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Cambridge Waste Water Treatment Plant Relocation Project

Preliminary Environmental Information

February 2022

Introductory Paper

Purpose of Preliminary Environmental Information

What is Preliminary Environmental Information?

Preliminary Environmental Information (PEI) is defined in the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 as '*information which has been compiled by the applicant; and is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development*).' This is a broad definition which can encompass many different formats. The Planning Inspectorate's Advice Note 7 confirms that there is no prescribed format as to what PEI should comprise and it is not expected to replicate or be a draft of the Environmental Statement.

What are 'likely significant environmental effects'?

An environmental effect is typically a function of the importance, value or sensitivity of the receptor or resource (e.g. habitats for wildlife, a watercourse or a nature reserve, community amenity) and the magnitude or scale of the impact, meaning the change as a result of the proposed development.

Effects determined to be slight or neutral are not deemed to be significant, and as such are not reported in detail and will not require specific mitigation. The exception to this is where the combination of multiple non-significant effects has the potential to lead to a significant cumulative effect.

For some environmental impact types, such as noise and vibration or air quality, numerical values are used to identify the magnitude of impacts. Other impact types such as potential impacts on landscape character, visual amenity or heritage assets make use of specific guidance as well as their professional judgement to assess the significance of effects.

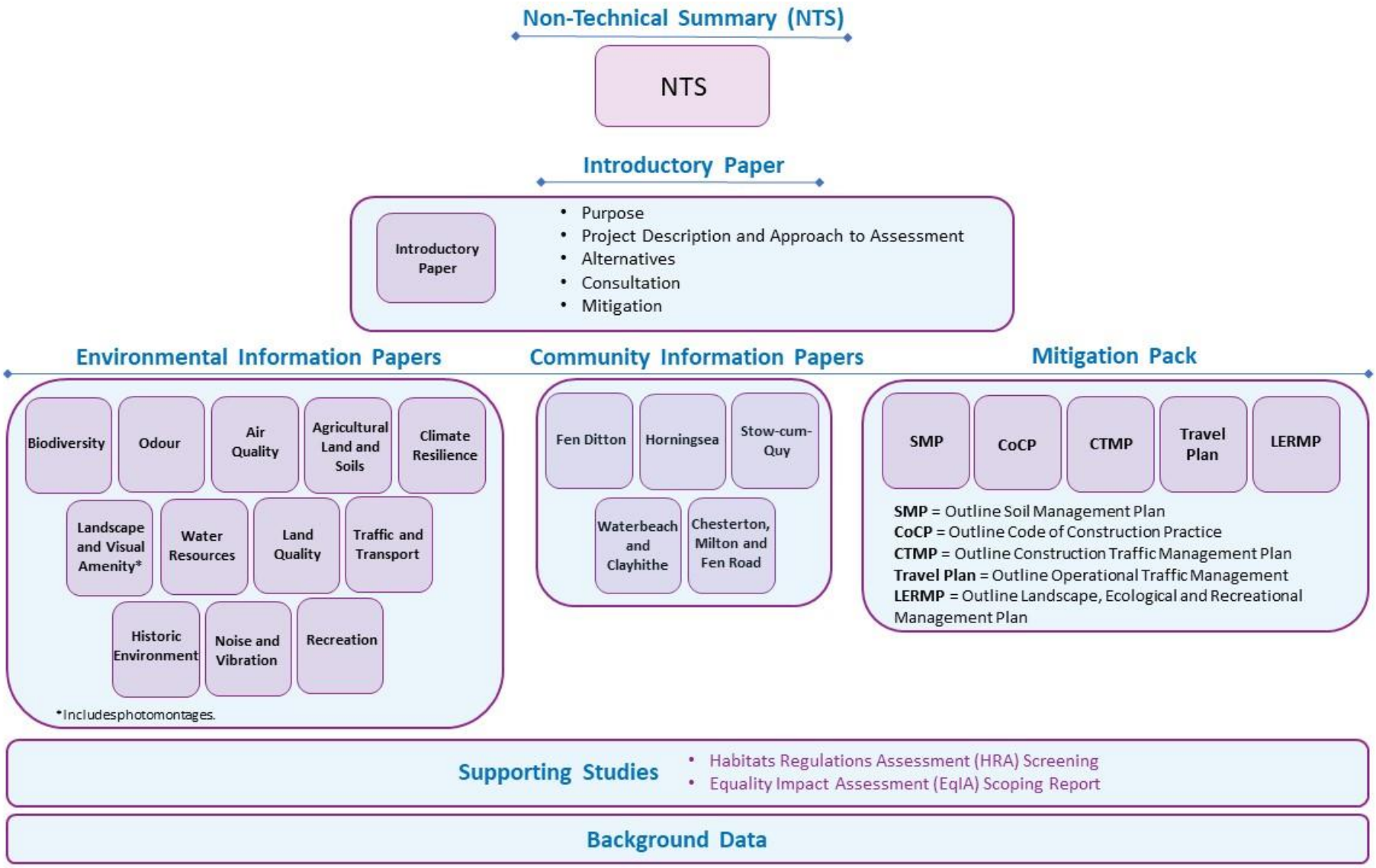
What is Preliminary Environmental Information for?

A good Preliminary Environmental Information Report (PEIR) is one that enables consultees (both specialist and non-specialist) to understand the likely significant environmental effects of the Proposed Development and helps to inform their consultation responses on the Proposed Development during the pre-application stage.

The information is 'preliminary'. Anglian Water is actively seeking consultees' comments in order to inform the final submission related to design and mitigation. There will be the opportunity for both the design of the Proposed Development and the Environmental Impact Assessment process to take into consideration any comments received through this consultation. You can comment through the Phase Three Consultation feedback system via the website here www.cwwtpr.com. For those unable to access materials digitally, hard copy materials are available at Community Access Points and post by request. Contact telephone number: 0808 196 1661 or FREEPOST: CWWTPR".

What is the approach and content of this Preliminary Environmental Information?

Anglian Water has chosen to facilitate the consultation process by providing this PEIR in a more accessible format than would be possible with a draft Environmental Statement. The content of the PEI is a series of papers as shown on the document map below. PEI has also been presented in an interactive website which can be found here www.cwwtpr.com.


Non-Technical Summary (NTS)
NTS
Introductory Paper
Introductory Paper
Purpose
Project Description and Approach to Assessment
Alternatives
Consultation
Mitigation
Environmental Information Papers
Biodiversity
Odour
Air Quality
Agricultural Land and Soils
Climate Resilience
Landscape and Visual Amenity*
Water Resources
Land Quality
Traffic and Transport
Historic Environment
Noise and Vibration
Recreation
*Includesphotomontages.
Community Information Papers
Fen Ditton
Horningsea
Stow-cum-Quy
Waterbeach and Clayhithe
Chesterton, Milton and Fen Road
Mitigation Pack
SMP
CoCP
CTMP
Travel Plan
LERMP
SMP = Outline Soil Management Plan
CoCP = Outline Code of Construction Practice
CTMP = Outline Construction Traffic Management Plan
Travel Plan = Outline Operational Traffic Management
LERMP = Outline Landscape, Ecological and Recreational Management Plan
Supporting Studies
Habitats Regulations Assessment (HRA) Screening
Equality Impact Assessment (EqIA) Scoping Report
Background Data

Project Description and Approach to Assessment

This section sets out a description of the proposed development comprising information on the site, design, size and other relevant features of the development.

Proposed Development purpose

The Proposed Development comprises the relocation of the Cambridge Waste Water Treatment Plant (WWTP) from its existing site on land adjoining the north eastern side of the city of Cambridge, to a new location. The relocation is required to enable the delivery of South Cambridgeshire District and Cambridge City Councils' Area Action Plan for a new low-carbon city district in North East Cambridge, which could create 8,350 homes and 15,000 jobs over the next 20 years.

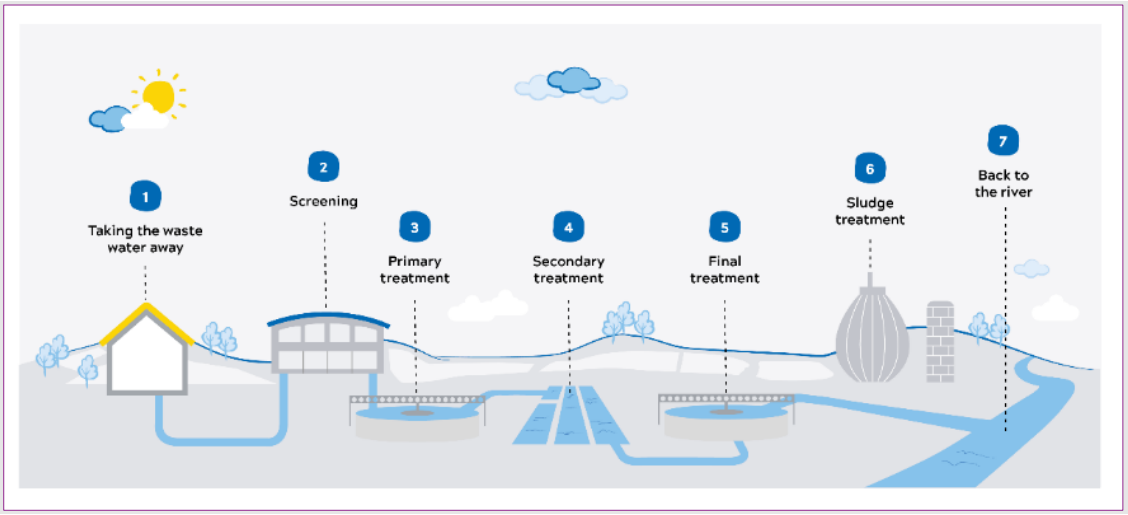
The purpose of the proposed Cambridge WWTP will be to treat all waste water and wet sludge from the Cambridge catchment just as the existing Cambridge WWTP currently does, plus that from the growth indicated and being planned within the catchment in the Local Plan to 2041, with ability to expand beyond to deal with further growth.

As part of its statutory function, Anglian Water operates the existing Cambridge WWTP. The existing Cambridge WWTP receives waste water from the Cambridge catchment either directly from the connected sewerage network or tankered to the plant from homes and businesses that are not connected. This waste water is then treated and the treated effluent discharged through an outfall to the nearby River Cam. The existing Cambridge WWTP is an integrated WWTP, as would be the Proposed Development. Integrated WWTP incorporate a sludge treatment function, in the form of a Sludge Treatment Centre (STC), which treats the sludge derived from the waste water from the catchment, and the "wet sludge" produced by other satellite plants which do not have integrated STC.

The proposed development of Waterbeach New Town lies to the north of Cambridge. The Waterbeach new town development when built out will comprise some 11,000 new homes along with associated business, retail, community and leisure uses. Waste water from Waterbeach will ultimately be treated by the proposed Cambridge WWTP once operational. However, the rate of development at Waterbeach New Town may require a new pipeline (rising main) to be built from Waterbeach to the existing Cambridge WWTP to allow treatment of waste water in advance of the proposed Cambridge WWTP becoming operational. In that case, either a later connection would be made to the proposed Cambridge WWTP from a point on the pipeline route, or flows diverted from the existing Cambridge WWTP via the transfer tunnel. The PEIR assumes a worst-case scenario of all Waterbeach waste water being transferred to the existing Cambridge WWTP and on to the proposed Cambridge WWTP once operational.

