, if less than the licensed rate) may not be possible during dewatering, then actions will be taken to ensure the required supply. Such actions could include:
 - Lowering the pump in the borehole, or combining this action with provision of a replacement pump, taking into account the higher head requirements;
 - constructing a replacement borehole to allow for increased drawdown; or,
 - providing an alternative water supply for the duration of dewatering and the period of subsequent groundwater level recovery.
- Providing mitigation for loss or reduction of spring discharges and flows in watercourses in the Lower Greensand outcrop is unlikely to be practicable in the event that test pumping indicates that dewatering could affect these features. The impact would, however, be temporary, for up to 12 months during dewatering, plus a subsequent period of aquifer recovery. Mitigation, if practicable, may need to be considered in the event that a significant reduction in water levels is predicted in the Cottenham Moat County Wildlife Site (CWS) as a result of dewatering in the lower Greensand.
- Risks from ground gases at the WWTP can be mitigated through ground investigation. Ground gas monitoring should be undertaken to establish the gas regime at the site and to allow gas protection measures to be designed and installed in new buildings, if required. This may, for example, include incorporation of gas membranes into building design for the protection of future site users and sufficient ventilation within buildings. Construction workers should also use the appropriate respiratory protective equipment, as required.
- If contamination is encountered on site, a Foundation Works Risk Assessment would be required to ensure any potential risks from piling through the River Terrace Deposits are mitigated.
- For option A, there is potential for mobilisation of contaminants (if present) along the treated effluent corridor (if in pipeline), through the River Terrace Deposits, towards the River Cam. If contamination is encountered, remediation may be required.

Site area 3

B.4.70 For site 3 mitigation would include the following:

- Use of a primary and secondary lining for tunnel sections and shafts passing through the Grey Chalk aquifer.
- Pipeline crossings of roads and railways would be constructed by pipe-jacking, micro-tunnelling or directional drilling to avoid surface disruption.
- Drains would be installed to ensure that the groundwater flow is re-directed around below ground structures to avoid any localised change in direction or rise in groundwater in the vicinity of the structure. One option for the drains might comprise the installation of gravel-filled trenches around the structure.
- The River Cam crossing for the pipeline from Waterbeach to Site 3 would be constructed beneath the river by micro-tunnelling or directional drilling. Construction activities at the location would be undertaken either side of the river and away from the river banks to ensure that the construction of the crossing does not disturb the river.
- Risks to surface waters could be mitigated through SuDS design, flood storage compensation, engineering features and WWTP operational practices.

Assessment of mitigated options

B.4.71 The only risk that would not be mitigated is:

- Changes to flow in the River Cam, including a reduction in flow, as a result of the outfall location being located downstream (for Options B at sites 1 and 2).

B.4.72 The RAG assessments, with mitigation measures, can be seen below.

Table B.26: Contaminated land RAG assessment (with mitigation)

Site area	Stage 3 screening results	Mitigation measures	Unmitigated RAG rating	Mitigated RAG rating
1 (Option A-effluent in tunnel)	Green	n/a	Green	Green
1 (Option A-effluent in pipeline)		Pipeline and tunnel routes would be adjusted in order to avoid potential contamination sources.	Amber	Green
1 (Option B)		n/a	Green	Green
2 (Option A-effluent in tunnel)	Amber Potential groundwater and ground gas contamination associated with Milton Landfill (off site)	Ground gas monitoring should be undertaken to establish the gas regime at the site and to allow gas protection measures to be designed and installed in new buildings, if required. This may, for example, include incorporation of gas membranes into building design for the protection of future site users and sufficient ventilation within buildings.	Amber	Green
2 (Option A-effluent in pipeline)		As above, and; Pipeline and tunnel routes would be adjusted in order to avoid potential contamination sources. Contaminated groundwater encountered during construction of pipeline or tunnel routes should be removed or treated if the groundwater has potential to adversely affect groundwater or surface water quality currently not affected by contamination.	Amber	Green
2 (Option B)		As above Ground gas monitoring should be undertaken to establish the gas regime at the site and to allow gas protection measures to be designed and installed in new buildings, if required. This may, for example, include incorporation of gas membranes into building design for the	Amber	Green

Site area	Stage 3 screening results	Mitigation measures	Unmitigated RAG rating	Mitigated RAG rating
		protection of future site users and sufficient ventilation within buildings.		
3	Green	n/a	Green	Green

Table B.27: Groundwater RAG assessment (with mitigation)

Site area	Mitigation measures	Unmitigated RAG rating	Mitigated RAG rating
1	<p>Temporary risks to the Lower Greensand aquifer during dewatering (and potentially the Cottenham Moat CWS). Depending on the source of water in the Moat and an assessment of likely impacts, mitigation may include providing an alternative water supply to the moat during dewatering but only if the assessed impact will be significant. Mitigation will therefore include GI to determine if the Moat is connected to the Lower Greensand and what the source of water is, assessing the point at which a decline in water levels may adversely impact ecological habitats (specifically GCNs) and provide a temporary alternative water supply to the moat when levels approach a critical level.</p> <p>If the impacts of dewatering the Lower Greensand indicate that private abstractions at the licensed rate (or the maximum abstraction rate required by the licensee or private abstractor, if less than the licensed rate) may not be possible during dewatering, then actions will be taken to ensure the required supply. Such actions could include: lowering the pump in the borehole; constructing a replacement borehole; or providing an alternative water supply for the duration of dewatering and the period of subsequent groundwater level recovery.</p> <p>Test pumping of observation boreholes during ground investigation and a hydrogeological risk assessment will determine the extent of the risks.</p>	Amber	Green
2		Amber	Green
3	<p>Drains would be installed to ensure that the groundwater flow is re-directed around below ground structures to avoid any localised change in direction or rise in groundwater in the vicinity of the structure. One option for the drains might comprise the installation of gravel-filled trenches around the structure.</p>	Amber	Green

Table B.28: WFD Surface water bodies RAG assessment (with mitigation)

Site area	Mitigation measures	Unmitigated RAG rating	Mitigated RAG rating
1 (Option A)	<p>Construction impacts would be mitigated through a CEMP and SuDS measures.</p> <p>Operational impacts would be mitigated through SuDS design, flood storage compensations, engineering features and WWTP operational practices.</p>	Amber	Green
1 (Option B)	<p>As above, and;</p> <p>The outfall location being located downstream would cause changes to flow in the River Cam. These changes could not be mitigated although will require scrutiny through the Environment Agency to ensure no negative impacts to the River Cam. In addition, it can be considered that the likely improvement in effluent quality will provide some compensation.</p>	Amber	Green
2 (Option A)	<p>Construction impacts would be mitigated through a CEMP and SuDS measures.</p> <p>Operational impacts would be mitigated through SuDS design, flood storage compensations, engineering features and WWTP operational practices.</p>	Amber	Green
2 (Option B)	<p>As above, and;</p> <p>The outfall location being located downstream would cause changes to flow in the River Cam. These changes could not be mitigated although will require scrutiny through the Environment Agency to ensure no negative impacts to the River Cam. In addition, it can be considered that the likely improvement in effluent quality will provide some compensation.</p>	Amber	Green
3	<p>Construction impacts would be mitigated through a CEMP and SuDS measures.</p> <p>Operational impacts would be mitigated through SuDS design, flood storage compensations, engineering features and WWTP operational practices.</p> <p>The River Cam crossing for the pipeline from Waterbeach to Site 3 would be constructed beneath the river by pipe-jacking or micro-tunnelling. Construction activities at the location would be undertaken either side of the river and away from the river banks to ensure that the construction of the crossing does not disturb the river.</p>	Amber	Green

Incorporating feedback

B.4.73 Phase one non-statutory consultation was held in order to share the proposals for relocating the WWTP with the public and stakeholders. This section provides a summary of the feedback received from the public in relation to the land and water quality and how the concerns, issues and opportunities raised have been considered within the assessment criteria for Stage 4 final site selection.

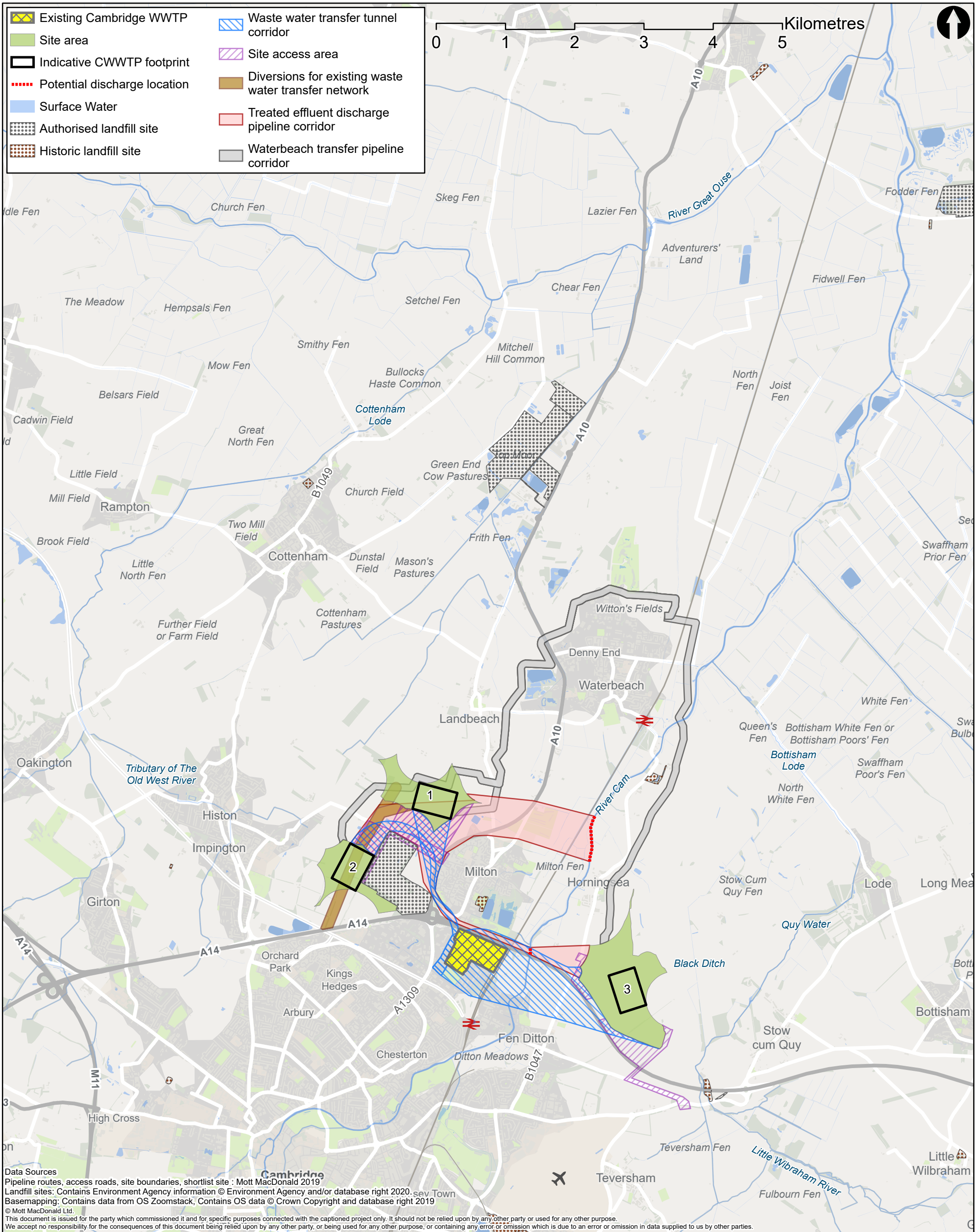
Table B.29: Flood risk, land and water quality feedback

Site (if specific)	Comment Summary	CWWTPR Response
Site area 1	Comment (in opposition to Site 3) that Sites 1 and 2 are rated as unproductive strata and very low risk to contamination.	The geology underlying the site areas is considered within the risk assessment for contaminated land and groundwater impacts. The bedrock below site areas 1 and 2 is the Gault Formation, which is classified as unproductive strata. However, sites 1 and 2 have superficial deposits (River Terrace Deposits) overlying the Gault Formation on site, which are classified as a secondary A aquifer. The Grey Chalk below site area 3 is classified as a principal aquifer. However, this is known to have no significant aquifer horizons. Further to this, site area 3 has less potential contamination sources compared to site areas 1 and 2. This is reflected within the land and water quality RAG assessments.
	Concern was also raised regarding the danger of soil contaminants from previous landfill site becoming air-borne/ water-borne during excavations.	Ground investigation will determine the extent of contamination on site. If present, this would be controlled through risk assessments and ensuring any excavated materials or contaminated groundwaters are appropriately managed through a CEMP. For instance, ensuring dust is suppressed and that trucks carrying material are covered. If dewatering is required, any contaminated water would be treated before being discharged, or else removed from site to an appropriate disposal facility.
Site area 2	As above (comments for Site 1 applicable to Site 2)	See comment above
Site area 3	A number of comments in opposition to Site 3 did cite a range of specific concerns relating to water contamination.	Site area 3 is on a Principal aquifer. However, these are no significant aquifer horizons, no groundwater abstractions within the study area, and the site is not located within a groundwater source protection zone. There are no existing contaminant sources at site 3. Any potential contaminant risks from proposed works would be mitigated (e.g. through secondary linings in tunnels). This is reflected within the land and water quality RAG assessments.

Site (if specific)	Comment Summary	CWWTPR Response
Site area 3 continued	<p>In particular, numerous respondents cited DEFRA's Magic Map showing a 'red risk designation' for the site and therefore raising concern of vulnerability to groundwater contamination.</p>	<p>The groundwater vulnerability of the strata below each site area are discussed within the land and water quality assessment. However, in relation to site area 3 there are unlikely to be any significant aquifer horizons within the chalk below site area 3, there are no groundwater abstractions from the chalk in the vicinity of the site area and the site is not within a groundwater SPZ. There are no significant existing contamination sources at site area 3. Any potential contamination risks to the chalk aquifer from proposed WWTP or associated infrastructure would be mitigated through design (e.g. through secondary linings in tunnel, appropriate drainage design etc.). This is discussed within the land and water quality assessment and reflected within the RAG evaluations.</p>
	<p>Concern was also raised regarding impacts to the chalk aquifer potentially contaminating a natural water source, and tunnelling crossing the River Cam potentially polluting the river and green sand layer.</p>	<p>Site area 3 is located on the Grey Chalk which is classified as a Principal aquifer. However, there are unlikely to be any significant aquifer horizons in the Chalk which underlies the site area or substantial groundwater yields from any boreholes in the Chalk in the vicinity of Site 3. There are no groundwater abstractions for public water supply from the Chalk in the vicinity of the site area and the site is not within a groundwater SPZ.</p> <p>Any potential contamination risks to the chalk aquifer from proposed WWTP or associated infrastructure would be mitigated through design (e.g. through secondary linings in tunnel, appropriate drainage design etc.).</p> <p>In regards to tunnelling under the River Cam, the waste water transfer tunnel would be constructed below the base of the river within the Gault Formation, which is an unproductive strata and as such there would not be a hydraulic connection between the tunnel and the River Cam.</p> <p>The River Cam crossing for the pipeline from Waterbeach to site area 3 would be constructed beneath the river by pipe-jacking or micro-tunnelling. Construction activities at the location would be undertaken either side of the river and away from the river banks. As a result, the construction of the crossing would not be expected to disturb the river. construction of the crossing does not disturb the river.</p> <p>Turbidity caused during tunnelling within the aquifers is expected to be minimal, and this is discussed within the report for both potential tunnelling methods.</p>
	<p>Comment that the in addition to potentially compromising the quality of drinking water, a plant on Site 3 would also threaten the Quy Fen wetland ecosystem and Stow Cum Quy Fen SSSI, where there are at least 15 long thin ponds that support a range of aquatic plants, some of which are</p>	<p>This is largely addressed within the nature conservation and biodiversity sections. These state that there are no discharge risks anticipated as all waste water will be treated and discharged to the river cam. they also state no hydrological impacts expected and that Infrastructure risk via the construction and operation of the treated effluent corridor unlikely to affect the qualifying features of the SSSI due to the distance from the WWTP</p>

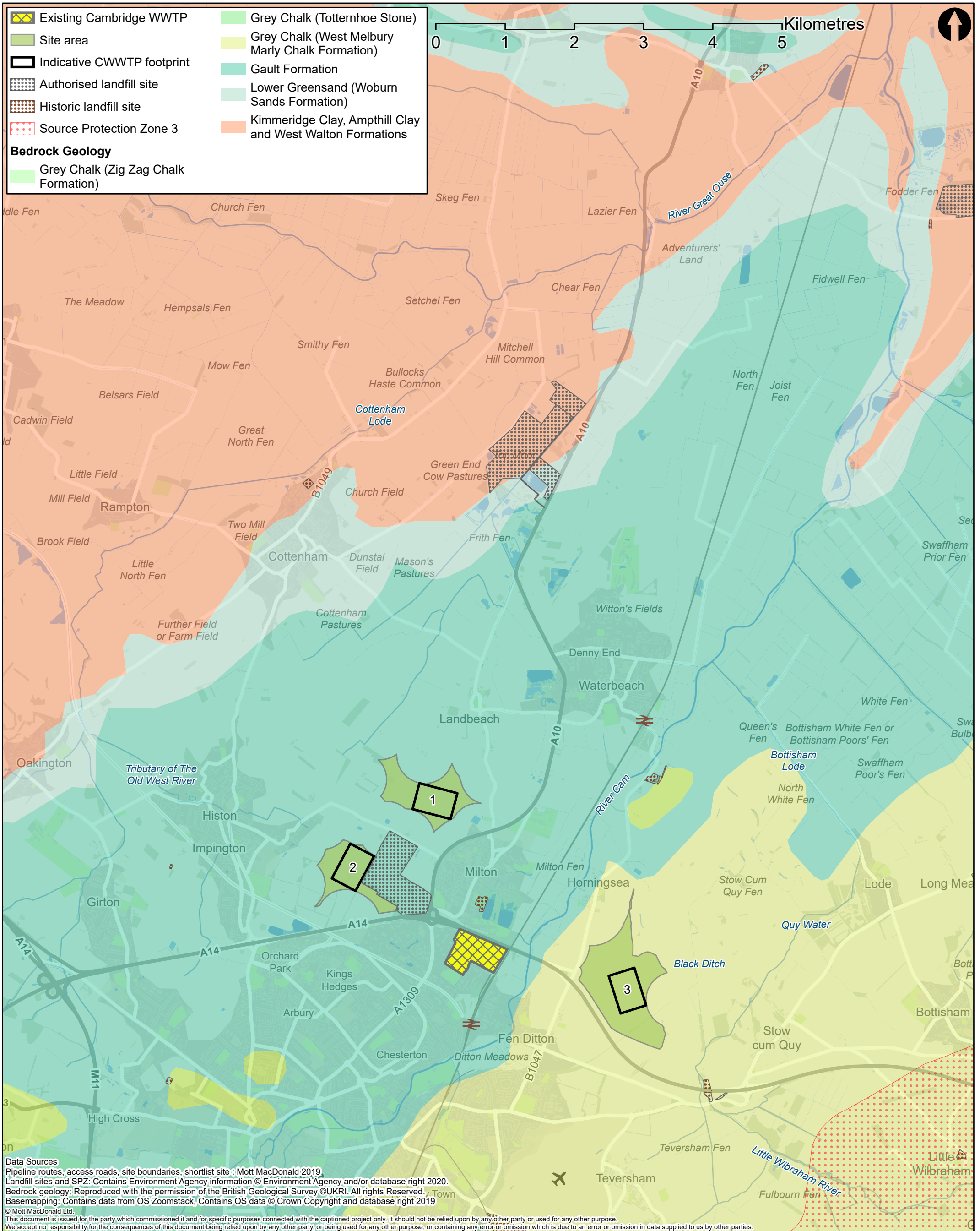
Site (if specific)	Comment Summary	CWWTPR Response
Site area 3 continued	uncommon species. The citation includes a statement that this open water habitat is rare in the British Isles.	development. Further to this, risks from changes in surface water/drainage patterns associated with the site and infrastructure would be accommodated within the design to ensure no negative impacts.
	Further comment that the discharge of effluent into the River Cam on the City side of Baits Bite Lock presents a risk to people living on houseboats, boat crews, etc in the event of accident or emergency. Comment that could be alleviated if the discharge were on the coast side of the Lock.	Current treated effluent is discharged to city side of Baits Bite Lock and so this situation would not change if site area 3 was selected. The new site would likely have improved effluent quality and so water quality would be improved.
	Some respondents did note that the proximity of Site 3 to the River Cam may provide more efficient discharge of treated effluent.	This is correct, since there would be a shorter length of tunnel/pipeline.

Drawings





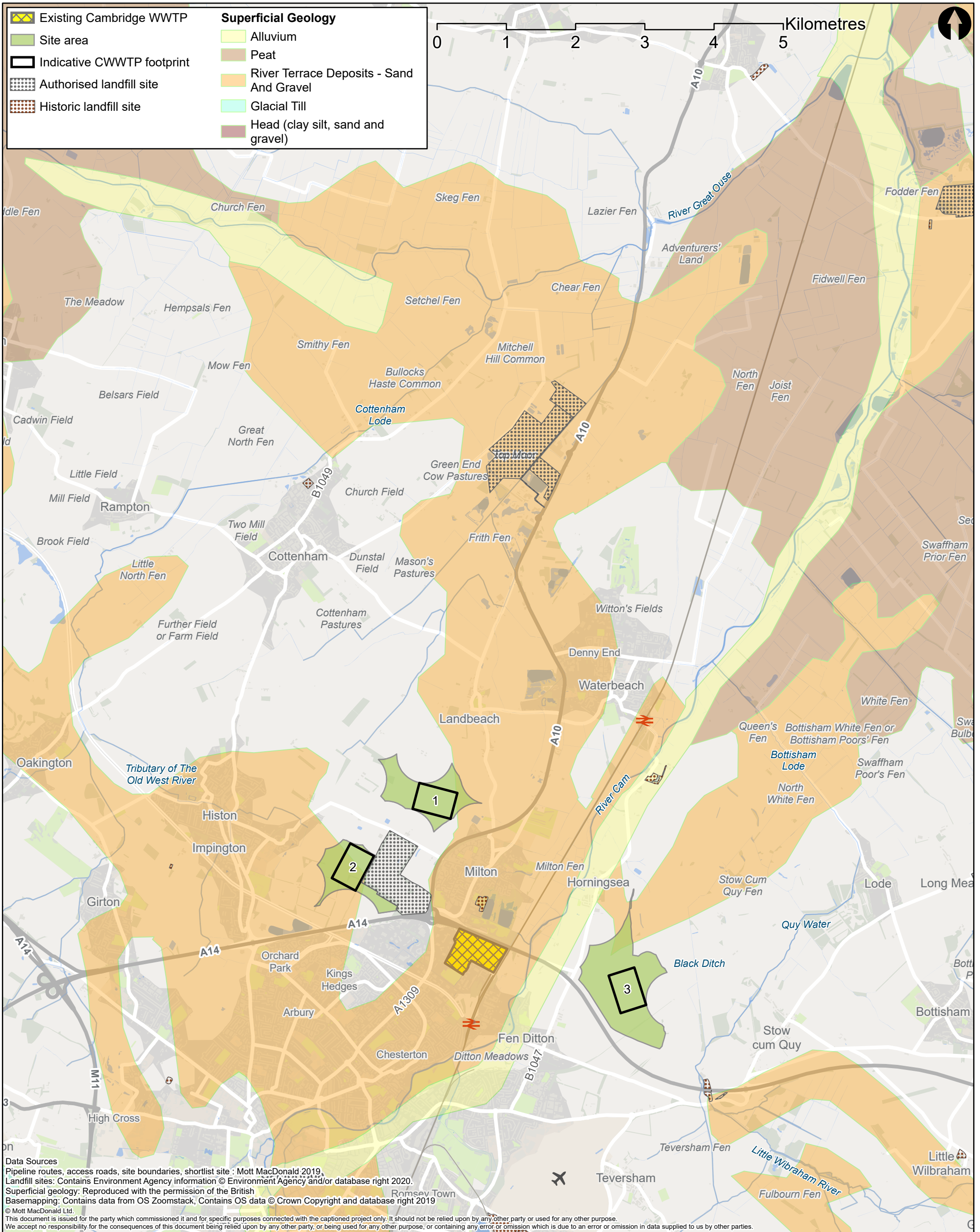
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						CWWTPR Project Stage 4 Final Site Selection Land and water quality study area			Checked	M Rickard												
									Approved	J Newton												
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										Approved	J Newton
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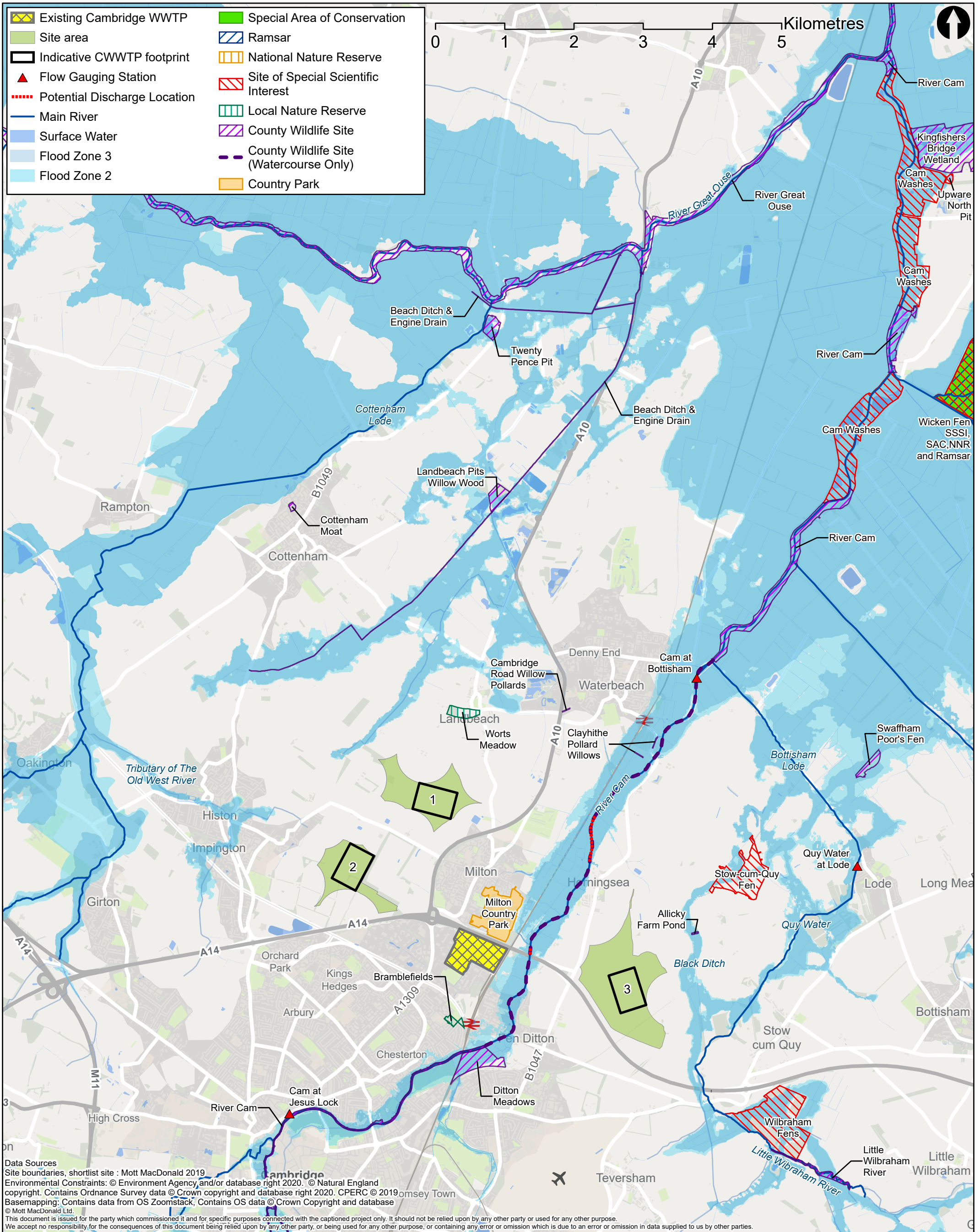
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Title	
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Drawing Number	
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							CWWTPR Project Stage 4 Final Site Selection Flood zones and nature conservation sites			Checked	M Rickard
										Approved	J Newton
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B.5 Carbon emissions

Assessment methodology

- B.5.1 A whole life carbon assessment of embodied and operational carbon has been carried out for the Stage 4 assessment. The assessment has focussed on infrastructure connections to and from the new WWTP as this varies significantly for each site. In contrast the carbon emissions for the WWTP itself will not vary significantly between sites and hence the WWTP emissions have not been included in the analysis.
- B.5.2 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. Each of the proposed options and sub-options were assessed.
- 9.1.2 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)

Scope and approach

- B.5.3 This assessment included the following infrastructure for each of the three potential new WWTP locations:
- Tunnel and pumping station to transfer waste water from the existing Cambridge WWTP to the new WWTP
 - Tunnel or pipelines (two options) and pumping stations to return the treated effluent from the new WWTP to each of the potential outfall options
 - The pipeline transferring waste water from the Waterbeach development to the new WWTP
 - Road improvements – to connect the new WWTP to the existing road network
 - Power transfer cables – to connect the new WWTP to the nearest power grid sub-station
- B.5.4 Table B.30 lists the infrastructure components included in the embodied and operational carbon assessment.

Table B.30: Scope of carbon assessment

Infrastructure asset	Embodied carbon	Operational carbon
Tunnels	<ul style="list-style-type: none"> ● Tunnels (excavation, lining and spoil removal). All tunnels assumed to be constructed using a bored segmental lining tunnelling technique. ● Shafts (excavation, lining and spoil removal) - including initial, intermediate and terminal shafts ● Additional (secondary) lining for shafts and tunnel sections passing through or close to aquifers ● Pumping stations (civil works and equipment). 	Power used to pump waste water or treated effluent
Pipelines	<ul style="list-style-type: none"> ● Pipelines (pipelines and laying) 	Power used to pump waste water or treated effluent

Infrastructure asset	Embodied carbon	Operational carbon
	<ul style="list-style-type: none"> Road, rail and river crossings Valves (chambers and valves) 	
Road improvements to provide access	<ul style="list-style-type: none"> Road surfacing materials Road earthworks/embankments 	Assumed no significant operational emissions
Power transfer cables	<ul style="list-style-type: none"> Power cables (cables and laying) Connections to grid and to new WWTP 	Assumed no significant operational emissions

B.5.5 The **embodied carbon emissions** estimates were prepared using embodied carbon models prepared by Mott MacDonald for Anglian Water which use typical asset designs (e.g. sizing of assets and assessment of appropriate materials and construction quantities) and industry standard carbon emissions factors for different materials.

B.5.6 The **operational carbon emissions** associated with the transfer infrastructure would be due to consumption of electrical energy required for pumping both raw waste water and treated effluent. The electrical energy consumption was estimated using industry standard pump hydraulic design calculations taking into account flows, pipelines (diameters, materials and lengths), as well as ground elevations for the start and finish locations.

B.5.7 The Defra 2019 carbon emissions factor for power consumption (0.2773 kgCO₂e/kWh)⁶⁷, which includes power generation as well as losses in power transmission and distribution, was used to convert power used for pumping into operational carbon emissions for each year. This gives a conservative estimate of operational carbon emissions as the UK Government forecasts that the power emissions factor should reduce by 75% between 2018 and 2035 as the grid is further 'decarbonised'⁶⁸.

B.5.8 **Whole life carbon** emissions were estimated over 20 years, by combining the estimate of the embodied carbon and the annual operational carbon emissions to give a whole life carbon estimate for the proposed sites. These assume two years construction followed by 18 years of operation. A 20 year timescale was considered sufficient due to the expected fall in power related operational carbon emissions over this period due to further decarbonisation.

Assumptions

B.5.9 The key assumptions used in estimating the carbon emissions in this study are described in this section. A full list of input assumptions for the carbon modelling of both unmitigated and mitigated options is provided in the next section.

B.5.10 Tunnels

B.5.11 A minimum internal diameter of 3.0m has been used for the new bored segmentally lined tunnel. This is larger than the existing tunnel to the current WWTP and the increase in tunnel diameter is due to (1) the need to provide space for additional tunnel lining for shafts and tunnel sections passing through or close to aquifers and (2) recent changes in minimum tunnel diameters required to provide safe access during construction and future maintenance.

B.5.12 Based upon the requirement to install a Tunnel Boring Machine (TBM), the starting (drive) shafts for a 3.0m diameter tunnel would need to have an internal diameter of approx. 12.5m. The carbon footprint includes an allowance for removing spoil and its disposal within 15km of

⁶⁷ www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2019, Conversion-Factors-2019-Condensed-set-for-most-users.xlsx. Value includes both emissions due to power generation and emissions associated with losses during power transmission and distribution.

⁶⁸ Updated Energy and Emissions Projections 2018, Department for Business, Energy and Industrial Strategy (BEIS), April 2019.

the tunnel excavation. The final (reception) tunnel shafts would have an internal diameter of 7.5m.

- B.5.13 All tunnel excavation would start from the site of the new WWTP.
- B.5.14 Where tunnel lengths are greater than 3km an intermediate shaft has been included along the tunnel, for both tunnel construction and future maintenance purposes. These intermediate shafts are assumed to have the same diameter as reception shafts.
- B.5.15 For the mitigated option carbon estimates, shafts and tunnels passing through or close to either the Lower Greensand aquifer or West Melbury Marly Chalk Formation aquifer, have a secondary lining to ensure water-tightness. No other changes are included in the 'with mitigation' carbon assessment.
- B.5.16 **Pipelines**
- B.5.17 It is assumed that Waterbeach flows would be transferred from the catchment to the new WWTP using a new pumping station and pumped pipelines. Two parallel pumped pipelines are assumed for both improved hydraulic operation and for resilience purposes.
- B.5.18 There is also an option to return treated effluent to the River Cam by pumped pipelines. In this case two parallel pumped pipelines are assumed, one for treated effluent and one for returned storm flows.
- B.5.19 For the larger diameter final effluent return pipelines the carbon emissions estimates include pipe jacked tunnel sections for crossing major roads and the railway. For the smaller diameter Waterbeach pipelines, crossings are assumed to use directional drilling techniques.
- B.5.20 The pipeline embodied carbon estimates also include allowances for ancillary items such as valves and valve chambers.
- B.5.21 **Pumps**
- B.5.22 The embodied carbon estimates for pumps are based on numbers of pumps (duty and standby) and pump size, defined in terms of a pump's power rating in kW. The power rating of pumps has been estimated using industry standard pump hydraulic design calculations taking into account flows, pipelines (diameters, materials and lengths), as well as ground elevations for the start and finish locations.
- B.5.23 The pump rating was then used to estimate operational power requirements in kWh (based on pump power consumption per hour and number of expected operational hours to pass annual average flows including waste water and storm flows) and hence operational carbon emissions.
- B.5.24 The RAG definitions for the carbon emissions assessment are provided in Table B.31.

Table B.31: Carbon assessment – RAG definitions

Green	Amber	Red
Within 130% of lowest option	<200% of lowest option	>200% of lowest option

Assumptions

Table B.32: Waste water transfer tunnel assumptions

Site	1Ai	1Bi	1Aii	1Bii	2Ai	2Bi	2Aii	2Bii	3Ai	3Aii
Return option	Tunnel	Tunnel	Pipeline	Pipeline	Tunnel	Tunnel	Pipeline	Pipeline	Tunnel	Pipeline
Outfall Location	Existing	New	Existing	New	Existing	New	Existing	New	Existing	Existing
Length of tunnel (m)	2550	2550	2550	2550	3000	3000	3000	3000	2650	2650
Length of tunnel (m)	2550	2550	2550	2550	3000	3000	3000	3000	2650	2650
Length requiring secondary lining (m) - unmitigated scenario	0	0	0	0	0	0	0	0	0	0
Length requiring secondary lining (m) - mitigated scenario	200	200	200	200	600	600	600	600	0	0
Intermediate shaft	no	no	no	no	no	no	no	no	no	no
Drive shaft depth (m)	23.53	23.53	23.53	23.53	26.09	26.09	26.09	26.09	23.65	23.65
lining required? (mitigated scenario)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Reception shaft depth (m)	17.34	17.34	17.34	17.34	17.34	17.34	17.34	17.34	17.34	17.34
lining required? (mitigated scenario)	no	no	no	no	no	no	no	no	no	no

Table B.33: Waterbeach to new treatment site rising main

Site	1Ai	1Bi	1Aii	1Bii	2Ai	2Bi	2Aii	2Bii	3Ai	3Aii
Return option	Tunnel	Tunnel	Pipeline	Pipeline	Tunnel	Tunnel	Pipeline	Pipeline	Tunnel	Pipeline
Outfall Location	Existing	New	Existing	New	Existing	New	Existing	New	Existing	Existing
total length of pipeline	4,510.00	4,510.00	4,510.00	4,510.00	6,270.00	6,270.00	6,270.00	6,270.00	6,460.00	6,460.00
directional drilling length	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00
Length of pipeline required (new TW location to existing discharge location)	4,360.00	4,360.00	4,360.00	4,360.00	6,120.00	6,120.00	6,120.00	6,120.00	6,310.00	6,310.00
Number of rising mains required	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Table B.34: Treated effluent return tunnel assumptions

Site	1Ai	1Bi	2Ai	2Bi	3Ai
Return option	Tunnel	Tunnel	Tunnel	Tunnel	Tunnel
Outfall Location	Existing	New	Existing	New	Existing
Length of tunnel (m)	3100	2600	4000	4000	1500
Length requiring secondary lining (m) - unmitigated scenario	0	0	0	0	0
Length requiring secondary lining (m) - mitigated scenario	0	0	0	0	100
Intermediate shaft	no	no	yes	yes	no
Drive shaft depth (m)	12.00	12.00	12.00	12.00	12.00
Lining required? (mitigated scenario)	yes	yes	yes	yes	yes
Intermediate shaft depth (m)	-	-	10.50	10.50	-
Lining required? (mitigated scenario)	yes	n/a	yes	yes	n/a
Reception shaft depth (m)	12.38	11.75	11.50	11.50	10.38
Lining required? (mitigated scenario)	no	no	no	no	no

Table B.35: Treated effluent return rising main assumptions

Site	1Aii	1Bii	2Ai	2Bi	3Ai
Return option	Pipeline	Pipeline	Tunnel	Tunnel	Tunnel
Outfall Location	Existing	New	Existing	New	Existing
Total pipeline length	3100	2600	0	0	0
Pipejacking for crossings	300	300	0	0	0
Length of pipeline required	3100	2600	0	0	0
Pipeline diameter (internal) - CAM + wb	1500	1500	1500	1500	1500
Pipejack diameter	2400	2400	2400	2400	2400
Shaft diameters for pipejacking	6500	6500	6500	6500	6500
nr shafts required	4	4	0	0	0
Number of rising mains required	2	2	2	2	2

Table B.36: Access road assumptions

	Site 3 (unmitigated)	Site 3 (mitigated)	Site 2 (mitigated and unmitigated)	Site 1 (mitigated and unmitigated)
Site clearance (m2)	6002	11596	4917	6218
Road area (m2)	5224	7512	3570	4536
Footpath area (m2)	562	0	1347	1682
Earthworks (m3)	3001	7486	2458.5	3109
Additional concrete for headwall to existing concrete (5m3)	no	yes	no	yes
Traffic signage (nr)	3	3	1	1
New traffic islands (nr)	3	3	3	3
Boundary fencing (m)	85	354	1091	1421
Traffic signal installation (nr)	0	2	0	0
Construction of additional structures over ditch (assumed 5m3 concrete)	Yes	Yes	No	No
Landscaping (m2)	2002	6317	0	0

Table B.37: HV cable assumptions

	site 1	site 2	site 3
Cable route length (m) - 2 x 300mm ² cables	3100	4000	1750
Length HPPE ducting required (m) - assumed 150mm duct per cable plus 1 spare	9300	12000	5250
Length laid open cut (m) - modelled as an open cut trench for 80mm pipe, which has a 0.55m width at the trench bottom, 1m deep. 1.4 factor uplift to account for laying 3 ducts	2650	3550	1600
Length constructed by directional drilling for road crossings (m) assumed 400mm diameter	300	300	0
Length constructed by directional drilling for rail crossings (m) assumed 400mm diameter	150	150	150

Assessment of unmitigated options

B.5.25 The results of the whole life carbon assessment of the embodied and operational carbon for each (unmitigated) site option are presented in Table B.38.

B.5.26 The following RAG definitions have been used in assessing options:

- Green: within 130% of lowest option whole life carbon
- Amber: <200% of lowest option whole life carbon
- Red: >200% of lowest option whole life carbon

Table B.38: Comparison of whole life carbon emissions for each site option

Site	Return option	Outfall Location	WLC tCO ₂ e - 20yrs	% compared to lowest option
1Ai	Tunnel	Existing	60,300	136%
1Bi	Tunnel	New	57,700	130%
1Aii	Pipeline	Existing	49,700	112%
1Bii	Pipeline	New	48,200	109%
2Ai	Tunnel	Existing	69,800	157%
2Bi	Tunnel	New	69,800	157%
2Aii	Pipeline	Existing	57,500	130%
2Bii	Pipeline	New	57,500	130%
3Ai	Tunnel	Existing	53,700	121%
3Aii	Pipeline	Existing	44,400	100%

B.5.27 It can be seen that, for the unmitigated case, Option 3Aii has the lowest whole life carbon estimate, followed by options 1Aii and 1Bii.

Assessment of mitigated options

B.5.28 The results of the whole life carbon assessment of the embodied and operational carbon for each mitigated site option are presented in Table B.39. Mitigation strategies included in this assessment include additional lining required in tunnels and shafts and alternative road layouts.

B.5.29 The following RAG definitions have been used in assessing options:

- Green: within 130% of lowest option whole life carbon
- Amber: <200% of lowest option whole life carbon
- Red: >200% of lowest option whole life carbon

Table B.39: Comparison of whole life carbon emissions for each site option

Site area option	Return option	Outfall Location	WLC tCO ₂ e - 20yrs	% compared to lowest option
1Ai	Tunnel	Existing	60,400	135%
1Bi	Tunnel	New	57,800	129%
1Aii	Pipeline	Existing	49,800	111%
1Bii	Pipeline	New	48,300	108%
2Ai	Tunnel	Existing	70,100	156%

Site area option	Return option	Outfall Location	WLC tCO2e - 20yrs	% compared to lowest option
2Bi	Tunnel	New	70,100	156%
2Aii	Pipeline	Existing	57,800	129%
2Bii	Pipeline	New	57,800	129%
3Ai	Tunnel	Existing	54,100	121%
3Aii	Pipeline	Existing	44,800	100%

B.5.30 It can be seen that, for the unmitigated case, Option 3Aii has the lowest whole life carbon estimate, followed by options 1Aii and 1Bii.

Incorporating feedback

B.5.31 Phase one non-statutory consultation was held in order to share the proposals for relocating the WWTP with the public and stakeholders. There were limited specific comments on carbon emissions during the public consultation, however, there were a number of concerns raised in relation to climate change. Therefore, this section provides a summary of the feedback received from the public in relation to climate change and how the concerns, issues and opportunities raised have been considered within the assessment criteria for Stage 4 final site selection.

Table B.40: Climate change feedback

Sub-Theme	Site (if specific)	Feedback Summary	Response
		Several comments included concern that odour impacts may become more prevalent in higher temperatures.	Prior to the submission of the planning application (Stage 4 of the DCO process), we will undertake a detailed odour assessment (including odour modelling) in line with the Institute of Air Quality Management (IAQM) Guidance on the assessment of odour for planning. We will mitigate odour impacts to all stakeholders to ensure 'negligible' impact, in line with the IAQM guidance.
	General	Those who showed support for the relocation had also referenced the benefit of creating a more modern WWTP.	The relocation of Cambridge WWTP will allow Anglian Water to continue to provide vital water recycling services to customers across Greater Cambridge in a modern, carbon efficient facility.
		Others criticised any impact to greenfield sites and biodiversity in light of the increasing climate emergency.	As described above the relocation provides the opportunity to construct modern, carbon efficient facility. In addition, the project will aim to achieve biodiversity net gain and the design of the scheme will follow the mitigation hierarchy to avoid impacts in the first instance (i.e. safeguard high quality habitats such as woodland, mature trees), followed by mitigation, compensation, and offsetting if required.
		Although all sites sit within the greenbelt, this appeared to be a more relevant issue for those opposed to site 3.	Green belt has been considered in the planning assessment, specifically the Green Belt study in Appendix J.
	Site area 3	Many comments referred to this area as part of the 'green lung between Cambridge and Wicken Fen'.	The Wicken Fen Vision aims to create a range of habitats for a wide number of species, including many which are rare and threatened, as well as mitigating wider problems created by climate change through measures such as carbon capture and storage in wetlands and sustainable drainage systems to allow water to percolate into soils and replenish ground water. The CWWTP team will engage with stakeholders to incorporate the aims of the Wicken Fen Vision in the design of the scheme. The scheme will take a landscape scale approach when it comes to green infrastructure and will include habitat creation proposals that will work with the Wicken Fen Vision.

B.6 Noise

Assessment methodology

- B.6.1 Preliminary assessments have been undertaken to identify potential noise and vibration impacts on sensitive receptors and receptor groups to the proposed options. The assessment considers noise and vibration impacts during construction and operation phases.
- B.6.2 During construction, works have the potential to directly alter the noise and vibration baseline for sensitive receptors for a temporary period during the programme of construction activities. Adverse impacts are likely to be restricted to areas where the existing baseline noise levels are exceeded subject to the application of appropriate mitigation. This would be principally in the immediate vicinity (within 300m) of the proposed development (including any haul roads and construction compound areas).
- B.6.3 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 vibration impacts during construction are a function of a number of factors including: the magnitude of impacts, sensitivity of receptors and duration of impacts. The exact location of construction work areas and methods are not known at this stage. It is understood sub-options will require different construction methods for pipeline/tunnel construction although comparative differences will be equivalent between options. On this basis no differentiation is made between construction methods for each sub-option for the purposes of this assessment and assessment of options per site only has been completed. Qualitative assessment of potential impacts has been made based on indicative site area locations and potential works with respect to sensitive receptors.
- B.6.4 Construction traffic using the wider road network during construction also has the potential to adversely impact sensitive receptors. Preliminary assessment has considered potential impacts at sensitive receptors within 50m of existing routes which are likely to increase existing noise levels by 1dB(A) or more due to construction traffic.
- B.6.5 Fixed plant and machinery, on site mobile plant and any associated vehicle movements (for deliveries and maintenance) are likely sources of noise during operation of the new site. Potential noise impacts may also result from changes in road traffic using the wider road network to access the site.
- B.6.6 There is potential that new noise sources during operation of the site will result in changes to baseline noise conditions at noise sensitive receptors. The magnitude of change may result in adverse noise impacts. In accordance with national and local policy, appropriate mitigation design would aim to minimise potential adverse noise impacts at the nearest noise sensitive receptors.
- B.6.7 Noise during operation of the proposed site therefore has the potential to impact a wide area subject to existing background noise levels and predicted noise levels during operation of the new site. However, the closest existing residential properties have the potential to be most affected. Details relating to operational noise sources are not available at this stage to enable quantitative assessment of potential noise impacts. A qualitative assessment of potential noise impacts has therefore been undertaken based on indicative locations of option elements with respect to nearby sensitive receptors.
- B.6.8 Vibration during operation of the site is unlikely to result in adverse effects due to the location of each option site area with respect to nearby vibration sensitive receptors. It is considered design of any individual significant vibration source within each option is independent of the site or

option selection process and would be subject to detailed design where necessary. Vibration during operation has therefore not been considered further within this selection assessment.

B.6.9 The RAG definitions for noise and vibration assessment are provided in Table B.41.

Table B.41: Noise and vibration assessment – RAG definitions

	Green	Amber	Red
Construction noise and vibration	Sensitive receptors are located at a distance greater than 300m from proposed work areas.	Sensitive receptors are located less than 300m from proposed work areas. Potential impacts are unlikely to be significant.	Sensitive receptors are located less than 300m from proposed work areas. Potential impacts are likely to be significant.
Construction traffic	Sensitive receptors are located at a distance greater than 50m from proposed construction traffic routes. Potential impacts are unlikely to be significant.	Sensitive receptors are located within 50m from construction traffic routes. Potential impacts are unlikely to be significant.	Sensitive receptors are located within 50m from construction traffic routes which would result in a potentially large increase in noise level for an extended period. Potential impacts are likely to be significant.
Operational noise and vibration	Receptors are not located close to operational noise sources and new noise sources are unlikely to be significant.	Receptors located close to operational noise sources. New noise sources have the potential to increase baseline noise levels and result in minor impacts.	Receptors located close to operational noise sources. New noise sources have the potential to increase baseline noise levels and result in significant impacts.

Assessment of unmitigated options

Construction

Site area 1, Option A

B.6.10 Site area 1 is located in a rural and relatively sparsely populated location. Noise and vibration impacts from construction of site area 1 are expected to be low due to its location with respect to nearby noise sensitive receptors. Tunnel and pipeline corridors and discharge points associated with Option 1A are generally located away from sensitive receptors which minimises potential construction noise and vibration impacts. However, temporary adverse impacts could occur where construction activities including construction of tunnel or pipeline corridors and diversions of the existing waste water transfer network navigate close to sensitive receptors including those on the outskirts of Waterbeach, Landbeach and Milton.

B.6.11 Preliminary assessment of construction traffic indicates vehicles would access Site Area 1 via the A10 and Butts Lane or by Landbeach Road. Construction traffic routes are however not fully developed for this site option. There is potential for temporary adverse impacts at a small number of sensitive receptors (less than 10) located on Butt Lane and Milton Road. Several construction phases would result in larger increases in construction traffic (e.g. during concrete pours) however the duration of these activities is unlikely to result in Significant Adverse Effects due to construction traffic. Impacts are subject however to developed design of construction routes.

Site area 1, Option B

B.6.12 Subject to the precise location of the treated effluent waste tunnel/pipeline associated with Option 1B, construction noise and vibration of the tunnel/pipeline has the potential to impact a

greater number of receptors on the northern edge of and surrounding Milton and Horningsea compared to Option 1A.

Site area 2, Option A

B.6.13 Similar to site area 1, site area 2 is located in a rural and relatively sparsely populated location. Construction noise and vibration impacts from construction of the main site area 2 are expected to be low due to its location with respect to nearby noise sensitive receptors. Tunnel and pipeline corridors and discharge points associated with Option 2A are generally located away from sensitive receptors which minimises potential construction noise and vibration impacts. However, temporary adverse impacts could occur where construction activities including construction of tunnel or pipeline corridors and diversions of the existing waste water transfer network navigate close to sensitive receptors including those on the outskirts of Waterbeach, Landbeach and Milton.

B.6.14 Preliminary assessment of construction traffic indicates vehicles would access Site Area 2 via the A10 and Butts Lane. Construction traffic routes are however not fully developed for this site option. There is potential for temporary adverse impacts at a small number of sensitive receptors (less than 10) located on Butt Lane and Milton Road. Several construction phases would result in larger increases in construction traffic (e.g. during concrete pours) however the duration of these activities is unlikely to result in Significant Adverse Effects due to construction traffic. Impacts are subject however to developed design of construction routes.

Site area 2, Option B

B.6.15 Subject to the precise location of the treated effluent waste tunnel/pipeline associated with Option 2B, construction noise and vibration of the tunnel/pipeline has the potential to impact a greater number of receptors on the northern edge of and surrounding Milton and Horningsea compared to Option 2A.

Site area 3, Option A

B.6.16 Site area 3 is located in a rural and relatively sparsely populated location. Construction noise and vibration impacts from construction of the site area 3 are expected to be low due to its location with respect to nearby noise sensitive receptors. Tunnel and pipeline corridors and discharge points are generally located away from sensitive receptors which minimises potential construction noise and vibration impacts. However, temporary adverse impacts could occur where construction activities including construction of tunnel or pipeline corridors navigate close to sensitive receptors including those on the outskirts of Waterbeach and Horningsea.

B.6.17 Preliminary assessment of construction traffic indicates vehicles would access Site Area 3 via the A14, High Ditch Road and Low Fen Drove Way or via the A14 and Horningsea Road. Construction traffic routes are however not fully developed for this site option. There is potential for temporary adverse impacts at a small number of sensitive receptors located on High Ditch Road. Several construction phases would result in larger increases in construction traffic (e.g. during concrete pours) however the duration of these activities is unlikely to result in Significant Adverse Effects due to construction traffic. Impacts are subject however to developed design of construction routes.

B.6.18 The following table summarises unmitigated construction noise and vibration RAG assessment of each option.

Table B.42: Construction Noise and Vibration RAG assessment

Site Option	Construction Noise and Vibration	RAG Rating
Site area 1 Option A	<p>Construction of site area 1 is likely to be low due to its location with respect to nearby noise sensitive receptors.</p> <p>Temporary adverse impacts during tunnel or pipeline corridor works at nearby receptors including those on the outskirts of Waterbeach, Landbeach and Milton.</p> <p>Temporary adverse impacts due to construction traffic at a small number of receptors on Butts Lane and Milton Road subject to developed design of routes.</p>	Amber
Site area 1 Option B	<p>Construction of site area 1 is likely to be low due to its location with respect to nearby noise sensitive receptors.</p> <p>Temporary adverse impacts during tunnel or pipeline corridor works at nearby receptors including those on the outskirts of Waterbeach, Landbeach, on the northern edge of and surrounding Milton and Horningsea.</p> <p>Temporary adverse impacts due to construction traffic at a small number of receptors on Butts Lane and Milton Road subject to developed design of routes.</p>	Amber
Site area 2 Option A	<p>Construction of site area 2 is likely to be low due to its location with respect to nearby noise sensitive receptors.</p> <p>Temporary adverse impacts during tunnel or pipeline corridor works at nearby receptors including those on the outskirts of Waterbeach, Landbeach and Milton.</p> <p>Temporary adverse impacts due to construction traffic at a small number of receptors on Butts Lane and Milton Road subject to developed design of routes.</p>	Amber
Site area 2 Option B	<p>Construction of site area 2 is likely to be low due to its location with respect to nearby noise sensitive receptors.</p> <p>Temporary adverse impacts during tunnel or pipeline corridor works at nearby receptors including those on the outskirts of Waterbeach, Landbeach, on the northern edge of and surrounding Milton and Horningsea.</p> <p>Temporary adverse impacts due to construction traffic at a small number of receptors on Butts Lane and Milton Road subject to developed design of routes.</p>	Amber
Site area 3 Option A	<p>Construction of site area 3 is likely to be low due to its location with respect to nearby noise sensitive receptors.</p> <p>Temporary adverse impacts during tunnel or pipeline corridor works at nearby receptors including those on the outskirts of Waterbeach and Horningsea.</p> <p>Temporary adverse impacts due to construction traffic at a small number of receptors on High Ditch Road subject to developed design of routes.</p>	Amber

Operation

Site area 1, Option A

B.6.19

Noise impacts from site area 1 during the operational phase at the nearest receptors are expected to be low due to its location with respect to nearby noise sensitive receptors. Noise sources associated with operation of pipelines, or ancillary pumping stations along the pipeline or discharge locations, have the potential to result in adverse effects if located near to sensitive receptors. At this stage it is not known where these additional fixed plant items would be located, or noise levels generated by these elements. Operational noise impact from the discharge point is expected to be low due to its distance from sensitive receptors.

