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APPENDICES

9. LAND QUALITY

Introduction

9.1 This chapter of the ES considers the potential for environmental and health impacts associated with land quality at the proposed Spring Green Power AD Plant and pipeline. This chapter describes the scope, relevant legislation, assessment methodology, and the baseline conditions existing at the Site and its surroundings. It considers any potential significant human health and environmental effects the proposed development (including earthworks and construction) would have on this baseline environment; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been employed.

9.2 Historical land use activities can give rise to contamination of land and water on a site. Such contamination may present ongoing risks to health and the environment long after the activities that caused the contamination have ceased. Assessment of the human health and environmental risks that may be associated with land quality are therefore an integral part of robust planning and preparation for the redevelopment of land.

9.3 This chapter is supported by Appendix 01 which includes a Preliminary Land Quality Risk Assessment (PLQRA) completed during 2022.

Methodology

Policy and Regulatory Context

9.4 The primary UK regulatory regimes under which potentially contaminated land is managed under the planning process are described in the National Planning Policy Framework (NPPF) (Department for Communities and Local Government, 2012 - revised 2021) and under Part 2A of the Environmental Protection Act 1990 (Department for Environment Food and Rural Affairs, 2012).

National Planning Policy Framework

9.5 The NPPF has a core aim to encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value. The NPPF says the planning system should contribute to and enhance the natural and local environment by:

- 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,
- remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

9.6 Furthermore, the NPPF says that planning policies and decisions should also ensure that:

- 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);
- after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990; and
- adequate site investigation information, prepared by a competent person, is available to inform these assessments.

9.7 In addition, where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

9.8 It is clear that the national planning policy directs those involved in development to ensure sites are suitable for use and not be capable of being determined as contaminated land under Part 2A – which means that the category of land, following remediation (if required) also needs to be considered.

Statutory Contaminated Land Regime

9.9 Contaminated Land Statutory Guidance[1] advocates a precautionary approach to dealing with contaminated land, with clear direction to avoid the "excessive cost burdens" of "wastefully expensive remediation". For clarity:

- Category 1: describes land which is clearly problematic from a contamination risk perspective;
- Categories 2 and 3: cover the less straightforward land where detailed consideration is needed before deciding whether it is Category 2 (contaminated land requiring remedial action) or Category 3 (not contaminated land) - wider socio-economic factors come into play if health risks assessment fails to produce a decision; and
- Category 4: describes land that is clearly not contaminated land.

9.10 The Category 4 test is particularly important in defining when land is clearly not contaminated land in the legal sense, it would be exceptional for land exhibiting:

- normal background levels of contamination; or
- contaminant levels below published assessment criteria (including Category 4 Screening Criteria)

[1]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/223705/pb13735cont-land-guidance.pdf

9.11 To be considered as contaminated land, Regulators can only require remediation to a point where land is no longer contaminated land in the legal sense (i.e. the boundary between Categories 2 and 3) and not require "unnecessary" clean up to attain Category 4 standards. Exceedance of published assessment criteria should simply trigger further risk assessment.

Other relevant National Land Quality Guidance

9.12 The assessment approach adopted in this chapter summarises the information provided to the consenting authority to allow it to determine whether the site is suitable for its proposed end use, taking into account remediation (or mitigation) measures that may be required.

9.13 There is no single guidance document that provides a methodology for assessing the environmental effects of developments on geology, soils and land quality receptors. However, there are a number of guidance documents that have been referred to in developing the bespoke EIA methodology used in this assessment, as explained below.

9.14 The Institute of Environmental Management and Assessment (IEMA) Guidance for Environmental Impact Assessment (IEMA, 2006) provides general advice on how to undertake an EIA and has been taken into account in this assessment.

