Remediation Method Statement

at: Southern Residential Area, Sumners Pond, Barns Green, Horsham, RH13 0PR

for: Sigma Homes Ltd

Report Reference: LP3662/RMS/Southresi/3

Report Date: 19th December 2024

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LEAP ENVIRONMENTAL GENERAL NOTES

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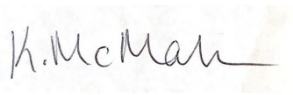
Signature		Signature	
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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

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EXECUTIVE SUMMARY

This report presents a Remediation Method Statement for the proposed residential development of the southern residential section of a site referred to as Sumners Pond, Chapel Road Barns Green, West Sussex. A remediation method statement for the northern land parcel has been issued and submitted separately. The commercial portion of the site will also be dealt with under separate cover.

The site has been the subject of two investigation by LEAP undertaken in 2022 and 2024. The whole site covers an approximate area of 1.8 ha while the southern area (subject site of this RMS) covers an area of 1 ha. At the time of LEAP's first site investigation, the southern section of the site comprised several buildings used to house cattle and store hay, caravans and vehicles; the other smaller buildings were used for repair and sales of second-hand vehicles and garden machinery. LEAP then revisited the site in 2024 when four of the buildings on site had been demolished and the caravan area in the northwest had been removed. The northeast comprised the site compound with hardstanding and the northwest was used as a storage area for materials on the construction site and had overgrown vegetation .

It is proposed to redevelop the site with residential properties, associated infrastructure and areas of soft landscaping and private gardens. Two blocks for commercial use and a reception building for the campsite are also proposed on site.

The previous investigations recorded ground conditions to comprise made ground to a depth between 0.1 m and 0.9 mBGL over stiff clay over mudstone of the Weald Clay Formation at depth.

Groundwater seepages were recorded between 0.55 m and 2.3 mBGL and groundwater monitoring recorded resting groundwater levels between 0.45m and 0.6 mBGL.

Contamination testing of the soils identified locally elevated concentrations of PAH compounds within the made ground (when compared to residential with homegrown produce assessment criteria). No contaminants above the assessment criteria were encountered within any of the topsoil or natural clay samples tested except within TP205 at the top of the natural clays.

The elevated PAH concentrations impacted soils would present an unacceptable risk to future site users where retained in soft landscaped areas and if it were present within private gardens. No risk has been identified to groundwater or surface water receptors.

The following outlines the remedial activities that are proposed for the site to protect human health against the recorded contaminants.

- In areas of proposed gardens where made ground is present this is to be excavated to 600 mm below finished level level and to 450 mm below finished level for soft landscaped / public open space areas. Noting where made ground is shallower than 600 mm / 450 mm then the full depth of made ground shall be removed.
- Visual inspections at stripped formation level to confirm no gross contamination (defined as visible asbestos, non-aqueous phase product, oil staining, strong hydrocarbon odour) is present;
- Installation of a clean cover system of 600 mm in thickness in private gardens. The clean cover system to include a minimum of 150 mm certified clean topsoil (to provide a suitable

'growing medium') and the remainder certified clean subsoil. The top 450 mm of material should be freely diggable, in accordance with NHBC requirements.

- The "cover" layer thickness may be reduced where natural soils are encountered at shallower depths to match the thickness of the made ground removed where this is less than 600 mm in gardens and 450 mm in soft landscaping.
- Elsewhere across the site (where made ground is not present) a suitable thickness of clean chemically suitable topsoil (minimum of 150 mm) will be required in soft landscaped areas and gardens.
- A watching brief to be maintained during construction in the event that any further contamination is identified, with measures in place to assess suspect soils appropriately and deal with them accordingly; and
- If significant visual or olfactory evidence for contamination or evidence for asbestos containing materials are encountered at stripped formation anywhere across the site then the cover system may need to be revised, and the use of an engineered cover system may be required.

Waste disposal is the responsibility of the developer and records will be maintained by the developer.

1 INTRODUCTION

1.1 Authority

RSK Environment Ltd trading as Leap Environmental (hereafter referred to as LEAP) were engaged by Sigma Homes Ltd herein referred to as the "Client" to carry out a Remediation Method Statement (RMS) for the southern residential area of the land at Sumners Pond, Barns Green, Horsham, West Sussex, RH13 0PR.

The works were undertaken by means of LEAP's fee proposal letter LPQ11312 dated 22 March 2024 including RSK Standard Terms and Conditions (Issue No12 July 2023) which forms the appointment between LEAP and the Client.

References in this report to 'we', 'us' or 'our' shall mean Leap Environmental as a trading name of RSK Environment Limited (company no.SC115530) at registered address 65 Sussex Street Glasgow G41 1DX.

The report should be read and used in accordance with the limitations and constraints identified in the report text, and at **Appendix A** – Service Constraints.

The site is approximately 1.8Ha in size and is located at TQ 12459 26768, with the nearest postcode being RH13 0PR (LP3662-LW-111-XX-D-G-11101-C01, **Appendix B**).

1.2 Objective

It is proposed to redevelop the wider site with 7 No. 1.5 storey commercial units and 32 no. 1.5 to 2 storey residential properties. The southern area of the site will be developed with 11 No. semi-detached residential properties with private gardens with associated infrastructure, garages and access roads. two blocks for commercial use and a reception building for the campsite to the west. An area of public open space including a swale and pond is proposed near the centre of the site as per the attached layout in Drawing Ref. LP3662-LW-116-XX-D-G-11601-C01, **Appendix B**.

