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MANOR FARM, POYLE ROAD, SLOUGH
OUTLINE REMEDIATION STRATEGY

RAMBOLL

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Made by	**Jennifer Gill**
Checked by	**Yvonne McGillycuddy / Jon Eudall**
Approved by	**Jon Eudall**

Made by:

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APPENDICES

1. INTRODUCTION

1.1 Background

Ramboll UK Limited ("Ramboll") has been instructed by Manor Farm Propco Limited ("the Client") to prepare an Outline Remediation Strategy (ORS) for an area of land at Manor Farm, Poyle, Slough, UK, SL3 0BL (the "site") relating to the proposed re-development of the site as a data centre and battery energy storage system (BESS).

The proposed development plan is included in Appendix 1.

The site comprises two main areas, which are connected by a strip of land that runs from north to south. The northern section consists of two large areas used for airport car parking, whilst the central and western areas of the northern section comprise a mix of light industrial and commercial units. This includes a former builders yard area with two underground storage tanks. The southern parcel comprises approximately ~25% of the site and consists of vacant former agricultural land and some derelict metal sheds with a footpath running from west to east along its northern extent. A residential building is situated in the east of the site adjacent to the access road leading from Poyle Road and this will be removed as part of the redevelopment. The central area of the site comprises a narrow strip of land running from north to south.

A Site location plan is included as Figure 1 with a site layout plan presented as Figure 2, Appendix 2.

This strategy presents an overview of previous environmental investigations and risk assessments and proposes a general approach for sustainably improving the condition of the brownfield site to make it suitable for its proposed end use.

1.2 Proposed Development

The Remediation Strategy has been undertaken in connection with the proposed demolition of existing buildings and the redevelopment to comprise a Data Centre (Use Class B8) and Battery Energy Storage System (BESS) with ancillary substation, welfare and guard buildings, offices, associated plant, emergency backup generators and associated fuel storage, landscaping, sustainable drainage systems, car and cycle parking, and new and amended vehicular and emergency access from Poyle Road. .

1.3 Objectives

The overall objective of this Remediation Strategy is to describe how contamination will be addressed in order to ensure the ground conditions are suitable for the proposed development and significant risks to future site users and the environment have been mitigated.

Ramboll has prepared the following reports that support this Remediation Strategy. These reports should be read in conjunction with this document.

- Preliminary Risk Assessment (PRA), Ramboll, November 2024
- Generic Quantitative Risk Assessment (GQRA), Ramboll, November 2024

This Remediation Strategy has been prepared in line with industry best practise guidance and UK regulations, including:

- UK Government guidance on Land Contamination: Risk Management (LCRM), Updated July 2023 (Environment Agency)[1];
- Part 2A, Environmental Protection Act, 1990, as amended in 1995[2]; and,
- Waste (England and Wales) Regulations 2011 (as amended)[3].

This Remediation Strategy intends to:

- set out in outline form how the selected remediation options will mitigate risks from the relevant pollutant linkages identified in the conceptual site model;
- set remediation objectives;
- be compatible with the plans for re-development of the site;
- state how it will protect human health, the environment, ecology and other receptors;
- provide a sustainable approach; and
- be practical, achievable, effective, durable and verifiable, taking into account impacts of climate change and extreme weather events.

1.4 Definition of Development Phases

For the purposes of this document, the stages of development are defined as follows:

- **Enabling Works** – All earthworks and associated remediation activities required to prepare the site for development such as soil stripping, removal of USTs and other infrastructure, construction of access points and utility connections.
- **Construction Works** – All work relating to the construction of the development such as the construction of the drainage network, gas protection measures, foundation construction sub-structure and superstructure of the buildings.

1.5 Regulatory Consultation

To support the planning application, Ramboll has discussed the proposed development and the nature of the site with the Environmental Health Officer (EHO); from those discussions it was requested by the EHO that the GQRA and ORS be produced based on the available information to allow a more complete assessment of the site as part of the planning application and given that a reasonable amount of information already existed for the site.

1.6 General Limitations and Reliance

This report has been prepared by Ramboll exclusively for the intended use by the Client in accordance with Ramboll's proposal (proposal reference number REH2024N145697-RAM-SS-PO-0001_2.0), dated 13 August 2024) defining, among others, the purpose, the scope and the terms and conditions for the services. No other warranty, expressed or implied, is made as to the professional advice included in this report or in respect of any matters outside the agreed scope of the services or the purpose for which the report and the associated agreed scope were intended, or any other services provided by Ramboll.

In preparation of the report and performance of any other services, Ramboll has relied upon publicly available information, information provided by the Client and information provided by third

[1] Environment Agency (2021) *LCRM. Guidance.* https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm; accessed 21 December 2023
[2] https://www.legislation.gov.uk/ukpga/1990/43/part/IIA
[3] The Waste (England and Wales) Regulations 2011 (legislation.gov.uk); accessed 2nd January 2024

parties. Accordingly, the conclusions in this report are valid only to the extent that the information provided to Ramboll was accurate, complete and available to Ramboll within the reporting schedule.

Ramboll's services are not intended as legal advice, nor an exhaustive review of site conditions and/or compliance. This report and accompanying documents are initial and intended solely for the use and benefit of the client for this purpose only and may not be used by or disclosed to, in whole or in part, any other person without the express written consent of Ramboll. Ramboll neither owes nor accepts any duty to any third party, unless formally agreed by Ramboll through that party entering into, at Ramboll's sole discretion, a written reliance agreement.

The Outline Remediation Strategy is designed to support the proposed remediation process. Should the proposed development change, or previously unidentified impact be encountered during development, the Outline Remediation Strategy and the risk assessment which underpins it should be reviewed accordingly and may need to be updated.

This document is not intended to present a detailed design, risk assessments or control measures for the remediation. Such information will be presented in a Remediation Method Statement, to be prepared for each phase of works by the selected specialist remediation contractor.

The regulatory status of PFAS is continuing to evolve, and the scientific community is generating additional data regarding PFAS properties and potential impact. The conclusions of this report are therefore subject to reassessment as regulations change and additional scientific information regarding PFAS becomes available".

2. SITE DETAILS

2.1 Introduction

The Application Site has been subject to intrusive investigation and monitoring over several years. A list of investigation and contamination assessment reports is provided in Ramboll's Preliminary Risk Assessment Report (PRA) in Generic Quantitative Risk Assessment (GQRA).

Ramboll has undertaken additional gas and groundwater monitoring/sampling in 2023 and 2024 to supplement the historical data, and subsequently produced the GQRA to include the additional site investigation data. The GQRA reports (2023 and 2024) detail the findings of investigation of a wider site area, including land off-site to the west. For the purpose of this Remediation Strategy, only data from the proposed development site, and significant findings from adjacent off-site sampling locations are discussed. The adjacent site is not considered nor is part of the current planning application relating to the datacentre/BESS.

The monitoring location plan for the 2023/2024 work is shown in Figure 3, Appendix 1.

2.2 Site Land Use, History and Sensitivity

2.2.1 Site Land Use

As noted in Section 1, the site is currently in a mixed use. The site covers an area of approximately 8.5 hectares in size, subdivided into two areas connected by a strip of land that runs from north to south.

- The northern parcel comprises approximately 60% of the site and is used for a range of car parking and industrial/commercial end use. The north-east section consists of two large areas used for airport car parking, whilst the central and western areas of the northern section comprise a mix of light industrial and commercial units. In addition, a single residential building is situated in the east of the site adjacent to the access road leading from Poyle Road. Two underground foam filled tanks along with three above ground fuel tanks are known to be present in the northern parcel. Other associated chemical storage was also noted to be present on site.
- The central area of the site comprises approximately 10% of the site and consists of a narrow strip of land running from north to south. Thames Wire Metalworks, a metal fabricator warehouse with smaller ancillary buildings and areas of car parking and materials storage are located in the north of this area.
- The southern parcel comprises approximately 30% of the site and consists of vacant former agricultural land and some derelict metal sheds with a footpath running from west to east along its northern extent.

2.2.2 Site History

Historically the site comprised vacant agricultural land until the north-west and southern areas of the site were excavated for gravel extraction and subsequent landfilling between the 1940s and the 1980s.

- The northern area of the site was subsequently developed with a builders yard and other industrial/commercial units including a welding services from the 1990s, with airport car parking services comprising the northern extent from the early 2020s.

- The southern and central areas of the site have remained in a largely agricultural use prior to and following gravel extraction and infilling, with the exception of the construction of a metal fabrication unit and yard in the mid 1980's in the central strip of land that connects the northern and southern areas.

The topography of the site is noted to be largely flat.

2.2.3 Geology

A summary of the geological sequence and ground conditions is provided in Table 2.1 below. Further information about the geological descriptions can be found in Ramboll's PRA and GQRA reports[4] and as detailed in the Fugro Stage 1 Ground Investigation report [5].

Table 2.1: Summary of Ground Condition

Formation	Description	Thickness (m)	EA Aquifer Designation	Hydrogeological Significance
Surface Geology				
Topsoil	Topsoil	Variable, locally 0.15m	-	Negligible
Made Ground / Infilled Ground* (Landfill in one location in the north-west and most of southerly areas)	Made Ground (comprising layers of sandy gravel, gravelly sand and silt with layers of fissured dark grey clay)	Approx. 0.1-6.9m	-	Negligible
Shepperton Gravel Member (majority of north, centre, and southern areas, covering 75% of site)	Sand And Gravel	0-8m (proven 2.5-7.6m), locally 12-14m	Principal Aquifer, high vulnerability	Deposits that provide a high level of water storage and may support water supply or river base flow on a strategic scale.
Alluvium (runs along a marginal area of the north-east of the site covering 25% of the site and likely to extend off-site to the east)	Silt, sand and gravel	No record available	Secondary A Aquifer	Permeable layers capable of support water supplies at a local rather than strategic scale and can form an important source of base flow for rivers.
Bedrock Geology				
London Clay Formation	Clay	Up to 30-40 m according to nearby BGS logs	Unproductive Bedrock Aquifer	Deposits with low permeability that have negligible significance for water

[4] Generic Quantitative Risk Assessment, Manor Farm, Poyle. Ramboll, Reference: Project no.REH2023N02678-RAM-RP-00012 – Issued November 2024.
[5] Heathrow Expansion Project - Stage 1- Ground Investigation - Package 15a - Fugro Reference: G190012U (04) - Issue Date: May 2020

Formation	Description	Thickness (m)	EA Aquifer Designation	Hydrogeological Significance
		(encountered from 7.5m)		supply or river base flow.
London Lower Tertiaries, Thames Group	Clay, Silt, Sand and Gravel	Up to 10-20m	Unproductive Bedrock Aquifer	Deposits with low permeability that have negligible significance for water supply or river base flow.
Chalk group	Chalk	Up to 200m	Principal Aquifer	Deposits that provide a high level of water storage and may support water supply or river base flow on a strategic scale.

Notes:

* Generally, it appears that the Made Ground encountered in the area recorded as landfill according to regulatory records, was more variable and typical of mixed waste landfill. Outside of this area the material appears to relate more to re-worked natural ground i.e. the latter was recorded across most of the northern portion of the site, the former across the remainder of the site. There is no record or evidence of the landfill being provided with engineered controls such as a landfill cap or basal layer and has acted as a 'dilute and disperse' landfill.

The off-site shallow geological conditions are expected to comprise the gravel layer overlying London Clay, albeit in areas of recorded landfill the superficial deposits are likely to have been removed.

2.3 Hydrogeology

Groundwater is present within the Made Ground / infilled land between 0.98m and 3.86m bgl, with the shallower groundwater levels recorded along the periphery of the site.

Groundwater levels across the majority of the site appear to be relatively level. The range in recorded groundwater elevations was between 15.43 mAOD in BH2515 in 2019 and 21.17 mAOD in BH2597 in 2019.

Groundwater contour plans show that groundwater in the northern half of the site typically flows towards the east, with some northerly flow present in the north-west of the site. Flow direction in the south is generally inferred to the west; flow within the wider off-site landfill is variable, likely as a result of the heterogenous nature of the underlying waste materials. The contour plots were produced based on monitoring data provided from spring (April 2024), summer (August 2019), autumn (October 2024) and winter (December 2019) to capture seasonal variation in groundwater levels.

Further discussion of hydrogeology is provided in Ramboll's Updated PRA and GQRA reports.