9.15 EIA guidance has been published by the Highways Agency in the Design Manual for Roads and Bridges (DMRB), Volume 11 Environmental Assessment, Section 3, Part 11, Geology and Soils (Highways Agency, 1993) for assessing the geology and soils effects of highways schemes. That guidance is not, however, particularly prescriptive on how a practitioner should determine the magnitude of impacts/change and the significance of effects. A later DMRB document: Volume 11 Environmental Assessment, Section 2, Part 5, HA205/08 Assessment and Management of Environmental Effects Highways Agency (Highways Agency, 2008), does provide a commonly used framework for assessing effects using a matrix approach.

9.16 In terms of assessing risk from contaminated land, especially Made Ground, the overarching guidance document is the Environment Agency's Land Contamination Risk Management (LCRM) published in October 2020. This provides a useful risk-based evidence approach for determining whether effects are significant or not. However, it is important to note that there is no commonly accepted guidance within LCRM on how practitioners should utilise the risk assessment approach in EIA. SLR has, therefore, applied a logical approach and defined the significance of contaminated land risk after developing a Conceptual Site Model (CSM) as prescribed in LCRM.

Land Quality Environmental Impact Assessment Criteria

9.17 The method for assessing the effects of the development due to land contamination risks is outlined below; this follows a separate risk assessment based methodology in accordance with published guidance.

9.18 The approach to the assessment of the environmental effects on geology and soils resources has been based on a widely used and accepted 'significance matrix assessment approach' (as used in DMRB Volume 11) which is based on the characteristics of the impact (magnitude and nature) and

the sensitivity of the receptor. This allows the relative significance of effects to be determined on a scale and ultimately the significant effects determined.

9.19 The EIA Regulations require consideration of a variety of types of effect. Each will have a source originating from the development, a pathway and a receptor.

9.20 The magnitude and significance of potential impacts on geology and soils resource features during both construction and operation of the proposed development have been assessed using standard criteria. There is no statutory definition of significance. In this ES the following descriptive terms are used:

- Substantial;
- Moderate;
- Minor;
- Negligible.

The meaning of the terms in relation to magnitude and sensitivity shown below:

Table 9-1 – Environmental Effect Matrix Categories for Geology and Soils Resources

		Sensitivity of Receptor			
		High	Medium	Low	Negligible
Magnitude of Impact	High	Substantial	Substantial	Moderate	Negligible
	Medium	Substantial	Moderate	Minor	Negligible
	Low	Moderate	Minor	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Contaminated Land Risk Assessment

9.21 One key aspect of the assessment of impact relates to the condition and/or quality of the land before any development takes place. This is because land that is due to be developed, especially if it has a historic industrial use, is not necessarily pristine in terms of its existing condition.

9.22 In such circumstances it is likely that development will have a material enhancement of the land quality (contamination) through mitigation activities associated with the remediation of the historic contamination such that the land is suitable for the intended use.

9.23 Accordingly, there is a standard approach to assess whether the land to be developed and the associated soil, hydrogeological (groundwater) and hydrological (surface water) quality, has been impacted from historic activities. The defining assessment of land contamination/quality is undertaken in accordance with the Environment Agency guidance Land Contamination Risk Management (LCRM).

9.24 LCRM is intended to assist all those involved in dealing with land contamination, including landowners, developers, professional advisors, regulatory bodies and financial providers. The

technical approach presented in LCRM is designed to be applicable to a range of non-regulatory and regulatory contexts that includes:

- development or redevelopment of land under the planning regime;
- regulatory intervention under Part 2A of the Environment Protection Act 1990;
- voluntary investigation and remediation; and
- managing potential liabilities of those responsible for individual sites or a portfolio of sites.

9.25 LCRM is split into stages: risk assessment, options appraisal and remediation and verification, which can be sub-divided as shown in Table 9-2.