B.6.20 Operational HDV movements to site area 1 will exceed 100 daily movements. Vehicular access will be via Butt Lane, A10 Ely Road or Landbeach Road. The location of new access road may result in minor adverse noise effects at individual receptors for access routes via Butt Lane. Changes in road traffic using the existing road network due to additional vehicle movements may also result in minor adverse noise effects. Further assessment is required to determine the extent of noise impacts due to changes in road traffic.

Site area 1, Option B

B.6.21 The potential noise impacts for Option 1B are very similar to Option 1A. The difference in impacts due to Option 1B compared to Option 1A are subject to the precise location for the discharge or pumping stations location which may be closer to receptors. However, the operation of this part of the water treatment infrastructure is unlikely to result in significance adverse effects on these receptors.

Site area 2, Option A

B.6.22 Noise impacts from site area 2 during the operational phase at the nearest receptors are expected to be low due to its location with respect to nearby noise sensitive receptors. Noise sources associated with operation of pipelines or ancillary pumping stations along the pipeline or discharge locations have the potential to result in adverse effects if located near to sensitive receptors. At this stage it is not known where these additional fixed plant items would be located, or noise levels generated by these elements. Operational noise impact from the discharge point is expected to be low due to its distance from sensitive receptors.

B.6.23 Operational HDV movements to site area 2 will exceed 100 daily movements. Vehicular access will be via Butt Lane. The location of new access road may result in minor adverse noise effects at individual receptors on Butt Lane. Changes in road traffic using the existing road network due to additional vehicle movements may also result in minor adverse noise effects. Further assessment is required to determine the extent of noise impacts due to changes in road traffic.

Site 2, Option B

B.6.24 The potential noise impacts for Option 2B are very similar to Option 2A. The difference in impacts due to Option 2B compared to Option 2A are subject to the precise location for the discharge or pumping stations location which may be closer to receptors. However, the operation of this part of the water treatment infrastructure is unlikely to result in significance adverse effects on these receptors.

Site 3, Option A

B.6.25 Noise impacts from site area 3 during the operational phase at the nearest receptors are expected to be low due to its location with respect to nearby noise sensitive receptors. Noise sources associated with operation of pipelines or ancillary pumping stations along the pipeline or discharge locations have the potential to result in adverse effects if located near to sensitive receptors. At this stage it is not known where these additional fixed plant items would be located. Operational noise impact from the discharge point is expected to be low due to its distance from sensitive receptors.

B.6.26 Operational HDV movements to site area 3 will exceed 100 daily movements. Vehicular access will be via Horningsea Road in an unmitigated scenario. The location of new access road may result in minor adverse noise effects at individual receptors on Horningsea Road. Changes in road traffic using the existing road network due to additional vehicle movements may also result in minor adverse noise effects. Further assessment is required to determine the extent of noise impacts due to changes in road traffic.

B.6.27 The following table summarises the unmitigated operational noise RAG assessment of each option.

Table B.43: Operational Noise RAG Assessment

Site Option	Operational Noise	RAG Rating
Site area 1 Option A	Noise impacts from site area 1 at the nearest receptors are expected to be low due to its location with respect to nearby noise sensitive receptors. Potential adverse impacts may occur at receptors near to fixed plant elements including pumping stations or due to changes in road traffic from site traffic.	Amber
Site area 1 Option B	Noise impacts from site area 1 at the nearest receptors are expected to be low due to its location with respect to nearby noise sensitive receptors. Potential adverse impacts may occur at receptors near to fixed plant elements including pumping stations or due to changes in road traffic from site traffic.	Amber
Site area 2 Option A	Noise impacts from site area 2 at the nearest receptors are expected to be low due to its location with respect to nearby noise sensitive receptors. Potential adverse impacts may occur at receptors near to fixed plant elements including pumping stations or due to changes in road traffic from site traffic.	Amber
Site area 2 Option B	Noise impacts from site area 2 at the nearest receptors are expected to be low due to its location with respect to nearby noise sensitive receptors. Potential adverse impacts may occur at receptors near to fixed plant elements including pumping stations or due to changes in road traffic from site traffic.	Amber
Site area 3 Option A	Noise impacts from site area 3 at the nearest receptors are expected to be low due to its location with respect to nearby noise sensitive receptors. Potential adverse impacts may occur at receptors near to fixed plant elements including pumping stations or due to changes in road traffic from site traffic.	Amber

Mitigation identified

Site area 1

B.6.28 Where significant adverse noise and vibration impacts are identified for works within the construction phase, appropriate mitigation measures will be applied including the use of Best Practicable Means (BPM) in accordance with BS5228-1&2:2009+A1:2014 guidance. Mitigation may comprise a number of measures including management of construction hours, selection of low noise and vibration construction plant, use of screening (enclosures, barriers or bunds), noise and vibration monitoring.

B.6.29 Mitigation of construction traffic would include implementation of a Construction Management Plan.

B.6.30 Mitigation of operational noise would be applied through design to minimise potential adverse noise impacts at the nearest noise sensitive receptors. Measures may include selection of plant and equipment, location and orientation of fixed plant items and use of screening (e.g. acoustic enclosures, barriers or bunds).

Site area 2

B.6.31 The mitigation outlined for site area 1 is also appropriate for site area 2.

Site area 3

B.6.32 The mitigation outlined for site area 1 is also appropriate for site area 3.

Assessment of mitigated options

B.6.33 It is considered that where mitigation is applied appropriately that construction noise and vibration effects could be effectively minimised or managed to prevent significant disturbance and adverse effects.

B.6.34 The following table summarises mitigated construction noise and vibration RAG assessment of each option.

Table B.44: Construction Noise and Vibration RAG Assessment

Site Option	Construction Noise and Vibration	Mitigated RAG Rating
Site 1 Option A	Noise and vibration from construction works does not exceed significant adverse effect level thresholds for extended periods at receptor locations.	Green
Site 1 Option B	Noise and vibration from construction works does not exceed significant adverse effect level thresholds for extended periods at receptor locations.	Green
Site 2 Option A	Noise and vibration from construction works does not exceed significant adverse effect level thresholds for extended periods at receptor locations.	Green
Site 2 Option B	Noise and vibration from construction works does not exceed significant adverse effect level thresholds for extended periods at receptor locations.	Green
Site 3 Option A	Noise and vibration from construction works does not exceed significant adverse effect level thresholds for extended periods at receptor locations.	Green

B.6.35 The following table summarises mitigated operational noise RAG assessment of each option.

Table B.45: Operational Noise RAG Assessment

Site Option	Operational Noise	Mitigated RAG Rating
Site 1 Option A	Design of site to include appropriate measures such that noise from fixed plant or changes in road traffic does not result in significant changes to baseline noise conditions or significant adverse effects.	Green
Site 1 Option B	Design of site to include appropriate measures such that noise from fixed plant or changes in road traffic does not result in significant changes to baseline noise conditions or significant adverse effects.	Green
Site 2 Option A	Design of site to include appropriate measures such that noise from fixed plant or changes in road traffic does not result in significant changes to baseline noise conditions or significant adverse effects.	Green
Site 2 Option B	Design of site to include appropriate measures such that noise from fixed plant or changes in road traffic does not result in significant changes to baseline noise conditions or significant adverse effects.	Green
Site 3 Option A	Design of site to include appropriate measures such that noise from fixed plant or changes in road traffic does not result in significant changes to baseline noise conditions or significant adverse effects.	Green

Incorporating feedback

B.6.36 Phase one non-statutory consultation was held in order to share the proposals for relocating the WWTP with the public and stakeholders. This section provides a summary of the feedback received from the public in relation to noise and how the concerns, issues and opportunities raised have been considered within the assessment criteria for Stage 4 final site selection.

Table B.46: Noise feedback

Sub-Theme	Site (if specific)	Feedback Summary	Response
Construction	Site area 1	Particular concern raised regarding significant traffic noise of construction vehicles using A10 and Landbeach Road.	It is understood that the majority of construction traffic would access the site via the A14 and A10. It is considered unlikely that the addition of construction vehicles using these routes to the site would result in significant adverse effects due to increases in traffic. Mitigation including management of delivery hours to site would be applied to reduce potential noise impacts. Further assessment would be undertaken during detailed design stages to consider potential impacts and mitigation measures.
		Further comment that construction noise will be a concern for all in local villages, particularly with an increased number working from home.	Mitigation including Best Practicable Means would be applied to reduce potential temporary impacts from construction noise and vibration.
	It was commented that there will be an increase in traffic and noise to an already over used road, and that the area around Site 1 already experiences significant noise pollution from A10 traffic.	As described above the impacts are considered unlikely to result in significant adverse effects however mitigation would be applied to reduce potential noise impacts. Further assessment would be undertaken during detailed design stages to consider potential impacts and mitigation measures.	
	Site area 3	Comment that Fen Ditton already experiences significant noise impacts so would experience less relative additional disruption.	Existing baseline noise levels at Fen Ditton are understood to include noise from road traffic using the A14. Potential noise from site area 3 would be masked to some degree by existing ambient noise sources. Further assessment would be undertaken during detailed design stages to consider potential noise impacts at this community area and nearby sensitive receptors and support the design of mitigation measures.
Operation	General	Some respondents have raised concerns regarding operational noise for all three sites. Some respondents asked for the site to be relocated further north, away from any communities.	Preliminary assessment indicates potential operational noise impacts are similar for all three site options. Noise impact assessments will be undertaken and mitigation measures included to minimise and prevent significant adverse noise effects during detailed design.

B.7 Air quality

Assessment methodology

- B.7.1 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.
- B.7.2 During construction, dust and vehicle emissions have the potential to affect sensitive receptors through dust deposition and health effects. Potential dust effects have been identified by measuring distances from site areas to nearby receptors, aligned with the Institute of Air Quality Management's (IAQM) 'Guidance on the assessment of dust from demolition and construction'⁶⁹. Using this guidance, factors such as construction magnitudes, proximity and number of sensitive receptors, duration of impacts and number of Heavy-Duty Vehicle (HDV) movements are used to determine the likely level of dust risk and inform the most appropriate dust mitigation. Construction work areas, quantities and methods of working are unknown at this stage, although it is understood that different construction methods may be required for pipeline construction. Construction methods for each site option are assumed to be the same for the purposes of this assessment. Qualitative assessment of potential impacts has been made based on indicative site area locations and potential works with respect to locations of sensitive receptors.
- B.7.3 Vehicle movements are sources of pollutant emissions, and construction and operation of the new site may result in additional traffic movements near sensitive receptors. Increased vehicle movements may result in adverse air quality impacts and significant effects at sensitive receptors. The Preliminary TA in Appendix K provides provisional traffic numbers for construction and operation, indicating that construction HDV movements will be approximately 70 annual average daily traffic (AADT) movements and that operational HDV will have approximately 146 AADT movements.
- B.7.4 Operational traffic may require further assessment within an EIA as the vehicle movements likely exceed the HDV assessment threshold of 100 AADT within the Environmental Protection United Kingdom (EPUK) and IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality'⁷⁰. Construction traffic may also require assessment for affected roads within the A14 Corridor Air Quality Management Area (AQMA), an air quality sensitive area designated by South Cambridgeshire District Council (SCDC)⁷¹. The EPUK/IAQM guidance has an HDV assessment threshold of 25 AADT within AQMAs, exceeded by the predicted construction HDV traffic movements. It is worth noting that the operational traffic through the AQMA is predicted to be similar to the movements from the existing WWTP site, with a small uplift of 16 HDVs, therefore it is unlikely that significant effects will occur within the AQMA as a result of operational traffic.
- B.7.5 All sites will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby human receptors. Combustion plant on site will comply with Environmental Permitting Regulations, as required, and emissions will be regulated and mitigated accordingly. Impacts on air quality from combustion plant will

⁶⁹ Institute of Air Quality Management (2014) Guidance on the assessment of dust from demolition and construction http://iaqm.co.uk/wp-content/uploads/guidance/iaqm_guidance_report_draft1.4.pdf

⁷⁰ Environmental Protection UK and Institute of Air Quality Management (January 2017) Land-Use Planning and Development Control: Planning for Air Quality (version 1.2) <http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf>

⁷¹ 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>

therefore be comprehensively assessed through the permitting process and any resultant significant effects identified will be required to be fully mitigated prior to operation. As such the energy plant emissions have not been considered in this report.

B.7.6 The RAG definitions for the air quality assessment are provided in Table B.47.

Table B.47: Air quality assessment – RAG definitions

Green	Amber	Red
Air quality impacts are unlikely to lead to significant effects at affected sensitive receptors. i.e. existing baseline conditions do not exceed the national air quality objectives, no receptors are located within 350m of the site or 200m of affected roads, the site is not expected to have any adverse impacts upon air quality, mitigation expected to negate all adverse impacts.	Air quality impacts have the potential to lead to significant effects at affected sensitive receptors. i.e. existing baseline conditions are close to or exceeding the national air quality objectives, receptors are located within 350m of the site or 200m of affected roads, the site is expected to have adverse impacts upon air quality.	Air quality impacts are likely to lead to significant effects at affected sensitive receptors. i.e. existing baseline conditions are exceeding the national air quality objectives, receptors are located within 350m of the site or 200m of affected roads, the site is expected to have adverse impacts upon air quality.

Assessment of unmitigated options

Construction

Site area 1, Option A

B.7.7 Under this option, the Waterbeach transfer pipeline corridor will be within 250m of residential receptors in Waterbeach, the treated effluent pipeline within 50m of residential receptors in Milton and the diversions of the existing waste water transfer network within 50m of residential receptors in Kings Hedges. These pipeline corridors may result in increased dust effects due to excavation, either at shaft and portal sites, in the case of tunnelling, or along the entire length of the pipeline if a trench is required. Dust deposition and human health effects from dust may also occur at sensitive receptor locations close to site area 1, due to construction works, although receptors are greater than 200m from the site boundary.

B.7.8 Approximately 70 heavy-duty vehicle (HDV) movements per day are anticipated over the 4-year construction period, with the potential to increase vehicle and dust emissions and associated pollutant (nitrogen dioxide and particulate) concentrations along local roads. It is assumed that access to site area 1 would be via Butt Lane off the A10 Ely Road. Some construction traffic will travel within the A14 Corridor AQMA, and therefore may require further assessment if the vehicle movements along the A14 exceed the assessment thresholds within the EPUK/IAQM guidance ‘Land-Use Planning and Development Control: Planning for Air Quality’ (2017).

Site area 1, Option B

B.7.9 Under this option, the Waterbeach transfer pipeline corridor will be within 250m of residential receptors in Waterbeach, the treated effluent pipeline within 50m of residential receptors in Milton and the diversions of the existing waste water transfer network within 50m of residential receptors in Kings Hedges. These pipeline corridors may result in increased dust effects due to excavation, either at shaft and portal sites, in the case of tunnelling, or along the entire length of the pipeline if a trench is required. Dust deposition and human health effects from dust may also occur at sensitive receptor locations close to site area 1, due to construction works, although receptors are greater than 200m from the site boundary.

B.7.10 Approximately 70 heavy-duty vehicle (HDV) movements per day are anticipated over the 4-year construction period, with the potential to increase vehicle and dust emissions and associated

pollutant (nitrogen dioxide and particulate) concentrations along local roads. It is assumed that access to site area 1 would be via Butt Lane off the A10 Ely Road. Some construction traffic will travel within the A14 Corridor AQMA, and therefore may require further assessment if the vehicle movements along the A14 exceed the assessment thresholds within the EPUK/IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality' (2017).

Operation

Site area 1, Option A

- B.7.11 Operational HDV movements will likely exceed 100 daily movements. It is assumed that all site traffic will enter and exit the site via Butt Lane off the A10 Ely Road. Operational traffic may require further assessment as the vehicle movements exceed the assessment thresholds within the EPUK/IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality' (2017).

Site area 1, Option B

- B.7.12 Operational HDV movements will likely exceed 100 daily movements. It is assumed that the all site traffic will enter and exit the site via Butt Lane off the A10 Ely Road. Operational traffic may require further assessment as the vehicle movements exceed the assessment thresholds within the EPUK/IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality' (2017).

Table B.48: Air quality – unmitigated RAG evaluation for site area 1, Options A and B

Site area	Construction	Operational		
	Evaluation	Unmitigated RAG rating	Evaluation	Unmitigated RAG rating
Site area 1 – Option A	<p>Existing baseline conditions do not exceed the national air quality objectives.</p> <p>Receptors are located within 350m of the site or 200m of affected roads.</p> <p>Potential for dust deposition effects at closest receptors to site and pipeline corridors. Construction site traffic may impact upon the air quality within the A14 AQMA, potentially causing significant effects at receptors along the A14. Further assessment is required to determine the likely impacts upon air quality.</p>	Amber	<p>Existing baseline conditions do not exceed the national air quality objectives.</p> <p>Receptors are located within 350m of the site or 200m of affected roads.</p> <p>Operational traffic may impact upon the air quality on local roads, potentially causing significant effects at receptors close to affected roads. Further assessment is required to determine the likely impacts upon air quality.</p>	Amber
Site area 1 – Option B	As with Option A.	Amber	As with Option A.	Amber

Construction

Site area 2, Option A

B.7.13 Under this option, Waterbeach transfer pipeline corridor is within 250m of residential receptors in Waterbeach, the treated effluent pipeline within 50m of residential receptors in Milton, and the diversions of the existing waste water transfer network within 50m of residential receptors in King’s Hedges. These pipeline corridors may result in increased dust effects due to excavation, either at shaft and portal sites, in the case of tunnelling, or along the entire length of the pipeline if a trench is required. The pipeline-related dust effects are considered to be similar to those for site area 1. Dust deposition and human health effects from dust may also occur at sensitive receptor locations close to the site area 1, due to construction works, although receptors are located more than 200m from the site boundary.

B.7.14 Approximately 70 heavy-duty vehicle (HDV) movements per day are anticipated over the 4-year construction period, with the potential to increase vehicle and dust emissions and associated pollutant (nitrogen dioxide and particulate) concentrations along local roads. It is assumed that access to site area 2 would be via Butt Lane off the A10 Ely Road. Some construction traffic will travel within the A14 Corridor AQMA, and therefore may require further assessment if the vehicle movements along the A14 exceed the assessment thresholds within the EPUK/IAQM guidance ‘Land-Use Planning and Development Control: Planning for Air Quality’ (2017). The traffic emission effects are considered to be similar to those for site area 1.

Site area 2, Option B

B.7.15 This option puts the Waterbeach transfer pipeline corridor within 250m of residential receptors in Waterbeach, the treated effluent pipeline within 50m of residential receptors in Milton, and the

diversions of the existing waste water transfer network within 50m of residential receptors in King's Hedges. These pipeline corridors may result in increased dust effects due to excavation, either at shaft and portal sites, in the case of tunnelling, or along the entire length of the pipeline if a trench is required. The pipeline-related dust effects are considered to be similar to Site 1. Dust deposition and human health effects from dust may also occur at sensitive receptor locations close to the main Site, due to construction works, although receptors appear to be located >200m from the Site boundary.

- B.7.16 Approximately 70 heavy-duty vehicle (HDV) movements per day are anticipated over the 4-year construction period, with the potential to increase vehicle and dust emissions and associated pollutant (nitrogen dioxide and particulate) concentrations along local roads. It is assumed that access to site area 2 would be via Butt Lane off the A10 Ely Road. Some construction traffic will travel within the A14 Corridor AQMA, and therefore may require further assessment if the vehicle movements along the A14 exceed the assessment thresholds within the EPUK/IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality' (2017). The traffic emission effects are considered to be similar to those for site area 1.

Operation

Site area 2, Option A

- B.7.17 Similar to site area 1, the operational HDV movements will likely exceed 100 daily movements. It is assumed that the all site traffic will enter and exit the site via Butt Lane off the A10 Ely Road. Operational traffic may require further assessment as the vehicle movements exceed the assessment thresholds within the EPUK/IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality' (2017).

Site area 2, Option B

- B.7.18 Similar to site area 1, the operational HDV movements will likely exceed 100 daily movements. It is assumed that the all site traffic will enter and exit the site via the Butt Lane off the A10 Ely Road. Operational traffic may require further assessment as the vehicle movements exceed the assessment thresholds within the EPUK/IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality' (2017).

Table B.49: Air quality – unmitigated RAG evaluation for site area 2, Operation A and B

Site area	Construction	Operational		
	Evaluation	Unmitigated RAG rating	Evaluation	Unmitigated RAG rating
Site area 2 – Option A	<p>Existing baseline conditions do not exceed the national air quality objectives.</p> <p>Receptors are located within 350m of the site or 200m of affected roads.</p> <p>Potential for dust deposition effects at closest receptors to site and pipeline corridors. Construction site traffic may impact upon the air quality within the A14 AQMA, potentially causing significant effects at receptors along the A14. Further assessment is required to determine the likely impacts upon air quality.</p>	Amber	<p>Existing baseline conditions do not exceed the national air quality objectives.</p> <p>Receptors are located within 350m of the site or 200m of affected roads.</p> <p>Operational traffic may impact upon the air quality on local roads, potentially causing significant effects at receptors close to affected roads. Further assessment is required to determine the likely impacts upon air quality.</p>	Amber
Site area 2 – Option B	As with Option A.	Amber	As with Option A.	Amber

Construction

Site area 3

- B.7.19 Under this option, the Waterbeach transfer pipeline corridor is within 50m of residential receptors in Clayhithe and Horningsea and the treated effluent pipeline within 20m of residential receptors at Biggin Abbey Cottages. These pipeline corridors may result in increased dust effects due to excavation, either at shaft and portal sites, in the case of tunnelling, or along the entire length of the pipeline if a trench is required. Dust deposition and human health effects from dust may also occur at sensitive receptor locations close to the site area 3, due to construction works, although receptors are located >300m from the site boundary. There are fewer air quality sensitive human receptors located near to site area 3, compared to site areas 1 and 2.
- B.7.20 Approximately 70 heavy-duty vehicle (HDV) movements per day are anticipated over the 4-year construction period, with the potential to increase vehicle and dust emissions and associated pollutant (nitrogen dioxide and particulate) concentrations along local roads. It is assumed that access to site area 3 would be via junction 34 (Fen Ditton) of the A14 and Horningsea Road. Some construction traffic will travel within the A14 Corridor AQMA, and therefore may require further assessment if the vehicle movements along the A14 exceed the assessment thresholds within the EPUK/IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality' (2017). The traffic emission effects are considered to be similar to those for site area 1.

Operation

- B.7.21 Similar to site area 1, the operational HDV movements will likely exceed 100 daily movements. It is assumed that access to site area 3 would be via junction 34 (Fen Ditton) of the A14 and

Horningsea Road. Operational traffic may require further assessment as the vehicle movements exceed the assessment thresholds within the EPUK/IAQM guidance ‘Land-Use Planning and Development Control: Planning for Air Quality’ (2017).

Table B.50: Air quality – unmitigated RAG evaluation for site area 3

Site area	Construction	Operational		
	Evaluation	Unmitigated RAG rating	Evaluation	Unmitigated RAG rating
Site 3 – Option A	<p>Existing baseline conditions do not exceed the national air quality objectives.</p> <p>Receptors are located within 350m of the site or 200m of affected roads.</p> <p>Potential for dust deposition effects at closest receptors to site and pipeline corridors.</p> <p>Construction site traffic may impact upon the air quality within the A14 AQMA, potentially causing significant effects at receptors along the A14. Further assessment is required to determine the likely impacts upon air quality.</p>	Amber	<p>Existing baseline conditions do not exceed the national air quality objectives.</p> <p>Receptors are located within 350m of the site or 200m of affected roads.</p> <p>Operational traffic may impact upon the air quality on local roads, potentially causing significant effects at receptors close to affected roads. Further assessment is required to determine the likely impacts upon air quality.</p>	Amber

Mitigation identification

Site area 1

B.7.22

The following mitigation measures should be implemented to reduce adverse effects from reductions in air quality.

- Dust control measures consistent with best practice environmental management will be implemented.
- Construction and operational traffic may require further assessment as the vehicle movements exceed the assessment thresholds within the Environmental Protection UK and Institute of Air Quality Management guidance ‘Land-Use Planning and Development Control: Planning for Air Quality’ (2017).
- Dispersion modelling would be used to quantitatively assess the likely impacts from construction and operation along likely site access and haulage routes; if significant effects are found to be likely, appropriate mitigation will be recommended as necessary.

Site area 2

B.7.23

The mitigation outlined for site area 1 is also appropriate for site area 2.

Site area 3

B.7.24

The mitigation outlined for site area 1 is also appropriate for site area 3.

Assessment of mitigated options

B.7.25 The RAG ratings for each site area in a mitigated scenario are detailed in Table B.51.

Table B.51: Air quality – mitigated RAG evaluation for scenarios

Site area	Construction	Operational		
	Evaluation	Mitigated RAG rating	Evaluation	Mitigated RAG rating
Site 1 – Option A	<p>Existing baseline conditions do not exceed the national air quality objectives.</p> <p>Receptors are located within 350m of the site or 200m of affected roads.</p> <p>Dust deposition effects at closest receptors to site and pipeline corridors will be negated with appropriate dust control measures.</p> <p>Construction site traffic may impact upon the air quality within the A14 AQMA, potentially causing significant effects at receptors along the A14. Further assessment is required to determine the likely impacts upon air quality and mitigation recommended if significant effects identified. Mitigation is anticipated to reduce the likely impacts to negligible.</p>	Green	<p>Existing baseline conditions do not exceed the national air quality objectives.</p> <p>Receptors are located within 350m of the site or 200m of affected roads.</p> <p>Operational traffic may impact upon the air quality on local roads and within the A14 AQMA, potentially causing significant effects at receptors close to affected roads. Further assessment is required to determine the likely impacts upon air quality and mitigation recommended if significant effects identified. Mitigation is anticipated to reduce the likely impacts to negligible.</p>	Green
Site 1 – Option B	As with Site 1 Option A.	Green	As with Site 1 Option A.	Green
Site 2 – Option A	<p>Existing baseline conditions do not exceed the national air quality objectives.</p> <p>Receptors are located within 350m of the site or 200m of affected roads.</p> <p>Potential for dust deposition effects at closest receptors to site and pipeline corridors.</p> <p>Construction site traffic may impact upon the air quality within the A14 AQMA, potentially causing significant effects at receptors along the A14. Further assessment is required to determine the likely impacts upon air quality and mitigation recommended if significant effects identified. Mitigation is anticipated to reduce the likely impacts to negligible.</p>	Green	<p>Existing baseline conditions do not exceed the national air quality objectives.</p> <p>Receptors are located within 350m of the site or 200m of affected roads.</p> <p>Operational traffic may impact upon the air quality on local roads and within the A14 AQMA, potentially causing significant effects at receptors close to affected roads. Further assessment is required to determine the likely impacts upon air quality and mitigation recommended if significant effects identified. Mitigation is anticipated to reduce the likely impacts to negligible.</p>	Green
Site 2 – Option B	As with Site 1 Option A.	Green	As with Site 2 Option A.	Green

Site area	Construction	Operational		
	Evaluation	Mitigated RAG rating	Evaluation	Mitigated RAG rating
Site 3 – Option A	<p>Existing baseline conditions do not exceed the national air quality objectives.</p> <p>Receptors are located within 350m of the site or 200m of affected roads.</p> <p>Potential for dust deposition effects at closest receptors to site and pipeline corridors.</p> <p>Construction site traffic may impact upon the air quality within the A14 AQMA, potentially causing significant effects at receptors along the A14. Further assessment is required to determine the likely impacts upon air quality and mitigation recommended if significant effects identified. Mitigation is anticipated to reduce the likely impacts to negligible.</p>	Green	<p>Existing baseline conditions do not exceed the national air quality objectives.</p> <p>Receptors are located within 350m of the site or 200m of affected roads.</p> <p>Operational traffic may impact upon the air quality on local roads and within the A14 AQMA, potentially causing significant effects at receptors close to affected roads. Further assessment is required to determine the likely impacts upon air quality and mitigation recommended if significant effects identified. Mitigation is anticipated to reduce the likely impacts to negligible.</p>	Green

Incorporating feedback

B.7.26 Phase one non-statutory consultation was held in order to share the proposals for relocating the WWTP with the public and stakeholders. This section provides a summary of the feedback received from the public in relation to air quality and odour and how the concerns, issues and opportunities raised have been considered within the assessment criteria for Stage 4 final site selection.

Table B.52: Air quality and odour feedback

Sub-Theme	Site (if specific)	Feedback Summary	Response
		Odour was the most frequently raised concern, primarily regarding anticipated impacts to nearby residential communities.	Comments provided below
		Several comments referred to current odour pollution from the existing site and concerns of this being exacerbated.	The odour assessment undertaken identified minor adverse impacts only even using 'worst-case' summer odour emission rates from the existing site and found only minor adverse effects at nearby receptor locations.
		Some feedback suggested a new site should be proposed further north in a more rural location.	The study area used in site selection was determined during the initial options appraisal in which the potential to relocate the WWTP outside of the drainage catchment area to the north was also considered. This option was not deemed appropriate due to the study area that was deemed appropriate for the relocation of Cambridge WWTP. There were several potential site areas identified in the north of the study area.
Odour and Air Quality	General	Some comments also challenged the modelling / assessment of odour impacts presented in the site selection work. For example, it was remarked that a 400m buffer zone is not proportionate to the magnitude of the proposed plant and suggested a buffer zone of 1000m be used instead. Another suggestion was that the 400m buffer zone should also be applied to academic facilities.	The odour assessment has found that at the closest receptors there is only a slight adverse impact without mitigation at site area 1. Further away from the site, there would be less of an impact. Mitigation would reduce this impact further.
		As well as odour, broader concerns about the health and wellbeing impacts on local residents were also commonly noted. This included in relation to local amenity and traffic and transport impacts on noise and air quality particularly during peak hours, such as on non-motorised users (NMUs) and PRowers, and around sensitive receptors such as schools and nurseries especially.	The results of the air quality, odour, noise and traffic assessments have been utilised to assess the potential impacts on local amenity for all of the proposed sites and the associated, the assessments can be found in the community sections of this report. Peak traffic is not a major concern for air quality unless there is potential for the hourly NO ₂ national objective to be breached. This would generally occur in locations with a high existing baseline, such as near roads in central London, and therefore is unlikely in rural Cambridgeshire.

Sub-Theme	Site (if specific)	Feedback Summary	Response
		A significant number of concerns were raised regarding potential odour impacts from Site 1 to nearby communities and amenities (such as Landbeach, Waterbeach, Milton, Histon, Impington and Orchard Park). It was widely considered that these impacts would be significant given distance and wind directions. Socio-economic concerns were also raised about the potential impacts of odour on business and employment.	The odour assessment undertaken identified minor adverse impacts only even using 'worst-case' summer odour emission rates in an unmitigated scenario, but also recommends that <i>"the odour assessment, including odour modelling, be redone based on the final process design, site layout and plant elevations during detailed design stage, to confirm the odour mitigation measures required to match the chosen process configuration"</i> .
	Site area 1	Several comments promoted the importance of good air quality for health and wellbeing with concern that this would be compromised at nearby schools, hospital, and open / recreational spaces (such as the Mere Way, Impington Village College, Milton Maze and The Wendy House Nursery), as well more historically sensitive sites such as Milton Cemetery and the Tithe Barn.	See above comment.
		Concern was also raised regarding the danger of soil contaminants from previous landfill site becoming air-borne/ water-borne during excavations.	A ground investigation (GI), including groundwater monitoring, will be used to investigate ground conditions. Following GI, a conceptual site model will be produced to ensure that risks from landfill are low. Potential impacts will further be mitigated through dust control and site management measures implemented through a CEMP.
		However, other comments suggested site 1 would result in lower relative odour impacts, given prevailing wind directions and its proximity to the existing recycling centre site (off Butt Lane), the current CWWTP, and busy roads (A14 and A10).	The odour assessment identified that site area 3 is likely to have the least impact on receptors as there are no receptors close by.
		A significant number of the comments relating to Site 1, such as the proximity to residential areas, were also considered to apply to Site 2.	See above comment.
	Site area 2	It was commented that Site 2 is very close to an Air Quality Management Area around the A14, and that any further reduction to air quality in the needs to be avoided and could be illegal.	Traffic from all of the proposed site areas will travel within the A14 AQMA, which has been considered in the air quality assessment. However, it is noted that traffic travelling within the AQMA will not be dissimilar to current movements from the existing WWTP site.
	Site area 3	A number of respondents commented that Site 3 would be the most appropriate from an odour perspective, as the areas downwind of the site are considered to be less densely populated.	This feedback reflects the conclusion of odour assessment that there would be no sensitive receptors expected to experience odour nuisance
Construction Impacts	General	Concern was raised regarding the potential air pollution caused by the clearing of the existing CWWTP site, and the construction of a new a site and necessary access infrastructure.	These potential impacts will be mitigated through dust control and site management measures implemented through a CEMP.
Climate change	General	Several comments included concern that odour impacts may become more prevalent in higher temperatures.	The odour assessment undertaken identified negligible impacts at nearby receptors (IAQM guidance ratings), using summer odour emission rates (worst case) from the exiting site. This was used all year long, rather than applying reductions for spring, autumn and winter. Furthermore, we have

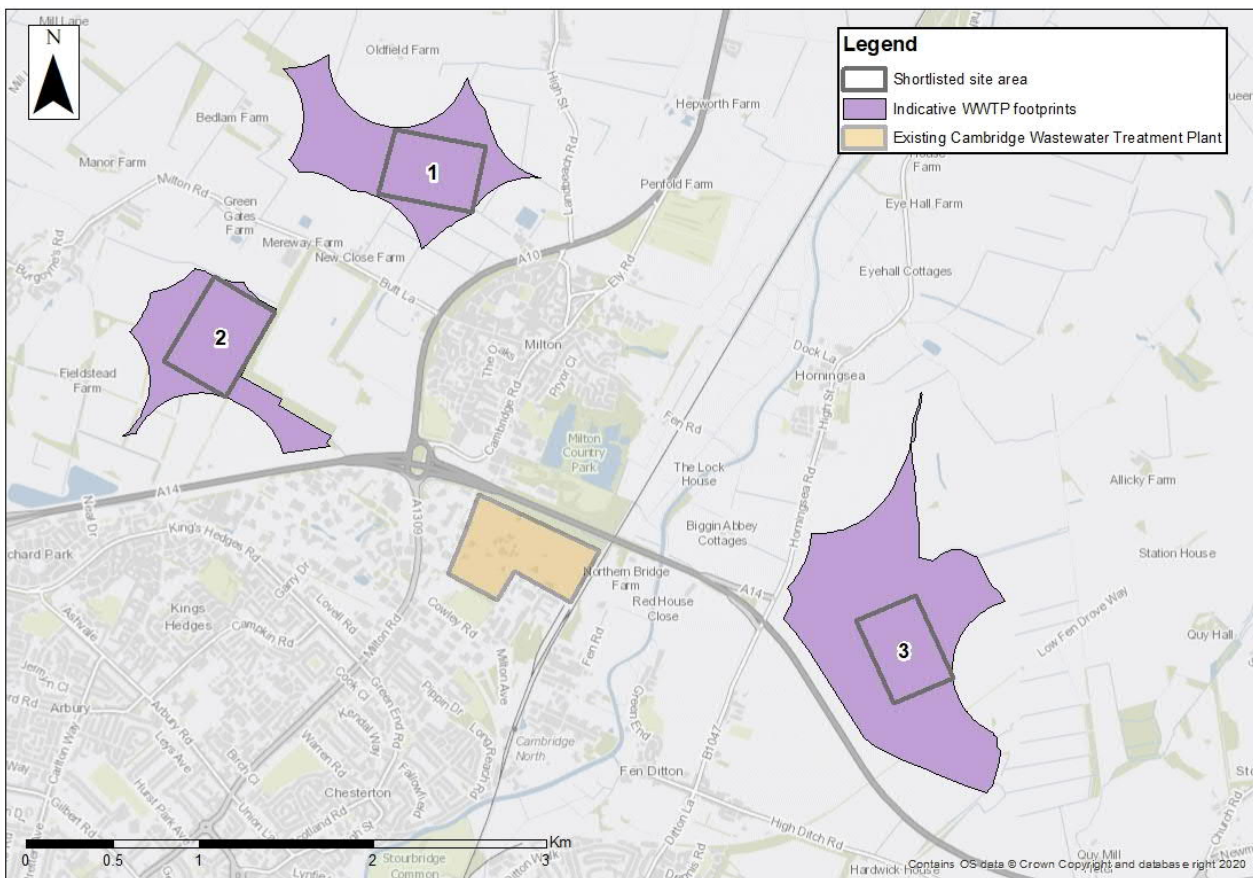
Sub-Theme	Site (if specific)	Feedback Summary	Response
			used best practice odour modelling techniques, which requires screening several years' MET data and choosing the worst year of the data set to carry out the odour modelling exercise. These worst case viewpoints encompasses both the potential for longer summers and changes in weather patterns.

B.8 Odour

Assessment methodology

B.8.1 This criterion was devised to differentiate between the site areas in terms of the potential odour impacts from a new WWTP. This was undertaken using the results of a preliminary odour study (See Appendix M), which estimated odour emissions from a WWTP located at an indicative footprint within each site area as shown on Figure B.1. The results of the study were used to identify the potential odour impacts on receptors in close proximity to the proposed site areas.

Figure B.1: Indicative WWTP footprints



Source: Mott MacDonald

B.8.2 The preliminary study established a baseline scenario using an indicative WWTP layout utilising similar technology to the existing WWTP but with the following changes:

- Covering and venting of air from the terminal pumping station (TPS) and inlet works through odour control units (OCUs). This will reduce the odour impact associated with potentially receiving sewage out of the network of unpredictable quality.
- Improvements in the design configuration of the sludge treatment centre (STC) with all tanks in the STC being covered and either vented to OCU or connected to the biogas collection and utilisation system. This will reduce the odour impact of the STC.

- The proposed site will be more compact in nature than the existing WWTP site: approximately 22 hectares for the new, compared to approximately 48 hectares for the existing. The existing site includes several areas planted with trees around the site, which provides natural odour dispersion. It is noted that landscape mitigation for the new WWTP will include woodland planting around the site boundary to provide long term screening of views from nearby visual receptors, which will also assist with natural odour dispersion.

- B.8.3 Conservative odour emissions based on the existing WWTP and local meteorological information (prevailing wind directions and speeds) were then used to estimate the dispersion of odour from a new WWTP on each site area.
- B.8.4 The baseline scenario using odour emissions from the existing WWTP and changes as described in B.8.2, is considered to represent a reasonable, yet worst case for an unmitigated scenario of potential odour impacts from the new WWTP.
- B.8.5 In order to define the potential odour impact of a new WWTP at each of the proposed site areas, the receptors that could potentially be impacted by odour require identification.
- B.8.6 The Institute of Air Quality Management’s (IAQM) guidance for the assessment of odour for planning (Institute of Air Quality Management, 2018) establishes the level of sensitivity of receptors to odour impacts. This classification system was adopted in the preliminary study to assess the potential odour impacts on receptors in proximity to the site areas, due to operation of a new WWTP in an unmitigated scenario.
- B.8.7 It is noted that the IAQM guidance (Institute of Air Quality Management, 2018) classifies PRowS and farmland as low sensitivity receptors, commercial properties as medium sensitivity receptors and residential dwellings as high sensitivity receptors. These types of receptors have, therefore, been considered as such in the assessment of potential odour impacts.
- B.8.8 The RAG definitions for the odour assessment are provided in Table B.53.

Table B.53: Odour assessment – RAG definitions

Green	Amber	Red
Negligible ⁷² odour impacts for all receptors in accordance with the Institute of Air Quality Management’s (IAQM) guidance for the assessment of odour for planning	Slight odour impacts for one or more receptors in accordance with the Institute of Air Quality Management’s (IAQM) guidance for the assessment of odour for planning	Moderate or substantial odour impacts for one or more receptors in accordance with the Institute of Air Quality Management’s (IAQM) guidance for the assessment of odour for planning

- B.8.9 In the event that the unmitigated scenario indicates that receptors could be adversely impacted by a new WWTP, additional measures would be factored into the cost of the scheme in a mitigated scenario to minimise potential odour impacts.
- B.8.10 Additional control measures may be required to reduce the potential odour impact at the impacted receptor(s) to negligible in accordance with the IAQM’s guidance for the assessment of odour for planning (Institute of Air Quality Management, 2018). It is noted that further odour assessment, including odour modelling, will be carried out based on the final process design, site layout and plant elevations during detailed design stage, to confirm the odour mitigation measures required to match the chosen process configuration.

⁷² Negligible impact is defined as an odour exposure level of <1.5 C₉₈ OUE/m³ for high sensitivity receptors (residential properties), see Appendix M for further details and odour exposure levels for lower sensitivity receptors

Assessment of unmitigated options

B.8.11 The results of the indicative unmitigated odour scenario from the site areas were compared with the location of the receptors. This comparison indicated that that some receptors in proximity to the site areas could experience odour impacts in an unmitigated scenario.

B.8.12 The RAG ratings for each site area in an unmitigated scenario are detailed in Table B.54.

Table B.54: Odour – unmitigated RAG evaluation for scenarios

Site area	Evaluation	Unmitigated RAG rating
Site 1 – Option A	Potential for odour impacts at housing on the west side of the High Street in Landbeach and housing to the south of Akeman Street in Landbeach, identified in odour assessment. A section of Mere Way to the west of site area 1 and farmland surrounding the indicative WWTP footprint are also located within the area that could experience odour nuisance. However, the level of impact on these receptors is considered to be negligible in the odour assessment.	Slight impact
Site 1 – Option B	As with Site 1 Option A.	Slight impact
Site 2 – Option A	Odour assessment indicated that commercial properties at Evolution Business Park on Butt Lane, the section of Mere Way east of site area 2 and farmland surrounding the indicative WWTP footprint are located within the area that could experience odour impacts. However, due to the lower sensitivity of these receptors, according to the IAQM guidance, the level of impact is considered to be negligible in the odour assessment. No other receptors at risk of odour impact identified in the vicinity of the site. Minimal potential for odour impacts.	Negligible impact
Site 2 – Option B	As with Site 2 Option A.	Negligible impact
Site 3 – Option A	A section of the Low Fen Drove Way public byway and farmland surrounding the indicative WWTP footprint are also located within the area that could experience odour impacts. However, due to the lower sensitivity of these receptors, according to the IAQM guidance, the level of impact is considered to be negligible in the odour assessment. No other receptors at risk of odour impact identified in the vicinity of the site. Minimal potential for odour impacts.	Negligible impact

B.8.13 The results above indicate that there is some differentiation between the site areas in an unmitigated scenario. The differentiation is mainly due to the location of receptors in relation to the prevailing wind direction from the site areas.

B.8.14 For site area 1 there are some receptors located close enough downwind that may be affected slightly in an unmitigated scenario. In contrast, for site areas 2 and 3 there are no receptors located in close proximity to the indicative WWTP location for which an odour impact beyond 'negligible' is predicted for the operation of a WWTP in an unmitigated scenario.

B.8.15 It is noted that although there are other receptors at similar distances from the site areas in other directions, such as other residential areas and commercial properties, the results of the preliminary study indicated that they are not within areas that would likely experience odour impacts.

Mitigation identification

Site area 1

B.8.16 The preliminary odour study identified that some receptors could experience odour impacts in an unmitigated scenario. Therefore, additional odour control measures would be required to further reduce the odour emissions beyond the boundary of the WWTP such as installing covers on additional process units, orientation and design of the WWTP such that process units would be further away from receptors.

Site area 2

B.8.17 The preliminary odour study identified that there are no receptors likely to experience odour impacts in an unmitigated scenario (negligible impacts in accordance with the IAQM guidance). Therefore, no additional odour control measures would be required.

Site area 3

B.8.18 The preliminary odour study identified that there are no receptors likely to experience odour impacts in an unmitigated scenario (negligible impacts in accordance with the IAQM guidance). Therefore, no additional odour control measures would be required.

Assessment of mitigated options

B.8.19 The RAG ratings for each site area in a mitigated scenario are detailed in Table B.55.

Table B.55: Odour – mitigated RAG evaluation for scenarios

Site area	Evaluation	Mitigated RAG rating
Site 1 – Option A	<p>Potential for odour impacts at housing on the west side of the High Street in Landbeach and housing to the south of Akeman Street in Landbeach, identified in odour assessment.</p> <p>Mere Way and farm land also within area that could experience odour impacts. However, due to the lower sensitivity of these receptors the level of impact is considered to be negligible in both unmitigated and mitigated scenarios.</p> <p>Proposed mitigation comprises a combination of installing covers on additional process units, orientation and design of the WWTP such that process units would be further away from receptors. Mitigation is anticipated to reduce the likelihood of odour impacts to negligible for all receptors.</p>	Negligible impact
Site 1 – Option B	As with Site 1 Option A.	Negligible impact
Site 2 – Option A	<p>Odour assessment indicated that commercial properties at Evolution Business Park on Butt Lane, the section of Mere Way east of site area 2 and farm land surrounding the indicative WWTP footprint are located within the area that could experience odour impacts. However, due to the lower sensitivity of these receptors, according to the IAQM guidance, the level of impact is considered to be negligible in both unmitigated and mitigated scenarios.</p> <p>No other receptors at risk of odour impact identified in the vicinity of the site. Minimal potential for odour impacts. Therefore, no additional odour mitigation is required for site area 2.</p>	Negligible impact

Site area	Evaluation	Mitigated RAG rating
Site 2 – Option B	As with Site 2 Option A.	Negligible impact
Site 3 – Option A	<p>A section of the Low Fen Drove Way public byway and farm land surrounding the indicative WWTP footprint are located within the area that could experience odour impacts. However, due to the lower sensitivity of these receptors, according to the IAQM guidance, the level of impact is considered to be negligible in both unmitigated and mitigated scenarios.</p> <p>No other receptors at risk of odour impact identified in the vicinity of the site. Minimal potential for odour impacts. Therefore, no additional odour mitigation is required for site area 3.</p>	Negligible impact

Incorporating feedback

B.8.20

Phase one non-statutory consultation was held in order to share the proposals for relocating the WWTP with the public and stakeholders. A summary of the feedback received from the public in relation to air quality and odour and how the concerns, issues and opportunities raised have been considered within the assessment criteria for Stage 4 final site selection is provide in the Appendix B.7.

C. Community assessment

C.1.1 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 diversions of the existing water transfer network, the access roads and potential location of shafts.

C.1.2 The key receptors that were considered are as follows:

- Private property and housing;
- Community land and assets;
- Businesses, premises and land (including agricultural land); and
- Areas of open space and recreation, including walking and cycling routes.

C.1.3 There are three community criteria which have been used for the community assessment:

- Land use, property and business viability;
- Amenity;
- Traffic

C.1.4 These criteria are explained in further detail below. Each of these criteria have been given a RAG rating for each of the sites during both construction and operation.

C.2 Land use, property and business viability

Assessment methodology

C.2.1 The following factors have been considered to assess the potential impact on property and business viability:

- 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.

C.2.2 The RAG definitions developed to assess the impact on property and business viability from the construction and operation of the WWTP are shown in Table C.56.

Table C.56: Land use, property and business viability assessments – RAG definitions

Green	Amber	Red
<ul style="list-style-type: none"> ● Pipeline routes largely avoid residential areas/communities; tunnel shafts outside residential areas; no or minor disruption from construction of new access road; minor or no impact from site construction. ● The temporary or permanent acquisition of land, property or business does not directly affect the viability of the property or business as there is only very minor loss or alteration to one or more key characteristics or features. ● Access to property, business or community resources is maintained throughout construction and operation and any changes in access do not impact use, operation, or enjoyment of the resource. ● The potential business impacts are unlikely to impact employment. 	<ul style="list-style-type: none"> ● Pipeline routes partially through residential areas/communities; or one or more tunnel shafts within/adjacent to residential areas/communities; or, moderate disruption from construction of new access road; or, moderate impact from site construction. ● The temporary or permanent acquisition of land, property or business, may partially compromise the viability of the property or business as there is partial loss of/damage to key features or elements. ● Access to property, business or community resources may be constrained or altered during construction, and changes may partially impede use, operation, or enjoyment of the resource. ● The potential business impacts may impact employment, but this is not to a substantial proportion of the existing employees. 	<ul style="list-style-type: none"> ● Pipeline routes largely through residential areas/communities or; all tunnel shafts within/adjacent to residential areas/communities or; major disruption from construction of new access road or; significant impact from site construction. ● The temporary or permanent acquisition of property, land or premises, or change in access, compromises the viability of the land, property or business as there is full loss of key features or elements. ● Access to property, business or community resources may be prevented during construction, and changes may substantially impact use, operation, or enjoyment of the resource. ● The potential business impacts are likely to impact employment which will affect a substantial proportion of the existing employees.

Assessment of unmitigated options

Site area 1 – Construction

- C.2.3 Agricultural land is required to construct the water treatment plant as well as the ancillary infrastructure. As land will be required from the construction stage, permanent land requirements are included within the assessment of construction, rather than the operational impacts. This loss of land is likely to have both permanent and temporary impacts on business operations for the existing landowners.
- C.2.4 It is understood that land which is currently used as a fruit farm will be acquired to develop the WWTP at site area 1 and construct the treated effluent tunnel/pipeline corridor, waste water transfer tunnel corridor and site access area. The permanent acquisition of the required land has the potential to impact the viability of the fruit farm business, including potentially extinguishing it, as the land required is crucial for the operation of the business. The fruit farm is

also understood to employ seasonal workers, and these jobs would no longer be available as a result of the fruit farm business no longer being viable.

- C.2.5 Milton Maize Maze is located to the south east of site area 1 and is accessed either directly from the A10 or from Landbeach Road. During construction there is a potential for a reduction in patron's use and enjoyment of the recreational activities provided by the business from a reduction in amenity from a combination of potential landscape and visual, air quality and noise effects. Access to the business will not be impacted. The potential impacts on recreational activities provided by Milton Maize Maze may affect popularity and potentially reduce patronage.
- C.2.6 The construction of the Waterbeach transfer pipeline requires the temporary use of agricultural land between site area 1 and Waterbeach. The proposed route of the transfer pipeline goes through agricultural land for the majority of the length of the pipeline. There will be a temporary impact on ability to use the impacted areas of land as open cut trenching will be used for the construction for the majority of the pipeline. To the north of Waterbeach, the proposed route passes through disused army barracks which are understood to be earmarked for development. The construction of diversions of the existing waste water transfer network will also require the temporary use of agricultural land between site area 1 and the A14.
- C.2.7 The construction of the waste water transfer network and the treated effluent tunnel/pipeline corridor currently includes a portion of the Milton Park & Ride. This may have a temporary impact on the use this area of the park and ride. As the construction work includes a portion of the site, and the majority of the construction works are proposed to be tunnelled, it is not envisaged that the disruption will prevent use of the entire facility.
- C.2.8 For Option A, the construction of the treated effluent and stormwater discharge tunnel/pipeline includes a portion of the Milton Country Park. This may have a temporary impact on the use of this portion of the park, which is between Cambridge Road and the A14. For Option B, the construction of the treated effluent and stormwater discharge tunnel/pipeline includes a portion land currently used by Milton Park Footgolf, the Milton Maize Maze, Milton Cemetery and allotments located between Ely Road and the A10. Depending on the final location of the tunnel/pipeline there is the potential for a temporary impact on these receptors during construction.
- C.2.9 Mere Way, which is a PRow, provides access from south of the A14 to Oldfield Farm. The area required for site area 1 to construct the water treatment plant and the diversions of the existing waste water transfer network includes a portion of this PRow. This is likely to temporarily impact the ability of people use this route to travel north from the community of Kings Hedges.
- C.2.10 The proposed construction activities may disrupt access to businesses in close proximity to site area 1. The construction of the treated effluent transfer tunnel/pipeline, diversions of the existing waste water transfer network, site access road as well as other construction activities are likely to temporarily disrupt use of Butt Lane, impacting the way in which people access businesses located on the road, including (but not limited to) Milton Recycling Centre, a Fruit Shop, CMR Surgical Headquarters and a logistics company.
- C.2.11 The RAG ratings for site 1 in an unmitigated scenario are detailed in Table C.57.

Table C.57: Land take, property and business viability – unmitigated RAG evaluation during construction for Site 1 Option A and Option B

Site area	Evaluation	Unmitigated RAG rating
Site area 1 – Option A	<p>There is the potential for both temporary and permanent impacts on the use and viability of agricultural land. The construction of the WWTP is likely to compromise the viability of fruit farm as the area required for permanent land take is essential to the operation of the business. There is also likely to be a loss of employees affecting a substantial proportion of existing employees as the business is unlikely to be able to operate.</p> <p>There is the potential for impact on recreational activities provided by Milton Maize Maze, which may affect popularity and potentially reduce patronage. Businesses on Butt Lane are likely to experience a temporary disruption to access. This is unlikely to affect the viability of these businesses as due to their existing location; people need to make a specific trip, mainly by car, to access these businesses. People are likely to continue to make these trips, despite the potential for a temporary reduction in access. There is likely to be a temporary disruption in use of Milton Park and Ride, Mere Way and Milton Country Park. Only a small portion of these receptors are likely to be impacted.</p>	Red
Site area 1 – Option B	<p>Impacts are the same as above, except there is the potential for disruption to Milton Park Footgolf, the Milton Maize Maze, Milton Cemetery and the allotments located between Ely Road and the A10, rather than Milton Country Park. As the RAG rating is already red, this has not been changed for Option B.</p>	Red

Site area 1 – Operation

- C.2.12 Temporary and permanent land requirements were considered as part of the construction impacts. Since the use of the permanent land take starts from the construction period and have been reported during this period, these impacts are not further considered as part of the operational assessment.
- C.2.13 As mentioned above, Milton Maize Maze is located to the south-east of site area 1 and is accessed either directly from the A10 or from Landbeach Road. During operation there is the potential for the WWTP to be visible from parts of the site, which will change the surrounding visual character, and could impact on the perception of attractiveness of the recreational activities provided by the business.
- C.2.14 Although there will be increased traffic along Butt Lane where there are existing businesses, access to these businesses will be maintained. A separate entrance will be created for the WWTP off Butt Lane. As such, there is not envisaged to be an impact on the viability of these businesses or an impact on employment.