How will waste water and sludge be treated at the relocated Cambridge WWTP?

The proposed WWTP will act as a hub dealing not only with the waste water treatment process for the catchment areas in which they and their nearby population centres are located, but also completing the waste water treatment process for the wet sludge tankered in from the local satellite facilities. The wet sludge from these satellite plants will be transported to the WWTP by tankers and deposited into the first stage of the STC process. The sludge treatment process would produce nutrient rich biosolids cake for use as bio-fertiliser for spreading on agricultural land and produce energy via anaerobic digestion as biogas is produced as a by-product. This is no different to the operations ongoing at the existing Cambridge WWTP.



As part of its statutory function, Anglian Water operates the existing Cambridge WWTP. The image above provides an overview of the treatment process proposed for waste water and sludge which is explained below.

1. The existing Cambridge WWTP receives waste water from the Cambridge catchment either directly from the connected sewerage network or tankered to the plant from homes and businesses that are not connected.
2. This waste water is then screened to remove solids such as grit from road run-off, and large nondegradable objects (such as nappies, face wipes and plastic bags).
3. The screened waste water is then flows to primary treatment where a large proportion of the solid organic matter is separated from the water by allowing it to gravitate to the base of the primary settling tanks. The settled solids are pumped to the sludge treatment centre for further treatment and a weir near the top of the tanks then transfers the flows to the secondary treatment stage.
4. Secondary treatment is the biological treatment process which relies on bacteria to further break down the solids. For the proposed WWTP the current proposal is to utilise a modern membrane aerated bioreactor (MaBR) configuration to ensure low energy utilisation for maximum oxygen transfer, however other activated sludge process options remain a potential.

5. Final treatment provides the finest grade of treatment to ensure the effluent complies with discharge consent limits.
6. The existing Cambridge WWTP is an integrated WWTP, as would be the Proposed Development. Integrated WWTP incorporate a sludge treatment function, in the form of a Sludge Treatment Centre (STC), which treats the sludge derived from the waste water being treated, and the "wet sludge" produced by other satellite plants which do not have integrated STC. The sludge treatment process produces nutrient rich biosolids cake used as a bio-fertiliser for spreading on agricultural land as well as producing energy via anaerobic digestion as biogas is produced as a by-product.
7. The treated effluent is discharged through an outfall to the nearby River Cam.

What happens after heavy rainfall?

Storm overflows play a vital role in our combined waste water network systems as they work like pressure release valves to protect homes and businesses from sewer flooding during periods of extreme rainfall. The Environment Agency (EA) issues permits for our storm overflows.

There is an existing combined sewer overflow (CSO) to the River Cam approximately 2km upstream of the existing Cambridge WWTP, which operates as part of the existing Cambridge WWTP system. During storm events, when waste water infrastructure is operating at full capacity, the CSO may be used as an overflow to convey storm water and waste water to the River Cam, and prevent flooding of streets and homes. Analysis for the CSO shows that it has discharged at most four times per year between 2018 and 2020. As discharge from the CSO contains untreated waste water, each CSO overflow to the River Cam adversely impact water quality downstream.

The existing Cambridge WWTP includes storm water storage which are used during storm events to store combined volumes of waste water and storm water. Once the storm tanks are full and preliminary treatment through settlement has occurred, the settled storm water is discharged to the River Cam.

The pumping infrastructure of the proposed WWTP has been designed to receive all flow conditions (including storm) without having a negative impact on the existing Cambridge sewer network. Should the level of flow ever exceed the facility's 'flow to full treatment' capacity, storm pumps will start working to divert the excess incoming flows to the WWTP stormwater storage and treatment plant. This stormwater management solution will be in accordance with the agreement reached with the Environment Agency as part of the treatment facility permit

Will the waste water and sludge treatment processes at the relocated WWTP be different to those at the existing WWTP?

In terms of process steps these will be the same as those used on the existing Cambridge WWTP, however the process units and technologies used to carry out the process steps will be more energy efficient, due to advances in technology.

How has the proposed WWTP been sized?

The design capacity of the proposed WWTP will be approximately 548,000 population equivalent. The waste water treatment element (i.e. the Water Recycling Centre not including the Sludge Treatment Centre) has an overall design capacity of 270,000 to 300,000 population equivalent. The Sludge Treatment Centre will be designed to treat sludge produced at the proposed WWTP plus imported liquid sludges arriving by road. The STC is designed to treat a total amount of up to 16,000 Tonnes Dry Solids (TDS) per year for both indigenous and imported sludge.

There is flexibility and capacity within the operational footprint of the proposed WWTP to allow for future expansion ensuring the proposed development can accommodate growth to at least 2080. These elements are likely to be modular process tanks and units with associated equipment within the footprint of the operational WWTP and not require works to transfer infrastructure outside of this area. At present it is anticipated that impacts arising from a phased construction of these elements would fall within the realistic worst case scenarios assessed.

How will the waste water treatment process at the proposed WWTP be regulated with respect to protecting the River Cam?

The Environment Agency regulates WWTP by setting compliance limits (via a discharge permit) for the quality of the effluent they discharge to a watercourse. The proposed WWTP is designed and will be operated to meet the requirements of the Environment Agency discharge permit. The level of treatment and monitoring required is based on the population the WWTP serves and where the waste water is discharged.

The Environment Agency has proposed, as a result of the permit pre application process, the following indicative limits for the proposed Cambridge WWTP:

- Phosphorus – 0.4mg per litre
- Total Suspended Solids – 14mg per litre
- Biochemical Oxygen Demand (BOD) – 11mg per litre
- Ammonia – 3mg per litre
- Storm Storage – 23,000m^3 total

The requirements of the Environment Agency permit for the proposed WWTP would replace those in the permit for the existing Cambridge WWTP carrying the following limits:

- Phosphorus – 1mg per litre
- Total Suspended Solids – 20mg per litre
- Biochemical Oxygen Demand (BOD) – 15mg per litre
- Ammonia – 5mg per litre
- Storm Storage – 23,000m^3 total

The existing WWTP outfall for treated effluent and stormflows entering the river is on the same stretch of the River Cam and within 100 metres upstream of the proposed relocated WWTP outfall.

Consultation is ongoing between Anglian Water Services and the Environment Agency with the objective of defining an “agreement in principle” regarding the limits of the discharge permit.

Due to the fact the Cambridge sewer network collects water falling on the ground and entering surface drains (as well as waste water from households, businesses and industry) stormwater will end up at the WWTP as well as sewage. It is not economically proportionate to provide full treatment capacity for these larger diluted ‘storm’ flows at the WWTP. Therefore, once the rate of flow into the pumping station at the entrance into the WWTP exceeds a set level the flows cannot be fully treated. Storm pumps divert the excess incoming flows to be stored temporarily, most commonly this is done using large concrete uncovered tanks. The Environment Agency issue and monitor permits for storm overflows and set the rates at which waste water must be fully treated.

This stormwater management solution will be in accordance with the agreement reached with the Environment Agency. The solution proposed will utilise the new transfer tunnel to deliver an element of the required storm storage. This will mean there will be storm storage underground as well as in onsite storm storage tanks.

In the event of a prolonged or particularly heavy storm the stormwater storage will reach capacity. In this eventuality, the screened and partially settled stormwater excess will enter overflow pipework and be transferred to the River Cam The circumstances under which these transfers of partly treated storm water to the Cam occur are also regulated by the Environment Agency.

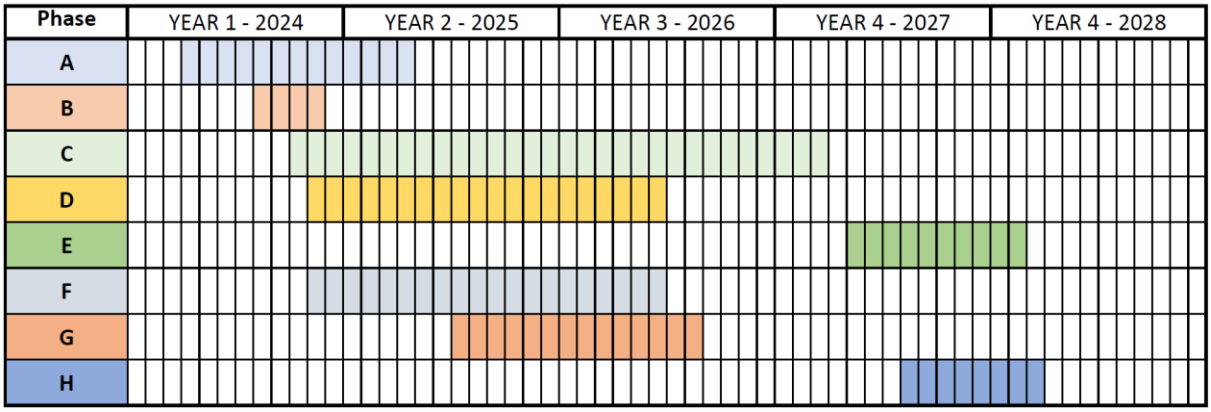
The Cambridge combined sewer networks includes an outlet to the Cam known as a combined sewer outfall (CSO). This is a common feature in all sewerage systems served by combined sewer systems. The purpose of these outfalls is to avoid surplus water backing up and flooding settlements (homes, infrastructure, etc) in the event that the sewer network is inundated with rainwater. This can be further exacerbated by blockages in the system. This would occur due to a large volume of rainfall in a short period of time resulting in the network not being able to convey flows quickly enough to the WWTP. When this occurs, untreated stormwater can enter the River Cam at the combined sewer outfall at Grand Arcade car park in Cambridge several kilometres upstream from the existing Cambridge WWTP.

Construction timeline

During construction of the proposed WWTP the existing Cambridge WWTP and existing Waterbeach WRC would remain in operation under their current discharge permits. There would be a planned transition period between the existing Cambridge WWTP and proposed relocated WWTP.

The earliest construction is expected to start is 2024. We have assumed a start date of April 2024 for the purposes of this Preliminary Environmental Information which is based on the construction programme below. The final Environmental Statement will not present calendar dates but a starting month dependent upon the application submission date. Durations of construction activities and the way they overlap are presented to aid understanding of simultaneous activities, as they will be in the final Environmental Statement. The proposed WWTP is planned to be fully operational in 2028. The maximum durations of construction work in particular areas are set out below and shown on the annotated maps within each Environmental Information Paper, where relevant. All dates shown in the construction programme below are subject to change and are preliminary.

Construction Phase		Duration	Start	End
A	Waterbeach works including enabling works and mobilisation and decommissioning of the Waterbeach WRC	12 months	Apr-2024	Apr-2025
B	Enabling works and mobilisation for non-Waterbeach elements	3.5 months	Aug-2024	Nov-2024
C	Water Recycling Centre including water testing and dry commissioning	31 months	Oct-2024	Mar-2027
D	Sludge Treatment Centre including water testing and dry commissioning	19 months	Nov-2024	Jun-2026
E	Wet Commissioning	5.5 months	May-2027	Feb-2028
F	Transfer Tunnel	18 months	Nov-2024	Jun-2026
G	Treated and storm Effluent Main and outfall	14 months	Jul-2025	Aug-2026
H	De-Commissioning existing Cambridge WWTP	8 months	Oct-2027	Mar-2028



The 'Rochdale' envelope - How have we dealt with the need for design flexibility within the assessment of environmental effects?