Table 9-2 – Extract from LCRM

Stage 1 Risk Assessment		Stage 2 Options Appraisal		Stage 3 Remediation and Verification
Tier 1 - Preliminary risk assessment	>	Identification of feasible remediation options	>	Develop the remediation strategy
Tier 2 - Generic quantitative risk assessment		Detailed evaluation of options		Remediate
Tier 3 - Detailed quantitative risk assessment		Select final remediation option		Produce a verification report
				Long-term monitoring and maintenance (if required)

9.26 The first stage, Risk Assessment, is an essential component in achieving effective management of the risks from land contamination. Risk assessment for chemical contamination can be a highly detailed process as there are a range of specific technical approaches for different contaminants and circumstances. As shown in Table 9-2, the risk assessment stage is itself subdivided or tiered; assessors apply each tier in turn. Higher tiers require the assessment of more detailed information.

9.27 The common approach used by practitioners is to assess the direct effects of development on the site's geology and land quality (through changes to ground conditions because of development) and the indirect effects of those changes on the ultimate end users of the land. To enable this assessment there are firstly two risk assessments that are undertaken:

- a ***Development Impact Assessment*** discusses the potential impacts of the proposed development via loss (removal, erosion, disaggregation or compaction) and pollution. The assessment considers impacts during construction and occupation of the development.
- a ***Land Quality Assessment*** of the chemical quality risks posed by the site:
- during the construction phase to construction workers, and controlled waters; and;
- the risks of chemical exposure to future human site end-users and Controlled Water receptors from the period following completion of construction, taking into account the change in the land use brought about by the development.

9.28 Where there is a historic contaminated land risk at a site, a Conceptual Site Model (CSM) of the development site is prepared.

9.29 Potential land contamination impacts and associated risks to human health and controlled waters are assessed using a methodology based upon the CIRIA C552 Contaminated Land Risk Assessment – A Guide to Good Practice document (CIRIA, 2001). This method is specifically tailored to assess the impacts and risks that may arise from exposure to ground contamination and ground gases.

9.30 These are then used to inform the significance of environmental impact as shown in Table 9-1.

9.31 The CIRIA C522 guidance provides a description regarding the risk categories resulting from the application of the methodology, as summarised in Table 9-3. It is considered that moderate or higher risks are considered to be potentially significant in terms of the EIA as these are likely to require further investigation, remediation or other mitigation in order to reduce risks to acceptable levels.

Table 9-3 – Significance of Generic Qualitative Risk Assessment Categories

Conceptual Site Model Risk Level	Description	Significant/Not significant
Very High Risk	There is a high probability that severe harm could arise or there is evidence that severe harm is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not already undertaken) is required and remediation is likely to be required.	Would be classified as Category 1 or 2 site according to the Part 2A of the Environment Protection Act 1990. Significant.
High Risk	Harm is likely to arise and realisation of the risk is likely to present a substantial liability. Urgent investigation (if not already undertaken) is required and remediation may be necessary in the short term and is likely to be required over the longer term.	Category 1 or 2 site. Significant.
Moderate Risk	It is possible that harm could arise. However, it is either relatively unlikely that harm would be severe or if harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.	Category 2 or 3 site. Significant.
Low Risk	It is possible that harm could arise but it is likely that this harm would at worst normally be mild.	Category 3 site. Not significant.

Conceptual Site Model Risk Level	Description	Significant/Not significant
Very Low Risk	There is a low probability that harm could arise. In the event of such harm it is not likely to be severe.	Category 4 site. Not significant.

Limitations and Assumptions

9.32 The assessment undertaken is as objective as possible as it takes into account planning policy, legislation and published guidance in the assessment methodology and determination of significant effects. The assessment uses data from previous desk study and site investigation sources completed during 2022. The method relies on professional judgement in undertaking the qualitative assessment using a matrix approach. Therefore, the assessment results are presented as value judgements using professional experience.

Baseline Conditions

Sources of Information

9.33 As part of an assessment of a development's effects on land quality, baseline information has been obtained for the site and up to a 2km buffer area around the main site boundary and 500m buffer around the pipeline route (the study area).