2.4 Hydrology

The nearest identified watercourse is the Poyle Channel, a flood relief channel, which is located approximately 10m from the northern site boundary. The Poyle Channel runs westwards and

discharges into the Colne Brook located 300m to the north-west running from north to south. Wraysbury Reservoir is also located 135m south and the River Thames is located 2.9km to the west.

Groundwater on-site does not appear to be in significant hydraulic continuity with the Poyle channel as evidenced by the predominantly easterly flow at the northern end of the site, groundwater elevations and no noticeable effect of residual contaminant in groundwater on-site on the channel or downgradient Colne Brook.

There are also open drains in parts of the site and soakaway drains for surface water management at the northern end of the site. A schematic drainage plan is provided in figure 5.1, Appendix 5.

Two septic tanks with associated leach fields are also identified in the north of the site. These are understood to discharge to ground and not to surface water.

Further discussion of the connectivity between groundwater and surface waterbodies is provided in Ramboll's PRA and GQRA.

2.5 Contaminative Profile

A high-level summary of contaminants identified at the site within soil, groundwater and surface water is provided below. Further details, and an assessment of pollutant linkages, is presented in Ramboll's GQRA.

2.5.1 Field Evidence of Potential Contamination

Field evidence of contamination as reported on-site is provided in table 2.1 below.

Table 2.1 Observations in Soils

Exploratory Location	Observations	PID Reading (parts per million (ppm))
Made Ground		
On-Site		
BH2514	Landfill waste observed at 2.0–2.5m bgl; slight hydrocarbon and organic odour	<0.1
BH2515	Slight organic odour observed at 1.3–2.5m bgl Landfill waste observed at 2.5–5.3m bgl; slight organic odour	<0.1
BH2501	Slight organic odour observed at 0.9–2.1m bgl	-
BH2516	Slight organic odour observed at 0.5–3.0m bgl	<0.1
BH2492	Clinker observed in gravel at 0.0–0.7m bgl Rare fragments of clinker (<5x15mm) observed at 0.7–1.6m bgl Green discolouration observed at 1.6–3.0m bgl	-
BH2519	Rare fragments of clinker (<60mm) observed at 0.0–1.0m bgl Occasional fragments of clinker (<60mm) and clinker in gravel observed at 1.0–1.4m bgl Slight organic odour observed at 3.5–5.1m bgl	<0.1–0.3 0.2 <0.1–0.6
BH2506	Frequent subangular fragments of slag (<5x60mm) observed at 0.3m bgl Slight organic odour observed at 0.55–1.2m bgl	-

Exploratory Location	Observations	PID Reading (parts per million (ppm))
BH2520	Slight organic odour observed at 0.6–1.9m bgl Slight hydrocarbon odour observed at 1.9–2.7m bgl Slight organic odour observed at 2.7–6.2m bgl	<0.1–0.1 0.1–1.1 <0.1–1.1
BH2489	IDT engineer noted rare fragments of possible asbestos tile and glass at 0.0–1.7m bgl IDT engineer noted rare fragments of clinker at 1.7–1.9m bgl	-
BH2523	Possible asbestos tile (<5x5mm) observed at 0.0–1.8m bgl Rare fragments of clinker (<60mm) observed at 1.8–2.5m bgl	<0.1

In addition, groundwater generally appeared to be of a poor quality with occasional sulphurous odours, slight hydrocarbon sheens and odours and occasional chemical odours. No record of free phase product was identified as a discernible layer floating on groundwater and groundwater levels generally well below the slotted section of monitoring wells such that product could freely ingress to wells (if present).

2.5.2 Soil

No significant or widespread exceedances of the soil Generic Assessment Criteria (GAC) have been identified on the site other than a single exceedance of lead in shallow soils in the north-west corner and the general presence of fairly low concentrations of asbestos in 35 soils, mostly as loose fibres or fibre bundles and with one tile fragment identified. In 17 of the 35 samples concentrations were recorded above the limit of detection of <0.001 up to a maximum concentration of 0.967%, though concentrations were mostly low in nature. Four samples exceeded the hazardous waste concentration threshold of 0.1%, though no formal assessment of the likely waste classification status of soils has been completed to date.

2.5.3 Shallow Groundwater within the Landfill / Made Ground

Concentrations of metals, inorganics, ammoniacal nitrogen (as N), TPH, PAHs and trace sVOCs and VOCs were noted in the groundwater above the relevant laboratory detection limit (LOD).

- When compared against the Ramboll Human Health GAC for industrial end use, principally relating to volatilisation risks, there were no concentration exceedances recorded.
- When compared against the Ramboll GAC for groundwater quality exceedances were noted for metals (arsenic, boron, iron and nickel) as well as sulphate, chloride, ammonia, TPH, PAH, occasional PFAS and marginal VOCs.
- In general, the identified exceedances appear to be sporadic with no consistent area of exceedances identified other than for iron (elevated across the site) and ammoniacal nitrogen, which are considered to be present at variable concentrations across the site. However, there are likely limiting factors with lower permeability alluvium and a trading estate located downgradient to groundwater flow in the north and /or groundwater flows back into the landfill area in the south.
- When compared against the Ramboll GAC for surface water protection similar sporadic exceedances were recorded for metals and organics with more widespread exceedances of ammonia, iron, PAHs and PFAS, which for the latter three analytes were generally present at low concentrations. Ramboll notes given the locality and surrounding land uses of the trading

estate and further landfills nearby that the conditions recorded on-site are likely reflective of the general poor quality of groundwater in this area. Groundwater is not abstracted for use and does not appear to provide significant base flow to the nearby Poyle channel nor are higher concentrations recorded in the downstream Colne Brook compared to upstream samples, as discussed in the following sections.

- PFOS concentrations on-site over the monitoring period were generally low, however, with exceedances of the PFOS EQS recorded. No exceedances for the PFOA EQS were identified.

2.5.4 Surface Water

Concentrations of contaminants recorded in the downstream surface water sample of the Colne Brook were generally the same if not lower than upstream samples points from both the Poyle Channel and the Colne Brook. This indicates that residual contamination in groundwater beneath the site is not migrating laterally into adjacent surface water features to a significant extent.

2.5.5 Connectivity Between the Groundwater and Surface Water

Based on publicly available surface water level data obtained from an upstream gauge approximately 300m to the east of the site in the Poyle Channel, shows water level within the channel to be an average depth of 20.6 mAOD. Groundwater levels beneath the site at the closest location to the channel (BH2516) during the same period (October 2024) were recorded at a depth of 19.11 mAOD. As this groundwater level is positioned towards the base of the water level of the Poyle Channel this indicates that the two water bodies are not in significant hydraulic continuity, limiting any potential interaction or contaminant mass flux between the two waterbodies. Furthermore, groundwater predominantly flows to the east based on the available data whereas flow in the channel is to the west, further demonstrating that groundwater and surface water are not in significant continuity.

On this basis and taking account of the concentrations of contaminants recorded on-site and that there is no evidence of a significant increase in concentrations down-gradient of the site in the Colne Brook, a significant source-pathway-receptor relationship between groundwater and surface-water has not been identified.

No active groundwater remediation is proposed on-site and the site lies in an area of generally poor groundwater quality with further landfills in close proximity and the presence of the Poyle Trading Estate to the east and the wider Heathrow airport complex to the east.

2.5.6 Ground Gases

Based on a worst case GSV calculation the site is classified as 'Characteristic Situation 4' (CS4, that corresponds to a moderate to high hazard) in BS8485. However, Ramboll considers there are a number of factors that would indicate a Characteristics Situation 3 is more applicable to the proposed development, particularly for the datacentre area given the age of the fill (1960's to 1980's) and the limited depth of approximately 5.0-6.0m fill as a gas source.

Whilst elevated flow rates were identified in three locations in the datacentre development area it should be noted that ground gas volumes recorded at these locations were not correspondingly high. As a result, only BH2499 in the area of the decommissioned USTs contained volumes of methane and an elevated flow rate that would result in a CS4 Characteristic Situation classification. All other locations in the north of the site corresponded with a CS2 (three locations) or CS1 (six locations) when characterised independently. The presence of methane in BH2499

may relate to residual conditions associated with the USTs that would be improved under this remediation strategy through removal of the tanks and adjacent soils (if grossly impacted). This is discussed later in this report.

With the exception of flow in BH2484 which consistently exceeded 9 l/hr in 2019, flow rates in the south of the site were generally recorded at 0.1 l/hr. As a result, three out of the five locations when individually characterised correspond with CS1 or CS2 with only BH2488 and BH2484 corresponding to CS3.

In Ramboll's opinion the individual results are considered to be more reflective of the expected Characteristic Situation at the site given the variable nature of the fill. Based on Ramboll's most recent data from September 2023 to October 2024 flow rates at the site were consistently lower than those recorded in 2019 with a maximum flow rate of 0.5 l/hr recorded in BH2488. As such Ramboll considers that a CS4 classification for the site is not representative, alongside the fact that no borehole flow rates exceeded 70 l/hr, which is a qualifying factor to escalate CS2 to CS3 according to C665.

It would be prudent to undertake further investigation of the gas source beneath the datacentre building and to use to continuous monitoring techniques to further assess using quantitative techniques the characteristic situation during the detailed design stage. However, for now a CS3 rating should be assumed based on the available data. Thus gas risk is manageable for a low sensitivity commercial use site.

Gas mitigation is further discussed in Section 8.

3. PRE-REMEDIATION CONCEPTUAL SITE MODEL

3.1 Conceptual Site Model

The pre-remediation CSM follows the source-pathway-receptor philosophy that is a main principle of UK guidance and legislation. The CSM identifies the Potential Contaminant Linkages (PCLs) between the identified contamination and sensitive receptors. Risks identified as being moderate/low or higher are considered to be significant and are therefore PCLs of concern requiring remedial action.

The overarching remediation objectives are to address the PCLs. The required remediation actions are described in the following sections of this Remediation Strategy.

The pre-remediation CSM is provided in Appendix 2 and the PCLs are summarised in Table 3.1 below. A pictorial CSM is provided in Figure 12, Appendix 1.

Table 3.1: PCL Summary

PCL	Description	Remediation Actions
PL1	Leaching to Groundwater and Lateral Groundwater Flow	The site is currently unsurfaced with localised point source features relating to fuel storage/refuelling activities (including two decommissioned USTs), and two active septic tanks. Removal of these features will occur as part of the site preparatory works. A significant risk has not been identified from on-site contamination to off-site watercourses and aquifers. Risks to these receptors was considered to be low or very low based on the content of the GQRA with limited potential for off-site migration identified in the Conceptual Site Model. Capping of a significant proportion of the site with hardstanding and the datacentre building will further reduce the potential for infiltration and mobilisation of contamination. Localised areas including the substation and southerly BESS infrastructure will need to remain unsurfaced to facilitate rapid surface water drainage given the inherent nature of the electricity infrastructure that is proposed.
PCL2 and PCL3	Dermal contact, ingestion and outdoor inhalation of locally elevated contaminants in Made Ground and landfilled material by future site users and construction workers.	Residual ground contamination is present in shallow soils. A clean capping layer across the entire site is planned to break these potential pathways. Appropriate management measures will need to be implemented during development to protect construction workers. **Refer to Section 6**

PCL	Description	Remediation Actions
PCL4	Vapour risks to buildings	Risk assessment has not identified a significant risk to future occupants of buildings on-site via volatilisation from soil or groundwater. No remediation actions are required in relation to this PCL.
PCL5	Ground Gas risks	The site is located on infilled ground / partially on a landfill. The site has been initially classified as Characteristic Situation (CS) 3 and gas protection measures are required in new buildings. Gas risks relating to the BESS infrastructure is considered to be relatively limited given the containerised nature of the batteries and that said containers it on plinths. However, consideration of gas risks is relevant to the construction work and in relation to conduits that cross through the ground and into associated buildings at this end of the site – gas protection measures will be required in this regard. Likewise lateral migration of off-site gas sources from the landfill to the west and north was considered plausible and would be protected by CS rated measures. Appropriate management measures will need to be implemented during development (including by contractors). **Refer to Section 8**
PCL6	Inhalation of contaminated dust and asbestos fibres in Made Ground and landfilled material by neighbouring commercial users (off-site).	Appropriate management measures will need to be implemented during development. **Refer to Section 6**
PCL7	Disturbance and downwards migration of contaminants in soils and groundwater during piling and groundworks.	An initial appraisal of piling risks is provided in this report. **Refer to Section 7**
PCL8	Lateral migration of ground gases and vapours from off-site land	A hotel lies to the north of the site, although beyond the Poyle channel that acts as a natural barrier to gas migration. To the east the Poyle Trading Estate is present though buildings are located from approximately 50m east. A residential building sits in the east of the site (within the site boundary) – this will be demolished as part of the work and given the lower permeability ground mapped in the west of the site and off-site to the east (alluvium) the potential for off-site migration to represent a risk is considered to be negligible.