The 'Rochdale Envelope' approach is employed "where the nature of the Proposed Development means that some details of the project have not been confirmed" (for instance the precise dimensions of structures).

Where the details of the Proposed Development cannot be defined precisely, flexibility is sought in alignment with the Rochdale/Design Envelope approach. Flexibility is required in this case as elements of the proposed development are yet to be finalised in terms of choice of technology and for several elements there are options under consideration of which a preferred option is yet to be selected e.g. location of the outfall.

Flexibility is sought in terms of the physical extent of elements that make up the Proposed Development, to allow for optimisation through detailed design whilst providing a level of information sufficient to enable 'the main,' or the 'likely significant' effects on the environment to be assessed and the mitigation measures to be described. The extent of flexibility in terms of area of land required temporarily or permanently including heights and depths of structures is provided in the plans presented. The scope of assessment assumes a realistic worst case presented in terms of the potential impacts on the relevant receptor or resource. For example, the largest land use change area and disturbance would be assumed for biodiversity matters such as species and habitats whereas the minimum capacity of drainage may be the worst case for assessing the effects of surface water flooding. The assumed realistic worst case is made clear in the information papers which present the likely significant environmental effects both in terms of the geographical extents or areas and durations of potential impacts.

Construction traffic and access

Construction traffic and access information is annotated on the plans below showing the routes construction traffic would use and the access points into working areas from the public highway. The Traffic and Transport Environmental Information Paper adds details which define estimated construction traffic types, numbers and durations.

For likely numbers of vehicles and other information on traffic and transport, please refer to the plans included within the Traffic and Transport Environmental Paper.

Heavy good vehicles would access Waterbeach to install the Waterbeach pipeline using the A10, roads within Waterbeach and Clayhithe.

Light goods vehicles (non-HGV), depending on origin, may travel through Horningsea.

Construction traffic will make use of existing vehicular access points along the length of route to access the Waterbeach pipeline working area.

Existing vehicular access point proposed for entry to the Waterbeach pipeline working areas. This will be temporary – during construction only.

Denny End Road
Bannold Road
Burgess's Drove
A10 Ely Road
B1047 Horningsea Road
A14
A1309 Milton Road
Cowley Road
A14
0 0.25 0.5 km

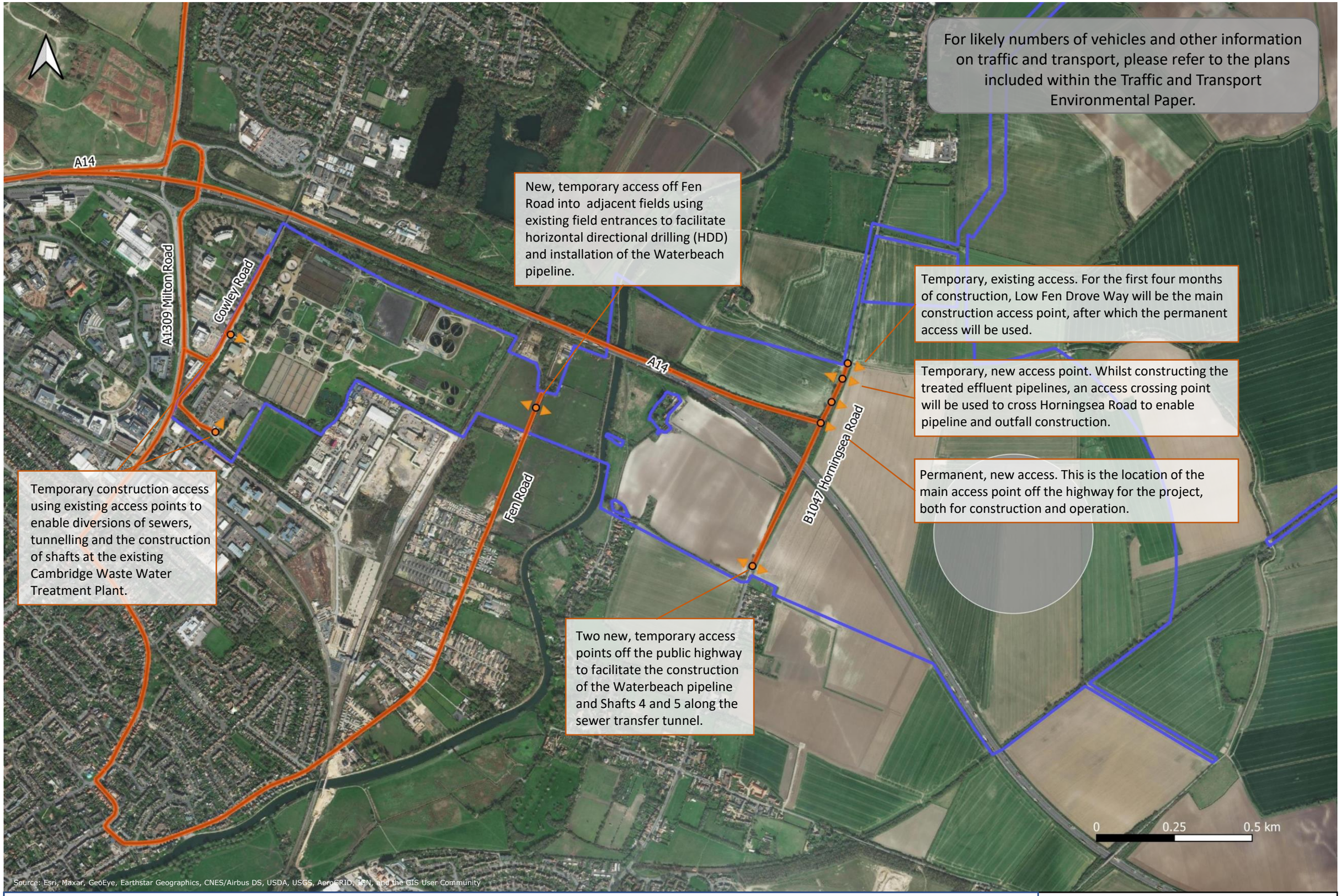
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Cambridge Waste Water Treatment Plant Relocation Project – Preliminary Environmental Information

Construction Traffic Routing and Access for Heavy Goods Vehicles – Waterbeach Pipeline Route

Legend

- Draft Scheme Order Limits
- Construction traffic routes (HGV)
- Construction traffic vehicular access point



Cambridge Waste Water Treatment Plant Relocation Project – Preliminary Environmental Information

Construction Traffic Routing and Access for Heavy Goods Vehicles – Core Area and Existing Cambridge Waste Water Treatment Plant

Legend

- Draft Scheme Order Limits
- Construction traffic routes (HGV)
- Vehicular access point for construction traffic

Construction activities

Construction activities are described on the annotated plans provided showing the working areas associated with the indicative locations of construction activities. The Environmental Information Papers add details which define durations of particular activities where these are relevant to defining impacts such as noise and traffic movements.

Construction activities are described below by project area.

Waste water transfer tunnel and shafts

Waste water will be transferred from the existing Cambridge WWTP using a new tunnel constructed from an interception point at the existing Cambridge WWTP to the proposed WWTP. The tunnel will have an approximate length of 2.4km, an internal diameter of 2.4m and will be up to 24m deep (to the top of tunnel). The tunnel is a gravity system and will require six shafts, sited at connections and changes of tunnel direction and otherwise at approximately 600m intervals, at the following locations as shown on the corresponding plans:

- Interception shaft 1, to intercept the existing sewer;
- Intermediate shaft 2, located adjacent to the above interception shaft and linking to the proposed tunnel;
- Intermediate shaft 3, located adjacent to the eastern boundary of the existing Cambridge WWTP, on the west side of the railway;
- Intermediate shaft 4, located on the eastern side of the River Cam;
- Intermediate shaft 5, located on the east side of Horningsea Road (the B1047); and
- Reception shaft 6, which will accommodate the terminal pumping station located at the proposed WWTP.

The tunnel will use a trenchless method of construction known as pipe jacking and will pass uninterrupted along its route without surface interference, other than at the shaft locations. The shafts will require construction compounds for materials, equipment and access. The pipe sections (pre-cast coated concrete or glass reinforced plastic) will be jacked along the tunnel behind the micro-tunnel boring machine (MTBM) which is used to excavate the ground. The tunnel will be constructed in sections, each section commencing at an intermediate shaft (shafts 3 and 5, known as jack-pit shafts) and progress towards a reception shaft (shafts 2, 4 and 6) where the MTBM will be retrieved. Where possible, the spoil removed will be dewatered and transported to the new Cambridge WWTP and used to facilitate landscaping activities.

Final effluent and storm pipelines

We will require treated effluent transfer pipelines to extend from the proposed WWTP to a new discharge location on the east bank of the River Cam, close to the current discharge location from the existing Cambridge WWTP. The final effluent pipeline will have an approximate length of 1.25km and an internal diameter of 1.5m and will be laid adjacent to

the storm outfall (which is provisionally set to include two similar pipelines, each also of 1.5m internal diameter).

Outfall structure

The final effluent and storm pipelines will connect to the outfall structure at the river as shown on the corresponding plans. Construction of the outfall structure will make use of in-situ and pre-cast techniques where appropriate and will require a coffer-dam located on the river bank, so that the main structure can be constructed set-back from the river.

Waterbeach pipeline

The proposed Waterbeach pipeline is expected to comprise twin 500mm pipes to be laid below ground (with the potential exception of the section within the existing Cambridge WWTP which may be above ground). The indicative alignment of the pipeline is shown on the corresponding plans. The pipeline will be located at an average depth of 2-5 metres below ground level except where it passes beneath the River Cam, larger drainage ditches, the A14 and the railway where it will be a maximum of 20 metres deep.

The pipeline will be installed via a combination of open cut and trenchless techniques. Trenchless crossing techniques are proposed for the River Cam, A14 and railway. These will be either horizontal direction drilling (HDD) or pipe jack micro-tunnelling. Where HDD is used a series of drill pits will be required. The final location of these will be dependent upon the length of the drill shot being undertaken. The associated access pits are expected to be circa 10 metres by 5 metres. They will be backfilled once the drill shot is complete. Where pipe jack micro-tunnelling is used then a larger access pit will be required, circa 15 metres by 15 metres. At this stage it is anticipated that this technique will only be used in relation to the southern railway crossing, as indicated on the corresponding plans.

Where the pipeline is installed by open techniques, the topsoil will be stripped and placed to one side of the working corridor. Subsoil will also be temporarily removed, whilst a trench in which to lay the pipeline is cut. This will then be backfilled, compacted and the topsoil reinstated. The soil will be reinstated in the order in which has been removed to preserve the soil structure.

WWTP and surrounding area works

Flows to the proposed WWTP would first arrive at the terminal pumping station/Shaft 6, as labelled on the corresponding plans. This pumping station will lift waste water into a new elevated inlet channel or stormwater management system. To do this, the waste water will be pumped approximately 31m. This will transfer the waste water from approximately 23m below ground (the depth of the sewer tunnel) to approximately 8m above ground (at the elevated inlet works) to allow the waste water flows to gravitate through the treatment process.