9.34 Baseline conditions pertaining to the site have been compiled in 2022 from a review of readily available published information and previous reports. The site has been subject to the following assessment which is contained in Appendix 01:

- Spring Grove Green Power Proposed Anaerobic Digestion Facility at Thurlow Estate, Suffolk, Preliminary Land Quality Risk Assessment (PLQRA). Prepared for Acorn Energy, December 2022.

9.35 In developing the understanding of the baseline geology and land quality conditions at the site, the report listed above refers to sources of desk based publicly available information as follows:

- Historical and current Ordnance Survey maps from 1886 to present and Google Earth aerial images from 1945;
- West Suffolk District Planning portal for records of previous planning permissions;
- Groundsure EnviroGeoInsight reports on site conditions dated March 2022 and November 2022;
- British Geological Survey website (www.bgs.com);
- MAGIC website (www.magic.defra.gov.uk); and
- Zeticas UXO (unexploded ordnance) risk map (Risk Maps | Zetica UXO).

Site walkover

9.36 The main proposed digestion plant site was inspected by a representative of SLR's Land Quality team on 28th March and the route of the proposed pipeline and northern storage lagoon was inspected on 29th November 2022. The purpose of the walkover was to visually assess current activities at the site and on adjacent surrounding land and identify potential sources of land contamination.

Current Land Use

9.37 The main site is on the rural outskirts of Haverhill market town, approximately 2km northwest of the town's centre. The pipeline route extends from the main site approximately 2.5km north to the location of the former RAF Wratting Common, east of Skippers Lane at Withersfield.

9.38 The main site includes two adjoining arable fields. Bowsey Field in the west was covered with dead crop stubble and Spring Grove Field in the east was open and ploughed. Two intermediate pressure gas supply pipelines were noted to run parallel to each other in an east-west direction along the northern boundary of Bowsey Field. A ditch runs in a southerly direction between the two fields.

9.39 Spring Grove Farm buildings are in the southern part of the main site and include a farmhouse and various outbuildings and barns. An integrally bunded domestic oil tank was noted in the garden of the farmhouse. Various materials such as wood, paving slabs and various containers were noted on the ground next to an open sided barn.

9.40 The pipeline route mainly follows field boundaries in the south before crossing Horseheath Road, a field and Skippers Lane and then following the route of the Stour Brook River and adjacent public footpath in its northern section. It crosses underneath power lines in the southern section and runs parallel to an oil pipeline to the east of the road in its central section. At the northern most end the route is under a slightly degraded and overgrown concrete access road associated with a former airfield. Three brick structures with curved corrugated roofs (Nissen huts) are adjacent to the path at the northern end. One was empty, one was used to store pipes and flagstones for construction purposes (both had concrete floors) and the third was closed.

9.41 The proposed lagoon at the northern end of the pipeline is located within an open field which slopes towards the south. There were no structures within the field but two further brick stores were located on the access road to the east of the lagoon.

9.42 The pipeline route is surrounded by arable fields and occasional pockets of woodland. One woodland named Cadge's Wood is located immediately west of the northern terminus near the proposed storage lagoon. The pipeline route passes by occasional residential dwellings and farmhouse buildings within 250m.

Historical Land Use

9.43 The main site has a continuous history of being undeveloped open fields with a central drain running southwards through them and farm buildings in the south (Spring Grove Farm), as shown on historical mapping dating from 1886. Spring Grove Farm buildings comprise various small

structures, some of which were demolished between the 1999 and 2007. A strip of woodland and a footpath labelled Roman Road ran along the northern site boundary until around 1926.

9.44 A railway line ran along the southern boundary of the main site from 1886 until it was dismantled around 1971. An embankment associated with the former railway line remains present and overgrown adjacent to the south-eastern boundary.

9.45 The proposed pipeline route has typically comprised undeveloped land since the earliest mapping records from 1886.

9.46 The northern part of the site around the proposed digestate lagoon formed the southern extent of RAF Wratting Common airfield from around 1943. Several small buildings and Nissen huts were present on-site or in the immediate vicinity which were primarily used for bomb storage. The existing concrete roadway and structures on-site are legacy infrastructure from this land-use. SLR understands the airfield was disused shortly after the end of the war. By 1984 most of the structures were no longer present and the area had reverted to agricultural use.