PCL	Description	Remediation Actions
		No further action required.

Note that this report does not consider geotechnical risks including the potential chemical aggressivity of the ground to future structures and building materials. This will need to be considered in the Detailed Design phase by the appropriate party.

3.2 Development Led Remediation Activities

The development design has taken into account the brownfield nature of the site and provides a number of development-led remediation solutions, as listed below.

- Enabling works will allow the removal of known contamination sources including two underground storage tanks, a septic tank and localised surface staining associated with current activities, as well as any 'unexpected finds' identified during earthworks.
- Design of the scheme will require installation of an engineered capping layer (or piling mat). At the time of reporting, it was unclear whether the site will be slightly raised, or if the site will be excavated to allow construction of the capping layer.
- Selection of appropriate foundations and ground improvement solutions (engineering design is outside the scope of this assessment – detailed design will occur in future).
- The presence of new buildings, paved areas and a suitably designed drainage system will limit infiltration rates and minimise residual soil leaching and contaminant migration (if occurring, as the evidence to date is not significant in this regard).
- Break layers to de-mark for future maintenance workers the base of engineered capping through provision of a geotextile membranes or equivalent.
- The provision of appropriate ground gas protection measures to all occupied buildings and in utility service conduits.

This Outline Remediation Strategy describes how the above development-led remediation will address many of the PCLs identified within the pre-remediation CSM.

4. SITE UNCERTAINTIES & CONSTRAINTS

The following uncertainties and potential constraints to remediation of the Site have been identified:

4.1 Uncertainties

- *Detailed Design of Foundation Solutions:* At the time of writing the foundation and ground improvement solutions for the development has not been finalised. This will involve further intrusive investigation and characterisation of the soil and groundwater conditions. The final design may influence aspects of this Remediation Strategy. Following confirmation of the detailed design solutions, the Remediation Strategy will be reviewed to ensure the approaches remain relevant, or are updated as appropriate.
- *Unexpected Contamination:* Whilst several stages of ground investigation have been undertaken, there remains a possibility that further unexpected contamination may be present. A procedure for managing unexpected contamination (if encountered) is detailed in Section 7.6.

4.2 Constraints

The main constraints for the remediation have been identified as including:

- The interaction between the shallow groundwater on site and Poyle Channel is considered to be minimal, as the groundwater flow direction is to the east and there is an elevation difference between the shallow groundwater and the surface of the brook (whereby shallow groundwater is considered to be in limited continuity with the channel). However, due consideration should be made to ensure the channel is not impacted during enabling works and targeted remediation works at the site. This includes a need for temporary surface water management measures.
- The remediation will need to consider timescales for the development. Preliminaries which may be required (such as obtaining permits and licenses) should be factored into the overall programme for delivering the remediation work.

5. PRELIMINARIES AND GENERAL REQUIREMENTS

5.1 Remediation Method Statement

Ahead of the remediation and earthworks, the selected contractor will be responsible for developing the detailed design for all aspects of the remediation which will be incorporated into a Remediation Method Statement (RMS).

The RMS will be reviewed by Ramboll (as the Environmental Consultant) prior to finalising. It is also expected that the Regulators (Environment Agency and Slough Borough Council) will also review and provide comment on the RMS prior to finalising.

5.2 Remediation Oversight

A Remediation Supervisor should be appointed during earthworks and remediation activities. The Remediation Supervisor will be responsible for overseeing the remediation work, liaison with Ramboll (as the Environmental Consultant) and for compilation of information required as part of the Verification Plan (Section 11).

The Remediation Supervisor shall be a suitably qualified person with at least five years of relevant experience. It will be the role of the Remediation Supervisor to ensure that the remediation is taking place in accordance with the Remediation Strategy and RMS and is present full-time during the earthworks.

Any additional personnel appointed to carry out groundwater and ground gas verification monitoring and sampling shall also be required to be suitably qualified and experienced.

5.3 Health and Safety

5.3.1 CDM 2015

The works will comply with the Construction (Design Management) Regulations (CDM) 2015. It is envisaged that a Main Contractor will be instructed for the development who will have an overall responsibility for health and safety management of the proposed remediation works. Prior to the works being undertaken appropriate health and safety documentation will be produced by the Main Contractor. The documents must include risk mitigation measures for staff involved in remediation works.

5.3.2 Dust, Odour and Asbestos Management

Due to the presence of infilled ground containing asbestos and residual contamination and the presence of landfill materials, there is potential for generating dusts, and to a lesser extent, odours and vapours, where the existing ground is disturbed. The site is not located in a particularly sensitive setting i.e. there are no residential receptors adjacent (bearing in mind the on-site property will be unoccupied/demolished) and there are no commercial buildings directly adjacent to the boundary with the hotel and trading estate off-set to the north and east). Nevertheless, as is the case of any re-development exercise on brownfield land controls will be required to minimise dust as well as odour and vapour.

The final proposals for management of dust, odours and vapours during the Enabling Works will be detailed within the contractors RMS taking account their proposed working methods and the nature of the risks that arise.

The contractor will need to collect baseline monitoring data ahead of the earthworks and on-going monitoring will be required during the work.

Asbestos fibres have been recorded in the ground and there is potential for workers to be exposed to asbestos fibres during earthworks. Site workers may come into contact with asbestos in soil via inhalation. An Asbestos Management Plan will be developed ahead of the work and in accordance with industry guidance[6] taking account of the proposed works once the Detailed Design is available. This will also ensure that asbestos risks are managed on-site and that off-site fugitive releases do not occur.

A site-specific Asbestos Risk Assessment and Asbestos Plan of Works will also need to be in place to address the risk from asbestos contaminated soils during earthworks to ensure compliance with the Control of Asbestos Regulations 2015.

Through the previous investigations the impacts identified on-site included:

1.. loose fibres or fibres bundles in many locations in the Made Ground, though not all locations;

2. occasional visually identifiable asbestos containing materials present within the soil matrix; and

3. residual soils intended for excavation and re-use would also require laboratory analysis to determine suitability for use (if intended).

Where excavation and disposal of soil is required to facilitate the development UK guidance requires the segregation of visually identifiable asbestos fragments from the soil wastes to minimise the volumes of mixed waste streams. Thus the following should occur:

1.. Visible asbestos fragments to be hand-picked and placed in a dedicated lockable skip separate from residual soils.

2. Laboratory analysis should be completed on the residual soils following the hand pick exercise, to confirm the asbestos content for re-use/waste classification purposes. The asbestos quantification can be used to determine if the soils are suitable for re-use on site (where there is a requirement for soils), or if off-site disposal is required, and to determine the waste classification as either hazardous or non-hazardous.

Asbestos Thresholds for Re-use On-site

As the site is to be developed for a commercial end-use, and the ground conditions observed across the main site indicated that where visual localised fragments asbestos impacts were found within the shallow soils, the residual soils were typically characterised by low concentrations of fibres and fibre bundles of asbestos. Hence, the following remedial targets were proposed to determine the suitability for the residual soils to remain on-site:

1. 'No visually identifiable asbestos'; and

2. 'Very Low' concentrations of asbestos fibres or fibrous debris in residual soil (i.e., concentrations of between 0.001% - 0.01% wt/wt).

[6] CIRIA C733, 2014: Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risks

'Very Low' concentrations are those which have been defined in CL:AIRE (2016) Control of Asbestos Regulations 2012 – Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials: Industry guidance – refer to the extract from CL:AIRE (2016) Watch Point 12 below.

Watch Point 12

For the purposes of definition of quantities, reference is made to the following mass concentration descriptors in the Work Category Assessment Decision Support Tool:

- Large - ≥ 0.1% wt/wt
- Moderate - ≥0.05% wt/wt to <0.1% wt/wt
- Low - ≥0.01% wt/wt to <0.05% wt/wt
- Very Low - 0.001% wt/wt to <0.01% wt/wt

These mass concentrations relate to the amount of asbestos fibre estimated to be present in selected ACM/fibre type as a mass percentage of the host matrix material, detected in samples submitted for quantification analysis.

Residual soils intended for re-use in the wider development site as site-won material would therefore need to have an asbestos quantification concentration of <0.01% wt/wt, and should be re-used in accordance with the approved Remediation Strategy and material re-use mechanism developed for the site.

5.4 Permits and Licenses

Relevant licenses, exemptions, permits, consents and deployment forms must be obtained for the remediation work and complied with.

Details of any proposed permits such as a trade effluent consent and/or Environmental Permit should be confirmed and details of which entity will take long-term responsibility for operation and compliance confirmed (if relevant).

5.5 Monitoring Well Protection and Decommissioning

There is a network of existing monitoring wells at the site. Where the wells are located in areas that will be affected by the works (i.e. disturbed by excavations / remediation) and present a viable preferential pathway through which contaminants could migrate into the underlying aquifer if left in-situ. Monitoring wells will be required to decommissioned either in line with the Environment Agency's guidance on decommissioning redundant boreholes and wells[7] or acceptable alternate methodology, prior to earthworks commencing in those areas.

Selected monitoring wells will need to be retained and protected throughout the duration of the earthworks, to allow groundwater samples to be collected for construction phase monitoring and verification purposes. This is intended to be 3-4 strategically located monitoring wells that will be confirmed following the detailed design characterisation work.

This will be temporary enabling phase and piling phase monitoring and longer-term monitoring is not proposed given the limited nature of the pollutant linkages identified in the Conceptual Site Model.

[7] Good Practice for Decommissioning Boreholes and Wells; Environment Agency, October 2012

5.6 Environmental Consultant Remediation Monitoring

It will be ensured that a Remediation Supervisor is appointed during the Enabling Works (refer to Section 6.2). In addition, the Environmental Consultant will undertake a part-time monitoring role during the remediation works, to ensure that the work is being carried out in accordance with the Remediation Strategy.

6. SOIL REMEDIATION

6.1 Potential Contaminant Linkages

The pre-remediation PCLs are summarised in Section 3. Those that relate to the soil remediation include:

- **PCL1** – preventing the leaching of soil contaminants to groundwater and reducing the potential for off-site migration.
- **PCL2, PCL3** - dermal contact, ingestion and inhalation of locally elevated PAHs, TPH, heavy metals, PCBs and asbestos by future site users and construction workers.
- **PCL4** - inhalation of contaminated dust and asbestos fibres by neighbouring residential and commercial users (off-site).

6.2 Building Footprint - Engineered Capping Layer

The presence of an engineered foundation slab for the datacentre building, as well as buildings associated with the BESS, will prevent infiltration and leaching and direct contact/ingestion/inhalation pathways.

Limited areas of hardstanding are present on-site forming access roads and areas of car parking.

The presence of the buildings/hardstanding will break potential pathways between the identified contamination and future users (PCL1, PCL2 and PCL3).

Note where direct contact with below ground structures is anticipated, selection of appropriate materials resistant to the chemical profile will be required.

6.3 Removal of Contaminants Sources

The following sources of contamination have been identified on-site and that will need to be removed during the enabling works:

- 2 x Underground Storage Tanks (USTs) located in the west of the datacentre building's footprint associated with the former builders yard. The tanks have been decommissioned and infilled. Pipework infrastructure may remain in place and residual soil and groundwater contamination may locally be present. Grossly impacted soils or groundwater i.e. that impacted by free phase product will need to be removed (though is not expected based on available data). Otherwise, soil or groundwater conditions that do not exceed the Ramboll GAC may remain in-situ.
- There are at least 2x septic tank located in a similar area to the USTs that will need to be decommissioned and nearby catch-pits removed.
- There is localised surface staining associated with refuelling activities as identified from the Phase I that will need to be scraped and removed.
- Any further localised soil hotspots as may be identified during the Detailed Design site investigations or during watching brief activities covering the enabling works, including reduced level digs to facilitate clean capping layers for soft landscaping (see item 6.3 below).

Contaminants sources are identified in the schematic figure below and as identified in the PRA.

