Cambridge Waste Water Treatment Plant Relocation Project
Anglian Water Services Limited

Appendix 9.1: Asset Management Plan

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01	30.01.23	-	DCO Submission
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Summary

This document sets out the climate resilience requirements for asset management throughout the operational lifetime of the Proposed Development. These are the secondary mitigations against the potential impacts of climate change which should be written into The Applicant's Asset Management Plan (AMP).

The requirement for the Applicant to prepare an AMP, and thereby the climate change secondary mitigations included within, will be secured through a requirement within the DCO application schedule 2 which stipulates preparation of an AMP with these inclusions.

The AMP will be prepared at the appropriate time before the onset of the operation phase of the Proposed Development. The trigger for the preparation of AMP will be at the discretion of The Applicant and will require approval by the Local Planning Authority prior to commencement of the operational phase.

Throughout the design life of the Proposed Development, the AMP may need to be periodically reviewed and updated to reflect changing needs. For example, as the climate continues to change, the frequency of planned inspections and maintenance may need to be increased as chronic weather damage and deterioration rates increase.

Secondary mitigations that support resilience of the Proposed Development to climate change should apply to all physical assets of the Proposed Development and include:

- maintenance and inspections of physical assets
- monitoring of wastewater processes and anaerobic digestion efficiency, energy plant conditions, odour levels, temperatures, flood levels and extreme weather events, and future climate projections
- management of the impacts of climate change on biodiversity and landscape (throughout the entire operational lifetime of the Proposed Development).
- consideration for use of an Early Warning Systems,
- business continuity planning for extreme weather,
- outlining the approach to determining future resilience measures at the time of future refurbishments or upgrades.

1 Introduction

1.1 Anglian Water Services Limited

1.1.1 Anglian Water Services Limited (the 'Applicant') is the largest regulated water and water recycling company in England and Wales by geographic area, supplying water and water recycling services to almost seven million people in the East of England and Hartlepool.

1.1.2 The Applicant is committed to bringing environmental and social prosperity to the region they serve, through their commitment to Love Every Drop. As a purpose-led business, The Applicant seeks to contribute to the environmental and social wellbeing of the communities within which they operate. As one of the largest energy users in the East of England, they are also committed to reaching net zero carbon emissions by 2030.

1.2 Introduction to the relocation project

1.2.1 Anglian Water's Cambridge Waste Water Treatment Plant Relocation project (CWWTPRP) ("the Proposed Development") is funded by Homes England, the Government's housing accelerator which seeks to improve neighbourhoods and grow communities by releasing land for development.

1.2.2 The Proposed Development involves the relocation of the existing Cambridge Waste Water Treatment Plant (WWTP) currently operating at Cowley Road, Cambridge, to a new site between Horningsea, Fen Ditton and Stow cum Quy, adjacent to the A14 in Cambridgeshire.

1.2.3 The relocation would make the site of the existing WWTP available to form part of the development of a new low-carbon city district, known as North East Cambridge. The site at Cowley Road, is Cambridge's last major brownfield site, and the wider North East Cambridge district proposals envisage creating around 8,350 homes and 15,000 jobs over the next 20 years.

1.2.4 North East Cambridge is a highly sustainable location for housing. In addition to the Homes England funding, the area has benefitted from Transport Infrastructure Fund (TIF) funding for Park & Ride, the completion of Cambridge Guided Bus public transport infrastructure, the delivery of the Cambridge North rail station and the Chisholm Trail.

1.2.5 North East Cambridge is one of three key strategic sites which will form "*central building blocks of any future strategy for development*" in the proposed Greater Cambridge Local Plan being jointly prepared by Cambridge City Council and South Cambridgeshire District Council that will be subject to public consultation in Autumn

2023. The North East Cambridge Area Action Plan (AAP), currently in "Proposed Submission" form, will be the planning policy framework which ultimately guides the development of North East Cambridge city district.

1.2.6 The importance of the Proposed Development, both regionally and nationally, was recognised by the Secretary of State for Environment, Food and Rural Affairs (DEFRA) in January 2021, who directed that the Proposed Development is nationally significant and is to be treated as a development for which a Development Consent Order (DCO) is required (see Appendix 1-3 of the Planning Statement, App Doc Ref 7.5).

1.2.7 The policy context of the Proposed Development is described in more detail in the Planning Statement (Application Document Reference 7.5)

1.3 The relocation site

1.3.1 The relocation site was selected following comprehensive study and public consultation. The site selection process and consideration of alternatives is described in more detail in Chapter 3: Alternatives of the Environmental Statement (App Doc Ref 5.2.3).

1.3.2 The current environmental conditions at the existing Cambridge WWTP site and at the relocation site are described in Chapter 2: Project Description of the Environmental Statement (App Doc Ref 5.2.2). The site is located to the north-east of Cambridge and 2km to the east of the existing Cambridge WWTP, as shown on the Works Plans (App Doc Ref 4.3.1). It is situated on arable farmland immediately north of the A14 and east of the B1047 Horningsea Road in the green belt between the villages of Horningsea to the north, Stow cum Quy to the east and Fen Ditton to the south west. Two overhead lines of pylons cross the northern and eastern edges of the main development site and come together with a third line at the north eastern corner of the site. The topography is fairly flat with an approximately 4m fall across the site south west to north east.