Ground Conditions

9.47 The main site is undulating with the local topography generally sloping down in a south easterly direction from 90m AOD to 83m AOD. Both fields also slope down towards the Stour Brook to the south and dip towards the ditch which separates them. The proposed pipeline route is also undulating, with the local topography sloping down from the north and west at an elevation of approximately 125m AOD towards the southeast at an elevation of approximately 101m AOD.

9.48 Made Ground associated with the former railway line embankment is mapped adjacent to the southern boundary of the eastern part of the main site.

9.49 The Site and surrounding areas are underlain by superficial deposits comprising Lowestoft Formation - Diamicton (clay, silt, sand and gravel). Bedrock geology comprises Lewes Nodular Chalk Formation (chalk).

9.50 There are no BGS borehole records within 250m of the main site. The nearest record is approximately 750m to the south but at a similar ground elevation which records approximately 30m of boulder clay (diamicton) over the chalk.

9.51 There are two BGS borehole records within 250m of the proposed pipeline route. The nearest record is 174m southeast of the approximate mid-point and records approximately 32m of boulder clay (diamicton) over the chalk.

9.52 The site is reported to be at low risk from shrink swell clays, very low risks from running sands, collapsible deposits, landslides and negligible risk from compressible deposits. The risk of ground dissolution of soluble rocks is very low as while soluble rocks are present few dissolution features are likely to be present and there are no records of natural cavities in the area.

9.53 Sporadic underground mining of restricted extent may have occurred although there are no records of mineral workings.

9.54 Site buildings are at low risk from radon and radon protection measures are not required within buildings.

9.55 There is no ground investigation data available on-site.

Groundwater and Surface Water Conditions

9.56 The Stour Brook flows in an east-west direction adjacent to the southern boundary of the main site before it turns south and away from the site approximately halfway along Spring Grove Field. A ditch runs in a southerly direction through the centre of the main site between the two fields. Ditches also form the western boundary and run through the woodland along the northern boundary.

9.57 A separate arm of Stour Brook also flows east-west along the southern boundary of the proposed digestate lagoon adjacent Cadge's Wood before turning south and flowing immediately east and parallel with the approximate northern half of the proposed pipeline route in a southeast direction.

9.58 Superficial deposits are defined as a secondary undifferentiated aquifer (variable in nature) and the bedrock aquifer (chalk) is a principal aquifer (high level of water storage and may provide water supply for rivers on a strategic scale). Groundwater flow in the chalk is likely to be through well connected fissures.

9.59 The site is located within a total catchment groundwater source protection zone (SPZ 3).

9.60 A small southern portion of the main site and a small area near the mid-point of the pipeline route are at a medium to high risk of riverine flooding and are designated within a Flood Zone 3. The site is at a low risk of groundwater flooding.

9.61 Land immediately adjacent the River Stour is recorded at a maximum surface water flooding risk of greater than 1m impact at 1 in 30 years.

9.62 There are four recorded groundwater abstractions within 2km of the site all dating from 1966 with no end date for farming and domestic use. They are located 840m to the south of the main site, 362m west of the northern part of the pipeline route and 962m and 1.2km northwest of the pipeline. There are no recorded surface water abstractions within 2km.

9.63 Groundwater is sensitive within the area given the presence of a principal chalk aquifer beneath the site and the groundwater source protection zone. The sensitivity is mitigated by the presence of approximately 30m thick superficial deposits of variable permeability and the distance to the nearest abstractions. Therefore, overall, groundwater is considered to be of moderately high sensitivity at the site.

9.64 Surface water sensitivity is considered to be moderately high given the on-site and adjacent ditches and the adjacent Stour Brook.