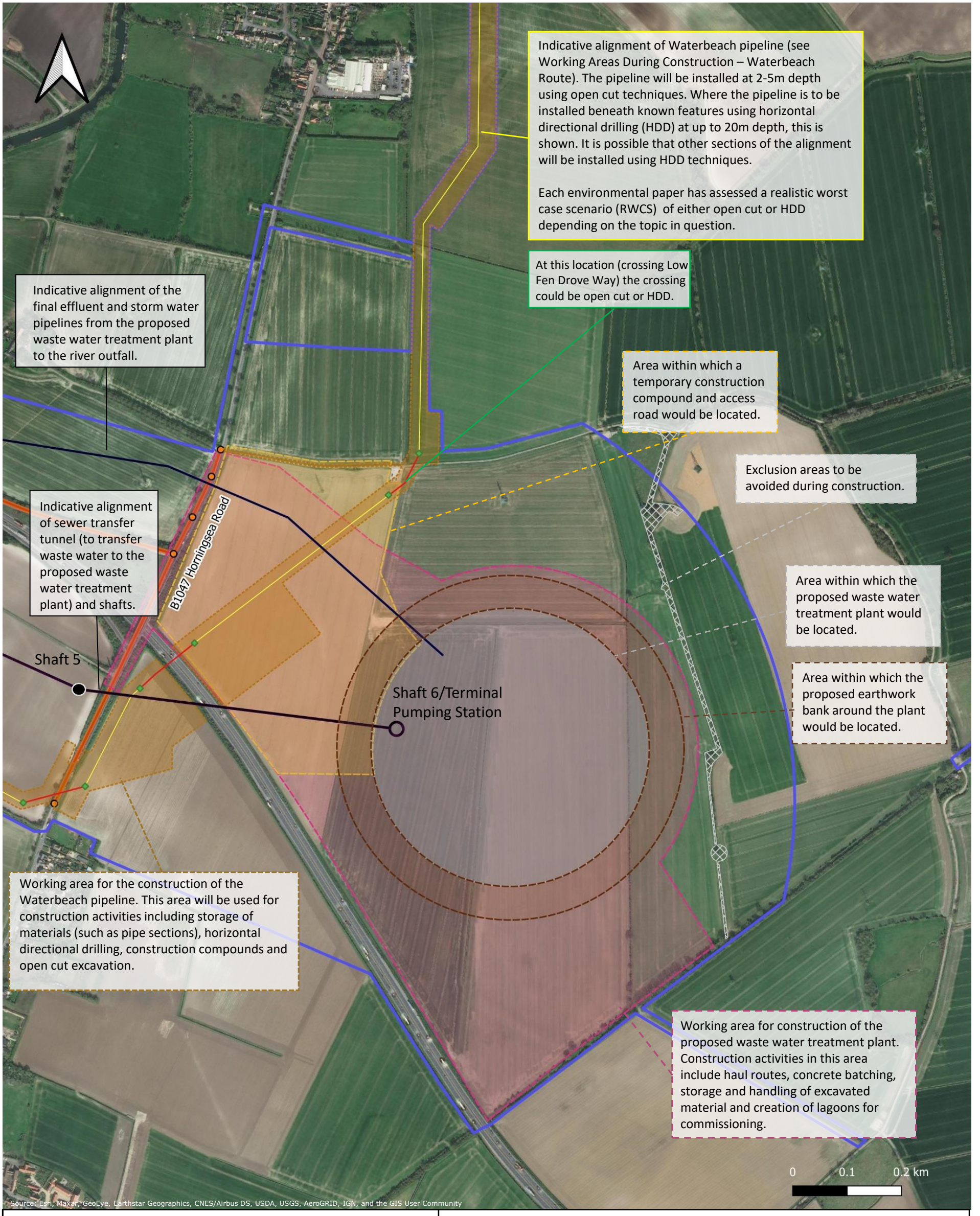
The sump to the pumping station, which will funnel the waste water into the pumps, will be approximately 5m below the invert of the sewer tunnel, giving a total depth below ground to the pump station of approximately 28m. There may be the need for foundations to a

depth of 40m below finished ground level. Whilst other features of the proposed WWTP may require construction depths of up to 20m, the 40m depth associated with the terminal pumping station is the maximum construction depth for any features being constructed as part of the proposed WWTP.

Conversely, the tallest structures within the operational area would be up to 24m in height. This includes a stack that would be 24m above ground level and two digester tanks within the Sludge Treatment Centre that would be 20m above ground level.

An earthwork bank is to be constructed around the proposed WWTP. Construction activities to facilitate the construction of the proposed WWTP and earthwork bank include siting of haul routes, construction of the main access road, concrete batching, storage and handling of excavated material and creation of lagoons for storage of water used in the commissioning stage.

Following construction of the proposed WWTP and earthwork bank the area surrounding the plant will be landscaped to deliver visual screening, landscape enhancement, ecological habitat creation and recreational opportunities for people as detailed in the following section.

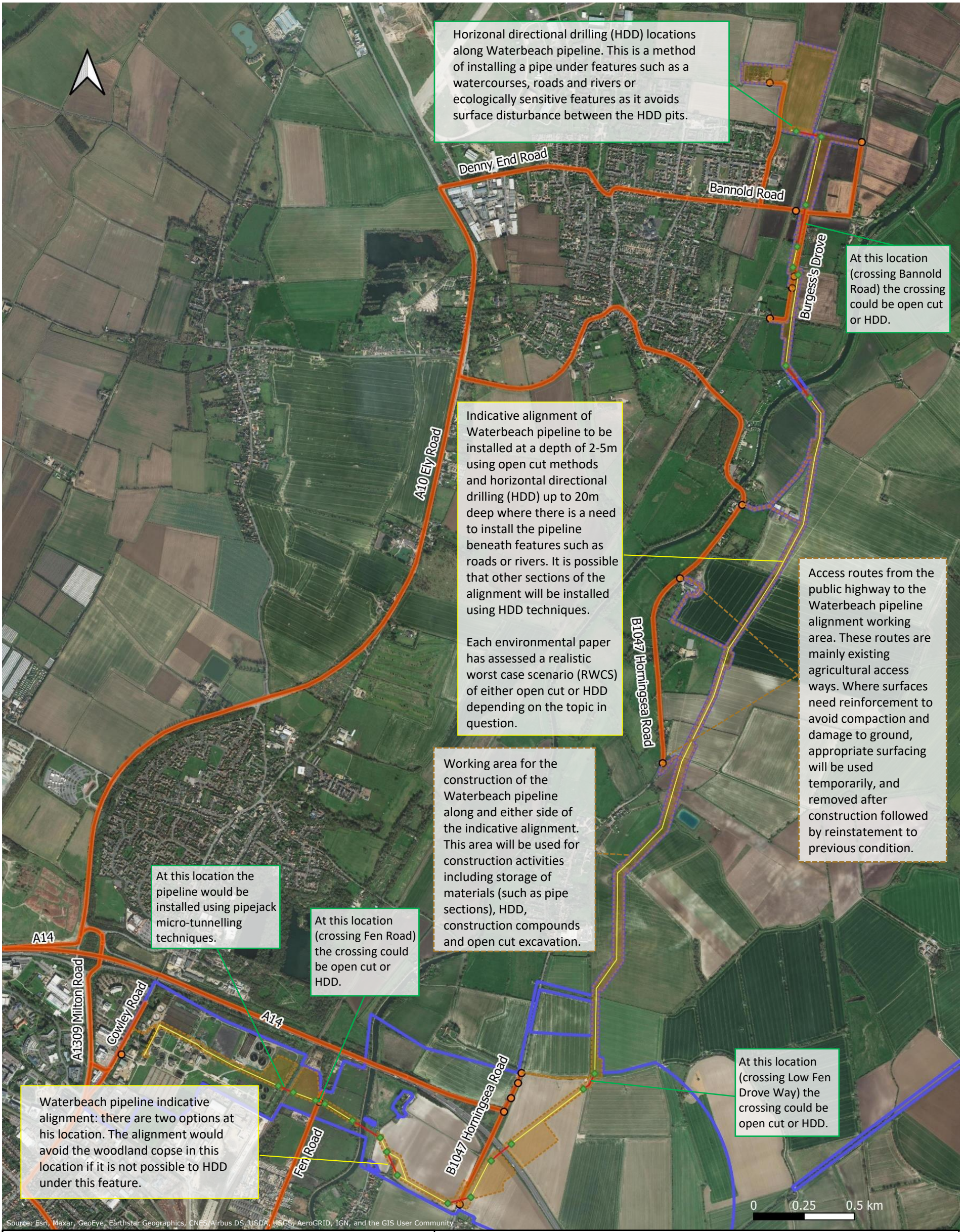


Cambridge Waste Water Treatment Plant Relocation Project – Preliminary Environmental Information

Working Areas During Construction – Core Area

Legend

- Draft Scheme Order Limits
- Construction traffic routes (HGV)
- Construction traffic vehicular access point
- Waterbeach pipeline working area
- Location of proposed works
- Location of proposed earthwork bank
- Working area for construction of proposed works
- Location of working compounds and access road
- Pipeline installed using open cut methods
- HDD pipeline installed below ground unless otherwise stated



Cambridge Waste Water Treatment Plant Relocation Project – Preliminary Environmental Information

Working Areas During Construction – Waterbeach Pipeline Route

Legend

- Draft Scheme Order Limits
- Construction traffic routes (HGV)
- Construction traffic vehicular access point
- Waterbeach pipeline working area
- Pipeline installed using open cut methods
- HDD pipeline install below ground, unless otherwise stated

Cambridge Waste Water Treatment Plant Relocation Project – Preliminary Environmental Information

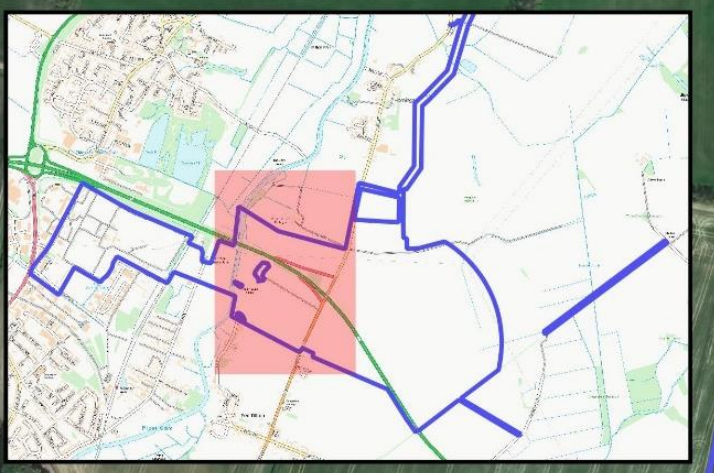
Working Areas During Construction - Existing Cambridge Waste Water Treatment Plant to the River Cam

Legend

- Draft Scheme Order Limits
- Construction traffic routes
- Vehicular access point off the public highway for construction traffic
- Pipeline installed using open cut methods
- Sewer tunnel and shafts working area
- Sewer diversion and connections working area
- Waterbeach pipeline working area
- HDD pipeline installed below ground unless otherwise stated

The outfall structure would be constructed (see Outfall Plan) within this area. The outfall would not occupy all of this area as the structure and bank stabilisation would occupy a maximum of 55m of the river bank.