1.4 Purpose of the Proposed Development

1.4.1 The Proposed Development for which the DCO is being sought will deliver all the functions of the existing Cambridge WWTP at Cowley Road, treating all waste water from the Cambridge catchment and wet sludge from the wider region.

1.4.2 In addition, it will have an increased capacity, being intended to treat the waste water from the Waterbeach catchment and anticipated housing growth in the combined Cambridge and Waterbeach catchment area.

1.4.3 The infrastructure provided as part of the main works will have a design life to at least 2090, and the supporting infrastructure (i.e. the transfer tunnel, pipelines and

outfall) will have a designed capacity sufficient to meet population growth projections plus an allowance for climate change into the 2080s. Furthermore, there is capability for expansion in space that has been provided within the earth bank and by modification, enhancement and optimisation of the design to accommodate anticipated flows into the early 2100s.`

1.5 Outline description of the Proposed Development

1.5.1 The DCO application is seeking approval for the following main elements of the Proposed Development:

- an integrated waste water and sludge treatment plant.
- a shaft to intercept waste water at the existing Cambridge WWTP on Cowley Road and a tunnel/ pipeline to transfer it to the proposed WWTP and terminal pumping station. Temporary intermediate shafts to launch and recover the micro-tunnel boring machine.
- a gravity pipeline transferring treated waste water from the proposed WWTP to a discharge point on the River Cam and a pipeline for storm water overflows.
- a twin pipeline transferring waste water from Waterbeach to the existing Cambridge WWTP, with the option of a connection direct in to the proposed WWTP when the existing works is decommissioned.
- on-site buildings, including - a Gateway Building with incorporated Discovery Centre, substation building, workshop, vehicle parking including electrical vehicle charging points, fencing and lighting.
- environmental mitigation and enhancements including substantial biodiversity net gain, improved habitats for wildlife, extensive landscaping, a landscaped earth bank enclosing the proposed WWTP, climate resilient drainage system and improved recreational access and connectivity.
- renewable energy generation via anaerobic digestion which is part of the sludge treatment process that produces biogas designed to be able to feed directly into the local gas network to heat homes, or as an alternative potential future option burnt in combined heat and power engines.
- renewable energy generation via solar photovoltaic and associated battery energy storage system.
- other ancillary development such as internal site access, utilities, including gas, electricity and communications and connection to the site drainage system.

- a new vehicle access from Horningsea Road including for Heavy Goods Vehicles (HGV's) bringing sludge onto the site for treatment and other site traffic.
- Temporary construction works including compounds, temporary highway controls, accesses and signage, fencing and gates, security and safety measures, lighting, welfare facilities, communication control and telemetry infrastructure.
- Decommissioning works to the existing Cambridge WWTP to cease its existing operational function and to facilitate the surrender of its operational permits including removal of pumps, isolation of plant, electrical connections and pipework, filling and capping of pipework, cleaning of tanks, pipes, screens and other structures, plant and machinery, works to decommission the potable water supply and works to restrict access to walkways, plant and machinery.

1.5.2 Additional elements, together with more information on the above features are provided in Chapter 2: Project Description of the Environmental Statement (App Doc Ref 5.2.2). Principles of Good Design have been used to inform the development of the project, which has been guided by the National Infrastructure Commission's Design Principles, advice from the Design Council and review by the Cambridgeshire Quality Panel, as described in the Design and Access Statement (App Doc Ref 7.6).

1.5.3 Construction activities, likely to take 3-4 years, will include the creation of a shaft to intercept waste water at the existing Cambridge WWTP and temporary intermediate shafts between the existing Cambridge WWTP and the proposed WWTP to launch and recover a micro-tunnel boring machine. The sequence and location of construction activities are also detailed in Chapter 2: Project Description of the Environmental Statement (App Doc Ref 5.2.2).