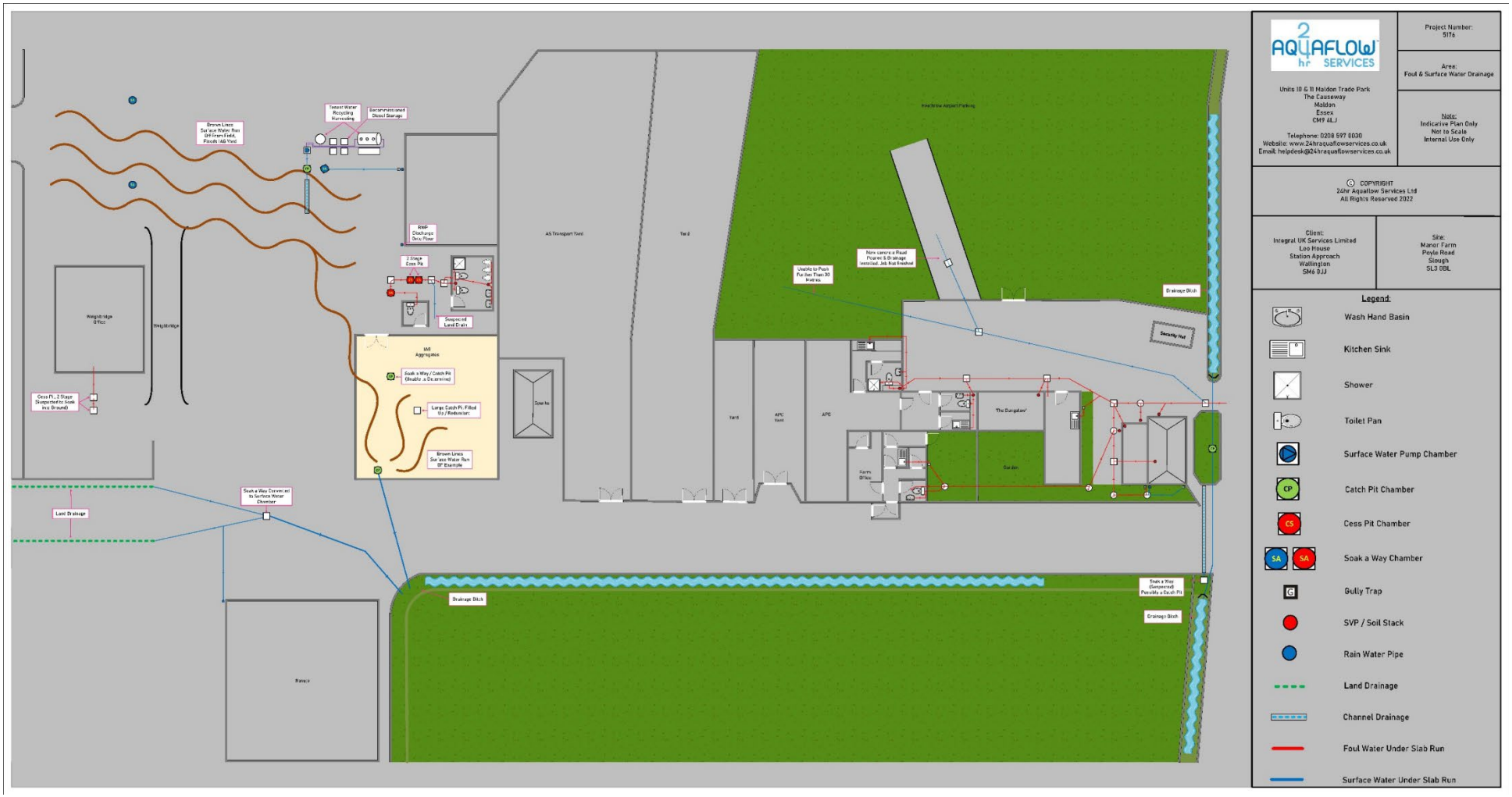


Figure 5.1: UST, Septic Tanks and Catch-Pits

6.4 External Areas Clean Cover Layer

In addition to the engineered cap which will be formed of buildings and hard cover, a clean cover layer will need to be installed as part of the Construction Works within areas of proposed soft landscaping to protect future site users, which further addresses PCL2 and PCL3.

Existing in-situ soils are not deemed suitable for use to form the cover layer for proposed landscaped areas and there will be a requirement to import soils for this purpose. However, it may be possible to re-use the soil bunds located on-site that are acceptable for use on a construction site and from initial testing comply with BS3882:2015 British Topsoil Standard.

The imported soils to be used to form the cover layer should meet the following minimum requirements, in addition to any landscaping and planting requirements:

- In soft landscaped areas the clean cover layer will comprise a minimum thickness of **450mm** of subsoil and topsoil which meets the requirements of the British Standards for subsoil and topsoil (BS8601:2013 and BS3882:2015 respectively) and has been chemically verified to ensure it is suitable for its intended use. Soil may comprise chemically suitable material that is stockpiled on-site, see section 6.9 in relation to the compliance elements for soil re-use. The capping thickness and topsoil/subsoil chemical content will also need to take account of the landscape design requirements for the scheme, though the minimum thickness of 450mm will be maintained across all soft landscaped areas. Verification sampling requirements are provided in Section 11 and Appendix 3.
- A coloured geotextile marker layer will be installed at the base of the cover soils to separate these materials from underlying Made Ground.
- The clean cover system will include a capillary break layer of a minimum thickness of **100mm** to prevent upward migration of contaminants from the soil and groundwater in the underlying waste deposits and Made Ground by capillary action. This may comprise a dedicated layer separating the clean cover and geotextile marker from the underlying soils.
- In areas where electrical infrastructure is present, such as the substation compound or the battery yard, and given that these areas are unmanned except for occasional maintenance activities the geotextile membrane and then capillary break layer of 100mm (i.e. as an aggregate surfacing) is considered sufficient given there will be very limited access to these areas.
- Documentation on the source, quantity and testing results confirming suitability for use shall be obtained and made available to the Environmental Consultant to review prior to emplacement of the material. These records will be retained on site for inspection and included in the contractor's Verification Report.

Verification sampling requirements are detailed in Section 11.

The development is being carried out in phases, and therefore the clean cover layer will be required to be placed and verified for each phase of the development.

The detailed design of the clean cover system should give consideration to CIRIA Special Publication 124 'Barriers, liners and cover systems for containment and control of land contamination' (1996) including consideration of potential failure mechanisms.

6.5 Underground Services

Future below ground infrastructure (such as drains or other utility service corridors) which may be installed within the Made Ground materials have the potential to act as preferential pathway for shallow contaminated groundwater or ground gases.

Underground utilities, including cable routes associated with the BESS, will be required to be designed to ensure that preferential migration pathways are not created (e.g. installation of low permeability plugs within sections of service corridors, providing venting, or use of other engineered solutions).

As part of the measures to protect future maintenance workers and manage the risk of exposure from contaminants, certified clean materials should be used to backfill service corridors. These should be lined with a geotextile membrane to provide a marker layer between the clean service trench fill materials and surrounding soils.

Consultation with the local water supply authority will be required regarding the final selection of water pipe materials.

Ground gas mitigation requirements for underground services are discussed further in Section 8.

6.6 Unexpected Contamination Procedure

As with any site there is the potential to encounter contamination in areas where it was not expected or find more significant contamination than anticipated. As discussed in Section 6.2 a Remediation Supervisor shall be present during the earthworks.

If unexpected contamination is encountered during the earthworks, it should be investigated by and reported to the Client and Ramboll. Slough Borough Council and / or the Environment Agency (as required) will be notified if the unexpected contamination found is not in line with that encountered during previous ground investigation and alters the risk profile or the CSM.

The procedure, should unexpected contamination be found, is provided below:

- Deciding what is expected or unexpected will reduce unnecessary stoppages to work whilst still maintaining control of risks. However, all finds (if any) should still be reported and will need to be managed appropriately. The proposed method for dealing with unexpected contamination shall then be agreed between the contractor, Environmental Consultant and Client/Client representatives and potentially the regulatory authorities if there is uncertainty on the proposed course of action i.e. most unexpected finds will relate to localised conditions that can be simply managed through careful removal of the soil or identified feature (e.g. asbestos fragment, but not more notable feature such as tanks or unexpected areas of impact >10m^3 in extent, which would be reported to the regulator).
- All excavations should be routinely inspected by the Remediation Supervisor. If ground conditions are encountered that are not in keeping with past investigations or if visual and olfactory evidence of contamination is encountered (i.e. asbestos fragments, evidence of neat fuel, strong chemical odours, heavily discoloured soils), then works should stop in the immediate working area and reported to the Client and Ramboll.
- The Remediation Supervisor should assess the unexpected contamination, which could include on-site testing and obtaining samples for laboratory analysis.
- If needed, the most likely remedial action for small hotspots of unexpected contamination would be excavation and disposal.

- Excavated contaminated materials should be segregated and stockpiled within a bunded and polythene covered area or sealed container whilst testing is undertaken for appropriate disposal routes or reuse on-site. Contaminated liquids should be stored in suitable containers.

If excavation of the unexpected contamination is likely to cause more harm than good, other methods of removing or mitigating the contamination should be considered. For example, rather than excavate asbestos containing materials that may release fibres, it may be safer to encapsulate and leave in the ground at the base or sides of an excavation (following documentation).

The testing suites, frequencies and verification criteria to be used for unexpected contamination excavations (if undertaken) is detailed in Section 9.

For the avoidance of doubt and in the context of this project, unexpected contamination is defined as substances that have not previously been recorded as present within existing soils and groundwater at the site, or that have the potential to change the outcome of the risk assessments made when developing this Remediation Strategy.

6.7 Discovery Strategy

The condition and active status of the existing drainage network and route has not been fully established. Disused underground storage tanks and septic tanks are known to be present at the site, and there is the potential for other redundant infrastructure to be encountered during earthworks.

A Discovery Strategy shall be adopted in the event that additional below ground infrastructure is encountered. This shall include:

- assessment to determine if it is redundant infrastructure which can be removed (if posing an obstruction to the development), or to put into place appropriate protection measures to avoid disturbance;
- assessment to determine if the infrastructure represents a potential pathway for contamination. Should apparent pathways for contamination be observed these would be 'chased out' as far as reasonably practicable (e.g. if a service trench or drain is found to be heavily impacted with contamination) and sealed (as appropriate); and
- in the event that contamination is encountered associated with existing infrastructure, the unexpected contamination procedure shall also be followed.

6.8 Materials Management

6.8.1 Overview of Existing Stockpiles

This section provides a materials management options appraisal to assess the potential for the relocation and/or reuse of the existing soil bund located on the site, both within and external to the current development area. These are summarised below:

- Soil bund (c. 6,000 m^3) located along the western and north-eastern development site boundaries, installed around the area previously operated by Amber Builders Limited.
- Larger stockpiled material (c. 64,074 m^3) located to the west of the development area, reported to be topsoil stripped from two nearby development sites that was imported to the site by a previous site owner in the 1990s. *These are not proposed to be re-located during development activities (unless potentially usable as topsoil or subsoil on-site in which case limited quantities may be re-used). Further consideration will take place during*

detailed design or longer-term development plans to the re-use potential of this material. The stockpiles are therefore referenced here for completeness.

There is a potential for the existing soils to be reused on site in soft landscaped areas as topsoil or subsoil to build up the 'clean' capping layer (refer to Section 6.4).

Given there could be a net surplus of soil at the site, options for reusing the existing soils on a third-party site(s) and disposal options have also been included in the materials management options appraisal.

Further, soil arisings (if any) generated as part of the earthworks will need to be removed from the site i.e. reduced levels digs, utility trenches, pile arisings etc.

6.8.2 Soil Bund

A soil sampling exercise undertaken in 2022 concluded that the soil bund material would be suitable for commercial use and included a composite sample from the soil bunds which passed the BS3882 specifications for multipurpose topsoil (in terms of chemical content), whilst one sample from the soil bunds (BS09, N-E Bund) failed at least one of the criteria for multipurpose topsoil. In its current state, the soil bund material would be suitable for infilling on a commercial site.

Should the soil bund material be considered for re-use as topsoil or subsoil within the proposed soft landscaping, further sampling and chemical testing would likely be required to confirm its suitability for use and segregation and improvements to the material may be required.

The soil bund material could be reused on the development site under the CL:AIRE Definition of Waste Code of Practice (DoWCoP) subject to agreement with the regulatory authorities based on the proposed use.

It is likely that the soil bund material was imported to site under an environmental permit (ref. EPR/HP3191LC, granted on 27th May 2011) relating to the import, treatment and storage of waste material on-site for the purpose of recycling, recovery and re-use (i.e., the material was intended to be sold). The EA has confirmed that this permit was surrendered in November 2022. No active waste permits are currently held for the site.

