**Cambridge Waste Water Treatment Plant Relocation Project**
Anglian Water Services Limited

# Environmental Statement Chapter 14: Land quality

Application Document Reference: 5.2.14
PINS Project Reference: WW010003
APFP Regulation No. 5(2)a

**Revision No. 05**
April 2024

## Document Control

| | |
|---|---|
| **Document title** | Chapter 14: Land Quality |
| **Version No.** | ~~04~~05 |
| **Date Approved** | 29.09.23 |
| **Date 1st Issued** | 29.09.23 |

## Version History

| Version | Date | Author | Description of change |
|---|---|---|---|
| 01 | 30.01.23 | - | DCO Submission |
| 02 | 20.04.23 | - | Updated to reflect s.51 advice letter |
| 03 | 29.09.23 | - | Procedural Decision 01 Amendments to Appendices list and cross-referencing updates |
| 04 | 19.02.23 | - | Incorporate Errata details & mitigation wording clarifications and updates |
| 05 | 02.04.24 | - | Update to Decommissioning Plan reference, management system text, and mitigation securing text in section 5.3 |

# Contents

# Tables

# Summary

This chapter of the Environmental Statement (ES) presents the findings of Environmental Impact Assessment (EIA) completed in relation to the likely significant effects of the Proposed Development in respect of land quality.

For land quality, the resources and receptors scoped in for assessment are: soils and geology (including impacts arising from land contamination); human health (including land users and surrounding land users); and mineral resources such as minerals safeguarding areas. The resources and receptors scoped out are: geodiversity including geological Sites of Special Scientific Interest (SSSI), regionally or locally important geological sites or non-designated outcrops/features of interest.

**Study area**

The study area for land quality includes all resources and receptors within 250m of the Scheme Order Limits (App Doc Ref 4.1). This distance has been selected based on professional judgement, by a suitably qualified and competent environmental engineer, considering the distance beyond which migration of contamination is likely to be minimal.

**Baseline**

The majority of the study area comprises rural agricultural land in arable production. There are two historical landfills within the study area. These are located near the Waterbeach pipeline. The underlying geology comprises local deposits of river terrace deposits and alluvium overlying the Grey Chalk Subgroup and, in turn, the Greensand and Gault Formations.

Several areas of potential infilled land were identified within the Preliminary Risk Assessment (2022) (App Doc Ref 5.4.14.1) (such as coprolite mining pits). However, these were not encountered during ground investigation.

Site-specific ground investigations have confirmed the baseline conditions to be as considered at scoping stage. The ground investigations have also identified localised areas of made ground where it is mainly associated with the existing Cambridge waste water treatment plant (WWTP), as anticipated. No visual or olfactory evidence of contamination was recorded during the ground investigations. Based on the desk study information and the results of the ground investigations, the presence of contamination is limited due to the lack of potentially contaminative land uses.

Two Mineral Safeguarding Areas (MSA) are present within the study area related to the River Terrace Deposits and Chalk. It is likely that some mineral resources will be removed and/or made inaccessible as part of the construction, in particular where open cut trenching for pipelines and permanent structures correspond to the MSA. The waste water transfer tunnel and under river/railway line crossings, which will be in tunnel 24m deep, are unlikely to encounter the River Terrace Deposits or Chalk, with the exception of the shaft and

Horizontal Directional Drilling (HDD) launch and recovery pit locations. The proposed WWTP is within the Chalk MSA only.

**Summary relevant mitigation**

Primary mitigation measures will ensure that the design of the operational site includes appropriate bunding of tanks and use of hardstanding to break any significant pathways for contamination. They will also ensure design of the works minimise impacts on MSA.

Tertiary mitigation ensures any pre-existing contamination would be adequately managed through the contaminated land regime (LCRM) to ensure that the operational area is suitable for use. The Land Contamination Risk Management (LCRM) guidance details the steps that will need to be followed as the Proposed Development is progressed through the development and planning process. These steps include the production of a Preliminary Risk Assessment (PRA) and completion of an appropriate ground investigation (which have been partially undertaken at the time of writing), tiered stages of risk assessments together with an assessment of unacceptable pollutant linkages. Where such linkages are found then a remediation options appraisal and strategy will be produced and implemented.

Tertiary mitigation will also ensure decommissioning of existing tanks will follow requirements set out by the Environment Agency to rescind the current operational permits, specifically the final effluent and storm discharge consents, and sludge treatment operation permit.

Secondary mitigation measures applied during construction are set out in the Code of Construction Practice (CoCP). These include use of a Construction Environmental Management Plan (CEMP), a Pollution Incident Control Plan and an Outline Soil Management Plan.

**Assessment approach**

The general approach to assessment is described in Chapter 5: Assessment Methodology (App Doc Ref 5.2.5).

Following the preliminary assessment of the likely significant effects of the Proposed Development taking into account primary and tertiary mitigation measures, any further mitigation measures (secondary mitigation) are identified and described. These mitigation measures would further reduce an adverse effect or enhance a beneficial one. The assessment of likely significant effects is then carried out taking into account the identified secondary mitigation measures to identify the 'residual' environmental effects.

The methodology for assessing land contamination effects is based around the change in land contamination risks between the situation at baseline and those estimated to exist during the construction and operational stages.

For minerals, the assessment is based upon a matrix, where the effects are a product of the impact magnitude and receptor sensitivity.

**Summary construction effects**

***Mineral Safeguarding Areas – Construction***

The potential effects on the MSA for both River Terrace Deposits and Chalk were assessed. The magnitude of impact during construction was determined to be negligible, with receptors designated as medium sensitivity. This results in a negligible effect which is not significant. No additional mitigation measures are required.

**Land Contamination – Construction**

The potential land contamination effects were assessed for construction of the Proposed Development. Construction impacts included risks to surrounding land users from inhalation of contaminated soils. Risks were deemed to be very low with significance of effect being assessed as negligible. Risks to controlled waters from migration of existing contamination through preferential pathways (by piling, pipelines, tunnelling and construction of shafts) were assessed as low to low/moderate. The significance of effect was assessed as negligible, which is not significant. No additional mitigation measures are required.

**Summary operation effects**

***Land Contamination – Operation***

Impacts during operation include risks to site users from inhalation, ingestion and direct contact of dusts (and surrounding land users from inhalation only) from site won soils which will be reused within landscaping areas. Risks were deemed to be very low with significance of effect being assessed as negligible. Risks to controlled waters from migration of contamination or leachate from reused soils on site were assessed as low to low/moderate. The significance of effect was assessed as negligible. No additional mitigation measures are required.

**Cumulative and transboundary impacts**

An assessment of potential cumulative impacts determined that decommissioning of the existing Cambridge WWTP may result in beneficial effects on land quality following ground remediation. No significant effects on land quality are likely as a result of committed development adjacent to the Proposed Development.

# 1 Introduction

## 1.1 Purpose of this chapter

1.1.1 This chapter of the Environmental Statement (ES) presents the findings of Environmental Impact Assessment (EIA) completed in relation to the potential impacts of the Proposed Development on land quality.

1.1.2 The assessment for land quality considers:

- soils and geology (including impacts arising from contaminated land);
- human health (including land users and surrounding land users); and
- mineral resources such as Minerals Safeguarding Areas (MSA).

1.1.3 The ES has been prepared as part of the application to the Planning Inspectorate (PINS) for a Development Consent Order. This chapter considers the potential land quality impacts from the Proposed Development associated with existing contamination and impacts on MSA within the study area during construction (including commissioning), operation and maintenance, and decommissioning phases.

1.1.4 This chapter summarises information from supporting studies, technical reports and publicly available data which are included within the following:

- Appendix 14.1 Preliminary Risk Assessment Report (App Doc Ref 5.4.14.1).
- Appendix 14.2 Contaminated Land Risk Assessments (App Doc Ref 5.4.14.2).
- Appendix 14.3 Geoenvironmental Results - proposed WWTP (App Doc Ref 5.4.14.3).
- Appendix 14.4 Geoenvironmental Results - Waterbeach (App Doc Ref 5.4.14.4).
- Appendix 14.5 Mineral Safeguarding Area calculations (App Doc Ref 5.4.14.5).
- Appendix 14.6 Groundwater Investigation Waterbeach (App Doc Ref 5.4.14.6).
- Appendix 14.7 Ground Investigations Report Cambridge WWTP (App Doc Ref 5.4.14.7).
- Appendix 14.8 Ground Investigations Report B Cambridge WWTP (App Doc Ref 5.4.14.8).
- Appendix 14.9 Preliminary Ground Investigation Factual Report Cambridge WWTP (App Doc Ref 5.4.14.9).
- Appendix 14.10 Geotechnical Interpretative Report (App Doc Ref 5.4.14.10).

1.1.5 Land contamination issues are closely linked with those involving water resources. Potential impacts of the Proposed Development on water resources and material

resources and waste are assessed in Chapter 20: Water resources and Chapter 16: Material resources and waste.

## 1.2 Competency statement

1.2.1 Summaries of the qualifications and experience of the chapter authors are set out in Table 1-1~~Table 1-1~~.

**Table 1-1: Competent experts**

| Author | Qualification/Professional membership | Years of experience | Project experience summary |
|---|---|---|---|
| HBS | BSc (Hons) Earth Science, University of Glasgow, 2016<br>MSc Hydrogeology, University of Strathclyde, 2017<br>Fellow of the Geological Society of London | 4 years | Hydrogeologist with experience in contaminated land, ground investigation and water resources projects. |
| KT | BSc (Hons) Geology,<br>MSc Environmental Engineering<br>Fellow of the Geological Society | 16 years | Principal Environmental Geologist with experience in geotechnical and geo-environmental projects.<br>Experience includes Project Management, Phase I geotechnical and geo-environmental desk studies, design and supervision of ground investigations, Preliminary Risk Assessments, interpretive reports and land quality EIA topic authoring. |
| JS | BEng (Hons) Environmental Engineering, Cardiff University<br>MSc Land Reclamation and Restoration, Cranfield University<br>Chartered member of the Institution of Water and Environmental Management (CWEM) and Chartered Engineer (CEng)<br>CIWEM Professional Standards Committee member<br>CL:AIRE Qualified Person 2015-2018 | 17 years | Experienced in contaminated land and geotechnical engineering projects. Project experience includes preliminary risk assessments, geotechnical and environmental site investigations, generic quantitative risk assessment, detailed human health risk assessments, remediation strategies, inputs to EIA and planning applications, contaminated land emergency response and due diligence. |
| DG | BSc Physical Geography | 23 years | A contaminated land consultant, engineering |

| Author | Qualification/Professional membership | Years of experience | Project experience summary |
|---|---|---|---|
| | MSc Engineering Geology<br>Chartered Environmentalist<br>Member of the Institution of Environmental Sciences<br>Fellow of the Geological Society<br>Specialist in Land Condition (SiLC)<br>Suitably Qualified Person (SQP) under the National Quality Mark Scheme. | | geologist and Chartered Environmentalist with over twenty three years' experience in consultancy, encompassing: contaminated land assessment, remediation, site investigation, engineering geology and EIA for waste water and infrastructure schemes. |

## 1.3 Planning policy context

### National Policy Statement requirements

1.3.1 Planning policy on waste water for Nationally Significant Infrastructure Projects (NSIP), specifically in relation to land quality, is contained in the National Policy Statement (NPS) for Waste Water (Department of Environment, Food and Rural Affairs, 2012).

1.3.2 Table 1-2~~Table 1-2~~ sets out how the scope proposed in this chapter complies with the NPS for Waste Water.

**Table 1-2: Scope and NPS Compliance**

| NPS requirement | Compliance of ES scope with NPS requirements |
|---|---|
| Paragraph 4.8.8 Identify any effects and minimise impacts on soil quality taking into account any mitigation measures | A review of soil quality (contamination) is included in the assessment with impacts during construction and operation considered. See Chapter 7: Agricultural Land and Soil Resources in relation to agricultural soil quality. |
| Paragraph 4.8.8 For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination | Previously developed land is limited to the existing Cambridge Waste Water Treatment Plant (WWTP) and small areas along the waste water transfer tunnels. Consideration of contaminated land risk is included within the scope of the assessment. |
| Paragraph 4.5.3 The Applicant should set out any effects on sites of geological conservation importance | Geodiversity baseline was reviewed within the Scoping Report (Appendix 4.2, App Doc Ref 5.4.4.2) and was scoped out of the assessment as no sites of geological importance were noted within 250m of the EIA Scoping Boundary. |
| Paragraph 4.8.9 Mineral resources should be safeguarded as far as possible including long term potential | Assessment considers the MSA within the assessment boundary. |

| NPS requirement | Compliance of ES scope with NPS requirements |
|---|---|
| of land use after future decommissioning | |

## National planning policy

1.3.3 Other national planning policies of relevance to land quality, and pertinent to the Proposed Development are listed below:

- National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2021) with particular reference to paragraphs 119 and 120 in relation to brownfield land and remediation; and Section 15, paragraphs 183 and 184, in relation to ground conditions and suitability of a site for its proposed uses in relation to land instability and contamination.

## Local planning policy

1.3.4 Local planning policy of relevance to the Proposed Development includes:

- South Cambridgeshire District Council Local Plan 2018 with particular reference to policy SC/11 (contaminated land) and policy CC/6 (construction methods);
- Cambridge City Council Local Plan 2018 with particular reference to policy 33 (Contaminated Land); and
- Cambridgeshire and Peterborough Minerals and Waste Local Plan (2021) with particular reference to Policy 5 Mineral Safeguarding Areas (MSAs) and Policy 20 Biodiversity and Geodiversity.

1.3.5 South Cambridgeshire District Council and Cambridge City Council have commenced the joint preparation of both the Greater Cambridge Local Plan (GCLP) and the North East Cambridge Area Action Plan (NEC AAP).

1.3.6 The GCLP is intended to replace both the adopted Cambridge and South Cambridgeshire Local Plans 2018 and cover the period to 2041. In November/December 2021 public consultation was held on the GCLP – First Proposals (Regulation 18: Preferred Options) including the GCLP: First Proposals – Sustainability Appraisal (October 2021). Accompanying these documents, the Councils published a number of supporting documents and topic papers which are referenced below where they provide relevant background.

1.3.7 Following consultation in July 2020 on Cambridge City and South Cambridgeshire Councils joint Draft Regulation 18 NEC AAP, the Councils have now completed the preparation of their Reg.19 Submission version of the NEC AAP which went through respective District and City Council Committee cycles between 30 November 2021 and 11 January 2022. The Reg.19 version of the AAP has now been approved for consultation but shelved pending the outcome of the DCO.

1.3.8 Particular reference to Policy 25 of the NEC AAP relating to Environmental Protection is considered together with the Geo-Environmental Desk Study 2021.

## 1.4 Legislation

1.4.1 This section is not intended to provide a full and exhaustive account of legislation relating to land contamination within the European Union (EU) or United Kingdom (UK). However, it is intended to provide a thematic background to applicable legislation and guidance at the time of writing.

1.4.2 Other legislation pertinent to this report is listed in Table 1-3~~Table 1-3~~. Further legislation concerning water resources is covered in Chapter 20: Water resources.

**Table 1-3: Legislation and guidance for land quality**

| Aspect | Legislation/policy/guidance |
|---|---|
| Buildings | Planning Act 2008 |
| | The Building Regulations 2010 |
| | National Policy Statement for Waste Water 2012 |
| | National Planning Policy Framework 2021 |
| Contaminated land | The Environmental Permitting (England and Wales) Regulations 2016 |
| | The Control of Pollution (Oil Storage) (England) Regulations 2001 |
| | The Control of Substances Hazardous to Human Health 2002 (as amended 2004) |
| | The Contaminated Land (England) Regulations 2006 (as amended) |
| | Environmental Quality Standards Directive 2008/105/EC |
| | Contaminated Land Statutory Guidance 2012 |
| | The Control of Asbestos Regulations 2012 |
| | The Environmental Damage (Prevention and Remediation) Regulations 2015 |
| | Land Contamination Risk Management (LCRM) guidance, 2021 |
| Waste/materials reuse/emissions | Waste Framework Directive 2008/98/EC |
| | The Hazardous Waste (England and Wales) Regulations 2005 (as amended by The Waste (England and Wales) Regulations 2011) |
| | Definition of Waste: Development Industry Code of Practice CL:AIRE, 2014 |
| | The Environmental Permitting Regulations 2016 (as amended) |
| | The Industrial Emissions Directive 2010/75/EU |
| Water resources | The Water Resources Act 1991 |
| | Water Framework Directive 2000/60/EC |
| | Groundwater Daughter Directive 2006/118/EC |
| | The Groundwater Regulations 2009 |
| | The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 |
| | The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 |
| | Environment Agency's Groundwater Protection Technical Guidance (2017) |

| Aspect | Legislation/policy/guidance |
|---|---|
| UXO | Unexploded ordnance (UXO) A guide for the construction industry (C681) 2009 |

## Hydrology and Hydrogeology

1.4.3 With regard to groundwater, the following legislation is relevant:

- EU Water Framework Directive (European Commission, 2000);
- Environmental Permitting Regulations (The Environmental Permitting Regulations (England and Wales), 2016);
- Industrial Emissions Directive (European Commission, 2010); and
- Water Resources Act 1991 (Gov.UK, 1991).

***Water Framework Directive 2000***

1.4.4 The Water Framework Directive (WFD) introduces consideration of 'significant' pollution of controlled waters. In determination of whether significant pollution is being caused, the following criteria are used:

- pollution equivalent to 'environmental damage' as per the Environmental Damage Regulations 2015;
- deterioration of abstracted water quality or such water intended for use in the future for human consumption such that additional treatment would be required to enable such use; and
- a breach of statutory surface water Environmental Quality Standards (EQS), and/or the input of a substance in groundwater resulting in a significant and sustained upward trend in concentration of contaminants.

***Environmental Permitting Regulations 2016***

1.4.5 The Environmental Permitting Regulations aim to provide comprehensive help for those operating, regulating, or interested in facilities that are covered by the Environmental Permitting (England and Wales) Regulations 2010 SI 2010/675 (as amended) ('the Regulations'). It describes the main provisions of the Regulations and sets out how the Regulations should be applied and how particular terms should be interpreted in England and Wales.

***Industrial Emissions Directive 2010***

1.4.6 The Industrial Emissions Directive (IED) 2010/75/EU commits EU member states to control and reduce the impact of industrial emissions on the environment, including releases of hazardous substances to land (i.e., to soil and groundwater). The permit requirements for installations falling under the IED require operators to carry out periodic monitoring of groundwater and soil quality or justify the absence of monitoring as part of an environmental risk assessment in terms of a systematic appraisal of the risk of contamination to soil and/or groundwater.

***Water Resources Act 1991***

1.4.7 The Water Resources Act 1991 (WRA) sets national regulatory controls and restrictions used to protect the water environment. Under Section 85 of the WRA, it is an offence to cause or knowingly permit any poisonous, noxious, polluting matter or any solid waste matter to enter into controlled waters, which include groundwater and surface waters.

## Land Contamination

1.4.8 The following legislation is relevant to land contamination issues:

- Part IIA of The Environmental Protection Act 1990 (EPA) (Gov.UK, 1990);
- Contaminated Land (England) Regulations 2006 (as amended) (Gov.UK, 2006); and
- Contaminated Land Statutory Guidance 2012 (DEFRA, 2012).

