Source(s)	Pathway(s)	Receptor(s)	Risk	Comments/Mitigation
				Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction & Demolition materials: Industry Guidance" (shortened name CAR-SOILTM). The Contractor will need to prepare a risk assessment which identifies a safe system of work to handle the asbestos containing soils which is likely to include asbestos awareness training, a protocol for unexpected finds (should gross asbestos material be identified) as well as safe working procedures such as damping down of excavations and stockpiles in line with general dust generation mitigation. The Contractor should determine the need for appropriate levels of PPE and/or RPE and any associated air monitoring as required. A 'hotspot' protocol should be in place for groundworkers to act upon during any future redevelopment of the site. These recommendations should be captured in site health and safety documentation and in maintenance plans.
		Unproductive Strata (London Clay Formation).	**Low**	Elevated concentrations of heavy metals have been identified in perched groundwater collected from the

Source(s)	Pathway(s)	Receptor(s)	Risk	Comments/Mitigation
	Migration of contaminants into controlled waters	Roxbourne ditch (approx. 615 m north)		site. Given the low permeability of the London Clay Formation classified as an Unproductive Aquifer the potential for migration to surface waters is considered negligible. In addition, the site is not located within an SPZ and there are no licensed potable water abstractions within 1 km. As such the risk to controlled waters is considered to be low.
Organic contamination in soils and groundwater	Direct infiltration in water supply pipes	Drinking water supply pipes	**Low**	Hydrocarbons, especially aromatics, are known to permeate plastic pipes. Assessment of the risk to water pipes for any new supply will have to be undertaken as a requirement of the statutory undertakers, who should be provided with a copy of this Assessment and provide recommendations for upgrading of potable water supply pipes. It is considered that the use of upgraded water supply pipes should not be anticipated (if required at all).
Ground Gas	Indoor exposure/explosive hazard via enclosed space accumulation of ground gas	Future site users	**Low**	Based on the results of four rounds of monitoring, the site has been classified as Characteristic Situation 1 (Low risk), where basic ground protection measures are not considered to be required based on the monitoring completed to date.
Potential ACMs within on-site buildings	Inhalation/ ingestion of asbestos fibres	Future site users. Groundworkers during redevelopment or sub-surface maintenance.	**Low to Moderate**	It is recommended that an Asbestos Survey is undertaken and any ACMs likely to be disturbed by the proposed development are removed by an appropriately licenced contractor.

12.0 Conclusions and Recommendations

12.1 Ground Model Summary

The ground conditions encountered during the site investigation comprised a sequence of hardstanding and Made Ground to depths between 0.35 and 0.67 m bgl (where proven) followed the bedrock geology of the London Clay Formation comprised of soft to firm slightly silty clay and firm silty clay with rare selenite crystals to a maximum borehole depth of 5.00 m bgl.

Perched groundwater was encountered during drilling at depths ranging between 0.50 and 3.00 m bgl (39.07 m and 36.19 m AOD) within the Made Ground and London Clay Formation. Subsequent groundwater level monitoring recorded at depths ranging between 0.44 and 1.88 m bgl (39.13 – 37.31 m AOD).

12.1.1 Contaminated Land Considerations

Significantly elevated concentrations of contaminants have not been identified within shallow soils at the site. However, loose fibres of amosite and chrysotile asbestos was identified at DS103 within the shallow Made Ground in the eastern area of the site. Quantification of the sample indicated asbestos at a concentration of 0.010 %. Buildings and hardstanding will be present across the majority of the site preventing direct exposure to end users. Due to the proposed extension of the current building on site, there are not understood to be any new proposed soft landscaping areas.

Safe working procedures need to be adopted. The groundworks Contractor should be made aware of the possibility of encountering potential Asbestos Containing Materials (ACM) within the Made Ground and an appropriate protocol to mitigate exposure of the workforce and general public should be in place with due respect to his duties under the Control of Asbestos Regulations 2012 and with reference to the Joint Industry Working Group Asbestos in Soil and Construction & Demolition (C&D) Materials guidance (published by CL:AIRE) titled “Control of Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction & Demolition materials: Industry Guidance” (shortened name CAR-SOILTM).

The Contractor will need to prepare a risk assessment which identifies a safe system of work to handle the asbestos containing soils which is likely to include asbestos awareness training and a protocol for unexpected finds (should gross asbestos material be identified). The Contractor should determine the need for appropriate levels of PPE and/or RPE and any associated air monitoring as required.

A hotspot protocol (watching brief) should be put in place should any unexpected contamination be encountered, included as Appendix K.

Consequently, Geo^2 consider there to be a **Low to Moderate** risk to human health from soil, primarily to construction workers during the development phase.

Elevated concentrations of heavy metals have been identified in perched groundwater collected from the site. Given the low permeability of the London Clay Formation classified as an Unproductive Aquifer the potential for migration to surface waters is considered negligible. In addition, the site is not located within an SPZ and there are no licensed potable water abstractions within 1 km. As such Geo^2 consider there to be a **Low** risk to controlled waters.