Working area for the construction of the pipelines and outfall including haul routes, compounds and storage of materials.



Indicative alignment of the final effluent and storm water pipelines from the proposed waste water treatment plant to the river outfall.

A14

Working area for the construction of the sewer transfer tunnel and up to two shafts.

Indicative alignment of sewer transfer tunnel (to transfer waste water to the proposed waste water treatment plant) and indicative location of shafts at up to 24m deep.

The tunnel will be constructed of precast concrete (or glass reinforced plastic (GRP)) sections which are driven using a tunnel-boring machine. Shafts are either drive shafts where the tunnel sections are driven and soil is removed or receiving shafts where the tunnel boring machine will emerge.

Shaft 4

Shaft 5

B1047 Horningsea Road

Waterbeach pipeline indicative alignment: there are two options at this location. The alignment would avoid the woodland copse in this location if it is not possible to horizonal directional drill under this feature.

Indicative alignment of Waterbeach pipeline (see Working Areas During Construction – Waterbeach Route). The pipeline will be installed at 2-5m depth using open cut techniques. Where the pipeline is to be installed beneath known features using horizontal directional drilling (HDD) at up to 20m depth, this is shown. It is possible that other sections of the alignment will be installed using HDD techniques.

Each environmental paper has assessed a realistic worst case scenario (RWCS) of either open cut or HDD depending on the topic in question.

Indicative locations of horizontal directional drilling (HDD) entry and exit pits used to install pipeline under roads, watercourses, railway lines and ecologically sensitive features.

Working area for the construction of the Waterbeach pipeline along and either side of the indicative alignment. This area will be used for construction activities including storage of materials (such as pipe sections), horizontal directional drilling, construction compounds and open cut excavation.

0 0.1 0.2 km

Cambridge Waste Water Treatment Plant Relocation Project – Preliminary Environmental Information

Working Areas During Construction – River Cam to Horningsea Road

Legend

- Draft Scheme Order Limits
- Construction traffic routes (HGV)
- Construction traffic vehicular access point
- Waterbeach pipeline working area
- Pipeline installed using open cut methods
- HDD pipeline install below ground unless otherwise stated

Working area for the constructions of the pipelines and outfall including haul routes, compounds and storage of materials.

Area within which the outfall structure would be constructed, as per the inset diagram. The structure would occupy up to 55m of river bank, including bank stabilisation.

Refer to 'Outfall – Detailed Plan'

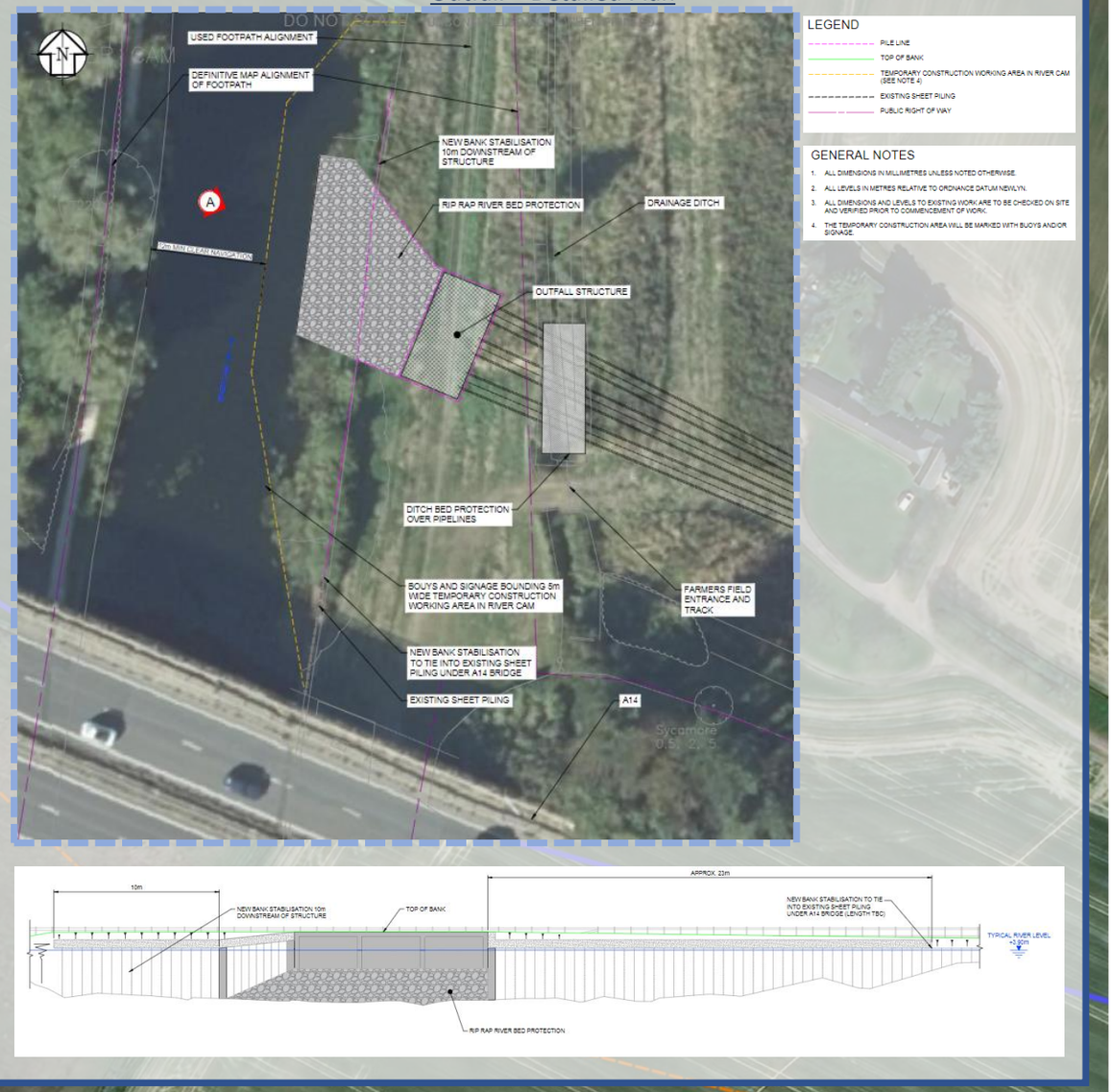
Location of existing outfall structure

Indicative alignment of final effluent and storm water pipelines from proposed waste water treatment plant to outfall structure at the River Cam.

0 25 50 m

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Outfall – Detailed Plan



Cambridge Waste Water Treatment Plant Relocation Project – Preliminary Environmental Information

Permanent Features – Outfall Area

Legend

- Draft Scheme Order Limits
- Working area for construction of treated effluent pipelines and outfall
- Area within which outfall structure would be constructed

What are the permanent features of the proposed WWTP, once operational?

The permanent features of the proposed Development are shown on the annotated plans on the following pages.

All the land temporarily used in construction for the laying of pipelines, soil handling, siting of construction compounds, haul roads etc will be reinstated to previous condition and uses. Land will be reinstated as construction areas are demobilised including works such as returning land to previous levels, reseeding areas and replacing hedgerow sections where these were affected by a pipeline route. The main landscape planting work will also be possible in a phased manner as presented in the Outline Landscape, Ecological and Recreational Management Plan (LERMP), leading to the delivery of the landscape masterplan involving tree planting, grassland and other habitats and pathways and places for people.

Potential phasing of the proposed WWTP delivery

Elements of the waste water treatment process within the Proposed Development may be phased to be delivered at a later date. These elements are likely to be modular process tanks and units with associated equipment. At present it is anticipated that impacts arising from a phased construction of these elements would fall within the realistic worst-case scenarios presented in the Preliminary Environmental Information.

How have we managed the potential impact of Covid-19 on baseline conditions such as traffic (and associated air quality and noise)?

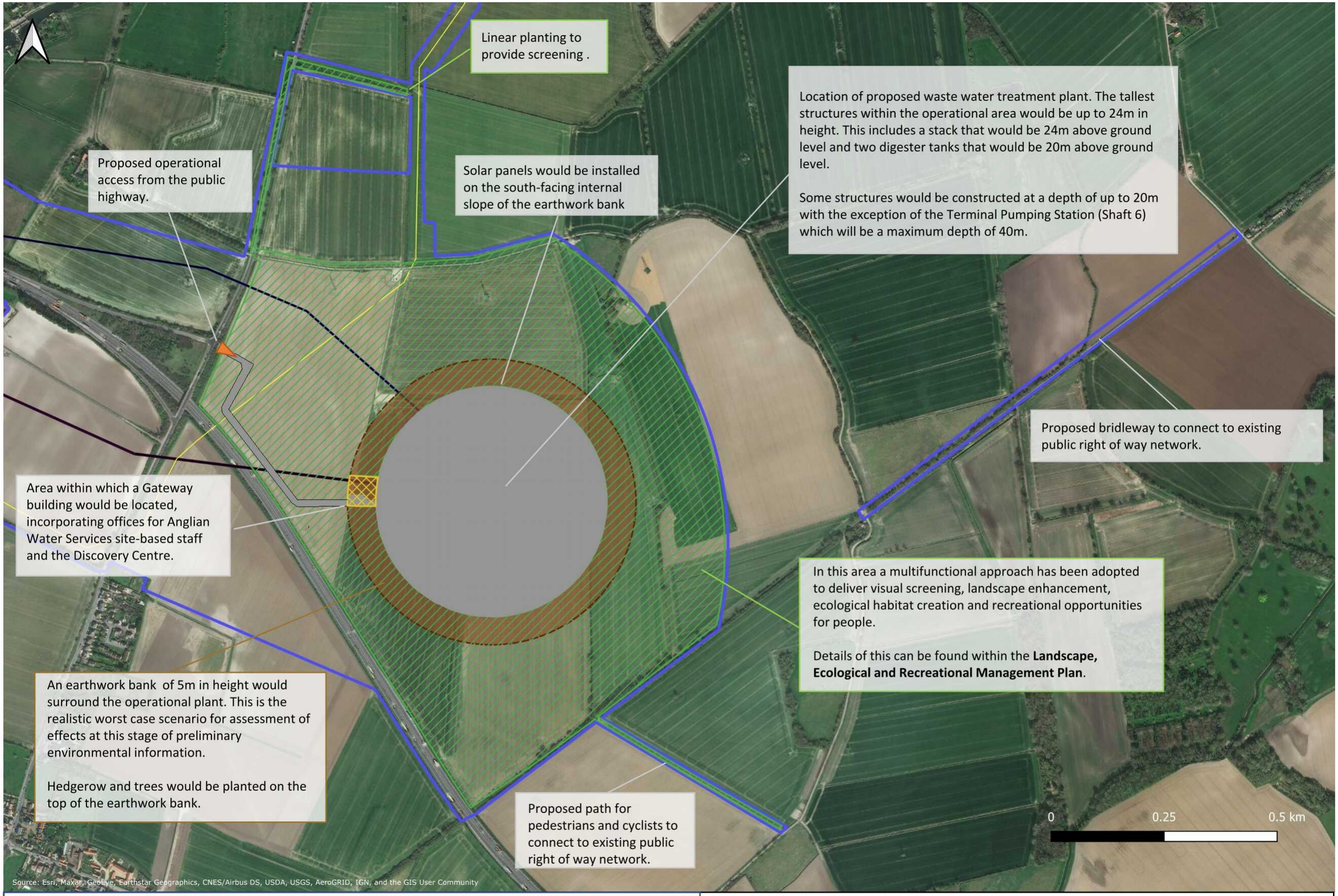
Prior to the lockdowns associated with the Covid-19 pandemic the strategic road network serving the proposed WWTP (particularly junctions of the A14) were known to experience congestion and delay. Additional traffic surveys were conducted in early December 2021, as agreed with Cambridge County Council, to collect neutral baseline traffic flow conditions unaffected by the Covid-19 pandemic to inform the early assessment work. Due to ongoing uncertainty of traffic patterns, this data will be reviewed to determine if further surveys are required to verify this data.