The material is currently registered as being available on the CL:AIRE Register of Materials, for interested third-parties. If the material was to be disposed at a licensed waste disposal site it would likely be classified as non-hazardous in nature.

6.8.3 Larger Stockpiled Material

Soil sampling undertaken by Ramboll in 2022 concluded the stockpiled material adjacent to the redline boundary (i.e. off-site) could be re-used as general fill on a commercial site with a proportion of the material suitable for re-use on a residential site, and potentially some of the material could be reused as subsoil and topsoil.

Should the stockpiled material be considered for re-use as topsoil or subsoil within the proposed soft landscaping, further sampling and chemical testing would likely be required to confirm its suitability for use and segregation and improvements to the material may be required.

Similar to the soil bund material, there is potential for the stockpiled material to be reused on site, under the DoWCoP , subject to agreement with the regulatory authorities.

The material is currently registered as being available on the CL:AIRE Register of Materials, for interested third-parties. If the material was to be disposed at a licensed waste disposal site it would likely be classified as non-hazardous in nature.

6.8.4 Materials Management Options Appraisal

On this basis the following regulatory controls enabling re-use or disposal are likely to be followed, subject to final agreement with the regulatory authorities:

1. Re-use of the material on the development site or a third-party development site under the CL:AIRE Definition of Waste Code of Practice;
2. Disposal of the material off-site at a licensed waste facility (treatment facility or worst-case, landfill). This is the least sustainable option and finding an on-site use for the material would be most sustainable.

Furthermore, if re-use of existing Made Ground is intended this may fall under the re-use on development site under DoWCoP ('Site of Origin' scenario). Further testing and assessment of the specific Made Ground proposed for re-use would be required to assess its potential for re-use. The re-use of Made Ground appears unlikely at this stage.

6.8.5 Options Appraisal Summary

Taking account of the current regulatory mechanisms for re-using waste soils, the current proposed development design, and the associated risks, the following materials management options apply:

- Either the soil bund material or the off-site adjacent stockpiled material (or a proportion of) is re-used on the development site to infill excavations following the removal of the USTs and other features, create the visual screening bund around the proposed car park and potentially be used within soft landscaping areas (subject to further evaluation by the landscape consultant). Further sampling and chemical testing of the material will need to be undertaken to confirm the material suitability for use, particularly within soft landscaping areas.
- Should the material be re-used on site under the CL:AIRE DoWCoP, consultation with the EA (and LPA) will be required.
- Surplus soils arising from the construction activities within the redline boundary with no demonstrable proven need for reuse should be removed from site, unless agreed separately with the regulatory authorities. The disposal options should consider soil treatment and recycling, with disposal to landfill only considered as a last resort.

6.8.6 Imported Material

There may be a requirement to use imported material to achieve the formation level or to provide suitable subsoil and topsoil material for the landscaped areas.

Where virgin non-waste uncontaminated material is to be imported, records shall be provided of the source of the material, the supplier, evidence that the material meets the engineering requirements, the volume of material imported and the location of use.

If the contractor intends to use / import a recycled aggregate, it should be ensured that this material has been produced in accordance with the Quality Protocol 'Aggregates from Inert Waste'[8].

Where recycled material (such as aggregates) is to be used it shall be ensured that the following WRAP Quality Protocol requirements have been complied with:

- the producer is required to follow a system for factory production control in accordance with the content contained within the protocol (as taken from appropriate British Standards);
- the product will need to be described including the intended use and if relevant in line with the description of an intended natural product;
- any relevant specification shall be confirmed;
- the producer shall maintain acceptance criteria to ensure that only inert wastes are accepted;
- the producer should provide a method statement detailing the waste recovery process and the range of products produced;
- an inspection and testing regime should be completed for the finished product; and
- statutory record keeping requirements for waste must be observed with regards to incoming wastes and outgoing products.

[8] Quality protocol: aggregates from inert waste - GOV.UK (www.gov.uk); accessed 2nd January 2024

The producer of the recycled aggregate must provide a written declaration that the material has been produced in accordance with the WRAP Quality Protocol. Evidence to support the declaration should be retained and made available upon request.

Prior to use on-site, imported material should be inspected by the Remediation Supervisor for visible signs of contamination such as asbestos, hydrocarbon staining or odours; and records of the inspections kept for verification purposes. Appropriate testing and chemical analysis will also be required to be undertaken and compared to the import criteria set in Appendix 3.

6.8.7 Waste Management

Where materials are unable to be reused during the earthworks, the appropriate off-site disposal routes will be required to be identified. The disposal options should consider soil treatment and recycling, with disposal to landfill only considered as a last resort.

Laboratory analysis for waste classification and (if necessary) waste acceptance criteria (WAC) purposes will be required. This should be undertaken at an appropriately accredited laboratory.

Details of all off-site material movements will be recorded and completed in accordance with the Duty of Care regulations. Waste transfer/consignment notes and disposal certificates will be provided for each load of material removed from site so that an auditable trail of the dates, volumes and destination of material removed from site can be maintained. Correspondence with the landfill or receiving facility regarding the classification of waste shall also be provided. Records of Environmental Permits (or appropriate exemptions) in place at receiving sites shall also be obtained.

6.9 Earthwork Control Measures

The following control measures should be implemented during the earthworks to ensure the material intended for re-use does not become cross contaminated by the underlying landfill material:

1. Soils should only be considered potentially suitable for reuse if they meet the above visual description of the informal capping layer.
2. Where excavation is required within the made ground, any grossly impacted or unsuitable material should be segregated and stockpiled separately to avoid cross-contamination if practicable.
3. The contactor(s) should prepare a stockpile management plan to ensure potential contamination risks are mitigated during the excavation and stockpiling works on-site (see Table 7.1).
4. Made Ground soils considered to be potentially suitable for use must undergo appropriate sampling and testing prior to reuse (see Section 9).
5. Stockpiles should not be stored longer than 12 months without prior agreement by the Environment Agency. Any materials stockpiled for longer than 12 months without agreement from the Environment Agency will be considered waste and should be managed as such.

6.10 Environmental Controls

This section provides an outline of the expectations with regards to environmental controls during earthworks. The controls in this section do not address the formal requirements under planning or health and safety regulations which may also be required to implement the works.

Mitigation measures and corrective actions relating to contamination/pollution risk will also be incorporated into a CEMP ahead of the earthworks commencing. Environmental controls specific to proposed foundation and ground improvement works is detailed in Section 8.

Table 7.1: Environmental Controls

Item	Environmental Controls
Soil Management and Stockpiling	A stockpile management plan shall be prepared prior to earthworks commencing. Excavated materials will need to be temporarily stockpiled according to material type to segregate materials of similar geotechnical and chemical properties. Each stockpile will require chemical and geotechnical characterisation to determine the locations on-site where it can be reused or inform disposal options. Stockpiling should not take place within 10m of a watercourse. If unexpected contaminated material is encountered during the earthworks, this material should be segregated and stockpiled in a dedicated area of the site for the purpose of characterising, management and processing of the impacted soils. Contaminated material shall be stockpiled in accordance with the following: • stockpiles will be kept to a manageable size and good housekeeping procedures implemented; • stockpiles will be placed in an impermeable area of the site, covered with impermeable sheeting and secured; • stockpiles will be labelled with specific identification; and • the stockpiles should be managed to prevent rainwater run-off, generation of dust (and asbestos fibres), and release of odour.
Surface Water Run-Off Management	Management of all surface water run-off will be required and 'contaminated' run-off entering must be prevented from entering nearby watercourses or surface water drains. The management controls shall comply with BS 6031:2009, Code of Practice regarding the general control of site drainage. There will be a requirement to make arrangements to limit run-off and allow for collection, including either pumping and disposal via a tanker or treated (as required) and discharged to sewer under a temporary consent with the local water authority.
Groundwater Management within Excavations	Groundwater management may be required where perched water is encountered, or standing water generated from precipitation collecting during excavation. The contractor should describe in their method statements how they will manage and dispose of water from excavations. Should disposal to public sewer be deemed appropriate, there may be a requirement for pre-treatment, additional sampling and monitoring. Any specific testing requirements will need to be agreed with the local water authority, prior to any discharge to sewer taking place. It shall be ensured that any discharges are only made with the appropriate discharge consents from the local water authority.
Release of Contaminants to Ground	The use of plant and equipment on-site during the earthworks and remediation works could result in the potential for the release of contaminants to ground, such as fuel, oils, coolants and lubricants. To avoid the accidental leakage of fuel, oils and/or lubricants, all plant should be maintained to a safe and efficient working condition at all times and any oils or fuels should be contained in accordance with Control of Pollution (Oil Storage) (England) Regulations 2001 SI 2954. As a minimum all liquids and solids of a potentially hazardous nature (e.g. diesel fuel, oils, degreasers) shall be stored with appropriate secondary containment (e.g. bunding). A dedicated area for the refuelling of plant and vehicles away from remediation / excavation areas and surface watercourses shall be established and the fuelling area shall be kept clean at all times. No refuelling shall be undertaken

Item	Environmental Controls
	outside of the established refuelling area. Spillages or leaks of fuel shall be cleaned up immediately and contingency arrangements for dealing with spillages shall be available at all times, including absorbency granules and dedicated spill response kits. All equipment containing fuel/oils (e.g. pumps and generators) shall be placed on spill mats, plant nappies or similar (no use of drip trays to be permitted) and these shall be maintained. The storage and use of hazardous materials on-site will be conducted in accordance with the Control of Substances Hazardous to Health (COSHH) Regulation 2002. In accordance with COSHH, records held of all hazardous materials on-site will be maintained.
Dust, Asbestos, Vapour and Odour Control	Dust control is of importance in respect of any major earthmoving, on-site stockpiling or vehicle loading and movement over unsurfaced areas. The excavation of the Made Ground may result in exposure of contamination, in order to prevent the mobilisation of contamination (including asbestos fibres) via wind-blown dusts; therefore, mitigation measures will be required, including but not limited to damping down of dry soil materials with the potential to generate dust emissions during excavation and handling. Subsequent foundation works may generate piling arisings that comprise landfill waste. It shall be ensured that appropriate measures to deal with dust and any identified contamination during the works (including asbestos in soils) are put in place. It shall be ensured that odours to air from exposure of fill materials are minimised. Precautions will be required to prevent the occurrence of smoke emissions, fumes or odours from contaminated soil, site plant, stored fuel or other substances and prevent any emissions / odours drifting into the nearby residential areas, workplaces or public open spaces. Dust emission and odour monitoring will be required for the duration of the works in accordance with a specific Dust and Odour Management Plan taking account of the proposed works and contractor methodology, with pre-works baseline conditions established over an appropriate period. here will be a requirement for an Asbestos Management Plan to be prepared and implemented by the contractor.
Environmental Incidents	Environmental incidents can be defined as unexpected events which lead to, or could in different circumstances have led to, adverse effects on people, property or on environmental resources such as habitats or watercourses. Procedures shall be put in place to deal with environmental emergencies and incidents. It shall be ensured that a response plan is developed in the unlikely event of an incident occurring during the remediation work, such as a fuel spillage, an episode of unexpectedly elevated dust, asbestos fibre or odour levels, or a spike in volatile vapour or ground gas readings. Any non-compliance, corrective and preventative actions shall comply with operational management procedures which will be detailed within the CEMP and / or specific management plans.
Vehicle Cleanliness	All reasonable measures shall be taken to prevent, as far as is practically possible, the deposit or tracking of mud or debris arising from the site onto roadways outside of the site area. During excavation activities, the loading of vehicles shall be performed in an organised manner so as to prevent the escape of materials. All vehicles will be appropriately designed to hold the waste without release during transit and sheeted prior to leaving the study area. All reasonable and applicable measures to prevent the escape of material during loading and transportation shall be taken.

7. FOUNDATION WORKS

7.1 Potential Contaminant Linkages

The pre-remediation PCLs are summarised in Section 3. Those that relate to proposed foundation work include:

- **PCL5** – disturbance and downwards migration of contaminants in soils and groundwater in the Made Ground/waste deposits towards the underlying aquifers.

Risk associated with the creation of piling arisings at the surface (PCL1 and PCL2) is expected to be addressed via the use of appropriate precautionary working procedures and PPE to mitigate risks to workers. Material management requirements are detailed in Section 7; it is assumed that pile arisings would be disposed off-site, if generated.

The foundation solution for the building at this point has not been confirmed but is likely to be piled in nature.