Table C.58: Land take, property and business viability – unmitigated RAG evaluation during operation for Site 1 Option A and Option B

Site area	Evaluation	Unmitigated RAG rating
Site area 1 – Option A	<p>No additional land is required temporarily or permanently during operation and no limitations to access will be required during operation.</p> <p>Although there will be increased traffic along Butt Lane, where there are existing businesses, there is no change in access to these businesses. There is not envisaged to be an impact on the viability of these businesses or an impact on employment.</p> <p>It is acknowledged that during operation there is the potential for an impact on the perception of attractiveness of the recreational activities provided by Milton Maize Maze. However, this is considered to only be a very minor loss or alteration to one of the features of the maze which is unlikely to directly affect the viability of the business.</p>	Green
Site area 1 – Option B	<p>Impacts are the same as above as presence of a discharge point is not confirmed and not likely to have a substantial impact on business receptors.</p>	Green

Site area 2 – Construction

- C.2.15 Similar to site area 1, agricultural land is required to construct the WWTP as well as the ancillary infrastructure. As land will be required from the construction stage, permanent land requirements are included within the assessment of construction, rather than the operational impacts. This loss of land is likely to have both permanent and temporary impacts on business operations for the existing owners.
- C.2.16 It is understood that land required to construct the WWTP is part of large land holdings, so although there may be a partial impact on the viability of the property, there will not be a loss of key features or elements which will make the whole business unviable.
- C.2.17 Similar to site area 1, the construction of the Waterbeach transfer pipeline requires the temporary use of agricultural land between site area 2 and Waterbeach and follows the same route. The key difference between site area 1 and site area 2 is that more temporary land will be required for the transfer pipeline as site area 2 is located further to the south. However, the impact of this difference, when comparing site area 1 and 2 is considered to not be significant.
- C.2.18 Similar to site area 1, there is likely to be a temporary impact on Milton Park and Ride, Milton Country Park and Mere Way.
- C.2.19 The construction of the treated effluent transfer tunnel/pipeline, diversions of the existing wastewater transfer network and construction of the site access road as well as other construction activities are likely to temporarily disrupt use of Butt Lane. The proposed construction activities associated with the site area 2 may disrupt access to businesses in close proximity to the site on Butt Lane. These businesses are the same as those described above in relation to site area 1 as the two sites are close in proximity.

Table C.59: Land take, property and business viability – unmitigated RAG evaluation during construction for site area 2 Option A and Option B.

Site area	Evaluation	Unmitigated RAG rating
Site area 2 – Option A	<p>There is the potential for both temporary and permanent impacts on the use and viability of agricultural land. However, based on current information, the permanent land requirements are part of larger holdings, so the permanent land acquisition is only like to partially compromise the viability of the business. Current potential employment impacts are not known.</p> <p>Businesses on Butt Lane are likely to experience a reduction temporary disruption to access. This is unlikely to affect the viability of these businesses as due to their existing location; people need to make a specific trip, mainly by car, to access these businesses. People are likely to continue to make these trips, despite the potential for a temporary reduction in access. There is likely to be a temporary disruption in use of Milton Park and Ride, Mere Way and Milton Country Park. Only a small portion of these receptors are likely to be impacted.</p>	Amber
Site area 2 – Option B	<p>Impacts are the same as for Option A. Except for the following:</p> <p>There is the potential for disruption to Milton Park Footgolf, the Milton Maize Maze, Milton Cemetery and the allotments located between Ely Road and the A10, rather than Milton Country Park.</p>	Amber

Site area 2 – Operation

- C.2.20 Temporary and permanent land requirements were considered as part of the construction impacts. Since the use of the permanent land take starts from the construction period and have been reported during this period, these impacts are not further considered as part of the operational assessment.
- C.2.21 Similar to site area 1, there will be increased traffic along Butt Lane where there are existing businesses, access to these businesses will be maintained. A separate entrance will be created for the water treatment plant off Butt Lane. As such, there is not envisaged to be an impact on the viability of these businesses or an impact on employment.

Table C.60: Land take, property and business viability – unmitigated RAG evaluation during operation for site area 2 Option A and Option B

Site area	Evaluation	Unmitigated RAG rating
Site area 2 – Option A	<p>No additional land is required temporarily or permanently during operation and no limitations to access will be required during operation.</p> <p>Although there will be increased traffic along Butt Lane, where there are existing businesses, there is no change in access. As such, there is not envisaged to be an impact on the viability of these businesses or an impact on employment.</p>	Green
Site area 2 – Option B	<p>Impacts are the same as above as the presence of a discharge point is not confirmed and not likely to have a substantial impact on residential, business and community receptors.</p>	Green

Site area 3 – Construction

- C.2.22 Similar to site areas 1 and 2, agricultural land is required to construct the WWTP as well as the ancillary infrastructure. As land will be required from the construction stage, permanent land requirements are included within the construction impacts rather than the operational impacts. This loss of land is likely to have both permanent and temporary impacts businesses operations for the existing owners. The areas required for ancillary infrastructure are smaller than those required for site areas 1 and 2.
- C.2.23 It is understood that the land required to construct the WWTP as well as the ancillary infrastructure is part of large land holdings, so although there may be a partial impact on the viability of the property, there will not be a loss of key features or elements which would make the whole business unviable.
- C.2.24 There will be a temporary impact on access to PRowS in close proximity to the site. In particular, Low Fen Drove Way byway which is located to the east of site 3 and follows the existing routing of the unpaved dirt track section of Low Fen Drove Way.
- C.2.25 The closest business receptors are located to the west of the intersection between the A1303 and High Ditch Road and on the eastern edge of Horningsea. Although there will be increased traffic from construction activity, access to these properties will be maintained so there is not envisaged to be an impact on the operation of the business.
- C.2.26 Similar to site areas 1 and 2, the construction of the Waterbeach transfer pipeline requires the temporary use of agricultural land between site area 3 and Waterbeach. The key difference between site area 3 and site areas 1 and 2, is that is it the shortest route and therefore less temporary land will be required for the transfer pipeline. However, the impact of this difference, when comparing site area 3 with 1 and 2 is considered to not be significant.
- C.2.27 The construction of the treated effluent transfer if constructed as a pipeline would have a temporary impact on a relatively small area of agricultural land between site area 3 and the River Cam.

Table C.61: Land take, property and business viability – unmitigated RAG evaluation during construction for site area 3

Site area	Evaluation	Unmitigated RAG rating
Site area 3	Similar to site area 2, there is the potential for both temporary and permanent impacts on the use and viability of agricultural land. However, based on current information, the permanent land requirements are part of larger holdings, so the acquisition of land is only likely to partially compromise the viability of the business. There will be temporary disruption to access the PRoW on a portion of Low Fen Drove Way. Current potential employment impacts are not known. No disruptions to businesses are envisaged.	Amber

Site area 3 – Operation

- C.2.28 Temporary and permanent land requirements were considered as part of the construction impacts. Since the use of the permanent land take starts from the construction period and have been reported during this period, these impacts are not further considered as part of the operational assessment.
- C.2.29 The operation of the WWTP at site area 3 will not impact the operation of businesses as there are none in close proximity to the site. In the unmitigated scenario, access to site area 3 would be provided using a new priority T-junction off Horningsea Road. Although there will be increased traffic along Horningsea Road, this will not compromise access to businesses.

Table C.62: Land take, property and business viability – unmitigated RAG evaluation during operation for site area 3

Site area	Evaluation	Unmitigated RAG rating
Site area 3	No additional land is required temporarily or permanently during operation and no limitations to access will be required during operation. Although there will be increased traffic along Horningsea Road, there is no change in access to businesses as a result of operation of WWTP at site area 3. Therefore, there is not envisaged to be an impact on the viability businesses or an impact on employment.	Green

Mitigation identification

- C.2.30 The following mitigation measures would be implemented to manage effects of land take on property and business viability.
 - Temporary and permanent land take of agricultural land during construction will be informed by the following principles:
 - Minimise land take as far as possible
 - Take into consideration the existing use of the land, to reduce potential impacts on farm viability by implementing measures such as keeping close to field boundaries and working with land owners and tenants to gain access so that existing operational planning can take into account the construction requirements.
 - Return the temporary land take to its former condition prior to its use for construction activities.

- Access to properties, including businesses, will be maintained at all times during construction and the relevant management measures included within the Construction Environmental Management Plan.

Assessment of mitigated options

C.2.31 Based on the mitigation outlined above, Table C.63 re-evaluates the impacts on the community for each of the options during the construction and operational phases.

Table C.63: Land take, property and business viability RAG evaluation (with mitigation)

Site area	Evaluation	Unmitigated RAG rating	Mitigated RAG rating
Construction – site area 1			
Site area 1 – Option A	The construction of the WWTP is likely to compromise the viability of the fruit farm as the permanent land take is essential to the operation of the business. There is also likely to be a loss of employment affecting a substantial proportion of existing employees as the business is unlikely to be able to operate. As an alternative site is not part of the package of mitigation, the impacts from the business no longer being viable, and the potential loss of employment, have not been mitigated. Therefore, the RAG rating between the mitigated and unmitigated options stay the same.	Red	Red
Site area 1 – Option B	The main difference in the construction effects of the treated effluent pipeline for Option B. However, there will still be an impact on the viability of the fruit farm and loss of employment. Therefore, the RAG rating between the mitigated and unmitigated options stay the same.	Red	Red
Operation - site area 1			
Site area 1 – Option A	No additional land is required temporarily or permanently during operation and no limitations to access will be required during operation. Although there will be increased traffic along Butt Lane, where there are existing businesses, access to these businesses will be maintained. As such, there is not envisaged to be an impact on the viability of these businesses or an impact on employment. The RAG rating between the mitigated and unmitigated options stay the same.	Green	Green
Site area 1 – Option B	Impacts are the same as above as presence of a discharge point is not confirmed and not likely to have a substantial impact on business receptors. The RAG rating between the mitigated and unmitigated options stay the same.	Green	Green
Construction – site area 2			
Site area 2 – Option A	Mitigation required temporary land take to be minimised as much as possible and will reduce disruption to the operation of existing businesses. As the full extent of the land take on the operation of the land is not yet known, there is the potential for a partial impact on the viability of the business, even with mitigation applied. Therefore, the RAG rating between the mitigated and unmitigated options has stayed the same.	Amber	Amber

Site area	Evaluation	Unmitigated RAG rating	Mitigated RAG rating
	There are number of businesses on Butt Lane which are likely to experience temporary impacts as a result of construction activity from disruption to access. This will be reduced with adherence to mitigation measures associated with traffic management.		
Site area 2 – Option B	The main difference in the construction effects of the treated effluent pipeline for Option B, compared to Option A, the potential impacts on more receptors around the north of Milton and Horningsea. Mitigation requires this to be minimised and to avoid businesses and recreational facilities, such as Cambridge Foot Golf Centre. Therefore, the RAG rating has been downgraded from Red to Amber.	Red	Amber
Operation - site area 2			
Site area 1 – Option A	No additional land is required temporarily or permanently during operation and no limitations to access will be required during operation. Although there will be increased traffic along Butt Lane, where there are existing businesses, access to these businesses will be maintained. As such, there is not envisaged to be an impact on the viability of these businesses or an impact on employment. The RAG rating between the mitigated and unmitigated options stay the same.	Green	Green
Site area 1 – Option B	Impacts are the same as above as presence of a discharge point is not confirmed and not likely to have a substantial impact on business receptors. The RAG rating between the mitigated and unmitigated options stay the same.	Green	Green
Construction – site area 3			
Site area 3	As stated within the Access Assessment, safe access will be maintained to the nearby PRoW via Horningsea Road and via Low Fen Drove Way, with the exception of a few periods. Mitigation required temporary land take to be minimised as much as possible and will reduce disruption to the operation of existing businesses. As the full extent of the land take on the operation of the land is not yet known, there is the potential for a partial impact on the viability of the business, even with mitigation applied. Therefore, the RAG rating between the mitigated and unmitigated options has stayed the same.	Amber	Amber
Operation – site area 3			
Site area 3	No additional land is required temporarily or permanently during operation and no limitations to access will be required during operation. Although there will be increased traffic along High Ditch Road, there is no change in access to businesses as a result of operation of WTP at site 3. Therefore, there it is not envisaged that there will be an impact on the viability businesses or an impact on employment. The RAG rating between the mitigated and unmitigated options has stayed the same.	Green	Green

Incorporating feedback

C.2.32 Phase one non-statutory consultation was held in order to share the proposals for relocating the WWTP with the public and stakeholders. This section provides a summary of the feedback received from the public in relation to community and how the concerns, issues and opportunities raised have been considered within the assessment criteria for Stage 4 final site selection.

Table C.64: Community feedback

Sub-Theme	Site (if specific)	Feedback Summary	Response
		Comments regarding local amenities often concerned odour impacts detracting from these facilities. Again, it was commented that these impacts may be exacerbated by a prevailing westerly wind.	This is addressed within the odour section. The preliminary odour modelling used in the odour assessment utilised local meteorological information (prevailing wind directions and speeds) to estimate the dispersion of odour from a new WWTP on each site area. The results of the odour assessment have been used within the amenity assessment. An amenity effect reported if there is a combination of at least two effects on a receptor. The potential effects that were taken into consideration were air quality, odour, noise, landscape and visual and traffic.
	General	Concern was also raised regarding potential leakage of waste into the River Cam. This concern is also reported under 'Water Quality and Flood Risk'.	This is addressed within the water quality section. Potential impacts during operation of the scheme, for example due to excessive variations in discharge, or discharge of treated effluent of an unacceptable quality, will be controlled by engineering features, operational practices included in the design and management of the scheme, and by the discharge licence.
		As is to be anticipated, comments received regarding impacts on local amenities have the greatest significance for both community, as well as environmental criteria as part of Stage 4 site selection. Although most comments relating to the local amenity of outdoor space at Site 3 also referenced its designation as Green Belt as a planning constraint. Odour and wind direction were the most common impacts raised, however, comments in relation to local amenity largely tended to focus on the presence of community and environmental receptors to odour rather than operational factors themselves.	The proximity of local amenities to construction and operation of the WWTP were taken into consideration within the individual environmental assessments which were used to establish amenity effects. The potential effects that were taken into consideration were air quality, odour, noise, landscape and visual and traffic. Green belt has been considered in the planning assessment, specifically the Green Bely study in Appendix J.
	Site area 1	Again, given their proximity, a number of concerns applied to both Site 1 and Site 2, and concerned impacts to local residential, educational, and recreational amenities.	The proximity of local residential, education and recreational amenities were taken into consideration within the individual environmental assessments which were used to establish amenity effects. The potential effects that were taken into consideration were air quality, odour, noise, landscape and visual and traffic. The access to these amenities is considered within the land take, property and business viability assessment.

Sub-Theme	Site (if specific)	Feedback Summary	Response
		<p>Impacts to guided busway were referenced a number of times, as was the consideration that the northern edge of Cambridge (including Orchard Park) is already underserved for high quality green space and these proposals would further detract from that.</p>	<p>The impact on the quality of areas in close proximity to the three sites has been assessed within the amenity assessment, rather than an assessment of how the WWTP development may further detract from high quality green space for areas which are underserved.</p>
		<p>In relation to Site 1 in particular, historic character was often cited as providing valuable amenity to local residents owing to features such as the Tithe Barn and other thatched buildings, the Roman road (Akeman street) and Mere Way, as well as other local points of interest including Milton Maize Maze, Milton Cemetery, and Milton Recreation Ground.</p>	<p>The potential impacts on heritage assets are assessed in the historic environment assessment. The proximity of local amenities to construction and operation of the WWTP were taken into consideration within the individual environmental assessments which were used to establish amenity effects. The potential effects that were taken into consideration were air quality, odour, noise, landscape and visual and traffic.</p>
		<p>In addition to a number of points above also being considered to apply to Site 2, particular concern was raised regarding potential impacts to the Wendy House Nursery in Impington, who have an ethos of learning in nature through Forest Schools etc. Comments suggested this would be compromised by air quality and visual impacts if the plant is located on Site 2. Concern was also submitted regarding impacts to Impington Village College.</p>	<p>The proximity of local amenities to construction and operation of the WWTP were taken into consideration within the individual environmental assessments which were used to establish amenity effects. The potential effects that were taken into consideration were air quality, odour, noise, landscape and visual and traffic.</p>
	Site area 2	<p>There were also comments on the potential impacts to existing farmland that currently provides visual amenity, walking and exercise opportunity, and employment opportunity to local communities. Other amenities referenced include: Impington recreation park, Histon Football Club and recreation ground, Lea Hospital, the Mere Way, and the bus and cycle way.</p>	<p>The potential impact of the use of agricultural land for the WWTP development is considered within the land take, property and business viability assessment. This included the assessment of employment opportunities. Potential amenity effects are a separate assessment which have been considered for amenities, including recreational receptors, walking and cycling routes and community receptors. For the amenity assessment, potential effects that were taken into consideration were air quality, odour, noise, landscape and visual and traffic.</p>
		<p>Other respondents considered Site 2 to be preferable as they viewed impacts to be relatively lower, considering local amenities to be fewer and already compromised by the recycling centre. One respondent described the site as 'quasi-industrial' and suggested a well screened waste water treatment plant could be an improvement.</p>	<p>These elements have been considered as part of the landscape and visual assessment which formed part of the amenity assessment.</p>
	Site area 3	<p>Those commenting on the impact on local amenities of Site 3 predominantly noted its designation within the Green Belt in relation to this, often with a perception that Sites 1 and 2 already contain areas of brownfield and as such provided less amenity. Noting that Site 3 contains valuable open space necessary to protect from 'urban sprawl' and provide access to the outdoors for local residents for activities including walking, cycling, and horse riding etc.</p>	<p>Access to walking, cycling and horse riding routes have been considered within the land take, property and business viability assessment. The amenity of the users of these routes during construction and operation is a separate assessment.</p>

Sub-Theme	Site (if specific)	Feedback Summary	Response
		<p>A number of comments cited concern in reference to the Green Corridor flanking the River Cam between Cambridge and the Wicken Fen – described as the city’s ‘green lungs’. In addition to this, locating the plant at Site 3 would be seen as incompatible with developing the Wicken Fen Vision, linking with the Landmark East Bridge of Reeds project, which ultimately aims to extend the Wicken Fen wetland to the A14 boundary.</p>	<p>The potential impact on the amenity of walking and cycling routes near to site area 3 has been considered within the amenity assessment. The Wicken Fen Vision is considered within the landscape and visual, and nature conservation and biodiversity assessments and also in the planning assessment.</p>
		<p>The Quy Fen was also cited numerous times, in regard to its importance for recreational space, addressing the climate emergency, and supporting mental health of the local community, as well as Fen Ditton being a statutorily designated Conservation Area and concern for historical landmarks such as Fleam Dyke.</p>	<p>The potential impacts on recreational spaces, in relation to both disruption to access, land take and amenity have been considered as part of the community assessment. No impacts are anticipated on public access to Quy Fen. Potential impacts on Stow-cum-Quy Fen SSSI are considered in the nature conservation and biodiversity assessment. The potential impacts on heritage assets are assessed in the historic environment assessment.</p>
		<p>Other comments referred to Lower Fen Drove Way (at Snout's Corner opposite Biggin Abbey) being a public path leading to a popular circular walk, while some respondents referred to potentially impacted local amenities more generally, including schools, pubs, rowing, sailing & boat clubs.</p>	<p>The potential impacts on Low Fen Drove Way, in relation to both disruption to access, land take and amenity have been considered as part of the community assessment.</p>
		<p>One comment claimed that a relocation to this site was expressly ruled out when the Marleigh/Wing development was agreed.</p>	<p>Anglian Water is not aware of any representations included in the application for the Marleigh/Wing development indicating that Cambridge WWTP would not be relocated in the vicinity of site area 3. However, Anglian Water have carried out a comprehensive site selection exercise to choose the best performing site area for relocation.</p>
		<p>However, another comment described Site 3 as offering an opportunity to be innovative and think more holistically about the new waste water treatment facility. They requested a transformative vision that includes creating a new local amenity such as a lake (that can act as a reservoir), being carbon positive with really ambitious renewable energy generation capacity, and enhancing or creates new high quality, large habitat areas. They claimed the other two sites are ‘too hemmed in’ and so don’t offer this opportunity.</p>	<p>This feedback is noted. For any site which is chosen a vision will be developed to further progress the design and implementation of the WWTP.</p>

C.3 Amenity

Assessment methodology

- C.3.1 The introduction of construction works and the operation of the WWTP has the potential to impact on amenity – the pleasantness or attractiveness of a place. Changes in the amenity of an area primarily affect residents, businesses, and users of community and recreational resources. The following factors contribute to a change in amenity value in an area:
- Air quality – changes to air quality levels
 - Odour – changes to odour levels
 - Noise – changes to noise levels
 - Landscape and visual effects – potential visual effects from key receptors
 - Traffic – effects from increased traffic
- C.3.2 Potential changes in amenity arise as a result of the above 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 and there is considered to be a change in amenity where **two or more factors** are impacted to a moderate or greater degree in a location. This **combination of effect** has been assessed to determine whether there is a change in amenity for each of the sites, informing the RAG rating.
- C.3.3 The methodology for assessing landscape and visual amenity, noise, odour and air quality for each option are outlined in Appendix B. RAG assessment for both mitigated and unmitigated options have been undertaken and included within the respective sections in Appendix B for each of these topics.
- C.3.4 The methodology for assessing traffic impacts is outlined in the following section. RAG assessment for both mitigated and unmitigated options have been undertaken and included within Appendix B.

Table C.65: Amenity assessment – RAG definitions

Green	Amber	Red
<ul style="list-style-type: none"> ● No changes to relevant environmental factors (air quality, odour, noise landscape and visual, and traffic) affecting the resource. ● Changes to the environment from only one of air quality, odour, noise landscape and visual, and traffic effects. ● Changes are unlikely to impact on the amenity of any resources in the area. 	<ul style="list-style-type: none"> ● Changes to the environment from a combination of at least two of air quality, odour, noise, landscape and visual effects, and traffic affecting a resource. ● The changes in amenity affect few resources in the area and represent a minor change from the baseline position. 	<ul style="list-style-type: none"> ● Changes to the environment from a combination of at least two of air quality, odour, noise, landscape and visual effects and traffic. affecting a resource. ● The changes in amenity affect many resources in the area and represent a major change from the baseline position.

- C.3.5 The Interim Phase 1 Community Report has been used to supplement findings for the amenity and community criteria. Feedback has been reviewed to ascertain whether any additional impacts on community receptors have been identified or if the magnitude of an already identified impact is considered to be greater or lesser. Professional judgement, in addition to a review of

the findings from other relevant environmental topics, such as noise, air quality, landscape and visual and traffic, has been used to draw these conclusions and set out as part of the assessment.

Assessment of unmitigated options

Site area 1 – Construction

Site area 1 Option A

- C.3.6 As noted above, potential changes in amenity arise as a result of five environmental factors already considered (air quality, odour, noise, landscape and visual and traffic) combining to further affect a receptor in a location.
- C.3.7 There are anticipated to be temporary adverse impacts on amenity where tunnel or pipeline corridors navigate close to sensitive receptors on the outskirts of Waterbeach, Landbeach and Milton. This is due to adverse impacts from a combination of changes to air quality, noise and landscape and visual effects.
- C.3.8 The businesses located along Butt Lane are likely to experience a reduction in amenity due to a temporary reduction in air quality, from dust deposition effects, in combination with landscape and visual effects, as the construction activity would be visible from this location, as well as increases in traffic.
- C.3.9 The landscape and visual assessment states that nearby PRow, including Mere Way, would have clear views of the construction works. As no changes to air quality, noise or traffic are anticipated, no additional amenity effects on users of this PRow have been identified.

Site area 1 Option B

- C.3.10 Subject to the precise location of the treated effluent waste tunnel/pipeline associated with Option 1B, construction noise and vibration of the tunnel/pipeline has the potential to impact a greater number of receptors on the northern edge of and surrounding Milton and Horningsea compared to Option 1A.
- C.3.11 As a result, a combination of air quality and noise effects are predicted. There is therefore anticipated to be a temporary reduction in amenity, which is likely to be worse than Option A, as a result of the receptors being closer to the construction activity.

Table C.66: Amenity impacts – unmitigated RAG evaluation during construction for site area 1

Site area	Evaluation	Unmitigated RAG rating
Site area 1 – Option A	The construction of the tunnel or pipeline corridors construction is located close to sensitive receptors on the outskirts of Waterbeach, Landbeach and Milton and businesses along Butt Lane. Unmitigated, amenity impacts are likely to be a notable change from the baseline position as there is the potential to impact many receptors on the outskirts of Waterbeach, Landbeach and Milton. These receptors are primarily residential and the occupants are likely to experience a reduction in amenity for the duration of construction activities.	Red
Site area 1 – Option B	Impacts are the same as above, except that the discharge location is closer to a greater number of receptors, compared to Option A. Overall, the difference between Option A and B are not significant enough for the RAG rating to be different.	Red

Site area 1 – Operation

Site area 1 Option A

- C.3.12 It is assumed that all site traffic will enter and exit the site via Butt Lane off A10 Ely Road. Due to combination of increased traffic, reduced air quality and landscape and visual effects in this location, there will be a reduction in amenity for businesses and other properties along this road.
- C.3.13 There is the potential for odour impacts for residential properties on the west side of the High Street and to the south of Akeman Street in Landbeach. As there are visual receptors in Landbeach that would have a clear view of the new structures during operation, there is an impact on amenity at this location, from the combination of odour impacts and landscape and visual effects.
- C.3.14 Additionally, there is the potential for a reduction in amenity for users of Mere Way which is to the west of site 1. This is due to a combination of odour impacts and landscape and visual effects. It is noted that this is likely to occur for only a portion of Mere Way.

Site area 1 Option B

- C.3.15 The impacts on the community are very similar to Option A. The only difference is that, subject to the precise location of the discharge location, there is the potential for this feature to be closer to receptors in Option B compared to Option A. As a result there may be different noise impacts. However, the operation of this part of the water treatment infrastructure is not likely to have significant adverse effects on these receptors.
- C.3.16 The table below summarises the RAG evaluation for community during operation (unmitigated) for site area 1 Option A and Option B.

Table C.67: Unmitigated RAG evaluation during operation for site area 1 Option A and Option B

Site area	Evaluation	Unmitigated RAG rating
Site area 1 – Option A	<p>There is likely to be reduction in amenity for businesses located on Butt Lane and for users of Mere Way.</p> <p>There is the potential for a reduction in amenity at residential properties on the west side of the High Street and to the south of Akeman Street in Landbeach.</p> <p>At these two locations, unmitigated, amenity impacts are likely to represent a minor change from the baseline position from a combination of changes to two environmental factors. Only a small number of resources in the area will be impacted. Additionally, 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.</p>	Amber
Site area 1 – Option B	<p>Impacts are the same as above as presence of a discharge point is not confirmed and not likely to have a substantial amenity impact on community receptors.</p>	Amber

Site area 2 – Construction

Site area 2 -Option A

- C.3.17 Similar to site area 1, there are expected to be temporary adverse impacts on amenity where tunnel or pipeline corridors navigate close to sensitive receptors on the outskirts of Waterbeach, Landbeach and Milton. This is due to adverse impacts from a combination of changes to air quality, noise and landscape and visual effects during construction.
- C.3.18 The businesses located along Butt Lane are likely to experience a reduction in amenity due to a temporary reduction in air quality, from dust deposition effects, in combination with landscape and visual effects (as the construction activity would be visible from this location), as well as increases in traffic.
- C.3.19 The landscape and visual assessment states that receptors on the Blackwell caravan site, which is a travellers’ site, would have clear and partially filtered views of the construction works. This, in combination with a reduction in air quality, is likely to have an adverse impact on the amenity in this location.
- C.3.20 The landscape and visual assessment states that nearby PRoW, including Mere Way, would have clear views of the construction works. As no changes to air quality, noise, odour or traffic are anticipated, no amenity effects on users of this PRoW are reported.

Site area 2 Option B

- C.3.21 Similar to site area 1, subject to the precise location of the treated effluent waste tunnel/pipeline associated with Option 1B, construction noise and vibration of the tunnel/pipeline has the potential to impact a greater number of receptors on the northern edge of and surrounding Milton and Horningsea compared to Option 1A. Air quality effects, as a result of increased dust effects due to construction, are also reported to be worse for this option as the construction is closer to residential receptors.

C.3.22 A combination of air quality and noise effects are predicted, so there is anticipated to be a temporary reduction in amenity, which is likely to be worse than Option A, as a result of the receptors being closer to the construction activity.

Table C.68: Amenity impacts – unmitigated RAG evaluation during construction for site area 2

Site area	Evaluation	Unmitigated RAG rating
Site area 2 – Option A	<p>There are anticipated to be temporary adverse impacts on amenity where tunnel or pipeline corridors navigate close to sensitive receptors on the outskirts of Waterbeach, Landbeach and Milton.</p> <p>The businesses located along Butt Lane and the Blackwell caravan site are also likely to experience a reduction in amenity</p> <p>Unmitigated, amenity impacts are likely to be a major change from the baseline position as there is the potential to impact many receptors on the outskirts of Waterbeach, Landbeach and Milton. These receptors are primarily residential receptors. The occupants are likely to spend long periods of time within their properties and are likely to experience a reduction in amenity for those periods. The number of potential receptors affected, in addition to the reduction in amenity for businesses along Butt Lane and the Blackwell caravan site, means there will be a major change in amenity from the baseline position.</p>	Red
Site area 2 – Option B	<p>Impacts are the same as above, except that the discharge location is also closer to a greater number of receptors, compared to Option A. Overall, the impacts between Option A and B are not significant enough for the RAG rating to be different.</p>	Red

Site area 2 – Operation

Site area 2 Option A

C.3.23 Similar to site area 1, it is assumed that the all site traffic will enter and exit the site via Butt Lane and A10 Ely Road. Due to combination of increased traffic, reduced air quality, landscape and visual effects, noise effects and potential odour impacts (at Evolution Business Park), there will be a reduction in amenity for businesses, and other properties, along Butt Lane.

C.3.24 Additionally, there is the potential for a reduction in amenity for users of Mere Way which is to the west of site 2. This is due to a combination of odour impacts and landscape and visual effects. It is noted that this is likely to occur for only a portion of Mere Way.

C.3.25 It is noted that the potential odour impacts at the Evolution Business Park and on Mere Way are classified as negligible in the odour assessment, in accordance with IAQM guidance. These impacts alone would not constitute a reduction in Amenity at these receptors. However, when combined with the other potential impacts they contribute to a reduction in Amenity.

Site area 2 Option B

C.3.26 Similar to site area 1, the impacts on the community are very similar to Option A. The only difference is that subject to the precise location of the discharge location, there is the potential for the discharge location to be closer to community receptors in Option B when compared to Option A. However, the operation of this part of the water treatment infrastructure is not likely to have significant adverse amenity effects on these receptors.

C.3.27 The table below summarises the RAG evaluation for community during operation (unmitigated) for site area 1 Option A and Option B.

Table C.69: Unmitigated RAG evaluation during operation for site area 2 Option A and Option B

Site area	Evaluation	Unmitigated RAG rating
Site area 2 – Option A	There is likely to be reduction in amenity for businesses located on Butt Lane and for users of Mere Way. There are a small number of businesses located on Butt Lane. The area already also contains activities which reduce the amenity of the environment, including the recycling facility and the Milton Park and Ride. Due to the small number of businesses impacted and the amenity of the existing environment, the proposed changes represent a minor change from the baseline position.	Amber
Site area 2 – Option B	Impacts are the same as above as presence of a discharge point is not confirmed and not likely to have a substantial impact on community receptors change the RAG score.	Amber

Site area 3 – Construction

C.3.28 There are anticipated to be temporary adverse impacts on amenity where tunnel or pipeline construction corridors navigate close to sensitive receptors on the outskirts of Waterbeach, Horningsea and Clayhithe. This is due to adverse impacts from a combination of a reduction in air quality and potential noise impacts.

C.3.29 The area around site area 3 understood to be an area which is popular recreational activities, in particular walking and cycling. There is a shared-use pedestrian and cycleway on Horningsea Road. PRow 85/14 is located to the east of site 3 and follows the existing routing of the unpaved dirt track section of Low Fen Drove Way. Surrounding site 3 there are numerous other PRow including an extensive network of footpaths connecting the rural settlements of Stow-cum-Quy, Lode, Waterbeach and Horningsea. The landscape and visual assessment states that visual receptors on many PRow in the area would have clear or partially filtered views of the new structures. Construction will temporarily introduce new elements into the landscape and views that are uncharacteristic of the existing rural landscape and views over farmland. Additionally, the traffic assessment states that the increase in traffic would have a significant impact on PRow and the shared-use pedestrian and cycleway on Horningsea Road. The changes to recreational receptors views in combination with traffic effects will reduce amenity for recreational receptors using walking and cycling routes near to the site.

C.3.30 The table below summarises the RAG evaluation for community during construction (unmitigated) for site area 3.

Table C.70: Unmitigated RAG evaluation during construction for Site 3

Site area	Evaluation	Unmitigated RAG rating
Site 3	<p>There are anticipated to be temporary adverse impacts on amenity where tunnel or pipeline corridors navigate close to sensitive receptors on the outskirts of Waterbeach, Horningsea and Clayhithe. Additionally, there is anticipated to be a temporary reduction in amenity for users of cycling and walking routes near to the site.</p> <p>Unmitigated, amenity impacts are likely to be a major change from the baseline position as there is the potential to impact many receptors on the outskirts of Waterbeach, Horningsea and Clayhithe. The number of potential receptors, in addition to the reduction in amenity for users of cycling and walking routes near to the site are considered to be a major change from the baseline position.</p>	Red

Site area 3 – Operation

- C.3.31 Vehicular access to the site during operation will be via Horningsea Road. The location of the new access road may result in minor adverse noise effects at individual receptors on Horningsea Road. At these locations, operational traffic may also have an impact on the air quality for these receptors. The noise and air quality impacts, in combination with traffic effects, is likely to reduce amenity for receptors on Horningsea Road as a result of operational activities.
- C.3.32 The landscape and visual assessment concluded that users of PRoW in the area, including Low Fen Drove Way, would have clear or partially filtered views of the new structures during operation. Additionally, the odour assessment states that a section of Low Fen Drove Way PRoW is located within an area that could experience odour impacts. These potential impacts in combination with the traffic impacts on Low Fen Drove Way PRoW and the shared-use pedestrian and cycleway on Horningsea Road, will cause a reduction in amenity for walkers and cyclists using these routes.
- C.3.33 It is noted that the potential odour impacts on Low Fen Drove Way are classified as negligible in the odour assessment, in accordance with IAQM guidance. These impacts alone would not constitute a reduction in Amenity at this receptor. However, when combined with the other potential impacts they contribute to a reduction in Amenity.

Table C.71: Unmitigated RAG evaluation during operation for Site 3

Site area	Evaluation	Unmitigated RAG rating
Site 3	Amenity impacts are predicted for residential receptors located on Horningsea Road and walkers and cyclists using routes and PRow near to the site. Unmitigated, amenity impacts are likely to be a minor change from the baseline position as few receptors are impacted. Furthermore, the users of walking and cycling routes are likely to temporarily experience a reduction in amenity as the PRow/routes which are impacted are likely to only be a portion of their total route.	Amber

Mitigation identification

9.1.3 Noise, air quality and odour measures are listed in the respective sections above and are relevant to managing amenity effects on community receptors. In addition, the following mitigation measures would be implemented to manage effects on the community

- When determining the exact location of construction activities for the ancillary infrastructure, the proximity to recreational areas, residential properties, businesses and community receptors (such as schools, early childcare centres, GPs, hospitals) will be considered so the greatest distance is maintained between the receptors and construction activities.
- To ensure the negative impacts on amenity value and disruption are reduced as far as possible during the construction stage on walking and cyclists, the following mitigation measures would be incorporated into a CEMP.
 - Any temporary diversionary works or closure of PRow would be undertaken following consultation with affected individuals, groups, and the local authority.
 - The public would be informed of the nature, timing and duration of particular activities during the construction stage and the duration of any works by newsletter and other forms of appropriate communication.
 - All diversions and alternative routes would be clearly sign-posted.

Assessment of mitigated options

C.3.34 Based on the mitigation outlined in above, Table C.72 reevaluates the impacts on the community for each of the options during the construction and operational phases.

Table C.72: Amenity RAG evaluation B (with mitigation)

Site area	Evaluation	Unmitigated RAG rating	Mitigated RAG rating
Construction – site area 1			
Site area 1 – Option A	In the unmitigated assessment a reduction in amenity for sensitive receptors located on the outskirts of Waterbeach, Landbeach and Milton was due to a combination of noise, air quality and landscape and visual effects. Mitigation measures are proposed to reduce noise and air quality effects. As a result of this, there will be a reduction in the number receptors impacted by this option as noise and air quality effects will be appropriately managed, and no amenity effects anticipated at these locations.	Red	Amber

	<p>Businesses on Butt Lane are likely to still experience a reduction in amenity from a combination of landscape and visual effects and traffic effects, as a result of construction 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. Therefore, the RAG rating has been changed from Red to Amber, as less receptors are impacted as a result of mitigation measures.</p>		
Site area 1 – Option B	<p>Impacts are the same as above, except that the discharge location is also closer to a greater number of receptors, compared to Option A. Overall, the difference in impacts between Option A and B are not significant enough for the RAG ratings to be different between Option A and Option B.</p>	Red	Amber
Operation - site area 1			
Site area 1 – Option A	<p>In the unmitigated scenario, amenity impacts were anticipated for certain properties within Landbeach as a result of a combination of odour, and landscape and visual effects. With mitigation, odour effects will be effectively managed so amenity effects at this receptor are no longer anticipated at this location.</p> <p>There is likely to be reduction in amenity for businesses located on Butt Lane from a combination of traffic and landscape and visual effects. Both of these assessments report similar levels of effects, even with mitigation. As a result of this, the RAG assessment has not been downgraded as amenity effects, which are a minor change from the baseline position, are still anticipated.</p>	Amber	Amber
Site area 1 – Option B	<p>Impacts are the same as above. The discharge location is also closer to a greater number of receptors, compared to Option A. Overall, the difference in impacts between Option A and B are not significant enough for the RAG ratings to be different between Option A and Option B</p>	Amber	Amber
Construction – site area 2			
Site area 2 – Option A	<p>Similar to site 1, in the unmitigated assessment a reduction in amenity for sensitive receptors located on the outskirts of Waterbeach, Landbeach and Milton was due to a combination of noise, air quality and landscape and visual effects. Mitigation measures are proposed to reduce noise and air quality effects. As a result of this no amenity effects anticipated at these locations.</p> <p>Amenity impacts are no longer anticipated at the Blackwell caravan site as a result of mitigation of air quality effects.</p> <p>Businesses on Butt Lane are likely still to experience a reduction in amenity from a combination of landscape and visual effects and traffic effects, as a result of construction 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 are likely to affect the amenity of the environment, including the recycling facility and the Milton Park and Ride.</p>	Red	Amber

	Therefore, the RAG rating has been changed from Red to Amber, as fewer receptors are affected as a result of mitigation measures.		
Site area 2 – Option B	Impacts are the same as above. The discharge location is also closer to a greater number of receptors, compared to Option A. Overall, the difference in impacts between Option A and B are not significant enough for the RAG ratings to be different between Option A and Option B	Red	Amber
Operation - site area 2			
Site area 1 – Option A	<p>The unmitigated assessment reported that there would be a reduction in amenity for businesses and properties along Butt Lane and users of Mere Way as a result of a combination of increased traffic, reduced air quality, landscape and visual effects, noise effects and potential odour effects (at Evolution Business Park only). Proposed mitigation measures effectively manage air quality and noise effects.</p> <p>There is still likely to be a reduction in amenity for businesses located on Butt Lane from a combination of traffic, landscape and visual effects and odour impacts and on Mere Way from a combination of landscape and visual effects and odour impacts. The assessments of all these criteria report similar levels of effects, even with mitigation. As a result of this, the RAG assessment has not been downgraded as amenity effects, which are a minor change from the baseline position, are still anticipated.</p> <p>It is noted that the potential odour impacts at the Evolution Business Park and on Mere Way are classified as negligible in the odour assessment. These impacts alone would not constitute a reduction in Amenity at these receptors. However, when combined with the other potential impacts they contribute to a reduction in Amenity.</p>	Amber	Amber
Site area 1 – Option B	Impacts are the same as above. The discharge location is also closer to a greater number of receptors, compared to Option A. Overall, the difference in impacts between Option A and B are not significant enough for the RAG ratings to be different between Option A and Option B.	Amber	Amber
Construction – site area 3			
Site area 3	<p>As stated in Appendix sections B.6 and B.7, the proposed mitigation is anticipated to reduce air quality and noise impacts to non-significant or negligible effects. Therefore, amenity impacts can only arise from a combination of landscape and visual and traffic impacts at a specific location.</p> <p>Unmitigated, amenity effects are anticipated for walkers and cyclists using Low Fen Drove Way PRow and the Horningsea Road shared-use pedestrian and cycleway as a result of change to views and traffic effects. Taking into consideration mitigation, the traffic assessment reported that the highway improvements and temporary traffic measures (outlined in Appendix D.2) there will still be an impact on users of Low Fen Drove Way PRow. Additionally, there will still be visual effects on recreational receptors using this route. As a result of this, the RAG assessment has not been</p>	Amber	Amber

downgraded as amenity effects, which are a minor change from the baseline position, are still anticipated.			
Operation – site area 3			
Site area 3	<p>As stated in Appendix sections B.6 and B.7, the proposed mitigation is anticipated to reduce air quality and noise impacts to non-significant or negligible effects. Therefore, amenity impacts will only arise from a combination of landscape and visual, odour and traffic impacts at a specific location, taking into consideration the specific mitigation proposed by these environmental topics.</p> <p>The landscape and visual assessments reported that even with mitigation, the development would remain an uncharacteristic addition to the landscape and views would be of a similar level of effects to the unmitigated scheme. This included views from Low Fen Drove Way PRow. The traffic assessment reports that the operational access to site 3 would have a moderate negative impact on Low Fen Drove Way PRow. In addition, a section of Low Fen Drove Way PRow is located within an area that could experience odour impacts, but does not require mitigation due to the low sensitivity of this receptor. Therefore, amenity impacts are predicted walkers and cyclists using Low Fen Drove Way PRow, due to the combination of visual, odour and traffic effects.</p> <p>Amenity impacts are likely to be a minor change from the baseline position as receptors are limited to walkers and cyclists near to the site. Furthermore, the users of walking and cycling routes are likely to temporarily experience a reduction in amenity as the PRow/routes which are impacted are likely to only be a portion of their total route.</p> <p>It is noted that the potential odour impacts on Low Fen Drove Way are classified as negligible in the odour assessment. These impacts alone would not constitute a reduction in Amenity at this receptor. However, when combined with the other potential impacts they contribute to a reduction in Amenity.</p>	Amber	Amber

Incorporating feedback

- 9.1.4 Phase one non-statutory consultation was held in order to share the proposals for relocating the WWTP with the public and stakeholders. A summary of the feedback received from the public in relation to community and how the concerns, issues and opportunities raised have been considered within the assessment criteria for Stage 4 final site selection is provide in the Appendix C.2.

C.4 Traffic-related impacts of construction and operation on local communities

Assessment methodology

- C.4.1 The assessment criterion considered the potential traffic impacts of the unmitigated options on residents, business' and communities in relation to congestion and road safety.
- C.4.2 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.
- C.4.3 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. Impacts along the main carriageway of the A14 are to be considered negligible and were therefore not considered further for the purposes of this assessment.
- C.4.4 The assessment conducted used available aerial imagery, OS mapping, Cambridgeshire County Council's 'My Cambridge' interactive maps, operational flow data obtained at existing sites and predicted construction flows to consider the following:
- The potential areas that would be affected by increased congestion on the route to site during construction and operation.
 - Sensitive receptors along the routes, for example; residential communities, schools, nurseries, playgrounds, local businesses and elderly care facilities.
 - Safety of other road users, such as pedestrian crossings and cycling routes.
 - Local Public Rights of Way (PRoW)
 - Accident clusters along the routes (Cambridgeshire County Council, 2019).
 - Any existing Heavy Goods Vehicle (HGV) restrictions located along each route (Cambridgeshire County Council, 2019).
 - A consideration of the cumulative impacts of local committed developments on the proposed accesses to site.
- C.4.5 The RAG definitions adopted for the traffic impact of construction and operation on local residents are shown below in Table C.73.

Table C.73: Traffic impact of construction and operation on local communities - RAG definitions

Green	Amber	Red
Overall impact on local residents/communities from option construction and operation expected to be minor: Minor localised disturbance/ delays caused by construction traffic/traffic management measures: Minor increase in traffic within localised area during construction and/or operation: Sensitivity of route to site area from strategic network is low; and, No negative impact upon nearby Public Rights of Way.	Overall impact on local residents/communities from option construction or operation expected to be moderate: Moderate traffic delays/congestion during peak hours (7.30-9.30am/4.30-6.30pm) including road closures/diversions during construction; or Moderate increase in traffic during operation; or Sensitivity of route to site area from strategic network is moderate; or, Moderate impact to nearby Public Rights of Way.	Overall impact on local residents/communities from option construction and/or operation has the potential to be severe: Potentially severe traffic delays/congestion diversions/ extinguishments during peak hours (7.30-9.30am/4.30-6.30pm); or Potentially severe traffic Impacts within and beyond local area during construction and/or operation; or Sensitivity of route to site area from strategic network is high; or, Significant negative impact to nearby Public Rights of Way.

- C.4.6 For the purposes of assessing the traffic related impacts of each site, the differences in scheme sub-options such as 1A and 1B were considered negligible. Each option is therefore grouped together as a singular site-based option. The associated ancillary infrastructure options will cause an impact on the local highway, as spoil that cannot be backfilled will need to be removed. However, this level of impact is consistent across site area options and is therefore not considered to be of relevance to the assessment.
- C.4.7 Once a preferred site option is chosen, further assessment may include assessing the traffic related construction impacts of ancillary tunnelling works; including the impacts of further “off-site” HGV movements. Mitigations of these impacts will be outlined within a Construction Management Plan.

Assessment of unmitigated options

- C.4.8 A summary of the screening assessment for each site area regarding the traffic related impacts of construction and operation on the community and the resulting RAG evaluation are provided below. Greater detail regarding site access and site routing is provided in the preliminary transport assessment in Appendix K.

Site areas 1 and 2

- C.4.9 Sites 1 and 2 both provide site routing from the A14 Milton Interchange via the A10 and Butt Lane during both construction and operation.
- C.4.10 The proposed access locations during both construction and operation do not encourage routing past numerous sensitive receptors.
- C.4.11 Access to site area 1 is not considered to have an impact upon nearby PRowWs such as Mere Way.
- C.4.12 Access to site area 2 is considered to have a moderate impact upon PRowWs as HGVs, like all vehicles, would have to cross Mere Way to reach the site.

Operational Impacts

- C.4.13 As highlighted in the Preliminary TA, the A10 and the A14 Milton Interchange already experience significant levels of congestion and delay, particularly during peak traffic periods (7:30-9:30AM and 4:30-6:00PM). However, the operational impact of site relocation to site area 1 or 2 is unlikely to worsen the impact on the strategic highway network as operational vehicles will continue to access the site via the Milton Interchange.
- C.4.14 A similar number of HGVs will still use the Milton Interchange; but instead perform a different turning movement at the junction, dependent upon their respective origin and destination. The community-based impact of this is considered negligible.
- C.4.15 As highlighted in the Preliminary TA, there will be a moderate increase in operational traffic at the new site due to its increased capacity. However, this increase is expected to have a negligible effect on current levels of delay/congestion experienced along the A10 and at the Milton interchange.
- C.4.16 As discussed in the Preliminary TA, the preferred site will need to be assessed cumulatively alongside committed developments such as Waterbeach New Town to assess the capacity of local junctions. However, it is worth noting that the operational increase in traffic for WWTP is considered minor compared to the increase in traffic associated with Waterbeach New Town.

- C.4.17 There will be a moderate increase in operational traffic delay at the A10/Butt Lane junction during peak periods; as vehicles exiting southbound towards the A14, exit onto the A10 via a separate Milton Park & Ride junction. However, given the fact that operational vehicles accessing/egressing the site will do so throughout a 12-hour operational period, the overall impact is considered to be moderate.

Construction Impacts

- C.4.18 It is important to note that during construction of site areas 1 or 2, the existing site will remain operational at all times, resulting in a compound effect of traffic related impacts.
- C.4.19 During peak levels of construction, such as the large concrete pour, there will be increased levels of delay, particularly on approach to the A10/Butt Lane junction and at the Milton Interchange. This level of impact is considered to be significant given that the Milton Interchange is currently operating at capacity.
- C.4.20 There is also potential for temporary localised road closures on sections of Butt Lane, particularly to construct the site access junction. However, the impact of such is considered moderate at this stage as diversion via the A14, would not significantly impact upon journey time.

Site area 3

- C.4.21 The unmitigated option for site area 3 provides routing from Junction 34 of the A14, via Horningsea Road during both construction and operation.
- C.4.22 The proposed access location during both construction and operation does not encourage routing past sensitive receptors and does not pass any Air Quality Management Areas (AQMAs).

Operational Impacts

- C.4.23 As site area 3 utilises access from Junction 34 of the A14 instead of the Milton Interchange, operational traffic associated with the new site will be re-assigned to the strategic highway network accordingly. Operational flow at the Milton interchange will likely decrease; whilst, flow at Junction 34 will likely increase.
- C.4.24 The reassignment of operational flow is likely to have an impact on current levels of delay/congestion experienced along Horningsea Road. However, given the fact that operational vehicles accessing/egressing the site will do so throughout a 12-hour operational period, the overall impact is considered to be negligible.
- C.4.25 The major residing concern over operational access via Horningsea Road is the functionality of Junction 34 itself. As Junction 34 is a west-only junction, operational vehicles accessing to/from the east would need to perform a U-turn movement at the Milton Interchange, which is already operating at capacity during peak periods.
- C.4.26 As discussed in the Preliminary TA, the preferred site will need to be assessed cumulatively alongside committed developments such as land north of Newmarket Road and Land north of Cherry Hinton to assess the capacity of local junctions. However, it is worth noting that the operational increase in traffic for WWTP is considered minor compared to the increase in traffic associated with the aforementioned developments.

C.4.27 Unmitigated access to site area 3 is considered to have a significant negative impact upon nearby PRowS and upon the shared-use pedestrian and cycleway on Horningsea Road, highlighted in the preliminary transport assessment (Appendix K).

Construction Impacts

C.4.28 During peak levels of construction, such as the large concrete pour, there will be significant increases to levels of flow, particularly on approach to Junction 34 of the A14. However, this level of impact is far lower than that of sites 1 and 2 as Junction 34 is not currently operating at capacity.

C.4.29 Site area 3 utilises a different interchange with the A14 to the existing site, so construction impacts are far less likely to be compounded with the existing operational impact.

C.4.30 There is potential for lengthy diversions and localised road closures on sections of Horningsea Road, particularly to construct the site access junction. Road closures at this location, severing the villages of Horningsea and Fen Ditton, are likely to have a significant community impact.

C.4.31 Unmitigated access to site area 3 is considered to have a significant negative impact upon nearby PRowS and upon the shared-use pedestrian and cycleway on Horningsea Road, highlighted in the preliminary transport assessment (Appendix K).

Table C.74: Unmitigated traffic related impacts of operation on local communities – RAG summary

Site	Unmitigated RAG score
1	Amber
2	Amber
3	Red

Table C.75: Unmitigated traffic related impacts of construction on local communities – RAG summary

Site	Unmitigated RAG score
1	Red
2	Red
3	Red

Mitigation identification

C.4.32 Mitigation measures for potential traffic impacts are outlined in the access assessment in Appendix D.2.

Assessment of mitigated options

C.4.33 A summary of the screening assessment for each site area regarding the traffic related impacts of construction and operation on the community and the resulting RAG evaluation, after mitigation, are provided below. Greater detail regarding site access and site routing is provided in the preliminary transport assessment in Appendix K.

Site areas 1 and 2

- C.4.34 As outlined in Appendix D.2, it is not considered at this stage that the preferred access routes into site areas 1 and 2 require further physical mitigation measures.
- C.4.35 Although a CTMP would mitigate the impacts of construction to some degree; flow would still route via the Milton Interchange and produce a significant impact upon the junction, adding to the existing operational flow experienced here.
- C.4.36 As a result, the RAG evaluations regarding the traffic related impacts of construction and operation on local communities for sites 1 and 2 are unchanged from the unmitigated assessment.

Site area 3

Operational Impacts

- C.4.37 The mitigated operational access for Site 3 provides routing from Junction 35 of the A14, the Quy Interchange, via High Ditch Road and Low Fen Drove Way.
- C.4.38 As site area 3 utilises access from Junction 35 of the A14 instead of the Milton Interchange, operational traffic associated with the new site will be re-assigned to use a different junction of the strategic highway network. Operational flow at the Milton interchange will likely decrease; whilst, flow at Junction 35 may moderately increase.
- C.4.39 The reassignment of operational flow may have an impact on current levels of delay/congestion experienced along High Ditch Road. However, given the fact that operational vehicles accessing/egressing the site will do so throughout a 12-hour operational period, the overall impact is considered to be minor.
- C.4.40 The Preliminary TA has considered the potential cumulative impact of local committed developments to site area 3, namely the development of land both North of Cherry Hinton (S/1231/18/OL)⁷³ and North of Newmarket Road (S/2682/13/OL) (also known as the Marleigh/Wing development).
- C.4.41 The junction performance data associated with these developments highlights the potential for the A14 Junction 35 roundabout (Quy interchange) to be over capacity with the Marleigh/Wing development in place, but as this assessment dates back to 2013, should site area 3 be taken forward, there would need to be an up-to-date traffic assessment of the area which considers the cumulative impact.
- C.4.42 The proposed access location during operation does not encourage routing past numerous sensitive receptors.
- C.4.43 Operational access to Site 3 is considered to have a moderate negative impact upon nearby PRoWs such as Low Fen Drove Way and the proposed pedestrian access from the Marleigh development south of the High Ditch Road junction. However, improved access to this route can be incorporated into the design for the improvements to the bridge over the A14 (outlined in Appendix D.2).

⁷³ North of Cherry Hinton Development: S/1231/18/OL - 1200 residential dwellings (including retirement living facility (within Use Class C2/C3)) a local centre comprising uses within Use Class A1/A2/A3/A4/A5/B1a/D1/D2 primary and secondary schools community facilities open spaces allotments landscaping and associated infrastructure.

Construction Impacts

- C.4.44 During peak levels of construction, such as the large concrete pour, there will be significant increases to levels of flow, particularly on approach to Junction 34 of the A14. However, this level of impact is lower than that of sites areas 1 and 2 as Junction 34 is not currently operating at capacity.
- C.4.45 Site area 3 utilises a different interchange with the A14 to the existing site, so construction impacts are far less likely to be compounded with the existing operational impact.
- C.4.46 With the formation of a CTMP there is potential for a reduced impact upon the nearby residents of Fen Ditton and Horningsea as diversions and localised road closures along Horningsea Road can be kept to a minimum.
- C.4.47 Sourcing construction vehicles and construction materials from the north (A1 via A14 west), south (M11 via A14 west) or west (A14), where possible, will reduce the number of vehicles performing a U-turn manoeuvre at the Milton Interchange or Histon Interchange.
- C.4.48 Given the highway improvements and temporary traffic measures (outlined in Appendix D.2), mitigated construction access to site area 3 will have little impact upon the shared-use pedestrian and cycleway on Horningsea Road and will not significantly impede access to the nearby PRoW from Horningsea Road. It is likely however, that access to the PRoW via High Ditch Road will be temporarily disrupted during construction of the operational access and during the improvements to the Low Fen Drove Way A14 bridge.