***Environmental Protection Act 1990***

1.4.9 The EPA outlines the legal responsibilities for dealing with contaminated or potentially contaminated land, contained within Part IIA. Within the EPA contaminated land is defined as 'any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that (a) significant harm is being caused or there is a significant possibility of such harm being caused; or (b) pollution of controlled waters is being, or is likely to be, caused'.

1.4.10 Part IIA of The EPA 1990 was introduced by The Environment Act 1995 (Environment Act, 1995) and provides an overarching framework for the control of risks to the environment or human health from land contamination arising from historical or current site uses. It outlines the responsibilities of Local Authorities to inspect and act based upon suitable risk assessment in accordance with Statutory Guidance, with the exception of 'Special Sites' that are regulated by the Environment Agency.

***Contaminated Land Regulations 2006***

1.4.11 These regulations apply to England and set out provisions relating to the identification and remediation of contaminated land under Part IIA of the EPA 1990. The regulations also include additional description of contaminated land that is required to be designated as a 'Special Site'. The regulations also state the Environment Agency will be the enforcing authority for any sites which fall under the definition of a 'Special Site', whereas lo1.4.12cal authorities will be the enforcing authority in relation to any other type of site.

## National Legislation

1.4.12 New development is regulated under the Town and Country Planning Act 1990 (as amended). This regime provides a mechanism for the planning authority to regulate development of land through land use planning.

***National Planning Policy Framework (NPPF) 2021***

1.4.13 In England, the NPPF provides policy on the implementation of contaminated land and pollution management requirements to address contamination risks associated with future site uses through the planning system. NPPF includes the following in relation to contaminated land:

1.4.14 Paragraph 120:

"c) *give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land"*

1.4.15 Paragraph 174: "Planning policies and decisions should contribute to and enhance the natural and local environment by:

*e) Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and,*

f) *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate".*

1.4.16 Paragraph 185: "Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

*a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
*b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
*c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."*

1.4.17 Paragraph 183: "Planning policies and decisions should ensure that:

*a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);*
*b) After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and*
*c) Adequate site investigation information, prepared by a competent person, is available to inform these assessments."*

1.4.18 Paragraph 184: “Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/ or landowner”.

## 1.5 Consultation

### Scoping

1.5.1 Table 1-4 provides a summary of key points raised during scoping.

**Table 1-4: Key points raised during scoping**

| ID | Consultee | Points raised | Response |
|---|---|---|---|
| 3.10.1 | PINS | The Applicant proposes to scope out contamination of soils on the basis that the majority of the site is greenfield with only limited sources of contamination at or within close proximity to the site. In the absence of the results of the ground investigation the potential for significant effects due to contamination cannot be ruled out and an assessment should be provided based on relevant standards. | Following the receipt of the Scoping Opinion (Appendix 4.2, App Doc Ref 5.4.4.2), a land quality assessment has been included into the ES. Findings of the ground investigation have also been included in Section 3.1 (Current baseline). |
| 3.10.3 | PINS | The Applicant proposes to scope out an assessment of effects on minerals and mining resources as no mineral resources at proposed WWTP and MSA located in areas of the Proposed Development is unlikely to represent a significant effect. Considering the location of the MSA within Scheme Order Limits and design flexibility sought in the DCO, Planning Inspectorate does not agree to scope out the assessment of effects on minerals and mining resources. ES should highlight the potential quantitative effects on minerals, any proposed mitigation and significance of any residual effects. | Following the receipt of the Scoping Opinion, an MSA assessment has been included into the ES. Also see Appendix 14.5 Mineral Safeguarding Area calculation (App Doc Ref 5.4.14.5). Details are included in Section 3.1 (current baseline) and Section 4 (Assessment of effects). |
| 3.10.5 | PINS | The Applicant proposes a study area of 250m from the site as it is suggested that the migration of contamination is likely to be minimal beyond this. However, If any contamination pathways exist | Clarity on the chosen study area with justification is provided in Section 2.3 (Study area). |

| ID | Consultee | Points raised | Response |
|---|---|---|---|
| | | beyond 250m from the site, the study area should be extended to accommodate these risks. | |
| 3.10.6 | PINS | The Scoping Report indicates that there is the potential for unexploded bombs at the site and that a specialist will be consulted to undertake further assessment to confirm potential risks of encountering UXO. The ES should incorporate the findings of this assessment and the potential for any likely significant effects. | The assessment to confirm potential risks of encountering UXO was undertaken, and the findings of the assessment are incorporated in Section 3.1 (Current baseline). |
| N/A | Greater Cambridge Shared Planning | It is noted that Section 5.2 (Structure of the Environmental Statement) Table 5.1 has 'scoped out' land quality. We do not agree with this proposal and recommend that land quality is 'scoped in', as suggested elsewhere in the EIA scoping report. | Following the receipt of the Scoping Opinion, a land quality assessment has been included in the ES. |
| N/A | Greater Cambridge Shared Planning | Section 15.5 states, "The baseline conditions for land quality are described for the three zones within the EIA Scoping boundary as [sic] set out in Appendix H". However, Appendix H displays Mineral Safeguarding Areas and no other land quality information. We would expect a plan depicting land quality considerations (including land use and vulnerability) when discussing land quality. | A drawing showing potential contamination sources along the route of the Proposed Development has been included in the ES (Figure 14.1, Technical Chapter Figures, App Doc Ref 5.3.14). A description of the land use is included in Section 3.1 (Current baseline). As land use is mainly agricultural, a separate plan has not been produced. |
| N/A | Greater Cambridge Shared Planning | Section 15.5 also states that the baseline will be further supported by the completion of a land contamination, Preliminary Risk Assessment (PRA) of the area within the EIA Scoping boundary. We would like clarification that this covers all three zones of the Proposed Development fully. | PRA covers all three zones of the Proposed Development fully (see Appendix 14.1: Preliminary Risk Assessment Report App Doc Ref 5.4.14.1). |

| ID | Consultee | Points raised | Response |
|---|---|---|---|
| N/A | Greater Cambridge Shared Planning | In reference to tables 15-4 and 15-5 (summarising 'potential contamination sources' and 'identified receptors' respectively), we expect that these tables would be reviewed based upon the results of the PRA. This is because the PRA report will reveal actual data on the site, and therefore a conceptual model and associated proposals will need review and update. | The ES includes a review of these tables based on the findings of the PRA (Appendix 14.1: Preliminary Risk Assessment Report App Doc Ref 5.4.14.1). |
| N/A | Greater Cambridge Shared Planning | Section 15.6 states that a ground investigation for the purposes of geotechnical, contaminated land and hydrogeological baseline data collection is currently underway at the site. However, it does not specify where at the site and for which zones. Standard procedure is to submit a full desk study, PRA and ensuing remedial proposals where required. We expect to see all this information as soon as it is available. | A PRA has been completed to support the ES and inform the assessment. This is available for review (see Appendix 14.1: Preliminary Risk Assessment Report, App Doc Ref 5.4.14.1). Ground investigation data are also presented within this chapter.<br>The subsequent stages following LCRM will be undertaken as part of the embedded mitigation. |
| N/A | Greater Cambridge Shared Planning | Paragraph 15.8.2 lists potential Impacts per zone for both construction and operational phases. We anticipate that this may need review following the PRA and decommissioning details of the existing sites. | The ES includes a review of these based on the findings of the PRA (Appendix 14.1: Preliminary Risk Assessment Report App Doc Ref 5.4.14.1). |
| N/A | Greater Cambridge Shared Planning | We note that the use of spoil from excavation and tunnelling activities to create the rotunda may also present land contamination issues and this should be included in the assessment. | The PRA considers sources of contamination along the excavation and tunnelling routes. As a mitigation measure it requires a Materials Management Plan (MMP)/exemption to be produced for the Proposed Development to ensure that any material that is not natural and uncontaminated and is proposed for reuse as part of the Proposed Development, is suitable for use and does not pose any significant risk to controlled |

| ID | Consultee | Points raised | Response |
|---|---|---|---|
| | | | waters or human health. This has been considered in the assessment. |
| N/A | Greater Cambridge Shared Planning | Overall, we conclude that due to variations in expected land quality in the 3 zones, development proposals in the 3 zones and the scope and nature of the overall development, land quality is 'scoped in' in the EIA and further into the ES. | Following receipt of the Scoping Opinion (Appendix 4.1, App Doc Ref 5.4.4.1), a land quality assessment has been included into the ES. |
| N/A | Fen Ditton Parish Council | Clause 15.5.30 and Table 15-5 identify "drainage channels on and off-site" as having Low Sensitivity. This is incorrect since these channels provide pathways to Quy Fen SSSI, are close to PROWs and may be used for irrigation or sub-irrigation. | The sensitivity of receptors has been redefined in the ES in Section 2.2. In terms of land quality, the sensitivity remains low. Assessment relating to water resources can be found in Chapter 20: Water resources (App Doc Ref 5.2.20). |
| N/A | Fen Ditton Parish Council | Table 15.7 should cross reference the risk of sewage overflows at the proposed works in addition to pipeline leakages and bursts as described in our comments on Chapter 21. | Pipe and tank leakages are assessed in Chapter 20: Water Resources (App Doc Ref 5.2.20). |
| N/A | Public Health England | We would expect the Applicant to provide details of any hazardous contamination present on site (including ground gas) as part of a site condition report and associated risk assessment. Emissions to and from the ground should be considered in terms of the previous history of the site and the potential of the site, during construction and once operational, to give rise to issues. Public health impacts associated with ground contamination and/or the migration of material off-site should be assessed in accordance with the Environment Agency publication Land Contamination: risk management 11 and the potential impact on nearby receptors; control and mitigation measures should be outlined. | The PRA completed to support the ES follows LCRM guidance (Gov.UK, 2021) requirements (Appendix 14.1: Preliminary Risk Assessment Report. App Doc Ref 5.4.14.1). |

| ID | Consultee | Points raised | Response |
|---|---|---|---|
| N/A | Cambridgeshire County Council | The Minerals and Waste Planning Authority welcomes and agrees with the scoping in of the topic of mineral resource use and consideration of the designated Mineral Safeguarding Areas as set out in paragraph 17.12.1. | Consideration of MSA is given in Section 3.1 (Current baseline) and Section 4 (Assessment of Effects) of this chapter. |
| N/A | Cambridgeshire County Council | We recommend that the Applicant reviews the extent of the Mineral Safeguarding Areas in H. Land Quality Figure. This seems to have only taken into account the sand and gravel Mineral Safeguarding Area, which is more extensive than shown in Figure H, and omits the Chalk Mineral Safeguarding Area which in part overlaps with the sand and gravel area. The MWPA are of the view that all of the EIA scoping boundary falls in one or both of the Mineral Safeguarding Areas. | Consideration of MSA including the Chalk is considered in Section 3.1 (Current baseline) and Section 4 (Assessment of Effects) of this chapter. Also see Appendix 14.5 Mineral Safeguarding Area calculation (App Doc Ref 5.4.14.5) |
| N/A | Cambridgeshire County Council | The MWPA agrees with the principle that the effect of mineral extraction at existing minerals facilities can be scoped out as set out in paragraph 17.12.3. However, if mineral is extracted during the undertaking of excavations within Mineral Safeguarding Areas in accordance with criterion (i) of Policy 5 of the Cambridgeshire and Peterborough Minerals and Waste Local Plan (July 2021), this would not previously have been subject to assessment, so should be considered as part of the EIA. | Assessment of likely significant effects on MSA where minerals can be extracted is included in Section 4 (Assessment of Effects) of this chapter. This considers what potential mitigation can be undertaken to minimise impacts, such as removing and utilising minerals where practicable. Also see Appendix 14.5 Mineral Safeguarding Area calculation (App Doc Ref 5.4.14.5) |

## Technical Working Groups

1.5.2 Engagement with Technical Working Groups did not raise any points in relation to land quality.

## Statutory s42 consultation

1.5.3 Table 1-5~~Table 1-5~~ provides a summary of key points raised during statutory s42 consultation.

**Table 1-5: Key points raised during statutory consultation**

| Date | Consultee | Points raised | How and where addressed |
|---|---|---|---|
| 27 April 2022 | Cambridgeshire County Council | In order to help the local planning authorities, understand the extent to which local plan policy has been considered and reflected, it is requested that the Applicant update the relevant PEI (Preliminary Environmental Information Report) and Management Plan documents so that they include consideration of relevant local plan policy. Alternatively, a separate document could be prepared to demonstrate how local planning policy has been considered. Additional MWLP policies that are relevant include:<br>• Policy 1: Sustainable development and climate change.<br>• Policy 5: Mineral Safeguarding Areas (MSAS)<br>• Policy 17: Design<br>• Policy 18: Amenity Considerations<br>• Policy 20: Biodiversity and Geodiversity<br>• Policy 21: The Historic Environment<br>• Policy 22: Flood and Water Management<br>• Policy 23: Traffic, Highways and Rights of Way.<br>The Contaminated Land and Minerals PEI considers the topic of Mineral Safeguarding Areas (MSAs). These are areas safeguarded under Policy 5: Mineral Safeguarding Area of the Cambridgeshire and | Of the policies listed, the following are relevant to land quality: Policy 5 has been considered within the assessment of likely significant effects on MSA where minerals can be extracted. This is included in Section 4 of this chapter. This considers what potential mitigation can be undertaken to minimise impacts, such as removing and utilising minerals where practicable prior to development.<br>Policy 20, which relates to geodiversity, is considered in Section 1.3 (Planning policy context). |

| Date | Consultee | Points raised | How and where addressed |
|---|---|---|---|
| | | Peterborough Minerals and Waste Local Plan (2021). Reference to, and consideration of, the Plan and MSAs is welcomed. The MWPA suggests for completeness that Policy 5 should be referenced within the PEI. | |
| 27 April 2022 | Cambridgeshire County Council | The MWPA notes that the Sand and Gravel MSA shown on page 6 of the PEI appears to show the MSA from the old Cambridgeshire and Peterborough Minerals and Waste Core Strategy – Policies Map C (2011). The Applicant should update their map to reflect the 2021 extents. It should be noted that the sand and gravel MSA now covers a much larger area, and that the Proposed Development now also partially falls within the Chalk MSA. The MWPA, therefore, also requests that the Applicant updates and reassesses their assessment in light of the revised MSA areas. | Plans have been updated with current MSA. The ES includes a calculation of the impacted areas for both the Chalk and Sand and Gravel MSA based on the updated plans (Appendix 14.5, App Doc Ref 5.4.14.5). |
| 27 April 2022 | Cambridgeshire County Council | It would be appreciated if the Applicant could confirm what safeguards are to be introduced when decommissioning the existing site in terms of:<br>• Site Security<br>• Ongoing Maintenance to ensure direct impact on soils and groundwater and increased odour from the existing site<br>• The impact of any major lighting of the decommissioned site such as glare affecting traffic on the A14 | No demolition is proposed as part of the decommissioning works, rather emptying and decommissioning of tanks and structures. An Outline Decommissioning Plan (Appendix 2.3, App Doc Ref 5.4.2.3) sets out in detail measures to ensure that these activities do not result in harm to the surrounding environment.). |
| 27 April 2022 | Cambridgeshire County Council | In terms of the proposed new WWTP CCC would welcome information relating to mitigation measures aimed at preventing spray of wastewater, | As with the existing Cambridge WWTP, the design will mean that there is no means for ambient weather conditions to cause spray from operations equipment. |

| Date | Consultee | Points raised | How and where addressed |
|---|---|---|---|
| | | causing by changes in wind direction, coming on contact with walkers and cyclists, in the proposed recreation area new cycle walking routes and other PRoW. Please also see our comment under Landscape and Ecology Management Plan below. | Together with the presence of the earthwork bank as part of the landscape design this is considered sufficient embedded mitigation. |
| 27 April 2022 | South Cambridge District Council | It is noted that section 6.4 of the CoCP on 'Land Quality' makes reference to Part 2a of the Environmental Protection Act 1990 (EPA) as a means of setting out when land is to be regarded as contaminated. The Council's view is that the risks from contamination should also be assessed in terms of suitability for use in accordance with the NPPF. | The NPPF is referenced within Section 1.3 (Planning policy context) of this chapter. Assessment of contaminated land also follows LCRM guidance (Gov.UK, 2021). |
| 27 April 2022 | Fen Ditton Parish Council | FDPC draw attention again to the possibility that there is an historic landfill on the northern side of Field/Filly Lane towards its western end. Anecdotal information in Cambridge Archives refers to night soil being emptied in this area around the start of the 20th Century. This could be within the red line boundary and under or close to the proposed route of the Waterbeach transfer pipelines. | The Preliminary Risk Assessment (Appendix 14.1, App Doc Ref 5.4.14.1) recorded a coprolite pit adjacent to a field lane in historical mapping from 1903 to 1904. A ground investigation was undertaken in the area proposed for construction, and this did not identify any significant contamination sources.<br>The CoCP (Appendix 2.1, App Doc Ref 5.4.2.1) includes a protocol for unsuspected contamination and how to deal with this if encountered. |

## Statutory s47 local community consultation

1.5.4 The Consultation Report (App Doc Ref: 6.1) describes the consultation process that the CWWTPR project has followed, and Section 9 of that report details the responses to all comments made during this consultation. There were no matters raised in relevance to land quality.

# 2 Assessment Approach

## 2.1 Guidance

2.1.1 The National Planning Practice Guidance includes a dedicated section on land affected by contamination, refer to section 1.4.13 (Gov.UK, 2021).

2.1.2 Guidelines on assessment of land affected by contamination in England and Wales detail the process of identifying sources, pathways and receptors and associated pollutant linkages. This allows a conceptual site model and risk assessment to be produced. The guidance for this comprises Land Contamination Risk Management (Environment Agency, 2021) and Contaminated land risk assessment: A guide to good practice (CIRIA, 2001).

2.1.3 Contaminated Land Statutory Guidance 2012 (DEFRA, 2012) explains how local authorities should implement the Part 2A regime which provides the legal framework for dealing with contaminated land in England. The guidance explains how local authorities should go about deciding whether land is contaminated land in the legal sense of the term. It also elaborates on the remediation provisions of Part 2A, such as the goals of remediation, and how regulators should ensure that remediation requirements are reasonable. The guidance also explains specific aspects of the Part 2A liability arrangements, and the process by which the enforcing authority may recover the costs of remediation from liable parties in certain circumstances.

2.1.4 In the absence of other guidance, the Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 11: Geology and Soils offers guidance on potential impacts on geology, soils and designated sites in terms of an EIA. Professional judgement has been used to determine where this is applicable or not since the development is not for roads and bridges.

## 2.2 Assessment methodology

2.2.1 The general approach to assessment is described in Chapter 5: Assessment Methodology.

2.2.2 Following the preliminary assessment of the likely significant effects of the Proposed Development, any further mitigation measures (secondary mitigation) are identified and described. These mitigation measures would further reduce an adverse effect or enhance a beneficial one. The assessment of likely significant effects is then carried out taking into account the identified secondary mitigation measures to identify the 'residual' environmental effects.

2.2.3 This section provides specific details of the land quality methodology applied to the assessment of the Proposed Development.