Results from the four rounds of ground gas monitoring did not identify elevated concentrations of methane and carbon dioxide. As such, Geo^2 considers there is a **Low** risk to human health receptors/built environment.

12.1.2 Geotechnical Considerations

Based upon the findings of the ground investigation traditional pad/trench fill foundations are considered suitable within the natural firm clays of the London Clay Formation. The use of traditional foundations should give consideration to the variable ground conditions, groundwater levels and volume change potential of the clays. All foundation excavations should be inspected by a suitably qualified engineer prior to casting to ensure the appropriate depth, founding medium and strength characteristics have been achieved.

A lightly loaded ground bearing floor slab is likely suitable for the proposed development following excavation and removal of Made Ground and any soft soils, and replacement with engineered granular backfill. Alternatively, floor slabs could be suspended.

12.2 Recommendations

It is recommended that a hotspot protocol (watching brief) is put in place for groundworkers to act upon should previously unidentified potential contaminants be identified (included as Appendix K).

Furthermore:

- Groundworkers who are required to perform sub-surface work at the Site should be made aware of the potential for contaminants in soil and groundwater and the possibility of encountering additional localised low levels of contamination (including potential Asbestos Containing Materials (ACM)). Therefore, good standards of personal hygiene should be observed, and appropriate levels of personal protective equipment (PPE) and respiratory protective equipment (RPE) utilised where necessary;
- An asbestos survey should be undertaken for all buildings prior to any demolition and redevelopment works, where existing ACMs could be disturbed by the proposed development, and any ACMs dealt with in a safe and controlled manner, with appropriate method statements and risk assessment to ensure safety to groundworkers, site users and adjacent site users;

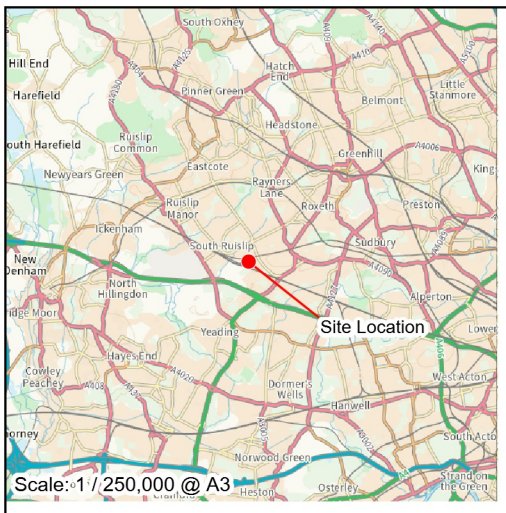
- Waste classification has not been undertaken as part of the scope of works, should it be proposed to dispose of materials from the Site then specific additional investigations may be needed to classify the materials in accordance with current regulatory requirements; and,
- Confirmation should be sought from the Local Water Authority as to whether they will require upgraded pipework to be installed for new service installations, although this is considered to be unlikely.

13.0 References

In completing this Assessment, Geo^2 has utilised the following data sources and third party information:

- Current and Historical Ordnance Survey (OS) maps;
- British Geological Survey (BGS) data;
- Environment Agency (EA) online data;
- Coal Authority (CA) online data;
- A Landmark Envirocheck Report for the site (Ref. 365083728_1_1), dated 5/12/24;
- Historical Maps included as part of the Envirocheck Report;
- Information provided by Hillingdon London Borough Council;
- C552 Contaminated Land Risk Assessment, a guide to good practise, 2001;
- C665, Assessing risks posed by hazardous ground gases to buildings, 2007; and,
- Good Practice For Risk Assessment For Coal Mine Gas Emissions, October 2021.

Appendix A – Figures



Site Boundary

Site Location

0 300 600 900 1,200 1,500 1,800 2,100 m

N

DO NOT SCALE. NOT FOR CONSTRUCTION

Figure: Site Location Plan		
Job: Bradfield Road, South Ruislip		
Client: Safestore		
Figure No.: 1	Revision: 1	Date: 03 January 2025
Drawn by: MOK	Checked by: TH	Scale: 1:16,000
Job No.: 4383		

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Legend

Exploratory Hole Locations

DS10x - Dynamic Sampler Borehole

FIP10x - Foundation Inspection Pit

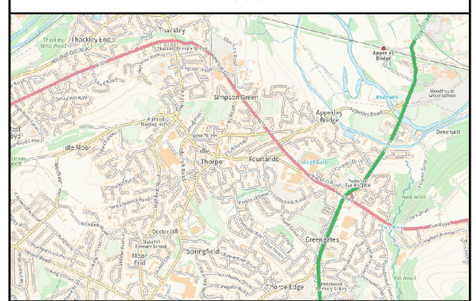
Site boundary

(s) - Standpipe

0 3 6 9 12 15 m

N

Figure: Exploratory Hole Locations		
Job: Safestore, Ruislip		
Client: Safestore		
Figure No.: 2	Revision: 1	Date: 10 January 2025
Drawn by: MOK	Checked by: TH	Scale: 1:325
Job No.: 4383		



DO NOT SCALE. NOT FOR CONSTRUCTION

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