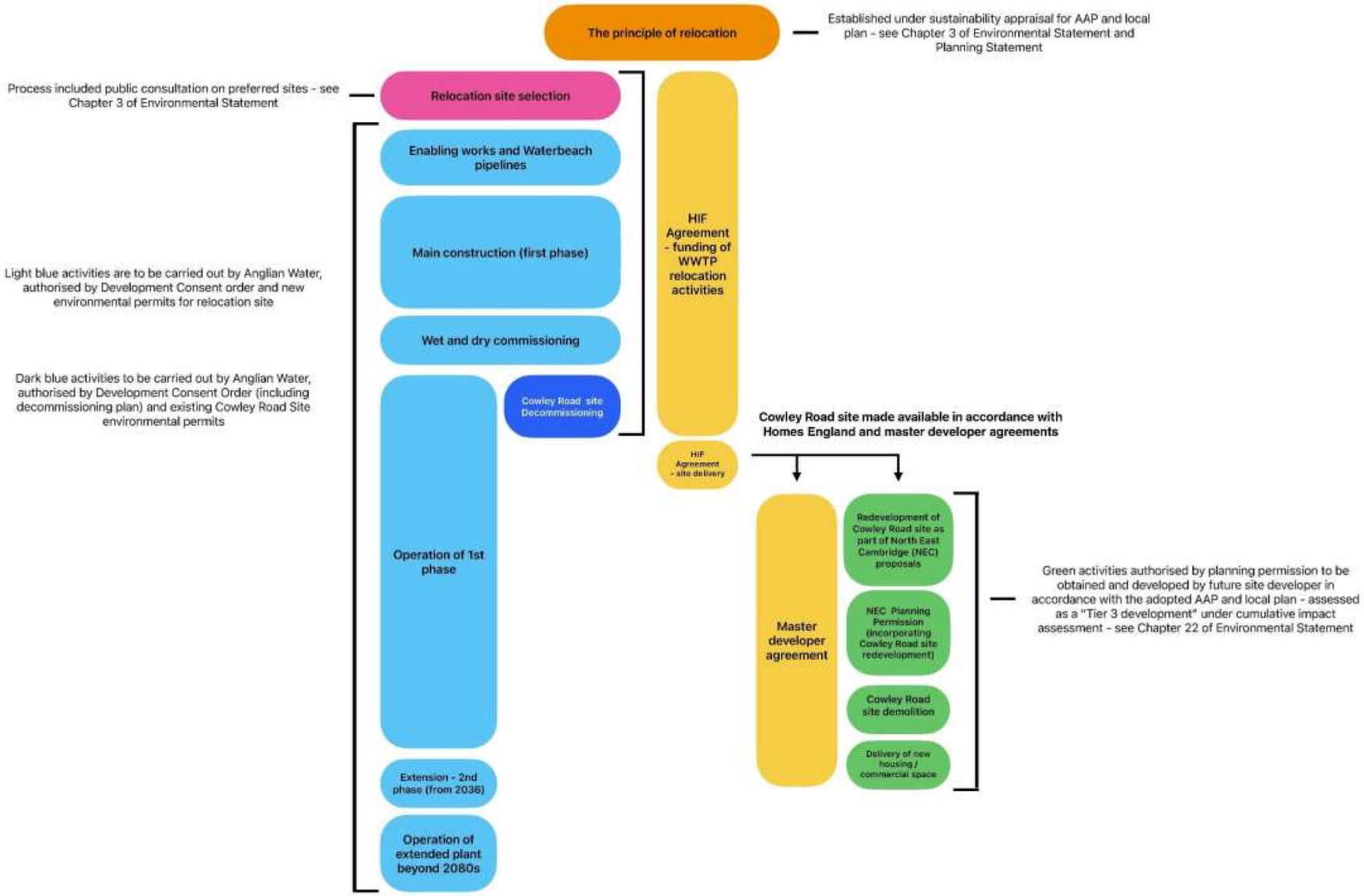
1.5.4 Towards the end of the construction period, commissioning of the Proposed Development will commence, lasting for between 6 months and 1 year.

1.5.5 The Proposed Development will also involve the decommissioning of the existing Cambridge WWTP at Cowley Road. This is secured by the Development Consent Order and the Outline Decommissioning Plan (Appendix 2.3, App Doc Ref 5.4.2.3) and involves activities necessary to take the existing plant out of operational use and to surrender its current operational permits.

1.5.6 Following decommissioning, the site of the existing plant will be made available in accordance with agreements already in place with Homes England and with the master developer appointed to deliver the redevelopment of North East Cambridge

1.5.7 Consent is not sought under the Development Consent Order for the subsequent demolition or redevelopment of the Cowley Road site, which, as described in Chapter 2: Project Description of the Environmental Statement (App Doc Ref 5.2.2) will be consented under a separate and future planning permission, by master developers, U+I and TOWN, appointed under the agreements described above.

1.5.8 The relationship between the Proposed Development, the scope of the proposed DCO and the future demolition and redevelopment of the site at Cowley Road is set out in Figure 1.1, ~~[~~below~~]~~.


The principle of relocation
Established under sustainability appraisal for AAP and local plan - see Chapter 3 of Environmental Statement and Planning Statement
Process included public consultation on preferred sites - see Chapter 3 of Environmental Statement
Relocation site selection
Enabling works and Waterbeach pipelines
Main construction (first phase)
Wet and dry commissioning
Operation of 1st phase
Extension - 2nd phase (from 2036)
Operation of extended plant beyond 2080s
Cowley Road site Decommissioning
HIF Agreement - funding of WWTP relocation activities
HIF Agreement - site delivery
Cowley Road site made available in accordance with Homes England and master developer agreements
Master developer agreement
Redevelopment of Cowley Road site as part of North East Cambridge (NEC) proposals
NEC Planning Permission (incorporating Cowley Road site redevelopment)
Cowley Road site demolition
Delivery of new housing / commercial space
Green activities authorised by planning permission to be obtained and developed by future site developer in accordance with the adopted AAP and local plan - assessed as a "Tier 3 development" under cumulative impact assessment - see Chapter 22 of Environmental Statement
Light blue activities are to be carried out by Anglian Water, authorised by Development Consent order and new environmental permits for relocation site
Dark blue activities to be carried out by Anglian Water, authorised by Development Consent Order (including decommissioning plan) and existing Cowley Road Site environmental permits