There is a potential that poor quality materials could be pushed or drawn down during piling activities. However, the site is underlain by a substantial thickness of ~40m of London Clay and therefore it is unlikely that piles would penetrate through the clay and then allow the re-distribution of shallow impacted materials to the deeper aquifers that underline the clay.

Nevertheless, on-going groundwater and surface water monitoring is proposed to evaluate the potential for shallow disturbance of the ground to temporarily redistribute contaminants on-site, such that this can be monitored and contingency actions taken if needed.

8. GROUND GAS MITIGATION

As summarised in Section 2.5.6, a conservative approach to the proposed gas mitigation will be adopted, to ensure ground gas risks for 'worst credible' conditions are mitigated and take into consideration potential future changes to the gas regime as a result of the development and effects of climate change.

Ground gas mitigation will be required during both the Enabling Works and Construction Works and will be required to be installed and verified throughout the development phases.

8.1 Potential Contaminant Linkages

The pre-remediation PCLs relating to ground gases which will require mitigation include:

- **PCL5** – risks to construction workers via accumulation of ground gases into confined spaces such as deep excavations.
- **PCL5** – migration via permeable soils and subsequent accumulation into future on-site buildings and structures.

The first element of PCL5 is expected to be addressed via the use of appropriate precautionary working procedures and PPE to mitigate risks to workers and specific risks from ground gases should be incorporated into the RMS.

Outline gas mitigation requirements to address the PCL5 are summarised below.

Verification requirements are detailed in Section 9.5.

8.2 Gas Protection for Buildings - Datacentre

The proposed commercial buildings are considered to be consistent with a 'Type D' building, as described in BS8485 guidance:

- Type D building: industrial style building having large volume internal space(s) that are well ventilated. Corporate ownership with building management controls on alterations to the ground floor and basement areas of the building and on maintenance of ground gas protective measures. Probably civil engineering construction. Examples are retail park sales buildings, factory shop floor areas, warehouses. (Small rooms within these style buildings should be separately categorized as Type B or Type C). See section 8.3 for gas protection requirements for smaller rooms.

Based on the Ramboll gas assessment to date, a CS3 gas regime is considered to be the worst credible scenario for the proposed building. A Type D development situated within a CS3 gas regime would be expected to achieve a ground gas solution score of 2.5. A gas protection score of more than 2.5 points for a Type C building can be achieved via the following:

- structural barrier – Cast in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations would achieve a score of 1 point (to achieve a score of 1.5 the raft or suspended slab should be well reinforced to control cracking and have minimal penetrations cast in);
- ventilation - passive sub floor dispersal layer to provide a score of 1.5 points for 'good' performance (or 2.5 points for 'very good' performance supported by calculations), (selection will depend on the final foundation design); *OR* an active dispersal layer (1.5 to 2.5 points); and
- gas resistant membrane – appropriately constructed, installed and verified which would provide a score of 2 points.

If sub-floor ventilation is considered the detailed design requires site-specific calculations for the building to determine the dilution efficiencies required. This will be based on the building and foundation design. The design criteria being developed will be to maintain the concentrations to typically <1% methane and <1.5% carbon dioxide.

8.3 Gas Protection for Buildings – BESS Buildings and smaller rooms in datacentre

The smaller proposed commercial buildings are considered to be consistent with a 'Type C' building, as described in BS8485 guidance (i.e. a commercial building with full control of alterations and maintenance including gas protection, with small to large rooms).

Based on the Ramboll gas assessment, a CS3 gas regime is considered to be the worst credible scenario for the proposed buildings. A Type C development situated within a CS3 gas regime would be expected to achieve a ground gas solution score of 3. A gas protection score of more than 3 points for a Type C building can be achieved via the following:

- structural barrier – Cast in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations would achieve a score of 1 point (to achieve a score of 1.5 the raft or suspended slab should be well reinforced to control cracking and have minimal penetrations cast in);
- ventilation - passive sub floor dispersal layer to provide a score of 1.5 points for 'good' performance (or 2.5 points for 'very good' performance supported by calculations), (selection will depend on the final foundation design); *OR* an active dispersal layer (1.5 to 2.5 points); and
- gas resistant membrane – appropriately constructed, installed and verified which would provide a score of 2 points.

If sub-floor ventilation is considered the detailed design requires site-specific calculations for the building to determine the dilution efficiencies required. This will be based on the building and foundation design. The design criteria being developed will be to maintain the concentrations to typically <1% methane and <1.5% carbon dioxide.

8.4 Managed Dispersion and Venting for External Areas

To mitigate risks from lateral migration as a result of the proposed development, managed dispersion and venting will be incorporated into the hardstanding external areas and other impermeable features (such as proposed attenuation basins), to allow a safe pathway for ground gases to vent to atmosphere where capped by the development design.

At this stage, this is anticipated to include incorporation of below ground venting using geocomposite strips (or similar) which allows ground gases to move by diffusive flow through an interconnected migratory pathway and vent to atmosphere via vent bollards, gully vents or gravel trenches within the soft surfaced landscaped areas.

8.5 Underground Services

The majority of proposed services and utility corridors will be placed within the capping layer. These will be required to be designed to ensure that preferential migration pathways for ground gases are not created (e.g. installation of clay trench dam/stanks installed at the locations where utility corridors exit the site or prior to entry to buildings).

8.6 Detailed Design

A gas protection design report and design details will need to be prepared at detailed design stage. This will detail the site-specific requirements for the development's gas protection system, including for the buildings and external areas.

The expectations for verification will also be included within the gas protection design report. Further details regarding verification of gas protection measures are detailed in Section 9.5.

8.7 Other Considerations

8.7.1 Well Decommissioning

There is a requirement to decommission existing monitoring wells which are to become redundant, so as not to create preferential pathways for ground gases (or contaminated groundwater). This is detailed in Section 5.5.

9. VERIFICATION PLAN

9.1 Introduction

As stated in the LCRM guidance, verification is defined as 'the process of demonstrating that the risk has been reduced and that the remediation objectives and criteria have been met, based on a quantitative assessment of remediation performance'. Verification is a key part of the risk management process, and reference has been made to the current guidance, LCRM, for this verification plan.

This verification plan sets out the requirements for collecting data and evidence to demonstrate the work has been carried out in accordance with the Remediation Strategy and has achieved the remediation objectives. The plan describes the methodology for monitoring, sampling and testing and details the records that shall be collected.

9.2 Soil Verification

9.2.1 Soil Sample Collection

A programme of soil sampling and analysis will be required to be carried out during the earthworks, including:

- sampling of excavations (base and sides) following excavation of contamination 'hot spots' (if encountered or required);
- sampling of excavated soils to inform the potential suitability for reuse or to help determine the appropriate disposal route; and
- sampling of imported material (where from a non-virgin source or recycled).
- sampling of imported subsoil and topsoil used to form the cover layer for future soft surfaced landscaped areas.

Sampling will be undertaken in accordance with BS10175[9] and LCRM guidance, following the principles below:

- minimise the risk for cross contamination of samples both during sampling and transit;
- every sample will have a unique name / reference;
- store samples in clean, laboratory supplied vessels; and
- all samples should be labelled, stored appropriately (i.e. cool boxes, ice packs) and transported under chain of custody to the laboratory.

Analysis will be undertaken at an independent laboratory holding UKAS and MCERTS accreditation. Duplicate samples and field blanks shall be collected and submitted to the laboratory, in line with best practice.

9.2.2 MMP Verification Plan

If needed, an MMP verification plan detailing how the re-use of the materials will be verified must be developed before the material is generated. The plan should set out how compliance with the regulatory and procedural controls will be documented and audited. Detail of the verification plan is required in the MMP.

[9] BS10175:2011+A2:2017 Investigation of Potentially Contaminated Sites. Code of Practice

9.2.3 Soil Verification Criteria

Site-Won Soils for Re-Use

Site specific chemical verification criteria for re-use of site-won soils have been developed based on Ramboll's commercial GAC. The GAC are available on request.

Imported Material

As described in Section 7, there may be a requirement to use imported material to achieve the formation level, this is anticipated to include both recycled aggregate (such as 6F2) and virgin quarried aggregate (such as Type 1 material). In addition, a clean cover layer will need to be installed within areas of proposed soft landscaping to protect future site users.

Verification of imported material shall include:

- **Recycled aggregate**: Section 7.8.2 outlines the documentation requirements required to be obtained from the producer prior to import to confirm the recycled aggregate is suitability for use and has followed the WRAP Quality Protocol requirements. Once brought onto site, the material should be inspected by the Remediation Supervisor for visible signs of contamination such as asbestos, hydrocarbon staining or odours; and records of the inspections kept for verification purposes. In-situ verification requirements are detailed in Table 9.1.
- **Virgin quarried aggregate**: As stated in Section 6.8.6, records of the source of the material shall be provided. In-situ verification sampling is not required; however, the material should be inspected by the Remediation Supervisor for visible signs of contamination such as asbestos, hydrocarbon staining or odours; and records of the inspections kept for verification purposes.
- **Clean cover layer soils**: The documentation and placement requirements for the cover layer (including thickness of the cover layer and geotextile membrane requirements) are detailed in Section 6.4. The verification criteria to confirm that the material is suitable for use is based on the Ramboll Generic Assessment Criteria (GAC) for public open space as well as requirements detailed in the British Standard specifications for topsoil and subsoil.

The fill material must also meet appropriate geotechnical criteria, as specified by the clients engineer. The clean cover layer soils must also meet any specific requirements of the landscape architects.

9.2.4 Soil Verification Frequencies

Soil verification sampling should be carried out at the frequencies outlined in Table 9.1 below. Limits of detection must be appropriate to the analysis being undertaken to provide confidence that concentrations fall below the agreed verification criteria.

It should be noted that the sampling frequencies set out in Table 9.1 are intended as a guideline and the contractor will reserve the right to propose the actual frequency, depending on the outcome of the watching brief as excavations progress. If amendments to the sampling frequency guidelines are deemed appropriate, these should be clearly documented and accepted by all stakeholders prior to implementation.

Table 9.1: Soil Verification Sampling Criteria and Frequencies

Material Type	Anticipated Verification Sampling Frequency	Verification Sampling Criteria
Excavations for unexpected contamination hot spots	One sample per 5m x 5m grid square across the base and one sample every 5m along the face of the excavation. For excavations smaller than this, at least one sample per base and per face. *The final sampling regime will be confirmed following assessment of the contamination.*	*The suite of analysis and verification criteria will depend on the nature of contamination encountered and will be confirmed with the Environmental Consultant following assessment of the contamination.*
Site won soils intended for reuse once emplaced	One sample per **250-500 m^3**	Refer to Table A3.1, Appendix 3.
Imported recycled aggregate to be used as general fill material beneath buildings and hardstanding and WRAP Quality Protocol materials	One sample per **500 m^3**	Asbestos screen and quantification only. Imported material should be visibly free from asbestos and analysis confirming <0.001% by weight.
Imported topsoil / subsoil to form a cover layer for soft landscaped areas	One sample per **250 m^3**	Refer to Table A3.2, Appendix 3.

Providing all other MMP and Regulator requirements are satisfied, site-won material will be considered acceptable for use if chemical test results from samples obtained from that material are below or equal to the relevant verification criteria. Chemical test results which exceed the verification targets will typically mean that the material would be considered unacceptable. The exception to this is if only marginal / localised exceedances of the verification targets are identified, in which case the Client's environmental consultant may choose to request further sampling and analysis, or qualitative or quantitative risk assessment to determine whether the results are acceptable.

9.3 Groundwater and Surface Water Monitoring

The Enabling Works have the potential to mobilise contaminants and therefore monitoring and sampling of groundwater and surface water will be required to be carried.

The expectations for groundwater and surface water are summarised in Table 9.2 below.

Table 9.2: Groundwater and Surface Water Monitoring Requirements

Type	Frequency	Timescale
Pre-Enabling Works baseline	Quarterly	Two rounds prior to commencement
Enabling Works monitoring	Quarterly	Duration of Enabling Works
Targeted Enabling Works and piling monitoring – groundwater	Monthly	Duration of foundation works
Targeted Enabling Works and piling monitoring – surface water	Weekly	Visual inspection - Duration of foundation works
Post completion monitoring (following Enabling Works)	Quarterly	Six months following completion of Enabling Works.

9.4 Groundwater Verification

9.4.1 Groundwater Monitoring Wells

There will be a requirement to install/maintain a network of permanent monitoring wells in downgradient locations to assess groundwater quality during the work. Surface water samples will also be collected.