Table C.76: Traffic related impacts of operation on local communities – RAG summary

Site	Mitigation Measures	Unmitigated RAG score	Mitigated RAG score
1	No further mitigation needed following preferred access option assessment	Amber	Amber
2	No further mitigation needed following preferred access option assessment	Amber	Amber
3	Change of routing from access option HSR-01 to HDR-01. Access from Junction 35 of the A14 via Newmarket Road, High Ditch Road and Low Fen Drove Way to avoid routing through sensitive receptors at Fen Ditton. Highways improvements to High Ditch Road. Junction improvements to High Ditch Road/Newmarket Road and High Ditch Road/Low Fen Drove Way Junction Infrastructure improvements to bridge over the A14, maintaining safe access to PRoW. Improved signage regarding access only weight restrictions	Red	Amber

Table C.77: Traffic related impacts of construction on local communities – RAG summary

Site	Mitigation Measures	Unmitigated RAG score	Mitigated RAG score
1	CTMP	Red	Red
2	CTMP	Red	Red
3	Introduce temporary speed reduction along Horningsea Road. Maintain safe access to PRow. Maintain safe access to Low Fen Drove Way itself for existing road users. Construction Management Plan.	Red	Amber

Incorporating feedback

9.1.5 Phase one non-statutory consultation was held in order to share the proposals for relocating the WWTP with the public and stakeholders. A summary of the feedback received from the public in relation to traffic and access and how the concerns, issues and opportunities raised have been considered within the assessment criteria for Stage 4 final site selection is provide in the Appendix D.2.

D. Operational assessment

D.1 Anglian Water's operational requirements



Appendix D.1 Operational Requirements

1 Introduction

This document provides further details on Anglian Water's Operational Requirements which have been incorporated into the site selection process for the relocation of the CWWTP.

As set out in the Statement of Requirements, the land requirements for CWWTPR, are in the region of 22 hectares, (not including any necessary landscaping or other mitigating requirements).

The early design assumptions for the processes required are based on known successful WWTP processes and include the following.

- New Road Access into WWTP Location
- Incoming sewer
- Pumping station
- Storm storage and settlement tank
- Preliminary treatment (screening and grit removal)
- Primary settlement
- Biological treatment
- Final settlement
- Tertiary Treatment
- Pumping station
- Outfall to watercourse
- Sludge reception
- Enhanced pre-digestion treatment
- Biogas storage for renewable energy generation
- Anaerobic digestion
- Post-digestion treatment and de-watering
- Treated sludge biofertiliser
- Offices/Welfare Building(s) and Car Parking
- Utilities connections

The land area needs to accommodate the connecting infrastructure which includes but is not limited to the following:

1. A new drive shaft located at the chosen site to enable a connecting tunnel site back to the existing WWTP, that upon completion would be retrofitted as the new on-site Terminal Pumping station.
2. A new Final Effluent tunnel from the new site to a final outfall into the River Cam.
3. Connecting infrastructure from Waterbeach
4. Potential to divert and connect any existing assets which would aid to the operational efficiency of the scheme.

In addition to these operational process requirements, the site selection process has to take the following into account:

1. Anglian Water's statutory and regulatory obligations
2. Anglian Water's strategic corporate commitments
3. Operational resilience
4. Employee health and safety
5. The management of odour
6. The resilience of the plant to potential future urban growth
7. The ability to manage longer term changes in the regulatory or economic environment

The aggregate of these requirements generally favours sites which are relatively more distant from concentrations of population, allowing for management of odour and resilience to changes in the urban environment around Cambridge, including future urban growth towards the perimeter of a site, and potential future shifts in the regulation.

2 Anglian Water's legal obligations

2.1 Statutory Duty pursuant to the Water Industry Act 1991 (as amended)

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

In fulfilling this duty, Anglian Water must comply with the requirements of all relevant environmental legislation, including 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.

2.2 Environmental Permit Regulations

The Environmental Permitting (England and Wales) Regulations ("EPR") require Anglian Water to obtain environmental permits for wastewater treatment plants before they can operate because they could harm the environment or human health unless they are regulated. The aim of the EPR is to:

- protect the environment so that statutory and government policy environmental targets and outcomes are achieved;
- deliver permitting, and compliance with permits and certain environmental targets, effectively and efficiently;
- encourage regulators to promote best practice in the operation of facilities; and
- continue to implement European legislation fully.

The Environment Agency regulate and issue the relevant permits that are required. The existing Anglian Water site has environmental permits that cover, the discharge point, the quality and limits of the final effluent discharged via the discharge point into the River Cam, the storm arrangements and the sludge treatment conditions and limits.

Anglian Water have submitted applications to the Environment Agency to update the existing permits for the period up to the commissioning of CWWTP and for all new permits for CWWTP itself.

The conditions and limits imposed on these permits are being discussed and reviewed at present with both the Environment Agency and Natural England. The project's basis of design means that it will be designed to meet the requirements of all current relevant legislation and permits, regardless of the selected shortlisted location.

3 Anglian Water's strategic corporate commitments

As a purpose led company Anglian Water is committed to seeking positive environmental and social outcomes for the region it serves. Anglian Water's Strategic Direction Statement 2020 – 2045¹ maintains four core ambitions, as follows.

- To make the East of England resilient to the risks of drought and flooding
- Enable sustainable economic and housing growth in the UK's fastest growing region
- Reach net zero carbon emissions by 2030
- Work with others to achieve significant improvement in ecological quality across the Anglian Water catchment

Anglian Water has set out in further details how it will deliver these ambitions in its Five Point Green Delivery Plan which can be found at www.anglianwater.co.uk/siteassets/household/about-us/green-recovery-five-point-plan.pdf.

The five points are as follows.

1. Becoming a net zero carbon business
2. Accelerating sustainable housing and infrastructure growth
3. Creating green jobs and boosting skills
4. Delivering climate change adaptations and resilience
5. Enabling nature recovery

In order to become a net zero carbon business by 2030, Anglian Water as a company will source 44% of its energy requirements from on-site renewable sources by 2025 by utilising innovative solutions around solar energy and heat generated by its sludge treatment processes. Anglian Water will continue to collaborate with a wide range of companies through its supply chain and innovation networks to discover and implement new approaches to technology led solutions.

Anglian Water is also committed to driving down whole life carbon emissions in the delivery of major infrastructure projects. Working with Government and other leading business Anglian Water developed the world's first standard for managing carbon in infrastructure (PAS 2080) which is now being used nationally and internally.

¹ Anglian Water Services Limited, Strategic Direction Statement 2020–2045, LED612/11/17

Anglian Water intends to utilise these carbon reduction objectives to drive innovation into the delivery of CWWTP. Following the guidance set out in the Water UK “Net Zero 2030 Routemap” Anglian Water will shape the way it powers the plant and vehicles serving it, as well as continuing to explore opportunities to decarbonise heat generation for the local community and to apply circular economy thinking across the facility in order to maximise resource reuse, whilst preserving and enhancing the surrounding natural capital, including the River Cam.

To achieve all these objectives Anglian Water will as part of the delivery of the project reduce its capital carbon by 70% against a 2010 baseline using the Anglian Water’s PAS 2080 carbon modelling process, thereby reducing the impact of the project.

The project will also reduce operational carbon by 27% against a 2010 baseline using the AW PAS 2080 carbon modelling process, ensuring the facility remains carbon efficient throughout its life. Using innovative wastewater treatment technologies, Anglian water will reduce its process emissions at the plant by 60% against a 2010 baseline, by looking to harvest rather than treat vital nutrients entering the plant as well as filtering and removing harmful process emissions.

In order to achieve Anglian Water’s targets on becoming net zero carbon by 2030 the chosen site must have sufficient space to allow for the mitigation and possible enhancements needed to achieve these targets as well as those within the 5-point green recovery plan.

In addition, the biogas created at the plant through sludge treatment provides a valuable source of renewable energy. Anglian Water will explore ways to harness this energy, for example, to help improve the carbon impact of Anglian Water’s vehicles and to provide heat for the homes of nearby communities.

Treating wastewater as a resource promotes the circular economy thinking to harvest nutrients for use within our communities, thereby reducing the carbon impact of these resources. As the design of the treatment plant develops Anglian Water will explore the latest in construction techniques and products to minimise the impact of the delivery of the project, ensuring the treatment plant is a champion of the sustainability ethos that Cambridge is renowned for.

CWWTPR provides an opportunity to plan from the start how best to maximise the use of renewables in providing the necessary power needed to serve the Anglian Water community. Building on the vision set out in the UK Government Energy White Paper “Powering our Net Zero Future”, Anglian Water has the opportunity to benefit from the fast-developing renewable industry and deploy cutting edge solutions to ensure the plant is resilient in its power needs. Anglian Water also understands the role in ensuring the community moves to an energy solution matrix that aligns with Government’s net zero carbon goals. Anglian Water will, therefore, be ensuring the treatment plant not only serves its own heat needs, but where possible contributes to the needs of the local network.

Anglian Water will be exploring opportunities to see where the water recycled can add the most value to the surrounding water resources, either through further processing or transfer. Anglian Water will also deploy local water reuse measures on the structures it develops to minimise their water footprint.

Working with the Environment Agency and Natural England, Anglian Water will ensure the water is recycled back to the River Cam in the most sensitive way.

4 Odour (operational)

Odour modelling has been carried out as part of the site selection process to predict the potential impact of odour from an indicative CWWTPR footprint at each site during normal operations, in line with the Institute of Air Quality guidance for considerations during planning stages of projects.

The modelling reflects the covering of some tanks and process units to allow for the air from these to be extracted to odour control units or biogas management equipment, as appropriate. Anglian Water from their experience of operating over 1,000 wastewater treatment works understands that there is a delicate balance between covering tanks that may hold an odour potential and leaving others with less odour potential open, to ensure ease of operation. The decision to cover tanks also requires complying with Health and Safety related guidance and regulations, as well as considerations for asset life implications arising from creating sealed environments.

Covering tanks or process units increases technical complexity with the need for additional equipment from sensors, overflows and release valves, complicated monitoring software, to the covers and their associated support structures and odour control ducting and treatment themselves. Furthermore, it also introduces further risks associated with the potential for any of these components' failure. In addition, significant employee health and safety risks arise from working in confined spaces where hazardous gaseous may be present. Health and safety guidance advise the avoidance of carrying out tasks in confined spaces.

The odour modelling suggests CWWTPR could be developed at Sites 2 and 3 within the thresholds recommended by the relevant technical guidance, without the need to cover any tanks or assets additional to the baseline. To meet those thresholds at Site 1, the modelling suggests that further tanks or assets would need to be covered.

5 Future urban growth

Anglian Water needs to ensure that the relocated WWTP remains resilient in the face of change, including in respect of future urban growth and the evolution of environmental and industry regulation.

It is likely that over the lifetime of the project that the urban growth of Cambridge will continue. The potential for interactions between new development and wastewater infrastructure is managed by Anglian Water through its asset encroachment policy.

In order to manage odour and other potential operational effects, Anglian Water needs to maintain a suitable distance between the water recycling centres it operates and the communities they serve. In what is one of the fastest growing regions of the UK, however, there cannot be a blanket presumption against new development in the proximity of our infrastructure. Anglian Water has, therefore, an established approach to assess and manage the risks associated with proposed new development close to our works and any impact from them.

Our assessment of encroachment risk is aligned with the relevant planning policies in the adopted Cambridgeshire and Peterborough Minerals and Waste Plan which provides for wastewater treatment safeguarding areas (policy CS31).

The policy states that within a 400m safeguarding area around a WWTP there is a presumption against allowing development which would be occupied by people and planning permission will only be granted where it is demonstrated through an odour assessment report that the proposed development would not be adversely affected by the continued operation of the existing water treatment works.

Where applications for development are made within 400 metres of one of our WWTP it is our policy to assess the encroachment risks following a review of all relevant data (including the site manager's experience of odour issues) and engage with the local planning authority accordingly.

As outlined in the site selection report, we have adopted this 400m threshold, together with the use of odour modelling, to determine an appropriate physical buffer between the proposed sites and sensitive receptors. However Anglian Water's preference during site selection has been, wherever possible, to seek a greater distance than this minimum to ensure that potential future encroachment can be minimised. Sites with a greater distance from concentrations of population provide lower risks in this respect.

6 Future operational needs

As discussed above, the capacity of the proposed relocation project is based on a robust assessment of future demand to 2050. However, Anglian Water also believes that it is 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. Therefore, where possible during the site selection process, Anglian Water has considered the potential for the site to be expanded or adapted in the event that tighter environmental requirements are imposed on the water industry or for population growth occurring after 2050.

D.2 Access

Assessment methodology

- D.2.1 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.
- D.2.2 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. It was assumed that the A14 is suitable to carry the necessary traffic (similar to that of the existing WWTP) and therefore was not included in the assessment.
- D.2.3 The assessment conducted used available aerial imagery, OS mapping and a review of Cambridgeshire County Council's 'My Cambridge' interactive map to consider the following:
- The physical nature of existing highways infrastructure to the site from the A14, including; carriageway widths and junction types.
 - A swept path analysis for the proposed access arrangements into the site.
 - Any existing restrictions for Heavy Goods Vehicles (HGVs) along the routes.
 - Any weight restrictions present at bridges or crossings.
 - The resilience of the proposed access route, taking into consideration future plans to alter or remove existing highways infrastructure.
 - The cumulative impact of traffic associated with local committed developments and proposed infrastructure have been considered in the Preliminary Transport Assessment (TA) for each site (See Appendix K).
- D.2.4 The RAG definitions adopted for the access related operational impacts of each site are shown below in Table D.46.

Table D.78: Transport related operational impact – RAG definitions

Green	Amber	Red
Overall impact of site access during operation is expected to be minor: The physical nature of existing highways infrastructure to the site is considered adequate to accommodate HGV movements: There are no concerns regarding the resilience of the proposed access route.	Overall impact of site access during operation is expected to be moderate: The physical nature of existing highways infrastructure to the site is in need of improvement to accommodate high numbers of HGV movements: There are minor concerns regarding the resilience of the proposed access route.	Overall impact of site access during operation is expected to be severe: The physical nature of existing highways infrastructure to the site is considered inadequate/ unsafe to accommodate HGV movements: Existing weight restrictions are severely impeding the proposed access route and are not able to be moved/removed; or There are major concerns regarding the resilience of the proposed access route.

- D.2.5 For the purposes of assessing the operational access related impacts of each site, the differences in scheme sub-options such as 1a and 1b were considered negligible. Therefore, each option is grouped together as a singular site-based option.

Assessment of unmitigated options

D.2.6 A summary of the operational access screening assessments for the unmitigated options and the resulting RAG evaluation are provided below. Greater detail regarding site access and site routing is provided in the Preliminary TA in Appendix K.

Site area 1 and 2

D.2.7 Site areas 1 and 2 both provide site routing from the A14 Milton Interchange via the A10 and Butt Lane. Junctions along these access routes are suitable for the movement of HGVs and the route itself, highlighted in the Preliminary TA, contains no existing weight restrictions.

D.2.8 There are potential issues in relation to the A14 Milton Interchange as it is already considered to operating at capacity, which has been raised as a concern by Highways England.

D.2.9 Access to site areas 1 and 2 would be provided using a new priority T-junction off Butt Lane which would be designed to support queuing from HGVs using a dedicated right turn lane. A Swept Path analysis of this proposed junction has been conducted to demonstrate the junction would operate satisfactorily.

D.2.10 For site areas 1 and 2, there are minor operational concerns regarding the A10/Butt Lane junction. When exiting Butt Lane, heading southbound on the A10, vehicles must route through the existing Milton Park & Ride site, before stopping at a separate set of lights to turn right. Although this route through the Park & Ride is a piece of adopted highway, it is noted that the turning movement is already used by HGVs routing from Milton Recycling Centre and any additional HGV flow may impact upon congestion at this junction.

D.2.11 There is a possibility for the signalised A10/Butt Lane junction to reincorporate a right turn movement to prevent routing through the Park & Ride site. However, this would require further modelling and discussion with Cambridgeshire County Council.

D.2.12 The Preliminary TA has considered the potential cumulative impact of local committed developments to site areas 1 and 2, namely the addition of Waterbeach New Town, on the junctions that could be used for access to site areas 1 and 2. The assessment highlights that Waterbeach New Town has the potential to cause junctions to operate above capacity, therefore any future assessment of site areas 1 and 2 will require further consideration and assessment once more is known about the existing and proposed traffic generation for the WWTP site. As the A14 Milton Interchange is already considered to operating at capacity, it is considered that cumulative impacts of Waterbeach New Town are likely to be significant.

Site area 3

D.2.13 The unmitigated option for site area 3 provides operational routing from Junction 34 of the A14, via Horningsea Road. Junctions along this access route appear to be able to support the predicted level of HGV movements; however, as highlighted in the Preliminary TA, Horningsea Road has existing weight restrictions, which would need to be addressed.

D.2.14 In the unmitigated scenario, access to site area 3 would be provided using a new priority T-junction off Horningsea Road, which would be designed to support queuing from HGVs using a dedicated right turn lane. A Swept Path analysis of this junction has been conducted to demonstrate the junction would operate satisfactorily.

D.2.15 Junction 34 of the A14 is a 'west only' junction therefore only traffic to and from the west can access the site directly; whilst traffic travelling to and from the east via the A14, would currently be required to perform a U-turn manoeuvre at the Milton Interchange. Concerns have been

raised by Highways England in relation to use of this junction as it is already considered to be at capacity.

- D.2.16 In addition, there are some concerns regarding GCP's Cambridge Eastern Access Study which will consider the future role of Junction 34, including whether it will remain as a junction. However, the study is at an early stage and has not reached a conclusion on the future of Junction 34 as yet. Therefore, regular engagement with GCP will be required to monitor progress on this potential option.
- D.2.17 Table D.79 shows the operational access RAG assessment for all three sites that are being considered.

Table D.79: Operational access RAG assessment

Site	Unmitigated RAG score
1	Amber
2	Amber
3	Red

Mitigation identification

Site area 1

- D.2.18 For site area 1 there are no additional mitigation opportunities identified, during operation, that were not previously considered when evaluating the preferred access locations highlighted in the Preliminary TA in Appendix K.
- D.2.19 The mitigation opportunities considered in defining the preferred access option in the Preliminary TA include the following:
 - Site access from Butt Lane will take into consideration the proximity to the A10, to minimise any future impact of queueing to and from the proposed access route.
 - Site access from Butt Lane will consider field boundaries and follow existing field patterns to reduce the impact upon local farmers and reduce land take.
 - Site access will take into consideration the location of Mere Way and will be distanced accordingly to minimise interference with localised Non-Motorised User (NMU) movements.
 - Site access from Butt Lane via the A10 will be used as the access route to the A14 to minimise flows through nearby sensitive receptor locations such as Histon and Impington.
 - Site access from Butt Lane assumes construction of a new priority junction on Butt Lane with a dedicated right-turn into the site to prevent blocking back towards the A10.
- D.2.20 Mitigation for construction traffic impacts would include the preparation of a Construction Traffic Management Plan (CTMP) to achieve the following:
 - Reduce the duration and/or impact of any future road closures.
 - Reduce construction traffic flows during peak periods

Site area 2

- D.2.21 For site area 2 there are no additional mitigation opportunities identified, during operation, that were not previously considered when evaluating the preferred access locations highlighted in the Preliminary TA in Appendix K.

D.2.22 The mitigation opportunities considered in defining the preferred access option in the Preliminary TA include the following:

- Site access from Butt Lane will take into consideration the proximity to the A10, to minimise any future impact of queueing to and from the proposed access route.
- Site access from Butt Lane will consider field boundaries and follow existing field patterns to reduce the impact upon local farmers and reduce land take.
- Site access will take into consideration the location of Mere Way and will be distanced accordingly to minimise interference with localised Non-Motorised User (NMU) movements.
- Site access from Butt Lane via the A10 will be used as the access route to the A14, to minimise flows through nearby sensitive receptor locations such as Histon and Impington.
- Site access from Butt Lane assumes construction of a new priority junction on Butt Lane with a dedicated right-turn into the site to prevent blocking back towards the A10.

D.2.23 Mitigation for construction impacts would include the preparation of a CTMP to achieve the following:

- Reduce the duration and/or impact of any future road closures.
- Reduce construction traffic flows during peak periods

Site area 3

D.2.24 Numerous mitigation measures were considered for the construction and operation of site area 3, as described below.

Site area 3 mitigation measures during construction

D.2.25 In the mitigated scenario, access to Site 3 for construction will remain from Horningsea Road via Junction 34. The only exception to this is the construction of the operational access to Site 3, and the infrastructure changes to the south of the bridge over the A14 (as outlined below in D.2.27) which will take place from High Ditch Road via Junction 35.

D.2.26 The following mitigation measures have been considered:

- Formation of a CTMP:
 - To mitigate the duration and/or impact of any future road closures.
 - To minimise the quantity of construction vehicles accessing the site from the east. Construction vehicles and construction materials should be sourced from the north (A1 via A14 west), south (M11 via A14 west) or west (A14), where possible, to reduce the number of vehicles performing a U-turn manoeuvre at the Milton Interchange. In addition, the Histon Interchange could be used as an alternative junction to perform a U-turn manoeuvre to alleviate the compounding effects of existing operational traffic and construction traffic on the Milton interchange.
 - To minimise construction traffic flows during peak periods
- Possible speed reduction to improve the safety of the proposed construction access junction and reduce impact upon NMUs using the shared use pedestrian and cycleway along Horningsea Road.
- Maintain safe access to Low Fen Drove Way Public Right of Way for NMU's travelling from both Horningsea Road and High Ditch Road - with the exception of a few periods where it is anticipated that the bridge over the A14 will have to be closed for a short duration to carry out infrastructure works to Low Fen Drove Way to the south of the bridge and the access junction from High Ditch Road.

- Maintain safe access to Low Fen Drove Way itself via Horningsea Road, to negate the possibility of severance for dependant road users.

Site area 3 mitigation measures during operation

D.2.27 In the mitigated scenario, it is proposed that operational access will be via High Ditch Road/Low Fen Drove Way from Junction 35 of the A14 rather than from Junction 34 via Horningsea Road. This is because access from the A14 via Junction 34 (Fen Ditton) is restrictive and only currently caters for movements to and from the west and the future of Junction 34 is dependent upon the wider Cambridge Eastern Access Study. Please see the Preliminary TA in Appendix K for further detail.

D.2.28 The following mitigation measures have been considered:

- Highways improvements to High Ditch Road to increase the width of the carriageway by approximately 1m to the north.
- Junction improvements to both the High Ditch Road/Newmarket Road junction and High Ditch Road/ Low Fen Drove Way junction to allow for safer turning movements for HGVs.
- Infrastructure improvements to integrate one-way signals over the Low Fen Drove Way bridge over the A14, reducing conflict and allowing safe access to site area 3.
- Widening the approach to Low Fen Drove Way bridge to allow for safe passage of HGVs.
- Improving the existing safety of NMU's along Low Fen Drove Way by ensuring a safe and clear route for all Non-Motorised Users.
- Improved signage to provide prior warning signs to access only weight restrictions along High Ditch Road.

Assessment of mitigated options

D.2.29 A summary of the operational access screening assessments for the mitigated options and the resulting RAG evaluation are provided below. Greater detail regarding site access and site routing is provided in the Preliminary TA in Appendix K.

Site areas 1 and 2

D.2.30 As outlined in above, the preferred operational access routes into site areas 1 and 2 do not require further mitigation measures at this stage.

D.2.31 As a result, the RAG evaluations for site areas 1 and 2 are unchanged from unmitigated scenario.

Site area 3

D.2.32 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, highlighted in the Preliminary TA (Appendix K), put in place; junctions along this access route appear to be capable of accommodating the predicted number of HGV movements.

D.2.33 The existing "access only" weight restriction for HGVs along High Ditch Road would be highlighted using an advance warning sign at the improved Newmarket Road/High Ditch Road Junction; to inform HGVs drivers about the proposed site access and prevent HGVs drivers continuing along High Ditch Road towards Fen Ditton.

D.2.34 High Ditch Road itself would be widened to the northern side to allow for the passing of HGV vehicles without risk of kerb and verge degradation.

- D.2.35 Access to site area 3 would be provided using a new priority T-junction off Low Fen Drove Way, which would be designed to support queuing of HGVs.
- D.2.36 Operational vehicles travelling to and from the east via the A14, would no longer need to perform a U-turn manoeuvre at the Milton Interchange, as vehicles would instead route via Junction 35, the Quy Interchange. There are currently no concerns regarding the resilience of the mitigated access route as operational access would no longer depend on Junction 34. Operational access via High Ditch Road does not currently conflict with GCP's plans for Cambridge Eastern Access.
- D.2.37 The Preliminary TA has considered the potential cumulative impact of local committed developments to site area 3, namely the development of land both North of Cherry Hinton (S/1231/18/OL)⁷⁴ and North of Newmarket Road (S/2682/13/OL) (also known as the Marleigh/Wing development).
- D.2.38 The junction performance data associated with these developments highlights the potential for the A14 Junction 35 roundabout (Quy interchange) to be over capacity with the Marleigh (formerly Wing) development in place, but as this assessment dates back to 2013, should site area 3 be taken forward, there would need to be an up-to-date traffic assessment of the area which considers the cumulative impact. However, the operational increase in traffic for WWTP is considered to be minor compared to the increase in traffic associated with the Marleigh (formerly Wing) development.
- D.2.39 It is considered that the potential cumulative impacts of committed development are greater for operational access to site areas 1 and 2 than for site area 3.

Table D.80: Operational access RAG assessment

Site	Mitigation Measures	Unmitigated RAG score	Mitigated RAG score
1	No further mitigation needed following preferred access option assessment	Amber	Amber
2	No further mitigation needed following preferred access option assessment	Amber	Amber
3	Complete change of routing from access option HSR-01 to HDR-01. Access from Junction 35 of the A14 via Newmarket Road, High Ditch Road and Low Fen Drove Way. Highways improvements to High Ditch Road. Junction improvements to High Ditch Road/Newmarket Road and High Ditch Road/Low Fen Drove Way Junction Infrastructure improvements to bridge over the A14	Red	Green

⁷⁴ North of Cherry Hinton Development: S/1231/18/OL - 1200 residential dwellings (including retirement living facility (within Use Class C2/C3)) a local centre comprising uses within Use Class A1/A2/A3/A4/A5/B1a/D1/D2 primary and secondary schools community facilities open spaces allotments landscaping and associated infrastructure.

Incorporating feedback

D.2.40 Phase one non-statutory consultation was held in order to share the proposals for relocating the WWTP with the public and stakeholders. This section provides a summary of the feedback received from the public in relation to traffic and access and how the concerns, issues and opportunities raised have been considered within the assessment criteria for Stage 4 final site selection.

Table D.81: Traffic and access feedback

Sub-Theme	Site (if specific)	Feedback Summary	Response
		Most respondents commenting on traffic and access were concerned with air quality, noise and increased congestion during construction and operation of the plant.	The noise and air quality assessments consider the potential impacts of traffic during construction and operation of the new WWTP; and therefore do not need to be considered when evaluating the potential impact of traffic and access. Congestion during construction and operational periods is considered within the traffic impacts assessment and will be managed with a Construction Management Plan.
		Concerns about the proposed A10 dualling	The traffic and access assessments considered the potential for cumulative impacts including infrastructure improvements. This is assessed further in the preliminary Transport Assessment which states that the A10 dualling scheme is not committed at present and therefore has not been considered further at this stage.
General		Concerns over safety from site traffic using local roads were raised, particularly in relation to local schools.	Safety of road uses has been considered in the assessment including pedestrian crossings and sensitive receptors such as schools and playgrounds (see Appendix C.4). The assessment confirms that the proposed access routes to all of the proposed sites do not pass numerous sensitive receptors and do not pass any schools.
		In terms of Traffic and access, site 3 was most favoured. A number of comments queried how access to Sites 1 or 2 would be achieved.	The access assessment (see Section D.2) presents how Site 1 & 2 would be accessed from a new priority T-junction off Butt Lane which would be designed to support queuing of HGV's using a dedicated right turn lane. A Swept Path analysis of this proposed junction has been conducted to demonstrate the junction would operate satisfactorily.
		Comment that traffic on the A10 will already be increased with the development of Waterbeach New Town and the new police and fire stations.	The access (see Section D.2) and traffic (see Appendix C.4) assessments discuss how Site 1 & 2 have been considered with the cumulative impact of Waterbeach New Town. The proposals for the police and fire stations to be relocated to land south of Milton Park & Ride are not committed at the time of writing and thus have not been included in the assessment.

Sub-Theme	Site (if specific)	Feedback Summary	Response
Impacts of increased Traffic	Site 1 & 2	Concern raised over traffic impacts to local communities, for which a significant number of comments consider to be greater for Sites 1 and 2. The proximity to schools, nurseries and a travellers' site were specifically sited.	The assessment includes sensitivity receptors along the route for example, residential communities, schools and nurseries (see Appendix C.4).
		Noise and pollution were the most common concerns amongst those commenting on sites 1 and 2, often owing to either the historic character of site 1 or the potential cumulative impacts of the existing levels of A10 traffic.	Noise and air quality assessments will use the traffic assessment to undertake their analysis. However, noise and air quality are assessed separately to traffic and therefore do not need to be reported when evaluating the potential impact of traffic and access.
		Responses relating to site 3 were less concerned with major commuter routes however were concerned about the impacts and safety of HGVs on roads considered to be unsuitable, such as High Ditch Road, including the junction with Newmarket Road.	It has been recognised that High Ditch Road is not presently suitable for HGV movements and the proposals for site area 3 would include highways improvements to increase the width of both the carriageway and junction with Newmarket Road (see mitigation section above)
		Many respondents suggested Site 3 was more suitable as any increase in traffic would not affect as many local communities through a relatively lower impact on congestion.	Existing congestion on the localised network pertinent to Site 1, 2 & 3 is outlined within the Preliminary TA and has been used to inform Stage 4 Site selection.
	Site 3	The increased congestion of the A14 was raised multiple times regarding Site 3, although with less frequency than to sites 1 & 2.	The access and traffic assessments assume that the A14 is suitable to carry the necessary operational traffic (similar to that of the existing WWTP) and the use of the A14 would be similar across all the proposed sites, with the exception of which junctions are used to access the sites. Therefore, the impact on the A14 carriageway was not included in the assessment, however the potential impact on the A14 junctions used to access the sites are included in the assessments.
		Comment that if Site 3 is selected, a new non-motorised user bridge over the A14 suitable for horses should be built, as well as all current PROW and non-registered but established in use access routes for horse riders protected.	There are currently no plans to build a new bridge over the A14. Safe access to the PROW will be maintained using the following proposed mitigations included within the assessment: (see mitigation section above) <ul style="list-style-type: none"> ● Infrastructure improvements to integrate one-way signals over the Low Fen Drove Way bridge over the A14, reducing conflict and allowing safe access to Site 3. ● Infrastructure improvements over the Low Fen Drove Way bridge over the A14 to maintain safe access to the Low Fen Drove Way PROW.
		Comment that local cycle ways, in particular a newly completed route between Horningsea and Fen Ditton, would be compromised by Site 3 traffic.	Assessment states that operational access would be from Junction 35 of the A14 via High Ditch Road, thus the route would not impact on the road between Fen Ditton and Horningsea (Horningsea Road) and would not impact on the cycleway (which is off-road on a shared-use path)

Sub-Theme	Site (if specific)	Feedback Summary	Response
			The impact of construction access on the cycleway will be mitigated using a Construction Management Plan, to minimise flow during peak periods. A traffic order will also be sought to introduce a temporary speed reduction on approach to the proposed construction access.
Access	Site 1	Some responses suggested that Sites 1 & 2 had considerably better access than site 3, although others claimed it was unclear where the access to the site would come from, given the closure of Butt Lane and additional disruption from police station proposal.	Access to Site 1 would be provided using a new priority T-junction off Butt Lane which would be designed to support queuing from HGV's using a dedicated right turn lane. A Swept Path analysis of this proposed junction has been conducted to demonstrate the junction would operate satisfactorily. The proposal to relocate Cambridge Police station is not committed and can therefore not be included in the cumulative assessment.
	Site 2	Similarly, concern was raised regarding accessing Site 2 from Butt Lane via the A10 in having a negative impact on the traffic both during construction and operation. Comment that Butt Lane would not be a suitable access point as it is already used to access a recycling centre, a Park and Ride facility and, currently, a Covid-19 testing facility.	Access to Site 1 would be provided using a new priority T-junction off Butt Lane which would be designed to support queuing from HGV's using a dedicated right turn lane. A Swept Path analysis of this proposed junction has been conducted to demonstrate the junction would operate satisfactorily. A preliminary traffic flow assessment has been undertaken using the Waterbeach New Town planning application to assess baseline traffic and committed developments.
		Concern reported over existing traffic levels on the A10, and that this may be exacerbated by the Waterbeach New Town and proposed Police Station.	see above
	Site 3	It was commented that Site 3 was favourable as there is access to the A14 without having to go through residential areas for construction. However, other comments were concerned about site traffic needing to use a bridge over the disused railway or a farmer's bridge to cross the A14, neither of which would be suitable.	Construction access is proposed to be provided directly from Junction 34 of the A14 via Horningsea Road. Traffic will not be permitted to route through local residential areas such as Horningsea and Fen Ditton. Access into Site 3 is not proposed to use either a farmer's bridge or the bridge over the disused railway. As discussed in the mitigation section, proposed access to Site 3 routes via the Low Fen Drove Way bridge following improvements.

D.3 Flood risk

Assessment methodology

- D.3.1 This assessment criterion considers 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. Flood risk over the lifetime of the development has additionally been considered for all site areas using climate change data provided by the Environment Agency,.
- D.3.2 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 (See Appendix B.4).
- D.3.3 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)
- D.3.4 The RAG categories developed for this assessment are provided in Table D.82. The RAG evaluations for the individual flood risk assessed components have been combined to provide a single RAG evaluation per shortlisted site area. The final RAG score per site is conservative and is based on the worst-case flood risk element per site.

Table D.82: Flood Risk RAG categories

Flood Risk	Green	Amber	Red
Fluvial/Tidal	EA Flood Zone 1. Unimpacted by Environment Agency climate change projections.	EA Flood Zone 1. Potential FZ2 or FZ3 in future according to Environment Agency climate change projections.	Currently located in EA Flood Zone 2 or 3
Surface Water	Majority of site at "Very Low" or "Low" risk of surface water flooding (EA RoFSW data).	Majority of site at a "Medium" risk of surface water flooding (EA RoFSW data).	Majority of site at "High" risk of surface water flooding (EA RoFSW data).
Groundwater	No EA or SFRA recorded incidents of groundwater flooding within vicinity of site.	Recorded EA or SFRA incidents of groundwater flooding within vicinity of site.	Recorded EA or SFRA incidents of groundwater flooding on site.
Sewer	No recorded EA or SFRA incidents of sewer flooding within vicinity of site.	Recorded EA or SFRA incidents of sewer flooding within vicinity of site.	Recorded EA or SFRA incidents of sewer flooding on site.
Residual Risk	Low risk of flooding from reservoirs, or from breached flood defences (EA data). In the unlikely event of flooding from these sources, the FD2320 'flood hazard to people' would be low.	Medium risk of flooding from reservoirs, or from breached flood defences (EA data). In the unlikely event of flooding from these sources, the FD2320 'flood hazard to people' would be low.	Low, medium or high risk of flooding from reservoirs, or from breached flood defences (EA data). For a medium to high risk event from these sources, the flood hazard to people may be low, medium or high. For a low-risk event, the FD2320 'flood hazard to people' would be medium or high.

Assessment of unmitigated options

D.3.5 The detailed flood risk screening assessment for each site area is provided in Appendix I. A summary of the assessments and the resulting RAG evaluation are provided below.

Site area 1

D.3.6 Site area 1 is located entirely within Environment Agency (EA) Flood Zone 1 (See Appendix I.1). The site is a minimum of 1.7km north-west of the River Cam, which is an EA main river, and is a minimum of 3.7km south-east of the Great Ouse, which is also an EA main river.

D.3.7 The closest EA Flood Zone 2 and 3 areas are located approximately 360m north west of site, associated with the ordinary watercourses/drain network which drains to the Great Ouse.

D.3.8 Given that the site is located entirely within Flood Zone 1 the fluvial/tidal flood risk to site is considered to be low.

D.3.9 According to the EA Risk of Flooding from Surface Water (RoFSW) extents maps (See Appendix I.1), the risk of surface water flooding on site may be considered "Very Low" to "Low". Therefore, the risk of surface water flooding is considered to be low.

D.3.10 Bedrock in this area is considered to have essentially no groundwater. The site is not located within an EA groundwater Source Protection Zone. The South Cambridgeshire and Cambridge City Level 1 Strategic Flood Risk Assessment (SFRA) (South Cambridgeshire District Council & Cambridge City Council, 2010) states that groundwater flooding has occurred within the district, but there is no indication that the area to the west of Milton has previously been affected by groundwater flooding. Therefore, the risk of flooding from groundwater is considered to be low.

- D.3.11 The South Cambridgeshire and Cambridge City SFRA (South Cambridgeshire District Council & Cambridge City Council, 2010) indicates that there have been no recorded incidents of sewer flooding on site, based on information provided by the Highways Agency, parish councils and Anglian Water Services DG5 register. Therefore, the risk of flooding from sewer sources is considered to be low.
- D.3.12 The site is not located with an area that is considered to benefit from EA defences to a 1 in 100-year standard of protection. Therefore, the risk to the site in the event of a breach of defences is considered to be low.
- D.3.13 The EA Risk of Flooding from Reservoirs map demonstrates that the site is not located within an area considered at risk in the event of reservoir failure.

Site area 2

- D.3.14 Site area 2 is located entirely within EA Flood Zone 1 (See Appendix I.2). The site is a minimum of 2.1km north-west of the River Cam, which is an EA main river, and is a minimum of 2.8km south-east of the Great Ouse, which is also an EA main river.
- D.3.15 The closest EA Flood Zone 2 and 3 areas are approximately 1km north-west of site, associated with a public drain, which in turn drains to the Great Ouse.
- D.3.16 Given that the site is located entirely within Flood Zone 1 the fluvial/tidal flood risk to site is considered to be low.
- D.3.17 According to the EA Risk of Flooding from Surface Water (RoFSW) extents maps (See Appendix I.2), the risk of surface water flooding on site may be considered "Very Low". Therefore, the risk of surface water flooding is considered to be low.
- D.3.18 Bedrock in this area is considered to have essentially no groundwater. The site is not located within an EA groundwater Source Protection Zone. The South Cambridgeshire and Cambridge City SFRA (South Cambridgeshire District Council & Cambridge City Council, 2010) states that groundwater flooding has occurred within the district, but there is no indication that the area to the west of Milton has previously been affected by groundwater flooding. Therefore, the risk of flooding from groundwater is considered to be low.
- D.3.19 The South Cambridgeshire and Cambridge City SFRA (South Cambridgeshire District Council & Cambridge City Council, 2010) indicates that there have been no recorded incidents of sewer flooding on site, based on information provided by the Highways Agency, parish councils and Anglian Water Services DG5 register. Therefore, the risk of flooding from sewer sources is considered to be low.
- D.3.20 The site is not located with an area that is considered to benefit from EA defences to a 1 in 100-year standard of protection. Therefore, the risk to site in the event of a breach of defences is considered to be low.
- D.3.21 The EA Risk of Flooding from Reservoirs map demonstrates that the site is not located within an area considered at risk in the event of reservoir failure.

Site area 3

- D.3.22 Site area 3 is located entirely within EA Flood Zone 1 (See Appendix I.3). The site is a minimum of 430m west of Quy Water which drains to the Rive Cam, both of which are EA main rivers. The site is a minimum of 600m south-east of the River Cam.

- D.3.23 The closest EA Flood Zone 2 and 3 areas are approximately 450km north-west of site, associated with the River Cam and 200m east of site, associated with Quy Water. As the site is located entirely within Flood Zone 1, the fluvial/tidal risk to site is considered to be low.
- D.3.24 EA guidance states that “Water Compatible” developments which are currently located within Flood Zone 1 but may be in Flood Zones 2 or 3 in the future, should apply the Central Allowance for peak river flow. In the Anglian catchment, the Central peak river flow allowance is 25%.
- D.3.25 The EA has supplied the modelled flood extents for the 1% Annual Exceedance Probability (AEP) including a 20% Climate Change (CC) peak river flow allowance (See Appendix I.3). The supplied data is from the Cam Urban model, which includes a blanket 20% climate change peak river flow allowance. Modelled flood extents and depths for the Central Allowance (25%) are not currently available from the EA (August 2020). The 1%AEP+20%CC flood extent may be considered indicative only of potential flooding in the 1%AEP+25%CC event.
- D.3.26 In a 1%AEP+20%CC event, the modelled flood level at the closest modelled upstream node to site (BL7420D, See Appendix I.3) would be 6.42mAOD. The average elevation on site is 9.07mAOD (according to Environment Agency 2m LiDAR data). EA modelled flood extents for the 1%AEP+20%CC event demonstrates that the site would not be inundated in this event.
- D.3.27 Confirmation of 1%AEP+25%CC flood levels, flows and extents should be sought where possible, availing of EA JFlow models, prior to development on this site.
- D.3.28 As the Cam Urban model demonstrates the site not to be inundated in the 1%AEP+20%CC event, the fluvial /tidal risk to site in the future is considered to be low.
- D.3.29 According to the EA Risk of Flooding from Surface Water (RoFSW) extents maps (See Appendix I.3), the risk of surface water flooding on site may be considered “Very Low”. Therefore, the risk of surface water flooding is considered to be low.
- D.3.30 The chalk bedrock below the site area is classified on a regional scale as a Principal aquifer. However, in this area, important aquifer horizons are absent in chalk. The site is not located within an EA groundwater Source Protection Zone. The South Cambridgeshire and Cambridge City SFRA (South Cambridgeshire District Council & Cambridge City Council, 2010) states that groundwater flooding has occurred within the district, but the closest recorded incident of groundwater flooding occurred approximately 1km east of site area. Therefore, the risk of flooding from groundwater is considered to be low.
- D.3.31 The site area is not located within an area that is considered to benefit from EA defences to a 1 in 100-year standard of protection. Therefore, the risk to site in the event of a breach of defences is considered to be low.
- D.3.32 The EA Risk of Flooding from Reservoirs map demonstrates that the site is not located within an area considered at risk in the event of reservoir failure.
- RAG summary**
- D.3.33 The table below summarises the RAG evaluation for flood risk at each site and confirms that the overall risk of flooding is low for all three sites.

Table D.83: Flood risk RAG assessment

Parameter	Site area 1	Site area 2	Site area 3
Fluvial/Tidal present day	Low Risk	Low Risk	Low Risk
Fluvial/Tidal Including climate change	Low Risk	Low Risk	Low Risk
Surface Water	Very Low to Low Risk	Very Low Risk	Very Low Risk
Groundwater	Low Risk	Low Risk	Low Risk
Sewer	Low Risk	Low Risk	Low Risk
Residual Risk	Low Risk	Low Risk	Low Risk
Overall flood risk	Low Risk	Low Risk	Low Risk

Incorporating feedback

D.3.34 Phase one non-statutory consultation was held in order to share the proposals for relocating the WWTP with the public and stakeholders. This section provides a summary of the feedback received from the public in relation to flood risk and how the concerns, issues and opportunities raised have been considered within the assessment criteria for Stage 4 final site selection.

Table D.84: Flood risk feedback

Sub-Theme	Site (if specific)	Comment Summary	Response
Flood Risk	General	Feedback shows some concern regarding an increase to flood risk in the local area.	During Stage 1 of site selection, the EA flood zones were used as a primary constraint so that no sites proposed would be in an area at a high risk of flooding. A high-level flood risk screening assessment has also been carried out on the three shortlisted sites within the Stage 4 assessment, which has demonstrated that all of the site area options have a low risk of flooding from all potential sources. A flood risk assessment will be carried out for the chosen site during the EIA stage to ensure that any risk of flooding from the site itself is mitigated through design and operation of the new WWTP.
	Site area 2	Specific comment received that Site 2 area is prone to flooding (from a non-technical stakeholder).	The high-level flood risk screening assessment carried out during Stage 4 has indicated that site area 2 has a low risk of flooding from all sources. However, were this site area to be chosen a flood risk assessment would be carried out during the EIA stage to ensure that any risk of flooding is mitigated through design and operation of the new WWTP.

Assessment of mitigated options

- D.3.35 As the assessment of unmitigated options resulted in a low flood risk it is not deemed necessary to identify mitigation measures for the purposes of the final site selection assessment. Therefore, an assessment of mitigated options in relation to flood risk has not been undertaken. A flood risk assessment will be carried out during the EIA stage to further assess the risk for the chosen site and identify if any mitigation measures are required to manage the risk of flooding from the site and associated infrastructure.

E. Economic assessment

E.1 Assessment methodology

- E.1.1 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.
- E.1.2 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.
- E.1.3 Initially an unmitigated cost for each option 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.
- E.1.4 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 cost estimates were forecast over a 20-year period.
- E.1.5 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.

E.2 Establishing a cost baseline

Approach

- E.2.1 A whole life cost for an unmitigated version of each of the site area options (including sub-options) has been calculated.
- E.2.2 As discussed above, the unmitigated versions of the options comprise 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. However, the unmitigated options do not include consideration of any site specific planning or operational constraints or potential impacts that the scheme may have on the environment or local communities.
- E.2.3 This approach establishes the baseline site area option against which all other site area options are compared.
- E.2.4 The whole life cost of each option is the discounted cost of the option over 20 years (including capital and operational costs over the lifetime of the project), converted into an equivalent unit of cost of waste water treatment in £/m³ net present value terms. This means that future costs and outputs are discounted, when compared to costs and outputs today.

E.2.5 The following sections outline the assumptions used in the calculation of the unmitigated costs.

CAPEX assumptions

E.2.6 The following assumptions have been used in the calculation of the CAPEX.

E.2.7 The construction cost of the WWTP is the same for all three sites as in an unmitigated version of the option there is no difference in the treatment processes and environmental protection measures employed at each site.

E.2.8 An estimate for the cost of land acquisition and compensation has been factored into the costs based on a preliminary understanding of the current land uses at each of the three site areas.

E.2.9 The cost of the associated transfer infrastructure differs due to the variation in length and method of construction. The main design assumptions for tunnels and pipelines in terms of diameters, construction methods, etc. were outlined in the Stage 3 Fine Screening report and are considered to still be valid. However, further work on defining the corridors for Stage 4 has resulted in some changes in the assumptions in relation to tunnel/pipeline lengths and these are provided in Table E.85.

Table E.85: Transfer infrastructure assumptions – tunnel and pipelines

Parameters	Site 1		Site 2		Site 3	
	Unit	Option A	Option B	Option A	Option B	Option A
Waste water transfer tunnel (all options)						
Total tunnel Length	m	2550		3000		2650
Drive shaft depth	m	23.5		26.1		23.7
Reception shaft depth	m	17.3		17.3		17.3
No. Intermediate shafts		0		0		0
Waterbeach waste water transfer pipeline (all options)						
Pipeline length	m	4360		6120		6310
Treated effluent return tunnel (sub-option i)						
Total tunnel length (m)	m	3100	2600	4000	4000	1500
Drive shaft depth	m	12.0	12.0	12.0	12.0	12.0
Reception shaft depth	m	12.4	11.8	11.5	11.5	10.4
No. Intermediate shafts		1	0	1	1	0
Intermediate shaft depth	m	0	0	10.5	10.5	0
Treated effluent return pipeline (sub-option ii)						
Pipeline length		3100	2600	4000	4000	1500

The costs for road access and high-voltage power connections have also been included in the unmitigated cost baseline.

OPEX assumptions

E.2.10 The following assumptions have been used in the calculation of the OPEX.

E.2.11 As per the CAPEX the operational cost for treatment of the waste water is equal for all three sites due to the identical requirements for treatment processes and operational controls in an unmitigated scenario. However, there are differences in the operational costs in terms of the

energy requirements for transferring waste water from Cambridge and Waterbeach to the new WWTP as well as returning treated effluent to the River Cam. These differences arise due to the variations in length and depth of the tunnels as well as the length of pipelines as described in the CAPEX assumptions above.

Calculated CAPEX and whole life costs

- E.2.12 Table E.86 details the baseline (unmitigated) CAPEX and equivalent unit costs calculated for each of the options.
- E.2.13 From the CAPEX comparison it can be seen that Option 3Aii has the lowest baseline CAPEX estimate. These CAPEX estimates are based on a preliminary design for the proposed options and it is not unusual for an uncertainty range to be applied to the CAPEX estimates. In this case an uncertainty range of +20% / -15% would be reasonable given the stage of project development. This range is in line with the US Association for Advancement of Cost Engineering (AACE) cost estimation classification scheme⁷⁵, which provides guidance on cost estimate classification and uncertainty ranges. If the final CAPEX was at the higher end of this uncertainty range then both options 3Ai and 3Aii provide greater certainty of being within budget than the other options.
- E.2.14 From the whole life cost comparison it can be seen that Option 3Aii has the lowest whole life costs, closely followed by option 3Ai. However, the difference between the options is small, with a maximum difference of 6% between the lowest and highest whole life cost options (2Ai, 2Aii, 2Bi and 2Bii).

Table E.86: Comparison of total capex and whole life costs (unmitigated)

Option	Total CAPEX as % of lowest cost options	WLC as % of lowest cost options
1Ai	107%	103%
1Bi	105%	102%
1Aii	107%	103%
1Bii	105%	102%
2Ai	113%	106%
2Bi	113%	106%
2Aii	112%	105%
2Bii	112%	105%
3Ai	101%	101%
3Aii	100%	100%

⁷⁵ AACE, International Recommended Practice No. 18R-97, Cost estimate classification system – as applied in engineering, procurement, and construction for the process industries, TCM Framework: 7.3 – Cost Estimating and Budgeting, 2005. Available at: https://www.costengineering.eu/Downloads/articles/AACE_CLASSIFICATION_SYSTEM.pdf

Baseline option

- E.2.15 The calculation of the whole life costs has identified that the baseline option is a new WWTP on site area 3, using pipelines for returning treated effluent to the River Cam. This represents the option that all other options will be compared against in the mitigated scenarios.

E.3 Mitigated costs

Approach

- E.3.1 The mitigation measures for the different options are outline in mitigation identification sections in Appendices B, C and D. Some of these mitigation measures would have either no impact or very low impact on the cost of each option. However, some options would have a more significant cost impact and these additional mitigation costs should be taken into account in site selection and reflected in the 'with mitigation' option costs. The 'with mitigation' costs (CAPEX, OPEX and WLC) for each option have been assessed by adding the estimated costs of proposed mitigation measures to the baseline (unmitigated) costs discussed in Appendix E.1.1.

- E.3.2 The following mitigation measures were estimated to have significant cost impacts and have been included in the 'with mitigation' option costs:

- Use of a primary and secondary lining for tunnel sections and shafts passing through the Lower Greensand or Grey Chalk aquifers to prevent interaction with groundwater in the aquifers
- Access impact mitigation measures. For site area 3, construction of proposed operational access via High Ditch Road/Low Fen Drove Way from Junction 35 of the A14 (see Appendix D.2).
- Nature Conservation and Biodiversity.
- Landscape and visual amenity. Provision of tree and hedge planting, modification of structure elevations and appearance and other landscape modifications
- Odour. Installing covers on additional process units, orientation and design of the WWTP such that process units would be further away from receptors at site area 1. Similar mitigation measure not required for sites 2 and 3 (see Appendix B.8).

Results

- E.3.3 The mitigated costs are compared with the unmitigated costs in Table E.87.

Table E.87: Mitigated vs unmitigated costs

Site area option	% compared to lowest cost option (CAPEX)		% compared to lowest cost option (WLC)	
	Unmitigated	Mitigated	Unmitigated	Mitigated
1Ai	107%	111%	103%	105%
1Bi	105%	109%	102%	104%
1Aii	107%	109%	103%	104%
1Bii	105%	107%	102%	103%
2Ai	113%	116%	106%	107%
2Bi	113%	116%	106%	107%
2Aii	112%	113%	105%	105%
2Bii	112%	113%	105%	105%
3Ai	101%	102%	101%	101%
3Aii	100%	100%	100%	100%

F. Planning assessment

F.1 Planning assessment report

Planning Assessment

CWWTPR
Stage 4 Final Site Selection



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1. Purpose

- 1.1. To assess the suitability of the shortlisted sites in planning terms having regard to landscape and land use designations, heritage designations and planning policy objectives, surrounding uses, infrastructure capacity and amenity considerations.

2. Criteria and Changes to Assessment from Stage 3

- 2.1. In the previous site selection stages the following planning related matters have been considered as one aspect of the selection criteria:

Stage	Criteria Name	Objectives of Assessment:
Initial Options Appraisal	Impacts on local communities	High-level assessment of key factors such as traffic, odour, noise and visual amenity
Stage 1 – Initial Site Selection	Primary baseline constraints – Environmental and Community	Review of relevant national, regional and local policies to identify the primary constraints including existing residential communities, protected and statutory designated sites, green belt, flood risk areas, landfill sites and watercourses and, using buffers where appropriate, to identify suitable unconstrained areas with potential to limit impacts.
Stage 2 – Course Screening	Planning – Development Constraints and Green Belt	Identification of development constraints having regard to policy (including Green Belt), site allocations and committed development and sensitivity of neighbouring land. Assessment of the potential for environmental and community impacts.
Stage 3 – Fine Screening	Planning - Green Belt and Risk to Aviation	Assessment against Green Belt policy and guidance. Potential impacts on aviation in relation to proximity to Cambridge Airport. More focussed assessment of potential environmental and community impacts.

- 2.2. The conclusion from the previous stages is that only 3 site areas and their connecting infrastructure options are capable of meeting AWS' selection criteria.
- 2.3. For the Stage 4 Final Site Selection, the planning assessment looks at how each site area and corridor option performs against planning policy and considers whether each option is capable of being granted consent in the context of the requirements of national policy taking into account the potential scope for

mitigation (so far as possible at this stage of the project and within the confines of what is needed to deliver CWWTPR).

- 2.4. For the purposes of an NSIP for waste water¹, relevant planning policy is set out in the National Policy Statement for Waste Water (the 'NPS').
- 2.5. Part 4 of the NPS sets out policies that are relevant to particular physical impacts of the construction and operation of wastewater NSIPs, under a heading of Generic Impacts. The NPS also 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 provides a useful framework for the Stage 4 Planning Assessment:

ID	Criteria referenced in the NPS	Para.
1	Impact on Water quality and resources	4.2
2	Odour (quality of life) impacts on amenity of surrounding uses	4.3
3	Flood risk and drainage vulnerability (of the site and its users and from the project)	4.4
4	Impacts on biodiversity and geological conservation and availability of surrounding land for mitigation measures	4.5
5	Coastal change	4.6
6	Landscape and visual impacts (including townscape)	4.7
7	Impact on land use including open space, green infrastructure and Green Belt (openness and purposes)	4.8
8	Noise and vibration Impacts on quality of life including proximity to sensitive surrounding land uses (including quiet places)	4.9
9	Historic environment	4.10
10	Air quality and emissions impacts on health, protected species and habitats and the wider countryside	4.11
11	Potential impacts of dust, artificial light, smoke, steam and insect infestation on premises and locations	4.12
12	Traffic and transport impacts (construction and operation) including suitability and resilience of access route	4.13
13	Waste management	4.14
14	Socio-economic	4.15

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69505/pb13709-waste-water-nps.pdf

- 2.6. With the exception of Criterion 5 (Coastal change) and elements of Criterion 11, most of the matters identified in the above criteria are addressed in the focused assessments undertaken for the Operational, Programme, Economic, Environment and Community assessment criteria, which are covered elsewhere. These, where relevant, identify potential impacts which may arise from the development and their potential significance in the context of each site and its surroundings (for example, on noise sensitive receptors). This planning assessment draws from these but goes further in considering the potential wider planning policy and land use impacts of development under each option.
- 2.7. In respect of Criterion 5 (Coastal change), this is considered to be neutral for site assessment purposes since none of the site options are located in an area at risk from coastal change. For Criterion 11, potential impacts from dust on premises and locations are covered in the air quality and emissions assessment. Impacts from artificial light are considered as part of the landscape and visual impact assessment and biodiversity assessment. Impacts from smoke, steam and insect infestation are considered to be low and for the purposes of this assessment are considered equal to each site.
- 2.8. The only NPS criterion which remains to be assessed outside the Operational, Programme, Economic, Environment and Community assessment criteria, therefore, 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' is first required.