In terms of road safety, the duration of Personal Injury Collision (PIC) data collection was extended to the period of January 2016 to November 2021 to account for the potential for lower traffic volumes attributed to the Covid-19 pandemic

In terms of air quality, data unlikely to be representative of normal conditions (due to the changes to traffic flows associated with the Covid-19 pandemic lockdowns) is not considered in the air quality assessment.

Covid-19 pandemic restrictions resulted in changes to the ambient noise environment in many areas across the country. Locations most affected include areas near to sources of transportation noise (i.e. main roads, railways and airports). In general, this has resulted in lower ambient noise levels for many locations but also some changes in the distribution of noise throughout a typical day and week.

Noise surveys used to determine the baseline for the proposed Development were carried out in January 2022. Traffic count information from trunk roads in the surrounding area (including A14) indicates that road traffic levels at the time of noise surveys were similar to pre-pandemic conditions. As such, the ambient and background noise levels collected are representative for the purposes of assessment and are not significantly affected by the pandemic.



Cambridge Waste Water Treatment Plant Relocation Project – Preliminary Environmental Information

Permanent Features – Core Area

Legend

- Draft Scheme Order Limits
- Area of proposed waste water treatment plant
- Area of proposed earthwork bank around plant
- Proposed Gateway building area
- Landscaping in the form of woodland, grassland and hedgerows
- Operational access from public highway

The Waterbeach pipeline will transfer waste water south to the existing Cambridge Waste Water Treatment Plant.

Following construction of the Waterbeach pipeline, working areas would be reinstated to their previous condition. Permanent features include manholes along the length of the pipeline) with air valves.

Following construction of the treated effluent and storm pipelines, the pipelines would transfer treated effluent to the outfall structure on the River Cam. The working area would be reinstated to previous condition. Permanent features include manholes for maintenance access.

Indicative location of outfall structure in bank of River Cam. Following construction of the outfall, the structure and bank protection will remain as a permanent feature. The outfall will require occasional access for maintenance checks.

See separate plan – 'Permanent Features – Core Area'

The sewer tunnel will transfer waste water from the sewers of Cambridge to the proposed Waste Water Treatment Plant. The indicative location of air vents at sewer tunnel shaft locations is shown. These will vent air from the gravity tunnel and be fitted with odour control units. Each air vent will be up to 8m tall. These will require occasional access for maintenance purposes.

0 0.25 0.5 km

Cambridge Waste Water Treatment Plant Relocation Project – Preliminary Environmental Information

Permanent features of the CWWTPR project

Legend

- Draft Scheme Order Limits
- Indicative location of permanent outfall structure
- Indicative air vent locations along sewer tunnel alignment
- Direction of pipeline 'flow'

Alternatives

This section sets out a description of the alternatives to the project proposals studied by the Anglian Water. Alternatives were considered as part of the following activities:

- Site selection
- Confirmation of plant footprint
- Selection of treatment process
- Selection of preliminary concept design
- Location of concept design within selected site
- Selection of preferred vehicular access
- Further design refinement

Site selection

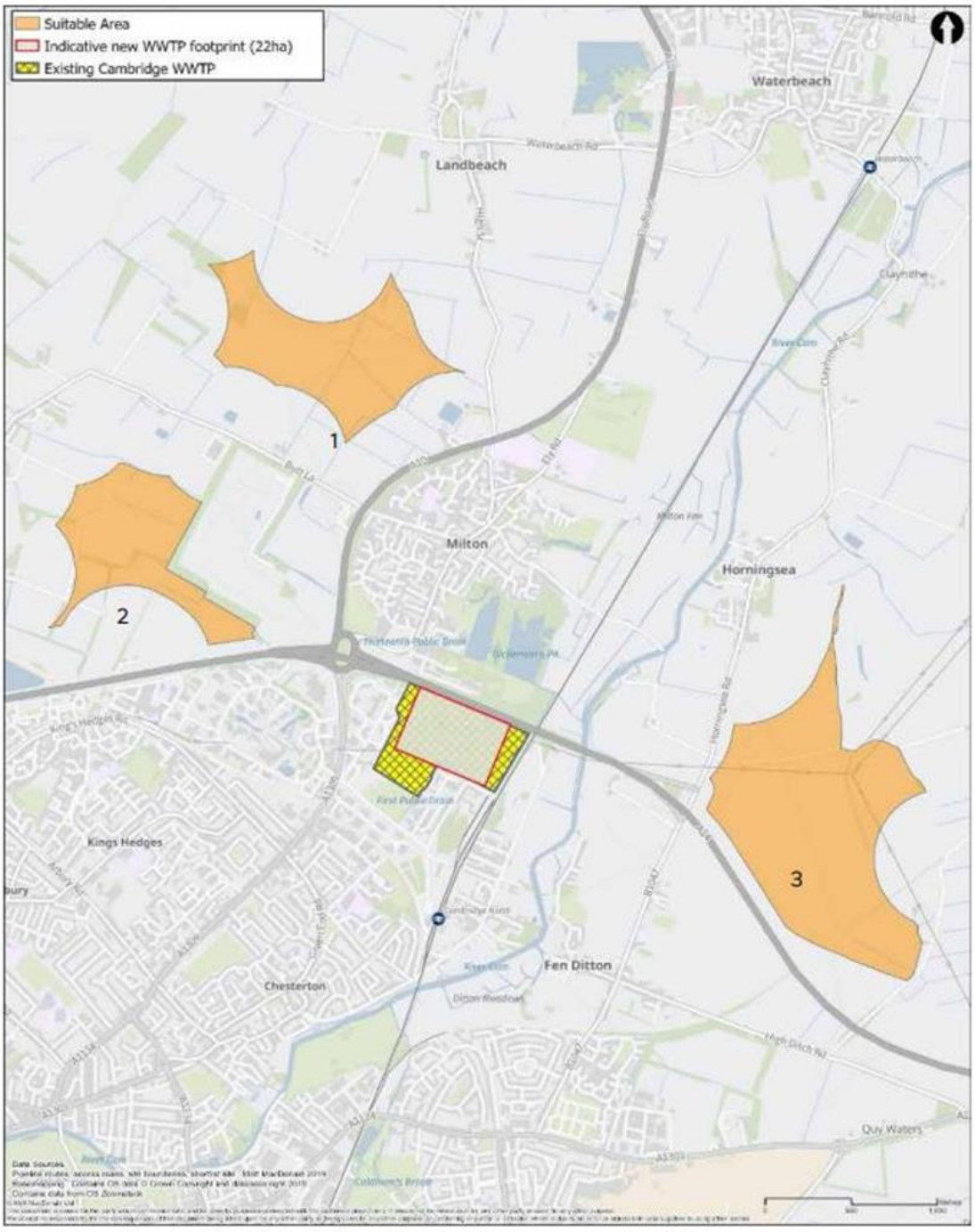
The site of the proposed WWTP was selected through a systematic four stage process. The first three stages of this process were consulted on during our first consultation. Full copies of the site selection reports are available in the document library on the CWWTPR website: https://cwwtpr.com/document-library/.

The study stages (Stage 1 Initial Site Selection, Stage 2 Coarse Screening, Stage 3 Fine Screening and Stage 4 Final Site Selection) were used to assess location options in increasing levels of detail, each building on the findings of the previous stages. Less suitable options were eliminated at each stage resulting in the identification of the best performing site to progress through the consultation and environmental impact assessment processes required for a DCO application. The site selection approach is summarised in the figure below.

Summary of the site selection process

Source: Mott MacDonald, CWWTPR Stage 4 Final Site Selection report, January 2021

After consultation on three short-listed sites following Stage 3 (Fine Screening) we progressed to the final site selection (Stage 4). The three shortlisted site areas are shown below.



Short-listed site areas

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

The criteria used in the Stage 4 selection process are listed in the table below.

Theme	Criteria
Environmental	● Nature conservation and biodiversity ● Landscape and visual amenity ● Historic environment ● Land and water quality ● Carbon emissions ● Noise ● Air quality ● Odour
Community	● Land use, property and business viability ● Traffic ● Amenity (based on the combined impacts of air quality, odour, noise, landscape and visual and traffic)
Operational considerations	● Delivery of Anglian Water's strategic corporate commitments ● Odour (operational) ● Future urban growth ● Future operational needs (post 2050) ● Transport and access ● Flood risk
Planning	● Evaluation of site against national and local planning policies
Economic	● Assessment of development, capital and operational costs of each site, with and without appropriate environmental mitigation
Timeline risks	● Whether the site could be developed within the timeframe required by the Homes England funding agreement

The comparison of the sites carried out by AW, drawing on the professional judgement of appropriately qualified experts is summarised as follows:

Site area 1 was deemed the compromise site in almost all aspects, with the exception of Nature conservation and biodiversity and recreation (in relation to amenity and traffic impacts), although the differences between all sites in these aspects was considered to be relatively minor. Site area 1 had a weaker contribution to Green Belt purposes than site 3 so there was considered to be a marginally lower consenting risk profile. However, it is in open landscape in close proximity to Landbeach and Milton and, unlike sites 2 and 3, additional odour control measures would be required to mitigate the risk of odour impact at the nearest high sensitivity receptors. Locating a WWTP at site area 1 would also have a significant impact on the fruit farming business within the site area, potentially resulting in extinguishment of the business and loss of employment, which presents a significant socio-economic impact. Like site area 2, there would be traffic impacts at Butt Lane/A10 during construction and operation. Therefore, it was considered that site area 1 was not a preferable option.

This left the comparison between site areas 2 and 3, which presented contrasting strengths and weaknesses for almost all assessments.

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

Whilst the current promotion of that site has not been included in the latest Regulation 18 stage of the emerging Greater Cambridge Local Plan, future urban growth and development pressures are likely to affect the long-term resilience of this site for CWWTP due to the close proximity to the Cambridge urban fringe. Also, opportunities to deliver significant enhancements to the environment and to connectivity (e.g., footpaths) of the area are more restricted compared to site areas 1 and 3. It also represents the highest cost option and risk of increase in land acquisition costs to the extent that they might undermine the viability of the WWTP development.

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

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

Balancing all the risks and opportunities it was considered that site area 3 represented the best performing site area. It was considered that site area 3 presented the greatest opportunity to deliver a development that includes wider benefits, rather than seeking to solely mitigate negative impacts, contributes to Anglian Water Services Limited's corporate objectives and addresses the concerns posed by the local community and stakeholders. Site 3 was therefore selected for the Proposed Development.