Waste Management Activities

9.65 There are no active or historical landfills within 500m of the site. There are records of waste exemptions associated with storage of sludge on a farm located near to the centre of the pipeline route and three other locations between 160m to 390m of the site in all directions indicating the agricultural nature of the area.

Pollution Controls and Authorisations

9.66 There is one record of a pollution incident within 500m of the site which occurred in 2002 approximately 130m west of the main site including diesel with no impact to water, land or air.

9.67 There are four licensed discharge to controlled waters records within 500m relating to sewage discharges to tributaries of the River Stour/Stour Brook.

9.68 There are no records of any of the following within 500m of the site: current or recent petrol stations, electricity cables, gas pipelines, sites determined as Contaminated Land, Control of Major Accident Hazards (COMAH) sites, regulated explosive sites, hazardous substance storage / usage, historical licensed industrial activities (IPC, Part A(1), Part A(2)/B), radioactive substance authorisations, pollutant release to surface waters (red List), pollutant release to public sewer, List 1 and 2 dangerous substances, pollution inventory substances, pollution inventory waste transfers and pollution inventory radioactive waste.

Unexploded Ordnance

9.69 The site is within an area which Zetica classify as low risk for “the potential for Unexploded Bombs to be present as a result of World War Two bombing”. However, given the historical storage of ordnance on-site near the proposed digestate lagoon, local investigation and further assessment may be necessary.

Land Quality Assessment

9.70 The historical RAF airfield land use (including bomb storage and demolition of structures) has been identified as a potential source of contamination. The historical land use has the potential to have impacted shallow soils in this northern area of site at the proposed digestate lagoon and northern section of the proposed pipeline.

9.71 Potential contaminants associated with the former land use could include: asbestos, metals, hydrocarbons, solvents, cyanide, explosive residues and chemical weapon residues.

9.72 The PLQRA determined the potential impacts to shallow soils from the former airfield land use present a moderate/low qualitative risk to construction workers and future site users, and a low risk to controlled waters within the Stour Brook and groundwater, in the north of the site. The low risk to controlled waters assumes that no significant groundwater is present in the superficial deposits and that environmental measures will be implemented during construction that will mitigate against dust and surface water runoff to the Stour Brook.

9.73 No other potential sources of contamination were identified across the remainder of the site.

Future Baseline

9.74 In the 'do-nothing' scenario (e.g. if the development was not proposed) the future baseline would not be expected to change significantly from that described above.

Mitigation Measures

Standard Mitigation Measures

9.75 The development scheme and infrastructure have been designed to mitigate potential impacts. Such mitigation design has been based on, or developed from, best practice guidance.

9.76 A Construction Environmental Management Plan (CEMP) would be adopted. It is reasonable to accept that there are several 'tried and tested' techniques that would be employed on the construction site by a competent contractor, to be prepared at a later date in detail for inclusion in the CEMP, that would reduce the potential for significant effects to arise. Those that are of most relevance to land quality and contaminated land EIA are:

- The works will be designed and carried out in accordance with current Best Management Practices following https://www.gov.uk/guidance/pollution-prevention-for-businesses which includes guidance on: activities that produce contaminated water; correct use of drains; storing materials, products and waste; unloading and moving potential pollutants; and, construction, inspection and maintenance.
- A series of specific method statements identifying methods of working and controls to address all identified ground conditions, hydrogeology and waste environment issues will be created as part of the final CEMP.
- The CEMP will be designed in response to a detailed review of the detailed principal contractor's Construction Phase Plan (CPP) and will include all of the key measures identified in this mitigation section, plus additional measures specified in planning conditions required by consultees as relevant to the detailed design of the works proposed. Provision will be made for addressing unexpected events (contingency planning).
- A working materials management plan (MMP) according to the CL:AIRE Development Industry Waste Code of Practice will be required to specify the reuse of site won materials in conjunction with the site's soil balance assessment.