3. Impact on Land Use (NPS Criterion 7) Site Options Assessment

- 3.1. Assessment of each site area and corridor option under NPS criterion 7 is addressed in this Planning Assessment having regard to the following matters:
- I. Policy designations
 - II. Description of surrounding land uses and activities
 - III. Function and value of each site in land use terms (including Green Belt)

- IV. Potential impacts of CWWTPR development on
- Green Belt purposes
 - Other policy designations
 - Surrounding land uses (existing, committed and proposed)

3.2. The statutory development plan for South Cambridgeshire comprises the South Cambridgeshire Local Plan 2018, the Cambridgeshire and Peterborough Minerals and Waste Core Strategy 2011 and the Cambridgeshire and Peterborough Site Specific Proposals Plan 2012. Supplementary Planning Documents (SPDs) provide guidance in some policy areas to support the adopted Local Plan (2018). Other Strategy documents have also been locally adopted including the Cambridgeshire Green Infrastructure Strategy June 2011 and the Cambridge Nature Conservation Strategy 2006.

3.3. Overarching non site-specific policies within the Local Plan 2018 relevant to all three site areas and the associated tunnel and pipeline corridor options include, but are not limited to:

- Policy S/3 - Presumption in Favour of Sustainable Development
- Policy S/4 - Cambridge Green Belt
- Policy S/6 – The Development Strategy to 2031
- Policy CC/1 - Mitigation and Adaptation to Climate Change
- Policy HQ/1 - Design Principles
- Policy NH/2 - Protecting and Enhancing Landscape Character
- Policy NH/3 - Protecting Agricultural Land
- Policy NH/4 - Biodiversity
- Policy NH/6 - Green Infrastructure
- Policy NH/8 - Mitigating the Impact of Development in and adjoining the Green Belt
- Policy NH/11 - Protected Village Amenity Areas
- Policy NH/14 - Heritage Assets
- Policy SC/12 - Air Quality
- Policy SC/14 - Odour and Other Fugitive Emissions to Air

- 3.4. Policies within the Minerals and Waste Core Strategy (2011) relevant to all three site areas and the associated tunnel and pipeline corridor options include, but are not limited to:
- Policy CS17 - Waste Water Treatment Works
 - Policy CS22 - Climate Change
 - Policy CS26 - Mineral Safeguarding Areas
 - Policy CS33 - Protection of Landscape Character
 - Policy CS35 - Biodiversity and Geodiversity
 - Policy CS36 - Archaeology and the Historic Environment
 - Policy CS37 - Public Rights of Way
 - Policy CS39 - Water Resources and Water Pollution Prevention
- 3.5. Site specific policy designations relevant to the three relocation options and/or tunnel and pipeline corridor options are referred to where appropriate in the planning appraisals of each site area below.
- 3.6. Given the need for planning judgement in the assessment of each site area option, and limited site-specific design details at this stage in the development process, the use of a RAG evaluation for planning assessment purposes at this latest stage of site selection is considered inappropriate and incapable of providing sufficient granularity to distinguish between sites. Given this, each site area option is assessed independently, and comparison between site options is considered in the main report in the overall assessment and final site selection.

4. Option Assessments

Site Area and Options 1A and 1B

I. Policy designations

- 4.1. None of the land encompassed by site area 1 is specifically allocated for development. However, site area 1 is situated within the Cambridge Green Belt and SCLP Policy SP/4 states that new development in the Green Belt will only be permitted in accordance with national Green Belt policy. Save in respect of the potential development of a new pumping station and its immediate connecting infrastructure at Waterbeach

(beyond the outer boundary of the Cambridge Green Belt), site area 1 and the connection corridor options 1A and 1B involve development in the Green Belt. The NPS is clear that the general policies controlling development in the countryside apply with equal force in Green Belts but there is, in addition, a general presumption against inappropriate development within them². Such development should not be approved except in very special circumstances. “Very special circumstances will not exist unless the harm by reason of inappropriateness, and any other harm, is clearly outweighed by other considerations”.

4.2. Other site-specific designations affecting Options 1A and 1B are:

- Waste Consultation Area – This designation affects the ‘waste water transfer tunnel corridor’ and ‘treated effluent tunnel/pipeline corridor’ for both Options 1A and 1B. It may also affect the ‘diversions for existing waste water transfer network’ for both Options 1A and 1B. This designation is not, however, considered determinative for site option selection purposes.
- Mineral Safeguarding Areas (Sand and Gravel) - This designation affects the ‘diversions for existing waste water transfer network’, ‘treated effluent tunnel/pipeline corridor’, ‘Waterbeach transfer corridor’, and ‘site access area’ for Options 1A and 1B.
- Conservation Area - This designation may affect the ‘Waterbeach transfer pipeline corridor’ for both Options 1A and 1B at points being within 100m of the Landbeach Conservation Area. The ‘treated effluent tunnel/pipeline corridor’ for Option 1B is also at points within 150m of the Milton Conservation Area. As all pipeline/tunnel corridors would be underground, through either ‘cut and cover’ or ‘directional drilling’, it is considered unlikely that they will materially affect the setting of this designation long-term, although a temporary impact may occur.
- Protected Village Amenity Area - The ‘treated effluent tunnel/pipeline corridor’ and ‘waste water transfer tunnel corridor’ for both Options 1A and 1B could directly impact on this designation. As all pipeline/tunnel corridors would be underground, through either ‘cut and fill’ or ‘directional drilling’, it is considered unlikely that they will materially affect this designation long-term, although a temporary impact may occur.

² NPS paragraph 4.8.10

II. Description of surrounding land uses and activities and their sensitivity

Planning History and Other Projects

- 4.3. A review of the South Cambridgeshire District Council and Cambridgeshire County Council publicly available planning records has been undertaken (supplemented by a search of local social media channels) to identify any extant planning permissions, current applications or other development projects currently being promoted which, directly or indirectly, could affect or be affected by the development of site area 1 and tunnel and pipeline corridor options.
- 4.4. The 'Waterbeach transfer corridor' for site area 1 could directly affect or be affected by the development of Waterbeach new town, a development comprising a combined 11,000 new homes to the north of Waterbeach. However, this risk is capable of being avoided by careful localised routing in consultation with the developers of Waterbeach new town.
- 4.5. Other known planning applications or projects are:
- The Cambridge Autonomous Metro – This is a project being pursued by the Mayor. The route from Cambridge North to Waterbeach has yet to be resolved. The precise form of transport and vehicle have also yet to be determined which will also affect the routeing to Waterbeach. The CAM network will comprise both tunnelled and surface elements and will be delivered over the next decade. If forthcoming, this proposal could directly affect the 'treated effluent tunnel/pipeline corridor' and 'waste water transfer tunnel corridor' for Options 1A and 1B, although as all pipeline/tunnel corridors would be underground, through either 'cut and cover' or 'directional drilling', it is considered unlikely that these schemes would be mutually exclusive. The project is not at this stage committed nor any funding confirmed. In this circumstance, these proposals currently have no weight in planning terms and are not determinative in this assessment.
 - Waterbeach to Cambridge Better Public Transport and Active Travel project – This is one of four corridor projects around Cambridge that aims to provide better public transport and active travel routes, such as walking and cycling, offering better connections and alternatives to car use between Waterbeach and Cambridge. The ongoing study seeks to identify a preferred transit route corridor to

integrate with the emerging Cambridge Autonomous Metro (CAM) proposals and to enhance walking and cycling infrastructure. The intention is to progress a Waterbeach to North East Cambridge Public Transport Scheme along this preferred corridor. Funding of £8m was committed in February 2020 by the Greater Cambridge Partnership. It is intended that the route would be completed in the period 2025-2028. Four corridor options have been put forward as part of a public consultation exercise running between 19 October and 14 December 2020. The 'West Area of Interest' option encompasses site area 1. The other route options could directly affect the 'treated effluent tunnel/pipeline corridor' and 'waste water transfer tunnel corridor' for Options 1A and 1B, although as all pipeline/tunnel corridors would be underground, through either 'cut and cover' or 'directional drilling', it is considered unlikely that these schemes would be mutually exclusive.

- A10 Upgrade - A funding application for duelling the A10 was submitted by the Mayor and the Combined Authority in August 2019. A consultation exercise on this upgrade was undertaken in June/July 2020. If forthcoming, this proposal could directly affect the 'treated effluent tunnel/pipeline corridor', 'waste water transfer tunnel corridor', 'Waterbeach transfer corridor', and 'site access area' for Options 1A and 1B. As details are not yet finalised the full impact is unclear. The Greater Cambridge Partnership has also recently established an A14 junction 33 working group looking at the suitability of the junction for the growing needs of the area.
- Police Accommodation - A planning application has been submitted for operational police accommodation and ancillary functions at land off Butt Lane south of the existing park and ride site. The 'treated effluent tunnel/pipeline corridor' and 'waste water transfer tunnel corridor' for Option 1A and the 'waste water transfer tunnel corridor' for Option 1B cross this site. If planning permission is granted for the current application and development proceeds, this may have implications on the corridors.
- Cambridge Rowing Lakes - An outline planning application was submitted in 2006 by the Cambridge Sport Lakes Trust for the proposed Cambridge Rowing Lakes. It was approved in 2013. Being an outline application, reserved matters had to be submitted by 2018. The Trust submitted the reserved matters application in 2018 but their EIA was based on survey data going back to 2005/6 and so the application was withdrawn. It is understood the Trust are still seeking to promote the project. If forthcoming, this project could directly affect the 'treated effluent tunnel/pipeline corridor' and 'waste

water transfer tunnel corridor' for Site 1 Options A and B. These proposals currently have no weight in planning terms and are not determinative in this assessment.

- As part of the Greater Cambridge Local Plan Call for Sites three 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, these have the potential to affect the discharge corridor route to the River Cam if they are allocated.
- Land comprising Rectory Farm has also 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.
- Chivers Farms Ltd has submitted a site for commercial use to the west of site area 1. 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 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.
- Trinity College Cambridge has also promoted a large site to the south of Butt Lane for substantial commercial development comprising the extension of the Cambridge Science Park which may affect the diversion for the existing waste water transfer network.

4.6. The location of the site area relative to surrounding land uses and these most relevant proposals are shown on the attached plan "Site Area 1 + 2: Contextual Plan". The plan only identifies the potential site area for the WWTP. Pipeline and tunnel route corridors are identified elsewhere in this report on Mott MacDonald drawings.

Other Land Uses and Activities

4.7. Identified land uses and activities surrounding the site are as follows:

- Horticultural - A fruit farm is located immediately adjacent the south of site area 1. It is potentially likely to be directly affected by development of site area 1. It could also be directly affected by the 'treated effluent tunnel/pipeline corridor' and 'waste water transfer tunnel corridor' for Option 1A, and

the 'waste water transfer tunnel corridor' for Option 1B. It could also affect the 'site access area' for Options 1A and 1B. Acquisition of the required land for these options has the potential to significantly impact (including potentially distinguishing) the fruit farm business at site area 1. 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.

- Residential - Cambridge's main built-up area is located approximately 1.87km to the south; the village of Milton is located approximately 450m to the south-east; the village of Impington is located approximately 850m to the south-west; and the village of Landbeach is located approximately 500m to the north east. There are also a number of isolated dwellings along Butt Lane/ Milton Road. There are 144 properties within 1km of the centre point of site area 1. The settlements would not be directly affected by development of site area 1 but could be affected by the 'treated effluent tunnel/pipeline corridor', 'waste water transfer tunnel corridor', and 'diversions for existing waste water transfer network' for Option 1A, and the 'waste water transfer tunnel corridor' and 'diversions for existing waste water transfer network' for Option 1B. They could also be affected by the 'site access area' for Options 1A and 1B. There is potential for moderate harm to the residential amenity of occupiers, both temporarily during construction and during operation.
- Open Space and Green Infrastructure – site area 1 lies within an area of open countryside and is surrounded by a network of public rights of way which together have value as a form of green infrastructure. There are no accessible open spaces immediately in the vicinity of site area 1, but Milton Cemetery and Milton Maize Maze are likely to experience a temporary reduction in amenity due their proximity to a number of the components of the ancillary infrastructure associated with Option 1A. Cambridge FootGolf Centre is located 700m to the east. It would not be directly affected by the relocation; however, it could be directly affected by the 'treated effluent tunnel/pipeline corridor' for Option 1B. The 'treated effluent tunnel/pipeline corridor' and 'waste water transfer tunnel corridor' for both Options 1A and 1B could directly impact on a Protected Village Amenity Area at Milton. As all pipeline/tunnel corridors would be underground, through either 'cut and cover' or 'directional drilling', it is considered unlikely that they will materially affect these uses long-term, although a temporary impact may occur.

- **Public Right of Way** - A public right of way (PRoW) in the form of a 'byway - open to all traffic' crosses site area 1 north to south ('Mere Way'). It constitutes a former Roman road. Works to encourage greater use of Mere Way are being prepared as part of a Section 106 undertaking given in the planning permission for Waterbeach new town. This route would be directly affected physically (at least temporarily) and in amenity terms by proximity to site area 1 and by 'diversions for existing waste water transfer network' for Options 1A and 1B. As all pipeline/tunnel corridors would be underground, through either 'cut and cover' or 'directional drilling', it is considered unlikely that they will materially affect this use long-term, although a temporary impact may occur. Site area 1 is large enough for development of the CWWTPR to avoid the need for diversion of this byway, but there will be loss of amenity to users of the byway from the proximity of the new WWTP and possible need for crossing of the route for vehicle access.
- **Heritage** - There are areas of Scheduled Ancient Monument to the north-east of Landbeach and the north-east of Milton which could potentially be impacted directly by the 'Waterbeach transfer pipeline corridor' for Options 1A and 1B, and the 'treated effluent tunnel/pipeline corridor' for Option 1B. These sites and the surrounding area may contain important archaeological remains. As all pipeline/tunnel corridors would be underground, through either 'cut and cover' or 'directional drilling', a direct impact may occur but is unlikely to be permanent or significant. Site area 1 straddles Mere Way which is formed from an old Roman Road which is an undesignated heritage asset which must be considered in any heritage assessment. Potential for archaeological remains is high but may be capable of avoidance or mitigation.
- **Landfill** - Site area 1 is located approximately 500m to the north of Milton Landfill, which is unlikely to be directly affected by development.
- **Commercial** - A business park is located approximately 500m to the south. It is unlikely to be directly affected by relocation to site area 1, although there is a likelihood of potential disturbance from traffic and (temporary) construction works.

III. Function and value of site in land use terms (including Green Belt)

4.8. Site area 1 comprises primarily agricultural land with a small element of woodland at its western end. All of this land is classified as grade 2 or 3 best and most versatile agricultural land. NPS paragraph 4.8.8 states that Applicants should seek to minimise impacts on the best and most versatile agricultural land, and preferably use land in areas of poorer quality. Save as referred to above, particularly in respect of its situation within the Cambridge Green Belt, there are no other specific planning policy designations relating to site area 1 itself nor the connection corridors. Although there is existing transport infrastructure and other development to the south, site area 1 is located in an exposed area of open countryside which presently provides a strong visual separation between the surrounding settlements of Landbeach, Milton and Impington/Histon..

4.9. The Green Belt Study prepared by Mott MacDonald dated August 2020 considers the overall site performance of each site area (sites areas 1, 2 and 3) against Green Belt purposes. For site area 1 the report states that:

“The presence of the transport and other large infrastructure north of the A14 has extended built development associated with the northern boundary of Cambridge into the farmed landscape around site area 1. This development has encroached on the countryside. The landscape around site area 1, however, still provides a clear separation between Milton, Landbeach, Histon and Impington and a setting for the villages which are partly in conservation area. It does not contribute to the historic setting of Cambridge owing to severance caused by the A14 and the urban character of the approaches to the city from the north. Site area 1 is not currently derelict or urban land.” It goes on to conclude that this site has a ‘Fair’ performance in relation to Green Belt purposes overall.

IV. Potential impacts of CWWTPR development on

- Green Belt purposes
- Other policy designations
- Surrounding land uses (existing, committed and proposed)

- 4.10. The Green Belt Study prepared by Mott MacDonald dated August 2020 considers the potential overall scale of impact from development. For site area 1 it states that:

“Development on site area 1, in a landscape of low sensitivity, would extend the existing developed area south of Butt Lane into open farmland and consequently reduce the openness of the Green Belt in this location. It would detract from the setting of Landbeach and would narrow the landscape gap between Milton and Landbeach. The development would have little effect on the landscape setting of Cambridge. It would be a prominent feature in the open landscape, visible from properties along High Street, Landbeach, from isolated properties near the site, and from the PRow along Mere Way.”

- 4.11. If this site is developed, it is considered that the Green Belt would be harmed by the erosion of separation between the settlements of Impington / Histon and Landbeach. There would also be a loss of openness. Whilst further development pressure may be lessened by the presence of the new CWWTP, the visual separation between Milton and Impington in views from the north (in which development on site area 1 will be particularly prominent) would be largely lost. The purposes of the Green Belt at a local level would be compromised by this development although the wider purposes of preserving Cambridge and its setting would remain unaffected.

- 4.12. In planning policy terms, development of this site for CWWTPR will represent inappropriate development within the Green Belt and will impact directly on the adjoining fruit farm business. Actual harm to Green Belt may partially be tempered by the present somewhat compromised performance of this area in Green Belt purpose terms.

- 4.13. Site area 1 may potentially be affected by the proposed improvements to the A10 although studies are still at optioneering stage (Option D directly impacts the site area). The connection corridor from Waterbeach may be affected by the planning permission for the new Waterbeach New Town. The corridor route back to the existing treatment works crosses a protected village amenity area at Milton. In both instances, given that the works at these points will be underground, disturbance is likely to be limited and temporary and not likely to conflict per se with policy.

- 4.14. 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 Butt Lane and 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, is likely to have a direct impact the long-term resilience of CWWTPR. Site area 1 sits on a potential future transport corridor and the eastern part of it is being promoted for commercial development through the emerging Greater Cambridge Local Plan process. At this time, this proposal has no planning weight. However, overlaying site area 1 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 other infrastructure and alternative economic development proposals. 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.

- 4.15. 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.
- 4.16. The corridor for the wastewater transfer tunnel for both Options 1A and 1B crosses a protected village amenity area at the southern end of Milton village. SCLP Policy NH/11 states that development will not be permitted within or adjacent to these areas if it would have an adverse impact on the character, amenity, tranquillity or function of the village. However, as the wastewater transfer tunnel would be underground and directionally drilled, it is considered unlikely that it would materially affect this designation permanently.
- 4.17. The transfer corridors are also affected by the waste safeguarding areas defined by Minerals and Waste Policy SSPW8. It is considered that the transfer corridors would not adversely affect the existing waste facilities and therefore this designation is unlikely to preclude the development of site area 1. The discharge pipeline routes run close to or beneath the River Cam Wildlife site and the Milton Road Hedgerow Wildlife site. However, any effects are likely to be temporary due to the depth of the pipeline routes.

- 4.18. Although the government has said that net gain requirements will not be made mandatory for NSIPs under the upcoming Environment Bill, biodiversity net gain and the potential for schemes to deliver and contribute to biodiversity net gain is capable of being an 'important and relevant matter' as part of the DCO determination process. It is Anglian Water's intention (as referenced in the Statement of Requirements and Operational Assessment – Appendix D.1) to deliver biodiversity net gain on this site in relation to additional habitat creation.
- 4.19. The Cambridgeshire Green Infrastructure Strategy 2011 sets out strategic aims and objectives for Cambridge and the wider area. Appendix 7 identifies opportunities for Green Infrastructure Gateways where people can move from urban to rural areas via public routes. Milton Country Park is identified as a Green Infrastructure Destination. Figure 7.12 identifies the Combined Gateway opportunities which includes the whole area north of Cambridge. There is opportunity to improve the green infrastructure around Mere Way.
- 4.20. The Wildlife Trust is also promoting Nature Recovery Network areas across the county. CWWTPR may offer opportunity to improve the River Cam corridor as part of this scheme, although the scope for improvement is likely to be limited to financial contributions given AWS's lack of land ownership in this corridor.
- 4.21. The development of this site area option may result in the partial loss or total extinguishment of the existing fruit farm business that operates in this location.
- 4.22. In terms of impact on conservation areas, the transfer corridors (as well as being underground) are sufficiently distant to not directly affect them. Their potential impact is not considered to weigh against site area 1 in heritage terms.

5. Site Area 2 and Options 2A and 2B

I. Policy designations

- 5.1. None of the land encompassed by site area 2 is specifically allocated for development. However, site area 2 is situated within the Cambridge Green Belt and SCLP Policy SP/4 states that new development in the

Green Belt will only be permitted in accordance with national Green Belt policy. Save in respect of the potential development of a new pumping station and its immediate connecting infrastructure at Waterbeach (beyond the outer boundary of the Cambridge Green Belt), site area 2 and the connection corridor options 2A and 2B involve development in the Green Belt. The NPS is clear that the general policies controlling development in the countryside apply with equal force in Green Belts but there is, in addition, a general presumption against inappropriate development within them³. Such development should not be approved except in very special circumstances. “Very special circumstances will not exist unless the harm by reason of inappropriateness, and any other harm, is clearly outweighed by other considerations”.

5.2. Other site-specific designations affecting Options 2A and 2B are:

- Waste Consultation Area – This designation directly affects site area 2. It also affects the ‘waste water transfer tunnel corridor’ and ‘treated effluent tunnel/pipeline corridor’ for Options 2A and 2B. It may also affect the ‘diversions for existing waste water transfer network’ for Options 2A and 2B. This designation is not, however, considered determinative for site option selection purposes.
- Mineral Safeguarding Areas (Sand and Gravel) - This designation may partially affect site area 2. It also affects the ‘diversions for existing waste water transfer network’, ‘treated effluent tunnel/pipeline corridor’, ‘Waterbeach transfer corridor’, and ‘site access area’ for Options 2A and 2B.
- Conservation Area - This designation may affect the ‘Waterbeach transfer pipeline corridor’ for Options 2A and 2B, at points being within 100m of the Landbeach Conservation Area. The ‘treated effluent tunnel/pipeline corridor’ for Option 2B is at points within 150m of the Milton Conservation Area. As all pipeline/tunnel corridors would be underground, through either ‘cut and cover’ or ‘directional drilling’, it is considered unlikely that they will materially affect the setting of this designation long-term, although a temporary impact may occur.
- Protected Village Amenity Area - This designation could directly affect the ‘treated effluent tunnel/pipeline corridor’ and ‘waste water transfer tunnel corridor’ for Options 2A and 2B. As all pipeline/tunnel corridors would be underground, through either ‘cut and cover’ or ‘directional drilling’,

³ NPS paragraph 4.8.10

it is considered unlikely that they will materially affect this designation long-term, although a temporary impact may occur.

II. Description of surrounding land uses and activities and their sensitivity

Planning History and Other Projects

- 5.3. A review of the South Cambridgeshire District Council and Cambridgeshire County Council publicly available planning records has been undertaken (supplemented by a search of local social media channels) to identify any extant planning permissions, current applications or other development projects currently being promoted which, directly or indirectly, could affect or be affected by the development of site area 2 and tunnel and pipeline corridor options.
- 5.4. The 'Waterbeach transfer corridor' for site area 2 could directly affect or be affected by the development of Waterbeach new town, a development comprising a combined 11,000 new homes to the north of Waterbeach. However, this risk is capable of being avoided by careful localised routing in consultation with the developers of Waterbeach new town.
- 5.5. Other known planning applications or projects are:
- Cambridge Science Park – Proposals for an extension to the Cambridge Science Park⁴ within the Green Belt north of the A14 have been promoted by the landowner (Trinity College, Cambridge) in representations to the early stages of the preparation of the Greater Cambridge Local Plan. These proposals currently have no weight in planning terms and are not by themselves determinative in this assessment. This situation is unlikely to change unless and until planning permission is granted or the site is proposed for allocation in the Preferred Options version of the Greater Cambridge Local Plan which is due to be published in Summer 2021. Both scenarios are considered to be unlikely at this time, but the proposals are 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

⁴ <https://www.cambridgesciencepark.co.uk/cambridge-science-park-north/>

priority” area.. In the event that the landowner’s proposals are supported by the local planning authority, they could be prejudiced by the development of site area 2 and the ‘diversions for existing waste water transfer network’ for Options 2A and 2B, with the effect that the new WWTP here could impede the future strategic growth of Cambridge by prejudicing or at worse obstructing alternative economic development proposals.

- Land at Milton Road, Impington - An outline planning application with all matters reserved, other than access, for the development of up to 50 residential dwellings and a Community Park was made in April 2019 on land off Milton Road to the north of St Andrews Way in Impington. This application was withdrawn in August 2019 has now been promoted in the recent Greater Cambridge Local Plan Call for Sites for residential development which, if allocated and brought forward could affect the ‘Waterbeach transfer pipeline corridor’ for Options 2A and 2B.
- The Cambridge Autonomous Metro - If forthcoming, this proposal could directly affect the ‘treated effluent tunnel/pipeline corridor’ and ‘waste water transfer tunnel corridor’ for Options 2A and 2B. The project is not at this stage committed nor any funding confirmed. In this circumstance, these proposals currently have no weight in planning terms and are not determinative in this assessment.
- Waterbeach to Cambridge Better Public Transport and Active Travel project – This is one of four corridor projects around Cambridge that aims to provide better public transport and active travel routes, such as walking and cycling, offering better connections and alternatives to car use between Waterbeach and Cambridge. The ongoing study seeks to identify a preferred transit route corridor to integrate with the emerging Cambridge Autonomous Metro (CAM) proposals and to enhance walking and cycling infrastructure. The intention is to progress a Waterbeach to North East Cambridge Public Transport Scheme along this preferred corridor. Funding of £8m was committed in February 2020 by the Greater Cambridge Partnership. It is intended that the route would be completed in the period 2025-2028. Four corridor options have been put forward as part of a public consultation exercise running between 19 October and 14 December 2020. The ‘West Area of Interest’ option encompasses site area 2. The other route options could directly affect the ‘treated effluent tunnel/pipeline corridor’ and ‘waste water transfer tunnel corridor’ for Options 2A and 2B, although as all pipeline/tunnel corridors would be underground, through either ‘cut and cover’ or ‘directional drilling’, it is considered unlikely that these schemes would be mutually exclusive.

- A10 Upgrade - A funding application for duelling the A10 was submitted by the Mayor and the Combined Authority in August 2019. A consultation exercise on this upgrade was undertaken in June/July 2020. If forthcoming, this proposal could directly affect the 'treated effluent tunnel/pipeline corridor', 'waste water transfer tunnel corridor', 'Waterbeach transfer corridor', and 'site access area' for Options 2A and 2B. As details are not yet finalised the full impact is unclear. The Greater Cambridge Partnership has also recently established an A14 junction 33 working group looking at the suitability of the junction for the growing needs of the area.
- Police Accommodation - A planning application has been submitted for operational police accommodation and ancillary functions at land off Butt Lane south of the existing park and ride site. The 'treated effluent tunnel/pipeline corridor' and 'waste water transfer tunnel corridor' for Option 2A and the 'waste water transfer tunnel corridor' for Option 2B cross this site. If planning permission is granted for the current application and development proceeds, this may have implications on the corridors.
- Cambridge Rowing Lakes - An outline planning application was submitted in 2006 by the Cambridge Sport Lakes Trust for the proposed Cambridge Rowing Lakes. It was approved in 2013. Being an outline application, reserved matters had to be submitted by 2018. The Trust submitted the reserved matters application in 2018 but their EIA was based on survey data going back to 2005/6 and so the application was withdrawn. It is understood the Trust are still seeking to promote the project. If forthcoming, this project could directly affect the 'treated effluent tunnel/pipeline corridor' and 'waste water transfer tunnel corridor' for Options 2A and 2B. These proposals currently have no weight in planning terms and are not determinative in this assessment.
- As part of the Greater Cambridge Local Plan Call for Sites three sites have been promoted to the north of Milton for employment and residential. None of the submissions under this call for sites has any planning weight at the time of writing. However, these have the potential to affect the discharge corridor route to the River Cam if they are allocated.
- A further site has been promoted to the south of Waterbeach for commercial development which has the potential to affect the Waterbeach 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.

- A site proposed for residential use has also been promoted south of Milton and north of the A14 which could affect the wastewater transfer tunnel corridor and the discharge to the River Cam.

5.6. The location of the site area relative to surrounding land uses and these most relevant proposals are shown on the attached plan “Site Area 1 + 2: Contextual Plan”. The plan only identifies the potential site area for the WWTP. Pipeline and tunnel route corridors are identified elsewhere in this report on Mott MacDonald drawings.

Other Land Uses and Activities

5.7. This section considers uses and activities surrounding the site. Land uses and activities include:

- Landfill – Site area 2 is located immediately adjacent to Milton Landfill which borders the western boundary. It is unlikely to be directly affected by the relocation. Landfill is due to be completed by 31 December 2026 at the latest. The site is then to be restored to agricultural use over the capped landfill. The gas system should not interfere with the agricultural use.
- Commercial - A business park is located to the immediate north. It would not be directly affected by development of site area 2, however it could be directly affected by the ‘treated effluent tunnel/pipeline corridor’, ‘waste water transfer tunnel corridor’, and ‘diversions for existing waste water transfer network’ for Option 2A and 2B. It could also be affected by the ‘site access area’ for Options 2A and 2B. Impacts from construction and operation of site area 2 have the potential to disrupt occupiers of the business park.
- Horticultural - A fruit farm is located to the north of Butt Lane approximately 360m to the north of site area 2. The business is unlikely to be directly affected by development of site area 2, but could suffer temporary disruption from construction of the ‘treated effluent tunnel/pipeline corridor’, ‘waste water transfer tunnel corridor’, and ‘diversions for existing waste water transfer network’ for Options 2A and 2B.
- Residential - Cambridge’s main built-up area is located approximately 500m to the south; the village of Milton is located approximately 900m to the east; the village of Impington is located approximately 400m to the west; and the village of Landbeach is located approximately 1.8km to the north east. There are also a number of isolated dwellings along Butt Lane/ Milton Road. There are also a number

of isolated dwellings along Butt Lane/ Milton Road. There are 163 properties within 1km of the centre point of Site area 2. The settlements would not be directly affected by development of site area 2, however they could be directly affected by the 'treated effluent tunnel/pipeline corridor', 'waste water transfer tunnel corridor', and 'diversions for existing waste water transfer network' for Options 2A and 2B. A gypsy/traveller site is located approximately 400m to the south of site area 2. There is potential for moderate harm to the residential amenity of occupiers, both temporarily during construction and during operation.

- Open Space and Green Infrastructure – Site area 2 lies within an area of open countryside and is surrounded by a network of public rights of way which together have value as a form of green infrastructure, albeit disturbed by various forms of existing development and activities. There are no accessible open spaces immediately in the vicinity of site area 2, but Milton Cemetery is likely to experience a temporary reduction in amenity due its proximity to site area 2. The Cambridge FootGolf Centre could be directly affected by the 'treated effluent tunnel/pipeline corridor' for Option 2B. The 'treated effluent tunnel/pipeline corridor' and 'waste water transfer tunnel corridor' for both Options 2A and 2B could directly impact on a Protected Village Amenity Area at Milton. As all pipeline/tunnel corridors would be underground, through either 'cut and fill' or 'directional drilling', it is considered unlikely that they will materially affect these uses long-term, although a temporary impact may occur.
- Public Right of Way - A public right of way (PRoW) in the form of a 'byway - open to all traffic' crosses the site north to south (Mere Way). It constitutes a former Roman road. It would be directly affected physically and in amenity terms by the access route and by proximity to site area 2 and by the 'treated effluent tunnel/pipeline corridor', 'waste water transfer tunnel corridor', and 'diversions for existing waste water transfer network' for Options 2A and 2B. As all pipeline/tunnel corridors would be underground, through either 'cut and fill' or 'directional drilling', it is considered unlikely that they will materially affect this use long-term, although a temporary impact may occur.
- Heritage - There are areas of Scheduled Ancient Monument to the north-east of Landbeach and the north-east of Milton which could potentially be impacted directly by the 'Waterbeach transfer pipeline corridor' for Options 2A and 2B, and the 'treated effluent tunnel/pipeline corridor' for Option 2B. These sites and the surrounding area may contain important archaeological remains. As all pipeline/tunnel corridors would be underground, through either 'cut and cover' or 'directional drilling', a direct impact

may occur but is unlikely to be permanent or significant. Site area 2 lies west of Mere Way which is formed from an old Roman Road which is an undesignated heritage asset which must be considered in any heritage assessment. The proposed development avoids the need for diversion of this byway, but there will be loss of amenity to users of the byway from the proximity of the new WWTP and possible need for crossing of the route for vehicle access. Potential for archaeological remains is high but may be capable of avoidance or mitigation.

III. Function and value of site in land use terms (including Green Belt)

5.8. Site area 2 comprises agricultural land and is classified as grade 2 or 3 best and most versatile agricultural land⁵. The site is located in the Green Belt in a relatively narrow (c.2km) gap of open countryside separating Milton and Landbeach. There are no other relevant site-specific planning policy designations other than the site is partially within a Waste Consultation Zone due to its proximity to the Milton Landfill site. Existing development within reasonably close proximity to the site includes the Milton Landfill site immediately to the East, a commercial business park to the north and the Milton Park and Ride site east of the Milton Landfill site. There is also a proposal for a new police station south of the existing Park and Ride site.

5.9. The Green Belt Study prepared by Mott MacDonald dated August 2020 considers the overall site performance against Green Belt purpose. For site area 2 it states that:

“The presence of the transport and other large-infrastructure and business units north of the A14 has extended built development into the farmed landscape adjacent to Site 2. This development has encroached on the countryside. The landscape around Site 2 still provides a clear separation between Milton, Histon and Impington and a setting for the historic parts of the villages. It does not contribute to the historic setting of Cambridge owing to severance caused by the A14 and the urban character of the approaches to the city from the north. Site 2 is not currently derelict or urban land.”

5.10. It goes on to conclude that this site has a ‘Fair’ performance as regards Green Belt purposes.

⁵ NPS paragraph 4.8.8 states that Applicants should seek to minimise impacts on the best and most versatile agricultural land, and preferably use land in areas of poorer quality.

IV. Potential impacts of CWWTPR development on

- Green Belt purposes
- Other policy designations
- Surrounding land uses (existing, committed and proposed)

5.11. The Green Belt Study prepared by Mott MacDonald dated August 2020 considers the overall scale of impact. For site area 2 it states that:

“Development on Site 2, in a landscape of existing 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 and residential properties close to the site, above intervening vegetation. The development would be visible from the PRoW along Mere Way”.

5.12. If this site is developed, it is considered that the Green Belt would be harmed by the erosion of separation between the settlements of Histon/ Impington and Milton, particularly in the context of other existing and proposed development in the immediate area. There would also be a loss of openness.

5.13. In planning policy terms, development of this site for CWWTPR will represent inappropriate development 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. However, development of the site is likely to significantly diminish the separation between Landbeach and Milton and prejudice the ability of what is an already narrow gap of land to continue to effectively perform its Green Belt purposes.

5.14. 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, could result in complaints and could impact negatively on businesses immediately to the north. Traffic generated by the development should be contained on Butt Lane and 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 2 promoted in the recent call for sites is realised, that development is likely to have a more direct impact the long-term resilience of CWWTPR. Site area 2 sits close to a potential future transport corridor and 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. 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.

- 5.15. 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.
- 5.16. The corridor for the wastewater transfer tunnel in both Options 2A and 2B crosses a protected village amenity area at the southern end of Milton village. Policy NH/11 states that development will not be permitted within or adjacent to these areas if it would have an adverse impact on the character, amenity, tranquillity or function of the village. However as the wastewater transfer tunnel would be underground and directionally drilled, it is considered unlikely that it would materially affect this designation.
- 5.17. The transfer corridors are also affected by the waste safeguarding areas required in Policy SSPW8. It is considered that the transfer corridors would not adversely affect the existing waste facilities and therefore this designation should not weigh against site area 2.
- 5.18. The discharge pipeline routes run close to or beneath the River Cam Wildlife site and the Milton Road Hedgerow Wildlife site. However, any effects are likely to be temporary due to the depth of the pipeline routes.

- 5.19. Although the government has said that net gain requirements will not be made mandatory for NSIPs under the upcoming Environment Bill, biodiversity net gain and the potential for schemes to deliver and contribute to biodiversity net gain is capable of being an 'important and relevant matter' as part of the DCO determination process. It is Anglian Water's intention (as referenced in the Statement of Requirements and Operational Assessment – Appendix D.1) to deliver biodiversity net gain on this site in relation to additional habitat creation.
- 5.20. The Cambridgeshire Green Infrastructure Strategy 2011 sets out strategic aims and objectives for Cambridge and the wider area. Appendix 7 identifies opportunities for Green Infrastructure Gateways where people can move from urban to rural areas via public routes. Milton Country Park is identified as a Green Infrastructure Destination. Figure 7.12 identifies the Combined Gateway opportunities which includes the whole area north of Cambridge. There is the opportunity to improve the green infrastructure around Mere Way.
- 5.21. The Wildlife Trust is also promoting Nature Recovery Network areas across the county. It may be possible to improve the River Cam corridor as part of this scheme.
- 5.22. There may also be opportunities to link in with the Waterbeach to Cambridge Public Transport Greenway along the river corridor.
- 5.23. In terms of impact on conservation areas, the transfer corridors (as well as being underground) are sufficiently distant to not directly affect them. Their potential impact is not considered to weigh against Site 2 in heritage terms.
- 5.24. There would be no adverse effect on the adjoining landfill site or other land uses in the vicinity, such as the park and ride site.

6. Site Area 3 and Option 3A

I. Policy designations

6.1. None of the land encompassed by site area 3 is specifically allocated for development. However, site area 3 is situated within the Cambridge Green Belt and SCLP Policy SP/4 states that new development in the Green Belt will only be permitted in accordance with national Green Belt policy. Save in respect of the potential development of a new pumping station and its immediate connecting infrastructure at Waterbeach (beyond the outer boundary of the Cambridge Green Belt), site area 3 and the connection corridor option 3A involve development in the Green Belt. The NPS is clear that the general policies controlling development in the countryside apply with equal force in Green Belts but there is, in addition, a general presumption against inappropriate development within them⁶. Such development should not be approved except in very special circumstances. *“Very special circumstances will not exist unless the harm by reason of inappropriateness, and any other harm, is clearly outweighed by other considerations”*.

6.2. Other site-specific designations affecting Option 3A are:

- Mineral Safeguarding Areas (Sand and Gravel) - This designation may affect the ‘waste water transfer tunnel corridor’, ‘treated effluent tunnel/pipeline corridor’, and ‘Waterbeach transfer corridor’ for Site 3 Option A.
- Conservation Area - The ‘waste water transfer tunnel corridor’ and ‘treated effluent tunnel/pipeline corridor’ for Option 3A run directly through the Fen Ditton Conservation Area. As all pipeline/tunnel corridors would be underground, through either ‘cut and fill’ or ‘directional drilling’, it is considered unlikely that they will materially affect the setting of this designation long-term, although a temporary impact may occur.

⁶ NPS paragraph 4.8.10

II. Description of surrounding land uses and activities and their sensitivity

Planning History and Other Projects

- 6.3. A review of the South Cambridgeshire District Council and Cambridgeshire County Council publicly available planning records has been undertaken (supplemented by a search of local social media channels) to identify any extant planning permissions, current applications or other development projects currently being promoted which, directly or indirectly, could affect or be affected by the development of site area 3 and tunnel and pipeline corridor options.
- 6.4. The 'Waterbeach transfer corridor' for site area 3 could directly affect or be affected by the development of Waterbeach new town, a development comprising a combined 11,000 new homes to the north of Waterbeach. However, this risk is capable of being avoided by careful localised routing in consultation with the developers of Waterbeach new town.
- 6.5. Other known planning applications or projects are:
- 'Marleigh' and Cambridge Airport – At least one part of the 'site access area' for Option 3A has the potential to directly impact land currently committed for development north of Cambridge Airport. The 'Marleigh' (formerly 'Wing') development north of Newmarket Road and east of Fen Ditton has commenced and when complete will provide a new neighbourhood of 1,300 homes with associated open space. The area of the development immediately adjacent to High Ditch Road is identified for open space, sports facilities and allotments.
 - Waterbeach Greenway – If forthcoming, this proposal could affect the 'waste water transfer tunnel corridor' for Option 3A. These proposals currently have no weight in planning terms and are not determinative in this assessment.
 - Cambridge Rowing Lakes - If forthcoming, this project could affect the 'waste water transfer tunnel corridor' for Option 3A. These proposals currently have no weight in planning terms and are not determinative in this assessment.

- As part of the Greater Cambridge Local Plan Call for Sites, two potential development sites have been promoted in the vicinity of site area 3; a large residential site immediately to the south of site area 3 and the A14 either side of the Horningsea Road, and a residential site west of Ditton Lane. The smaller site may affect the wastewater transfer tunnel corridor.

6.6. The location of the site area relative to surrounding land uses and these most relevant proposals are shown on the attached plan “Site Area 3: Contextual Plan”. The plan only identifies the potential site area for the WWTP. Pipeline and tunnel route corridors are identified elsewhere in this report on Mott MacDonald drawings.

Other Land Uses and Activities

6.7. This section considers uses and activities surrounding the site. Land uses and activities include:

- Residential - The village of Horningsea is located approximately 800m to the north from the edge of the indicative development area; the village of Lode is located 3.2km to the north-east; the village of Stow cum Quy is located approximately 1.2km to the east, and the village of Fen Ditton is located approximately 800m to the south-west. There is also a small farmstead located approximately 800m to the north-east. There are 9 properties within 1km of the centre point of site area 3. The settlements would not be directly affected by the relocation; however, they could be affected by the ‘treated effluent tunnel/pipeline corridor’, ‘waste water transfer tunnel corridor’, and ‘Waterbeach water transfer tunnel corridor’ for Option 3A. There is potential for moderate harm to the residential amenity of occupiers, both temporarily during construction and during operation.
- Open Space and Green Infrastructure – Site area 3 lies within an area of open countryside and is surrounded by a network of public rights of way which together have value as a form of green infrastructure. There are no accessible open spaces immediately in the vicinity of site area 3, but an area of public open space for recreation use is currently being developed as part of the Marleigh scheme south of High Ditch Road which could experience a temporary reduction in amenity due to construction activity.

- **Public Right of Way** - A public right of way (PRoW) in the form of a 'byway - open to all traffic' (Fen Drove Way) borders the north eastern boundary of the site. It would be directly affected by development of site area 3 and the 'waste water transfer tunnel corridor' and 'site access area' for Option 3A. There are also footpaths and bridleways which would be affected by the 'treated effluent tunnel/pipeline corridor', 'waste water transfer tunnel corridor', and 'Waterbeach water transfer tunnel corridor' for Option 3A. As all pipeline/tunnel corridors would be underground, through either 'cut and fill' or 'directional drilling', it is considered unlikely that they will materially affect this use long-term, although a temporary impact may occur.
- **Heritage** - Biggin Abbey is a grade II* listed building within the 'treated effluent tunnel/pipeline corridor' for Option 3A. Biggin Abbey and the surrounding area may contain important archaeological remains but may be capable of avoidance or mitigation. Anglesey Abbey is located approximately 2.5km to the east. It would not be directly affected by the relocation or the tunnel and pipeline corridor options. The setting of Biggin Abbey and other heritage assets could be impacted, however as all pipeline/tunnel corridors would be underground, through either 'cut and fill' or 'directional drilling', it is considered unlikely that there would be a long-term impact on the setting of the buildings themselves, however there may be a direct impact on archaeological remains.
- **Biodiversity** - Stow cum Quy Fen is located approximately 1.6km to the north-east. It would not be directly affected by the relocation or the tunnel and pipeline corridor options. The National Trust published the Wicken Fen Vision in 1999 which is a 100-year project to create a diverse landscape for wildlife and people and to increase the area covered by Wicken Fen to 53 square kilometres. This is over an area to the south west of Wicken Fen towards 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. Poorly designed development of the CWWTPR might compromise the achievement of the Wicken Fen Vision and the environmental and social benefits aspirations of the vision.

III. Function and value of site in land use terms (including Green Belt)

6.8. Site area 3 comprises agricultural land to the east of the A14 and is classified as Grade 2 best and most versatile agricultural land⁷. The site is located in the Green Belt. The site is quite isolated from other development with no other developments or land uses in close proximity.

6.9. The Green Belt Study prepared by Mott MacDonald dated August 2020 considers the overall site performance against Green Belt purpose. For site area 3 it states that:

“The area around site area 3 is open farmland with no large-scale development. Cambridge has a clearly defined edge in this area, with development up to, but not beyond, its boundary. The landscape provides a rural setting for north-eastern Cambridge and the villages of Horningsea, Stow cum Quy, Fen Ditton and Lode and a clear landscape separation between them. Stourbridge Common, Ditton Meadows and the River Cam corridor are a green link between the centre of the city and the countryside, a key feature of the city’s historic character. The landscape around site area 3 provides an important recreational resource for Cambridge. The A14 and an overhead power line, which crosses the site, detracts from the rural character of the landscape.”

6.10. It goes on to conclude that this site has a ‘Good’ performance against the purposes of the Green Belt.

6.11. The effluent pipeline corridor encompasses a grade II* listed building known as Biggin Abbey. This site and surrounding area may contain important archaeological remains. The wastewater transfer tunnel corridor also passes through the Fen Ditton conservation area.

IV. Potential impacts of CWWTPR development on

- Green Belt purposes
- Other policy designations
- Surrounding land uses (existing, committed and proposed)

⁷ NPS paragraph 4.8.8 states that applicants should seek to minimise impacts on the best and most versatile agricultural land, and preferably use land in areas of poorer quality

- 6.12. The Green Belt Study prepared by Mott MacDonald dated August 2020 considers the overall scale of impact. For site area 3 it states that:

“Development on site area 3, in a landscape of existing medium sensitivity, would introduce large-scale development into a rural area, contributing to the extension of sprawl of large built-up areas, encroaching on the countryside and reducing the openness of the Green Belt, due to the absence of existing built development nearby. The compactness of the city in this location would be reduced and the landscape gap between Horningsea and Stow cum Quy would be narrowed. The scheme would be clearly visible in the open landscape from the A14 and nearby PRow and its taller elements would be apparent from Stow cum Quy, Lode, Horningsea and Fen Ditton, detracting from the rural setting of the villages.”

- 6.13. In planning policy terms, development of this site for CWWTPR will represent inappropriate development within the Green Belt. Site area 3 is close to protected landscapes and habitats and in an area with a higher recreational value than surrounds site areas 1 and 2. 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. Development on site area 3 would introduce large-scale development into a rural area, contributing to the extension of the urban edge of Cambridge into the countryside. It would reduce the openness of the Green Belt in this location due to the absence of existing built development nearby.

- 6.14. The exposed nature of the site will result in development being highly visible in views from surrounding properties and viewpoints and will require significant landscape mitigation. The relative isolation of the site and absence of sensitive land uses in closer proximity is likely to limit the risk of amenity concerns and complaints. Traffic generated by the development would avoid the congested A10/A14 junction and potential disruption from network infrastructure projects but access to the site would require more extensive works including to the existing local road network which may cause (at very least) temporary disruption and amenity impacts.

- 6.15. 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 promotion land 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 promotion 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.

- 6.16. Development of site area 3 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 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.
- 6.17. Although the government has said that net gain requirements will not be made mandatory for NSIPs under the upcoming Environment Bill, biodiversity net gain and the potential for schemes to deliver and contribute to biodiversity net gain is capable of being an 'important and relevant matter' as part of the DCO determination process. It is Anglian Water's intention (as referenced in the Statement of Requirements and Operational Assessment – Appendix D.1) to deliver biodiversity net gain on this site in relation to additional habitat creation in support of the Wicken Fen Vision (considered in the Environmental Assessment at Appendix B).

- 6.18. The Cambridgeshire Green Infrastructure Strategy 2011 sets out strategic aims and objectives for Cambridge and the wider area. Appendix 7 identifies opportunities for Green Infrastructure Gateways where people can move from urban to rural areas via public routes. Wicken Fen is one of a number of areas identified as a Green Infrastructure Destination. Figure 7.12 identifies the Combined Gateway opportunities which includes the whole area north of Cambridge.
- 6.19. The Wildlife Trust is also promoting Nature Recovery Network areas across the county. It may be possible to improve the River Cam corridor as part of this scheme.
- 6.20. The wastewater transfer tunnel corridor is quite wide and passes through the Fen Ditton conservation area and the effluent pipeline corridor encompasses a grade II* listed building known as Biggin Abbey. Whilst these elements of the project are below ground it is possible there may be some adverse impact on heritage and archaeological remains.

7. Scope to Mitigate Land Use Impacts

- 7.1. Land use impacts can, at least in some respects, be mitigated through (for example) avoidance (e.g. diverting transfer corridors and access routes), the provision of replacement or additional land and facilities, relocation of amenities, translocation of habitat, visual screening, noise attenuation, etc. In these situations, planning policies make allowance for measures to avoid, reduce or compensate for any adverse impacts (e.g. policies using such phrases as 'development should minimise...'). A number of these potential mitigation measures are identified in the other assessments undertaken in this report. Potential measures to mitigate land use impacts for each site option are identified further below.
- 7.2. Some impacts, however, cannot be mitigated. Statutory provisions and certain planning policies are inflexible and seek to prevent certain development impacts. Loss of or substantial harm to designated heritage assets and inappropriate development in Green Belt are examples. In such circumstances, development proposals and their impacts can only be judged on whether they are compliant with these statutory provisions and policies or not. Non-compliance must be acknowledged as an adverse impact of proposed development and assessed as part of an overall judgement of the potential benefits and potential adverse impacts of proposed development (NPS para. 3.1.3). This is referred to as the 'planning balance'.

The degree of adverse impact (or harm) and the degree of potential benefits will differ between considerations. So, for example, loss of designated heritage assets and harm to Green Belt are matters on which planning policy advocates ‘great’ and ‘substantial’ weight respectively to be given⁸, whereas planning policy places less weight on harm arising from landscape impact outside nationally designated areas. Where the benefits of proposed development demonstrably outweigh the adverse impacts, a conclusion that exceptional and/or very special circumstances apply may be reached.

7.3. All three site areas and related connection corridor options are situated within the Cambridge Green Belt (as defined in the South Cambridgeshire Local Plan 2018). At least one element of the project, namely the WWTP itself, does not fall within the exceptions set out at paragraphs 145 and 146 of the NPPF and must, accordingly, be considered to be inappropriate development which is *“by definition, harmful to the Green Belt and should not be approved except in very special circumstances”*⁹. The proposed pumping station at Waterbeach is outside the Green Belt boundary, as are sections of the rising main connection and transfer tunnels in the vicinity of Waterbeach and to the south of the A14. A number of the elements of the project also fall within the exceptions to inappropriate development listed at paragraphs 145 and 146 of the NPPF. The transfer tunnels, proposed access roads to the WWTP and discharge point potentially fall within the exceptions at NPPF paragraphs 146(b) (engineering operations) and 146(c) (local transport infrastructure which can demonstrate a requirement for a Green Belt location) and may not, therefore, be considered to constitute ‘inappropriate development’.

7.4. In order to satisfy the requirements of the NPS, therefore, ‘very special circumstances’ will need to be demonstrated before development of any one of the three WWTP site options can be consented. Very special circumstances *“will not exist unless the harm by reason of inappropriateness, and any other harm, is clearly outweighed by other considerations”*¹⁰. Whether these ‘other considerations’ are sufficient to constitute very special circumstances in this instance is a matter for the determination of the Secretary of State. Except in respect of particular site-specific matters which may differentiate the three shortlisted sites,

⁸ See e.g. NPS paragraphs 4.10.14 and 4.8.18 respectively

⁹ Consistent with NPS paragraph 4.8.10

¹⁰ NPS paragraph 4.8.14

the principal 'other considerations' which may contribute to a conclusion of very special circumstances will apply equally to each site and are likely to cover:

- a clear and compelling need for the proposed development;
- absence of suitable alternative sites for the development outside the Cambridge Green Belt; and
- consistency of the project with the Government's key policy objectives¹¹.

7.5. Based on the above comments, the scope for mitigation of Land Use Impacts under each site option are considered below.

7.6. The focused assessments undertaken under the Operational, Programme, Economic, Environment and Community assessment criteria covered elsewhere in this report identify various opportunities to mitigate potential impacts on water quality and resources, odour, biodiversity and geological conservation, landscape and visual, historic environment and traffic and transport.

Site 1 – Options 1A and 1B:

The scope to mitigate socio-economic impacts on the fruit farm business, including by re-routing the 'treated effluent tunnel/pipeline corridor' and 'waste water transfer tunnel corridor' for Option 1A, and the 'waste water transfer tunnel corridor' for Option 1B is considered limited. Impacts on residences in Milton and Landbeach could be mitigated by sensitive routing away from these existing areas of the 'treated effluent tunnel/pipeline corridor', 'waste water transfer tunnel corridor', and 'diversions for existing waste water transfer network' for Option 1A, and the 'waste water transfer tunnel corridor' and 'diversions for existing waste water transfer network' for Option 1B. Similarly, impact from the 'site access area' for Options 1A and 1B could be at least partially mitigated by sensitive positioning. Impacts on Open Space and Green Infrastructure and the adjacent PRow could only partially be mitigated by visual screening. Sensitive routing of the 'treated effluent tunnel/pipeline corridor' and 'waste water transfer tunnel corridor' for both Options 1A and 1B away from the Protected Village Amenity Area at Milton could reduce or avoid impact. Similarly, the risk of heritage impacts could be mitigated by sensitive routing of the 'Waterbeach transfer pipeline corridor' for Options 1A and 1B, and the 'treated effluent tunnel/pipeline corridor' for Option 1B.