During the earthworks these monitoring wells will require protection. At present it is recommended that the protection comprise a concrete ring encompassing the well and signage denoting the borehole's presence, thereby protecting it from plant or excavation. The approach for protecting the well network for the duration of the earthworks shall be detailed in the RMS. This shall take into consideration the ground raising activities as well as corrective actions in the event wells become damaged or destroyed.

9.4.2 Groundwater Verification Sample Collection

Similarly to collection of soil verification samples, groundwater sampling will be undertaken in accordance with BS10175 and LCRM guidance. Groundwater sampling will also include:

- Unless otherwise agreed in writing with the Client's Environmental Consultant and the Regulator, the groundwater monitoring methodology will be in keeping with the 2023/2024 Ramboll sampling carried out at the site; i.e. depending on the depth of the monitoring wells, samples will be collected using low flow peristaltic pump.
- Samples will be collected with minimal turbulence and aeration into bottles or vials supplied by the laboratory and will be free of air bubbles.
- Where required, samples will be filtered using a dedicated sample-specific high capacity 0.45 micron filter and transferred to a plastic sample bottle, as supplied by the laboratory with appropriate preservative.
- Measurement of field water quality parameters (temperature, dissolved oxygen, pH, conductivity and oxygen redox potential).

Analysis will be undertaken at an independent laboratory holding UKAS and MCERTS accreditation. The laboratory used for analysis during the Ramboll site investigations was Element Materials Technology.

Duplicate samples and field blanks shall be collected and submitted to the laboratory at a minimum frequency of one groundwater verification sample per groundwater sampling round for quality assurance purposes.

9.4.3 Groundwater Verification Sample Frequencies

There will be a requirement to collect baseline groundwater data prior to commencement of the remediation.

Groundwater verification sampling will take place during the remediation and earthworks will be required to demonstrate effectiveness of the remediation works.

It is envisaged that verification samples will be collected over six months post remediation.

Full details of the approach to groundwater sampling collection and verification shall be provided within a Groundwater Monitoring Plan.

9.4.4 Building Protection Measures

Verification is an integral part of the gas protection system. Installation of gas protection measures, including membranes, should be undertaken by appropriately experienced and qualified workforce, for example, supervised by a Construction Skills NVQ Level 2 qualified installer.

All ground gas protection measures incorporated into the design of the buildings will need to be documented on-site in accordance with verification procedures outlined in CIRIA C735[10]. Photographic evidence of the general installation and sealing of the membrane will be required.

The installation should also be verified by a suitably qualified independent verifier, as described in CIRIA C735.

9.4.5 Below Ground Infrastructure

Below ground infrastructure which has been identified as a potential migration pathway (e.g. if it has been installed within the landfilled waste) will be installed in a way that prevents lateral migration to off-site receptors (e.g. installation of low permeability plugs within sections of service corridors, providing venting, or use of other engineered solutions).

Verification requirements will include providing details of the mitigation used and the stretches of below ground services this relates to, as-built drawings and photographic evidence of the mitigation measures following installation.

9.4.6 Verification Plan

Full details of the approach to ground gas verification shall be provided in the selected contractor's RMS.

The expectations for verification will be included within the ground gas design report. Early engagement with a specialist verification company will be required and a Verification Plan will then be developed by the appointed specialist verifiers at the design stage. This should outline the required evidence for verification, and the responsibilities of named parties in completing the verification works. The Verification Plan will be referred to during the construction works to demonstrate the effectiveness of a gas protection system.

9.5 Ambient Monitoring

Monitoring for noise, dust, asbestos fibres, vapours and odours will be required to meet standards set by the Environmental Health Department of SBC and in accordance with the CEMP.

[10] CIRIA (2014). C735 Good practice on the testing and verification of protection systems for buildings against hazardous ground gases.

This approach and contingencies shall take into consideration the dust and odour management plans being produced.

The expectations for ambient monitoring are also summarised in Table 11.5 below.

Table 11.5: Ambient Monitoring Requirements

Type	Frequency	Timescale
Continuous boundary monitoring (VOCs - PID, noise, particulates – PM10)	Continuous	3 months prior to Enabling Works and duration of Enabling Works
Odour monitoring	Daily	Duration of Enabling Works
On-site dust and particulate	Daily	Duration of Enabling Works
Off-site dust and particulate	Weekly	Duration of Enabling Works
Asbestos fibre monitoring	Dependent on outcome of asbestos management plan	
Vibration monitoring	Dependent on contractor's RAMS	

9.6 Verification Documentation

9.6.1 Enabling Works Records and Information

The following information shall be provided for the Enabling Works:

- verification reports for the foundation works will be compiled and provided which will present all groundwater monitoring results and trends in data graphically, with a view to demonstrating that the foundation works has been completed successfully with no significant impact to controlled waters. The reports will include the details of any mitigation or remediation works triggered by the monitoring programme;
- confirmation of any unexpected contamination encountered and how it was dealt with, or a statement to say that no unexpected contamination was found. Where relevant, plans showing the location and depths of soil verification samples should be provided;
- results of ambient monitoring including records of any exceedances of and responses to exceedances of threshold levels or nuisance complaints;
- 'as-dug' plans of where different material types have been placed, including the thicknesses and types and the final site levels;
- laboratory analysis results from soil and groundwater verification samples and monitoring (laboratory analytical certificates in PDF format and compiled laboratory results in Excel format) and results of any in-situ testing undertaken;
- details of consents, exemptions and permits for the works (if required) and any relevant correspondence with regulatory authorities, as well as confirmation they have been surrendered (where relevant);
- colour photographs documenting key stages of the work and any remedial works undertaken;
- records of the Remediation Supervisor's watching brief;
- If relevant, MMP verification report, clearly demonstrating how reuse of the material was undertaken in compliance with the MMP and all related controls. The MMP verification requirements are provided in full on the CL:AIRE website;
- volumes of water discharged to sewer under a Trade Effluent Discharge consent, or discharge to surface water or to ground under a discharge consent (environmental permit) – if this occurs;

9.6.2 Construction Works Records and Information

The following information shall be provided for the Construction Works:

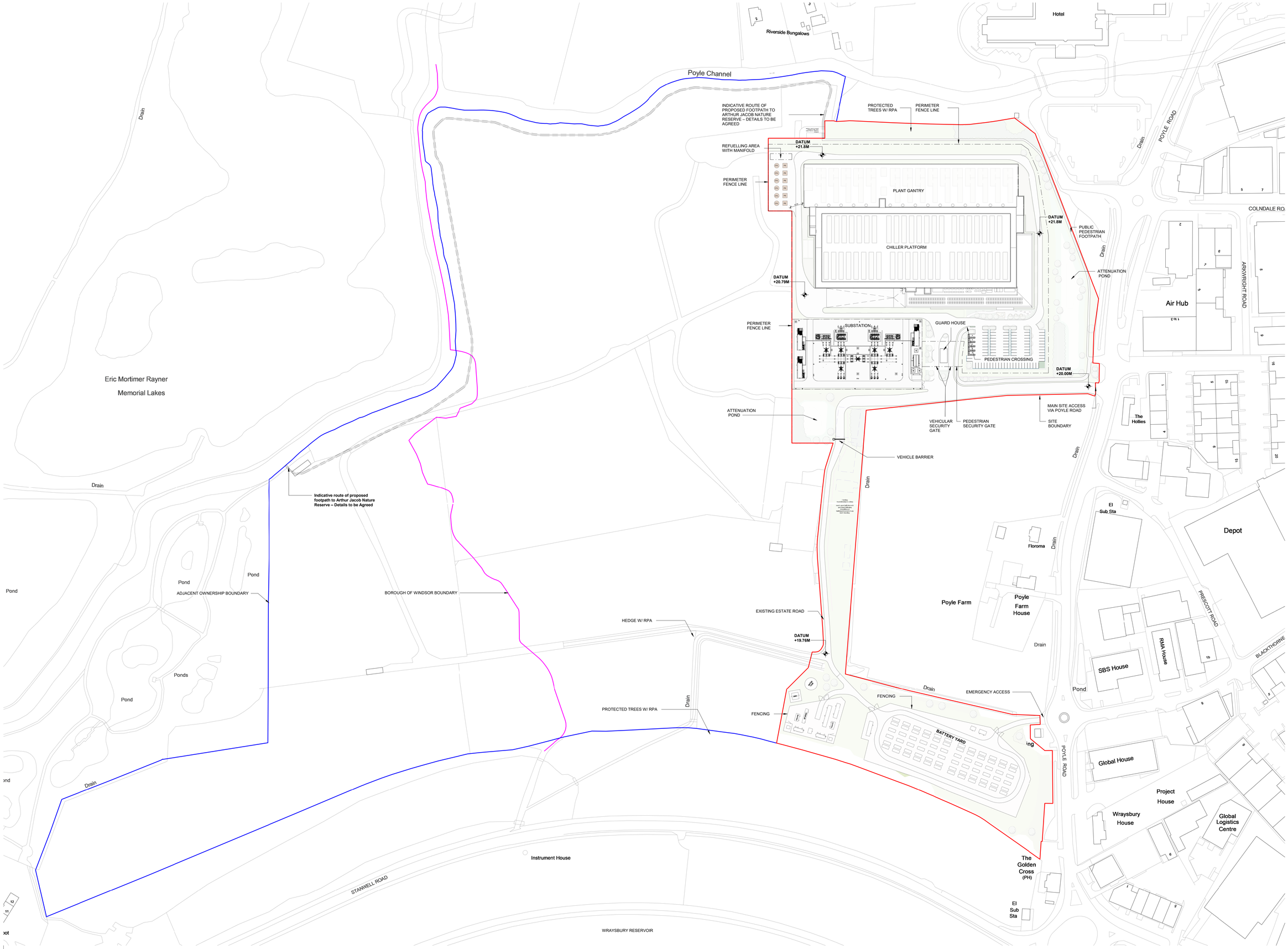
- documentation obtained from the topsoil and sub soil producers / sites of origin, including evidence that the topsoil and subsoil meet the characteristics set out in British Standards Publications 'BS 3882: 2015 Specification for topsoil' and BS 8601:2013 Specification for subsoil and requirements for use';
- laboratory analysis results from cover layer verification samples (laboratory analytical certificates in PDF format and compiled laboratory results in Excel format); and
- All ground gas protection measures incorporated into the design of the building will need to be documented on-site. Photographic evidence of the general installation, taping and sealing of the membrane will be required, and other verification evidence collated in accordance with the ground gas Verification Plan to be produced by the appointed verifier at design stage.

9.6.3 Lines of Evidence for the Verification Report

On completion of the remediation a verification report will be produced, which will include the following information, in accordance with current guidance on verification:

- the details and roles of the contractors involved in the remediation work;
- a summary of the original site conditions, with reference to the original site investigations and assessments;
- the remediation objectives and criteria, together with the basis on which the criteria were to be achieved (i.e. by reference to the remediation strategy);
- the CSM for the remediation and reference to the lines of evidence which demonstrate that the pollutant linkages have been broken;
- a description of the remedial activities with reference to relevant design reports including the RMS, detailed designs, permits, phasing etc.;
- a photographic record of the remediation works, together with plans indicating the dates and locations of remediation activities;
- a clear description of the verification plan, including the methods used for data collection and interpretation;
- a summary of progress data such as excavation records and groundwater monitoring data, waste consignment notes, imported fill records, any variations;
- a register of monitoring wells, including records of retained wells, newly installed wells and decommissioned wells;
- details of communications held with the Environment Agency and SBC during the remediation works;
- the ground gas verification report(s) produced by the appointed verifier;
- reference to the Health and Safety file;
- a clear statement that the remedial objectives have been completed; and
- supporting documents, to include where appropriate analytical results, monitoring data, health and safety documentation and quality management documentation.

APPENDIX 1
PROPOSED DEVELOPMENT LAYOUT



1 PROPOSED SITE PLAN
1 : 1000

12/12/2024 16:58:46

CORGAN
185 Park St, Triptych Bankside London, SE1 9SH, United Kingdom
www.corgan.com

N

NOTES:

Do not scale for construction. Figured dimensions only to be taken from this drawing. Check dimensions on site and report discrepencies back to the Architect.
All areas have been measured from current drawings. They may vary because of (e.g) survey, Construction tolerances, Statutory requirements or re-definition of the area to be measured.

This drawing has been prepared in accordance with the scope Corgan's appointment to it's Client and subject to the T&Cs of that appointment. Corgan accepts no responsibility for the use of this document for any other purpose.