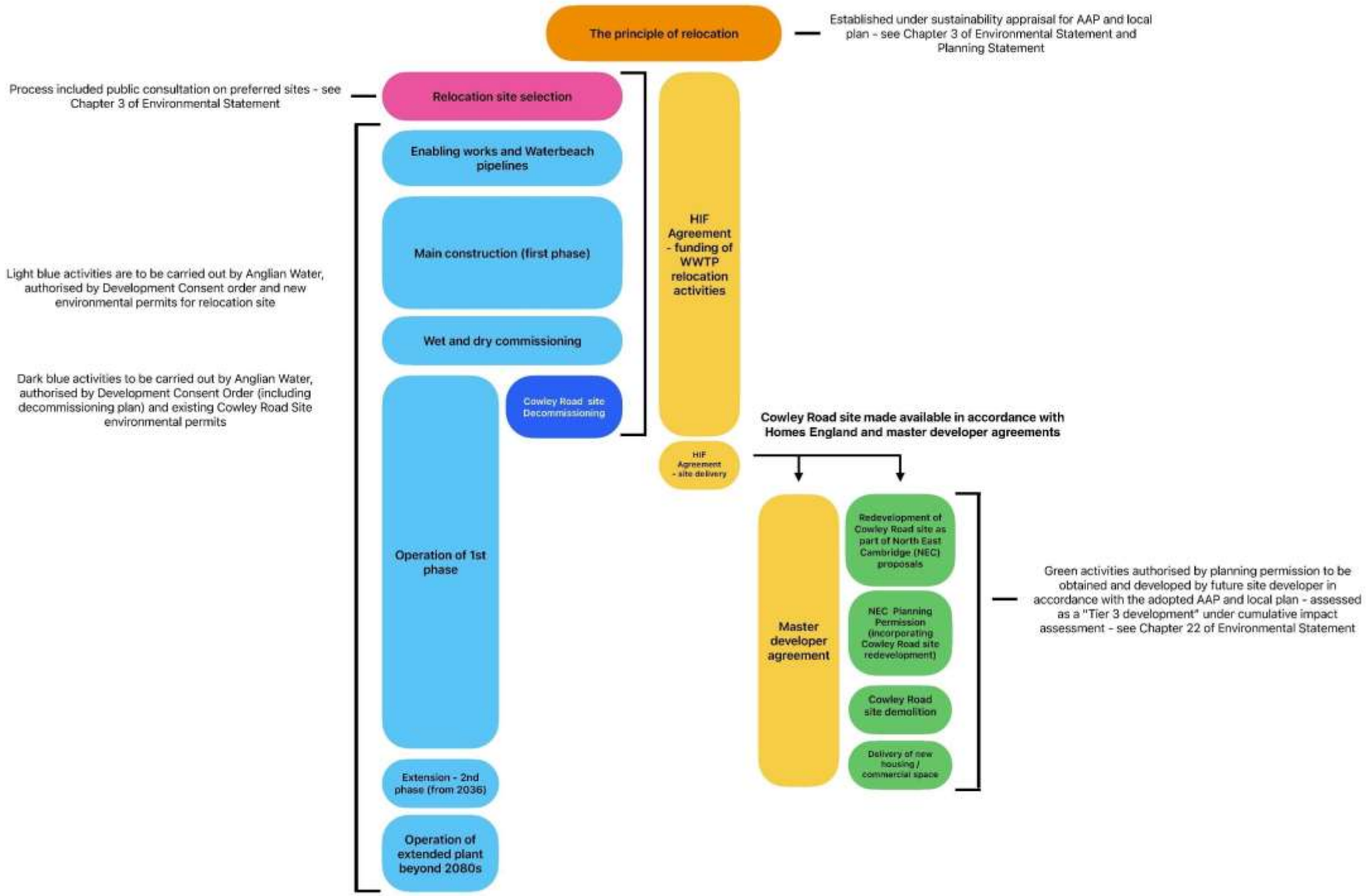

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Figure 1.1: Scope of the draft DCO and the future demolition and redevelopment of the site at Cowley Road

1.6 Environmental mitigation

1.6.1 Through the environmental impact assessment process and community and technical stakeholder engagement the Proposed Development has incorporated comprehensive environmental mitigation, secured through the Development Consent Order.

1.6.2 This mitigation includes a Landscape, Ecological and Recreational Management Plan ("LERMP", Appendix 8.14, App Doc Ref 5.4.8.14) has been developed to complement regional and local initiatives, including the Wicken Fen Vision and the Cambridge Nature Network. The 22-hectare footprint of the plant is encircled by a landscaped and planted earth bank situated within the broader LERMP area of around 70-hectares,

1.7 Additional project benefits

1.7.1 In addition to enabling housing growth and future economic development of the Greater Cambridge area the project will also give rise to a number of additional benefits including:

- significantly reduced carbon emissions compared to the existing Cambridge WWTP, being operationally net zero and energy neutral, contributing to Anglian Water's ambition of being operationally net zero as a business by 2030.
- greater resilience and improved storm management, meaning storm overflows and Combined Sewer Overflows (CSOs) are far less likely to occur. This means that, as Greater Cambridge continues to grow, the facility will be able to treat a greater volume of storm flows to a higher standard than would be the case at today's facility.
- The proposed WWTP is being designed to reduce concentration in final treated effluent discharges of phosphorus, ammonia, total suspended solids and biological oxygen demand (BOD), compared to the existing Cambridge WWTP. This means that when the new facility starts to operate, water quality in the River Cam will improve.