Actionable Mitigation Measures

9.77 The following mitigation measures, contained within or developed from the findings of the PLQRA in Appendix 01, are required as part of redevelopment:

- A localised ground investigation is to be undertaken in the former airfield area to assess the nature of shallow soils and if there is a risk to receptors from potential impacts. A ground investigation would inform the development design, allow the conceptual site

model to be revised with site-specific data, and determine if further mitigation or remediation measures are required if unacceptable risks to receptors are identified. The ground investigation will confirm the presence/absence of shallow groundwater as a significant receptor.

- Industry best-practice dust management, stockpile and soil handling techniques are to be implemented during construction to mitigate against risks of potential impacts to worker health and nearby surface water during construction. Required measures to be adopted will be informed by the results of the ground investigation and will be outlined within a CEMP.
- Given the historic RAF bomb storage area in the north of the site, the advice of a specialist unexploded ordnance (UXO) consultant will be obtained before planning any intrusive works.
- A watching brief for unexpected contamination is to be maintained for the duration of the intrusive works.
- Control measures are to be implemented for any imported soil and/or aggregate materials, to ensure any imported materials do not contain contaminants which may present an unacceptable risk to receptors for the proposed development.

Assessment of Environmental Impacts

Impact Assessment

9.78 This section details the impacts which might be present assuming the inherent and standard mitigation measures are implemented.

Construction Phase

9.79 The conceptual model within the PLQRA discusses the qualitative risks from potential contamination of site soils, and assesses them in terms of their likely magnitude, significance and effect. Mitigation measures, where warranted, are outlined in Section 6.77. The conceptual model for the Site has considered potential contaminants, pathways and receptors, which together form potential pollutant linkages.

9.80 The PLQRA has identified construction workers as significant human health receptors which could potentially be impacted during the construction phase. A site investigation in the former RAF area is recommended prior to completed design and commencement of construction to characterise the nature of shallow soils and if there are any potentially unacceptable risks to human health.

9.81 The primary risks to human health from shallow soil contaminants are via the direct contact, ingestion and inhalation pathway. Risks to human health are likely to be mitigated through PPE/RPE and behavioural control measures outlined in a CEMP, however the potential risks cannot be discounted at this stage without ground investigation data.

9.82 Given the potential for the presence of asbestos in shallow soils in the former RAF area, all site workers will have received asbestos awareness training before commencing works. An asbestos discovery strategy will be outlined within the CEMP.

9.83 A watching brief for unexpected contamination will be maintained throughout the duration of the intrusive works and a discovery strategy will be outlined within the CEMP.

9.84 The PLQRA has identified Stour Brook as a significant controlled waters receptor which could potentially be impacted during the construction phase during works in the northern RAF area. However, risks to surface water are likely to be mitigated by preventing runoff to the Stour Brook through appropriate soil handling and stockpile management measures outlined in a CEMP.

9.85 Given the uncertainty due to the lack of site investigation data but localised nature of the potential source, time since the airfield was operational, recent agricultural use and likelihood that assumed implementation of health and safety control measures will mitigate the risk, the impact of proposed development during this phase would be **low**. This impact assessment will need to be reviewed after completion of the ground investigation. No potential contamination sources were identified outside the former RAF area and the impact of proposed development in this area of site would be **negligible**. The impact assessment during the construction phase is summarised in Table 9-4.