This drawing is to be read in conjuction with all relevant drawings and specifictions from other disciplines. Please refer to Civil, Landscape and M&E drawing where referenced.

LEGEND

- SITE BOUNDARY 20.16 Acre
- ADJACENT OWNERSHIP BOUNDARY 54.51 Acre

TOTAL BOUNDARY AREA 74.67 Acre

PARKING SCHEDULE

Comments	COUNT
Standard Bay	81
WCA Bay	5
	86

Rev	Revision Description	Date	Author/ Reviewer
P01	ISSUE FOR PLANNING	12.12.24	JB

PLANNING

Client: Manor Farm Propco Limited

Project: Manor Farm

Address: Poyle Road, Slough, SL3 0BL, England, U.K.

Title:
PROPOSED SITE PLAN

Scale	As indicated	**Size**	A0
Date	12.12.2024	**Drawn**	MDV
Job Number	24303.0000	**Checked**	YC

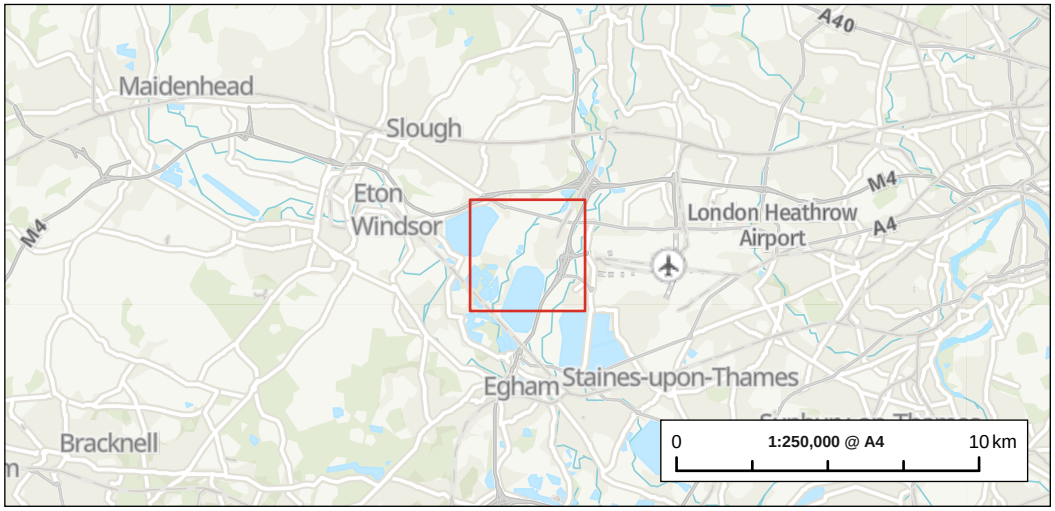
CON - COR - ZZ - ZZ - D - SK - 00104

Project	Originator	Functional Breakdown	Spatial Breakdown	Form	Discipline	Number

STATUS S3 **REVISION** P01

APPENDIX 2
FIGURES

SBC PLANNING
RECEIVED : 17.12.2024



RAMBOLL	Figure Title: Site Location	Project Name: Manor Farm, Poyle, Slough, UK	Date: December 2024	
			Prepared By: PH / CT	Figure No.: 1
	Client: **Manor Farm Propco Limited**	Project No./Filery ID: 1620016166-006 / REH2023N02678	Scale: As Shown	Revision: 2.0

1620016166-RAM-MA-ZZ-00010_SiteLoc_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Development Boundary
- Adjacent Ownership Boundary

Figure Title
Site Layout

Project Name
Manor Farm, Poyle, Slough, UK

Project No./Filery ID
1620016166-006 / REH2023N02678

Date	Figure No.	Revision
December 2024	2	2.0

Prepared By	Scale
PH / CT	1:5,000 @A3

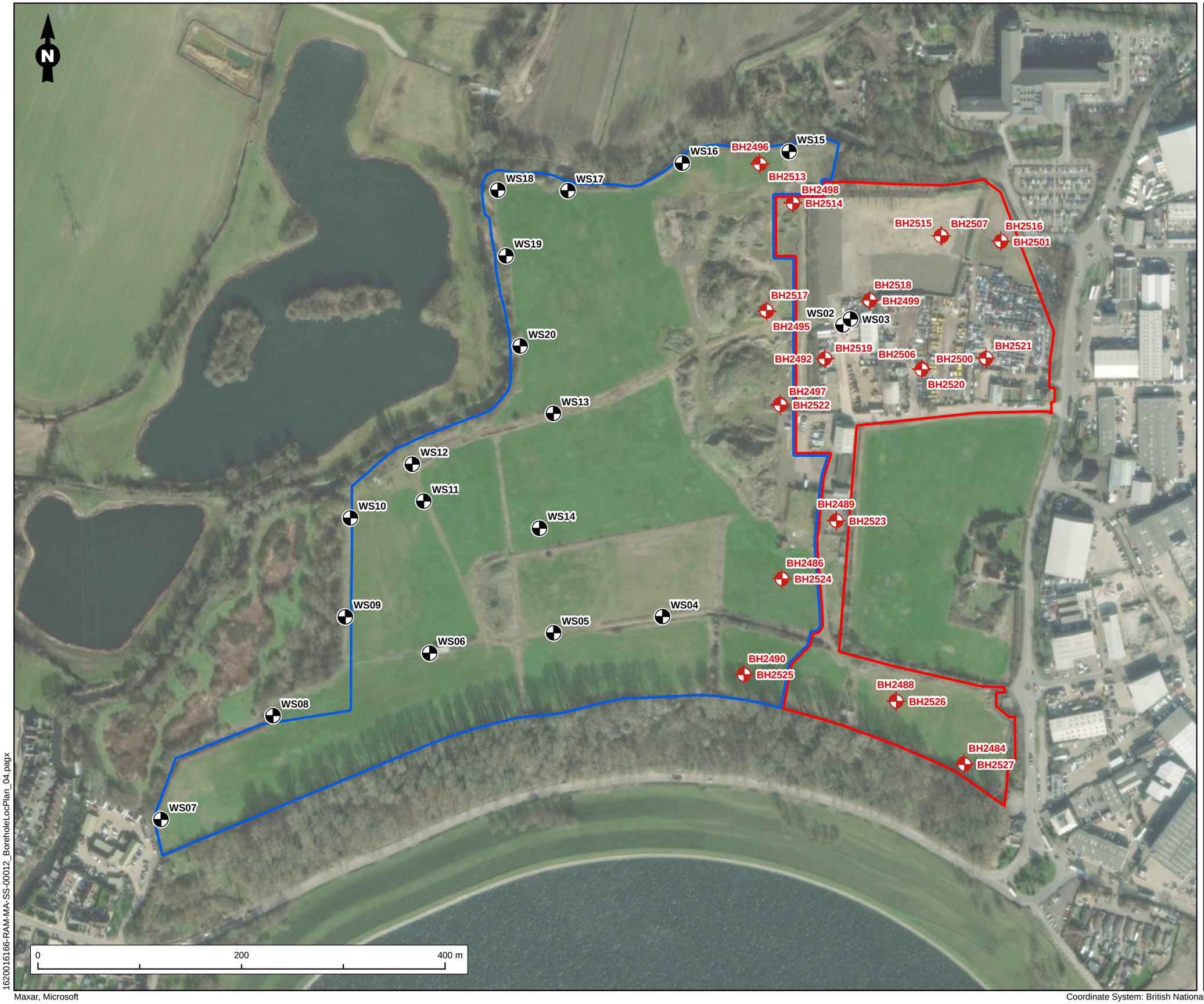
Client
Manor Farm Propco Limited

RAMBOLL

1620016166-RAM-MA-ZZ-00011_SiteLayout_04.pagx

Maxar, Microsoft

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Development Boundary
- Adjacent Ownership Boundary
- Window Sample (Ramboll)
- Borehole (HAL)

Figure Title
Borehole Location Plan

Project Name
Manor Farm, Poyle, Slough, UK

Project No./Filery ID
1620016166-006 / REH2023N02678

Date	Figure No.	Revision
December 2024	3	2.0

Prepared By	Scale
PH / CT	1:3,500 @A3

Client
Manor Farm Propco Limited

RAMBOLL

1620016166-RAM-MA-SS-00012_BoreholeLocPlan_04.pagx

Maxar, Microsoft

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Development Boundary
- Adjacent Ownership Boundary
- Surface Water Sample

Figure Title
Surface Water Sampling Location Plan

Project Name
Manor Farm, Poyle, Slough, UK

Project No./Filery ID
1620016166 / REH2023N02678

Date	Figure No.	Revision
December 2024	4	2.0

Prepared By	Scale
SR / CT	1:6,500 @A3

Client
Manor Farm Propco Limited

RAMBOLL

1620016166-RAM-MA-SS-00003_SurfaceWaterBoreholeLocPlan_03.pagx

Maxar, Microsoft

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

SBC PLANNING
RECEIVED : 17.12.2024

Legend

- Development Boundary
- Adjacent Ownership Boundary
- Regulatory Record of Historic Landfill
- Window Sample (Ramboll)
- Borehole (HAL)
- Window Sample (Ramboll)

Figure Title
Potential Extent of Historic Landfill

Project Name
Manor Farm, Poyle, Slough, UK

Project No./Filery ID
1620016166-006 / REH2023N02678

Date	Figure No.	Revision
December 2024	5	2.0

Prepared By	Scale
PH / CT	1:3,500 @A3

Client
Manor Farm Propco Limited

RAMBOLL

1620016166-RAM-MA-SS-00013_HistoricLandfill_05.pagx

Maxar, Microsoft

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

APPENDIX 3
VERIFICATION CRITERIA

Table A3.2: Verification Criteria for Imported Soil to Form a Cover Layer

Analytical Determinand	**Verification Target (mg/kg)**
Inorganics	
Asbestos identification and quantification (analytical methods accredited to ISO17025)	No ACM visible, no asbestos fibres or ACM detected in laboratory screen / <0.001% by weight within the quantification
Arsenic	79
Beryllium	2.2
Boron	21,000
Cadmium	140
Hexavalent chromium	21
Chromium III	1,500
Copper[1]	100 at <pH6.0 / 135 at pH6.0 to 7.0 / 200 at pH>7.0
Lead	630
Mercury (inorganic)	120
Nickel[1]	60 at <pH6.0 / 75 at pH6.0 to 7.0 / 110 at pH>7.0
Selenium	1,100
Zinc[1]	200 at <pH6.0 / 300 pH >7.0
pH	5.5 to 8.5
Free cyanide	24
BTEX suite	
Benzene	47
Toluene	100[3]
Ethylbenzene	100[3]
Xylenes (sum)	100[3]
Speciated Total Petroleum Hydrocarbons (TPH CWG Suite)	
Aliphatic C5-6	100[3]
Aliphatic C6-8	100[3]
Aliphatic C8-C10	100[3]
Aliphatic C10-C12	100[3]
Aliphatic C12-C16	100[3]
Aliphatic C16-C21	100[3]
Aliphatic C21-C35	100[3]
Aromatic C8-C10	100[3]
Aromatic C10-C12	100[3]
Aromatic C12-C16	100[3]
Aromatic C16-C21	100[3]
Aromatic C21-C35	100[3]

Analytical Determinand	**Verification Target (mg/kg)**
Sum of all individual aliphatic and aromatic TPH C5-35 fractions	500[3]
Polycyclic Aromatic Hydrocarbons	
Benzo(a)pyrene	10
Naphthalene	100[3]
Sum of all PAHs (in addition to meeting the speciated PAH criteria listed above)	100[3]

Notes:

Except where stated, the topsoil/subsoil verification targets are based on Ramboll's risk based Generic Assessment Criteria (GAC) for public open space close to housing. This is considered to be protective of both human health and vegetation (for compounds where BS 3882:2015 does not provide targets).

[1] The verification targets for nickel, zinc and copper are based on the BS 3882:2015 Specification for Topsoil, which is below the risk based GAC for human health.

[2] The soil pH remedial target is based on the pH range for multipurpose topsoil as presented in BS 3882:2015 Specification for Topsoil.

[3] Although the GAC concentrations do not present a risk to human health, it is considered that a lower verification target is required to minimise the potential effects on vegetation growth when the topsoil is seeded. As such, a remedial target of 100mg/kg has been selected based on Ramboll's professional judgement. In addition, the sum of all TPH fractions should not exceed 500mg/kg and the sum of all PAH compounds should not exceed 100mg/kg.