2.2.4 The scope of this assessment has been established through the formal EIA scoping process with the PINS. A request for an EIA scoping opinion was made in 2021 see 'Scoping Report' (Appendix 4.2, App Doc Ref 5.4.4.2) of the ES.

2.2.5 The points raised at scoping and how they are addressed are provided in Section 1.5.

2.2.6 The spatial scope of assessment for land quality are provided in Section 2.3.

2.2.7 The assessment parameters approach described in Section 1.5 of Chapter 5 is addressed for Land Quality in Section 2.5.

## Impact assessment criteria

2.2.8 The general approach to assessment is described in Chapter 5: Assessment Methodology.

2.2.9 Following the preliminary assessment of the likely significant effects of the Proposed Development, any further mitigation measures (secondary mitigation) are identified and described. These mitigation measures would further reduce an adverse effect or enhance a beneficial one. The assessment of likely significant effects is then carried out taking into account the identified secondary mitigation measures to identify the 'residual' environmental effects.

2.2.10 This section provides specific details of the topic methodology applied to the assessment of the Proposed Development.

2.2.11 The methodology for assessing land contamination effects is based around the change in land contamination risks between the situation at baseline and those estimated to exist during the construction and operational stages. The stages involved in this assessment are discussed in more detail in the following sections.

2.2.12 For minerals, the assessment is based upon a matrix, where the effects are a product of the impact magnitude and receptor sensitivity.

2.2.13 The baseline scenario considers the sub-surface conditions within the study area as they exist at the current time (2022) and the impacts on any particular resources or receptors. To assess the baseline, technical aspects must be considered to recognise which are applicable to the Proposed Development.

2.2.14 The temporal scope covers the baseline conditions (2022) and anticipated period of construction. Assessment of the construction period considers the impacts and associated effects of construction on identified receptors within the spatial scope of the Proposed Development and associated works, including the remediation of any contamination if required. The post-construction/operational and maintenance phase of the Proposed Development will also be assessed.

## Development of a Conceptual Site Model and Qualitative Risk Assessment

2.2.15 The initial stage of the assessment is to identify potential land contamination sources/sites, pathways and receptors within the study area. For each site (or group of similar sites), the development of three conceptual site models (CSM) is undertaken (one at baseline, one at construction and one at operation). The CSM identifies where sources and receptors may interact through pathways (which is termed a pollutant linkage).

2.2.16 For each of the pollutant linkages, an estimation of the risk magnitude is undertaken by assessing the probability (likelihood) of pollution/harm occurring and the consequence of that pollution/harm (Table 2-1~~Table 2-1~~ and Table 2-2~~Table 2-2~~). This is undertaken through a qualitative risk assessment in accordance with Contaminated land risk assessment: A guide to good practice (CIRIA, 2001) (and LCRM).

2.2.17 Construction workers are not included in the CSM for the construction phase as any risks to construction workers will be mitigated by the measures outlined in the Construction Environmental Management Plan (CEMP) and in accordance with the Construction (Design and Management) Regulations 2015. The CEMP is a requirement of the CoCP (Appendix 2.1, App Doc Ref 5.4.2.1, Section 4.4).

2.2.18 The development of a conceptual site model and qualitative risk assessment allows the calculation of a magnitude of impact, by using probability and consequence.

## Magnitude of impact

### *Land contamination*

2.2.19 The assessment of land contamination effects uses the concept of change in risk to determine the significance of effect. There is no single standalone impact magnitude criterion – instead impact is assessed concurrently with effects as part of a change in risk. The degree of risk change considers both elements of impacts (i.e., as a result of change in activity as well as receptor sensitivity as part of the assessment).

2.2.20 The process for estimating risk for land contamination is estimated through assessing probability against consequence. Classification of probability can be found in Table 2-1~~Table 2-1~~ with classification of consequences in Table 2-2~~Table 2-2~~.

**Table 2-1: Classification of probability**

| Classification | Definition of the probability of harm/pollution occurring |
|---|---|
| High likelihood | The contaminant linkage exists, and it is very likely to occur in the short-term, and/or will almost inevitably be realised in the long-term, and/or there is current evidence of it being realised. |
| Likely | The source, pathway and receptor exist for the contaminant linkage, and it is probable that this linkage will occur. Circumstances are such that realisation of the linkage is not inevitable, but possible in the short-term and likely over the long-term. |
| Low likelihood | The source, pathway and receptor exist, and it is possible that it could occur.<br>Circumstances are such that realisation of the linkage is by no means certain in the long-term and less likely in the short-term. |
| Unlikely | The source, pathway and receptor exist for the contaminant linkage, but it is improbable that it will be realised even in the long-term. |

*Source: Adapted from CIRIA, LCRM, DMRB*

**Table 2-2: Classification of consequence**

| Classification | Definition of Consequence |
|---|---|
| **Human Health Receptors** | |

| Classification | Definition of Consequence |
|---|---|
| Severe | Acute damage to human health based on the potential effects on the critical human health receptor (e.g., through explosion of building because of ground gas ingress). Likely to result in 'significant harm' if exposure occurs. |
| Medium | Chronic damage to human health based on the potential effects on the critical human health receptor. Could result in 'significant harm' if exposure occurs. |
| Mild | Minimal short-term effects on human health based on the potential effects on the critical human health receptor. |
| Minor | No measurable effect on human health based on the potential effects on the critical human health receptor. |
| **Controlled Water Receptors** | |
| Severe | Equivalent to Environment Agency Category 1 pollution incident including persistent and/or extensive effects on water quality. Pollution of a Principal aquifer within a source protection area (inner and outer) or potable supply.<br>Pollution of a surface water course characterised by a breach of an EQS at statutory monitoring location or resulting in a change in the General Quality Assessment (GQA) grade of a river reach. |
| Medium | Equivalent to Environment Agency Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value. Pollution of a Principal aquifer outside a source protection area (inner and outer) or a Secondary A aquifer characterised by a breach of drinking water standards. Pollution of an industrial groundwater abstraction or irrigation supply that impairs its function.<br>Substantial pollution but insufficient to result in a change in the GQA grade of river reach. |
| Mild | Equivalent to Environment Agency Category 3 pollution incident including minimal or short-lived effect on water quality. Pollution of a Secondary A or B aquifer.<br>Low levels of pollution insufficient to result in a change in the GQA grade of a river reach or pollution of a surface water course without a quality classification. |
| Minor | No appreciable pollution, or slight pollution of a low sensitivity receptor such as a secondary (undifferentiated) aquifer or a surface water course without a quality classification. No observed effects. |
| **Ecosystem Receptors – Covered in Chapter 8: Biodiversity** | |
| **Property Receptors – Buildings, Foundations and Services** | |
| Severe | Collapse of a building or structure including the services infrastructure from explosion due to ground gases. |
| Medium | Significant damage to a building or structure including the services infrastructure impairing their function. |
| Mild | Damage to buildings/structures and foundations but not resulting in them being unsafe for occupation.<br>Damage to services but not sufficient to impair their function. |

| Classification | Definition of Consequence |
|---|---|
| Minor | No appreciable damage to buildings/structures, foundations and services. |

*Source: Adapted from CIRIA, LCRM, DMRB*

2.2.21 Following this, land contamination risk can be estimated, as seen in the matrix in Table 2-3~~Table 2-3~~. The definitions of risk for land contamination are presented in Table 2-4~~Table 2-4~~.

**Table 2-3: Estimation of risk for land contamination**

| Probability | Consequence | | | |
|---|---|---|---|---|
| | **Severe** | **Medium** | **Mild** | **Minor** |
| **High Likelihood** | 6 | 5 | 4 | 3 |
| **Likely** | 5 | 4 | 3 | 2 |
| **Low Likelihood** | 4 | 3 | 2 | 1 |
| **Unlikely** | 3 | 2 | 1 | 1 |

*Source: Adapted from CIRIA, LCRM, DMRB*

**Table 2-4: Estimation of risk for land contamination**

| Risk level | Definition |
|---|---|
| Very high risk (6) | There is a high probability that a contaminant linkage could exist between a source and a designated receptor resulting in detriment to the receptor. Investigation and remediation will be required prior to (or as part of) construction. During construction, further mitigation and monitoring measures are likely to be required. |
| High risk (5) | It is likely that a contaminant linkage exists with potentially a severe effect on designated receptors. Investigation and remediation are very likely to be required. |
| Moderate risk (4) | It is possible that an effect could arise to a designated receptor through a contaminant linkage. However, the effect is most likely to be moderate to minor. Further investigative work is likely to be required to clarify the risk. Some remediation works may be required. |
| Moderate/low risk (3) | It is possible that a contaminant linkage could exist, but if it does, any effects would normally be minor. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited. |
| Low risk (2) | There is a low possibility that a contaminant linkage could exist. However, should there be a linkage, the effect to the receptor (with regard to controlled waters) would normally be minor or negligible and the effect on human health would be negligible. No investigation or remedial works are likely to be required. |
| Very low risk (1) | It is unlikely that a contaminant linkage could exist between a source and a designated receptor. |

*Mott MacDonald Ltd, 2022*

***Minerals***

2.2.22 The magnitude of impact for minerals is shown in Table 2-5~~Table 2-5~~.

**Table 2-5: Estimation of magnitude of impact for minerals**

| Magnitude of impact | Description |
|---|---|
| Major | Major loss of resource or major severance (more than 70% of MSA removed or made inaccessible). |
| Moderate | Moderate loss of resource or moderate severance (30% – 70% of MSA removed or made inaccessible). |
| Minor | Minor loss of resource or minor severance (10% – 30% of MSA removed or made inaccessible). |
| Negligible | No significant impact (less than 10% of MSA removed or made inaccessible). |
| Beneficial | Project allows definition/exploration/sustainable working of resource, thereby reducing impact (e.g., traffic). |

*Mott MacDonald Ltd, 2022*

## Sensitivity of receptor

2.2.23 The criteria for defining receptor sensitivity for the assessment of impacts to land contamination and minerals are defined within Table 2-6~~Table 2-6~~.

**Table 2-6: Sensitivity of receptors/resources**

| Sensitivity | Land contamination | Minerals |
|---|---|---|
| Very High | **Human health**: High sensitivity land use such as residential developments with gardens or allotments.<br>**Surface water**: Site protected under EU wildlife legislation (Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar site); WFD High status.<br>**Groundwater:** Principal aquifer providing a regionally important resource or Source Protection Zone (SPZ). | Mining or mineral resource of national importance (strategic) currently being worked. |
| High | **Human health:** High sensitivity land use such as residential developments (no gardens or allotments).<br>**Surface water:** Site protected under UK wildlife legislation (Site of Special Scientific Interest (SSSI)); WFD Good status.<br>**Groundwater:** Principal aquifer which provides locally important resource. | Non-strategic mining or mineral resource currently being worked, or Specific Sites/Preferred Area for mining within a Mineral Planning Authority's (MPA) Local Plan. |
| Medium | **Human health:** Medium sensitivity land use such as public open space. | MSA within an MPA Local Plan. |

| Sensitivity | Land contamination | Minerals |
|---|---|---|
| | **Surface water:** Site protected under Local wildlife legislation (Site of Nature Conservation Interest (SNCI), Local Nature Reserve (LNR)), WFD status Moderate.<br>**Groundwater:** Secondary aquifer which provides water for agricultural or industrial use. | |
| Low | **Human health:** Low sensitivity land use such as commercial or industrial.<br>**Surface water:** WFD Poor status, or waterbody is not classified under the WFD.<br>**Groundwater:** Secondary aquifer with poor water quality not providing baseflow to rivers; non-aquifer. | Mineral Consultation Areas within an MPA Local Plan. |

*Mott MacDonald Ltd, 2022*

## Significance of effect

2.2.24 For the purpose of this assessment, any effects with a significance level of minor or less are considered to be not significant. Moderate and major effects (both beneficial and adverse) are considered to be significant.

***Land contamination***

2.2.25 Effects of land contamination will be assessed by comparing the difference in risk of each contaminant linkage at baseline to those at construction and at operational stages. This provides a way of assessing both the adverse and beneficial effects during construction and the operational period. Where there has been an overall decrease in environmental risk, the Proposed Development will be considered to have a beneficial effect on the environment in the long-term (even though there may be adverse short-term construction effects). Significance criteria are presented in Table 2-7.

**Table 2-7: Significance of effect criteria for land contamination**

| Significance of effect | Definition |
|---|---|
| Major adverse effect | An increase in contamination risk of 4 or 5 risk levels in the risk matrix, e.g., land that has a very low contamination risk in the baseline becomes a high or very high risk. |
| Moderate adverse effect | An increase in contamination risk of 2 or 3 risk levels in the risk matrix, e.g., land that has a low contamination risk in the baseline becomes a moderate or high risk. |

| Significance of effect | Definition |
|---|---|
| Minor adverse effect | An increase in contamination risk of 1 risk level in the risk matrix, e.g., land that has a low contamination risk in the baseline becomes a moderate/low risk. |
| Negligible effect | No change in contaminated land risks. |
| Minor beneficial effect | A reduction in contamination risk of 1 risk level in the risk matrix, e.g., land that has a moderate/low contamination risk in the baseline becomes a low risk. |
| Moderate beneficial effect | A reduction in contamination risk of 2 or 3 risk levels in the risk matrix, e.g., land that has a high contamination risk in the baseline becomes a moderate/low or low risk. |
| Major beneficial effect | A reduction in contamination risk of 4 or 5 risk levels in the risk matrix, e.g., land that has a very high contamination risk in the baseline becomes a low or very low risk. |

*Mott MacDonald Ltd, 2022*

***Minerals***

2.2.26 Effects of minerals are assessed by forming a significance matrix between the sensitivity/value of the resource and the impact from the Proposed Development. Significance criteria are presented in Table 2-8~~Table 2-8~~ and defined in Table 2-9~~Table 2-9~~.

**Table 2-8: Significance of effect for minerals**

| | | Sensitivity/value | | | |
|---|---|---|---|---|---|
| | | **Very High** | **High** | **Medium** | **Low** |
| Magnitude | **Major** | Major adverse | Moderate adverse | Moderate adverse | Minor adverse |
| | **Moderate** | Moderate adverse | Moderate adverse | Minor adverse | Minor adverse |
| | **Minor** | Minor adverse | Minor adverse | Negligible | Negligible |
| | **Negligible** | Negligible | Negligible | Negligible | Negligible |
| | **Beneficial** | Moderate beneficial | Moderate beneficial | Minor | Negligible |

*Mott MacDonald Ltd, 2022*

**Table 2-9: Significance criteria for minerals**

| Significance of effect | Definition |
|---|---|
| Major adverse | Considerable detrimental or negative impact (by extent, duration or magnitude) of more than local importance or in breach of recognised standards, policy or legislation. |
| Moderate adverse | Limited detrimental or negative impact (by extent, duration or magnitude). |
| Minor adverse | Slight, very short or highly localised detrimental or negative impact without a significant consequence. |
| Negligible | Imperceptible impact to an environmental resource or receptor. |

| Significance of effect | Definition |
|---|---|
| Minor beneficial | Slight, very short or highly localised advantageous or positive impact without a significant consequence. |
| Moderate beneficial | Limited advantageous or positive impact (by extent, duration or magnitude). |
| Major beneficial | Considerable advantageous or positive impact (by extent, duration or magnitude) of more than local importance or in breach of recognised standards, policy or legislation. |

*Mott MacDonald Ltd, 2022*

### Residual effect

2.2.27 The assessment of effects follows the approach set out within Chapter 5: Assessment Methodology. Effects have been assessed to take into account for both embedded (primary) mitigation, best practice and measures secured by legal requirements (tertiary mitigation), and after the application of further mitigation measures (secondary mitigation). Effects after mitigation are referred to as 'residual effects'.

## 2.3 Study area

2.3.1 The maximum area of land required for the construction, operation, and maintenance of the Proposed Development and decommissioning of the existing Cambridge WWTP, including land required for permanent and temporary purposes, within the Scheme Order Limits as provided within App Doc Ref 4.1.

2.3.2 The study area for land quality includes all resources and receptors within 250m of the Scheme Order Limits. The study area is shown in Figure 14.1, Technical Chapter Figures, App Doc Ref 5.3.14.

## 2.4 Temporal scope of assessment

### Construction

2.4.1 For the assessment, these effects will be taken to be those for which the source begins and ends during the construction and commissioning stages prior to the proposed WWTP becoming fully operational as set out in Chapter 2 Project Description.

2.4.2 The assumed assessment years for construction are from 2024 until 2028. Any extension to the duration of the construction would not impact upon the assessment for Land Quality.

### Operation and maintenance

2.4.3 For the assessment, these are the effects that, start once the proposed WWTP is commissioned and fully operational and includes the effects of the physical presence of the infrastructure, its operation, use and maintenance, including the permanent change in land use.

2.4.4 The assessment of operational effects will be the first full 12 months of operation (excluding any commissioning period for the proposed WWTP as this is part of the Construction Phase). The proposed WWTP proposes to become fully operational in 2028, therefore the assessment year for the Operational Phase is 2028.

***Duration of effects***

2.4.5 Timescales associated with these effects, regardless of phase are as follows:

- Short-term – endures for up to 12 months after construction or decommissioning;
- Medium-term – endures for 1-5 years;
- Long-term – endures for 5-15 years; and
- Permanent effects – endures for more than 15 years and / or effects which cannot be reversed (e.g. where buried archaeology is permanently removed during construction).

## 2.5 Baseline study

### Desktop data

2.5.1 A land contamination PRA in accordance with LCRM has been undertaken within the Scheme Order Limits. The PRA informed the design of two ground investigations for the purposes of geotechnical, contaminated land and hydrogeological baseline data collection; these have also been undertaken. The ground investigations were designed to obtain sufficient data to allow generic quantitative risk assessment and to identify any specific remediation or mitigation requirements for the Proposed Development as required under LCRM guidance.

2.5.2 Baseline information within the Land Quality study area was collected through a detailed desktop review of existing studies and datasets. These are summarised in Table 2-10.