Having selected site 3, the design and layout of the site was refined further.

Confirmation of project footprint

An indicative project footprint of 22ha was selected for the site selection process as being suitable for the development of a relocated waste water treatment plant. A range of

treatment processes were considered in reaching this optimal size, balancing potential land take against cost, carbon, deliverability, and other operational considerations. This footprint size was subsequently tested through further study with a number of technologies being rejected as they would either give rise to a significantly larger footprint than the 22ha used to inform site selection, adversely impact carbon targets or place additional risk on achieving water quality targets.

Selection of treatment processes

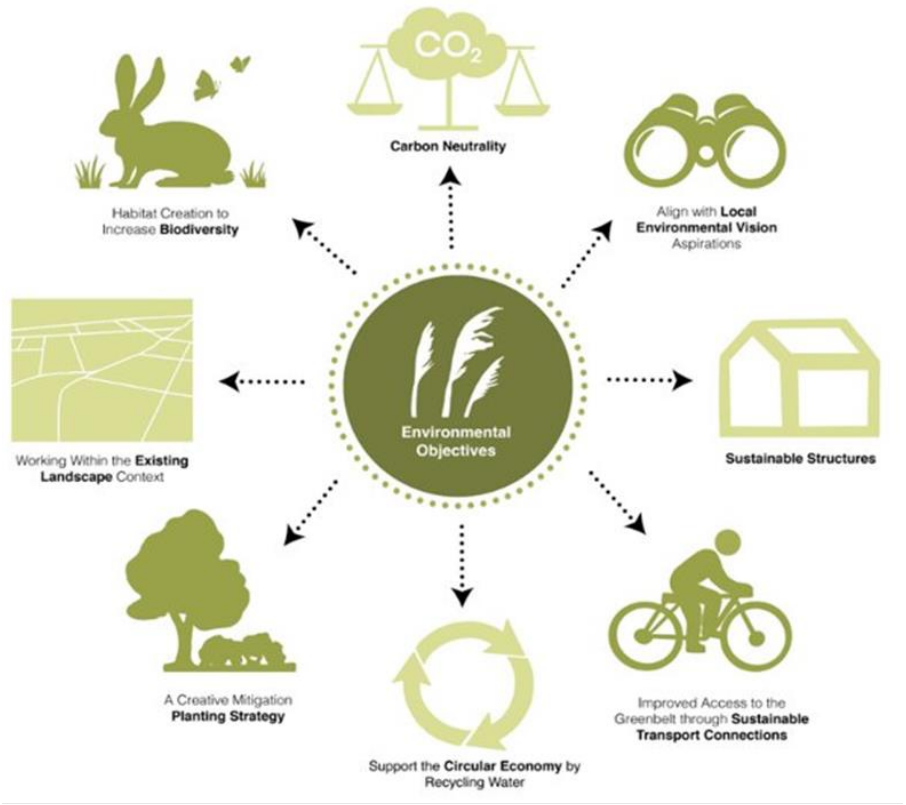
The treatment processes and technologies outlined in the project description have been selected through a series of "Risk, Opportunity and Value" (ROV) studies and workshops. This technical analysis considered a wide variety of technologies, concluding that Membrane Aerated Biofilm reactor technology (MaBR) for secondary treatment represented a well-balanced outcome, considering a wide number of factors including capital cost, operational cost, carbon, reliability, odour profile and operational complexity. However, the final choice of technology will be kept under review and enhanced activated sludge processes (ASP) remain under consideration.

Development of Preliminary Concept Design

We followed the National Infrastructure Commission's Design Principles for National Infrastructure to develop a set of project level design principles, as follows:

- To create a state of the art, low carbon water recycling centre of the future.
- to reduce the footprint of the modern plant to 22 hectares, which is about half the size of the existing plant.
- to create a strong identity for the site while screening the facility and reducing visual impacts on the surrounding community and landscape.
- to re-use excavated material on site which can be used to screen the facility and also reduce the carbon and traffic impact from construction.
- to minimise odour by incorporating solutions to address it at source and using best operational practices.
- to reduce harmful carbon emissions through sustainable design, helping address climate change.
- to increase biodiversity by creating new wildlife habitats.
- to improve access to the countryside with new paths and accessible open spaces; and
- to connect the site into the wider landscape and establish new wildlife corridors.

Subsequently, guided by advice from architects, landscape architects, ecologists and other design professionals, further environmental objectives for the project design were developed, as shown in the figure below, together with a design narrative, which is set out in the Outline Landscape, Ecology and Recreation Masterplan (LERMP), which forms part of this PEIR.



Environmental Objectives of the project

Building on the design narrative and environmental objectives, and supported by the Design Council, three design concepts were developed for Anglian Water by its architectural and landscape architectural advisors, as follows:

- A functional initial concept, supported by a landscape plan aligned with existing field patterns.

- A “rotunda” design, utilising retained excavation spoil to construct a landscaped feature in the local environment, inspired by local dykes and hillforts.

- A design utilising linear “green fingers”, with a sculptural landscape of retained spoil delineating a fragmented treatment plant.

Following further advice from the Design Council, including formal design panel review from independent built environmental experts of the three design concepts, the “rotunda” concept design was selected for further consideration. The functional design with its supporting linear landscape plan resulted in a triangular layout which was not suited to the process flows within a WWTP and was considered to offer a lower level of screening than the other two designs. The “green fingers” design was considered to be too expensive and operationally challenging, particularly because of its fragmented, partial sunken design. It also presented a more alien form in the landscape than the “rotunda” design which offered a more naturalistic screening.

Preliminary consultation took place with stakeholders in our technical working groups, which include Natural England, National Trust, RSPB, Wildlife Trust, Cam Valley Forum, Quy Fen Trustees, the Environment Agency and Cambridge Past, Present and Future (CPPF). Discussions included the three design concepts and more detailed elements of the "rotunda" design, including landscaping. Further refinement of the landscape design was carried out to mitigate adverse visual impacts and increase opportunities for ecological and recreational benefits.

In accordance with the Statement of Community Consultation agreed with the local councils, a single concept design, "the rotunda" was taken forward for public consultation to seek opinions on issues such as screening and architectural finishes.

Location of project within selected site

Having developed an outline design, including landscape and ecological mitigation, the proposed location of the project was refined within the site boundaries derived from the site selection exercise described above. The position selected, as shown in this PEIR, took into account issues including proximity to ecological receptors, including the county wildlife site, odour modelling and the three potential access arrangements described below.

Vehicular access

In parallel with the design processes outlined above, a range of potential permanent vehicle access options to the site were explored, including through engagement with National Highways (formerly Highways England) and Cambridgeshire County Council as the relevant highway authorities. Issues considered as part of this work included the safety of road users, compatibility with relevant policy and standards, the management of potential disruption to local communities and the existing road network and project economics (the relative costs of different options). As a result of this work, three potential permanent access options were taken forward to Phase Two Consultation (June to August 2021).

These were:

- Option 1: Access off Junction 34 of the A14 (Fen Ditton) which consisted of two sub options (1A and 1B);
- Option 2: Access off Junction 35 (Quy); and
- Option 3: A new junction on the north side of the A14.

Following the close of Phase 2 consultation we took careful consideration of all consultation responses from the local community, local authorities and other stakeholders, including the relevant highways authorities. We incorporated these responses into the process for selecting our preferred access option. This process drew on technical studies and expert judgement to inform an appraisal of relevant social, economic, environmental, technical, operational and policy aspects.

Highway and transport technical advice concluded that:

- There were significant Department of Transport (DfT) policy challenges to the delivery of Option 3.

- National Highways and Cambridgeshire County Council, as the relevant highways authorities, advised throughout the early consultation on the site access assessment that Option 3 did not pass the policy tests of DfT Circular 02/2013.

- The proposed traffic flows to the site during operation and the impact on the strategic and local highway network would be low.

- Traffic management measures would be required during construction and operation to restrict HGVs and other site traffic to designated routes (and not through the villages of Horningsea and Fen Ditton).

- Additional traffic assessment of the junction capacity, using survey traffic data, for Option 1a and 1b confirmed that there are no capacity issues with these options (both during construction and in operation).

- In highway terms both Option 1a and 1b provide viable site access options, with acceptable transport impacts.

- Further work would be required to mitigate the potential impacts of Options 1a and 1b

A highway safety audit concluded that all the options considered could be safely delivered.

Option 1 was found to be the best performing access option in comparison to Options 2 and 3 across a range of other, non-highways, criteria including land use, green belt, air quality, carbon, operational management, and cost.

Option 1 was therefore selected as the preferred permanent access option for the project. Subsequent discussions with the local community working group and further technical analysis, including development of mitigation, concluded that access sub-option 1b should be selected as the preferred option for the site access. This option minimises the amount of construction and operational traffic which will use Horningsea Road, allowing direct access to the site from junction 34 of the A14, by crossing Horningsea Road under signal control, rather than having to travel along Horningsea Road before accessing the site.

Further design refinement

The other main alternatives considered in the evolution of the project design are:

- **Consideration of architectural finishes** – this issue was consulted on at Phase 2 consultation following which it was concluded that bold or striking finishes would not be incorporated in the project design.

- **Digester height and visibility** – following stakeholder feedback the digester heights have been reduced from 26m to 20m. We have considered the potential for these structures to be sunk in the ground but concluded that such an approach would increase the risk of environmental impacts to groundwater; decrease the operational efficiency of the digesters, would present health and safety challenges (particularly during maintenance); and would only be possible at significant additional cost.
- **Screening of structures** – following Phase 2 consultation, and based on stakeholder feedback for natural screening, the decision was reached to adopt a planted screen on the landscaping bund, rather than an engineered structure.
- **Use of biogas** – in order to maximise the carbon performance of the plant it was decided to promote a "gas to grid" solution, exporting biogas to the domestic gas network, although burning the gas on-site through combined heat and power (CHP) units has been retained as an option for this phase of consultation.

Consultation

This section sets out how consultation has influenced the development of mitigation measures, as embedded mitigation through design (e.g. the location of particular elements) as well as specific measures and methods which would be enforced through management plans.

How has the Proposed Development changed since it was presented at Consultation Phase Two in Summer 2021?

Following stakeholder feedback from Consultation Phase Two, further workshops were held with both technical stakeholders and community stakeholders in order to discuss consultation responses and identify opportunities for improving the design. One of the workshops focused on design and landscape and the other on design and connectivity. Additionally, there has been ongoing conversations with both technical stakeholders and community stakeholders since Consultation Phase Two to discuss the traffic and access option and potential mitigations, including two Community Working Groups in December and January. Since receiving stakeholder feedback in the second round of consultation, the following changes have been incorporated into the project:

- **Screening** – stakeholders wanted to see natural screening around the bund instead of hard engineering options, this has been included in the design.
- **Architectural finishes** – stakeholders wanted to see more natural finishes to the architectural design, this has been included in the design.
- **Landscape design** – stakeholders wanted to see tree planting, rewilding, species rich grasslands, hedgerows, alignment with local proposals and an increase in Biodiversity Net Gain. The updated design has incorporated these features. Technical stakeholders also identified opportunities for species, such as Turtle Doves, this has been included, together with water-dependant habitats to encourage biodiversity
- **Discovery Centre** – local communities did not want to see an open visitor centre that would encourage large numbers of visitors to the local road network. The scope of the Discovery Centre has now changed and will include an education programme with visits attracting schools, colleges and interested groups, as a pre-arranged programme. This will mean that there will not be a significant number of visitors to the site on a daily basis.
- **Traffic and Access** – some community stakeholders preferred traffic access option 3, some technical stakeholders preferred option 1. Therefore since consultation phase 2 an extensive analysis of traffic options has been carried out. Using an evidence based approach option 1 was identified as the best option assessed against a wide range of criteria, with stakeholder feedback being considered in the design of mitigation measures.