1.8 Future Climate Baseline

1.8.1 The projected future climate is expressed as a departure from the present-day climate conditions, in accordance with climate modelling standard practice. The future climate baseline refers to the projected climate that may be experienced at the Proposed Development in both the 2050s (the average climate for the period 2040-2059) and the 2090s (the average climate for the period 2080-2099).

1.8.2 An overall summary for climate change trends for the East of England is to experience hotter, drier summers, and warmer, wetter winters. The following trends are a

summary of the future baseline outlined in detail in section 5.2.9: Chapter 9 Climate Resilience, based on currently available climate projection data. This summary is provided to give a context to the requirements for measures outlined in section 2 for the operational phase.

Temperatures

1.8.3 shows graphically the key projected trends in hotter summers and warmer winters under the high carbon emissions scenario (RCP8.5). The range of temperatures reflects the range of projections according to different modelled probabilities, with the highest temperatures indicating the worst case scenarios for the Proposed Development location.

1.8.4 Temperatures are projected to rise across both summer and winter. By the 2090s, summer average daily temperatures may increase from 16.3°C (present-day average) to 21.6°C, or to 24.8°C for the hottest projected conditions. Winter average daily temperatures are also increasing and by the 2090s may increase from 4.23°C (present-day average) to 7.9°C, or 10.0°C for the warmest projected conditions.

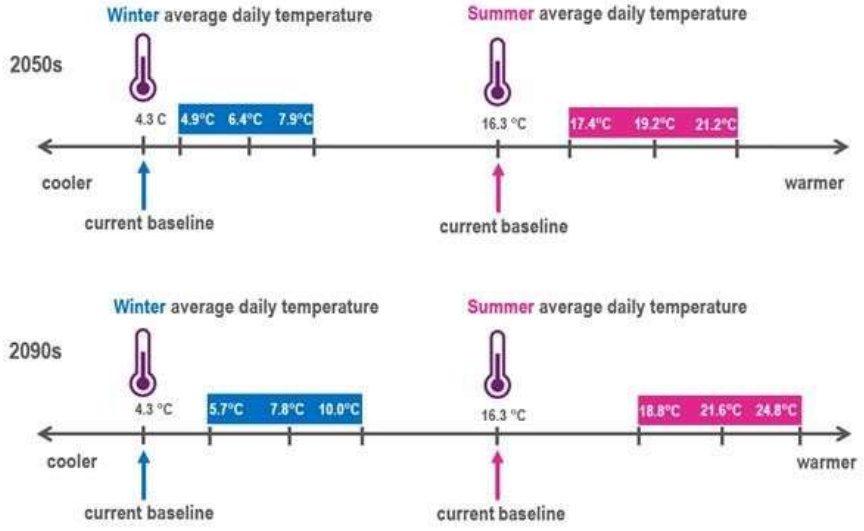

Figure 1.2: Baseline and future average daily temperature range in the 2050s and 2090s

Source: Adapted by Mott MacDonald from UK Climate Projections (2018) RCP 8.5 Probabilistic Projections, UK Met Office, Crown Copyright. Note: The shaded areas show the range in the projected changes for 10th, 50th and 90th percentiles. Not to scale.

1.8.5 It should be noted that in addition to the seasonal average temperature projections in Figure 1.2, that maximum summer temperatures are also modelled to become more higher due to climate change.

1.8.6 Higher summer maximum temperatures are modelled to increase from a presentday heatwave peak of 35.62°C to a worst case (90th percentile) maximum of 40.97˚C by the end of the 2050s and worst case maximum of 47.02˚C by the 2090s. This modelled rising trend to future hotter heatwaves should be used as context for the measures outlined in section 2 of monitoring and business contingency planning.

Precipitation

1.8.7 Figure 1.3 shows graphically the key projected rainfall trends of drier summers and wetter winters under the high carbon emissions scenario (RCP8.5). Under this scenario, by the 2090s, the summer average daily precipitation rate may remain the same as present-day averages at 1.6 mm or decrease to 0.5 mm under the driest (worst case) conditions. By contrast, by the 2090s, winter average daily precipitation rate may remain as present-day averages at 1.6 mm or increase up to 2.3 mm under the wettest (worst case) conditions.

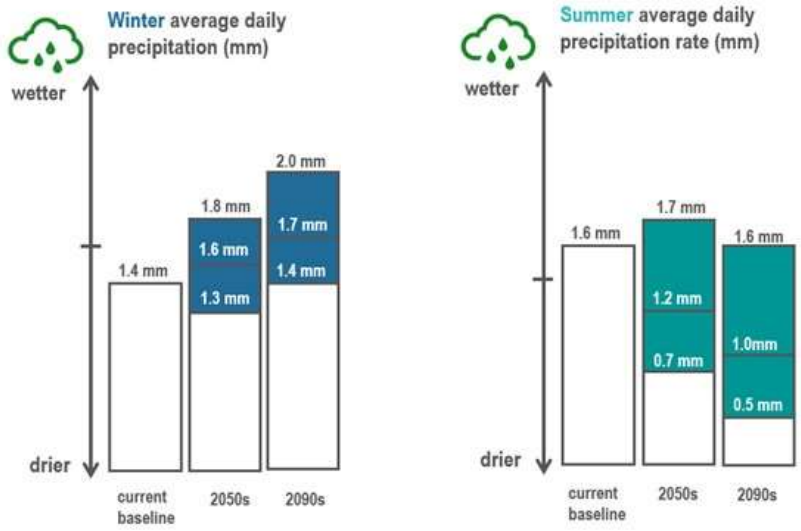

Figure 1.3: Baseline and future precipitation in the 2050s and 2090s

Source: Adapted by Mott MacDonald from UK Climate Projections (2018) RCP8.5 Probabilistic Projections, UK Met Office, Crown Copyright. Note: The shaded areas show the range in the projected changes for 10th, 50th and 90th percentiles. Not to scale.