**Table 2-10: Desktop information sources**

| Item or feature | Year | Source |
|---|---|---|
| Preliminary Risk Assessment | 2021 | Appendix 14.1, App Doc Ref: 5.4.14.1 |
| Envirocheck Reports by Landmark | 2018<br>2019<br>2021 | • Envirocheck Report by Landmark (2018), Order Number: 172033276_1_1<br>• Envirocheck Report by Landmark (2019), Order Number: 225020744_1_1<br>• Envirocheck Report by Landmark (2021), Order Number: 285568096_1_1 |

| Item or feature | Year | Source |
|---|---|---|
| | | Appendix B to the PRA (App Doc Ref 5.4.14.1) |
| Cambridge WWTP Relocation Hydrogeological Impact Assessment. | 2021 | Appendix 20.9 HIA (Site Selection Stage) (App Doc Ref 5.4.20.9) |
| British Geological Survey (BGS) Geoindex (onshore) map viewer | 2022 | British Geological Survey (BGS) [online] available at https://www.bgs.ac.uk/map-viewers/geoindex-onshore/ accessed in January 2022 |
| DEFRA Magic maps | 2022 | Department for Environment, Food and Rural Affairs (DEFRA) Magic Maps [online] available at https://magic.defra.gov.uk/ accessed in January 2022 |
| A preliminary ground investigation report for the transfer pipeline corridor from a pumping station off Bannold Drove, Waterbeach (hereafter referred to as Waterbeach pipeline) | 2022 | AF Howland Associates (March 2022) (AF Howland Associates, 2022) as Groundwater Investigation Waterbeach App Doc 5.4.14.6. |
| Zetica Unexploded Bomb (UXB) risk maps | 2022 | Zetica Risk Maps [online] available at https://zeticauxo.com/downloads-and-resources/risk-maps/ and accessed in January 2022 |
| A preliminary ground investigation report for the core site and associated infrastructure including the existing Cambridge WWTP | 2022 | Soil Engineering (Soil Engineering Ltd, 2022) as Appendix 14.9 Preliminary Ground Investigation Factual Report Cambridge WWTP (App Doc 5.4.14.9.) |
| Report on a Ground Investigation for Cambridge Waste Water Treatment Plant Relocation | 2022 | (Soil Engineering Ltd., 2022b) as Appendix 14.7 Ground Investigations Report Cambridge WWTP App Doc 5.4.14.7 |
| Report on a Ground Investigation for Cambridge Waste Water Treatment Plant Relocation Phase B | 2023 | (Soil Engineering Ltd., 2023) as Appendix 14.8 and Ground Investigations Report B Cambridge WWTP App Doc 5.4.14.8. |
| Geotechnical Interpretative Report | 2023 | (Mott MacDonald, 2023) as Appendix 14.10 Geotechnical Interpretative Report App Doc 5.4.14.10 |

### Surveys

2.5.3 In addition to existing information, non-intrusive and intrusive surveys were completed for specific information to support the PRA and obtain baseline data on land quality within the area of land required for the Proposed Development. Table 2-11 details the surveys completed in relation to the Proposed Development.

**Table 2-11: Summary of surveys for land quality**

| Survey | Coverage | Completed by | Date | Details |
|---|---|---|---|---|
| Site walkover | Area of land required for the proposed WWTP and Landscape Masterplan<br>Area of land required for the construction of the final effluent and storm flow pipelines | Mott MacDonald Ltd | May and December 2021 | To support site selection phase |
| Site walkover | Area of land required for the construction of the Waterbeach pipeline | Mott MacDonald Ltd | December 2021 | To inform PRA |
| Site walkover | Existing Cambridge WWTP | Mott MacDonald Ltd | July 2018 | To inform PRA |
| Ground investigation | Area of land required for the proposed WWTP, treated effluent discharge outfall to the River Cam (hereafter referred to as 'the outfall') and transfer pipeline | Soil Engineering | July to October 2021<br>(post-fieldwork monitoring in November 2021) | To inform baseline section of the ES and support LCRM process |
| Ground investigation | Area of land required for the construction of the Waterbeach pipeline | A F Howland | January 2022 | |

## 2.6 Maximum design envelope (Rochdale) parameters for assessment

2.6.1 The design parameters and assumptions presented are in line with the 'maximum design envelope' approach (base scheme design) as described in introductory chapters of the ES (2 and 5). For each element of this chapter the maximum design envelope parameters detailed within Table 2-12 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group.

2.6.2 The assessment parameters are based on the design of the proposed WWTP and access, waste water transfer tunnel route and outfall location, Waterbeach pipeline and connections within the existing Cambridge WWTP as described in Chapter 2: Project description. The assessment considers a realistic maximum design envelope based on the maximum scale of the elements and as a result, no effects of greater significance than those assessed are likely.

**Table 2-12: Maximum design envelope (Rochdale) parameters for land quality assessment**

| Potential impact | Maximum design scenario | Justification |
|---|---|---|
| Partial loss of river terrace deposits during construction | All excavations within the area of land required for the construction of the Waterbeach pipeline within MSA will be open cut with the exception of under-river or railway crossings. Impacted area calculated as the length of the Waterbeach pipeline multiplied by 30m width. The waste water transfer tunnel is below the MSA. | Working area along pipelines will be 30m width. Open cut will comprise excavating from ground level to 2m – 5m below ground level (bgl), within the footprint of the construction area. This will include the River Terrace Deposits, where present. The location of the proposed WWTP is outside the sand and gravel MSA. The transfer pipeline will be in a tunnel 10m – 25m deep and therefore will be located beneath MSA. |
| Loss of MSA (Chalk) | Chalk may be encountered during open cut excavations within the area of land required for the construction of the Waterbeach pipeline within the MSA. Assumed that the top 2m would be affected.<br>Chalk will be encountered at the area of land required for the construction of the proposed WWTP which is within the MSA. As a maximum design scenario, the whole footprint of the proposed WWTP has been included in the calculation of impacted area. (In practice, it will be lower than this, mainly associated with locations of structures. It is assumed that the majority of the site will comprise shallow foundations with potential for some piling for heavy structures). | Working area within the area of land required for the construction of the Waterbeach pipeline will be 30m width. Open cut will comprise excavating from ground level to 2m – 5m bgl within the footprint of the construction area. Chalk is encountered at various depths and absent in some locations along utility routes during ground investigation. In some locations the Chalk will not be encountered or only the top metre may be affected if maximum depths are excavated. In other areas, such as the proposed WWTP, Chalk is present at shallower depths. Transfer pipeline will be in a tunnel 10m – 25m deep and therefore will be located beneath MSA.<br>Shafts will penetrate from ground level to between 15 and 25m bgl. These will therefore interact with the Chalk. |
| Impact on human health from contact with soils during construction and operation including earthwork bank | Workers at the proposed WWTP will have access to the earth bank.<br>Materials to be used in the earth bank are from excavated material from tunnelling to install the transfer pipeline, from within the area of land required for the proposed | Ground investigation has not identified any significant made ground or soil contamination within land required for the Proposed Development. Made ground was encountered at the existing Cambridge WWTP but this is not part of the material to be reused within the Proposed |

| Potential impact | Maximum design scenario | Justification |
|---|---|---|
| | WWTP and suitable surplus material from the area of land required for the excavation of the final effluent, storm pipeline and the Waterbeach pipeline construction activities and are not contaminated. | Development. Materials proposed for reuse are not anticipated to be contaminated. |
| Impact on human health as a result of inhalation of dust during construction | Construction workers typically on site for ten-hour shifts during construction. Potential for dust to reach residential areas. Dust from on-site soils unlikely to be contaminated. | Ground investigation has not identified any significant made ground or soil contamination within land required for the Proposed Development. Dowsing down of dusts will be undertaken as required during construction. |
| Impact on groundwater from construction activities* | Piled foundations required at proposed WWTP. Horizontal Directional Drilling (HDD) within Gault Formation, open cut within superficial deposits, shaft sites through Chalk and into the Gault Formation. | Maximum depth of excavations of 2m – 5m for open cut, 24m for HDD and 28m for the terminal pumping station shaft and temporary shafts. |
| Impact on surface waters from construction activities* | Dewatering is required for the construction of temporary shafts to construct the waste water transfer tunnel. Water from excavations will be removed and discharged to surface waters through agreement with the Environment Agency. Discharges may be required to the River Cam, where there is an access shaft being constructed. Groundwater is unlikely to be significantly contaminated. | Ground investigation has identified presence of some metals in groundwater and surface waters, suggesting this is representative of background water quality.<br>Represents activity with potential for dewatering. |
| | Testing and commissioning of sub surface structures will follow industry standards. | Represents established methods which require specific controls and development of risk assessment and method statements related to the commissioning activities. |
| | Wet commissioning of the Waterbeach pipeline will be through the use of water. | Represents activity in commissioning which could result in release of liquids to surrounding area. |

| Potential impact | Maximum design scenario | Justification |
|---|---|---|
| Impact on soil and groundwater* during operation – leaks and spills | Potential for minor leaks and spills only within the proposed WWTP.<br>Areas with the potential for contamination will have an impermeable surface with a segregated drainage system.<br>The Waterbeach pipeline will comply with industry standards regarding materials and testing for pressurised pipelines. Monitoring of pressure integrated into system to detect leakage through loss of pressure. | Proposed tanks have solid concrete foundations, will be bunded and have level and leak monitors.<br>Pipes will be gravity fed; sludge lines on the proposed WWTP are above ground level (pressure fed). |
| | During operation an Environmental Permit will be in place which will include the requirement for a risk assessment and management of the site according to a written management system ~~n Environmental Management System (EMS)~~ including spill response procedures. | During operation an Environmental Permit will need to be in place. The written management system would be used in support of environmental permit application and once operation commences the operator must implement the management system or they will be in breach of the permit. |
| Decommissioning | Decommissioning includes emptying, cleaning and decommissioning of tanks only.<br>Decommissioning management plan will be applied and details of this plan will be agreed with the Environment Agency. | Impacts to ground during decommissioning are mitigated by measures set out in the Outline Decommissioning Plan (Appendix 2.3, App Doc Ref 5.4.2.3). |

** Refer to Chapter20: Water resources for detailed assessment*

## 2.7 Impacts scoped out of the assessment

2.7.1 The EIA Scoping Report (Appendix 4.2, App Doc Ref 5.4.4.2) was submitted to PINS in October 2021 and a Scoping Opinion (Appendix 4.1, App Doc Ref 5.4.4.1) received in November 2021. The items scoped out as agreed by PINS are summarised in Table 2-13.

**Table 2-13: Impacts scoped out of the land quality assessment**

| Potential impact | Justification |
|---|---|
| Potential impact on geodiversity including geological SSSI, regionally or locally important geological sites or non-designated outcrops/features of interest. | Scoped out as there is no evidence of any sites within 250m of the scoping boundary. |

2.7.2 The EIA Scoping Report (Appendix 4.2, App Doc Ref 5.4.4.2) originally scoped out land contamination on the basis that it would be dealt with through the planning regime. However, PINS did not agree with this approach and therefore we have scoped it into this ES.

## 2.8 Mitigation measures adopted as part of the Proposed Development

2.8.1 This section refers to the mitigation types, as defined of Chapter 5: EIA Methodology, and how they apply to the assessment of Land Quality.

2.8.2 In developing the Proposed Development through an iterative process including consultation and engagement with consultees, and through the Environmental Impact Assessment, (EIA) the Applicant has sought to identify and incorporate suitable measures and mitigation for potentially significant adverse effects, as well as maximising beneficial effects where possible.

2.8.3 Some measures are **'embedded'** in the design of the Proposed Development for which consent is sought by virtue of the scope of the authorised development as set out in Schedule 1 to the DCO and the accompanying Works Plans. These are considered **primary mitigation**. For example, adjustment of Order Limits to avoid sensitive features, amending the sizing and location of temporary access routes and compounds.

2.8.4 Secondary measures may be detailed activities for example the preparation of detailed AIMS in accordance with the CoCP, the preparation and delivery of a monitoring plan for specific matters (air quality, water quality) or the preparation and delivery of specific environmental management plans (for example air, noise, water), and the preparation and implementation is secured through the CoCP. These secondary measures are differentiated from the good practice measures

2.8.5 Tertiary measures comprise good practice measures (such as measures within Considerate Contractors Scheme) and measures integrated into legal requirements secured through environmental permits and consents (least flexible as either the legislation exists to create the mitigation or does not (i.e. Protected Species Licensing).

2.8.6 Section 2 of Chapter 5: Assessment Methodology sets out required permits and consents related to the Proposed Development.

2.8.7 Where beneficial effects are voluntarily introduced without the requirement to mitigate an effect, these are termed 'enhancement measures'.

2.8.8 The remainder of this section sets out the embedded measures (primary) and tertiary, and secondary/additional measures and enhancements relevant to the assessment of Land Quality.

## Primary (embedded) and tertiary measures

2.8.9 Primary and tertiary mitigation form part of the Proposed Development and therefore, the preliminary assessment of effects takes account of these measures.

2.8.10 Table 2-14~~Table 2-14~~ sets out the embedded mitigation measures that will be adopted during the construction, operation, maintenance and decommissioning of the Proposed Development.

**Table 2-14: Primary and tertiary mitigation measures relating to land quality adopted as part of the Proposed Development**

| Mitigation measures | | Type | Applied to | Justification |
|---|---|---|---|---|
| **Pre-construction** | | | | |
| Contaminated land risk assessment | Any pre-existing contamination would be adequately managed through the contaminated land regime from LCRM guidance to ensure that the operational area is suitable for use. The LCRM guidance details the steps that will need to be followed as the Proposed Development is progressed through the development and planning process. These steps include the production of a Preliminary Risk Assessment (PRA) and completion of an appropriate ground investigation (which have been partially undertaken at the time of writing), tiered stages of risk assessments together with an assessment of unacceptable pollutant linkages. Where such linkages are found, a remediation options appraisal and strategy will be produced. | Tertiary | All construction areas | Follows UK planning requirements and guidance |
| Suitability of materials reuse | Application of CL:AIRE Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) for the reuse of excavated waste materials (if required). | Tertiary | All construction areas (if required) | To comply with Environment Agency requirements and guidance |
| **Operation** | | | | |
| Exposure of future site users to potentially contaminated soils, groundwater or ground gases | Measures outlined in the pre-construction section relating to land contamination risk assessment would ensure that during the operational phase that pre-existing contamination would not pose an unacceptable risk to operation of the proposed development. | Tertiary | All construction areas | Follows UK planning requirements and guidance |
| | Primary mitigation measures will ensure that the design of the operational site includes appropriate bunding of tanks. | Primary | WWTP site | To provide appropriate containment systems within the operational WWTP |
| **Decommissioning** | | | | |

| Mitigation measures | | Type | Applied to | Justification |
|---|---|---|---|---|
| Decommissioning of tanks | Measures will be put in place to prevent and control the spillage of oil, chemicals and other potentially harmful liquids in accordance with the Control of Pollution (Oil Storage) (England) Regulations 2001 and Dangerous Substances and Explosive Atmospheres Regulations 2002.<br>Decommissioning will follow requirements set out by the Environment Agency to rescind the current operational permits, specifically the final effluent and storm discharge consents, and sludge treatment operation permit. | Tertiary | Existing WWTP and Waterbeach WRC | To comply with UK guidance and regulations such as Environment Agency Guidance RGN 9: Surrender. |

## Secondary measures

2.8.11 Secondary mitigation measures applied during construction are set out in the Code of Construction Practice (CoCP). These include use of a Construction Environmental Management Plan (CEMP), a Pollution Incident Control Plan and an Outline Soil Management Plan.

2.8.12 Section 7.4 of the CoCP Part A, Land quality, includes measures in relation to soil management including stockpile controls.

2.8.13 Construction dust effects will be mitigated proportionally, using the recommendations within the Institute of Air Quality Management (IAQM) 'Guidance on the assessment of dust from demolition and construction'.

2.8.14 Section 5.2 of the CoCP Part A, Training and Site Induction includes a requirement for all personnel to be properly inducted and to have the required Personal Protective Equipment (PPE). The site induction will also cover welfare facilities and pollution prevention measures.

2.8.15 Section 7.4 of the CoCP Part A, Land Quality sets out an unexpected contamination protocol in the event that contamination is encountered which was not previously anticipated.

2.8.16 Section 7.4 of the CoCP Part A, Land Quality includes a requirement for the Environmental manager to develop a UXO mitigation strategy in accordance with a Guide for the Construction Industry (CIRIA, 2009).

***Construction***

2.8.17 During the construction phase, the CoCP and associated management plans specify the range of measures to avoid and minimise impacts that may occur in construction (CoCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1). Post grant of the DCO and prior to commencement of construction of specific construction activities the contractor will prepare the CEMP and associated sub-plans as specified in the COCP Part A. These detailed plans will be approved by the Employer. The CEMP and associated management plans will remain 'live' documents and periodically modified throughout the duration of construction.

2.8.18 The CoCP details the measures that will need to be taken to ensure that construction works themselves do not introduce new contamination into the construction site; and also how to manage pre-existing contamination that could be encountered. This requires the appointed contractor to have in place appropriate consents for works that could affect surface water or groundwater, and to implement specific measures to protect springs, boreholes and watercourses, including control of surface water runoff.

2.8.19 An Agricultural Land Classification (Appendix 6.1, App Doc Ref 5.4.6.1) and outline Soil Management Plan (SMP) (Appendix 6.3, App Doc Ref 5.4.6.3) have been produced which sets out how soils are to be managed in accordance with Defra's Code of Practice (CoP). This will ensure that the quality of soil resources, won from the site, is maintained during construction so that they remain suitable for reuse, do

not become contaminated and ultimately do not become waste. This Outline SMP will be developed into a full SMP by the appointed contractor.

***Decommissioning***

2.8.20 Decommissioning of the existing Cambridge WWTP would be subject to a Decommissioning ~~Management~~ Plan which is to be agreed with the Local Planning Authority (LPA). An outline Decommissioning ~~Management~~ Plan (Appendix 2.3, App Doc Ref 5.4.2.3) describes measure applied to this activity. Post grant of the DCO and prior to commencement of decommissioning a detailed plan will be prepared and agreed with the LPA.

## 2.9 Assumptions and limitations

### Data limitations and assumptions

2.9.1 An inherent limitation of ground investigation is that the data obtained is from specific points within a wider study area. The design of the exploratory hole locations follows best practice and targets potential sources, however there is a possibility that variations in ground conditions are present between these discrete points.

### Assessment assumptions

2.9.2 Groundwater and surface waters are included as secondary receptors from impacted ground conditions (i.e., pre-existing contamination), however, the direct potential impacts of the Proposed Development on surface and groundwater resources are addressed in Chapter 20: Water resources. This includes impacts to water quality from dewatering and discharge of these waters; impacts to water quality from leaks and spills from tanks or pipelines/tunnels; and impacts to water quality from turbidity created as a result of shaft or tunnel construction.

2.9.3 This chapter excludes agricultural soils as this is covered in Chapter 6: Agricultural Land and Soils Resources (App Doc Ref:5.2.6)

2.9.4 Land contamination has the potential to affect ecological resources. Ecological effects are considered in Chapter 8: Biodiversity (App Doc Ref 5.2.8).

2.9.5 Remediation of contamination can lead to a requirement for disposal of contaminated materials. Issues of on-site treatment and re-use of contaminated materials will be dealt with in the land quality assessment, whereas issues of the disposal of contaminated soils off site are dealt with in Chapter 16: Material Resources and Waste.

2.9.6 This chapter does not assess impacts to construction workers as any impacts will be mitigated through the CoCP (Appendix 2.1 & 2.2, App Doc Ref 5.4.2.1 & 5.4.2.2). Additionally, construction workers will adhere to a site-specific risk assessment and method statement which will mitigate any potential risks from contaminated soils.

2.9.7 This assessment considered the CoCP as committed mitigation. The Outline Decommissioning Plan (Appendix 2.3, App Doc Ref 5.4.2.3) includes mitigation associated with decommissioning works for the site.

2.9.8 The assessment includes decommissioning works as set out in Chapter 2: Project Description (App Doc Ref:5.2.2), which comprises emptying and decommissioning of tanks only. The site of the existing Cambridge WWTP will then be handed over for redevelopment and subsequent decommissioning works outside the scope of this assessment.