How has consultation with technical stakeholders driven the development of mitigation?

Anglian Water has established several Technical Working Group (TWG) with key stakeholders as part of the project's pre-application consultation process. The TWGs have acted as the forum to develop an understanding of the project's plans, proposals and timescale, contribute to the shaping of the project and ensure a compliant consultation programme.

In regular meetings held throughout each consultation phase, the consultation has sought to identify any opposition or risks to proposals, discuss solutions and ensure an understanding and resolution of technical issues.

The TWGs have identified mitigation to include the following:

- The need for and opportunity to include innovative storm management proposals. In developing this with the Environment Agency it was identified that storm treatment options would not be possible or advisable but utilising the transfer tunnel for underground storage could mitigate carbon impacts and reduce the frequency of storm spills to the River Cam.
- Mitigation options set out in our Landscape Management Plan to ensure appropriate measures in place for protection of ecology and development and suitability of water features as options and protection of endangered species.
- Mitigation to ensure the design enhances and blends with the landscape and utilises suitable additional woodland and hedgerow species to specifically include additional complimentary habitats and connections to supplement the existing network. Habitat buffer around the County Wildlife site, rough grassland creation and open mosaic habitat to benefit terrestrial invertebrates and early planting and off site screening.
- Mitigation for key visual receptors and viewpoints with specific inclusion of recreational viewpoints and viewpoints from Anglesey Abbey and Ely Cathedral.
- Mitigation of odour and location and position to minimise any odour impacts.
- Identifying safety suggestions for crossing Horningsea Road and measures required to reduce impact to pedestrian and non- motorised users.
- Connectivity and public footpath development and enhancement to mitigate impact of development within the local area and add to community enjoyment and recreational enjoyment.

How has consultation with land owners driven the development of mitigation?

Liaison with landowners and occupiers has allowed the team to build up a good knowledge of the landowners' and occupiers' use of the land. By doing this, various mitigations have been incorporated including:

- Changing construction access points.
- Suggesting the segregation of construction traffic from farm traffic where possible.

- Providing indicative construction restrictions to landowners for the areas around the tunnel structure.

In addition, discussions with the landowners about the acquisition of their land for the project has identified the following mitigations.

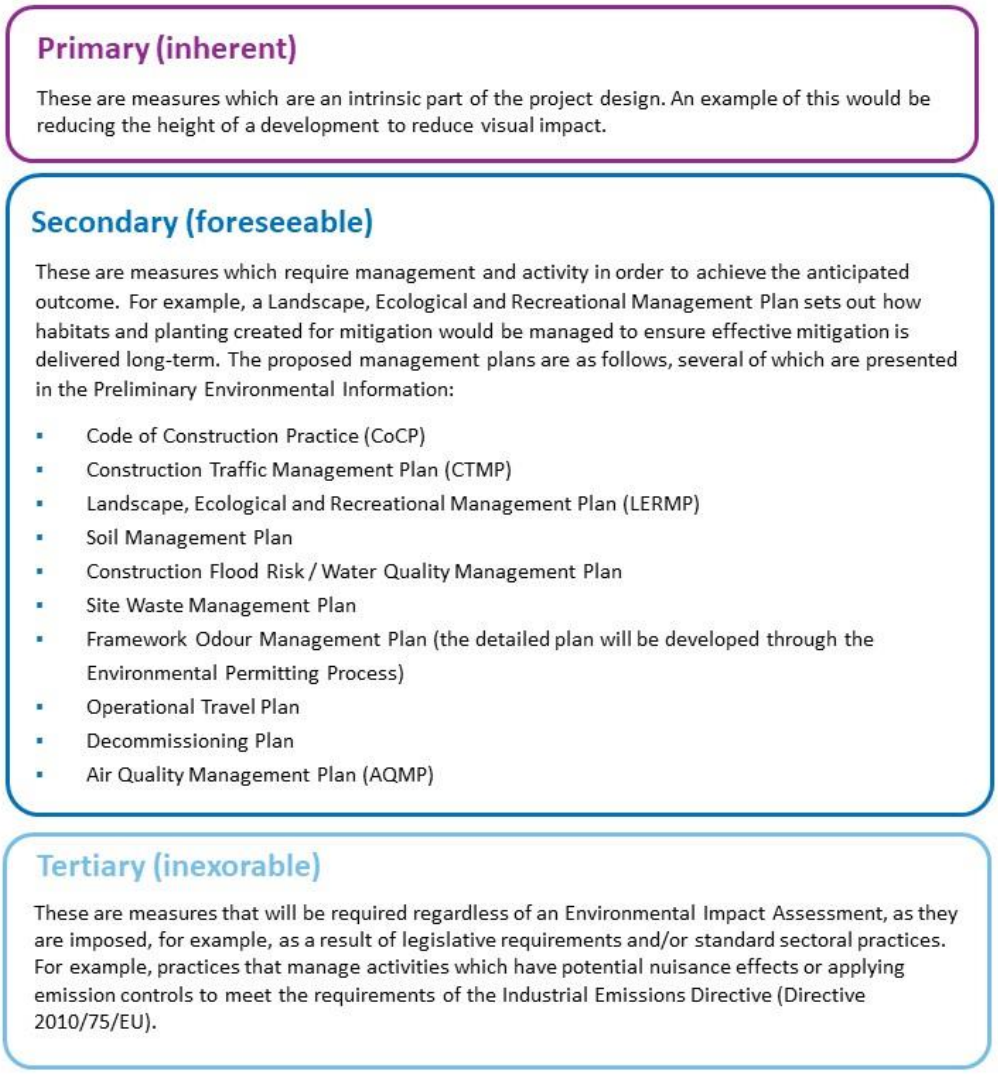
- Carrying out a thorough security review of the site layout.
- Ensuring landscape designs mitigate impacts on land with development potential.
- Discussing the potential for landowners to retain the ownership of landscaped mitigation areas.

Mitigation routemap / hierarchy

Measures have been identified to avoid or reduce adverse effects following the hierarchy below:

- **Avoidance** – incorporate measures to avoid the adverse effect, for example, alternative design options or modifying the proposed programme to avoid environmentally sensitive periods.
- **Reduction** – incorporate measures to lessen the effect, for example, fencing off sensitive areas during construction and implementing a Code of Construction Practice to reduce the potential impacts from construction activities.

The environmental information papers also set out the committed mitigation either on annotated maps or within the papers themselves. There are several different types of mitigation:



Effects that remain after primary, secondary and tertiary mitigation are referred to as residual effects.

Compensation

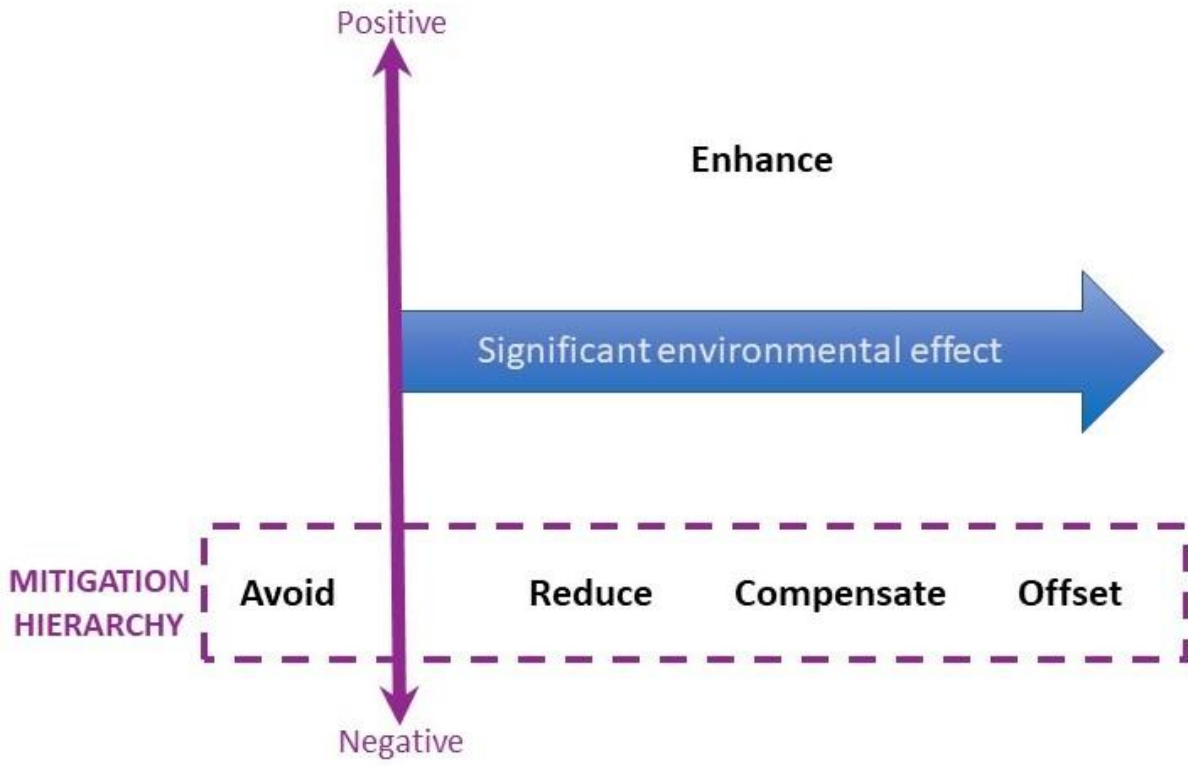
Where it is not possible to avoid or reduce an adverse effect then compensation measures will be considered, for example the provision of replacement of habitat to replace that lost to the Proposed Development.

Offsetting

Where it is not possible to compensate or replace a loss, provision of an alternative may be the next best approach, for example contributing to habitat creation or management regimes in a location outside of the Proposed Development boundary. This approach acknowledges that the impact cannot be avoided, and that compensation will not suffice.

Enhancement

Enhancement measures are considered to be over and above any avoidance, mitigation and compensation measures required to neutralise any adverse effects of the Proposed Development. In many cases enhancement may be delivered through the implementation of other mitigation – for example landscaping may deliver a biodiversity enhancement.



The core approach illustrated in the mitigation hierarchy shown above is to avoid impacts, and if they cannot be avoided, to reduce them. If impacts still remain, then the next option is to reduce or remedy the impact or compensate for it. The advice of specialists or statutory consultees may be required to advise what is considered satisfactory compensation; it may only be considered 'compensation' if it genuinely replaces what is

lost. Otherwise, it may be considered offset. New planting in place of lost mature broadleaved woodland will obviously not be totally a satisfactory substitute, especially in the short term.

How will mitigation be secured?

Mitigation will be secured through the requirements of the Development Consent Order which grants permission for the Proposed Development to be built.