1.8.8 It should be noted that the precipitation projections in Figure 1.3 indicate projected seasonal averages and that individual rainfall events may become more intense due to climate change, both in the summer and winter. The drainage design has included an allowance of a 40% uplift in rainfall intensity (for a 1 in 100 year event by the 2070s), however the increased rainfall intensity may additionally affect the staffing and operation of the Proposed Development. The measures outlined in section 2 should use this uplift in the context of monitoring and business contingency planning.

1.8.9 Alongside the trend in more intense rainfall events, drought conditions during summers may become more intense and prolonged, and this should be considered for the context of the measures outlined in section 2, in terms of water scarcity.

Snow and Ice

1.8.10 Minimum winter temperatures are projected to get warmer, which will lead to a decrease in the number of cold events (days when snow and ice fall or settle). Whilst projected increased precipitation volumes during winter and spring could increase the potential for heavier snow and ice, increasing temperatures reduce the frequency of this occurring. Overall, by both the 2050s and by the 2090s there is likely to be a reduction in the frequency of ice and snow fall and a decreased risk of it settling.

2 Secondary climate change mitigation measures to be secured through an asset management plan

2.1.1 This document sets out the activities related to climate resilience, for inclusion within The Applicant's Asset Management Plan (AMP) for the Proposed Development during its operation phase. These requirements will provide secondary mitigation for a range of effects of climate change upon the Proposed Development. They will also support tracking and management of assets and operations of the Proposed Development throughout its design life.

2.1.2 The AMP requirements listed within this document are not exhaustive and other requirements that do not have relevance to climate resilience, or that do relate to climate resilience that may be identified at a later date may be made within the AMP at the discretion of The Applicant.

2.1.3 The requirement for The Applicant to prepare an AMP, and thereby the climate change secondary mitigations included within, will be secured through a requirement within the DCO application schedule 2 which stipulates preparation of an AMP with these inclusions.

2.1.4 The AMP will be prepared at the appropriate time before the onset of the operation phase of the Proposed Development, currently scheduled to be fully operational in 2028. Any delays to the commencement of the operation phase may affect the time at which the AMP should be prepared. The trigger for commencement of AMP preparation should be at the discretion of The Applicant and before the onset of the operation phase.

2.1.5 Throughout the design life of the Proposed Development, the AMP may need to be periodically reviewed and updated to reflect changing needs, for example as the climate continues to change, the frequency of planned inspections and maintenance may need to be increased as chronic weather damage and deterioration rates increased.

2.1.6 Secondary mitigations that support resilience of the Proposed Development to climate change should apply to all physical assets of the Proposed Development, as outlined within Table 2-1, as well as to site staff.

Table 2-1 Physical Assets for inclusion within climate change impact assessment

Receptor	Receptor detail	Proposed design-life (years)
Built infrastructure	Buildings, structures and foundations	50
	Access road, internal roads hardstanding and hard surfaces, car parking	60

	Mechanical and electrical equipment, including solar voltaic panels, electrical wiring and control boards and communications equipment	15
	Surface water drainage pipework	60

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Receptor	Receptor detail	Proposed design-life (years)
	~~wiring and control boards and communications equipment~~	
	~~Surface water drainage pipework~~	~~60~~
	Fencing and lighting	20
Utilities and communications	Energy production infrastructure and battery storage system, renewable energy generation via anaerobic digestion processes	varied
	Utilities infrastructure – water, gas, electricity and communications structures, and their foundations	15
	Electric vehicle charging points	15
Waste Water Treatment Processing infrastructure	Inlet including buried pipes leading to terminal pumping station, treatment facilities (primary, secondary and tertiary), and sludge treatment infrastructure	Small pumps <7.5kw: 10 Control panels / MCC: 25 Other mechanical and electrical (excluding MCC and borehole pumps): 20 Onsite pipework: 60 Steel building frames: 50 Sewers / outfalls: 160
	Gas to grid membrane plant or CHP and boiler units	20
Storm Management infrastructure	Storage tanks and their foundations	60
Odour Management infrastructure	Odour control units, covers for reception areas such as Terminal Pumping Station, Inlet Works and Sludge Tanks, aeration equipment	Varies depending on equipment. 10-25 for pumps and steel equipment
Outfall	Final effluent channel and new outfall into the River Cam	160
Landscaping	Landscaping and planting around the Proposed Development	Whole project life

Workforce	Maintenance and renewal	Whole project life
Transfer tunnel	Transfer tunnel between the existing Cambridge WWTP and the Proposed Development	120
Waterbeach pipeline	New buried pipeline (rising main) and pumping station	100

2.1.7 The AMP inclusions, as pertaining to climate resilience, should include:

- inspections and maintenance of those physical assets listed in Table 2-1;
- business continuity plans for extreme weather events;
- monitoring requirements; and
- relevant information for planning future works **Inspections and maintenance**

2.1.8 A repairs or replacement regime will be part of the AMP, which will include replacement or repairs of damaged assets and will assist in improved resilience of those assets. Such planned inspection and maintenance will also be used to keep the waste water processes and the surface water drainage infrastructure clear and operating effectively and efficiently.