# 3 Baseline Environment

## 3.1 Current baseline

### Current and historical land use

***Land required for the construction of the proposed WWTP and Landscape Masterplan***

3.1.1 Historical maps (1887 – 2019) covering the land required for the proposed WWTP have been reviewed. The mapping indicates that land within the Scheme Order Limits have generally been occupied by open field/agricultural land since the publication of the oldest map. A pond was identified on-site in 1886 but is no longer shown, which may indicate that this feature has been infilled. The land is currently used for arable farming.

3.1.2 The surrounding land use was also historically agricultural with a railway (now dismantled) running along the south-eastern boundary. Current surrounding land use includes the A14 road which runs along the south-western boundary.

***Land required for the construction of the outfall and the waste water transfer tunnel***

3.1.3 The waste water transfer tunnel route leading from the existing Cambridge WWTP to the proposed WWTP is indicated to underlie the River Cam, the B1047 Horningsea Road, the A14 and a railway line. The remainder of this area has remained in continuous agricultural use. The waste water transfer tunnel route extends into the existing Cambridge WWTP which is currently in use. The existing Cambridge WWTP was identified on historical maps as a sewage farm in 1904, expanding until 1981.

3.1.4 The indicative treated effluent transfer pipeline route runs approximately 300m – 400m north of the waste water transfer tunnel (described above). The route, however, does not extend as far west towards the existing Cambridge WWTP and instead ends at the outfall. The land use in this area has been mainly agricultural with the A14 present to the south and the B1047 Horningsea Road to the east.

***Land required for the Waterbeach pipeline***

3.1.5 The land use along the Waterbeach pipeline is generally agricultural with the exception of some areas of residential use, the railway line in the north and the existing Waterbeach WRC. The route crosses beneath the River Cam in the north. Waterbeach Barracks were historically present to the west of the northern section of pipeline, although this is not within the study area (750m west of the Proposed Development).

3.1.6 Brick works and kilns were present in 1904 near Horningsea 250m west of the proposed Waterbeach pipeline.

## Geology

***Land required for the construction of the proposed WWTP and Landscape Masterplan***

3.1.7 Geological mapping (BGS GeoIndex) indicates that no superficial deposits are present across the land required for the proposed WWTP. BGS mapping indicates that this area is underlain by bedrock comprising the West Melbury Marly Chalk Formation (part of the Grey Chalk Subgroup) (Figure 14.2, Technical Chapter Figures, App Doc Ref 5.3.14). The total thickness of the West Melbury Marl Chalk Formation in the area was indicated to be approximately 10m based on historical geological logs from boreholes along the A14 and Low Fen Drove Way.

3.1.8 The soil engineering ground investigation included a number of exploratory holes in the area of the proposed WWTP which were completed for geotechnical and geo-environmental purposes. Exploratory hole location plans are included in Technical Chapter Figures (App Doc Ref 5.3.14), Figure 14.3 – 14.7. The borehole logs generally confirm the published geology, and findings are summarised in Table 3-1~~Table 3-1~~.

**Table 3-1: Encountered Geology – proposed WWTP**

| Encountered strata | Typical description | Typical thickness (m) | Depth to base (m bgl) |
|---|---|---|---|
| Topsoil | Slightly gravelly sandy clay. | 0.3 – 0.5 | 0.3 – 0.5 |
| Made ground (TP_STW_004, TP_STW_005, TP_STW_021 and BH_STW_12A only) | Slightly sandy gravelly clay. Gravel is brick, flint and quartz. | 0.3 – 0.5 | 0.3 – 0.5 |
| Possible River Terrace Deposits (limited locations only) | Sandy gravelly clay, fine to coarse calcareous sand and fine to coarse gravel. | 0.2 – 1.7 | 0.3 – 2.0 |
| West Melbury Chalk | Structureless Chalk comprising calcareous clay. | 7.25 – 13.41 | 9.0 – 13.5 |
| Cambridge Greensand Member | Very stiff greenish slightly gravelly clay and fine sand. Gravel is coprolite. | 0.15 – 0.5 | 9.25 – 13.87 |
| Gault Formation | Very stiff dark grey clay. | Proven to 36.07 | Proven to 47.6 |

** Made ground was encountered in discrete areas of Scheme Order Limits only. No evidence of visual or olfactory contamination.*

***Land required for the construction of the outfall to the River Cam and waste water transfer tunnel***

3.1.9 Geological mapping (BGS GeoIndex) indicates varying superficial geology deposits are present across the waste water transfer tunnel (including the existing Cambridge WWTP) and treated effluent transfer pipeline. River Terrace Deposits are present in the west of the study area, including beneath the existing Cambridge WWTP. Alluvium deposits are present 200m east of the existing Cambridge WWTP, extending 200m further east. Available BGS borehole logs in the surrounding area indicate that there is considerable variability in thickness (and composition) of these superficial deposits (3.5 – 7m).

3.1.10 The Gault Formation underlies the existing Cambridge WWTP site and surrounding area. The boundary between the Gault Formation and the West Melbury Marly Chalk Formation lies in the area of the River Cam, part-way along the waste water transfer tunnel. Therefore, the eastern area of the waste water transfer tunnel route and the final effluent pipeline are likely to be underlain by Chalk. The total thickness of the Gault Formation in the area is approximately 35m.

3.1.11 The soil engineering ground investigation included a number of exploratory holes in this area, which were completed for geotechnical and geo-environmental purposes (Appendix 14.7 Ground Investigations Report Cambridge WWTP App Doc 5.4.14.7 and Appendix 14.8 Ground Investigations Report B Cambridge WWTP App Doc 5.4.14.8).

3.1.12 Exploratory hole location plans are included in Technical Chapter Figures (App Doc Ref 5.3.14), Figure 14.3 – 5.3.14.7. The borehole logs generally confirm the published geology, and findings are summarised below. The encountered geology has been split into two areas, the treated effluent pipeline north of the A14 and the waste water transfer tunnel to the existing WWTP, south of the A14.

**Table 3-2: Encountered Geology – treated effluent transfer pipeline**

| Encountered strata | Typical description | Thickness (m) | Depth to base (m bgl) |
|---|---|---|---|
| Topsoil | Slightly sandy slightly gravelly clay, gravel is flint and quartz. | 0.16 – 0.32 | 0.16 – 0.32 |
| Alluvium | Slightly gravelly sandy clay. | 0.5 – 0.9 | 0.7 – 1.2 |
| River Terrace Deposits (BH_FE_001 only) | Clayey sandy gravel and sand and gravel. | 2.7 | 3.9 |
| Chalk (limited locations BH_FE_002, BH_FE_003, BH_FE_004A)* | Chalk recovered as calcareous clay. | 2.8 – 8.8 | 3.5 – 10 |
| Cambridge Greensand | Greenish-grey clay with gravel of coprolite. | 0.2 – 0.38 | 4.88 – 7.8 |
| Gault Formation | Stiff clay. | Proven to 12 | Proven to 15.9 |

** Chalk is thicker to the east of the transfer pipeline, thinning towards the river*

**Table 3-3: Encountered geology – waste water transfer tunnel to existing WWTP**

| Encountered strata | Typical description | Thickness (m) | Depth to base (m bgl) |
|---|---|---|---|
| Topsoil | Slightly sandy gravelly clay | 0.1 – 1.0 | |
| Made ground (BH_TUN_001A, BH_TUN_001B, BH-TUN_001PM. BH_TUN_002, BH_TUN_003, BH_TUN_005Ab, BH_TUN_006) | Slightly sandy gravelly clay with fragments of brick, flint, ash and concrete. Brick fill. | 0.2 – 1.2**<br>4.0 – 4.2 (BH_TUN_006 and 006P only)* | 0.8 – 1.2<br>4.0 – 4.2 |
| Alluvium (BH_TUN_011, BH_TUN_015, BH_TUN_016 only) | Slightly gravelly slightly silty clay. Gravel is flint. | 0.65 – 0.9 | 0.75 – 1.2 |
| River Terrace Deposits | Sand and gravel. | 0.9 – 5.1 | 1.2 – 6.5 |
| Chalk (BH_TUN_011 BH_TUN_015, BH_TUN_16, BH_TUN_17, BH_TUN_18 only) | Structureless Chalk recovered as calcareous clay. | 3.25 – 12.85 | 4.0 – 13.15 |
| Cambridge Greensand (BH_TUN_011, | Greenish grey slightly gravelly sandy clay. | 0.2 – 0.28 | 4.2 – 13.43 |

| Encountered strata | Typical description | Thickness (m) | Depth to base (m bgl) |
|---|---|---|---|
| BH_TUN_015, BH_TUN-017 only) | | | |
| Gault Formation | Dark grey clay. | 28.7 – 36.69 | 32.9 – 46.64 |
| Lower Greensand | Very stiff greenish grey slightly sandy gravelly clay and green sand. | Proven to 2.86 | Proven to 49.5 |

** Located in the east of the existing WWTP*
*** Located in the existing WWTP*

***Land required for the Waterbeach pipeline***

3.1.13 Geological mapping (BGS GeoIndex) indicates that varying superficial deposits are present along the Waterbeach pipeline. River Terrace Deposits are present at the existing Waterbeach WRC and in summarise areas along the Waterbeach pipeline including in the vicinity of Horningsea. Alluvium and peat deposits are present in the northern area where the route passes under the River Cam.

3.1.14 The West Melbury Marly Chalk Formation comprises the bedrock along the southern section of the proposed Waterbeach pipeline (up to and including Horningsea) as well as a 1km stretch south of Clayhithe. The Gault Formation forms the bedrock across the remainder of the Waterbeach pipeline and beneath the existing Waterbeach WRC.

3.1.15 The Cambridge Greensand (Lower Greensand) underlies the Gault Formation.

3.1.16 The ground investigation included nine exploratory holes along the pipeline route for geotechnical and geo-environmental purposes (Appendix 14.6 Groundwater Investigation Waterbeach, App Doc Ref 5.4.14.6). Exploratory hole location plans are included in Technical Chapter Figures (App Doc Ref 5.3), Figure 5.3.15.3 – 5.3.15.6. The borehole logs generally confirm the published geology and findings are summarised below.

**Table 3-4: Encountered geology – Waterbeach pipeline**

| Encountered strata | Typical description | Thickness (m) | Depth to base (m bgl) |
|---|---|---|---|
| Topsoil | Slightly gravelly silty clay, gravel is flint. | 0.2 – 0.65 | 0.65 |
| Made ground (BH07 and BH08 only)* | Slightly sandy gravelly clay, gravel is brick | 0.6 – 1.1 | 0.6 – 1.1 |
| Alluvium (including peat) | Peat and soft mottled clay | 0.7 – 4.6 | 1.2 – 5.2 |
| River Terrace Deposits | Slightly silty gravelly sand, gravel is flint | 1.0 – 1.4 | 1.6 – 3.7 |
| Chalk (BH06 only) | Structureless Chalk recovered as Chalk gravel | 3.3 | 4.5 |
| Gault Formation | Stiff blueish silty calcareous clay | Proven to 14.8 – 18.4 | Proven to 20 |

** Made ground encountered in locations adjacent to a road/ track junctions. No visual or olfactory evidence of contamination.*

## Hydrogeology

3.1.17 Based on the WFD, the Environment Agency has classified three groundwater resource types (aquifers) as Principal aquifers, Secondary aquifers and Unproductive Strata based upon their capacity to supply drinking water and support ecosystems. Principal aquifers are considered to have the greatest capacity and Unproductive aquifers the least. Table 3-5~~Table 3-5~~ provides a summary of aquifer designations.

**Table 3-5: Environment Agency aquifer designations**

| Strata | Environment Agency aquifer designations |
|---|---|
| Alluvium | Secondary A aquifer |
| River Terrace Deposits | Secondary A aquifer |
| Peat | Unproductive strata |
| West Melbury Marly Chalk Formation | Principal aquifer |
| Gault Formation | Unproductive strata |
| Lower Greensand Group | Principal aquifer |

*Source: Environment Agency*

3.1.18 The study area is not located within a groundwater SPZ or within 1km of an SPZ. Local abstractions have been identified in the surrounding area from the available Envirocheck Report (Appendix B to the PRA (App Doc Ref 5.4.14.1)) and details of local abstractions have been requested from the local authorities.

3.1.19 During the ground investigations, the levels at which groundwater was encountered during drilling were recorded. A summary is included in Table 3-6~~Table 3-6~~.

**Table 3-6: Groundwater strikes recorded during ground investigation**

| Location | Range of groundwater strikes (m bgl) | Strata |
|---|---|---|
| Land required for the construction of the proposed WWTP and Landscape Masterplan | 2.5 – 8.7 | Chalk |
| | 12.3 (second strike in one location) | Chalk near boundary with Cambridge Greensand |
| Land required for the construction of the waste water transfer tunnel and the outfall between the proposed WWTP and existing Cambridge WWTP | 2.5 – 5.2 | River Terrace Deposits |
| | 2.9 – 7.8 | Chalk |
| | 4.1 | Cambridge Greensand (upper) |
| | 42.5 | Cambridge Greensand (lower) |
| Land required for the construction of the Waterbeach pipeline from Waterbeach to Low Fen Drove Way | 1.0 – 2.3 | River Terrace Deposits |
| | 0.8 – 4.1 | Peat/alluvium |

## Hydrology

3.1.20 There is one main hydrological feature within the study area. The River Cam runs north to south between the existing Cambridge WWTP and the proposed WWTP, bisecting the waste water transfer tunnel. The River Cam also enters the study area further north as it crosses the Waterbeach pipeline approximately 600m north of Clayhithe. The outfall will discharge to the River Cam.

3.1.21 Certain surface waterbodies are classified under the WFD and are assessed for a number of parameters to give an overall ecological and chemical status or potential. This includes an assessment of water quality, morphology, tidal regime and freshwater flow inputs, chemical elements and mitigation measures. Further information on the status of the River Cam is provided in Chapter 20: Water resources.

3.1.22 In addition to the River Cam, there are numerous drains and other surface water bodies within the study area that are not identified as waterbodies under the WFD. Consequently, no quality data is available under the WFD for these surface waterbodies.

## Landfill and waste sites

3.1.23 There are two historical landfills within 250m of the Scheme Order Limits:

- Clayhithe Cottage landfill is located approximately 200m west of the Scheme Order Limits along the Waterbeach pipeline. This was used for inert waste between 1989 and 1992; and
- upon the closure of Clayhithe Cottage landfill, Northfields Farm landfill was opened adjacent to this site, approximately 112m west of the Scheme Order

Limits along the Waterbeach pipeline. This was used for inert waste dating back to 1992 (end date of use not specified).

### Unexploded ordnance

3.1.24 Zetica UXB risk maps (Zetica, 2022) indicate the potential for UXB to be present as a result of bombing during World War II. UXB maps covering the study area indicate a low risk area. Low risk is defined as areas indicated as having 15 bombs per 1,000 acre or less. The historical Waterbeach Barracks were recorded to have been a Luftwaffe target during World War II, however, this is outside the study area (750m west of Scheme Order Limits).

### Mineral safeguarding areas

3.1.25 MSA are designated for deposits of sand and gravel, brick, clay, limestone and Chalk which are considered to be of current or future economic importance. Cambridgeshire County Council (CCC) is the MPA. The Cambridgeshire and Peterborough Minerals and Waste Development Plan Core Strategy (2011) and Cambridgeshire and Peterborough Minerals and Waste Development Plan Site Specific Proposals (2012) documents were replaced in 2021. The current document is the Cambridgeshire and Peterborough Minerals and Waste Local Plan (July 2021). Section 2.2 of the plan identifies objectives, including ensuring a steady and adequate supply of minerals to support growth whilst ensuring the best use of materials and safeguarding productive land. The MSA are required to maintain a stock of sand and gravel reserves (a landbank) equivalent to at least seven years' supply. The plan sets out MSA to meet these objectives.

3.1.26 Sand and gravel deposits are present within the study area and are designated as within an MSA. These deposits are predominantly located between the existing Cambridge WWTP and the River Cam as well as areas along the Waterbeach pipeline.

3.1.27 River Terrace Deposits have been encountered during ground investigation in areas along the Waterbeach pipeline. These deposits were recorded at limited thicknesses of 1.0m – 1.4m. The exploratory holes along the treated effluent transfer pipeline route to the River Cam only encountered River Terrace Deposits at one location (BH_FE_001), 2.7m thick. The exploratory holes located along the waste water transfer tunnel to the existing WWTP encountered River Terrace Deposits between 0.9m and 5.1m thick with increasing depth towards the river.

3.1.28 Chalk deposits are present within the study area, areas of which are designated as an MSA. The Chalk MSA overlaps with the sand and gravel MSA in some areas. The proposed WWTP is outside the sand and gravel MSA but within the Chalk MSA. Some areas of the infrastructure, including the Waterbeach pipeline and the waste water transfer tunnel, fall within both MSA.

3.1.29 The Chalk has been encountered at various depths along the infrastructure routes during ground investigation and at shallow depth at the proposed WWTP. It was found to be absent in some areas including along the Waterbeach pipeline. Where present, the open cut excavations along the infrastructure routes may encounter the

Chalk, particularly if maximum potential depths are reached. HDD tunnelling under the River Cam, the existing railway line and the waste water transfer tunnel, which will be in a tunnel 24m deep, are unlikely to encounter the Chalk with the exception of the shafts and HDD pits.

## Geo-environmental laboratory testing results

***Land required for the construction of the proposed WWTP and Landscape Masterplan***

3.1.30 During the ground investigation geo-environmental laboratory testing was undertaken on 14 soil samples. Soil leachate and groundwater samples were also tested. The laboratory testing covered a range of potential contaminants including metals, total petroleum hydrocarbons (TPH) and volatile organic compounds (VOC). The results provide details on the contamination status of the soils and potential risks to human health receptors. The groundwater and leachate results provide information on the existing condition of, and potential risks to, water resources.

3.1.31 A summary of the laboratory results is included in Appendix 14.3: Geo-environmental results (proposed WWTP) (App Doc Ref 5.4.14.3).

3.1.32 In order to assess the risks to human health, the soil results have been compared to generic assessment criteria (GAC) appropriate to the proposed site use. As the land use in this area will comprise commercial and public open space, the GAC relating to both of these land uses have been used. The GAC used are the LQM Suitable for Use Levels (S4ULs) (1% SOM).

3.1.33 Fourteen soil samples from both made ground (one sample) and natural deposits were tested. Two soil samples (topsoil) contained polycyclic aromatic hydrocarbons (PAH) above the laboratory detection limit. Three soil samples contained TPH concentrations above the laboratory detection limit (two from topsoil and one from made ground).

3.1.34 There were no exceedances of GAC for commercial or public open space land use.

3.1.35 No asbestos was detected in any of the 14 soil samples.

3.1.36 In order to assess the risks to controlled waters, soil leachate results were compared to EQS, to be protective of surface water features such as field drains, and UK Drinking Water Standards (DWS), to be protective of the aquifers within the study area.

3.1.37 Two soil leachate samples (from made ground and Chalk) were tested for metals, inorganics and phenols. There were exceedances for metals and inorganics which are summarised in Table 3-7~~Table 3-7~~. Exceedances of DWS are highlighted in orange, EQS exceedances are highlighted in blue and exceedances of both are highlighted in red.