Table 9-4 – Summary of Impact Assessment – Construction Phase

Receptor	Sensitivity	Description of Effect	Inherent & Standard Mitigation Measures	Impact Magnitude	Type of Impact	Impact Significance
Human Health (Construction Worker)	Medium to High	Dermal contact, inhalation and/or ingestion of soils.	Land Quality Risk Assessment, Soil and Dust Management Plan, Materials Management Plan (MMP), Construction Environment Management Plan (CEMP). Health and Safety Risk Assessment associated with Contractors duty of care to its workers.	Low in former RAF area due to lack of investigation data to support assessment. Potentially lower provided appropriate mitigation such as wearing PPE is undertaken in accordance with the H&S risk assessment. To be reviewed following site investigation. Negligible elsewhere on-site.	Temporary and Short-term	Low/Negligible
Controlled Waters (Surface water – Stour Brook)	Medium to High	Runoff and infiltration leaching contaminants to surface water, erosion and deposition of soils, deposition of dust	Land Quality Risk Assessment, Soil and Dust Management Plan, Materials Management Plan (MMP), Construction Environment Management Plan (CEMP). Soil handling and stockpile management techniques, CEMP, water management and drainage plan.	Low in former RAF area due to lack of investigation data to support assessment. Potentially lower provided appropriate mitigation and environmental control measures are implemented such as correct stockpile management. To be	Temporary and Short-term	Low/Negligible

				reviewed following site investigation. Negligible elsewhere on-site.		

Occupation Phase

9.86 The occupation phase constitutes the normal day-to-day activities on the completed development.

9.87 The proposed nature of the scheme is unlikely to result in significant future contaminative impacts to site soils or surface water. It is possible that there may be some small-scale spills and leaks of chemicals or fuels but given the small scale of any event, they are unlikely to have a significant impact.

9.88 The presence of hardstanding and relatively impermeable shallow soils would act to prevent significant vertical migration of contaminants into unsaturated soils. Engineered lagoons and drainage systems will act to contain and minimise the likelihood of contaminants, 'dirty water' or digestate entering surface water courses.

9.89 The potential for ongoing risks to human health in the former RAF area will be reviewed and assessed on completion of the site investigation. If unacceptable risks are identified as a result of historic contamination, remedial actions will be outlined and implemented to ensure the development will be suitable for its intended use in accordance with planning requirements.

9.90 As such, it is considered that there are no potential significant risks to controlled waters or human health from the occupation phase that cannot be adequately mitigated. Therefore, the impact of proposed development during this phase would be **negligible**. The impact assessment during the operational phase is summarised in Table 9-5.

Table 9-5 – Summary of Impact Assessment – Occupation Phase

Receptor	Sensitivity	Description of Effect	Inherent & Standard Mitigation Measures	Impact Magnitude	Type of Impact	Impact Significance
Human Health (Future site workers)	Medium to High	Dermal contact, inhalation and/or ingestion of soils.	Land Quality Risk Assessment, remedial strategy and validation report (if required)	Negligible provided risk assessment concludes no unacceptable risk or remedial measures are implemented and the validation report is approved by the planning authority.	Long-term and direct	Negligible
Controlled Waters (Surface water – Stour Brook)	Medium to High	Runoff and infiltration leaching contaminants to surface water, erosion and deposition of soils, deposition of dust	Land Quality Risk Assessment, remedial strategy and validation report (if required) Operational phase pollution management and spill response.	Negligible provided risk assessment concludes no unacceptable risk or remedial measures are implemented and the validation report is approved by the planning authority. Where are releases occur due to operational activities, these will be addressed quickly and proactively through implementation of spill response planning.	Long term and direct	Negligible

Residual Impact Assessment

9.91 Following implementation of the actionable mitigation measures as set out in Section 6.77, the residual impacts will be reviewed pending the results of the site investigation.

Cumulative Impact Assessment

9.92 There were no other schemes identified requiring assessment of significant cumulative effects.

CONCLUSIONS

9.93 This chapter has considered the potential for the proposed development to impact upon human health, soils and controlled waters receptors (surface water and groundwater).

9.94 The assessment has determined the proposed development will have a low impact on human health and surface water during the construction phase in the former RAF airfield area due to the potential for soil contamination impacts to be present from historical use, but uncertainty in ground conditions from a lack of investigation data. The potential impact can likely be mitigated to negligible using control measures, but requires confirmation of ground conditions.

9.95 A ground investigation will be undertaken in the former RAF area to assess the potential risk to receptors and the impact assessment will be revised based on the results of the investigation.

9.96 The assessment has determined the proposed development will have a negligible impact on human health, soil and controlled waters during the occupation phase.