2.1.9 Weather triggers (specific temperatures and durations that trigger an inspection) will also be defined within the AMP or related, relevant plans.

2.1.10 Inspection and maintenance measures are outlined in Table 2-2.

2.1.11 As the climate continues to change, the frequency of inspections and maintenance may need to be increased to address the increasing the rate of deterioration of components due to climate-related processes such as scour, thermal deterioration, shrink-swell and freeze-thaw, water ingress or wind damage. The AMP will be reviewed periodically, and maintenance schedules will be updated as necessary to address this.

Table 2-2 Secondary mitigation measures for inclusion within the AMP

Measure	Description of secondary mitigation	Climate impact that this will address
Proposed WWTP built infrastructure and Waterbeach transfer pipeline		
Periodic inspection and maintenance of structures	Periodic monitoring of structure conditions will be carried out throughout the operation phase, to include inspection and monitoring of structures. This will include note of particular above ground elements comprising metals and plastics that are vulnerable to deterioration or damage due to heat, to be inspected during periods of high temperatures. Weather triggers (specific temperatures and durations which trigger an inspection) will be defined within the AMP. A repairs or replacement regime will be part of the AMP, which will include replacement of damaged structural assets and resurfacing of hardstanding,	Higher summer temperatures: structural damage
~~Inspection of energy plant – The AMP will include inspection of energy plant infrastructure (gas to infrastructure (gas to grid, – grid, boiler, and CHP components) condition and efficiency. Including boiler and CHP components) – monitoring of ambient temperatures and air pressure in energy plant to determine ambient conditions which may drive the design specifications for future repairs, renewals or upgrades.~~		~~Higher maximum summer temperatures: changes in efficiency of energy plant (boilers, gas to grid and CHP unit)~~

	which will assist in improved resilience of those assets.	
Periodic inspection and maintenance of M&E equipment	The AMP will include the inspection of electrical and communications equipment to ensure its function during extreme temperature events. Monitoring of temperatures within key electrical housings and components exposed to high temperatures will be carried out, with the addition of extra cooling features as necessary.	Higher maximum summer temperatures and incombination weather events: mechanical and electrical equipment failure
~~Measure~~	~~Description of secondary mitigation~~	~~Climate impact that this will address~~
Inspection of energy plant The AMP will include inspection of energy plant infrastructure (gas to infrastructure (gas to grid, grid, boiler, and CHP components) condition and	~~The AMP will outline an inspection and maintenance regime, which will be carried out to keep the waste water network and surface water drainage infrastructure clear and operating effectively.~~	Higher maximum summer temperatures: changes in efficiency of energy plant ~~Increased winter rainfall and heavy rainfall events: structural damage and flooding~~ ~~Higher maximum summer temperatures and lower~~

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efficiency. Including boiler and CHP components) monitoring of ambient temperatures and air pressure in energy plant to determine ambient conditions which may drive the design specifications for future repairs, renewals or upgrades. ~~Drainage infrastructure inspection and maintenance~~	~~For individual flood events, the AMP will outline the use of available early warning systems such as Met Office weather forecasts and Environment Agency flood warnings to inform and alert key staff as part of flood management procedures.~~	(boilers, gas to grid and CHP unit)	~~summer rainfall: septicity in process plant and tunnels~~
~~Outfall inspection and maintenance~~	~~The AMP will include a regime for inspections of the condition of the outfall that will be undertaken periodically, with repairs or replacement as required.~~		~~Increased winter rainfall and higher fluvial flows: damage to the outfall structure~~

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Measure	Description of secondary mitigation	Climate impact that this will address
~~Pipework~~Drainage infrastructure inspection and maintenance	The AMP will outline an inspection and maintenance regime, which will be carried out to keep the waste water network and surface water drainage infrastructure clear and operating effectively~~, to include:~~ . For individual flood events, the AMP will outline the use of available early warning systems such as Met Office weather forecasts and Environment Agency flood warnings to inform and alert key staff as part of flood management procedures. ~~• Periodic inspection of the surface water drainage infrastructure and wastewater network for siltation or obstruction~~	Increased winter rainfall~~,~~ and heavy rainfall events ~~and summer droughts: pipework siltation~~: structural damage and flooding Higher maximum summer temperatures and lower summer rainfall: septicity in process plant and tunnels
Outfall inspection and maintenance	The AMP will include a regime for inspections of the condition of the outfall that will be undertaken periodically, with repairs or replacement as required.	Increased winter rainfall and higher fluvial flows: damage to the outfall structure
Earthworks inspection and maintenance ~~Greater seasonal range between wetter winters and~~ assets, with repairs or replacement as required.	The AMP will outline a periodic inspection of earthworks for signs of ground movement and inspections of the condition of all earthwork	Greater seasonal range between wetter winters and drier summers: ground movement
Pipework inspection and maintenance	The AMP will outline an inspection and maintenance regime~~, which will be carried out~~ to keep the waste water network and surface water drainage infrastructure clear and operating effectively~~. For~~to include: • Periodic inspection of the surface water drainage infrastructure and wastewater network for siltation or obstruction	Increased winter rainfall, heavy rainfall events and summer droughts: pipework siltation