**Table 3-7: Summary of leachate exceedances (proposed WWTP and Landscape Masterplan) in µg/l**

| Determinant | EQS | DWS | BH_STW_009 | BH_STW_012A |
|---|---|---|---|---|
| Ammoniacal nitrogen as N | 200 | 380 | 110 | 670 |
| Fluoride | 1500 | - | 550 | 1,600 |
| Copper | 1 | 2000 | 2.4 | 4.4 |
| Lead | 1.2 | 10 | <0.50 | 1.4 |
| Iron | 1,000 | 200 | <5.0 | 1,400 |

3.1.38 Exceedances are generally minor, with higher exceedances occurring within the made ground. Made ground was only encountered in four exploratory holes across this site (see Table 3-1~~Table 3-1~~).

3.1.39 Seven groundwater samples, from standpipes installed within the Chalk, were tested for metals, inorganics, phenols, TPH, PAH and VOC. There were slight exceedances of metals and inorganics which are summarised in Table 3-8. Exceedances of DWS are highlighted in orange, EQS exceedances are highlighted in blue and exceedances of both are highlighted in red.

**Table 3-8: Summary of groundwater exceedances (proposed WWTP and Landscape Masterplan) in µg/l**

| Determinant | EQS | DWS | BH_STW_026 | BH_STW_001 | BH_STW_009 | BH_STW_015 | BH_STW_023 | BH_STW_024 | BH_STW_025 |
|---|---|---|---|---|---|---|---|---|---|
| Ammoniacal Nitrogen as N | 200 | 380 | 550 | 7,500 | 2,000 | 160 | 140 | 170 | 230 |
| Nitrate | - | 1129.5 | <500 | 350 | 53 | 670 | 2,300 | 1,200 | 210 |
| Copper | 1 | 200 | 0.09 | 1.6 | 1 | 1.1 | 1.4 | 1.1 | 0.6 |
| Lead | 1.2 | 10 | 1.4 | 1.2 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Zinc | 10.9 | 5,000 | 10 | 13 | 4 | 8 | 5 | 9 | 4 |
| Chromium (III) | 4.7 | - | <20 | <20 | <20 | 6,700 | 580 | 3,800 | <20 |

3.1.40 Exceedances are generally minor with the exception of Chromium (III). Chromium (VI) was recorded below laboratory detection limits in the groundwater samples. It should be noted that chromium samples were marked as deviating due to sample age exceeding the stability time.

3.1.41 Groundwater samples were all from Chalk strata, and there is limited made ground across this site (see Table 3-1~~Table 3-1~~). The area of land required for the proposed WWTP is currently agricultural and there are no known sources of chromium on- or off-site.

3.1.42 In addition to groundwater sampling, three surface water samples were taken from Quy Fen pond (SW01), Allicky Farm Pond (SW02) and Black Ditch (SW03). There were slight exceedances of metals and inorganics which are summarised in Table 3-9. Exceedances of DWS are highlighted in orange, EQS exceedances are highlighted in blue and exceedances of both are highlighted in red.

**Table 3-9: Summary of surface water exceedances (proposed WWTP and landscape masterplan) in µg/l**

| Determinant | EQS | DWS | SW01 (Quy Fen Pond) | SW02 (Allicky Farm Pond) | SW03 (Black Ditch |
|---|---|---|---|---|---|
| Ammoniacal nitrogen as N | 200 | 380 | 4,900 | 1,200 | 2,300 |
| Nitrate | - | 11,295 | <500 | <500 | 43,000 |
| Potassium | - | 12,000 | 13,000 | 2,800 | 4,000 |
| Copper | 1 | 200 | 2.3 | 2.5 | 2.9 |
| Manganese | 123 | 50 | 3 | 74 | 7.3 |
| Nickel | 4 | 20 | 0.0032 | 0.0008 | 0.0089 |
| Chromium (III) | 4.7 | - | 7,600 | 7,200 | 7,800 |

3.1.43 Exceedances are generally minor with the exception of ammoniacal nitrogen as N and Chromium (III). Chromium (VI) was recorded below laboratory detection limits in the surface water samples. It should be noted that chromium samples were marked as deviating due to sample age exceeding the stability time.

3.1.44 Surface water samples had similar exceedances to groundwater, indicating that these are likely natural background concentrations.

***Land required for the construction of the outfall and waste water transfer tunnel***

3.1.45 During the ground investigation geo-environmental laboratory testing was undertaken on 16 soil samples. Soil leachate and groundwater samples were also tested. The laboratory testing covered a range of potential contaminants including metals, total petroleum hydrocarbons and VOC. The results provide details on the contamination status of the soils and potential risks to human health receptors. The groundwater and leachate results provide information on the existing condition of, and potential risks to, water resources.

3.1.46 A summary of the laboratory results is included in Appendix 14.3: Geo-environmental results (proposed WWTP) (App Doc Ref 5.4.14.3). In order to assess the risks to human health, the results have been compared to GAC appropriate to the proposed site use. As the land use in this area will comprise commercial and public open space, the GAC relating to both of these land uses have been used. The GAC used are the LQM Suitable for Use Levels (S4ULs) (1% SOM).

3.1.47 A total of 16 soil samples from both made ground (three samples) and natural deposits were tested.

3.1.48 Four soil samples contained PAH above the laboratory detection limit (two from made ground and two from superficial deposits). Two soil samples contained TPH concentrations above the laboratory detection limit (one from topsoil and one from superficial deposits).

3.1.49 There were no exceedances of GAC for commercial or public open space land use.

3.1.50 No asbestos was detected in any of the 11 soil samples analysed for its presence.

3.1.51 Three soil leachate samples (two from made ground and one from RTD) were tested for metals, inorganics and phenols. There were two EQS exceedances of copper from BH_TUN_003 (0.2m) of 7µg/l and BH_TUN_004 (1.1m) of 15µg/l compared to the EQS of 1µg/l. Nickel marginally exceeded the EQS (4µg/l) within BH_TUN_004 (1.1m), recorded at 4.3µg/l.

3.1.52 Eight groundwater samples, from within five standpipes, were tested for metals, inorganics, phenols, TPH, PAH and VOC. Standpipe installations were installed within the Chalk (BH_FE_002), Chalk and Cambridge Greensand (BH_TUN_011), River Terrace Deposits (BH_FE_001 and BH_TUN_001A) and made ground/River Terrace Deposits (BH_TUN_006).

3.1.53 There were slight exceedances of metals and inorganics which are summarised in Table 3-10. Exceedances of DWS are highlighted in orange, EQS exceedances are highlighted in blue and exceedances of both are highlighted in red. All samples were taken in 2021.

**Table 3-10: Summary of groundwater exceedances (outfall and waste water transfer tunnel) in µg/l**

| Determinant | EQS | DWS | BH_TUN_011 | BH_FE_001 | BH_FE_002 | BH_TUN_001A | BH_FE_001 | BH_FE_002 | BH_TUN_011 | BH_TUN_006 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 17 Nov | 17 Nov | 17 Nov | 3 Nov | 3 Nov | 3 Nov | 2 Nov | 2 Nov |
| Ammoniacal nitrogen as N | 200 | 380 | 270 | 1,800 | 9,300 | 290 | <50 | <50 | 510 | 550 |
| Nitrate | - | 11,295 | 11,000 | 25,000 | 81,000 | <500 | 2,400 | 6,500 | 1,100 | 830 |
| Sulphate | - | 250,000 | 56,000 | 12,000 | 130,000 | 420,000 | 13,000 | 140,000 | 39,000 | 240,000 |
| Potassium | - | 12,000 | 29,000 | 5,800 | 2,800 | 11,000 | 6,400 | 3,100 | 14,000 | 14,000 |
| Sodium | - | 200,000 | 310,000 | 55,000 | 30,000 | 160,000 | 55,000 | 35,000 | 510,000 | 81,000 |
| Cadmium | 0.08 | 5 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | 0.57 |
| Copper | 1 | 200 | 18 | 2.7 | 1.1 | 2.2 | 1.7 | 1.1 | 1.5 | 9.5 |
| Manganese | 123 | 50 | 1.1 | 65 | 2.6 | 59 | 62 | 6.9 | <0.5 | 3,500 |
| Nickel | 4 | 20 | 5.8 | 9.6 | 3.9 | 6.2 | 7.8 | 8.3 | 3.9 | 21 |
| Lead | 1.2 | 10 | 4.6 | 1.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Selenium | - | 10 | 13 | 3 | 3.4 | 1.1 | 4.0 | 4.1 | 14 | 2.5 |
| Iron | 1,000 | 200 | 190 | <5 | <5 | <5 | <5 | <5 | 240 | 19 |
| Chromium (III) | 4.7 | - | 9400 | <20 | <20 | <20 | <20 | <20 | 13,000 | <20 |

3.1.54 Exceedances are generally minor with the exception of ammoniacal nitrogen as N and Chromium (III). Chromium (VI) was recorded below laboratory detection limits in the groundwater samples. It should be noted that chromium samples were marked as deviating due to sample age exceeding the stability time.

3.1.55 Groundwater samples were all from natural strata, and there is limited made ground across this site (see Table 3-1~~Table 3-1~~).

***Land required for the Waterbeach pipeline***

3.1.56 During the ground investigation (AF Howland Associates, 2022) geo-environmental laboratory testing was undertaken on 12 soil samples (Appendix 14.6 Groundwater Investigation Waterbeach App Doc 5.4.14.6). Soil leachate samples were not tested but 10:1 leachate testing was undertaken as part of the Waste Acceptance Criteria (WAC) testing on 10 soil samples. The soil laboratory testing covered a range of potential contaminants including metals, TPH and VOC. The results provide details on the contamination status of the soils and potential risks to human health receptors. The groundwater and leachate results provide information on the existing condition of, and potential risks to, water resources.

3.1.57 A summary of the laboratory results is included in Appendix 14.4: Geo-environmental results (Waterbeach) (App Doc Ref 5.4.14.4). In order to assess the risks to human health, the results have been compared to GAC appropriate to the proposed site use. As the land use in this area will comprise commercial and public open space, the GAC relating to both of these land uses have been used. The GAC used are the LQM Suitable for Use Levels (S4ULs) (1% SOM).

3.1.58 Eleven soil samples from both Made ground (one sample) and natural deposits were tested. Two soil samples (topsoil) contained PAHs above the laboratory detection limit. Three soil samples contained TPH concentrations above the laboratory detection limit (two from topsoil and one from made ground).

3.1.59 There were no exceedances of GAC for commercial or public open space land use.

3.1.60 No asbestos was detected in any of the six soil samples that were tested.

3.1.61 WAC testing indicated that seven samples would be suitable for inert waste. Three would not be suitable for inert waste due to excessive sulphate (BH02 at 0.75m) and excessive Total Organic Carbon (BH05 at 2.10m and BH06 at 0.25m).

## Summary

3.1.62 Potential contaminant sources in relation to the areas of the Proposed Development are summarised in Table 3-11~~Table 3-11~~. Information relating to contamination sources in the Proposed Development area was also requested from Cambridge City Council and South Cambridgeshire District Council in April 2021. They confirmed that the main sources would be the Cambridge WWTP, sand and gravel extraction activities and a dismantled railway.

**Table 3-11: Potential contamination sources**

| Location | Potential sources identified | Contaminants of concern |
|---|---|---|
| Proposed WWTP | Infilled ponds and dismantled railway line. | Metals/semi-metals, TPH, PAH, asbestos and ground gas (carbon dioxide and methane). |
| Existing Cambridge WWTP, waste water transfer tunnels from existing Cambridge WWTP to proposed WWTP and final effluent pipeline to outfall at River Cam. | Railway sidings, existing Cambridge WWTP, electrical substations. | Metals/semi-metals, TPH, PAH, semi-volatile organic compounds (SVOC)/VOC and poly chlorinated biphenyl (PCB), bacteriological contaminants. |
| Waterbeach pipeline | Railway, existing Waterbeach WRC, off-site landfill. | Metals/semi-metals, TPH, PAH, SVOC/VOC. |

3.1.63 The receptors shown in Table 3-12~~Table 3-12~~ are identified in the study area and could be impacted by the Proposed Development. The receptor sensitivities have been reviewed since the scoping stage, following completion of the methodology. These are based on Table 2-6~~Table 2-6~~.

**Table 3-12: Summary of identified receptors**

| Receptor type | Receptor description | Receptor sensitivity |
|---|---|---|
| People | Construction workers | Low |
| | On-site WWTP workers and visitors | Low |
| | Off-site industrial/commercial workers and visitors | Low |
| | Adjacent residents and other land users of development sites | Medium |
| Groundwater | Secondary A aquifer (River Terrace Deposits and alluvium) | Medium |
| | Principal aquifer (Lower Greensand Group and Chalk) | High |
| Surface water | On-site watercourse (River Cam) | Medium |
| | Drainage channels on and off-site | Low |
| Built environment | Buried structures and infrastructure: water supply pipe infrastructure, concrete structures (e.g., foundations), and tunnels. | Low |

## 3.2 Future baseline

3.2.1 The methodology relating to the CWWTPR project's approach to future baseline is presented in Chapter 5: EIA methodology (App Doc Ref 5.2.25), Section 3.6 Description of the environmental baseline conditions (including future baseline), alongside the list of proposed developments that, at this time, would form part of the baseline for assessment within the EIA.

3.2.2 Where this presents new environmental receptors or a change to the current baseline specific to land quality, it is discussed further below.

3.2.3 For the aspect of land quality, the future baseline will remain largely the same in terms of ground conditions. There will be a change in land use at the proposed WWTP site from agricultural land to industrial use (as a WWTP site). No additional contamination sources are anticipated from this change in land use as there will be appropriate pollution controls in place. There are no known committed developments proposed within the Scheme Order Limits. However, there are committed developments within the wider study area. None of these are expected to change ground conditions or alter the receptors considered in the ES such that there could be changes to the baseline or current assessment.

### Impacts of climate change on future baseline

3.2.4 Impacts of climate change on land quality are discussed within Chapter 9: Climate resilience.

3.2.5 In summary, the chapter identified that climate impacts with respect to land quality may arise from erosion and scour of contaminated soils below or at the ground surface during the operation phase. This will be monitored and managed during the operation phase through the Outline Landscape, Ecological and Recreational Management Plan (Appendix 8.14, App Doc Ref 5.4.8.14). Given these measures, it is considered that there are no in-combination climate effects on land quality.

# 4 Assessment of Effects

4.1.1 The section presents the assessment of effects and sets out a preliminary assessment that takes into account primary and tertiary mitigation in determining effects and then considers secondary mitigation and the assessment of residual effects.

## 4.2 Construction phase

### Proposed Development

4.2.1 This section sets out the assessment effects in relation to the Proposed Development as a whole, including the construction of the proposed WWTP, including the landscaping proposals, final effluent pipeline, outfall, transfer tunnel, new access connection connecting with the B1047 Horningsea Road, Waterbeach pipeline, and the existing Cambridge WWTP.

***Mineral safeguarding areas – loss of, or restricted access to, Chalk MSA***

4.2.2 The MSA assessment combines all areas of the Proposed Development which correspond to the MSA so that the impact across the entire Proposed Development can be confirmed. This section includes the proposed WWTP and the associated infrastructure in areas of Chalk MSA. An assessment of the sand and gravel MSA is included in paragraphs 4.2.13 to 4.2.21.

4.2.3 Construction is likely to encounter the shallow Chalk in the proposed WWTP location. It is assumed that structures will be generally on shallow foundations with some potential to pile heavy structures.

4.2.4 In areas of infrastructure, open cut excavations and shafts will intercept the Chalk (where present), however, where the river and railway crossings are located, this will be in a tunnel approximately 20m deep and therefore be below the Chalk MSA.

4.2.5 The transfer tunnel will be 24m deep and therefore will also be located beneath the MSA.

4.2.6 Appendix 14.5: Chalk MSA calculation (App Doc Ref 5.4.14.5) includes calculations to determine the area of the MSA that will be affected by the proposed construction. This includes a measurement of the area of development and comparison with the total area of the MSA. The percentage of the MSA that may be affected was then calculated.

4.2.7 Policy 5 of the Cambridgeshire and Peterborough Minerals and Waste Local Plan (July 2021) has been reviewed in relation to the project, in particular, criteria (i) which requires that the mineral can be extracted where practicable prior to development. Where possible, minerals which are extracted as part of the construction will be reused within the Proposed Development, which will reduce the impact on the resource. Reusing the minerals on-site will ensure the mineral resource is utilised as far as possible.

*Magnitude of impact*

4.2.8 The entire area of the proposed WWTP is underlain by an MSA and has been included in the calculation, however, in practice the permanent impacted area will be smaller as these will be associated with locations of structures. A 30m working corridor has been assumed for the infrastructure routes. The calculation therefore indicates that the maximum percentage of the MSA that may be affected on both a temporary and permanent basis is 0.18% of a total 636.5km$^2$. It is proposed to reuse as much as possible of any of the extracted minerals within the Proposed Development. The magnitude of impact is considered to be negligible.

*Sensitivity of receptor*

4.2.9 The MSA are considered medium sensitivity.

*Significance of effect*

4.2.10 Based on a negligible magnitude and a medium sensitivity, the significance of effect is negligible, which is **not significant**.

*Secondary mitigation or enhancement*

4.2.11 There are no secondary mitigation measures relevant to MSAs and the effect remains as negligible and is **not significant**.

*Residual effect*

4.2.12 The residual effect remains as negligible and is **not significant.**

***Mineral safeguarding areas – loss of, or restricted access to, sand and gravel MSA***

4.2.13 The MSA assessment combines all areas of the development which intersect with the sand and gravel MSA so that the impact across the entire scheme can be confirmed. Therefore, this section includes the Waterbeach pipeline, the waste water transfer tunnel and the outfall to the River Cam where they correspond to areas of sand and gravel MSA (River Terrace Deposits). The proposed WWTP is outside the sand and gravel MSA.

4.2.14 Construction is assumed to be in open cut excavations to between 2m and 5m bgl with the exception of the waste water transfer tunnel which will be 24m deep and therefore below the MSA. In the transfer tunnel area, only the shaft locations have been considered. HDD pits are located in the MSA; these have been accounted for. Where the river and railway tunnelling is located, it is assumed that the MSA would be unaffected due to the depth of the works (20m bgl).

4.2.15 Appendix 14.5: Mineral Safeguarding Area Calculation (App Doc Ref 5.4.14.5) includes calculations to determine the portion of the MSA that will be affected by the construction of the Proposed Development. This includes a measurement of the length of proposed excavation within the MSA and multiplies this by a 30m working area. The percentage of the MSA that may be affected was then calculated.

4.2.16 Policy 5 of the Cambridgeshire and Peterborough Minerals and Waste Local Plan (July 2021) has been reviewed in relation to the CWWTPR project, in particular,

criteria (i) which requires that the mineral can be extracted where practicable prior to development. Where possible, minerals which are extracted as part of the construction will be reused within the Proposed Development which will reduce the impact on the resource. Reusing the minerals on-site will ensure the mineral resource is utilised as far as possible.

*Magnitude of impact*

4.2.17 The majority of the Waterbeach pipeline is underlain by an MSA, however, in the context of the Proposed Development area as a whole and the size of the MSA, the area affected is small. The calculation indicates that the percentage of the MSA that may be affected is 0.02% of a total of 991.8km$^2$. It is proposed to reuse as much as possible of any of the extracted minerals within the Proposed Development. The magnitude of impact is considered to be negligible.