¹¹ Including (but not limited to) those set out at NPS paragraph 2.2.3

Site 2 – Options 2A and 2B:

Potential impacts on the business park located to the immediate north, and disruption to the businesses to the north of Butt Lane could be mitigated by sensitive routing of the 'treated effluent tunnel/pipeline corridor', 'waste water transfer tunnel corridor', and 'diversions for existing waste water transfer network' for Option 2A and 2B. Impacts on residences in Milton and Landbeach could be mitigated by sensitive routing away from these existing areas of the 'treated effluent tunnel/pipeline corridor', 'waste water transfer tunnel corridor', and 'diversions for existing waste water transfer network' for Option 2A, and the 'waste water transfer tunnel corridor' and 'diversions for existing waste water transfer network' for Option 2B. Impacts on Open Space and Green Infrastructure and the adjacent PRow could only partially be mitigated by visual screening. Sensitive routing of the 'treated effluent tunnel/pipeline corridor' and 'waste water transfer tunnel corridor' for both Options 2A and 2B away from the Protected Village Amenity Area at Milton could reduce or avoid impact. Similarly the risk of heritage impacts could be mitigated by sensitive routing of the 'Waterbeach transfer pipeline corridor' for Options 2A and 2B, and the 'treated effluent tunnel/pipeline corridor' for Option 2B.

Site 3 – Option 3A:

Impacts on Open Space and Green Infrastructure and the adjacent PRow could be mitigated by visual screening. Opportunity to deliver significant enhancements to the environment and to connectivity between the city and the countryside (including Stourbridge Common, Ditton Meadows and the River Cam corridor green links) 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. The risk of heritage impacts on Biggin Abbey could be mitigated by sensitive routing of the 'treated effluent tunnel/pipeline corridor' for Option 3A. Potential impacts on the setting of Biggin Abbey and other heritage assets could be mitigated by appropriate landscape screening.

- 7.7. It is not the purpose of this assessment, nor is it appropriate at this stage of the project, to further rehearse the justification for development within the Green Belt. What is relevant to this final stage of the Site Selection process is whether each site option is consentable (having regard to the relevant guidance in the NPS). This is considered below.

8. Overall NPS Planning Policy Assessment of Site Options (Mitigated)

- 8.1. Based on the above Land Use Impact assessment and the findings from the Operational, Programme, Economic, Environment and Community assessment criteria, an overall assessment of how each mitigated option performs 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 gives the following results:

Planning Assessment

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NPS Planning Policy Assessment

ID	Criteria referenced in the NPS	Summary of Findings
1	Water quality and resources (Groundwater)	<p>For site area 1 mitigation would include the following:</p> <ul style="list-style-type: none"> • Production of a CoCP and use of SuDS in order to reduce risks of contamination or pollution during construction works. • Adjusting pipeline and tunnel routes in order to avoid potential contamination sources. • Use of a primary and secondary lining for tunnel sections and shafts passing through the Lower Greensand or Grey Chalk aquifers • Pipeline crossings of roads and railways would be constructed by pipe-jacking, micro-tunnelling or directional drilling to avoid surface disruption. • Risks to surface waters could be mitigated through SuDS design, flood storage compensation, engineering features and WWTP operational practices. • Test pumping during ground investigations will be required in order to assess potential impacts on the Lower Greensand aquifer during construction (dewatering) and mitigation measures to minimise impacts on users, water courses and wildlife sites as a result of dewatering in the Lower Greensand. • For option 1A, there is potential for mobilisation of contaminants (if present) along the treated effluent corridor (if in pipeline), through the River Terrace Deposits, towards the River Cam. If contamination is encountered, remediation may be required. <p>For site area 2 mitigations would be similar to those for site area 1 but also include the following:</p> <ul style="list-style-type: none"> • Risks from ground gases at the WWTP can be mitigated through ground investigation. Ground gas monitoring should be undertaken to establish the gas regime at the site and to allow gas protection measures to be designed and installed in new buildings, if required. • If contamination is encountered on site, a Foundation Works Risk Assessment would be required to ensure any potential risks from piling through the River Terrace Deposits are mitigated. <p>For site area 3 mitigation would be similar to those for site area 1 but also include the following:</p> <ul style="list-style-type: none"> • The River Cam crossing for the pipeline from Waterbeach to Site 3 would be constructed beneath the river by micro-tunnelling or directional drilling. Construction activities at the location would be undertaken either side of the river and away from the river banks to ensure that the construction of the crossing does not disturb the river.
	Water quality and resources	Mitigation measures are available for all site area options.

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	(Surface Water)	
2	Odour	The same mitigation measures are proposed for site areas 1, 2 and 3. The mitigation measures include: <ul style="list-style-type: none"> • Installing covers on additional process units; and/or • Orientation and design of the WWTP such that process units would be further away from receptors.
3	Flood risk and drainage vulnerability	N/A
4	Biodiversity and geological conservation	Similar mitigation measures are proposed for site areas 1 and 2. The mitigation measures include: <ul style="list-style-type: none"> • Larger area for Biodiversity Net Gain to address potential for protected species and potential temporary impact on County Wildlife Site (Cottenham Moat); • Temporary measures to avoid impacts on lower greensand; • Temporary measures to avoid potential risk of encountering/mobilising contamination in proximity to landfill site. For site area 3, mitigation opportunities include: <ul style="list-style-type: none"> • Measures to reduce impact on County Wildlife Site • Opportunity for enhancement in relation to Quay Fen and integration with Wicken Fen vision
5	Coastal change	None of the site options is within an area subject to risk from coastal change.
6	Landscape and visual impacts	Similar mitigation measures are proposed for site areas 1, 2 and 3. The mitigation measures include: <ul style="list-style-type: none"> • Concentrating tree planting to screen views from the areas most exposed to visual receptors; • Planting along field boundaries to follow existing field patterns to help planting proposals blend-in with the existing landscape character; • Incorporating bunding, where appropriate, to minimise impact on receptors; • Carefully designing the site layout to take into consideration the location of PRoWs, with planting and screening located where the site is adjacent to PRoWs to minimise the impact on views from the PRoW; • Retention and inclusion of additional hedgerows (planting and enhancement) to screen potential access roads and enhance existing field boundaries to grade the visual impact; • Proposals for tree planting of minimum 20m depth in order to provide effective visual screening in winter; and • Where possible, following agreement with landowners, off-site planting to strengthen mitigation.
7	Land use	Scope for mitigation is addressed in the text above.
8	Noise and vibration	The same mitigation measures are proposed for site areas 1, 2 and 3. The mitigation measures include: <ul style="list-style-type: none"> • The use of Best Practicable Means (BPM) in accordance with BS5228-1&2:2009+A1:2014 guidance.

Planning Assessment

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		<ul style="list-style-type: none"> • In addition to the above, appropriate mitigation design would be considered to minimise any potential adverse noise impacts at the nearest noise sensitive receptors (including plant and equipment selection, location within the site, and screening and attenuation measures (e.g. acoustic enclosures, barriers or bunds).
9	Historic environment	<p>The same mitigation measures are proposed for both site areas 1 and 2. The mitigation measures include:</p> <ul style="list-style-type: none"> • Design considerations should aim to minimise change within the setting of designated heritage assets. • Archaeological investigation would be required if site area 1 is selected. Geophysical survey, trial trenching and/or other survey may identify areas of greater archaeological potential or specific remains of moderate value within the site area. <p>Mitigation measures for sites 1 and 2 related to design considerations and archaeological investigations also apply to site area 3. However, additional measures include:</p> <ul style="list-style-type: none"> • Additional design considerations to reduce the potential for impact on Biggin Abbey (grade II* listed) • Protection of the listed milestone • Fleam Dyke – avoid widening the access road unless absolutely necessary or if the road must be widened this should aim to avoid Fleam Dyke rather than focus on widening on only one side of the road.
10	Air quality and emissions	<p>The same mitigation measures are proposed for site areas 1, 2 and 3. The mitigation measures include:</p> <ul style="list-style-type: none"> • Dust control measures consistent with best practice environmental management will be implemented. • Construction and operational traffic may require further assessment as the vehicle movements exceed the assessment thresholds within the Environmental Protection UK and Institute of Air Quality Management guidance ‘Land-Use Planning and Development Control: Planning for Air Quality’ (2017). • Dispersion modelling would be used to quantitatively assess the likely impacts from construction and operation along likely site access and haulage routes; if significant effects are found to be likely, appropriate mitigation will be recommended as necessary.
11	Dust, artificial light, smoke, steam and insect infestation	<p>Dust impacts during construction and impacts from artificial light are capable of mitigation as considered as part of the air quality, landscape and visual impact assessment and biodiversity assessments. Impacts from smoke, steam and insect infestation are considered to be low and equal to each site.</p>
12	Traffic and transport impacts	<p>The same mitigation measures are proposed for both site areas 1 and 2. The mitigation measures are that the design of site access from Butt Lane will take into consideration the following:</p> <ul style="list-style-type: none"> • The A10 will be used as the main route to the A14 • Adverse impacts on A10 traffic must be minimised • That the access road route should minimise impacts on local farmers, land take and impacts on users of Mere Way.

Planning Assessment

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		For site area 3, mitigation opportunities include changing the proposed access route to include access from Junction 35 of the A14 via High Ditch Road/Low Fen Drove Way rather than from Junction 34 via Horningsea Road. The proposed mitigation would require highways Improvements to High Ditch Road and associated junctions as well as signalling measures and signage improvements.
13	Waste management	Arrangements proposed for managing any waste produced (including waste recovery and disposal of all waste generated by the development) are likely to be the same for each site option.
14	Socio-economic	Impacts are likely to be similar in terms of job creation and training opportunities for each option, as are demand for services and facilities. Development of any of the site areas will impact on existing farm businesses, with potentially the most significant impact being to the fruit farm business at site area 1. Impact on surrounding socio-economic activity caused by temporary disruption to businesses is likely to be greater at site areas 1 and 2 given the potential for impacts on businesses located on Butt Lane. Socio-economic effects arising from impacts on PRowS are unlikely to differ substantially between sites.

9. Planning Assessment and Conclusions

- 9.1. Analysis of the assessments undertaken for each option under the Operational, Programme, Economic, Environment and Community criteria (covered elsewhere in this report), and the impact on land use assessments set out above provides the basis to judge how each option (with mitigation) performs against planning policy and whether each option is capable of being granted consent in the context of the requirements of national policy.
- 9.2. In this instance, and because all of the site options impact on Green Belt, clear distinction between the relative suitability of each site area and transfer corridor option is difficult. All sites raise concerns in planning terms, in particular because they would result in the loss of best and most versatile agricultural land¹², impact on (albeit to different extents) Mineral Safeguarding Areas (Sand and Gravel) and development on each would comprise (at least in respect of the WWTP itself) inappropriate development within the Green Belt. All three sites are, therefore, equally objectionable in these terms.
- 9.3. The Green Belt Study prepared by Mott MacDonald dated August 2020 concludes that site area 3 is in a part of the Green Belt that makes a ‘good’ contribution to the purposes of the Green Belt (as compared to ‘fair’ contributions for site areas 1 and 2) and that its development would have more adverse effects on the openness and purposes of the Green Belt (site area 2 would have the least). All three sites would extend the urban edge of Cambridge into the countryside and reduce the landscape gaps between adjacent settlements, but the impact on openness in the Green Belt is assessed to be greatest at site area 3 “*due to the absence of existing built development nearby*”.
- 9.4. The very fact that the Green Belt in the area around site areas 1 and 2 is compromised by existing development (and the threat of more development in the future) provides the rationale for the conclusion that development on these sites would be less harmful on openness (particularly at site area 2). But it could equally be concluded that, because of the relative openness of site area 3, development within it could better be assimilated with appropriate landscape mitigation whilst maintaining the permanence and efficacy of the Green Belt, in contrast to site areas 1 and 2 where development would bring into question whether the immediately surrounding area could continue to play an effective Green Belt role. Similarly, if

¹² See NPS paragraph 4.8.8

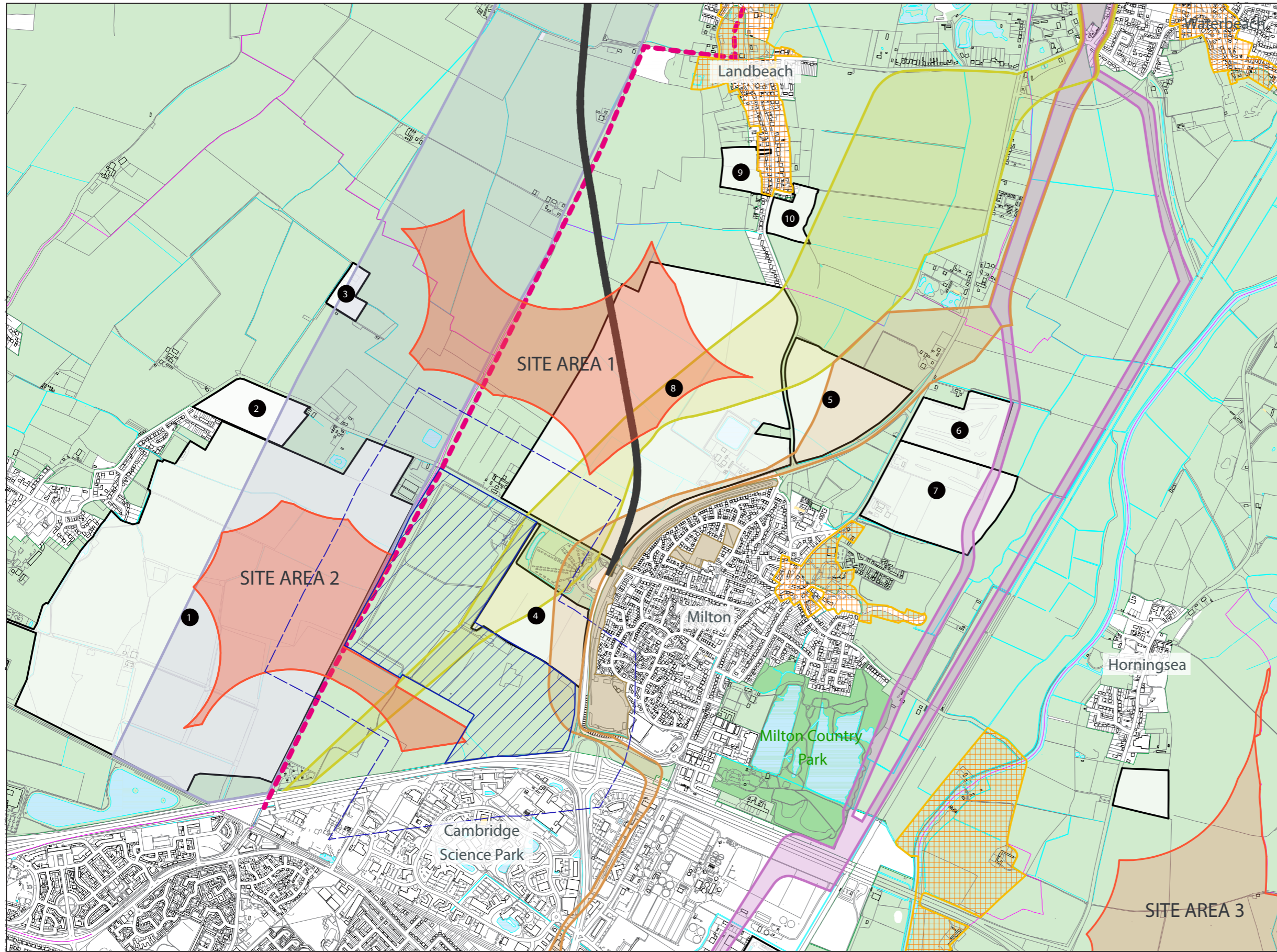
the case for at least some of the future development contemplated in the vicinity of site area 1 and particularly site area 2 is accepted and it comes forward, there would seemingly be very high probability either of this development being frustrated by CWWTPR, or the resilience and future scope for growth of the WWTP beyond its current design life being threatened. The same threat is considerably lower at site area 3, where the resilience of CWWTPR and its scope to accommodate future growth is much less likely to be compromised by surrounding development pressures (thus offering scope for potential longevity similar that achieved at the existing WWTP).

- 9.5. In terms of the other criteria referenced in the NPS aside from land use, the NPS itself recognises¹³ that some adverse impacts from this form of development may be unavoidable. Presuming that the need for CWWTPR and the absence of suitable alternative relocation sites outside Green Belt can be demonstrated sufficient to amount to 'very special circumstances', the scope to mitigate adverse impacts from development on each of the three site areas and their related transfer corridor options are broadly similar, although development of site area 3 for CWWTPR (being in a part of the Wicken Fen vision area) both threatens the achievement of the Wicken Fen Vision and potentially offers greatest opportunity to contribute to the delivery of a 'gateway' connecting the urban area to the countryside (including Stourbridge Common, Ditton Meadows and the River Cam corridor green links) and to support the biodiversity elements of this vision and realisation of the aspirations for the wider area in the Cambridgeshire Green Infrastructure Strategy 2011 and the adopted South Cambridgeshire Local Plan 2018.
- 9.6. Based on the above, and subject to a 'very special circumstances' Green Belt case, it is concluded that all site options are capable of satisfying the requirements of the NPS sufficient to deliver a consentable project.

¹³ See, for example, NPS paragraph 1.4.4



Annexes



KEY:

- Site Area Options
Source: Mott MacDonald
- Milton Country Park
Source: Savills Maps
- Green Belt
Source: Savills' GIS Database
- A10 Option D
Source: Jacobs: BESP0020-JAC-HGN-XX-SK-CH-0007
- Household Waste Recycling Centre and Landfill
Source: scams.gov.uk - 79/16
- Waste Consultation Area
Source: scams.gov.uk - 79/16
- Protected Village Amenity Area (Policy NH/11)
Source: scams.gov.uk - 79
- Conservation Area
Source: scams.gov.uk

Call for Sites:

- Most Relevant
Source: greatercambridgeplanning.org - Site Submission Map
- 1 Non- Residential
- 2 Residential
- 3 Non Residential
- 4 Mixed Use
- 5 Non-Residential
- 6 Residential
- 7 Residential
- 8 Mixed Use
- 9 Residential
- 10 Residential

Waterbeach to Cambridge Better Public Transport Study

- Central Area of Interest
Source: Waterbeach to Cambridge Consultation Brochure
- A10 Area of Interest
Source: Waterbeach to Cambridge Consultation Brochure
- West Area of Interest
Source: Waterbeach to Cambridge Consultation Brochure
- East Area of Interest
Source: Waterbeach to Cambridge Consultation Brochure
- Mere Way Upgrades
Source: Waterbeach to Cambridge Consultation Brochure

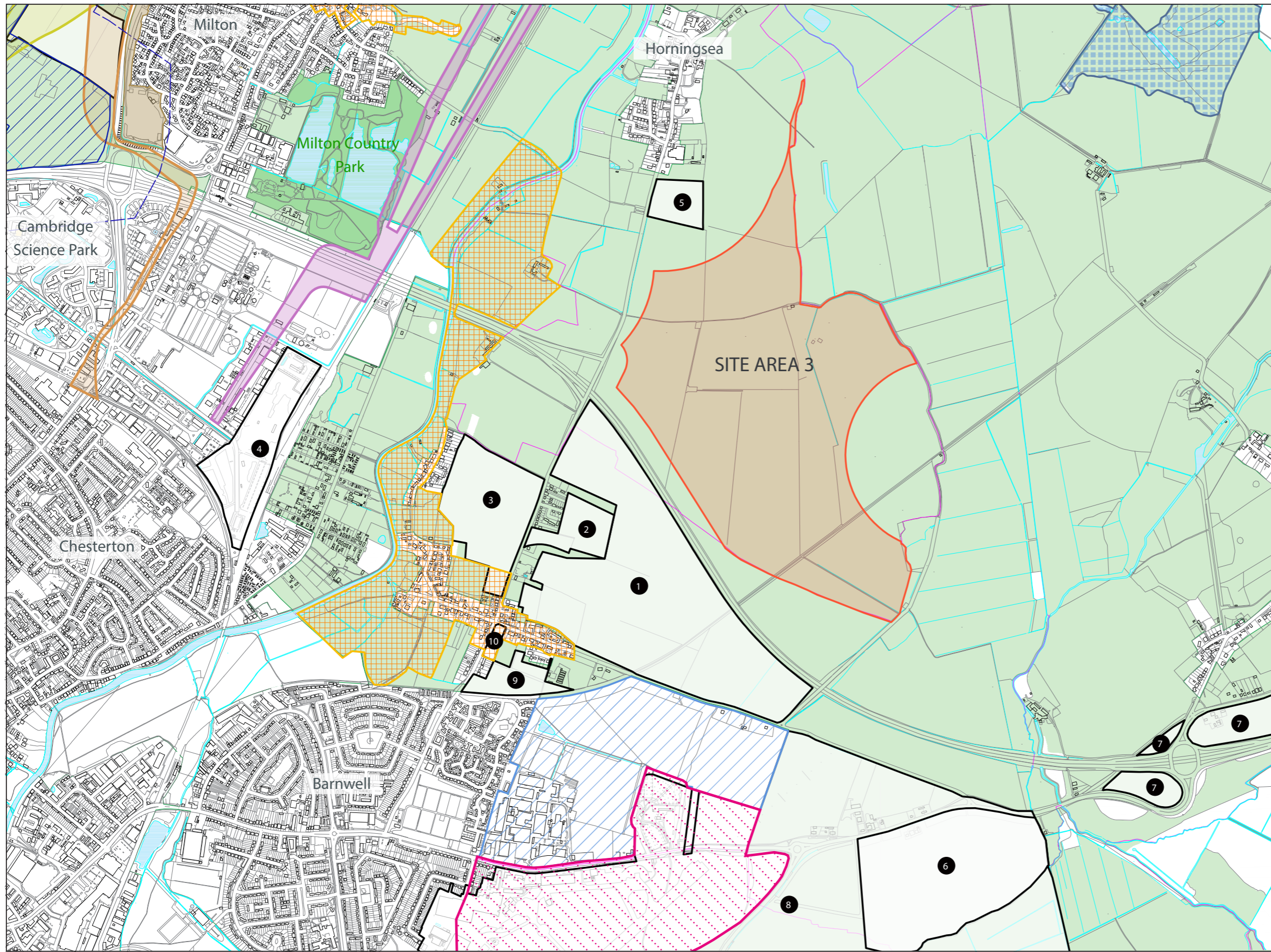
Site Area 1 + 2: Contextual Plan

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 C:\Users\matthew.laidman\Box\UKUrbanDesignProjects\AnglianWater\CAKC404351\B\Drawings\INDD\CAKC404351-0102-DRAFT-SiteArea123ContextualPlan_15022118/01/21
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drawing no.	01	drawing	Site Area 1+2: Context Plan
revision	A	scale	NTS
drawn by	ML	checked by	AD
date	18/01/21	job no.	CAKC404351

NOTES:
 This plan has been prepared for illustrative purposes only and contains elements that have been reproduced from external sources.
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- KEY:**
- Site Area Options
Source: Mott MacDonald
 - Milton Country Park
Source: Savills Maps
 - Green Belt
Source: Savills' GIS Database
 - Conservation Area
Source: scams.gov.uk
 - Site of Special Scientific Interest
Source: Savills Maps
 - Safeguarded Land (Policy SS/3 (4))
Source: scams.gov.uk - Inset C Cambridge East
 - Major Development Site (SS/3 (1a))
Source: scams.gov.uk - Inset C Cambridge East

- Call for Sites:**
- Most Relevant
Source: greatercambridgeplanning.org - Site Submission Map
 - 1 Residential
 - 2 Residential
 - 3 Residential
 - 4 Residential or non-residential
 - 5 Residential
 - 6 Residential
 - 7 Non-residential
 - 8 Mixed use
 - 9 Residential
 - 10 Residential

Site Area 3: Contextual Plan

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 C:\Users\matthew.laidman\Box\UKUrbanDesignProjects\AnglianWater\CAKC404351\B\Drawings\NDD\CAKC404351-0102-DRAFT-SiteArea123ContextualPlan_15022118/01/21
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drawing no.	02	drawing	Site Area 3: Context Plan
revision	A	scale	NTS
drawn by	ML	checked by	AD
date	18/01/21	job no.	CAKC404351

NOTES:
 This plan has been prepared for illustrative purposes only and contains elements that have been reproduced from external sources.
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F.2 Incorporating feedback

F.2.1 Phase one non-statutory consultation was held in order to share the proposals for relocating the WWTP with the public and stakeholders. This section provides a summary of the feedback received from the public in relation to planning aspects and how the concerns, issues and opportunities raised have been considered within the assessment criteria for Stage 4 final site selection.

Table F.88: Planning feedback

Sub-Theme	Site (if specific)	Feedback Summary	CWWTPr Response	
General	All sites	Perhaps the most common 'other' theme is a challenge to the need for relocation, and therefore a request for the plant to remain at the current site.	It is for the Councils to demonstrate that their proposed level of development cannot be achieved on the North East Cambridge site without the relocation of the treatment works. The North East Cambridge AAP relies on the relocation of the works in order to accommodate the proposed redevelopment of the site.	
		Respondents also reported concern regarding potential negative impacts to house prices and quality of life in the vicinity of a new plant.	House prices are not a material planning consideration. The site selection process has sought to achieve at least 400m from residential properties and other mitigation will be put in place to further mitigate impacts on residential amenity	
		There was also a theme of concern that the relocated plant will increase the potential for future developments to be brought forward and approved.	This project is solely for the proposed relocation of the waste water treatment works. It does not include any other development proposals.	
			A respondent requested that the new resources are created as part of the relocation, rather than exploiting existing infrastructure (e.g. roads, housing space, bicycle routes, bus routes).	This project will provide new infrastructure to replace the existing works and also to provide capacity for predicted development growth.
	Site areas 1 and 2	Concerns about the proposed A10 dualling also have implications for the consideration of planning criteria.	Anglian Water is liaising with the Cambridgeshire and Peterborough Combined Authority regarding the A10 upgrade to ensure there are no conflicts with either proposal.	
	Site area 1	Comment that Site 1 affects land belonging to Sunclose Farm and could therefore potentially reduce the number of local job opportunities as well as availability of local produce.	The impact on local job opportunities will be assessed in the DCO submission	
	Site area 3	Similarly, it was commented that Honey Hill (Site 3) is also high-grade agricultural land of local and national value.	Agricultural land value has been taken into account in the site selection process	

Sub-Theme	Site (if specific)	Feedback Summary	CWWTPR Response
Greenbelt	General	This is one of the most frequently raised issues with the relocation, with significant respondents being opposed to development of a greenbelt sites for this purpose. A range of values placed on the existing greenbelt have been submitted (e.g. public wellbeing, prevention of Urban sprawl, existing wildlife, and habitats).	It is recognised that all three sites are located in the Green Belt and that very special circumstances will have to be demonstrated in the final DCO submission
	Site area 3	Comment that Local greenbelt area will become more important to locals as the Marleigh housing development is completed.	The new development at Marleigh has been taken into account in the Stage 4 planning assessment.

G. Programme assessment

G.1 Assessment methodology

- G.1.1 This assessment considered whether there are significant programme risks associated with implementing any of the options either pre-construction or during construction.
- G.1.2 As the project is funded by the UK Government (through Homes England) the project is controlled by strict governance including a programme for the completion of the project, which contains fixed milestones for the start/completion of defined stages. Therefore, an assessment of the risks of not achieving the defined programme is important to identify if any of the proposed options would be not be possible to complete in the required timescales.
- G.1.3 This criterion will consider the potential impacts and constraints that have been identified in the assessment of the operational, environmental and planning criteria and what impact they could have on the programme. The main three areas of programme risk that were considered in this assessment are as follows.
- Constraints or activities that could delay the submission of the DCO application or gaining DCO approval
 - Constraints or activities that could extend or delay the start of construction on site
 - Constraints or activities that could extend or delay the construction period.
- G.1.4 In the unmitigated scenario, the identified risks will be considered without any measures to minimise the potential impact on the programme. The mitigated scenario will consider what measures could be put in place to minimise the programme risks and where, even with measures in place, residual risks of delay to the programme would remain.
- G.1.5 In order to compare the various options with one another, the following RAG evaluation categories have been established for programme risks.

Table G.89: Programme risks – RAG definitions

Green	Amber	Red
Low risk of programme impact	Moderate risk of programme impact	High risk of programme impact
Likely to achieve all HIF milestones and the final HIF deadline for project completion	Unlikely to achieve all HIF milestones but the final HIF deadline for project completion could be met	Unlikely to achieve all HIF milestones and the final HIF deadline for project completion might not be achieved

G.2 Assessment of unmitigated options

DCO submission and DCO approval

- G.2.1 The risks of delay to the submission of the DCO application are considered to mainly relate to uncertainty in relation to the enhancement and mitigation measures required. Due to the fact that all three site areas are located within green belt and potentials impacts have been identified in relation to landscape character, visual amenity, the setting of heritage assets and biodiversity, there is a potential that statutory consultation could result in the need to develop extensive enhancement and mitigation proposals to ensure that the scheme would gain DCO approval.
- G.2.2 The need to investigate and design extensive enhancement and mitigation plans following either of the two phases of statutory consultation would potentially have a major impact on the programme and cause a delay to the DCO application submission.
- G.2.3 It is considered that this risk is highest in relation to site area 3 due to the contribution to Green Belt purposes of the existing site, the changes in landscape character of the area, impacts on heritage assets and disruption of Green Infrastructure plans for the area. This risk is also moderate for site area 1 due to its contribution to Green Belt and the potential changes to the landscape character of the area. Whereas, the contribution to Green Belt purposes and the character of site area 2 has already been eroded by the presence of the surrounding land uses and infrastructure and therefore a WWTP in this area may not be as problematic.
- G.2.4 The promotion of site area 2 for an extension to the Cambridge science park presents a significant risk of delays in the submission of the DCO application and gaining DCO approval.

Start of construction

- G.2.5 The programme allows for a six month period between the grant of the DCO and start of construction on site to discharge the requirements set by the Secretary of State. It is assumed in this programme risk assessment that the planned programme of statutory consultation and establishment of technical working groups with statutory consultees will result in well defined requirements following DCO approval, which can be satisfactorily discharged within the period prior to the start of construction. However, there are certain aspects of the scheme that present additional risks to the start on site, which area described below.

Archaeological potential

- G.2.6 There is very high potential for archaeology relating to the Roman period within site area 3 and a high archaeological potential for Iron Age and Roman remains within site areas 1 and 2. If significant archaeology were to be discovered during the archaeological investigation then this could have a significant impact on the programme for all three sites whilst the finds are investigated. In addition, there are areas of high archaeological potential within the pipeline corridors for all of the options and therefore finds in these areas could also impact on the programme.

Presence of Great Crested Newts

- G.2.7 GCNs have been recorded within site area 2 and within 250m of the Waterbeach pipeline corridors for site areas 1 and 2 and within 350m of the Waterbeach pipeline corridor for site area 3. If further surveys determine that populations of GCN are present and could be impacted by the scheme then it may be necessary to obtain a protected species licence from Natural England and develop a mitigation strategy to define how impact on GCN and their habitats will be avoided or minimised. If impacts cannot be avoided e.g. if GCN are located with the scheme

boundary then translocation and habitat creation will be necessary, which could have a significant impact on the programme of all three sites.

Connection with designated sites

- G.2.8 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 will not be affected by the new WWTP; this could potentially delay commencement of construction on the site.
- G.2.9 There is also uncertainty in relation to dewatering at site area 1 and 2 and what impact this may have on the water supply to the Cottenham Moat CWS. This may require investigation to demonstrate that dewatering would not have a detrimental effect on the CWS and the population of Great Crested Newts it supports. This could potentially delay to commencement of construction on the site. However, the risk of an adverse impact is considered to be low.

Contamination risks

- G.2.10 4.4.10 Ground investigation will determine the extent of any existing soil or groundwater contamination on WWTP sites or along tunnel/pipeline routes. Due to the location of site area 2 being in proximity to Milton Landfill there are potential risks to programme, if the ground investigation identifies that remediation or mitigation measures are required prior to construction of the new WWTP such as gas protection measures.

Railway crossings

- G.2.11 All options will require waste water transfer infrastructure (tunnel or pipeline) to cross the Cambridge to Ely railway line that lies to the west of the River Cam and the Waterbeach pipeline option for site area 3 will also need to cross the railway to north-east of Waterbeach. There are stringent regulations in place to protect railways from being impacted by construction work and the process of agreeing such work can be protracted. Therefore, there is a risk that if any changes to the required crossing are necessary the process to agree these changes could cause a delay to the programme.

Enhancements and mitigation measures

- G.2.12 As discussed above there is a potential risk of the need for additional enhancement and mitigation measures to be required at site area 3 and to a lesser extent site area 1. It is possible that statutory stakeholders could stipulate in the DCO discharge requirement that these measures must be put in place prior to the commencement of construction. Depending on the extent of these measures this could have a significant impact on the programme for starting construction on site.

Construction and commissioning

- G.2.13 One of the main differentials between the delivery stage of the programmes for each site area option is the period of construction and commissioning for the waste water transfer infrastructure, which in an unmitigated scenario is mainly governed by the length of the waste water transfer tunnel and treated effluent transfer tunnel/pipeline associated with each of the site areas. An outline of construction and commissioning durations for the 3 site areas is detailed in Table G.90.
- G.2.14 Although there are two route corridor options for the treated effluent transfer (A and B) at site areas 1 and 2, the differences in length or construction method (i - tunnel or ii - pipeline) of these options does not have a significant impact on the construction duration and therefore no

differentiation is presented between these options. However, the routes and methods for all of the waste water transfer infrastructure do vary in terms of potential risks that could impact on the programme, which are discussed later in this section.

Table G.90: Construction and commissioning duration

Option	Duration of construction and commissioning (months)	Variance to site area 3 (shortest duration site) in months
Site area 1 (Option A(i), A(ii), B(i) and B(ii))	43	2
Site area 2 (Option A(i), A(ii), B(i) and B(ii))	48	7
Site area 3 (Option A(i) and A(ii))	41	-

G.2.15 The table shows that the construction and commissioning duration for site area 2 options is considerably longer than for the other sites. In isolation the duration for site area 2 would be achievable within the overall agreed programme, although it could result in one or more of the interim milestones being missed. However, it does mean there would be limited flexibility in the event of delays due to other factors. The duration of construction and commissioning for site areas 1 and 3 are relatively similar and would allow some flexibility in the event of delays due to other factors.

G.2.16 As mentioned above there are potential risks in relation to the routes and method for the construction of the waste water transfer infrastructure that could have an impact on the programme, which are detailed in table. There are some differences in the construction of the Waterbeach waste water transfer in relation to each site. However, it is considered that this element of the scheme is not part of the critical path in the programme and therefore it is assumed that delays in its construction would not have a significant impact on the overall programme, as such the difference as not considered in this assessment.

Table G.91: Waste water transfer infrastructure programme risks

Site area	Option	Potential unmitigated risks
1 and 2	A	<p>The waste water transfer tunnels to site area 1 and 2 and the shafts located at the sites are likely to penetrate the Lower Greensand aquifer. This presents potential difficulties in relation to groundwater pressures and stability of the sand during construction of the shafts and tunnel, which could cause delays to construction. The likelihood of interaction with the aquifer is higher for site area 2 due to the longer length and route of the tunnel.</p> <p>Corridors for both the waste water transfer tunnel and treated effluent are relatively tightly constrained as they pass below the A14, the cycle bridge and between the Milton Landfill and Milton village, if unexpected contamination is discovered this could delay construction of the tunnel.</p> <p>If the treated effluent transfer is constructed as a pipeline there are a number of constraints along this route that could cause a delay to construction such as:</p> <p>Proximity to Milton Landfill and the A14, crossing of the A10 in close proximity to Milton, navigating through the commercial businesses on Cambridge Road and crossing the railway.</p>
	B	<p>Risks for waste water transfer tunnel are the same as option A.</p> <p>The route corridor for the treated effluent transfer is less constrained and therefore there is more opportunity to avoid sensitive receptors if a pipeline method was chosen, such as the Milton cemetery and Rectory Farm reservoir. However, this route would still require crossing of the A10 and the railway.</p>
3	A	<p>Route for waste water transfer tunnel passes below the railway, River Cam and the A14. However, the tunnel is the shortest of the three sites and the risk of unexpected contamination is very low therefore risks are considered to be lower than sites area 1 and 2.</p> <p>Route for treated effluent transfer is short and only crosses one minor road, it is considered that this does not pose a significant risk of delay to the programme whether constructed as a tunnel or pipeline.</p>

G.2.17 In addition to the constraints discussed above any unplanned changes to working practices during the construction period, that have not been included in the DCO, such as increases in noise levels, night working or construction traffic access, will require subsequent application to the relevant local planning authority. This is a potential risk to the programme for all sites. However, there is potentially a greater risk at site areas 1 and 2 where there are more sensitive receptors within proximity to the sites.

G.2.18 Using the risks outlined above and the RAG categories provided in Section G.1 each site options have been evaluated to define the programme risks in an unmitigated scenario, the results of the evaluation are provided in Table G.92.

Table G.92: Unmitigated programme risk RAG results

Option	Unmitigated Programme risk RAG	Justification
Site area 1 (Option A(i) and A(ii))	Amber	<p>Moderate risk of delay in DCO submission in relation to potential need to develop additional environmental enhancement and mitigation measures.</p> <p>The risks of archaeological finds across the scheme area, the potential for GCNs within the pipeline corridors and constraints associated with the treated effluent corridor present a moderate risk of delay to the start of construction.</p> <p>Potential for additional enhancement and mitigation measures and the potential need to deliver them prior to starting on site presents a moderate risk of delay to the start of construction</p> <p>Shorter length of waste water transfer tunnel allows some flexibility in construction programme in case of other delays.</p> <p>Combination of risks result in a moderate risk of impact on the programme</p>
Site area 1 (Option B(i) and B(ii))	Amber	<p>As above, with the exception that there are less constraints along the treated effluent corridor. However, this does not change the overall risk to the programme.</p>
Site area 2 (Option A(i) and A(ii))	Red	<p>The promotion of site area 2 for an extension to the Cambridge science park presents a significant risk of delays in the submission of the DCO application and gaining DCO approval.</p> <p>The risks of archaeological finds across the scheme area and potential presence of GCNs within the site area, constraints associated with the treated effluent transfer corridor and the potential for contaminated land associated with the landfill adjacent to the site area presents a high risk of delay to the start of construction.</p> <p>Construction duration for long waste water transfer tunnel limits the flexibility in case of other delays. Risks in relation to interaction with the Lower Greensand aquifer and other constraints associated with the waste water transfer tunnel route present a moderate risk of delays to the construction programme.</p> <p>Combination of risks result in a high risk of impact to the programme</p>
Site area 2 (Option B(i) and B(ii))	Red	<p>As above, with the exception that there are less constraints along the treated effluent corridor. However, this does not change the overall risk to the programme</p>
Site area 3 (Option A(i) and A(ii))	Red	<p>High risk of delay in DCO submission in relation to potential need to develop extensive environmental enhancement and mitigation measures.</p> <p>The risks of archaeological finds across the scheme area and the potential for GCNs within the scheme area present a moderate risk of delay to the start of construction.</p> <p>Potential need for surveys and monitoring due to connection between drainage network at site area 3 and Stow Cum Quy Fen SSSI present a moderate risk of delay to the start of construction</p> <p>Potential for extensive enhancement and mitigation measures and the potential need to deliver them prior to starting on site presents a moderate risk of extending the construction programme</p> <p>Shortest duration of construction of the three site areas could allow some flexibility in case of other delays.</p> <p>Combination of risks result in a high risk of impact on the programme</p>

G.3 Assessment of mitigated options

DCO submissions and DCO approval

- G.3.1 With mitigation in place there is still a residual risks of delay to the submission of the DCO application in relation to the potential need additional enhancement and mitigation measures required for site area 3 and to a lesser extent site area 1. This is due to residual risks associated with landscape and visual impacts, setting of heritage assets and the contribution of these areas to Green Belt purposes.
- G.3.2 The promotion of site area 2 for an extension to the Cambridge science park presents a significant risk of delays in the submission of the DCO application and gaining DCO approval.
- G.3.3 The highways improvements required for construction and operational access to site area 3 present a potential risk to the submission of the DCO application and the discharge of requirements following DCO approval. The proposed improvements for operational access are extensive and require revision of existing Traffic Regulation Orders on local highways and changes to an asset that could impact on the strategic highways network (bridge over the A14). In addition, a different access route is proposed during construction to allow for the operational access improvements to be completed in conjunction with the WWTP and associated infrastructure. These proposals will require agreement with both the local highways authority and Highways England, who have both expressed concerns in their responses to consultation. Therefore, it is considered that there is a risk that these authorities could stipulate certain requirements that would be difficult to discharge within the programmed six month period between DCO approval and start of construction.

Start of construction

- G.3.4 As discussed above, the programme allows for a six month period between the grant of the DCO and start of construction on site to discharge the requirements set by the Secretary of State. However, even with mitigation measures in place there are certain aspects of the scheme that present additional risks to the start on site, which are described below.

Archaeological potential

- G.3.5 Archaeological investigation (including geophysical survey and trial trenching) may identify areas of greater archaeological potential within the site areas and infrastructure corridors, which may allow for the targeting of building and service locations to reduce impact on buried archaeology. However, as the landscape contains a high density of remains and the historic environment is not the only factor of consideration in the scheme design this is unlikely to materially reduce the potential for impact. As such there remains a risk of unexpected finds during construction for all of the site area options.
- G.3.6 There is also a specific concern around the location of Fleam Dyke in relation to the highway's improvements required on High Ditch Road for site area 3 and the extent of archaeological investigation that may be required to ensure the highways improvement do not impact on the Dyke.

Presence of Great Crested Newts

- G.3.7 The principal measure for mitigating the risk of impact on GCN is avoiding the loss of suitable waterbodies and terrestrial habitat. The nature conservation assessment has indicated that all of the scheme areas contain areas of habitat suitable for GCN and the presence of GCN have

been recorded within site area 2⁷⁶, within 250m of the Waterbeach pipeline corridors for site areas 1 and 2 and within 350m of the Waterbeach pipeline corridor for site area 3.

- G.3.8 It is considered that it will not be possible to completely avoid loss of habitat in any of the options. Therefore, there is risk that habitat creation and translocation may be required for all options, which would need to be completed prior to commencing construction in the areas of habitat loss. As construction of the Waterbeach waste water transfer pipeline is not considered to be a critical path item in the programme, it is likely that mitigation required within the corridors would not impact on the overall programme. However, there is potentially a higher risk of habitat loss within site area 2 and if mitigation is required within the site area then this could delay the start of construction on site, which could have a significant impact on the overall programme.

Connection with designated sites

- G.3.9 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 will not be affected by the new WWTP; this could potentially delay commencement of construction on the site.
- G.3.10 There is also uncertainty in relation to dewatering at site area 1 and 2 and what impact this may have on the water supply to the Cottenham Moat CWS. This may require investigation to demonstrate that dewatering would not have a detrimental effect on the CWS and the population of Great Crested Newts it supports. This could potentially delay commencement of construction on the site. However, the risk of an adverse impact is considered to be low.

Contamination risks

- G.3.11 Due to the location of site area 2 being in proximity to Milton Landfill, there are potential risks to programme, if the ground investigation identifies that remediation or mitigation measures are required prior to construction of the new WWTP such as gas protection measures. Completing the ground investigation within the site area as soon as possible after site selection would allow time to adjust the scheme design accordingly to minimise the potential risks and to establish a plan for any remediation and/or mitigation measures required.

Railway crossings

- G.3.12 As discussed in Appendix G.2. all options will require crossing of the Cambridge to Ely railway line and there are stringent regulations in place to protect railways from being impacted by construction work and the process of agreeing such work can be protracted. Early engagement with Network Rail and establishing a Construct Management Plan for the infrastructure crossing the railway as soon as possible should mitigate the risk to programme.

Enhancements and mitigation measures

- G.3.13 As discussed above there is a potential risk of the need for additional enhancement and mitigation measures to be required at site area 3 and to a lesser extent site area 1. It is possible that statutory stakeholders could stipulate in the DCO discharge requirements that these measures must be put in place prior to the commencement of construction. Depending on the extent of these measures this could have a significant impact on the programme for starting construction on site.

⁷⁶ Although as set out in section 4.2.27, the record does not appear to be linked to a waterbody or pond and, therefore, if further surveys do not identify presence of GCN, it will need to be discounted based on up to date survey data

Construction and commissioning

- G.3.14 In the mitigated scenario the main difference in the delivery programmes for each site area option remains to be the period of construction and commissioning for the waste water transfer infrastructure, specifically the waste water transfer tunnel and treated effluent transfer tunnel/pipeline associated with each of the site areas. However, there is also some uncertainty around the WWTP design and how this could affect the construction programme.
- G.3.15 The construction and commissioning duration for site area 2 options is considerably longer than for the other sites and lacks flexibility in the event of delays due to other factors. However, the risk of major design changes in relation to the WWTP are considered to be relatively low.
- G.3.16 The duration of construction and commissioning for site areas 1 and 3 are shorter than for site area 2, are relatively similar to one another and would allow some flexibility in the event of delays due to other factors. However, the uncertainty around the enhancement and mitigation required could result in a longer construction period if extensive measures are necessary, for example if major earthworks are needed.
- G.3.17 As discussed in Appendix G.2, there are potential risks in relation to the routes and method for the construction of the waste water transfer infrastructure that could have an impact on the programme. The residual risks in a mitigated scenario are detailed in Table G.93.

Table G.93: Waste water transfer infrastructure residual programme risks

Site area	Option	Potential mitigated risks
1 and 2	A	<p>Extensive ground investigation will be carried out at the new WWTP site and within the corridors for the waste water transfer tunnels, which will define the interaction with the Lower Greensand aquifer and identify the presence of contamination. The results will be used to influence the route design and construction techniques to ensure that risks during construction are managed effectively. Therefore, it is considered that the interaction with the aquifer and unexpected contamination do not present a major risk to the programme with this mitigation in place.</p> <p>There are numerous constraints associated with the treated effluent transfer if it is constructed as a pipeline and there is limited opportunity for avoidance in route alignment due to the constrained corridor. Therefore, it is considered that constructing the transfer as a pipeline presents a higher risk of delay to the programme than if it were constructed as a tunnel.</p>
	B	<p>Risks for waste water transfer tunnel are the same as option A.</p> <p>The route corridor for the treated effluent transfer is less constrained and therefore there is more opportunity to avoid sensitive receptors if a pipeline method was chosen. Therefore, the risk of programme delay for this route are considered to be lower than for option A.</p>
3	A	<p>Route for waste water transfer tunnel passes below the railway, River Cam and the A14. However, the tunnel is the shortest of the three sites and the risk of unexpected contamination is very low therefore risks are considered to be lower than sites area 1 and 2.</p> <p>Route for treated effluent transfer is short and only crosses one minor road, it is considered that this does not pose a significant risk of delay to the programme whether constructed as a tunnel or pipeline.</p>

G.3.18 Using the risks outlined above and the RAG categories provided in Appendix G.1 each site options have been evaluated to define the programme risks in an unmitigated scenario, the results of the evaluation are provided in Table G.94.

Table G.94: Mitigated programme risk RAG results

Option	Mitigated Programme risk RAG	Justification
Site area 1 (Option A(i) and A(ii))	Amber	<p>Moderate risk of delay in DCO submission in relation to potential need to develop additional environmental enhancement and mitigation measures.</p> <p>The risks of archaeological finds across the scheme area present a moderate risk of delay to the start of construction.</p> <p>Potential for additional enhancement and mitigation measures and the potential need to deliver them prior to starting on site presents a moderate risk of delay to the start of construction.</p> <p>Shorter length of waste water transfer tunnel allows some flexibility in construction programme in case of other delays.</p> <p>Combination of risks result in a moderate risk of impact on the overall programme.</p>
Site area 1 (Option B(i) and B(ii))		<p>As above, with the exception that there are less constraints along the treated effluent corridor. However, this does not change the overall risk to the programme.</p>
Site area 2 (Option A(i) and A(ii))	Red	<p>The promotion of site area 2 for an extension to the Cambridge science park presents a significant risk of delays in the submission of the DCO application and gaining DCO approval.</p> <p>The risks of archaeological finds across the scheme area and potential presence of Great Crested Newts within the site area presents a moderate risk of delay to the start of construction.</p> <p>Construction duration for long waste water transfer tunnel limits the flexibility in case of other delays.</p> <p>Combination of risks result in a high risk of impact on the programme.</p>
Site area 2 (Option B(i) and B(ii))		<p>As above, with the exception that there are less constraints along the treated effluent corridor. However, this does not change the overall risk to the programme.</p>
Site area 3 (Option A(i) and A(ii))	Red	<p>High risk of delay in DCO submission in relation to potential need to develop extensive environmental enhancement and mitigation measures.</p> <p>Potential need for surveys and monitoring due to connection between drainage network at site area 3 and Stow Cum Quy Fen SSSI present a moderate risk of delay to the start of construction</p> <p>Highways improvements required present a moderate risk of delay in gaining DCO approval and commencing construction on site.</p> <p>The risks of archaeological finds across the scheme area present a moderate risk of delay to the start of construction.</p> <p>Potential for extensive enhancement and mitigation measures and the potential need to deliver them prior to starting on site presents a moderate risk of extending the construction programme.</p> <p>Shortest duration of construction of the three site areas could allow some flexibility in case of other delays.</p> <p>Combination of risks result in a high risk of impact on the programme.</p>

H. Nature conservation and biodiversity assessment tables

H.1 Nature conservation and biodiversity assessment tables

Table H.95: Habitat types within indicative site areas and their associated corridors and access areas and their potential to support protected species

Site area	Habitat type (habitats in bold are HPI from Natural England inventory) ⁷⁷	Approximate area (ha) or length (km) ⁷⁸ (site area and indicative WWTP footprint in brackets) ⁷⁹	Approximate % land cover of the proposed site area and its associated corridors and access areas.	Habitat of principal importance from Natural England inventory	Potential to support protected species	RAG rating
1a	Broadleaved woodland	18.47 ⁸⁰ (1.54 site area)	2.46	Y	Bats, badgers, barn owls and breeding birds	Amber
	Coniferous woodland	1.02 ⁸¹	0.14	N	Bats, badgers, barn owls and breeding birds	
	Mixed woodland	1.93	0.26	Potentially	Bats, badgers, barn owls and breeding birds	
	Scrub	8.85 ⁸²	1.18	N	Badgers, breeding birds and amphibians	

⁷⁷ The HPI habitat areas are not in addition to the general habitat types areas. For example, the broadleaved woodland habitat area of 7.04ha will include the 6.34ha of HPI deciduous woodland habitat.

⁷⁸ Hedgerows, parkland/scattered trees, ditches, running water are in km only

⁷⁹ Where a habitat type exists within the shortlisted site area, this is included in brackets in order to compare between an area within the shortlisted site and total area (shortlisted site and associated corridors and access areas).

⁸⁰ Deciduous woodland habitat type combines the approximate area of A1.1.1 Broadleaved Woodland - semi-natural and A1.1.2 Broadleaved Woodland – plantation habitat types together.

⁸¹ Coniferous woodland habitat type combines the approximate area of A1.2.1 Coniferous Woodland – semi natural and A1.2.2 Coniferous Woodland – plantation habitat types together.

⁸² Scrub habitat type combines the approximate area of A2.1 - Scrub - dense/continuous and A2.2 - Scrub – scattered habitat types together.

Site area	Habitat type (habitats in bold are HPI from Natural England inventory) ⁷⁷	Approximate area (ha) or length (km) ⁷⁸ (site area and indicative WWTP footprint in brackets) ⁷⁹	Approximate % land cover of the proposed site area and its associated corridors and access areas.	Habitat of principal importance from Natural England inventory	Potential to support protected species	RAG rating
	Parkland/scattered trees	9km (2.95km site area) (1.69km Indicative WWTP footprint)	N/A	Potentially	Bats, badgers, barn owls and breeding birds	
	Semi-improved grassland	47.91 ⁸³ (7.39 site area) (2.70 indicative WWTP footprint)	6.39	N	Breeding birds and reptiles	
	Improved grassland	34.52 (1.93 site area)	4.60	N	Breeding birds, and reptiles	
	Other tall herb and fern - ruderal	0.11	0.01	N	Breeding birds, reptiles and amphibians	
	Standing Water	3.43	0.46	Potentially	Water voles, otters, great crested newt, aquatic invertebrates and spined loach	
	Running Water	1.49	0.20	Potentially	Water voles, otters, great crested newt, aquatic invertebrates and spined loach	
	Dry Ditch	12.03km (1.90 km site area and 0.05 km indicative WWTP footprint)	1.60	N	N/A	
	Species poor Hedgerow	7.94km ⁸⁴ (1.06 km site area 0.40 km indicative WWTP area)	N/A	N	Badgers, breeding birds and amphibians	

⁸³ Semi Improved Grassland habitat type combines the approximate area of B2.2 - Neutral grassland - semi-improved and B6 - Poor semi-improved grassland habitat types together.

⁸⁴ Species poor hedgerow habitat type combines the approximate area of J2.1.2 - Intact hedge - species-poor, J2.2.2 - Defunct hedge - species-poor and J2.3.2 - Hedge with trees - species-poor habitat types together.

Site area	Habitat type (habitats in bold are HPI from Natural England inventory) ⁷⁷	Approximate area (ha) or length (km) ⁷⁸ (site area and indicative WWTP footprint in brackets) ⁷⁹	Approximate % land cover of the proposed site area and its associated corridors and access areas.	Habitat of principal importance from Natural England inventory	Potential to support protected species	RAG rating
	Species rich Hedgerow	2.51 km (0.39 km site area)	N/A	Y	Badgers, breeding birds and amphibians	
	Arable land	485.71 (55.78 site area and 19.33 indicative WWTP footprint)	64.76	N	Breeding and over-wintering birds	
	Amenity Grassland	49.71(0.76 site area and 0.04 indicative WWTP footprint)	6.63	N	N/A	
	Other habitat	75.08 ⁸⁵ (0.57 site area and 0.01 indicative WWTP footprint)	10.01	N	Bats and breeding birds	
	Coastal and floodplain grazing marsh	3.52	N/A	Y	Breeding and over-wintering birds	
	Traditional orchard	0.36	N/A	Y	Breeding birds, terrestrial Invertebrates	
	Deciduous woodland	6.34 (1.48 site area)	N/A	Y	Bats, badgers, barn owls and breeding birds	
	No main habitat but additional habitats present ⁸⁶	0.01	N/A	Y	N/A	

⁸⁵ Other habitat type combines the approximate areas of JNCC Phase 1 habitat types J5 Hardstanding, J3.6 Buildings, J3.4 Caravan site, J4 Bare ground and J5 Other habitat. These habitats types in most cases are of low ecological value, apart from when buildings may support bat roosts.

⁸⁶ Where candidate habitats remain but no main habitat can be identified the whole polygon is mapped as 'No main habitat but additional habitats' and the priority habitats thought to be present are shown within the attribution as additional habitats.