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Measure	Description of secondary mitigation	Climate impact that this will address
	• Periodic inspection of surface water drainage pipework, structures, pipeline bedding and outfall structure for surface water scour or damage.	
Waste Water Processes		
Early Warning System	The AMP will consider implementation and use of an appropriate EWS to manage risk of extreme weather including stormwater and flooding. This will include adequate weather levels which trigger alerts that take climate change into account. The EWS itself should be periodically reviewed and updated as the climate changes and as climate projections and understanding are updated.	Extreme weather events: asset damage and operational interruptions, staff safety
In-combination climate impacts		
Management of Biodiversity and landscaping beyond the 30 year time period outlined within the LERMP	The Applicant's Biodiversity Strategy (2019) outlines that "The resilience of wildlife to climate change will be enhanced through good habitat management, introducing microclimate variability and improving connectivity at a landscape scale." The management of the biodiversity mitigation to be created within the Proposed Development will be managed as part of the LERMP (Appendix 8.14, App Doc Ref 5.4.8.14) during the initial 30 years of the operation phase. Beyond that the effects of climate change will be managed through the AMP, in line with biodiversity strategies and management plans available in through the remainder of the operational phase, within the context of the observed effects and projected effects on climate change on the wider geographical area.	All

Business continuity plans for extreme weather

2.1.12 The AMP will include business continuity plans for abnormal operational conditions such as those resulting from extreme weather events, to include considerations such as:

- monitoring of the temperature of welfare facilities and the provision of cooling equipment for staff as required;
- provision of Personal Protection Equipment (PPE), water and shaded areas to staff;
- consideration of industry best practice around working in high temperatures, including guidance available from the Health & Safety Executive, as updated during the operation phase;
- programming of maintenance or equipment renewal works outside of typical periods of extreme weather such as peak summer temperatures or heavy rains as applicable to the works planned;
- the timing of regular, routine visits at cooler times of the day;
- contingency planning for emergency attendance at site, with consideration given to safe staff travel requirements during extreme weather events (for example staff travel routes that are at risk of flooding, or distances for key staff travel to site);
- consideration of safety critical activities that may be affected by extreme weather events and the consequence of limitations in staff ability to respond;
- use of early warning systems including Met Office weather forecasts and Environment Agency flood warnings to inform disaster management processes and to alert key staff as part of flood management procedures;
- consideration of working practices and lessons learned relevant to the local area from the construction phase and wider construction and maintenance industry.

Monitoring

2.1.13 The AMP will outline the following monitoring requirements, which will support resilience against the impacts of climate change:

- monitoring during and/or following extreme storm, rainfall, and temperature weather events, according to weather triggers for monitoring and inspection (such as temperatures above design tolerances limits, surface water flooding of the access road or essential areas of hardstanding);

- monitoring of the frequency and size of extreme rainfall events and the response of the Proposed Development and waste water network to these, with a forward plan for installing additional pump capacity as required as climate change affects rainfall;
- monitoring of flood response of the proposed WWTP and health and safety of the workforce during these events, including recording of near misses and lessons learnt;
- periodic monitoring of structure conditions for deterioration of metals and plastic elements due to higher temperatures;
- temperature monitoring within the housings of electrical equipment that are exposed to high temperatures;
- temperature monitoring of further temperature-vulnerable elements of the design as required according to the response of structures or equipment to high temperatures;
- monitoring of boiler and CHP components to ensure their function in extreme temperature events;
- monitoring of maximum summer temperatures, temperatures within digesters and other wastewater systems, and corresponding anaerobic digestor efficiency, to inform the need for additional coolers, plant specifications and changes to wastewater treatment capacity;
- installation and use of remote monitoring systems as they become available to reduce the requirement of staff to visit during heatwaves and other extreme weather events;
- monitoring of changes to odour emissions during the operation phase to inform amendments or upgrades to be made to the Odour Control Units, to meet environmental permitting requirements. Monitoring of industry technology development and available during the operation phase to inform upgrade options;
- periodic review (such as every 5-10 years) of observed climate changes as well as the latest climate projections, to better understand maximum temperatures experienced and projected for the future. This information should then be used to determine renewal requirements of equipment and any necessary amendments to the specifications of plant and equipment.

Future replacements, refurbishments, and upgrades

2.1.14 Renewal and upgrades at the end-of-life of components (as outlined in Table 2-1) will be necessary. At the time of renewals and upgrades, decisions on the design

specification for future components should take the latest climate projections into consideration. When doing so, consider for likely and worst-case climate scenarios.

2.1.15 This review of design standards with respect to future climate will form an ongoing element of the AMP.

2.1.16 The climate change impact assessment currently considers risks to 2099 as this is the furthest future date for which a climate change future baseline could be constructed, using available climate projections data. Any future maintenance

works, upgrades or replacements that fall outside the scope of this EIA, i.e., after 2099 if the Proposed Development is still operational should also be included within the AMP.

Get in touch

You can contact us by:

Emailing at **info@cwwtpr.com**

Calling our Freephone information line on **0808 196 1661**

Writing to us at **Freepost: CWWTPR**

~~Visiting our website~~ 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/