*Sensitivity of receptor*

4.2.18 The MSA are considered medium sensitivity.

*Significance of effect*

4.2.19 Based on a negligible magnitude and a medium sensitivity, the significance of effect is negligible, which is **not significant.**

*Secondary mitigation or enhancement*

4.2.20 There are no secondary mitigation measures relevant to MSAs and the effect remains as negligible and is **not significant**.

*Residual effect*

4.2.21 The residual effect remains as negligible and is **not significant.**

## Proposed WWTP

4.2.22 This section sets out the assessment of effects in relation to the proposed WWTP, including the landscaping proposals, final effluent pipeline, outfall, waste water transfer tunnel and new access connecting with the B1047 Horningsea Road.

4.2.23 On-site land users during operation of the site are defined as those who have access to the construction site, such as WWTP visitors. Off-site land users during construction of the site are defined as those adjacent to the construction area, such as adjacent residents, walkers and farm workers, including those within 250m of the Scheme Order Limits.

***Exposure to contaminated soils through inhalation – off-site land users***

4.2.24 This refers to the potential inhalation of dusts from contaminated soils during construction works and the risk to off-site adjacent residents and surrounding land users including commercial/industrial workers and visitors.

*Magnitude of impact*

4.2.25 There are residents adjacent to the proposed WWTP and where tunnels and effluent pipelines are proposed. The surrounding land is used for recreation and agriculture. There are commercial/industrial workers adjacent to the existing Cambridge WWTP where shafts are being constructed.

4.2.26 There is potential for the creation and migration of dusts off-site during the construction works, for example from excavations, soil management and stockpiling and vehicle movement. However soils are unlikely to be contaminated based on the previous and current land use.

4.2.27 The assessment shows no change in risks between baseline and construction.

*Sensitivity of receptor*

4.2.28 Adjacent residents and other land users of development sites are considered **medium** sensitivity.

*Significance of effect*

4.2.29 The significance of effect is based on the change in risks from baseline to construction. For this particular pollutant linkage, the risks do not change from very low (1), which is a negligible significance of effect that is **not significant**.

*Secondary mitigation or enhancement*

4.2.30 Although not required in terms of reducing the significance of effects, the following secondary mitigation measures would further mitigate the impact to off-site land users. These measures are set out within Section 7.8 (Air quality) of the CoCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1) and for off-site users it outlines how the construction dust effects will be mitigated proportionally, using the recommendations within the Institute of Air Quality Management (IAQM) 'Guidance on the assessment of dust from demolition and construction'. This measure will be implemented through an Air Quality Management Plan as set out in Section 4.4 (CEMP) of the CoCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1).

4.2.31 Through the application of these measures, the impact remains as negligible and is **not significant.**

*Residual effect*

4.2.32 The residual effect remains as negligible and is **not significant**. No significant residual effects have been determined.

***Migration of existing contamination through preferential pathways to controlled waters***

4.2.33 This refers to the potential for leachates or other mobile contaminants to migrate through preferential pathways which are introduced by piling, pipelines, tunnelling and shaft construction.

*Magnitude of impact*

4.2.34 Anthropogenic contaminant transport pathways such as piles, shafts, tunnels and pipelines could create additional pathways to the aquifer and other water bodies. However, the aquifers and water bodies are in hydraulic continuity therefore this will not create an additional pollutant linkage.

4.2.35 There is limited made ground present within the land required for the proposed WWTP, landscaping and waste water transfer tunnel. Slightly elevated soil leachate concentrations have been encountered, however, these do not represent a significant source of contamination. The assessment shows no change in risks between baseline and construction.

4.2.36 Any pre-existing contamination would be adequately managed through the contaminated land regime (LCRM document (Environment Agency, 2021)) to ensure that the operational area is suitable for use.

*Sensitivity of receptor*

4.2.37 The Principal aquifers are considered high sensitivity. The Secondary A aquifers and River Cam are considered medium sensitivity. The drainage channels are considered low sensitivity.

*Significance of effect*

4.2.38 The significance of effect is based on the change in risk from baseline to construction. The risk during baseline is very low (1) for drainage channels, low (2) for Secondary A aquifers and low/moderate (3) for Principal aquifers and the River Cam. The risks remain the same during construction due to the lack of contaminant source and the existing pollutant linkages. Therefore, the significance of effect is negligible, which is **not significant**.

*Secondary mitigation or enhancement*

4.2.39 There are no secondary mitigation measures relevant to controlled waters and the effect remains as negligible and is **not significant**.

*Residual effect*

4.2.40 The residual effect remains as negligible and is **not significant**.

## Waterbeach pipeline

4.2.41 This section sets out the assessment of effects in relation to the Waterbeach pipeline, which consists of a transfer section running from the north near Waterbeach to Low Fen Drove Way, a section crossing the area of land required for the construction of the proposed WWTP and a section south of the A14 which connects to the area of land where the existing Cambridge WWTP is located.

***Exposure to contaminated soils through inhalation – off-site land users***

4.2.42 This refers to the potential inhalation of dusts from contaminated soils during construction works and the risk to off-site adjacent residents and surrounding land users.

*Magnitude of impact*

4.2.43 There are residents adjacent to the proposed Waterbeach pipeline. The surrounding land is used for recreation and agriculture. There is potential for migration of dusts off-site during the construction works however they are unlikely to be contaminated based on the land use.

4.2.44 The assessment shows no change in risks between baseline and construction.

*Sensitivity of receptor*

4.2.45 Adjacent residents and other land users of development sites are considered **medium** sensitivity.

*Significance of effect*

4.2.46 The significance of effect is based on the change in risks from baseline to construction. For this particular pollutant linkage, the risks do not change from very low (1) which is a negligible significance of effect that is **not significant**.

*Secondary mitigation or enhancement*

4.2.47 Although not required in terms of reducing the significance of effects, the following secondary mitigation measures would further mitigate the impact to off-site land users. These are set out within the CoCP. The measures of particular relevance to off-site land users are:

- Construction dust effects will be mitigated proportionally, using the recommendations within the Institute of Air Quality Management (IAQM) 'Guidance on the assessment of dust from demolition and construction'

4.2.48 Through the application of these measures, the impact remains as negligible and is **not significant.**

*Residual effect*

4.2.49 The residual effect remains as negligible and is **not significant.** No significant residual effects have been determined.

***Migration of existing contamination through preferential pathways to controlled waters***

4.2.50 This refers to the potential for leachates to migrate through preferential pathways which are introduced by the Waterbeach pipeline.

*Magnitude of impact*

4.2.51 Man-made contaminant transport pathways such as pipelines could create additional pathways to the aquifer and other water bodies. However, the aquifers and water bodies along the route are likely to be in hydraulic continuity and therefore additional pathways will not be created.

4.2.52 There is limited made ground on-site as the majority of the site is agricultural. Ground investigation was targeted to potential contaminant sources. There were no exceedances of human health GAC and there were no elevated contaminants within soil samples. Based on this and on the lack of contaminant sources present, significant contamination from soil leachate is unlikely to be encountered on-site.

4.2.53 The assessment shows no change in risks between baseline and construction.

*Sensitivity of receptor*

4.2.54 The Principal aquifers are considered high sensitivity. Secondary A aquifers and the River Cam are considered medium sensitivity. The drainage channels are considered low sensitivity.

*Significance of effect*

4.2.55 The significance of effect is based on the change in magnitude of impact from baseline to construction. The magnitude of impact during baseline is very low (1), for drainage channels, low (2) for Secondary A aquifers and low/moderate (3) for aquifers and the River Cam. The risks remain the same during construction as no significant contamination or existing pollutant linkages have been identified. Therefore, the significance of effects is negligible which is not significant.

*Secondary mitigation or enhancement*

4.2.56 There are no secondary mitigation measures relevant to controlled waters and the effect remains as negligible and is **not significant**.

*Residual effect*

4.2.57 The residual effect remains as negligible and is **not significant.**

## 4.3 Operation phase

### Proposed WWTP

4.3.1 This section sets out the assessment of effects in relation to the operation and maintenance of the proposed WWTP including the landscaping proposals, final effluent pipeline, outfall, waste water transfer tunnel and new access connection connecting with the B1047 Horningsea Road.

4.3.2 On-site land users during operation of the site are defined as those who have access to the operational WWTP site, such as WWTP visitors. Off-site land users during operation of the site are defined as those adjacent to the operational WWTP site, such as adjacent residents, walkers and farm workers including those within 250m of the Scheme Order Limits.

***Exposure to contaminated soils through inhalation – off-site land users***

4.3.3 Excavation is required for shafts and tunnels, which will create excess materials. These will predominantly be clean and natural materials. They are proposed for reuse within the proposed WWTP site within the landscaped earth bank, which will not be accessible by the public.

*Magnitude of impact*

4.3.4 There are residents adjacent to the proposed WWTP (approximate distance of closest receptor is 320m from the Scheme Order Limits). The land surrounding the proposed WWTP will be landscaped (as set out within the Landscape Ecology and Recreation Management Plan (LERMP), Appendix 8.14, App Doc Ref 5.4.8.14) and continue to be used for recreation. Land required for the construction of the waste water transfer tunnel will be returned to agricultural use. There is potential for direct contact with the reused soils used in the earth bank, although these will be vegetated and therefore contact is likely to be limited. Laboratory testing has determined that no soils tested exceed the GAC for human health (for commercial land use and public open space (park)).

4.3.5 The assessment shows no change in risks between baseline and operation.

4.3.6 A Materials Management Plan (MMP) will be developed if required to allow the application of CL:AIRE Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) for the reuse of excavated waste materials (if required), as detailed in Section 7.9 (Waste management and resource use) of the CoCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1).

*Sensitivity of receptor*

4.3.7 Adjacent residents and other land users of development sites are considered **medium** sensitivity.

*Significance of effect*

4.3.8 The significance of effect is based on the change in magnitude of impact from baseline to operation. The magnitude of impact during baseline and operation is very low risk (1), since soils will be suitable for reuse in terms of human health. No change in risk level is considered a negligible significance of effect which is **not significant**.

*Secondary mitigation or enhancement*

4.3.9 There are no secondary mitigation measures relevant to off-site land users and the effect remains as negligible and is **not significant**.

*Residual effect*

4.3.10 The residual effect remains as negligible and is **not significant**.

***Exposure to contaminated soils through inhalation – on-site land users***

4.3.11 Excavation is required for shafts and tunnels which will create excess materials. These will predominantly be clean and natural materials. They are proposed for reuse within the land required for the proposed WWTP within the earth bank as part of the landscape masterplan.

*Magnitude of impact*

4.3.12 There is potential for workers and visitors to the proposed WWTP to have direct contact with the reused soils. However, the earth bank will be vegetated and contact minimal. Laboratory testing has determined that no soils exceed the GAC for human health (commercial land use and public open space (park)). Therefore, the magnitude of impact is considered to be very low (1).

4.3.13 The assessment shows no change in risks between baseline and operation.

4.3.14 A Materials Management Plan (MMP) will be developed if required to allow the application of CL:AIRE Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) for the reuse of excavated waste materials (if required), as detailed in Section 7.9 (Waste management and resource use) of the CoCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1).

*Sensitivity of receptor*

4.3.15 On-site WWTP workers and visitors are considered low sensitivity.

*Significance of effect*

4.3.16 The significance of effect is based on the change in magnitude of impact from baseline to operation. The magnitude of impact during both baseline and operation is very low risk (1) due to soils on-site being safe for use and reuse in terms of human health. No change in risk level is considered a negligible significance of effect which is **not significant**.

*Secondary mitigation or enhancement*

4.3.17 There are no secondary mitigation measures relevant to off-site land users and the effect remains as negligible and is **not significant**.

*Residual effect*

4.3.18 The residual effect remains as negligible and is **not significant**.

***Migration of soil leachate contamination from soil reuse on-site***

4.3.19 Excavation is required for shafts and tunnels which will create excess materials. These will predominantly be clean and natural materials. They are proposed for reuse in the earth bank within the land required for the proposed WWTP.

*Magnitude of impact*

4.3.20 There is limited made ground present on-site, with the majority being present at the existing Cambridge WWTP. Slightly elevated leachate concentrations have been

encountered on-site. However, these do not represent a significant source of contamination.

4.3.21 Reused soils will be from clean and natural material. If made ground is proposed for reuse, this will need to be appropriately managed under a materials management plan. Testing will be required to prove the material is safe for reuse in terms of risks to human health and controlled waters.

4.3.22 A Materials Management Plan (MMP) will be developed if required to allow the application of CL:AIRE Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) for the reuse of excavated waste materials (if required), as detailed in Section 7.9 (Waste management and resource use) of the CoCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1).

4.3.23 The magnitude of impact is considered to be moderate/low (3) for the Principal aquifer, low (2) for the Secondary A aquifer and very low (1) for the drains on-site.

4.3.24 The assessment shows no change in risks between baseline and operation.

*Sensitivity of receptor*

4.3.25 The Principal aquifers are considered high sensitivity. Secondary A aquifers are considered medium sensitivity. The drainage channels are considered low sensitivity.

*Significance of effect*

4.3.26 The significance of effect is based on the change in magnitude of impact from baseline to operation. The risks remain the same during operation due to the pollutant linkage already existing and there being no significant contamination within soils. Therefore, the significance of effect is negligible which is **not significant**.

*Secondary mitigation or enhancement*

4.3.27 There are no secondary mitigation measures relevant to off-site land users and the effect remains as negligible and is **not significant**.

*Residual effect*

4.3.28 The residual effect remains as negligible and is not significant.

***Chemical attack on buried structures and infrastructure***

4.3.29 Buried structures and infrastructure may be at risk of chemical attack from aggressive ground conditions. This includes water supply pipelines, tunnels, and concrete structures such as foundations.

*Magnitude of impact*

4.3.30 The majority of the land required for the proposed WWTP comprises natural soils with no significant contamination. Information from the ground investigations will be used to inform the material requirements in the detailed design. The magnitude of impact is considered to be very low (1).

4.3.31 The assessment shows no change in risks between baseline and operation.

*Sensitivity of receptor*

4.3.32 Buried structures and infrastructure are considered to be low sensitivity.

*Significance of effect*

4.3.33 The significance of effect is based on the change in magnitude of impact from baseline to operation. The magnitude of impact during baseline is low risk (1) since there is no existing infrastructure on-site. The magnitude of impact is also low risk (1) during operation. No change in risk level is considered a negligible significance of effect which is **not significant**.

*Secondary mitigation or enhancement*

4.3.34 There are no secondary mitigation measures relevant to buried structures and infrastructure and the effect remains as negligible and is **not significant**.

*Residual effect*

4.3.35 The residual effect remains as negligible and is **not significant**.

## Waterbeach pipeline

4.3.36 This section sets out the assessment of effects in relation to the Waterbeach pipeline which consists of a transfer section running from the north near Waterbeach to Low Fen Drove Way, a section crossing the area of land required for the construction of the proposed WWTP and, a section south of the A14 which connects to the area of land where the existing Cambridge WWTP is located.

***Exposure to contaminated soils through ingestion, direct contact and inhalation – on-site land users***

*Magnitude of impact*

4.3.37 There is potential for workers and visitors on the land required for the Waterbeach pipeline to have direct contact with soils. Off-site industrial/commercial workers and visitors who are adjacent to the existing Waterbeach WRC may also have contact with soils. The land will be reinstated and continue to be used for agriculture and recreation (through access via PRoW) and so the public may have direct contact with soils.

4.3.38 A Materials Management Plan (MMP) will be developed if required to allow the application of CL:AIRE Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) for the reuse of excavated waste materials (if required), as detailed in Section 7.9 (Waste management and resource use) of the CoCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1).

4.3.39 No significant sources have been identified along the route with the exception of an off-site landfill and the Waterbeach WRC. Targeted laboratory testing has determined that no soils exceed the GAC for human health. Therefore, the magnitude of impact is considered to be very low risk (1).

4.3.40 The assessment shows no change in risks between baseline and operation.

*Sensitivity of receptor*

4.3.41 On-site WWTP workers and visitors and off-site industrial/commercial workers and visitors are considered **low** sensitivity.

*Significance of effect*

4.3.42 The significance of effect is based on the change in magnitude of impact from baseline to operation. The magnitude of impact during both baseline and operation is very low (1). No increase in risk level is considered a negligible significance of effect which is **not significant**.

*Secondary mitigation or enhancement*

4.3.43 There are no secondary mitigation measures relevant to on-site land users and the effect remains as negligible and is **not significant**.

*Residual effect*

4.3.44 The residual effect remains as negligible and is **not significant**.

***Chemical attack on buried structures and infrastructure***

4.3.45 Buried structures and infrastructure, such as the Waterbeach pipeline, may be at risk of chemical attack from aggressive ground conditions.

*Magnitude of impact*

4.3.46 The majority of the site is clean and consists of natural materials. Information from the ground investigations will be used to inform the material requirements in the design phase.

4.3.47 The assessment shows no change in risks between baseline and operation.

*Sensitivity of receptor*

4.3.48 Buried structures and infrastructure are considered to be low sensitivity.

*Significance of effect*

4.3.49 The significance of effect is based on the change in magnitude of impact from baseline to operation. The magnitude of impact during baseline is low (1) since there is no existing infrastructure on-site. The magnitude of impact is low (1) during operation as well. No change in risk level is considered a negligible significance of effect which is **not significant**.

*Secondary mitigation or enhancement*

4.3.50 There are no secondary mitigation measures relevant to buried structures and infrastructure and the effect remains as negligible and is **not significant**.

*Residual effect*

4.3.51 The residual effect remains as negligible and is **not significant**.

***Migration of contamination through preferential pathways to controlled waters***

4.3.52 This refers to the potential for soil leachate to migrate through preferential pathways which are introduced by the Waterbeach pipeline. Assessment in relation to leaks from Waterbeach pipeline is included within Chapter 20: Water resources.

*Magnitude of impact*

4.3.53 Anthropogenic contaminant transport pathways such as pipelines could create additional pathways to the aquifer and other water bodies. However, the aquifers and water bodies are in hydraulic continuity within land required for the Waterbeach pipeline and so additional pathways are unlikely.

4.3.54 There is limited made ground on-site as the majority of the land required for the Waterbeach pipeline is agricultural. Ground investigation was targeted to potential contaminant sources. There were no exceedances of human health GAC and there were no elevated contaminants within soil samples. No soil leachate samples were scheduled. However, significant contamination from soil leachate is unlikely to be encountered on-site as the majority of the site is agricultural land and no significant made ground is anticipated to be encountered.

4.3.55 The assessment shows no change in risks between baseline and operation.

*Sensitivity of receptor*

4.3.56 The Principal aquifers are considered high sensitivity. Secondary A aquifers and River Cam are considered medium sensitivity. The drainage channels are considered low sensitivity.

*Significance of effect*

4.3.57 The significance of effect is based on the change in magnitude of impact from baseline to operation. The magnitude of impact during baseline is low/medium (3) for Principal aquifers and the River Cam, low (2) for Secondary A aquifers and very low (2) for drainage channels. The risks remain the same during operation due to the pollutant linkage already existing and there being no significant contamination anticipated. Therefore, the significance of effect is negligible which is **not significant**.