Site area	Habitat type (habitats in bold are HPI from Natural England inventory) ⁷⁷	Approximate area (ha) or length (km) ⁷⁸ (site area and indicative WWTP footprint in brackets) ⁷⁹	Approximate % land cover of the proposed site area and its associated corridors and access areas.	Habitat of principal importance from Natural England inventory	Potential to support protected species	RAG rating
1b	Broadleaved woodland	11.27 ⁸⁷ (1.68 site area)	1.32	Y	Bats, badgers, barn owls and breeding birds	Amber
	Coniferous woodland	1.13 ⁸⁸	0.13	N	Bats, badgers, barn owls and breeding birds	
	Mixed woodland	8.85	1.03	Potentially	Bats, badgers, barn owls and breeding birds	
	Scrub	5.03 ⁸⁹	0.59	N	Badgers, breeding birds and amphibians	
	Parkland/scattered trees	8.70 km. (0.14 km site area)	N/A	Potentially	Bats, badgers, barn owls and breeding birds	
	Semi-improved grassland	65.60 ⁹⁰ (7.39 site area) (2.70 indicative WWTP footprint)	7.67	N	Breeding birds and reptiles	
	Improved grassland	34.58 (1.93 site area)	4.04	N	Breeding birds, and reptiles	
	Other tall herb and fern - ruderal	0.26	0.03	N	Breeding birds, reptiles and amphibians	
	Swamp	0.36	N/A	Y	Breeding birds and amphibians	

⁸⁷ Deciduous woodland habitat type combines the approximate area of A1.1.1 Broadleaved Woodland - semi-natural and A1.1.2 Broadleaved Woodland – plantation habitat types together.

⁸⁸ Coniferous woodland habitat type combines the approximate area of A1.2.1 Coniferous Woodland – semi natural and A1.2.2 Coniferous Woodland – plantation habitat types together.

⁸⁹ Scrub habitat type combines the approximate area of A2.1 - Scrub - dense/continuous and A2.2 - Scrub – scattered habitat types together.

⁹⁰ Semi Improved Grassland habitat type combines the approximate area of B2.2 - Neutral grassland - semi-improved and B6 - Poor semi-improved grassland habitat types together.

Site area	Habitat type (habitats in bold are HPI from Natural England inventory) ⁷⁷	Approximate area (ha) or length (km) ⁷⁸ (site area and indicative WWTP footprint in brackets) ⁷⁹	Approximate % land cover of the proposed site area and its associated corridors and access areas.	Habitat of principal importance from Natural England inventory	Potential to support protected species	RAG rating
	Standing Water	3.59	0.73	Potentially	Water voles, otters, great crested newts, aquatic invertebrates and spined loach	
	Running Water	6.45	0.75	Potentially	Water voles, otters, amphibians, aquatic invertebrates and spined loach	
	Dry Ditch	6.26km (1.90 km site area and 0.05 km indicative WWTP footprint)	0.73	N	N/A	
	Species poor Hedgerow	8.80km. ⁹¹ (1.06 km site area and 0.40 km indicative WWTP footprint)	N/A	N	Badgers, breeding birds and amphibians	
	Species rich Hedgerow	4.03km (0.39 km site area)	N/A	Y	Badgers, breeding birds and amphibians	
	Arable land	549.04 (55.78 site area and 19.33 indicative WWTP footprint)	64.19	N	Breeding and over-wintering birds	
	Amenity Grassland	68.94 (0.76 site area)	8.06	N	N/A	
	Other habitat ⁹²	84.73 (0.57 Site area and 0.01 indicative WWTP footprint)	9.91	N	Bats, Barn owls and breeding birds	

⁹¹ Species poor hedgerow habitat type combines the approximate area of J2.1.2 - Intact hedge - species-poor, J2.2.2 - Defunct hedge - species-poor and J2.3.2 - Hedge with trees - species-poor habitat types together.

⁹² Other habitat type combines the approximate area of J5 Hardstanding, J3.6 Buildings, J3.4 Caravan site, J4 Bare ground, J5 Other habitat .and I2.4 -Refuse-tip These habitats types in most cases are of low ecological value, apart from when buildings may support bat roosts.

Site area	Habitat type (habitats in bold are HPI from Natural England inventory) ⁷⁷	Approximate area (ha) or length (km) ⁷⁸ (site area and indicative WWTP footprint in brackets) ⁷⁹	Approximate % land cover of the proposed site area and its associated corridors and access areas.	Habitat of principal importance from Natural England inventory	Potential to support protected species	RAG rating
	Coastal and floodplain grazing marsh	9.76	N/A	Y	Breeding and over-wintering birds	Amber
	Traditional orchard	0.36	N/A	Y	Bats, Breeding birds, terrestrial Invertebrates	
	Deciduous woodland	2.98 (1.48 site area)	N/A	Y	Bats, badgers, barn owls and breeding birds	
	No main habitat but additional habitats present	0.01	N/A	Y	N/A	
2a	Broadleaved woodland	28.50 ⁹³ (1.87 site area and 0.85 indicative WWTP footprint)	2.77	Y	Bats, badgers, barn owls and breeding birds	
	Coniferous woodland	1.01 ⁹⁴	0.10	N	Bats, badgers, barn owls and breeding birds	
	Mixed woodland	9.31 (0.07 site area)	0.91	Potentially	Bats, badgers, barn owls and breeding birds	
	Scrub	7.59 ⁹⁵ (0.04 site area)	0.74	N	Badgers, breeding birds and great crested newts	
	Parkland/scattered trees	4.55km (0.02km site area)	N/A	Potentially	Bats, badgers, barn owls and breeding birds	

⁹³ Broadleaved woodland habitat type combines the approximate area of A1.1.1 Broadleaved Woodland - semi-natural and A1.1.2 Broadleaved Woodland – plantation habitat types together.

⁹⁴ Coniferous woodland habitat type combines the approximate area of A1.2.1 Coniferous Woodland – semi natural and A1.2.2 Coniferous Woodland – plantation habitat types together.

⁹⁵ Scrub habitat type combines the approximate area of A2.1 - Scrub - dense/continuous and A2.2 - Scrub – scattered habitat types together.

Site area	Habitat type (habitats in bold are HPI from Natural England inventory) ⁷⁷	Approximate area (ha) or length (km) ⁷⁸ (site area and indicative WWTP footprint in brackets) ⁷⁹	Approximate % land cover of the proposed site area and its associated corridors and access areas.	Habitat of principal importance from Natural England inventory	Potential to support protected species	RAG rating
	Semi-improved grassland	65.09 ⁹⁶ (1.71 site area and 0.53 indicative WWTP footprint)	6.33	N	Breeding birds and reptiles	
	Improved grassland	54.92 (0.02)	5.34	N	Breeding birds, and reptiles	
	Other tall herb and fern - ruderal	0.08	0.02	N	Breeding birds, reptiles and amphibians	
	Standing Water	2.80	0.27	Potentially	Water voles, otters, amphibians, aquatic invertebrates and spined loach	
	Running Water	1.49	0.15	Potentially	Water voles, otters, amphibians, aquatic invertebrates and spined loach	
	Dry Ditch	14.51km (0.11km site area and 0.04km indicative WWTP footprint)	1.41	N	N/A	
	Species poor Hedgerow	11.34km ⁹⁷ (1.78 km site area) (0.50km indicative WWTP footprint)	1.10	N	Badgers, breeding birds and amphibians	
	Species rich Hedgerow	2.71km (0.16 km site area)	0.26	Y	Badgers, breeding birds and amphibians	

⁹⁶ Semi Improved Grassland habitat type combines the approximate area of B2.2 - Neutral grassland - semi-improved, B3.2 - Calcareous grassland - semi-improved and B6 - Poor semi-improved grassland habitat types together.

⁹⁷ Species poor hedgerow habitat type combines the approximate area of J2.1.2 - Intact hedge - species-poor and J2.3.2 - Hedge with trees - species-poor habitat types together.

Site area	Habitat type (habitats in bold are HPI from Natural England inventory) ⁷⁷	Approximate area (ha) or length (km) ⁷⁸ (site area and indicative WWTP footprint in brackets) ⁷⁹	Approximate % land cover of the proposed site area and its associated corridors and access areas.	Habitat of principal importance from Natural England inventory	Potential to support protected species	RAG rating
	Arable land	511.62 (49.34 site area and 20.98 indicative WWTP footprint)	49.77	N	Breeding and over-wintering birds	Amber
	Amenity Grassland	41.03 (0.01 site area)	3.99	N	N/A	
	Other habitat ⁹⁸	276.37 (1.10 site area)	26.88	N	Bats and breeding birds	
	Coastal and floodplain grazing marsh	3.51	N/A	Y	Breeding and over-wintering birds	
	Traditional orchard	0.36	N/A	Y	Bats, Breeding birds, terrestrial invertebrates	
	Deciduous woodland	10.13 (0.24 site area)	N/A	Y	Bats, badgers, barn owls and breeding birds	
	No main habitat but additional habitats present	0.01	N/A	Y	N/A	
2b	Broadleaved woodland	22.42 (1.88 site area and 0.85 indicative WWTP footprint)	2.63	Y	Bats, badgers, barn owls and breeding birds	
	Coniferous woodland	10.08 (0.07 site area)	1.18	N	Bats, badgers, barn owls and breeding birds	
	Mixed woodland	9.31	1.09	Potentially	Bats, badgers, barn owls and breeding birds	

⁹⁸ Other habitat type combines the approximate area of J5 Hardstanding, J3.6 Buildings, J3.4 Caravan site, J4 Bare ground, J5 Other habitat .and I2.4 -Refuse-tip. These habitats types in most cases are of low ecological value, apart from when buildings may support bat roosts.

Site area	Habitat type (habitats in bold are HPI from Natural England inventory) ⁷⁷	Approximate area (ha) or length (km) ⁷⁸ (site area and indicative WWTP footprint in brackets) ⁷⁹	Approximate % land cover of the proposed site area and its associated corridors and access areas.	Habitat of principal importance from Natural England inventory	Potential to support protected species	RAG rating
	Scrub	9.19 ⁹⁹ (0.04 site area)	1.08	N	Badgers, breeding birds and great crested newts	
	Parkland/scattered trees	9.73 (0.02km site area)	N/A	Potentially	Bats, badgers, barn owls and breeding birds	
	Semi-improved grassland	86.11 ¹⁰⁰ (1.71 site area and 0.53 indicative WWTP footprint)	10.10	N	Breeding birds and reptiles	
	Improved grassland	55.13	6.47	N	Breeding birds, and reptiles	
	Tall herb and fern - ruderal	0.34	0.04	N	Breeding birds, reptiles and amphibians	
	Swamp	0.36	N/A	Y	Breeding birds and amphibians	
	Standing Water	6.63 ¹⁰¹	0.78	Potentially	Water voles, otters, great crested newts, aquatic invertebrates and spined loach	
	Running Water	6.57 ¹⁰²	0.77	Potentially	Water voles, otters, great crested newts, aquatic invertebrates and spined loach	

⁹⁹ Scrub habitat type combines the approximate area of A2.1 - Scrub - dense/continuous and A2.2 - Scrub – scattered habitat types together.

¹⁰⁰ Semi Improved Grassland habitat type combines the approximate area of B2.2 - Neutral grassland - semi-improved, B3.2 - Calcareous grassland - semi-improved and B6 - Poor semi-improved grassland habitat types together.

¹⁰¹ Standing Water habitat type combines the approximate area of G1 - Standing water, G1.1 - Standing water – eutrophic and G1.2 - Standing water – mesotrophic habitats together.

¹⁰² Running Water habitat type combines approximate area of G2 -Running water and 62.2 Running Water - mesotrophic

Site area	Habitat type (habitats in bold are HPI from Natural England inventory) ⁷⁷	Approximate area (ha) or length (km) ⁷⁸ (site area and indicative WWTP footprint in brackets) ⁷⁹	Approximate % land cover of the proposed site area and its associated corridors and access areas.	Habitat of principal importance from Natural England inventory	Potential to support protected species	RAG rating
	Dry Ditch	14.95km (1.11km site area and 0.40km indicative WWTP footprint)	1.75	N	N/A	
	Species poor Hedgerow	12.54km ¹⁰³ (1.78 km site area) (0.50km indicative WWTP footprint)	N/A	N	Badgers, breeding birds and amphibians	
	Species rich Hedgerow	4.24km ¹⁰⁴ (0.16km site area)	N/A	Y	Badgers, breeding birds and amphibians	
	Arable land	486.85 (49.34 site area and 20.98 indicative WWTP footprint)	57.10	N	Breeding and over-wintering birds	
	Amenity Grassland	49.71 (0.01 site area)	5.83	N	N/A	
	Other habitat ¹⁰⁵	75.07 (1.10 site area)	8.80	N	Bats, Barn owls and breeding birds	
	Coastal and floodplain grazing marsh	9.76	N/A	Y	Breeding and over-wintering birds	
	Traditional orchard	0.23	N/A	Y	Bats, Breeding birds, terrestrial Invertebrates	
	Deciduous woodland	6.17 (0.24 site area)	N/A	Y	Bats, badgers, barn owls and breeding birds	

¹⁰³ Species poor hedgerow habitat type combines the approximate area of J2.1.2 - Intact hedge - species-poor and J2.3.2 - Hedge with trees - species-poor habitat types together.

¹⁰⁴ Species Rich Hedgerow habitat type combines the approximate area of J2.3.1 – Hedge with trees-native species-rich and J2.1. – Intact hedge-native species-rich

¹⁰⁵ Other habitat type combines the approximate area of J5 Hardstanding, J3.6 Buildings, J3.4 Caravan site, J4 Bare ground, J5 Other habitat .and I2.4 -Refuse-tip

Site area	Habitat type (habitats in bold are HPI from Natural England inventory) ⁷⁷	Approximate area (ha) or length (km) ⁷⁸ (site area and indicative WWTP footprint in brackets) ⁷⁹	Approximate % land cover of the proposed site area and its associated corridors and access areas.	Habitat of principal importance from Natural England inventory	Potential to support protected species	RAG rating
	No main habitat but additional habitats present	0.01	N/A	Y	N/A	Amber
3	Broadleaved woodland	17.39 ¹⁰⁶ (0.35 site area)	1.06	Y	Bats, badgers, barn owls and breeding birds	
	Coniferous woodland	0.06	0.00	N	Bats, badgers, barn owls and breeding birds	
	Mixed woodland	3.87	0.23	Potentially	Bats, badgers, barn owls and breeding birds	
	Scrub ¹⁰⁷	4.12	0.25	N	Badgers, breeding birds and amphibians	
	Parkland/scattered trees	8.14 ¹⁰⁸	0.49	Potentially	Bats, badgers, barn owls and breeding birds	
	Semi-improved grassland	33.03 ¹⁰⁹ (1.25 site area)	2.01	N	Breeding birds and reptiles	
	Improved grassland	14.11 (0.03 site area)	0.86	N	Breeding birds, and reptiles	
	Swamp	1.08	N/A	Y	Breeding birds and amphibians	

¹⁰⁶ Broadleaved woodland habitat type combines the approximate area of A1.1.1 Broadleaved Woodland - semi-natural and A1.1.2 Broadleaved Woodland – plantation habitat types together.

¹⁰⁷ Scrub habitat type combines the approximate area of A2.1 - Scrub - dense/continuous and A2.2 - Scrub – scattered habitat types together.

¹⁰⁸ Parkland/scattered trees habitat type combines the approximate area of A3.1 - Broadleaved parkland/scattered trees and A3.3 - Mixed parkland/scattered trees habitat types together.

¹⁰⁹ Semi Improved Grassland habitat type combines the approximate area of B2.2 - Neutral grassland - semi-improved and B6 - Poor semi-improved grassland habitat types together.

Site area	Habitat type (habitats in bold are HPI from Natural England inventory) ⁷⁷	Approximate area (ha) or length (km) ⁷⁸ (site area and indicative WWTP footprint in brackets) ⁷⁹	Approximate % land cover of the proposed site area and its associated corridors and access areas.	Habitat of principal importance from Natural England inventory	Potential to support protected species	RAG rating
	Standing Water	0.06 ¹¹⁰	0.00	Potentially	Water voles, otters, great crested newts, aquatic invertebrates and spined loach	
	Running Water	0.10 ¹¹¹	0.01	Potentially	Water voles, otters, great crested newts, aquatic invertebrates and spined loach	
	Dry Ditch	13.03km (3.51km site area and 1.29km indicative WWTP footprint)	0.79	N	N/A	
	Species rich hedgerow	4.41km ¹¹² (2.26km site area and 0.60km indicative WWTP footprint)	N/A	Y	Badgers, breeding birds and amphibians	
	Species poor Hedgerow	12.87km ¹¹³ (3.64km site area and 1.31km indicative WWTRP footprint)	N/A	N	Badgers, breeding birds and amphibians	
	Arable land	719.46 (124.22 site area and 21.99 indicative WWTP footprint)	43.73	N	Breeding and over-wintering birds	

¹¹⁰ Standing Water habitat type combines the approximate area of G1 - Standing water, G1.1 - Standing water – eutrophic and G1.2 - Standing water – mesotrophic habitats together.

¹¹¹ Running Water habitat type combines approximate area of G2 -Running water and G2.2 Running Water - mesotrophic

¹¹² Species Rich Hedgerow habitat type combines the approximate area of J2.3.1 – Hedge with trees-native species-rich and J2.1. – Intact hedge-native species-rich

¹¹³ Species poor hedgerow habitat type combines the approximate area of J2.1.2 - Intact hedge - species-poor and J2.3.2 - Hedge with trees - species-poor habitat types together.

Site area	Habitat type (habitats in bold are HPI from Natural England inventory) ⁷⁷	Approximate area (ha) or length (km) ⁷⁸ (site area and indicative WWTP footprint in brackets) ⁷⁹	Approximate % land cover of the proposed site area and its associated corridors and access areas.	Habitat of principal importance from Natural England inventory	Potential to support protected species	RAG rating
	Amenity Grassland	31.87 (0.04 site area and 0.11 indicative WWTP footprint)	1.94	N	N/A	
	Other habitat ¹¹⁴	782.70 (0.85 site area and 0.024 indicative WWTP footprint)	47.57	N	Bats, Barn Owls and breeding birds	
	Coastal and floodplain grazing marsh	20.59	N/A	Y	Breeding and over-wintering birds	
	Deciduous woodland	11.69	N/A	Y	Bats, badgers, barn owls and breeding birds	
	No main habitat but additional habitats present	0.00	N/A	Y	N/A	

¹¹⁴ Other habitat type combines the approximate area of J5 Hardstanding, J3.6 Buildings, J3.4 Caravan site, J4 Bare ground, J5 Other habitat .and I2.4 -Refuse-tip. These habitats types in most cases are of low ecological value, apart from when buildings may support bat roosts.

Table H.96: Summary of the extended phase 1 habitat survey protected species target notes within the indicative WWTP footprint and site areas

Site	Extended Phase 1 habitat survey target notes	Protected species potential
Indicative WWTP footprint 1	Various discarded piles of disused wire fencing, plastic piping, wood and hay piles. Potential reptile refugia with suitable reptile habitat surrounding the refugia.	Potential Reptile Habitat
	Poor semi-improved grassland field margins around the polytunnels	Potential Reptile Habitat
	Bird box	Breeding bird potential
	Drainage ditch holds little water, a few cm's deep, Low potential for otter, water vole, as the ditch is too narrow and shallow. The habitat surrounding the ditch is suitable for reptiles.	Potential Reptile Habitat
	Breeding bird habitat along tree lines	Breeding birds
	Polytunnels present	None
	Poor semi-improved grassland field margins around the polytunnels.	Potential Reptile habitat
Site area 1	Potential reptile refugia with suitable reptile habitat surrounding the refugia.	Potential Reptile Habitat
	Potential reptile refugia with suitable reptile habitat surrounding the refugia and rabbit warren.	Potential Reptile Habitat and Rabbit Warren
	Potential reptile refugia with suitable habitat surrounding the refugia.	Potential Reptile Habitat
	Potential habitat for breeding birds and reptiles.	Reptile and breeding bird potential habitat
	Mere Way PRoW - hedgerow corridor, at base of which is broad, relatively floristically rich grassland bordering footpath. Hedge comprises willows, lime, poplar, ash, hawthorn, aspen, sycamore and oak, with some elm and old blackthorn.	Bird, reptile, bats, botanical, invertebrates.
	Rough grassland, semi- improved frequent species of; Hawkweed oxtongue, Ribwort plantain, Cirsium arvense and Poa pratensis. Oxeye daisy (R) and Ragwort (R)	Reptile, birds, botanical

Site	Extended Phase 1 habitat survey target notes	Protected species potential
	Standalone Fraxinus excelsior with cavities in main branches ~2m up. Facing north-east. Moderate as poor habitat and no connectivity.	Bats
	Mammal paths, badger footprints, and evidence of badger foraging in fields.	Badger
	Dry ditch, with plant species of Urtica dioica dominant in narrow channel with Typha latifolia (R) Great willowherb and Hemlock (F).	Reptiles
	Large brash pile with potential as reptile refugia, overgrowth includes common nettle (D), Scentless mayweed and Bristly oxtongue (O).	Reptiles
	Potential along lightly managed hedgerow for foraging and commuting bats, Badger, Breeding birds and reptiles. Rabbits seen and many holes along length of hedgerow.	Bats, badger, breeding birds, reptiles
	Possible badger annex sett. No dung pits found.	Badger
	Rabbit warrens	Rabbit
	Breeding bird habitat along tree line. Hedgerow trees have negligible bat roosting potential. Linear features all have commuting and foraging value to local bat populations.	Breeding bird and Bat foraging potential habitat
Indicative WWTP footprint 2	Badger outlier sett. Many rabbit holes adjacent. Needs further survey.	Badger sett and path
	Rot hole in common lime with potential for roosting bats. Feature is facing north-east at 2.5m in height on main trunk.	Bat roosting potential tree
	Potential reptile refugia with suitable reptile habitat surrounding refugia.	Potential Reptile Habitat
	Brash pile, providing potential reptile refugia with suitable reptile habitat surrounding refugia.	Potential Reptile Habitat
	Dead tree with woodpecker hole at 3m in height on main trunk, facing north-east.	Bat roosting potential tree

Site	Extended Phase 1 habitat survey target notes	Protected species potential
	Reptile refugia with suitable habitat surrounding refugia.	Potential Reptile habitat
	Unknown tree with two woodpecker holes facing north east and east.	Bat roosting potential tree
	Potential reptile refugia at edge of woodland plantation	Potential Reptile habitat
	Common lime tree with rot hole feature at 3m in height, facing north.	Bat roosting potential tree
	Likely main badger sett.	Badger sett
	Woodland - impressive quantity of dead wood, both standing and fallen – lime, ash and oak primarily; also present are hawthorn, sycamore, elder, field and Norway maples, pine and horse-chestnut. No elms present	Terrestrial invertebrates
	Dead tree with visible features. Needs further bat assessment.	Bat roosting potential tree
Site area 2	Potential badger outlier.	Badger sett
	Potential reptile refugia along Meres Way with suitable reptile habitat surrounding the refugia.	Potential reptile habitat
	Suitable habitat for breeding birds and reptiles.	Potential Breeding bird and reptile habitat
	Common ash tree in hedgerow with woodpecker hole at 4m in height, facing south-west and another woodpecker hole, located further down the trunk facing west. There are two additional woodpecker holes facing NE at similar heights. And one Pedunculate oak with suitable ivy cover for roosting bats.	Bat roosting potential trees
	Common ash tree in hedgerow with south-east facing woodpecker hole and two north and northwest facing woodpecker holes at 4m in height.	Bat roosting potential tree
	All tree lines along field margins present linear features for bats to commute and forage along. The trees along the field margins require an appraisal from the ground to assess Potential Roost Features.	Bat roosting potential trees and bat foraging and commuting habitat
	Mammal pathway (several along hedgerow)	Mammal path

Site	Extended Phase 1 habitat survey target notes	Protected species potential
	Mammal pathway likely used by badgers.	Possible badger path
	Common ash in hedgerow with bat roosting potential. Woodpecker hole facing north at 4m in height up the main trunk.	Bat roosting potential tree
	Common ash in hedgerow with bat roosting potential. Woodpecker hole facing north-east on main trunk.	Bat roosting potential tree
	Two common ash trees in hedgerow with bat roosting potential, one tree has a woodpecker hole at 2m in height on the main trunk facing north-west. The other tree has a tear out cavity, facing west at 4m in height on the main trunk and the feature may not lead anywhere. Both trees are suitable for climbing.	Bat roosting potential trees
	Badger dung pit on field margin.	Badger evidence
	Common ash tree with single woodpecker hole facing north west at 5m in height on a branch.	Bat roosting potential tree
	Discarded concrete with potential as reptile refugia with suitable reptile habitat surrounding refugia.	Potential reptile habitat
	Rot hole at 3m in height in common lime tree located at a north facing direction.	Bat roosting potential tree
	Sycamore with bat roosting potential, Ivy cover. Northern boundary of plantation.	Bat roosting potential tree
	Rabbit warren/disused badger sett. Unable to see clearly amongst vegetation. Requires further survey.	Badger sett
	Mammal pathway through field crop, likely Deer and/or Badger.	Possible badger path
	Ruderal patch of spear thistle (D) bristly oxtongue (O) common nettle (F) and teasel (R)	Tall ruderal habitat
	Broadleaved woodland, little understorey. D: oak spp, F: horse chestnut, sycamore. Suitable for breeding bird nesting, reptile hibernacula potential, badger foraging.	Potential Breeding bird, badger and reptile habitat
Indicative WWTP footprint 3	Small patch of broadleaved woodland: horse chestnut, field maple, hazel. Little ground flora. Breeding bird	Potential Breeding bird, badger and reptile habitat

Site	Extended Phase 1 habitat survey target notes	Protected species potential
	nesting potential. Good badger foraging habitat. Some reptile shelter and foraging potential.	
	Defunct hedge, few species. D: Hawthorn, F: elder, bramble. Good breeding bird nesting potential.	Potential Breeding bird habitat
	One common ash tree that requires a potential roost feature close inspection from the ground. The tree has nesting barn owl potential which can be accessible using a ladder.	Barn Owl and Bat roosting potential trees
	Breeding bird potential along hedge line. Linear feature for foraging or commuting bats	Breeding bird and bat foraging potential habitat
Site area 3	Woodland in the east of site area 3 has potential to support roosting bats. Several trees with bat roosting potential. E.g. field maple with potential for roosting bats. Split in trunk may lead upwards into cavity. South-west facing feature at 2m from ground.	Bat roosting potential tree. Breeding birds.
	Patch of rare round-leaved fluellen	Rare arable plants
	Patch of dwarf spurge, currently listed on the rare plant register	Rare arable plants
	Area suitable for foraging badgers, reptiles, breeding birds and foraging/commuting bats. Note: Several Roe deer seen in area.	Potential badger, reptiles, breeding bird and commuting and foraging bats. Deer sighting
	Small patch of bramble scrub. Suitable for reptile refugia and nesting birds.	Potential Breeding bird and reptile habitat
	Hedgerow with trees, species rich. D: hawthorn, F: blackthorn, Dog rose, English ivy, elder, bramble. Good breeding bird nesting habitat. Good food source and connectivity for hazel dormice.	Breeding bird and Dormouse habitat
	Several ash trees along Low Fen Drove Way Grasslands and Hedges CWS that need ground level appraisal for bat potential roost features (PRF's).	Bat roosting potential trees
	Potential reptile refugia with suitable reptile habitat surrounding the refugia.	Potential Reptile habitat
	Hedgerow with trees, species rich. D: hawthorn, blackthorn, Dog rose, English ivy, elder, ash O:	Breeding bird and Dormouse habitat

Site	Extended Phase 1 habitat survey target notes	Protected species potential
	bramble. Good breeding bird nesting habitat. Good hazel dormouse connectivity and food source.	
	Fresh badger latrine comprising of several fresh dung piles in one dung pit.	Badger evidence
	A badger subsidiary sett.	Badger sett and evidence
	Potential outlier badger sett.	Badger sett
	Potential reptile refugia of old wooden pallets surrounded by suitable reptile habitat.	Potential Reptile habitat
	Badger dung pit, fresh Badger dung pit, old dung pit	Badger evidence
	Small area of broadleaved woodland in north-east of site area 3. D: ash, F: field maple, ground flora Lords and ladies, nettle, ground ivy, false brome, occasional hazel. Dry ditch present. Good bird nesting habitat. No bat roosting potential trees. Good badger foraging habitat.	Potential Breeding bird and badger habitat
	Small patch of broadleaved woodland north-east of WWTP footprint. D: hazel and field maple. No mature trees, no bat roosting potential trees. Good foraging habitat for badger. The habitat provides good breeding bird nesting potential.	Potential Breeding bird and badger habitat
	Hedgerow intact species rich, with trees north-east of WWTP footprint. D: hawthorn, F: blackthorn, Dog rose. English ivy, elder, ash O: honeysuckle, holly, bramble, hornbeam. Good hazel dormice habitat with connectivity, nesting and food source. Good breeding bird nesting habitat.	Potential Breeding bird and Dormouse habitat
	A pair of old tree stumps that would be of hibernation value to reptiles if present, surrounded by suitable reptile habitat.	Potential reptile habitat
	Improved grassland verge	Improved grassland
	Poor semi improved grassland. D: cocksfoot, Italian rye, common couch, O: teasel, nettle, ground ivy. Good foraging and basking habitat for reptiles. Good badger foraging habitat.	Potential reptile and badger habitat

Site	Extended Phase 1 habitat survey target notes	Protected species potential
	linear features for foraging bats, breeding bird habitat, species-poor hedge	Potential Breeding bird and bat foraging habitat
	Dry ditch in hedge. Field margin with good foraging and basking opportunities for reptiles.	Potential reptile habitat
	Old storage shed/container. Metal sheeting, asbestos tiled roof. Low bat roosting potential. Multiple openings in roof and door open with barn owl potential.	Bat and Barn owl roosting potential
	Dry ditch. Bordered by species-poor semi improved grassland. Good foraging and basking potential for reptiles.	Potential reptile habitat
	Intact hedgerow species-poor. D: hawthorn, F: blackthorn, O: Dog rose. Good breeding bird nesting habitat. Dormouse foraging potential with connectivity to wider habitat.	Potential Breeding bird and Dormouse habitat
	Low Fen Drove Way Grassaldn and Hedges CWS. Large dead significantly damaged standing ash at one end of hedgerow. Hedgerow spur to the west is relatively poor. No obvious nesting sites for aculeates noted, although the bee and wasp interest here may be in the presence of nectar resources.	Terrestrial invertebrates

Table H.97: Great crested newt assessment

Site area	GCN recorded within 0.5km of site area	Waterbodies and ponds within 0.25km of site area	Approximate distance from site area (km)	Location	RAG rating
1	<p>Yes:</p> <ul style="list-style-type: none"> within 0.25km of Waterbeach transfer pipeline corridor (GCN licence return). within 0.25km of diversion of existing waste water transfer network <p>Not recorded within 0.5km of site option area.</p>	<p>210 waterbodies¹¹⁵ within 0.25km of the proposed site area 1a and its associated corridors and access areas.</p>	<p>83 waterbodies within the scheme's redline boundary.</p> <p>There are 13 waterbodies within the site area 1, of those three are within the indicative WWTP footprint. At least 8 out of the 13 waterbodies were all dry (some with grass banks and hedgerows on one bank) at the time of the site visit and therefore unlikely to be suitable for great crested newts. However, at least 5 waterbodies were wet at the time of survey and 2 of the 5 waterbodies were graded as poor (>0.5), 2 were graded as average (0.6-0.7) and 1 graded as below average (0.5-0.6) using the habitat suitability index for GCN and the waterbodies have low probability to support GCN, due to no suitable ponds or GCN records within 0.25km of shortlisted site area 1.</p> <p>127 waterbodies located approximately between 0 to 0.25km from the scheme's redline boundary.</p>	Site 1a	Red
		<p>35 ponds within 0.25km of the proposed site area 1a and its associated corridors and access areas.</p>	<p>2 ponds located within the scheme's redline boundary.</p> <p>There are no ponds within the site area 1 and indicative WTTP footprint.</p> <p>32 ponds located between 0 to 0.25km from the scheme's redline boundary.</p> <p>Two ponds within 0.25km of the site area 1. One of the two ponds (PD015) wasn't habitat suitability index scored (HSI) due to a landowner request not to survey their pond. The other pond (PD019) was graded as poor (0.35) using the habitat suitability index for GCN and assessed to have low probability to support</p>	Site 1a	

¹¹⁵ The waterbodies listed within this report are a combination of drains and ditches, and these habitat features are classified as linear features rather than ponds which are known as polygon features within the GIS data set.

Site area	GCN recorded within 0.5km of site area	Waterbodies and ponds within 0.25km of site area	Approximate distance from site area (km)	Location	RAG rating
			GCN, due to a poor HSI score and no GCN records were present within 0.25km of shortlisted site area 1.		Red Within site area 2
		238 waterbodies within 0.25km of the proposed site area 1b and its associated corridors and access areas.	105 waterbodies within the scheme's redline boundary. 133 located approximately between 0 to 0.25km from the scheme's redline boundary.	Site 1b	
		36 ponds within 0.25km of the proposed site area 1b and its associated corridors and access areas.	7 ponds located within the scheme's redline boundary. One of the two ponds (PD015) wasn't habitat suitability index scored (HSI) due to a landowner request not to survey their pond. The other pond (PD019) was graded as poor (0.35) using the habitat suitability index for GCN and assessed to have low probability to support GCN, due to a poor HSI score and no GCN records were present within 0.25km of shortlisted site area 1.	Site 1b	
			29 ponds located between 0 to 0.25km from the scheme's redline boundary.		
2	Yes: <ul style="list-style-type: none"> within site area 2, but c.50m east of the indicative WWTP footprint, (GCN licence return record)¹¹⁶ within 0.25km of Waterbeach transfer pipeline corridor 	240 waterbodies within 0.25km of the proposed site area 2a and its associated corridors and access areas.	95 waterbodies within the scheme's redline boundary. There are seven waterbodies within the site area 2, of those two are within the indicative WWTP footprint. The seven waterbodies were all dry (some with grassy banks and hedgerows on one bank) at the time of the site visit and therefore unlikely to be suitable for great crested newt. 145 waterbodies located approximately between 0 to 0.25km from the scheme's redline boundary.	Site 2a	
		35 ponds within 0.25km of the proposed site area 2a and its associated corridors and access areas.	4 ponds located within the scheme's redline boundary. There are no ponds within site area 2.	Site 2a	

¹¹⁶ The record is from Natural England's Open Source data set GCN Class Licence Survey Returns. However, the grid reference and X and Y coordinates do not link to a waterbody or pond and therefore it is unknown what this positive record may relate to. During the extended Phase 1 habitat surveys there were no waterbodies with standing water recorded and no ponds.

Site area	GCN recorded within 0.5km of site area	Waterbodies and ponds within 0.25km of site area	Approximate distance from site area (km)	Location	RAG rating
			<p>31 ponds located approximately between 0 to 0.25km from the scheme's redline boundary.</p> <p>One pond within 0.25km of the shortlisted site area 2 and the indicative WWTP footprint. This pond (PD022) was graded as poor (0.48) using the habitat suitability index for GCN and due to the presence of recent GCN record within 0.25km of site 2, the pond has potential to support GCN.</p>		Red
		287 waterbodies within 0.25km of site area 2b and their associated corridors and access areas of site area 2b.	<p>129 waterbodies within the scheme's redline boundary.</p> <p>158 located approximately between 0 to 0.25km from the scheme's redline boundary.</p>	Site 2b	
		35 ponds within 0.25km of the proposed site area 2b and its associated corridors and access areas.	<p>6 ponds located within the scheme's redline boundary.</p> <p>29 ponds located approximately between 0 to 0.25km from the scheme's redline boundary.</p> <p>One pond within 0.25km of the shortlisted site area 2 and the indicative WWTP footprint. This pond (PD022) was graded as poor (0.48) using the habitat suitability index for GCN and due to the presence of recent GCN record within 0.25km of site 2, the pond has potential to support GCN.</p>	Site 2b	
3	<p>Yes:</p> <ul style="list-style-type: none"> within 0.25km and 0.5km of Waterbeach pipeline corridor <p>Not within 0.5km of site 3 area.</p>	198 waterbodies within 0.25km of the proposed site area 3 and its associated corridors and access areas.	<p>58 waterbodies within the scheme's redline boundary.</p> <p>140 located approximately between 0 to 0.25km from the scheme's redline boundary.</p> <p>There are five waterbodies within the site area 3, but none fall within the indicative WWTP footprint. The five waterbodies were all dry (some with grassy banks and hedgerows on one bank) at the time of the site visit and therefore unlikely to be suitable for great crested newt.</p>	Site 3	Amber
		10 ponds within 0.25km of the proposed site area 3 and its associated corridors and access areas.	<p>All 10 ponds are located between 0 to 0.25km from the scheme's redline boundary.</p> <p>There are no ponds within the site area 3 and indicative WWTP footprint.</p>	Site 3	

Site area	GCN recorded within 0.5km of site area	Waterbodies and ponds within 0.25km of site area	Approximate distance from site area (km)	Location	RAG rating
			<p>Three ponds within 0.25km of shortlisted site area 3. One pond was dry at the time of the site visit (P0048) and two out of three ponds (P008 and PD002) were graded as good (0.71 and 0.79) using the habitat suitability index for GCN and therefore, these ponds have potential to support GCN.</p> <p>No ponds within 0.25km of the indicative WWTP footprint.</p> <p>10 ponds within 0.25km of the total site area.</p>		

H.1.1 As noted in Paragraph 1.5.4 when assessing the unmitigated scenario, a realistic worst-case scenario has been considered, which assumes the following:

- Standard construction management controls will be implemented through a Construction Environmental Management Plan (CEMP) or similar document, details of which will be subject to submission and approval through the DCO process. Concerns for contamination or pollution of surface watercourses and groundwater will be taken into account in a detailed CEMP to be produced as a separate document and implemented on site. The CEMP will include measures to ensure that the sediment content of site runoff and dewatering from excavations is at an acceptably low level when discharged to watercourses. Temporary sustainable drainage system (SuDS) measures may be employed at sites to control discharges in periods of high rainfall. Shallow pipelines are likely to impact the groundwater in any superficial deposits, and significant dewatering may be required. Any silt-laden water from pipeline trenches would be contained or treated before discharge to local ditches or surface watercourses.
- The operation of the WWTP would be subject to emission controls to meet the requirements of the Industrial Emissions Directive.
- The operation of the WWTP would be subject to an environmental permit to meet the requirements of the Urban Waste Water Treatment Directive.

These inexecutable 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.

Table H.98: Statutory designated sites RAG assessment for proposed site areas and their associated corridors and access areas

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
Ramsar, SAC, SSSI, NNR						
1a 1b	Shortlisted site area	Wicken Fen Ramsar, SSSI and National Nature Reserve (NNR) Fenland SAC	8.8	Yes – Combustion ¹¹⁸ . Yes -Discharge ¹¹⁹ .	No discharge risk anticipated. There will be no waste water discharged to ground or surface water, it will be treated and transferred to the discharge point on the river. Air pollution/ air quality impact on designated site qualifying features. The site will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby ecological receptors. Plant will comply with Environmental Permitting Regulations as required and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect. A Stage 1 Screening Habitat Regulations Assessment (HRA) to be completed to determine likely significant effect.	Amber (Stage 1 HRA to be completed)
1a 1b	Treated effluent corridor and associated potential discharge location	Wicken Fen Ramsar, SSSI, NNR Fenland SAC	1a: 9.3 1b: 7.8	Yes -Discharge	Potential for hydrological impact. These sites are highly dependent on surface water and is subject to winter flooding, potentially connected to the River Cam. Treated water that flows towards a SSSI has the potential to impact on water quality sensitive features.	Amber (Stage 1 HRA to be completed)

¹¹⁷ Site elements refer to the proposed site areas and their associated corridors and access areas. Site elements include: shortlisted site areas, waste water transfer corridor, treated effluent corridor, site access areas, Waterbeach pipeline corridor, and diversions of existing waste water transfer network. Site elements listed vary depending on their distance from a designated site and to avoid repetition. Site elements shortlisted site area, treated effluent corridor and waterbeach pipeline corridor are always listed. The treated effluent corridor is associated with the potential discharge location into the River Cam.

¹¹⁸ All general combustion processes. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/combustion - Description may vary to specify thresholds for energy input. Emissions from combustion can cause air pollution affecting the habitats and species on SSSIs. More than 500m away from a SSSI, only combustion processes over a certain minimum size are likely to have an impact. A very large project and could cause air pollution on SSSIs up to 10km away.

¹¹⁹ Discharge category includes discharge of treated effluent and waste of more than 20m³/day to surface water of the River Cam. Any discharge of water or liquid waste that is discharged to ground (i.e. to seep away) or to surface water, such as a beck or stream (NB This does not include discharges to mains sewer which are unlikely to pose a risk at this location) - Description may vary to specify volume thresholds for discharges or to include discharges to main sewer. Most foul water is removed from a development site by a mains sewer. Where this is not the case, foul water is usually treated on site and then discharged either to ground to filter away from the site, or into a nearby watercourse. If the treated water flows towards a SSSI, it has the potential to impact on water quality sensitive features.

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
					<p>Pollution of the River Cam or discharge of sediment-laden water to the River Cam during construction could affect downstream sites.</p> <p>Any significant adverse impacts will be avoided by measures either included in the CEMP or in the scheme design. Potential impacts during operation of the scheme, for example due to excessive variations in discharge, or discharge of effluent of an unacceptable quality, will be controlled by engineering features and operational practices included in the design and management of the scheme.</p> <p>Effluent discharge during operation.</p> <p>An improvement in the quality of the effluent discharge is foreseen as a consequence of operating the new WWTP, although inclusion of the effluent discharge from the WWTP at Waterbeach would increase the proportion of effluent in the river upstream of Waterbeach. Overall, however, an improvement in water quality is anticipated throughout the River Cam downstream of the outfall from the existing WWTP.</p> <p>Comparison of existing river quality with the prediction of quality resulting from operation of the new WWTP will be the subject of a separate assessment.</p> <p>The effluent outfall and any watercourse crossings will be designed to maintain flows at current levels and have no significant impact on flooding.</p> <p>As a result, no special mitigation measures are likely to be needed for these downstream sites.</p> <p>A Stage 1 Screening Habitat Regulations Assessment to be completed to determine likely significant effect.</p>	
1a 1b	Waterbeach pipeline corridor	Wicken Fen Ramsar, SSSI, NNR Fenland SAC	4.7	Yes – Combustion. Yes -Discharge.	SSSI impact risk zones present, however, they are not relevant to pipeline construction/operation. The construction and operation of pipeline corridor unlikely to impact qualifying features.	Green
2a 2b	Shortlisted site area	Wicken Fen Ramsar, SSSI, NNR	10.5		Over 10km from this site. Unlikely to be any significant effects on the sites qualifying features.	Green

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
		Fenland SAC				
2a 2b	Treated effluent corridor and associated potential discharge location	Wicken Fen Ramsar, SSSI, NNR Fenland SAC	2a: 9.4 2b: 7.8	Yes – Discharge.	See text for Site 1a, 1b treated effluent corridor and associated potential discharge location	Amber (Stage 1 HRA to be completed)
2a 2b	Waterbeach pipeline corridor	Wicken Fen Ramsar, SSSI, NNR Fenland SAC	4.7	Yes – Combustion. Yes -Discharge.	SSSI impact risk zones present, however, they are not relevant to pipeline construction/operation. The construction and operation of pipeline corridor unlikely to impact qualifying features.	Green
3	Shortlisted site area	Wicken Fen Ramsar, SSSI, NNR Fenland SAC	8.3	Yes – Combustion.	Hydrological impact unlikely Air pollution/ air quality impact on designated site qualifying features. The site will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby ecological receptors. Plant will comply with Environmental Permitting Regulations as required and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect. A Stage 1 Screening Habitat Regulations Assessment (HRA) to be completed to determine likely significant effect.	Amber (Stage 1 HRA to be completed)
3	Treated effluent corridor and associated potential discharge location	Wicken Fen Ramsar, SSSI, NNR Fenland SAC	9.4	Yes – Discharge.	See text for Site 1a, 1b treated effluent corridor and associated potential discharge location	Amber (Stage 1 HRA to be completed)
3	Waterbeach pipeline corridor	Wicken Fen Ramsar, SSSI, NNR Fenland SAC	4.7	Yes -Discharge Yes - Combustion.	SSSI impact risk zone present, but the construction and operation of pipeline corridor unlikely to impact qualifying features of Wicken Fen SSSI. However, due to the pipeline construction and crossing of the River Cam a Stage 1 Screening Habitat Regulations Assessment (HRA) should be completed to determine likely significant effect. The River Cam crossing for the pipeline from Waterbeach to Site 3 would be constructed beneath	Amber (Stage 1 HRA to be completed)

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
					the river by pipe-jacking or micro-tunnelling. Construction activities at the location would be undertaken either side of the river and away from the river banks. As a result, the construction of the crossing would not be expected to disturb the river. The CEMP implemented management measures for potential ecological impacts to control dust, water quality would mitigate construction impacts. Potential for hydrological impact. These sites are highly dependent on surface water and is subject to winter flooding, potentially connected to the River Cam.	
3	Shortlisted site area	Devils Dyke SAC	9.9	N/A	No hydrological impact expected. Air pollution/ air quality impact on designated site qualifying features. The site will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby ecological receptors. Plant will comply with Environmental Permitting Regulations as required and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect. A Stage 1 Screening Habitat Regulations Assessment (HRA) to be completed to determine likely significant effect.	Amber (Stage 1 HRA to be completed)
3	Waterbeach pipeline corridor	Devils Dyke SAC	9.7	N/A	No hydrological impact expected. Unlikely that the construction or operation of the pipeline corridor will result in an adverse significant effect on the SACs qualifying features given the distance from the proposed route.	Green
SSSIs only						
1a 1b	There are 16 SSSIs within 10km of the options 1a and 1b total area. However, not all are listed as they are considered to be of a sufficient distance from the site, no impact pathways are anticipated and or avoiding repetition. SSSIs south of the A14, south and west of Cambridge and south of Cambridge airport are excluded unless a SSSI impact risk zone falls within the site element area.					

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
1a 1b	Shortlisted site area	Stow-cum-Quy-Fen	3.5	Yes – Combustion	Air pollution/ air quality impact on designated site qualifying features. The site will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby ecological receptors. Plant will comply with Environmental Permitting Regulations as required and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect.	Green
1a 1b	Shortlisted site area	Wilbraham Fens	5.7	Potentially – Combustion.	As above.	Green
1a 1b	Shortlisted site area	Cam Washes	6.6	Yes – combustion Yes - discharge	As above. No discharge risk anticipated. There will be no waste water discharged to ground or surface water, it will be treated and transferred to the discharge point on the river.	Green
1a 1b	Shortlisted site area	Great Wilbraham Common	8.1	Unclear, but unlikely.	Unlikely	Green
1a 1b	Shortlisted site area	Fulbourn Fen	8.9	Unclear, but unlikely.	Unlikely	Green
1a 1b	Shortlisted site area	Upware South Pit	9.3	Yes - combustion	Air pollution/ air quality impact on designated site qualifying features. The site will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby ecological receptors. Plant will comply with Environmental Permitting Regulations as required and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect.	Green
1a 1b	Shortlisted site area	Devil's Dyke	9.4	Yes - combustion	As above.	Green

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
1a 1b	Treated effluent corridor and associated potential discharge location	Stow-cum-Quy-Fen	1a: 2.7 1b: 1.8	Yes -Discharge Yes-Infrastructure ¹²⁰ (risk zone does not cross Option 1a footprint)	No discharge risk anticipated. There will be no waste water discharged to ground or surface water, it will be treated and transferred to the discharge point on the river. No hydrological impacts expected. Infrastructure risk via the construction and operation of the treated effluent corridor unlikely to affect the qualifying features of the SSSI due to the distance from the WWTP development.	Green
1a 1b	Treated effluent corridor and associated potential discharge location	Cam Washes	1a: 7.1 1b: 5.6	Yes -Discharge	Potential for hydrological impact. The site is highly dependent on surface water and is subject to winter flooding, potentially connected to the River Cam. Treated water that flows towards a SSSI has the potential to impact on water quality sensitive features. Pollution of River Cam or discharge of sediment-laden water to the River Cam during construction could affect downstream sites. Effluent discharge during operation. Any significant adverse impacts will be avoided by measures either included in the CEMP or in the scheme design. Potential impacts during operation of the scheme, for example due to excessive variations in discharge, or discharge of effluent of an unacceptable quality, will be controlled by engineering features and operational practices included in the design and management of the scheme. An improvement in the quality of the effluent discharge is foreseen as a consequence of operating the new WWTP, although inclusion of the effluent discharge from the WWTP at Waterbeach would increase the proportion of effluent in the river upstream of Waterbeach. Overall, however, an improvement in water quality is anticipated throughout the River Cam downstream of the outfall from the existing WWTP.	Green

¹²⁰ Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals. Pipelines, pylons and overhead cables can create a collision risk for birds and the footprint of the construction can affect local water supplies, which the SSSIs depend on. An increase in road traffic as a result of new or extended roads can cause local air pollution impacts and significant transport infrastructure projects can have impacts on water supply mechanisms, especially by introducing new drainage. New or extended aviation proposals can cause disturbance to birds, as well as collision with birds. Increased air traffic also has the potential for significant air pollution.

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
					<p>Comparison of existing river quality with the prediction of quality resulting from operation of the new WWTP will be the subject of a separate assessment.</p> <p>As a result, no special mitigation measures are likely to be needed for this downstream site.</p> <p>The effluent outfall and any watercourse crossings will be designed to maintain flows at current levels and have no significant impact on flooding.</p>	
1a 1b	Treated effluent corridor and associated potential discharge location	Upware South Pit	1a: 9.9 1b: 8.6	Yes -Discharge	As above.	Green
2a 2b	There are 17 SSSIs within 10km of the options 2a and 2b total area. However, not all are listed as they are considered to be of a sufficient distance from the site, no impact pathways are anticipated and or avoiding repetition. SSSIs south of the A14, south and west of Cambridge and south of Cambridge airport are excluded unless a SSSI impact risk zone falls within the site element area.					
2a 2b	Shortlisted site area	Histon Road	1.4	Yes - Combustion	Air pollution/ air quality impact on designated site qualifying features. The site will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby ecological receptors. Plant will comply with Environmental Permitting Regulations as required and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect.	Green
2a 2b	Shortlisted site area	Traveller's Rest Pit	3.2	Potentially – Combustion. Difficult to identify SSSI impact risk zone presence or absence. To be confirmed with Natural England	As above.	Green

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
2a 2b	Shortlisted site area	Stow-cum-Quy Fen	4.5	Yes – Combustion	As above.	Green
2a 2b	Shortlisted site area	Wilbraham Fens	5.6	Potentially – Combustion. Difficult to identify SSSI impact risk zone presence or absence. To be confirmed with Natural England	As above.	Green
2a 2b	Shortlisted site area	Great Wilbraham Common	8	Unclear, but unlikely. Difficult to identify SSSI impact risk zone presence or absence. To be confirmed with Natural England	Unlikely	Green
2a 2b	Shortlisted site area	Cam Washes	8.2	Yes -Discharge	No discharge risk anticipated. There will be no waste water discharged to ground or surface water, it will be treated and transferred to the discharge point on the river.	Green
2a 2b	Shortlisted site area	Fulbourn Fen	8.6	Unclear, but unlikely. Difficult to identify SSSI impact risk zone presence or absence. To be confirmed with Natural England	Unlikely	Green
2a 2b	Treated effluent corridor and	Stow-cum-Quy Fen	2a: 2.7 2b: 1.8	Yes -Discharge Yes-Infrastructure	No discharge risk anticipated. There will be no waste water discharged to ground or surface water, it will be	Green

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
	associated potential discharge location				treated and transferred to the discharge point on the river. No hydrological impacts expected. Infrastructure risk via the construction and operation of the treated effluent corridor unlikely to affect the qualifying features of the SSSI due to the distance from the WWTP development.	
2a 2b	Treated effluent corridor and associated potential discharge location	Wilbraham Fens	3.6	Unclear, but unlikely.	Unlikely	Green
2a 2b	Treated effluent corridor and associated potential discharge location	Great Wilbraham Common	6.0	Unclear, but unlikely.	Unlikely	Green
2a 2b	Treated effluent corridor and associated potential discharge location	Cam Washes	2a: 7.2 2b: 5.6	Yes -Discharge	Potential for hydrological impact. The site is highly dependent on surface water and is subject to winter flooding, potentially connected to the River Cam. Treated water that flows towards a SSSI has the potential to impact on water quality sensitive features. Pollution of River Cam or discharge of sediment-laden water to the River Cam during construction could affect downstream sites. Effluent discharge during operation. Any significant adverse impacts will be avoided by measures either included in the CEMP or in the scheme design. Potential impacts during operation of the scheme, for example due to excessive variations in discharge, or discharge of effluent of an unacceptable quality, will be controlled by engineering features and operational practices included in the design and management of the scheme. An improvement in the quality of the effluent discharge is foreseen as a consequence of operating the new WWTP, although inclusion of the effluent discharge from the WWTP at Waterbeach would increase the proportion of effluent in the river upstream of Waterbeach. Overall, however, an improvement in water quality is anticipated	Green

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
					<p>throughout the River Cam downstream of the outfall from the existing WWTP.</p> <p>Comparison of existing river quality with the prediction of quality resulting from operation of the new WWTP will be the subject of a separate assessment.</p> <p>As a result, no special mitigation measures are likely to be needed for this downstream site.</p> <p>The effluent outfall and any watercourse crossings will be designed to maintain flows at current levels and have no significant impact on flooding.</p>	
2a 2b	Treated effluent corridor and associated potential discharge location	Upware South Pit	1a: 9.9 1b: 8.6	Yes -Discharge	As above.	Green
3	There are 20 SSSIs within 10km of the option 3 total area. However, not all are listed as they are considered to be of a sufficient distance and or location that no impact pathways are anticipated. SSSIs south of the A14, south and west of Cambridge and south of Cambridge airport are excluded unless a SSSI impact risk zone falls within the site element area.					
3	Shortlisted site area	Stow-cum-Quy Fen	1.1	Yes -Discharge Yes-Combustion Yes – Rural non-residential ¹²¹	<p>No discharge risk anticipated. There will be no waste water discharged to ground or surface water, it will be treated and transferred to the discharge point on the river.</p> <p>Black Ditch is connected to one of the water bodies at Stow-cum-Quy Fen SSSI. As a result, there is potential, without mitigation, for surface water and groundwater impacts at the SSSI during construction, due to the drainage feature connections. However, standard mitigation measures included within the CEMP will reduce any potential surface water and groundwater impact at Stow-cum-Quy Fen SSSI to a negligible level.</p> <p>The permanent site drainage will be designed to avoid any discharge of pollutants to Black Ditch during operation of the scheme. As a result, Stow-cum-Quy</p>	Green

¹²¹ Any non-residential development outside of existing urban areas where net additional gross internal floorspace following development is 30m2 or more. – Description may vary to specify different area thresholds. Rural non-residential developments can impact on water quality, cause disturbance to birds and impact on functional land outside SSSIs, which they depend on for feeding.