*Secondary mitigation or enhancement*

4.3.58 There are no secondary mitigation measures relevant to controlled waters and the effect remains as negligible and is **not significant**.

*Residual effect*

4.3.59 The residual effect remains as negligible and is **not significant**.

## Monitoring

4.3.60 No monitoring is required for operation of the Proposed Development for land quality purposes.

## 4.4 Decommissioning of the existing Cambridge WWTP

4.4.1 This section sets out the assessment of effects in relation to activities completed to rescind the environmental permit at the existing Cambridge WWTP. Demolition activities and intrusive works to decommission the existing Cambridge WWTP are considered within the cumulative assessment. Decommissioning of the existing Waterbeach WRC is considered within the cumulative assessment.

### Existing Cambridge WWTP

4.4.2 Decommissioning of the existing WWTP does not include below ground works and therefore contaminated land risks will not be affected by decommissioning.

### Proposed WWTP

4.4.3 Future decommissioning of the proposed WWTP would be governed by the regulatory regime in place at the time of the works. As with the present system, it is expected that rescinding the operational permit would require demonstration that the permitted facility did not present contaminated land risks once decommissioned.

### Monitoring

4.4.4 No monitoring is required for decommissioning of the Proposed Development for land quality purposes.

## 4.5 Cumulative effects

4.5.1 Cumulative effects are those arising from impacts of the Proposed Development in combination with impacts of other proposed or consented development projects that are not yet built or operational. An assessment of cumulative effects for Land Quality has been completed and is reported in Chapter 21: Cumulative effects assessment.

4.5.2 Following decommissioning of the existing Cambridge WWTP, the site will be demolished and prepared in phases for future development works. Demolition of the existing Cambridge WWTP will involve below-ground works with potential ground remediation, if required. No significant effects are anticipated in terms of land quality. However, remediation of the ground may result in beneficial effects on land quality.

4.5.3 There are committed developments within the wider study area including both commercial and residential developments. Those adjacent to the existing Cambridge WWTP are unlikely to be impacted as this will be decommissioned. Those adjacent to the proposed WWTP are unlikely to be impacted by land quality impacts as there are no significant effects on human health from construction or operation of the proposed WWTP. Off-site receptors have been included within the contaminated land assessment and this concluded no significant effects.

4.5.4 For land quality there are no residual cumulative effects.

## 4.6 Inter-related effects

4.6.1 Inter-relationships are the impacts and associated effects of different aspects of the construction and operation of the Proposed Development and the decommissioning of the existing Cambridge WWTP on the same receptor.

4.6.2 The following summarises the inter-related effects identified for Land Quality:

- The assessment has found that no significant effects on land quality are anticipated from the Proposed Development. Effects on land quality receptors which may have inter-related effects with other topics are discussed below.
- Groundwater and surface water quality may be impacted during construction and operation by contaminants or processes that are introduced as part of the works. These effects have been assessed in Chapter 20: Water resources.
- Impacts on human health from reuse of materials has been assessed in the land quality chapter as not significant. Use of site won materials is also reviewed in Chapter 16: Material resources and waste, however, this is not related to impacts on human health and rather to reduction of waste to landfill.
- Impacts on human health from dust, water pollution and hazardous waste are also considered in Chapter 12: Health. Effects are assessed as not significant and therefore does not increase the impact assessed as part of the land quality chapter.
- Impacts on health from production of dust during construction are also considered in Chapter 4: Air quality. This identified a negligible impact which does therefore not increase the impact assessed as part of the land quality chapter.

# 5 Conclusion and Summary

## 5.1 Mineral safeguarding areas

5.1.1 The assessment of the potential effects to two MSA (Chalk and sand and gravel) from the construction of the Proposed Development has been completed on the basis of the information currently available on the extent of the MSA and the RWCS in relation to extents of land likely to be physically disturbed.

5.1.2 The maximum percentage of the MSA (Chalk) that may be affected on both a temporary and permanent basis is 0.18% of a total of 636.5km$^2$.

5.1.3 The calculation indicates that the percentage of the MSA (sand and gravel) that may be affected is 0.02% of a total of 991.8km$^2$.

5.1.4 The magnitude of impact to each MSA is negligible.

5.1.5 The impacts to minerals are summarised in Table 5-1~~Table 5-1~~.

5.1.6 No significant effects to MSA have been identified.

## 5.2 Land quality

5.2.1 The assessment of the potential effects to land quality from the Proposed Development has been completed on the basis of the information currently available on ground conditions, previous land use and soil and groundwater quality.

5.2.2 The assessment takes into account mitigation measures required during the construction phase, including the CoCP, SMP and Outline Decommissioning Plan as well as regulatory requirements in relation to the control of risks related to land contamination. Potential impacts arising from the construction phase would be expected to be localised and short-term.

5.2.3 It is concluded that the likely significance of effect to land quality would be negligible during the construction phase.

5.2.4 If previously unidentified contaminated land was identified during construction, this may result in a minor beneficial effect owing to the requirement to complete remediation. In this instance, the benefits are not expected to be significant.

5.2.5 Potential impacts that could occur during operation would be expected to be localised and intermittent. Environmental performance compliance in operation will be monitored under the Environmental Permit. Taking into account design measures, regulatory controls and associated environmental management procedures, the effects would be negligible and not significant.

5.2.6 Any impacts arising from the decommissioning of the existing Cambridge WWTP would be expected to be localised and intermittent. Taking into account the application of the Decommissioning Plan and regulatory controls, the effects would be negligible and not significant.

5.2.7 Impacts from land contamination are summarized in Table 5-2~~Table 5-2~~.

5.2.8 All significance of effect has been assessed as negligible and not significant.

**Table 5-1: Summary of land quality effects (minerals)**

| Description of effect | Primary and tertiary measures adopted as part of the project | Magnitude of impact | Sensitivity of receptor | Initial classification of effect | Additional / Secondary mitigation | Residual effect significance | Proposed monitoring |
|---|---|---|---|---|---|---|---|
| Partial loss of river terrace deposits during construction | Minimising area required for construction where possible. Replacement of excavated materials where possible or reuse within the Proposed Development. | Negligible | Medium | **Negligible** | None required | None anticipated | None |
| Loss of MSA – Chalk | | Negligible | Medium | **Negligible** | None required | None anticipated | None |

**Table 5-2: Summary of land quality effects (land contamination)**

| Description of effect | Primary and tertiary measures adopted as part of the project | Magnitude of impact | Sensitivity of receptor | Initial classification of effect | Additional / Secondary mitigation | Residual effect significance | Proposed monitoring |
|---|---|---|---|---|---|---|---|
| Exposure to contaminated soils through inhalation –off-site land users | Dust control measures will be mitigated proportionally using the measures using the IAQM 'Guidance on the assessment of dust from demolition and construction' implemented through an Air Quality/Dust Management Plan as set out in CoCP Part A Section 4.4 (CEMP) | Very low (1) | Very low (1) | **Negligible** | Construction dust effects will be mitigated proportionally, using the recommendations within the Institute of Air Quality Management (IAQM) 'Guidance on the assessment of dust from demolition and construction' set out in CoCP. | None anticipated | None |
| Migration of existing contamination through preferential pathways to controlled waters (by piling, pipelines, tunnelling, and construction of shafts) | Ground investigation was undertaken to inform risks as part of LCRM process. | Principal aquifer and River Cam: low/moderate (3)<br>Secondary A aquifer (River Terrace Deposits and alluvium): Low (2)<br>Drainage channels on and off-site: Low (2) | Principal aquifer and River Cam: low/medium (3)<br>Secondary A aquifer (River Terrace Deposits and alluvium): Low (2)<br>Drainage channels on and off-site: Low (2) | **Negligible** | None required | None anticipated | None |
| Exposure of on-site and off-site land users to contamination through direct contact, ingestion or inhalation of dusts from contaminated soils which are reused on-site as part of the landscaping | Clean and natural materials are proposed for reuse on the WWTP site. Uncontaminated naturally occurring materials will require appropriate materials management including recording of material movement and testing.<br><br>If made ground is proposed for reuse, this will need to be appropriately managed under a materials management plan. Testing will be required to prove the material is safe for reuse in terms of risks to human health and controlled waters. | Very low (1) | Very low (1) | **Negligible** | None required. | None anticipated. | None |
| Migration of contamination or leachate from inappropriate reuse of soils on the proposed WWTP | Soils reused within the Proposed Development will be natural, uncontaminated. If any made ground is to be reused this will be tested for suitability for reuse under a CL:AIRE materials management plan. | Principal aquifer: low/moderate (3)<br>Secondary A aquifer (River Terrace Deposits and Alluvium): Low (2) | Principal aquifer: High (3)<br>Secondary A aquifer (River Terrace Deposits and | **Negligible** | None required. | None anticipated | None |

| Description of effect | Primary and tertiary measures adopted as part of the project | Magnitude of impact | Sensitivity of receptor | Initial classification of effect | Additional / Secondary mitigation | Residual effect significance | Proposed monitoring |
|---|---|---|---|---|---|---|---|
| | | Drainage channels on and off-site: Low (2) | Alluvium): Medium (3)<br>Drainage channels on and off-site: Low (2) | | | | |
| Damage from aggressive ground conditions on buried structures and infrastructure: water supply pipe infrastructure, concrete structures (e.g., foundations), and tunnels. | Materials and designs will be informed by the ground investigation results and prevailing ground conditions.<br>Operational monitoring of structural conditions and asset inspections | Very low (1) | Very low (1) | **Negligible** | None required. | None anticipated | None |

## 5.3 Securing mitigation

5.3.1 The delivery of mitigation will be controlled through the 'Development Consent Order (DCO) which:

- identifies parameters within which certain works activities will be located and constructed (e.g. maximum and minimum building dimensions (including below ground), or locational zones);
- sets requirements for construction, operation and maintenance of the Proposed Development to be undertaken in accordance with 'control plans / documents' (including those that are related to compliance with environmental permits); and
- sets requirements for the control of specific issues or works (e.g. time limits around the completion of the outfall construction)

5.3.2 Table 5-3 summarises all mitigation in relation to Land Quality, how these measures are secured, the party responsible for the implementation of the measure, when the measure would be delivered and any mechanisms to deliver the measure.

**Table 5-3: Land quality mitigation summary**

| Description of impact | Residual Effect | Mitigation measure | Mitigation type | Secured by | Responsible party | Timing on the provision of the measure | Trigger for the discharge of any related requirement |
|---|---|---|---|---|---|---|---|
| **MSA impacts** | | | | | | | |
| Loss of, or restricted access to, sand and gravel MSA | Negligible: not significant | Measures outlined in Section 7.9 (Waste management and resource use) of the CoCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1) to ensure, where possible, minerals which are extracted as part of the construction will be reused within the Proposed Development, which will reduce the impact on the resource | Primary | DCO Schedule 2 Requirement 3 (Phasing) (App Doc Ref 2.1)<br>DCO Schedule 2 Requirement 9 (CEMP) (App Doc Ref 2.1) which requires the preparation of a CEMP for each phase. Each plan submitted for approval must incorporate the measures specified in the CoCP as being contained within a CEMP in so far as they are relevant to the works proposed within the Phase. Alignment to the CoCP secured by Requirement 8 (CoCP) (App Doc Ref 2.1)~~Section 7.9 (Waste management and resource use), COCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1)~~ | Design team | During design | An approved Phasing Plan.<br>An approved CEMP prior to the start of construction<br>~~Approval of CoCP prior to development~~ |
| | | Where possible, minerals which are extracted as part of the construction will be reused within the scheme to reduce the impact of the resource. Appendix 14.5: Chalk MSA calculation (App Doc Ref 5.4.14.5) includes calculations to determine the area of the MSA<br>Furthermore, the land required for the proposed development will be minimise as much as possible. | Primary | ~~Appendix 14.5: Chalk MSA calculation (App Doc Ref 5.4.14.5) includes calculations to determine the area of the MSA~~<br>~~Paragraphs 4.2.13 to 4.2.21 of ES Chapter 14: Land Quality (App Doc Ref 5.2.14)~~DCO Schedule 2 Requirement 3 (Phasing) (App Doc Ref 2.1)<br>DCO Schedule 2 Requirement 9 (CEMP) (App Doc Ref 2.1) which requires the preparation of a CEMP for each phase. Each plan submitted for approval must incorporate the measures specified in the CoCP as being contained within a CEMP in so far as they are relevant to the works proposed within the Phase. Alignment to the CoCP secured by Requirement 8 (CoCP) (App Doc Ref 2.1) | Design team | During design | An approved Phasing Plan.<br>An approved CEMP prior to the start of construction<br>~~Approval of CoCP prior to development~~ |
| Loss of, or restricted access to, Chalk MSA | Negligible: not significant | Measures outlined in Section 7.9 (Waste management and resource use) of the CoCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1) to ensure, where | Primary | ~~Schedule 1~~<br>Section 7.9 (Waste management and resource use), CoCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1)<br>DCO Schedule 2 Requirement 3 (Phasing) (App Doc Ref 2.1) | Design Team<br>Appointed Contractor (s) | During construction | An approved Phasing Plan.<br>An approved CEMP prior to the start of construction |

| Description of impact | Residual Effect | Mitigation measure | Mitigation type | Secured by | Responsible party | Timing on the provision of the measure | Trigger for the discharge of any related requirement |
|---|---|---|---|---|---|---|---|
| | | possible, minerals which are extracted as part of the construction will be reused within the Proposed Development, which will reduce the impact on the resource. Furthermore, the land required for the proposed development will be minimise land required as much as possible. | | DCO Schedule 2 Requirement 9 (CEMP) (App Doc Ref 2.1) which requires the preparation of a CEMP for each phase. Each plan submitted for approval must incorporate the measures specified in the CoCP as being contained within a CEMP in so far as they are relevant to the works proposed within the Phase. Alignment to the CoCP secured by Requirement 8 (CoCP) (App Doc Ref 2.1) | | | |
| **Land contamination - construction impacts** | | | | | | | |
| Exposure to contaminated soils through inhalation –off-site land users | Negligible: not significant | Dust control measures will be mitigated proportionally using the measures using the IAQM 'Guidance on the assessment of dust from demolition and construction' implemented through an Air Quality/Dust Management Plan as set out in CoCP Part A Section 4.4 (CEMP) | Secondary | ~~Section 7.8 (Air quality), CoCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1)~~ ~~Section 4.4 (CEMP), CoCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1)~~DCO Schedule 2 Requirement 9 (CEMP) (App Doc Ref 2.1) which requires the preparation of a CEMP for each phase. Each plan submitted for approval must incorporate the measures specified in the CoCP as being contained within a CEMP in so far as they are relevant to the works proposed within the Phase. Alignment to the CoCP secured by Requirement 8 (CoCP) (App Doc Ref 2.1) | Appointed Contractor(s) | During construction | An approved Phasing Plan. An approved CEMP prior to the start of construction ~~Approval of CoCP prior to development~~ |
| Migration of existing contamination through preferential pathways to controlled waters (by piling, pipelines, tunnelling and construction of shafts) | Negligible: not significant | Any pre-existing contamination would be adequately managed through the contaminated land regime (LCRM) to ensure that the operational area is suitable for use. | Tertiary | Standard ~~planning~~ requirement (LCRM document (Environment Agency, 2021)) | Applicant and their appointed contractor(s) | During construction | Approval of LCRM documents prior to commencement of construction (as required). |
| **Land contamination - operational impacts** | | | | | | | |
| Exposure of on-site and off-site land users to contamination through direct contact, ingestion or inhalation of dusts from contaminated soils which are | Negligible: not significant | A Materials Management Plan (MMP) will be developed if required to allow the application of CL:AIRE | Tertiary | DCO Schedule 2 Requirement 9 (CEMP) (App Doc Ref 2.1) which requires the preparation of a CEMP for each phase. Each plan submitted for approval must incorporate the measures specified in the CoCP as being contained within a | Operator | Post construction – operational | An approved Phasing Plan. An approved CEMP prior to the start of construction Approval of CL:AIRE Materials Management Plan |

| Description of impact | Residual Effect | Mitigation measure | Mitigation type | Secured by | Responsible party | Timing on the provision of the measure | Trigger for the discharge of any related requirement |
|---|---|---|---|---|---|---|---|
| reused on-site as part of the landscaping | | Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) for the reuse of excavated waste materials (if required), as detailed in Section 7.9 (Waste management and resource use) of the CoCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1).<br>Dust control measures will be mitigated proportionally using the measures using the IAQM 'Guidance on the assessment of dust from demolition and construction' implemented through an Air Quality/Dust Management Plan as set out in CoCP Part A Section 4.4 (CEMP) | | CEMP in so far as they are relevant to the works proposed within the Phase. Alignment to the CoCP secured by Requirement 8 (CoCP) (App Doc Ref 2.1)~~Section 7.9 (Waste management and resource use), Code of Construction Practice (CoCP) Part A (Appendix 2.1, App Doc Ref 5.4.2.1), if required.~~ | | | (if required), prior to construction. |
| Migration of contamination or leachate from inappropriate reuse of soils on the proposed WWTP site | Negligible: not significant | A Materials Management Plan (MMP) will be developed if required to allow the application of CL:AIRE Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) for the reuse of excavated waste materials (if required), as detailed in Section 7.9 (Waste management and resource use) of the CoCP Part A (Appendix 2.1, App Doc Ref 5.4.2.1). | Tertiary | DCO Schedule 2 Requirement 9 (CEMP) (App Doc Ref 2.1) which requires the preparation of a CEMP for each phase. Each plan submitted for approval must incorporate the measures specified in the CoCP as being contained within a CEMP in so far as they are relevant to the works proposed within the Phase. Alignment to the CoCP secured by Requirement 8 (CoCP) (App Doc Ref 2.1)~~Section 7.9 (Waste management and resource use), Code of Construction Practice (CoCP) Part A (Appendix 2.1, App Doc Ref 5.4.2.1), if required.~~ | Operator | Post construction – operational | An approved Phasing Plan.<br>An approved CEMP prior to the start of construction<br>~~Approval of CoCP prior to development.~~ |

| Description of impact | Residual Effect | Mitigation measure | Mitigation type | Secured by | Responsible party | Timing on the provision of the measure | Trigger for the discharge of any related requirement |
|---|---|---|---|---|---|---|---|
| Damage from aggressive ground conditions on buried structures and infrastructure: water supply pipe infrastructure, concrete structures (e.g., foundations) and tunnels. | Negligible: not significant | Design of structures and materials for the ground conditions present.<br><br>Operational monitoring of structural conditions and asset inspections. | Primary (embedded) | DCO Schedule 2 Requirement 7 (Detailed Design) (App Doc Ref 2.1)<br><br>DCO Schedule 2 Requirement 18 (Operational Asset Management Plan) (App Doc Ref 2.1) which should incorporate the measures within the Asset Management Plan (App Doc Ref 5.4.9.1) ~~Schedule 1~~<br>~~Requirements within Schedule 2~~<br>~~Detail design approval~~ | Design team<br><br>Operator | Post construction – operational | Approval of designs prior to start of construction.<br><br>Approval of asset management plan prior to start of operation. |

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# 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**

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

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