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
					<p>Fen SSSI should not be adversely affected by surface water discharge from the site.</p> <p>Consideration has also been given to the potential impacts during operation of the WWTP, due to leakage of waste water from the treatment plant, leading to contamination of groundwater in the chalk aquifer at site 3, which could adversely affect Stow-cum-Quy Fen SSSI. However, these risks would be taken into account fully in the robust design, protection measures and operational procedures for the WWTP. In addition, monitoring of groundwater and drainage in the area within and surrounding the WWTP could be implemented prior to and during the construction of the works. However, the risk of such contamination moving towards the boundary, or away from any of the sites, is considered to be low.</p> <p>A Hydrogeological Impact Assessment¹²² (HIA) has been undertaken to further assess the potential impacts outlined in the Water Resources Statement (Mott MacDonald, 2020) 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</p> <p>Rural non-residential developments can impact on water quality, cause disturbance to birds and impact on functional land outside SSSIs, which they depend on for feeding. However, this SSSIs qualifying features</p>	

¹²² Further assessment of the potential impacts on the water 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

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
					<p>are not related to birds, it is designated for its floristically rich calcareous loam pasture.</p> <p>Air pollution/ air quality impact on designated site qualifying features. The site will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby ecological receptors. Plant will comply with Environmental Permitting Regulations as required and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect.</p>	
3	Shortlisted site area	Wilbraham Fens	1.3	Yes -Discharge Yes-Combustion	<p>No discharge risk anticipated. There will be no waste water discharged to ground or surface water, it will be treated and transferred to the discharge point on the river.</p> <p>Air quality impact on designated site qualifying features. Operational traffic may require further assessment as the vehicle movements exceed the assessment thresholds within the Environmental Protection UK and Institute of Air Quality Management guidance 'Land-Use Planning and Development Control: Planning for Air Quality' (2017). Wilbraham Fens SSSI, is within 200m of the A1303, which may be used by operational traffic and therefore further assessment may be needed to determine likely effects from vehicle emissions at this site. 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%. According to the Institute of Air Quality Management (IAQM) guidance <i>A guide to the assessment of air quality impacts on designated nature conservation sites</i>¹²³, where the change in concentration</p>	Green

¹²³ Holman *et al* (2019) A guide to the assessment of air quality impacts on designated nature conservation sites – version 1.0, Institute of Air Quality Management, London. Available online at: www.iaqm.co.uk/text/guidance/airquality-impacts-on-nature-sites-2019.pdf

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
					<p>is less than 1%, the effects can be deemed to be insignificant. Therefore, although identified as an area for further investigation, the rating has been assessed as green. Only operational traffic exceeds the thresholds for further assessments in this area. Therefore, construction has been excluded.</p> <p>The site will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby ecological receptors. Plant will comply with Environmental Permitting Regulations as required and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect.</p>	
3	Shortlisted site area	Great Wilbraham Common	3.7	Unclear, but unlikely. Difficult to identify SSSI impact risk zone presence or absence. To be confirmed with Natural England	Unlikely	Green
3	Shortlisted site area	Fulbourn Fen	4.5	Unclear, but unlikely. Difficult to identify SSSI impact risk zone presence or absence. To be confirmed with Natural England	Unlikely	Green
3	Shortlisted site area	Cam Washes	6.2	Yes -Discharge Yes - combustion	<p>No discharge risk anticipated. There will be no waste water discharged to ground or surface water, it will be treated and transferred to the discharge point on the river.</p> <p>Air pollution/ air quality impact on designated site qualifying features. The site will include Combined Heat</p>	Green

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
					and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby ecological receptors. Plant will comply with Environmental Permitting Regulations as required and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect.	
3	Shortlisted site area	Devil's Dyke	7.8	Potentially – Combustion. Difficult to identify SSSI impact risk zone presence or absence. To be confirmed with Natural England	As above	Green
3	Shortlisted site area	Newmarket heath	8.5	Potentially – Combustion. Difficult to identify SSSI impact risk zone presence or absence. To be confirmed with Natural England	As above	Green
3	Shortlisted site area	Upware South Pit	9.2	Yes - combustion	As above	Green
3	Waterbeach pipeline corridor	Stow-cum-Quy Fen	1.1	Yes – Infrastructure	Pipeline construction impacts. Infrastructure risk via the construction and operation of the pipeline is unlikely to affect the qualifying features of the SSSI. Black Ditch could be connected to the drainage system at Stow-cum-Quy Fen SSSI. As a result, there is potential, without mitigation, for surface water impacts at the SSSI during construction at site area 3, due to the drainage feature connections. However, standard mitigation measures included within the CEMP will reduce any potential surface water impact at Stow-cum-Quy Fen SSSI to a negligible level.	Green

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
3		Devil's Dyke	5.9	Yes – Infrastructure	Pipeline construction impacts. Infrastructure risk via the construction and operation of the pipeline is unlikely to affect the qualifying features of the SSSI.	Green
3	Treated effluent corridor and associated potential discharge location	Stow-cum-Quy Fen	1.9	Yes -Discharge	No discharge risk anticipated due to the treated effluent pipeline or tunnel. There will be no waste water discharged to ground or surface water, it will be treated and transferred to the discharge point on the river. No hydrological impacts expected.	Green
3	Treated effluent corridor and associated potential discharge location	Wilbraham Fens	2.9	Unclear, but unlikely.	Unlikely	Green
3	Treated effluent corridor and associated potential discharge location	Great Wilbraham Common	5.3	Unclear, but unlikely.	Unlikely	Green
3	Treated effluent corridor and associated potential discharge location	Cam Washes	7.2	Yes - discharge	Same for 2a above	Green
NNR only						
1a 1b	There is one National Nature Reserve within 10km of the option 1a and 1b total area.					
1a 1b	Shortlisted Site Areas ¹²⁴	Wicken Fen	8.8	N/A	No discharge risk anticipated. There will be no waste water discharged to ground or surface water, it will be treated and transferred to the discharge point on the river. Air pollution/ air quality impact on designated site qualifying features. The site will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have	Green

¹²⁴ The closest point of site 1 to Wicken Fen NNR is the Waterbeach transfer pipeline approximately 4.7km south of the NNR.

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
					adverse impacts on air quality and significant effects on nearby ecological receptors. Plant will comply with Environmental Permitting Regulations as required and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect.	
2a 2b	There is one National Nature Reserves within 10km of the options 2a and 2b total area.					
2a 2b	Waterbeach transfer pipeline ¹²⁵	Wicken Fen	4.7	N/A	Pipeline construction impacts. Infrastructure risk via the construction and operation of the pipeline is unlikely to affect the qualifying features of the NNR. Therefore, it is highly unlikely to result in an adverse significant effect.	Green
3	There is one National Nature Reserve within 10km of the option 3 total area.					
3	Shortlisted Site Areas	Wicken Fen	8.3	N/A	No discharge risk anticipated. There will be no waste water discharged to ground or surface water, it will be treated and transferred to the discharge point on the river. Air pollution/ air quality impact on designated site qualifying features. The site will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby ecological receptors. Plant will comply with Environmental Permitting Regulations as required and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect.	Green
LNR only						
1a 1b	There are 13 Local Nature Reserves within 10km of the options 1a and 1b total area. However, not all are listed as they are considered to be of a sufficient distance from the site, no impact pathways are anticipated and or avoiding repetition. Local Nature Reserves south of the A14, south and west of Cambridge and south of Cambridge airport are excluded.					

¹²⁵ Site area 2 is just over 10km from Wicken Fen NNR.

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
1a 1b	Shortlisted Site Areas	Worts Meadow	0.7	N/A	Air pollution/ air quality impact on designated site qualifying features. The site will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby ecological receptors. Plant will comply with Environmental Permitting Regulations as required and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect.	Green
1a 1b	Waterbeach pipeline corridor	Worts Meadow	0.3	N/A	Pipeline construction impacts. Infrastructure risk via the construction and operation of the pipeline is unlikely to affect the qualifying features of the LNR. Therefore, it is highly unlikely to result in an adverse significant effect.	Green
2a 2b	There are 13 Local Nature Reserves within 10km of the options 2a and 2b total area. However, not all are listed as they are considered to be of a sufficient distance from the site, no impact pathways are anticipated and or avoiding repetition. Local Nature Reserves south of the A14, south and west of Cambridge and south of Cambridge airport are excluded.					
2a 2b	Shortlisted site area	Worts Meadow	2.2	N/A	Air pollution/ air quality impact on designated site qualifying features. The site will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby ecological receptors. Plant will comply with Environmental Permitting Regulations as required and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect.	Green
2a 2b	Waterbeach pipeline corridor	Worts Meadow	0.3	N/A	Pipeline construction impacts. Infrastructure risk via the construction and operation of the pipeline is unlikely to affect the qualifying features of the LNR. Therefore, it is highly unlikely to result in an adverse significant effect.	Green

Site area	Site element ¹¹⁷	Designated site	Approximate distance (km)	SSSI Impact risk zone	Potential impact pathway	Rag analysis
3	There are 13 Local Nature Reserve within 10km of the option 3 total area. However, Site 3 is considered to be of a sufficient distance from the LNRs and or there are no anticipated impact pathways that would result in a significant adverse effects. All the LNRs are south of the A14, south and west of Cambridge and south of Cambridge airport and therefore excluded.					
3	Shortlisted site area	Worts Meadow	8.3	N/A	Air pollution/ air quality impact on designated site qualifying features. The site will include Combined Heat and Power (CHP) engines, standby boilers and backup generators, in case of emergencies. Energy plant emits pollutant emissions, which may have adverse impacts on air quality and significant effects on nearby ecological receptors. Plant will comply with Environmental Permitting Regulations as required and emissions will be regulated and mitigated accordingly. Therefore, it is highly unlikely to result in an adverse significant effect.	Green
3	Waterbeach Pipeline Corridor	Worts Meadow	4.7	N/A	Pipeline construction impacts. Infrastructure risk via the construction and operation of the pipeline is unlikely to affect the qualifying features of the LNR. Therefore, it is highly unlikely to result in an adverse significant effect.	Green

Table H.99: Non-statutory designated sites RAG assessment for proposed site areas and their associated corridors and access areas

Site area	Site element	Designated site	Approximate distance (km)	Potential impact pathway	Rag analysis
1a 1b	There are 74 non-statutory designated sites (CWSs) within 5km of the options 1a and 1b total area. However, not all are listed as they are considered to be of a sufficient distance from the site, no impact pathways are anticipated and or avoiding repetition. There are no CWS within the shortlisted site area red line boundary.				
	Shortlisted site area	Cottenham Moat CWS	3.8	No obvious direct surface water connection evident from OS mapping. The moat is shown by BGS to be located on Kimmeridge Clay. However, the location is adjacent to the contact with the lower Greensand outcrop which overlies the Kimmeridge Clay. It is possible, therefore, that a connection might exist between the moat and the lower Greensand aquifer. Potential impacts of temporary dewatering in the lower Greensand aquifer during shaft construction may need to be considered at Cottenham Moat, which supports great crested newts.	Amber
	Wastewater Transfer Corridors	Milton Road Hedgerows CWS	CWS on the boundary of the wastewater transfer corridor	Potential for habitat loss from construction. Air pollution/ air quality impact on designated site qualifying features. To be controlled by CEMP.	Amber
	Treated effluent corridor and associated potential	River Cam CWS	CWS adjacent to site element	Potential for habitat loss on the banks of the River Cam. Discharge, water quality, flow and level impacts during construction and operation.	Amber

Site area	Site element	Designated site	Approximate distance (km)	Potential impact pathway	Rag analysis
	discharge location				
2a 2b	There are 79 non-statutory designated sites (CWSs) within the options 2a and 2b total area. However, not all are listed as they are considered to be of a sufficient distance from the site, no impact pathways are anticipated and or avoiding repetition. There are no CWS within the shortlisted site area red line boundary.				
	Wastewater Transfer Corridors	Milton Road Hedgerows	CWS on the boundary of the wastewater transfer corridor	Potential for habitat loss from construction. Air pollution/ air quality impact on designated site qualifying features. To be controlled by CEMP.	Amber
	Treated effluent corridor and associated potential discharge location	River Cam CWS	CWS adjacent to site element	Potential for habitat loss on the banks of the River Cam. Discharge, water quality, flow and level impacts during construction and operation.	Amber
3	There are 74 non-statutory designated sites (CWS) within the Option 3 total area. However, not all are listed as they are considered to be of a sufficient distance from the site, no impact pathways are anticipated and or avoiding repetition.				
	Shortlisted site area	Low Fen Drove Way Grasslands and Hedges CWS	Partially within the shortlisted area and associated site access areas.	Potential for habitat loss from construction Air pollution/ air quality impact on designated site qualifying features. To be controlled by CEMP.	Amber

Site area	Site element	Designated site	Approximate distance (km)	Potential impact pathway	Rag analysis
		Allicky Farm Pond CWS	0.6km north-east	Without mitigation during construction, there is potential for hydrological impacts (surface water) due to drainage feature connections. However, this should be by a CEMP.	Green
	Wastewater Transfer Corridor	Milton Road Hedgerows CWS	CWS on the boundary of the wastewater transfer corridor	Potential for habitat loss from construction. Air pollution/ air quality impact on designated site qualifying features. To be controlled by CEMP.	Amber
		Low Fen Drove Way Grasslands and Hedges CWS	CWS on the boundary of the wastewater transfer corridor	Potential for habitat loss from construction. Air pollution/ air quality impact on designated site qualifying features. To be controlled by CEMP.	Amber
	Waterbeach transfer pipeline	River Cam CWS	CWS crossed by pipeline	Potential for habitat loss on the banks of the River Cam.	Amber
	Treated effluent corridor and associated potential discharge location	River Cam CWS	CWS adjacent to site element	Potential for habitat loss on the banks of the River Cam. Discharge, water quality, flow and level impacts during construction and operation.	Amber

Table H.100: Landscape scale initiatives (green infrastructure strategies or initiatives) with links to biodiversity within the proposed site area and their associated corridors and access areas

Site area	Network enhancement zones	Green infrastructure initiatives	RAG rating
1	Network enhancement zone ¹²⁶ 1 falls within the Waterbeach pipeline corridor	The proposed Cambridgeshire Strategic Green Infrastructure Network ¹²⁷ (strategic network area 6 Cambridge and Surrounding Areas) partially falls within the proposed site area and associated corridors.	Amber
2	Network enhancement zone 1 falls within the Waterbeach pipeline corridor	The proposed Cambridgeshire Strategic Green Infrastructure Network ¹²⁷ (strategic network area 6 Cambridge and Surrounding Areas) partially falls within the proposed site area and associated corridors.	Amber
3	Network expansion zone falls within the wastewater transfer corridor ¹²⁸	The proposed National Trust's Wicken Fen Vision area falls within the proposed site area and associated corridors ¹²⁹ .	Amber
	Network expansion zone adjacent to north-eastern boundary of the shortlisted site area and Waterbeach Pipeline Corridor	The proposed Cambridgeshire Strategic Green Infrastructure Network ¹²⁷ (strategic network area 6 Cambridge and Surrounding Areas) falls within the proposed site area and associated corridors.	

¹²⁶ From a spatial dataset that describes the geographic extent and location of Habitat Networks for 18 priority habitats based primarily, but not exclusively, on the priority habitat inventory with additional data added in relation to habitat restoration-creation, restorable habitat, plus fragmentation action, and network enhancement and expansion zones. The maps are created following a standardised process that incorporates a range of data layers and identifies specific locations for a range of actions to help improve the ecological resilience for each of the habitats/habitat networks. This is the combined habitat network map. The Habitat Networks (England) comprise a series of 23 individual habitat network maps for England plus a single 'Combined Habitat Networks Map' and 3 'Grouped Habitat Networks Map'. The habitat network maps seek to apply the best evidence and principles and to use the best available nationally consistent spatial data. The habitat network maps are developed around 4 distinct habitat components sets and include 4 distinct network zones where action may be undertaken to build greater ecological resilience. Land within close proximity to the existing habitat components that are more likely to be suitable for habitat re-creation for the particular habitat. These areas are primarily based on soils but in many cases has been refined by also using other data such as hydrology, altitude and proximity to the coast. This is termed the 'Network Enhancement Zone 1'. Information available at https://naturalengland-defra.opendata.arcgis.com/datasets/fceb93850462454ab3fb5accea2be35b_0?geometry=-29.930%2C48.013%2C25.573%2C57.298

¹²⁷ Cambridgeshire's Green Infrastructure Strategy has four objectives: 1. Reverse the decline in biodiversity, 2. Mitigate and adapt to climate change, 3. Promote sustainable growth and economic development, 4. Support healthy living and wellbeing. These four objectives were agreed by the Cambridgeshire Green Infrastructure Forum and supported through public consultation. They also reflect country-wide priorities as set out in 'Cambridgeshire's Vision 2007 – 2021 and the 'Cambridgeshire Quality Charter for Growth'. The Strategy is designed to assist in shaping and co-ordinating the delivery of Green Infrastructure in the County. Available online at: <https://www.cambridge.gov.uk/media/2557/green-infrastructure-strategy.pdf> <https://www.cambridge.gov.uk/cambridgeshire-green-infrastructure-strategy#:~:text=The%20Cambridgeshire%20Green%20Infrastructure%20Strategy.now%20and%20in%20the%20future.&text=To%20promote%20sustainable%20growth%20and%20economic%20development>

¹²⁸ Land within relatively close proximity to the Network Enhancement Zones 1 & 2 that are more likely to be suitable for habitat creation for the particular habitat and identifying possible locations for connecting and linking up networks across a landscape. This is termed the 'Network Expansion Zone'. Information available at https://naturalengland-defra.opendata.arcgis.com/datasets/fceb93850462454ab3fb5accea2be35b_0?geometry=-29.930%2C48.013%2C25.573%2C57.298

¹²⁹ Wicken Fen Vision area: <https://nt.global.ssl.fastly.net/wicken-fen-nature-reserve/documents/wicken-fen-vision-strategy-document.pdf>

H.2 Protected species records

Table H.101: Protected species records within 5km of site area 1, 2 and 3

Taxon group	Common name	Latin name	Designation(s)	Site area		
				1	2	3
Amphibian	Great crested newt	<i>Triturus cristatus</i>	Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	Common toad	<i>Bufo bufo</i>	Wildlife and Countryside Act 1981 (Schedule 5) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Bird	Avocet	<i>Recurvirostra avosetta</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y		Y
	Barn owl	<i>Tyto alba</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
	Bearded tit	<i>Panurus biarmicus</i>	Wildlife and Countryside Act 1981 (Schedule 1)			Y
	Bewick's swan	<i>Cygnus columbianus subsp. Bewickii</i>	Wildlife and Countryside Act 1981 (Schedule 1) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	Bittern	<i>Botaurus stellaris</i>	Wildlife and Countryside Act 1981 (Schedule 1) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	Black redstart	<i>Phoenicurus ochruros</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
	Black-necked Grebe	<i>Podiceps nigricollis</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
	Black-tailed Godwit	<i>Limosa limosa</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
	Brambling	<i>Fringilla montifringilla</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
	Cetti's warbler	<i>Cettia cetti</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
	Common crossbill	<i>Loxia curvirostra</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
	Common scoter	<i>Melanitta nigra</i>	Wildlife and Countryside Act 1981 (Schedule 1)			Y
	Dartford warbler	<i>Sylvia undata</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y

Dotterel	<i>Charadrius morinellus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Fieldfare	<i>Turdus pilaris</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Firecrest	<i>Regulus ignicapilla</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y		Y
Garganey	<i>Anas querquedula</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Greylag goose	<i>Anser anser</i>	Wildlife and Countryside Act 1981 (Schedule 1)			Y
Golden oriole	<i>Oriolus oriolus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Goshawk	<i>Accipiter gentilis</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Green sandpiper	<i>Tringa ochropus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Greenshank	<i>Tringa nebularia</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Hen harrier	<i>Circus cyaneus</i>	Wildlife and Countryside Act 1981 (Schedule 1) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		Y
Hobby	<i>Falco subbuteo</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Honey-buzzard	<i>Pernis apivorus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Kingfisher	<i>Alcedo atthis</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Leach's petrel	<i>Oceanodroma leucorhoa</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Little gull	<i>Hydrocoloeus minutus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Little ringed plover	<i>Charadrius dubius</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Marsh harrier	<i>Circus aeruginosus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Mediterranean gull	<i>Larus melanocephalus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Merlin	<i>Falco columbarius</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Montagu's harrier	<i>Circus pygargus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y		
Osprey	<i>Pandion haliaetus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Pallid harrier	<i>Circus macrourus</i>	Wildlife and Countryside Act 1981 (Schedule 1)			
Peregrine	<i>Falco peregrinus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Purple heron	<i>Ardea purpurea</i>	Wildlife and Countryside Act 1981 (Schedule 1)			
Quail	<i>Coturnix coturnix</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Red kite	<i>Milvus milvus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y

Red-backed Shrike	<i>Lanius collurio</i>	Wildlife and Countryside Act 1981 (Schedule 1) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		
Redwing	<i>Turdus iliacus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Ruff	<i>Calidris pugnax</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y		Y
Scaup	<i>Aythya marila</i>	Wildlife and Countryside Act 1981 (Schedule 1) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		Y
Shore lark	<i>Eremophila alpestris</i>	Wildlife and Countryside Act 1981 (Schedule 1)			
Slavonian grebe	<i>Podiceps auritus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y		Y
Snow bunting	<i>Plectrophenax nivalis</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Spoonbill	<i>Platalea leucorodia</i>	Wildlife and Countryside Act 1981 (Schedule 1)			
Spotted crane	<i>Porzana porzana</i>	Wildlife and Countryside Act 1981 (Schedule 1)			
Stone-curlew	<i>Burhinus oediconemus</i>	Wildlife and Countryside Act 1981 (Schedule 1) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		Y
Whimbrel	<i>Numenius phaeopus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Whooper swan	<i>Cygnus cygnus</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Wood sandpiper	<i>Tringa glareola</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Wryneck	<i>Jynx torquilla</i>	Wildlife and Countryside Act 1981 (Schedule 1) NERC ACT 2006. Section 41: Species of Principal Importance in England		Y	Y
Goldeneye	<i>Bucephala clangula</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Greylag goose	<i>Anser anser</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Pintail	<i>Anas acuta</i>	Wildlife and Countryside Act 1981 (Schedule 1)	Y	Y	Y
Arctic skua	<i>Stercorarius parasiticus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Brent goose	<i>Branta bernicla</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Bullfinch	<i>Pyrrhula pyrrhula</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Corn bunting	<i>Emberiza calandra</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y

Cuckoo	<i>Cuculus canorus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Curlew	<i>Numenius arquata</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Duncock	<i>Prunella modularis</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Grasshopper warbler	<i>Locustella naevia</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Grey partridge	<i>Perdix perdix</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Hawfinch	<i>Coccothraustes coccothraustes</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	
House sparrow	<i>Passer domesticus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Lapwing	<i>Vanellus vanellus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Lesser redpoll	<i>Acanthis cabaret</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Lesser spotted woodpecker	<i>Dendrocopos minor</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Linnet	<i>Linaria cannabina</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Marsh tit	<i>Poecile palustris</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		
Reed bunting	<i>Emberiza schoeniclus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Ring ouzel	<i>Turdus torquatus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Skylark	<i>Alauda arvensis</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Song thrush	<i>Turdus philomelos</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Spotted flycatcher	<i>Muscicapa striata</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y

	Starling	<i>Sturnus vulgaris</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	Tree pipit	<i>Anthus trivialis</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		Y
	Tree sparrow	<i>Passer montanus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	Turtle dove	<i>Streptopelia turtur</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	White-fronted Goose	<i>Anser albifrons</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	Wood warbler	<i>Phylloscopus sibilatrix</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		Y
	Yellow wagtail	<i>Motacilla flava</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	Yellow wagtail	<i>Motacilla flava subsp. Flavissima</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England			Y
	Yellowhammer	<i>Emberiza citrinella</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Bony fish (Actinopterygii)	Brown Trout	<i>Salmo trutta subsp. fario</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England			Y
Fern	Maidenhair Fern	<i>Adiantum capillus-veneris</i>	Nationally scarce	Y	Y	
Flowering plant	Annual Beard-grass	<i>Polygogon monspeliensis</i>	Nationally scarce	Y	Y	Y
	Basil thyme	<i>Clinopodium acinos</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		
	Bermuda-grass	<i>Cynodon dactylon</i>	Nationally rare	Y	Y	Y
	Bur medick	<i>Medicago minima</i>	Nationally scarce	Y	Y	
	Chives	<i>Allium schoenoprasum</i>	Nationally scarce	Y	Y	Y
	Corn buttercup	<i>Ranunculus arvensis</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		
	Corn cleavers	<i>Galium tricornutum</i>	Nationally rare	Y	Y	Y
	Cornflower	<i>Centaurea cyanus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		Y
	Dittander	<i>Lepidium latifolium</i>	Nationally scarce	Y	Y	Y

Dwarf Mouse-ear	<i>Cerastium pumilum</i>	Nationally scarce	Y	Y	Y
Early Meadow-grass	<i>Poa infirma</i>	Nationally scarce		Y	Y
Fang-toothed Hawkweed	<i>Hieracium diaphanum</i>	Nationally rare	Y	Y	Y
Fen pondweed	<i>Potamogeton coloratus</i>	Nationally scarce	Y		Y
Few-flowered Fumitory	<i>Fumaria vaillantii</i>	Nationally scarce			Y
Fine-leaved Fumitory	<i>Fumaria parviflora</i>	Nationally scarce			Y
Fly orchid	<i>Ophrys insectifera</i>	UK BAP			Y
Fringed Water-lily	<i>Nymphoides peltata</i>	Nationally scarce	Y		Y
Fritillary	<i>Fritillaria meleagris</i>	Nationally scarce			Y
Galingale	<i>Cyperus longus</i>	Nationally scarce	Y	Y	Y
Gold-of-pleasure	<i>Camelina sativa</i>	Nationally scarce			Y
Hoary mullein	<i>Verbascum pulverulentum</i>	Nationally scarce	Y	Y	Y
Jersey cudweed	<i>Gnaphalium luteoalbum</i>	Wildlife and Countryside Act 1981 (Schedule 8)	Y	Y	Y
Marsh-mallow	<i>Althaea officinalis</i>	Nationally scarce	Y		
Mezereon	<i>Daphne mezereum</i>	Nationally scarce	Y		Y
Perennial Flax	<i>Linum perenne</i>	Nationally scarce			Y
Purple fescue	<i>Vulpia ciliata</i> subsp. <i>Ambigua</i>	Nationally scarce	Y		
Sea-buckthorn	<i>Hippophae rhamnoides</i>	Nationally scarce	Y	Y	Y
Shepherd's-needle	<i>Scandix pecten-veneris</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England			
Sickle medick	<i>Medicago sativa</i> subsp. <i>Falcata</i>	Nationally scarce			Y
Slender tare	<i>Vicia parviflora</i>	Nationally scarce	Y	Y	Y
Spreading Hedge-parsley	<i>Torilis arvensis</i>	Nationally scarce			
Stinking hellebore	<i>Helleborus foetidus</i>	Nationally scarce			Y
Tasteless Water-pepper	<i>Persicaria mitis</i>	Nationally scarce			Y
Toothed medick	<i>Medicago polymorpha</i>	Nationally scarce	Y		
Tubular Water-dropwort	<i>Oenanthe fistulosa</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England			
Wall bedstraw	<i>Galium parisiense</i>	Nationally scarce	Y		
Welsh poppy	<i>Meconopsis cambrica</i>	Nationally scarce	Y		Y

	White Helleborine	<i>Cephalanthera damasonium</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England			Y
	White mullein	<i>Verbascum lychnitis</i>	Nationally scarce	Y	Y	Y
	Yellow vetchling	<i>Lathyrus aphaca</i>	Nationally scarce		Y	
Insect - beetle (Coleoptera)	Abdera biflexuosa	<i>Abdera biflexuosa</i>	Nationally scarce			Y
	Adonis' ladybird	<i>Hippodamia (Adonia) variegata</i>	Nationally scarce	Y	Y	Y
	Agrilus (Anambus) laticornis	<i>Agrilus (Anambus) laticornis</i>	Nationally scarce			Y
	Alder flea weevil	<i>Orchestes (Orchestes) testaceus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England			
	Amidobia talpa	<i>Amidobia talpa</i>	Nationally scarce			
	Ampedus quercicola	<i>Ampedus quercicola</i>	Nationally scarce			
	Anaglyptus mysticus	<i>Anaglyptus mysticus</i>	Nationally scarce	Y	Y	
	Anobium inexpectatum	<i>Anobium inexpectatum</i>	Nationally scarce			Y
	Anthribus nebulosus	<i>Anthribus nebulosus</i>	Nationally scarce	Y		
	Aphodius (Limarus) zenkeri	<i>Aphodius (Limarus) zenkeri</i>	Nationally scarce			Y
	Athous (Orthathous) campyloides	<i>Athous (Orthathous) campyloides</i>	Nationally scarce			Y
	Aulonium trisulcus	<i>Aulonium trisulcus</i>	Nationally scarce			
	Badister (Badister) unipustulatus	<i>Badister (Badister) unipustulatus</i>	Nationally scarce	Y		
	Bagous (Hydronomus) alismatis	<i>Bagous (Hydronomus) alismatis</i>	Nationally scarce			
	Barley flea beetle	<i>Phyllotreta vittula</i>	Nationally scarce	Y		
	Belladonna flea beetle	<i>Epitrix atropae</i>	Nationally scarce			Y
	Berosus (Berosus) luridus	<i>Berosus (Berosus) luridus</i>	Nationally scarce			
	Bloody cranesbill weevil	<i>Zacladus exiguus</i>	Nationally scarce	Y		
	Brush-thighed Seed-eater	<i>Harpalus (Harpalus) froelichii</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England			
	Carpelimus obesus	<i>Carpelimus obesus</i>	Nationally scarce			
Cassida prasina	<i>Cassida prasina</i>	Nationally scarce	Y			
Cercyon (Cercyon) bifenestratus	<i>Cercyon (Cercyon) bifenestratus</i>	Nationally scarce				
Chrysolina oricalcia	<i>Chrysolina oricalcia</i>	Nationally scarce			Y Y	
Cobweb beetle	<i>Ctesias serra</i>	Nationally scarce			Y Y	

Cossonus linearis	<i>Cossonus linearis</i>	Nationally scarce		Y
Crudosilis ruficollis	<i>Crudosilis ruficollis</i>	Nationally scarce	Y	Y Y
Demetrias (Risophilus) imperialis	<i>Demetrias (Risophilus) imperialis</i>	Nationally scarce	Y	Y Y
Diplapion stolidum	<i>Diplapion stolidum</i>	Nationally scarce	Y	Y
Diplocoelus fagi	<i>Diplocoelus fagi</i>	Nationally scarce	Y	Y
Donacia clavipes	<i>Donacia clavipes</i>	Nationally scarce		Y
Donacia dentata	<i>Donacia dentata</i>	Nationally scarce		
Donacia thalassina	<i>Donacia thalassina</i>	Nationally scarce	Y	Y
Dorytomus ictor	<i>Dorytomus ictor</i>	Nationally scarce		Y
Drupenatus nasturtii	<i>Drupenatus nasturtii</i>	Nationally scarce	Y	Y
Dryops (Dryops) similis	<i>Dryops (Dryops) similis</i>	Nationally scarce		
Eledona agricola	<i>Eledona agricola</i>	Nationally scarce		Y
Enochrus bicolor	<i>Enochrus bicolor</i>	Nationally scarce		
Enochrus quadripunctatus	<i>Enochrus quadripunctatus</i>	Nationally scarce		
Eubrychius velutus	<i>Eubrychius velutus</i>	Nationally scarce	Y	Y
Euglenes oculatus	<i>Euglenes oculatus</i>	Nationally scarce		Y
Flax flea beetle	<i>Longitarsus parvulus</i>	Nationally scarce		
Gymnetron melanarium	<i>Gymnetron melanarium</i>	Nationally scarce	Y	
Hallomenus binotatus	<i>Hallomenus binotatus</i>	Nationally scarce		Y Y
Hawthorn jewel beetle	<i>Agrilus (Anambus) sinuatus</i>	Nationally scarce		Y Y
Hydaticus seminiger	<i>Hydaticus seminiger</i>	Nationally scarce	Y	Y
Hydaticus transversalis	<i>Hydaticus transversalis</i>	Nationally scarce		
Hygrotus (Coelambus) nigrolineatus	<i>Hygrotus (Coelambus) nigrolineatus</i>	Nationally scarce		
Ischnomera cyanea	<i>Ischnomera cyanea</i>	Nationally scarce		Y Y
Ischnodes sanguinicollis	<i>Ischnodes sanguinicollis</i>	Nationally scarce		Y
Kissophagus hederæ	<i>Kissophagus hederæ</i>	Nationally scarce		Y
Longitarsus ballotæ	<i>Longitarsus ballotæ</i>	Nationally scarce		Y
Lissodema denticolle	<i>Lissodema denticolle</i>	Nationally scarce		

Longitarsus ballotae	<i>Longitarsus ballotae</i>	Nationally scarce	Y	Y
Mallow flea beetle	<i>Podagrica fuscicornis</i>	Nationally scarce	Y	Y
Malthinus balteatus	<i>Malthinus balteatus</i>	Nationally scarce		Y
Medon apicalis	<i>Medon apicalis</i>	Nationally scarce		Y
Mogulones geographicus	<i>Mogulones geographicus</i>	Nationally scarce	Y	
Musk beetle	<i>Aromia moschata</i>	Nationally scarce	Y	Y Y
Notaris scirpi	<i>Notaris scirpi</i>	Nationally scarce		Y
Ophonus (Metophonus) schaubergerianus	<i>Ophonus (Metophonus) schaubergerianus</i>	Nationally scarce	Y	
Ophonus (Ophonus) ardosiacus	<i>Ophonus (Ophonus) ardosiacus</i>	Nationally scarce	Y	
Ophonus (Ophonus) azureus	<i>Ophonus (Ophonus) azureus</i>	Nationally scarce		Y
Opilo mollis	<i>Opilo mollis</i>	Nationally scarce		Y Y
Orchesia micans	<i>Orchesia micans</i>	Nationally scarce		Y
Oulimnius major	<i>Oulimnius major</i>	Nationally scarce	Y	Y
Philonthus fumarius	<i>Philonthus fumarius</i>	Nationally scarce		Y
Phytoecia cylindrica	<i>Phytoecia cylindrica</i>	Nationally scarce	Y	Y Y
Platyderus depressus	<i>Platyderus depressus</i>	Nationally scarce	Y	Y
Platynaspis luteorubra	<i>Platynaspis luteorubra</i>	Nationally scarce	Y	
Platystethus (Craetopycrus) nodifrons	<i>Platystethus (Craetopycrus) nodifrons</i>	Nationally scarce		Y
Polydrusus (Chrysophis) formosus	<i>Polydrusus (Chrysophis) formosus</i>	Nationally scarce	Y	Y
Prionychus ater	<i>Prionychus ater</i>	Nationally scarce		Y
Pseudocistela ceramboides	<i>Pseudocistela ceramboides</i>	Nationally scarce		
Ptinus sexpunctatus	<i>Ptinus sexpunctatus</i>	Nationally scarce	Y	Y
Rhagonycha lutea	<i>Rhagonycha lutea</i>	Nationally scarce		Y
Scaphisoma boleti	<i>Scaphisoma boleti</i>	Nationally scarce		Y Y
Sepedophilus testaceus	<i>Sepedophilus testaceus</i>	Nationally scarce		Y
Smaller noterus	<i>Noterus crassicornis</i>	Nationally scarce	Y	Y
Sphindus dubius	<i>Sphindus dubius</i>	Nationally scarce		Y
Squamapion cineraceum	<i>Squamapion cineraceum</i>	Nationally scarce	Y	

	Stenus (Stenus) pusillus	<i>Stenus (Stenus) pusillus</i>	Nationally scarce		Y	
	Sunius melanocephalus	<i>Sunius melanocephalus</i>	Nationally scarce		Y	
	Trichosirocalus barnevillei	<i>Trichosirocalus barnevillei</i>	Nationally scarce	Y		
	Two-Spot Wood-Borer	<i>Agrilus (Anambus) biguttatus</i>	Nationally scarce			Y
	Wheat mud beetle	<i>Helophorus (Empleurus) nubilus</i>	Nationally scarce	Y		
Insect - butterfly	Grizzled skipper	<i>Pyrgus malvae</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	
	Small heath	<i>Coenonympha pamphilus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	Swallowtail	<i>Papilio machaon</i>	Wildlife and Countryside Act 1981 (Schedule 5)		Y	Y
	Wall	<i>Lasiommata megera</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	White admiral	<i>Limenitis camilla</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England			
	White-letter Hairstreak	<i>Satyrrium w-album</i>	Wildlife and Countryside Act 1981 (Schedule 5) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Insect - hymenopteran	Dolichovespula (Dolichovespula) media	<i>Dolichovespula (Dolichovespula) media</i>	Nationally scarce		Y	
	Five-banded Weevil-wasp	<i>Cerceris quinquefasciata</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England			Y
	Hill cuckoo bee	<i>Bombus (Psithyrus) rupestris</i>	Nationally scarce	Y	Y	
	Large garden bumble bee	<i>Bombus (Megabombus) ruderatus</i>	Nationally scarce NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	Lasioglossum (Evylaeus) malachurum	<i>Lasioglossum (Evylaeus) malachurum</i>	Nationally scarce	Y		
	Nysson trimaculatus	<i>Nysson trimaculatus</i>	Nationally scarce			Y
Insect - moth	Alder signal	<i>Stathmopoda pedella</i>	Nationally scarce			Y
	August thorn	<i>Ennomos quercinaria</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		

Beaded chestnut	<i>Agrochola lychnidis</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Blood-vein	<i>Timandra comae</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Bordered gothic	<i>Heliophobus reticulata</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		
Brindled beauty	<i>Lycia hirtaria</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		
Brown-spot Pinion	<i>Agrochola litura</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		Y
Buff ermine	<i>Spilosoma lutea</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Bulrush veneer	<i>Calamotropha paludella</i>	Nationally scarce	Y	Y	Y
Centre-barred Sallow	<i>Atethmia centrigo</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Cinnabar	<i>Tyria jacobaeae</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Crescent	<i>Celaena leucostigma</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		Y
Dark brocade	<i>Mniotype adusta</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		
Dark spinach	<i>Pelurga comitata</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Dark-barred Twin-spot Carpet	<i>Xanthorhoe ferrugata</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Deep-brown Dart	<i>Aporophyla lutulenta</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	
Dot moth	<i>Melanchra persicariae</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Dotted ermel	<i>Ethmia dodecea</i>	Nationally scarce	Y		Y
Double dart	<i>Graphiphora augur</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		
Dusky brocade	<i>Apamea remissa</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y

Dusky-lemon Sallow	<i>Cirrhia gilvago</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y
Ear moth	<i>Amphipoea oculatea</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y Y
Feathered gothic	<i>Tholera decimalis</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y Y
Garden dart	<i>Euxoa nigricans</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y Y
Garden tiger	<i>Arctia caja</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y
Ghost moth	<i>Hepialus humuli</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y
Ghost moth	<i>Hepialus humuli subsp. Humuli</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y Y
Giant Water-veneer	<i>Schoenobius gigantella</i>	Nationally scarce	Y	Y
Goat moth	<i>Cossus cossus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y Y
Green-brindled Crescent	<i>Allophyes oxyacanthae</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y Y
Grey dagger	<i>Acronicta psi</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y Y
Hedge rustic	<i>Tholera cespitis</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	
Hollyhock seed moth	<i>Pexicopia malvella</i>	Nationally scarce	Y	
Knot grass	<i>Acronicta rumicis</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y Y
Lackey	<i>Malacosoma neustria</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y Y
Large nutmeg	<i>Apamea anceps</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y Y
Large wainscot	<i>Rhizedra lutosa</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y
Latticed heath	<i>Chiasmia clathrata</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y Y

Lunar yellow underwing	<i>Noctua orbona</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		
Minor Shoulder-knot	<i>Brachylomia viminalis</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Mottled rustic	<i>Caradrina morpheus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Mouse moth	<i>Amphipyra tragopoginis</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Mullein Wave	<i>Scopula marginepunctata</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England			Y
Oak Hook-tip	<i>Watsonalla binaria</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		
Pale shining brown	<i>Polia bombycina</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		
Powdered quaker	<i>Orthosia gracilis</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Rosy minor	<i>Litoligia literosa</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	
Rosy rustic	<i>Hydraecia micacea</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Rustic	<i>Hoplodrina blanda</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Sallow	<i>Cirrhia icteritia</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Shaded Broad-bar	<i>Scotopteryx chenopodiata</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Shoulder-striped Wainscot	<i>Leucania comma</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Small emerald	<i>Hemistola chrysoprasaria</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Small phoenix	<i>Ecliptopera silaceata</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		Y
Small Square-spot	<i>Diarsia rubi</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y

	Spinach	<i>Eulithis mellinata</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	Spindle Knot-horn	<i>Nephoterix angustella</i>	Nationally scarce			Y
	Sulphur pearl	<i>Sitochroa palealis</i>	Nationally scarce	Y		Y
	V-moth	<i>Macaria wauaria</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	
	White ermine	<i>Spilosoma lubricipeda</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	White-line Dart	<i>Euxoa tritici</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	
	White-spotted Pinion	<i>Cosmia diffinis</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Insect - true bug (Hemiptera)	Agnocoris reclairei	<i>Agnocoris reclairei</i>	Nationally scarce	Y	Y	
	Anoscopus albifrons	<i>Anoscopus albifrons</i>	Nationally scarce	Y	Y	
	Tall fescue planthopper	<i>Ribautodelphax imitans</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England			Y
Insect - true fly (Diptera)	Acanthiophilus helianthi	<i>Acanthiophilus helianthi</i>	Nationally scarce			Y
	Agathomyia wankowiczii	<i>Agathomyia wankowiczii</i>	Nationally scarce			Y
	Atypophthalmus inustus	<i>Atypophthalmus inustus</i>	Nationally scarce			Y
	Aulacigaster leucopeza	<i>Aulacigaster leucopeza</i>	Nationally scarce			Y
	Beris clavipes	<i>Beris clavipes</i>	Nationally scarce			Y
	Blaesoxipha plumicornis	<i>Blaesoxipha plumicornis</i>	Nationally scarce			Y
	Brachyopa insensilis	<i>Brachyopa insensilis</i>	Nationally scarce			Y
	Brachyopa pilosa	<i>Brachyopa pilosa</i>	Nationally scarce			Y
	Cheilosia soror	<i>Cheilosia soror</i>	Nationally scarce			Y
	Cheilosia velutina	<i>Cheilosia velutina</i>	Nationally scarce			Y
	Chorisops nagatomii	<i>Chorisops nagatomii</i>	Nationally scarce	Y		
	Coenosia atra	<i>Coenosia atra</i>	Nationally scarce	Y	Y	
	Colobaea bifasciella	<i>Colobaea bifasciella</i>	Nationally scarce			Y
	Didea fasciata	<i>Didea fasciata</i>	Nationally scarce			Y
	Dioxyyna bidentis	<i>Dioxyyna bidentis</i>	Nationally scarce			Y

Drino lota	<i>Drino lota</i>	Nationally scarce		Y
Epistrophe diaphana	<i>Epistrophe diaphana</i>	Nationally scarce		Y
Eupachygaster tarsalis	<i>Eupachygaster tarsalis</i>	Nationally scarce		Y
Fannia clara	<i>Fannia clara</i>	Nationally scarce		Y
Fannia nigra	<i>Fannia nigra</i>	Nationally scarce		Y
Gnophomyia viridipennis	<i>Gnophomyia viridipennis</i>	Nationally scarce		Y
Golden Hoverfly	<i>Callicera spinolae</i>	Nationally scarce		Y
Helina abdominalis	<i>Helina abdominalis</i>	Nationally scarce		Y
Helius pallirostris	<i>Helius pallirostris</i>	Nationally scarce	Y	Y
Hercostomus nigrilamellatus	<i>Hercostomus nigrilamellatus</i>	Nationally scarce		Y
Hilara lugubris	<i>Hilara lugubris</i>	Nationally scarce		Y
Hydrotaea pilipes	<i>Hydrotaea pilipes</i>	Nationally scarce		Y
Lejogaster tarsata	<i>Lejogaster tarsata</i>	Nationally scarce	Y	Y
Lispocephala falcata	<i>Lispocephala falcata</i>	Nationally scarce		Y
Lophosia fasciata	<i>Lophosia fasciata</i>	Nationally scarce		Y
Macronychia striginervis	<i>Macronychia striginervis</i>	Nationally scarce		Y
Mallota cimbiciformis	<i>Mallota cimbiciformis</i>	Nationally scarce		Y
Merzomyia westermanni	<i>Merzomyia westermanni</i>	Nationally scarce	Y	
Mintho rufiventris	<i>Mintho rufiventris</i>	Nationally scarce		Y
Myolepta dubia	<i>Myolepta dubia</i>	Nationally scarce		Y
Neopachygaster meromelas	<i>Neopachygaster meromelas</i>	Nationally scarce		Y
Norellia spinipes	<i>Norellia spinipes</i>	Nationally scarce		Y
Odinia mejjerei	<i>Odinia mejjerei</i>	Nationally scarce		Y
Odontomyia tigrina	<i>Odontomyia tigrina</i>	Nationally scarce		Y Y
Orellia falcata	<i>Orellia falcata</i>	Nationally scarce		Y
Periscelis annulata	<i>Periscelis annulata</i>	Nationally scarce		Y
Pherbellia annulipes	<i>Pherbellia annulipes</i>	Nationally scarce		Y
Pherbellia dorsata	<i>Pherbellia dorsata</i>	Nationally scarce	Y	Y
Pherbellia nana	<i>Pherbellia nana</i>	Nationally scarce	Y	Y

	Phoenix fly	<i>Dorycera graminum</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	
	Pipizella virens	<i>Pipizella virens</i>	Nationally scarce	Y	
	Pipunculus zugmayeriae	<i>Pipunculus zugmayeriae</i>	Nationally scarce		Y
	Platypalpus articulatoides	<i>Platypalpus articulatoides</i>	Nationally scarce	Y	Y
	Platypalpus articulatus	<i>Platypalpus articulatus</i>	Nationally scarce	Y	
	Platypalpus infectus	<i>Platypalpus infectus</i>	Nationally scarce	Y	Y
	Platypalpus stigma	<i>Platypalpus stigma</i>	Nationally scarce	Y	Y
	Sapromyza opaca	<i>Sapromyza opaca</i>	Nationally scarce	Y	
	Scenopinus niger	<i>Scenopinus niger</i>	Nationally scarce		Y
	Stratiomys potamida	<i>Stratiomys potamida</i>	Nationally scarce	Y	Y Y
	Stratiomys singularior	<i>Stratiomys singularior</i>	Nationally scarce		Y
	Systemus leucurus	<i>Systemus leucurus</i>	Nationally scarce		Y
	Tachypeza fuscipennis	<i>Tachypeza fuscipennis</i>	Nationally scarce		Y
	Thecophora fulvipes	<i>Thecophora fulvipes</i>	Nationally scarce		Y
	Trachysiphonella scutellata	<i>Trachysiphonella scutellata</i>	Nationally scarce	Y	
	Triglyphus primus	<i>Triglyphus primus</i>	Nationally scarce		Y
	Typhamyza bifasciata	<i>Typhamyza bifasciata</i>	Nationally scarce	Y	Y
	Vanoyia tenuicornis	<i>Vanoyia tenuicornis</i>	Nationally scarce	Y	Y Y
	Volucella inanis	<i>Volucella inanis</i>	Nationally scarce		Y Y
	Volucella inflata	<i>Volucella inflata</i>	Nationally scarce		Y
	Volucella zonaria	<i>Volucella zonaria</i>	Nationally scarce	Y	Y Y
	Xanthandrus comtus	<i>Xanthandrus comtus</i>	Nationally scarce		Y
	Zophomyia temula	<i>Zophomyia temula</i>	Nationally scarce		Y
Lichen	Aspicilia contorta subsp. Hoffmanniana	<i>Aspicilia contorta subsp. Hoffmanniana</i>	Nationally rare	Y	Y
	Bacidia egenula	<i>Bacidia egenula</i>	Nationally scarce		Y
	Buellia badia	<i>Buellia badia</i>	Nationally scarce	Y	
	Caloplaca crenulatella	<i>Caloplaca crenulatella</i>	Nationally scarce	Y	
	Catillaria atomarioides	<i>Catillaria atomarioides</i>	Nationally scarce	Y	

	Chaenotheca brachypoda	<i>Chaenotheca brachypoda</i>	Nationally scarce			Y
	Lecania cyrtella	<i>Lecania cyrtella</i>	Nationally rare	Y	Y	Y
	Lecania hutchinsiae	<i>Lecania hutchinsiae</i>	Nationally scarce			Y
	Lecania inundata	<i>Lecania inundata</i>	Nationally scarce	Y	Y	
	Lecania rabenhorstii	<i>Lecania rabenhorstii</i>	Nationally scarce	Y		
	Lecanora persimilis	<i>Lecanora persimilis</i>	Nationally scarce	Y		
	Lecanora semipallida	<i>Lecanora semipallida</i>	Nationally scarce	Y		Y
	Placynthiella dasaea	<i>Placynthiella dasaea</i>	Nationally scarce	Y		Y
	Punctelia jeckeri	<i>Punctelia jeckeri</i>	Nationally scarce	Y		Y
	Xanthoria ucrainica	<i>Xanthoria ucrainica</i>	Nationally scarce	Y		Y
Liverwort	Micheli's Balloonwort	<i>Sphaerocarpos michelii</i>	Nationally scarce			Y
Reptile	Common lizard	<i>Zootoca vivipara</i>	Wildlife and Countryside Act 1981 (Schedule 5) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	Grass snake	<i>Natrix natrix</i>	Wildlife and Countryside Act 1981 (Schedule 5) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	Slow-worm	<i>Anguis fragilis</i>	Wildlife and Countryside Act 1981 (Schedule 5) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Stonewort	Clustered stonewort	<i>Tolypella glomerata</i>	Nationally scarce	Y	Y	Y
	Tassel stonewort	<i>Tolypella intricata</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	
Terrestrial mammal	Brown Long-eared Bat	<i>Plecotus auritus</i>	Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5)	Y	Y	Y
	Daubenton's bat	<i>Myotis daubentonii</i>	Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5)	Y	Y	Y
	European otter	<i>Lutra lutra</i>	Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5)	Y	Y	Y

			NERC ACT 2006. Section 41: Species of Principal Importance in England			
Long-eared Bat species	<i>Plecotus</i>		Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5)	Y	Y	Y
Natterer's bat	<i>Myotis nattereri</i>		Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5)	Y		Y
Noctule bat	<i>Nyctalus noctula</i>		Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Nyctalus Bat species	<i>Nyctalus</i>		Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5) NERC ACT 2006. Section 41: Species of Principal Importance in England			Y
Parti-coloured Bat	<i>Vespertilio murinus</i>		Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5)	Y	Y	
Pipistrelle Bat species	<i>Pipistrellus</i>		Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5)	Y	Y	Y
Serotine	<i>Eptesicus serotinus</i>		Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5)	Y	Y	Y
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>		Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Unidentified bat	<i>Myotis</i>		Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5)	Y	Y	Y
Western barbastelle	<i>Barbastella barbastellus</i>		Habitats and Species Directive (Annex II) Wildlife and Countryside Act 1981 (Schedule 5) NERC ACT 2006. Section 41: Species of Principal Importance in England			Y
Polecat	<i>Mustela putorius</i>		Habitats and Species Directive (Annex V) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y		Y
Eurasian badger	<i>Meles meles</i>		Protection of Badgers Act 1992	Y	Y	Y
Bats	<i>Chiroptera</i>		Wildlife and Countryside Act 1981 (Schedule 5)	Y	Y	

European water vole	<i>Arvicola amphibius</i>	Wildlife and Countryside Act 1981 (Schedule 5) NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Brown hare	<i>Lepus europaeus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y
Harvest mouse	<i>Micromys minutus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England			
West European hedgehog	<i>Erinaceus europaeus</i>	NERC ACT 2006. Section 41: Species of Principal Importance in England	Y	Y	Y

Table H.102: Protected and notable species records within the indicative WWTP footprint

Site area	Reported species	Designation	Location	Year reported
1	Stone-curlew	Wildlife and Countryside Act 1981 (Schedule 1) NERC ACT 2006. Section 41: Species of Principal Importance in England	Landbeach (TL4764)	2012
2	Mediterranean gull	Wildlife and Countryside Act 1981 (Schedule 1)	Milton landfill site (TL4663)	2019
	Bullfinch	NERC ACT 2006. Section 41: Species of Principal Importance in England	Mere Way, Milton (TL4663)	2019
	Lesser redpoll	NERC ACT 2006. Section 41: Species of Principal Importance in England	Milton (TL4663)	2019
	Turtle dove	NERC ACT 2006. Section 41: Species of Principal Importance in England	Milton (TL4663)	2019
	Yellow wagtail	NERC ACT 2006. Section 41: Species of Principal Importance in England	Milton (TL4663)	2019
	Grey partridge	NERC ACT 2006. Section 41: Species of Principal Importance in England	Milton (TL4663)	2019
	Curlew	NERC ACT 2006. Section 41: Species of Principal Importance in England	Milton (TL4663)	2019
3	Barn owl	Wildlife and Countryside Act 1981 (Schedule 1)	Low Fen Drove Way Grasslands and Hedges CWS	2011

Table H.103: Historical Natural England bat EPSM licence applications within 5km¹³⁰ of the proposed site areas

Site area	Case reference	Species	Location	Approximate distance (km)	Details	Start date	End date
1	EPSM2010-2402	Common pipistrelle Soprano pipistrelle	TL483615	3.7	Allowed destruction of a resting place	18/10/2010	30/09/2011
	EPSM2012-4691	Brown long-eared bat Noctule bat Common pipistrelle Soprano pipistrelle	TL483615	3.7	Allowed destruction of a resting place	16/05/2013	31/03/2015
	2014-775-EPS-MIT	Brown long-eared bat Noctule bat Common pipistrelle Soprano pipistrelle	TL480629	2.9	Allowed destruction of a resting place	01/01/2001	01/01/2001
2	EPSM2010-2402	Common pipistrelle Soprano pipistrelle	TL483615	2	Allowed destruction of a resting place	18/10/2010	30/09/2011
	EPSM2012-4691	Brown long-eared bat Noctule bat Common pipistrelle Soprano pipistrelle	TL483615	2	Allowed destruction of a resting place	16/05/2013	31/03/2015
	2014-775-EPS-MIT	Brown long-eared bat Noctule bat Common pipistrelle	TL482629	1.8	Allowed destruction of a resting place	01/01/2001	01/01/2001

¹³⁰ Excluding EPSM licences south and west of Cambridge conurbation and south of Cambridge airport due to the distance and lack of habitat connectivity because of the existing built up areas.

		Soprano pipistrelle					
3	2014-775-EPS-MIT	Brown long-eared bat	TL482629	1.6	Allowed destruction of a resting place	01/01/2001	01/01/2001
		Noctule bat					
		Common pipistrelle					
		Soprano pipistrelle					
	EPSM2012-4691	Brown long-eared bat	TL483615	0.8	Allowed destruction of a resting place	16/05/2013	31/03/2015
		Noctule bat					
		Common pipistrelle					
		Soprano pipistrelle					
	EPSM2010-2402	Common pipistrelle	TL483615	0.8	Allowed destruction of a resting place	18/10/2010	30/09/2011
		Soprano pipistrelle					
	2017-28568-EPS-MIT	Brown long-eared bat	TL532630	3.3	Allowed destruction and damage of a resting place	25/04/2017	30/04/2027
		Common pipistrelle					
		Natterer's bat					

Get in touch

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Writing to us at **Freepost: CWWTPR**

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

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