The southern area of the site is further divided into the residential area in the north and commercial area in the south and west. It is understood that Sigma Homes Ltd own only the residential portion of the site, and are only constructing the residential portion (see reference to Phase B on Drawing 6991-PL050-RevB in **Appendix B**). It is also understood that the commercial area is still owned by Sumners Pond Fishery and Campsite, and that another developer will be constructing the commercial units and reception building. Sigma Homes Ltd currently has no access to the commercial portion of the site. It is also understood that, for the purposes of planning, it has been agreed that the residential and commercial portions of the site will be separated into individual zones to support discharge of conditions for the residential area, which is being constructed before the commercial area. The separate phases of the site are shown on Drawing LP3834-LS-112-XX-D-G-11201-C01.

The objective of this document is to provide a scheme of remediation for the southern residential area to ensure that no relevant land contaminant linkages remain after the scheme is implemented relating to future residents or other identified receptors. It is recommended that this RMS be submitted for approval to Horsham District Council.

1.3 Previous studies

The site has been the subject of previous investigations by LEAP and others. The reader is referred to these earlier reports which should be read in conjunction with this report:

- Phase I Desk Study, Site Reconnaissance & Phase II Site Investigation Report produced for Sigma Homes Ltd by LEAP . Ref LP3019. Issued 13 September 2022.
- Groundwater Monitoring Results Sumners Pond, Horsham produced for Sigma Homes Ltd by LEAP . Ref EL/23/LP3019/GW. Issued 8 June 2023.
- Addendum Site Investigation at Southern Area, Sumners Pond, Barns Green for Sigma Homes Ltd by LEAP . Ref. KM/24/LP3662/Addendum SI-South. Issued 15 August 2024.
- Re: LP3662/LP3834 – Addendum Site Investigation – Southern Area, Sumners Pond, Barns Green produced for Sigma Homes Ltd by LEAP. Dated 18th November 2024, ref LP3662-LP3834/Addendum SI- south/2.

The northern section of the site (beyond the scope of this investigation has been the subject of further investigations as set out below:

- Archaeological Evaluation Report for Sumners Pond, Horsham produced for Sigma Homes by Archaeology South-East on behalf of RPS Group Report Ref. 2023127 dated June 2023.
- Phase III Investigation Report produced for Sigma Homes Ltd by LEAP Ref. LP3444 Issued 29 September 2023.
- Addendum Site Investigation – Northern Area, Sumners Pond, Barns Green, RH13 0PR produced for Sigma Homes Ltd by LEAP . Ref. ADC/24/LP3662/Addendum SI dated 5 June 2024.
- Remediation Method Statement for Sigma Homes Ltd by LEAP Ref. LP3662/RMS/North Issued 19 June 2024.

1.4 Limitations

This report is subject to the RSK service constraints given in **Appendix A** and limitations that may be described below and throughout this document.

This report was prepared in accordance with good practice guidance at the time of issue. Consideration should be considered in the light of changes in legislation, statutory requirements, or industry practices subsequent to the date of issue.

The study aims to principally identify and assess the potential risks and liabilities associated with contamination of the ground, on and in the vicinity of the site. While this includes consideration of current operations and housekeeping on the site, the report does not constitute a comprehensive environmental audit of the site, as covered under ISO 14001.

A detailed survey of invasive plant species is outside the scope of this investigation therefore detailed comments with regards to such species have been omitted from this report.

The comments given in this report and the opinions expressed are primarily based on third party data and investigations, while RSK have undertaken a review of the information provided RSK cannot be held liable for the quality of the data provided. There may be conditions pertaining to the site that have not been disclosed by the investigations and therefore could not be taken into account.

In particular, it should be noted that there may be areas of made ground and potential contamination not detected due to the limited nature of the investigations or the thickness and quality of made ground and concentrations of contamination across the site may be variable. In addition, groundwater levels and groundwater concentrations may vary from those reported due to seasonal, or other, effects.

2 THE SITE

2.1 Site location and description

The site is located west off of Chapel Road, Barns Green, Horsham RH13 0PR as shown in LP3662-LW-111-XX-D-G-11101-C01, **Appendix B**.

The approximate National Grid Reference of the site is TQ 12455 26761. The site lies at an estimated elevation of 36 m Above Ordnance Datum (mAOD).

The wider site is approximately 1.8 ha and is part of an active campsite and fishery, although the site itself was used for a combination of vehicle storage, agricultural purposes and car parking.

The southern portion of the site covers an area of ~1 Ha. At the time of LEAPs previous investigations in 2022 and 2023 the southern half of the site comprised several buildings: the largest two were (~800 m^2) irregular in shape and was used to house cattle and store hay and (~825 m^2) and rectangular in shape and was used to store caravans and vehicles; the others were smaller and rectangularly shaped and were used for repair and sales of second hand vehicles and garden machinery. Between these structures the ground cover comprised blacktop and concrete in various states of disrepair. In the far southern section of the site was a grass topped mound/ embankment. It is also reported by the client that above ground storage tanks were previously present in the centre-south of the site (within the proposed commercial area). These were removed prior to LEAP's intrusive works being undertaken.

During the most recent investigation (October 2024)four buildings in the northeast had been demolished and the caravan area in the northwest had been removed from site. The northeast comprised of hardstanding with the site compound and the northwest comprised of overgrown vegetation and was used as an area of storage for materials on the construction site. A worker also noted that this area had previously been used to store stockpiles of material from excavations on site.

A timber framed barn is present in the centre west of the site and is used as a visitors centre and storage of materials and machinery, industrial/commercial units are located in the centre and a house to the west. A type 1 gravel carpark is located in the south of the site. A site plan showing the location of the former buildings on site is presented in Drawing Ref. LP3662-LW-112-XX-D-G-11203-C01.

The site is relatively level: the elevation of the southern site is 35m AoD at its lowest at the boundary between the north and southern sections with a gentle slope up toward the south of 38m AoD on the southern site boundary.

The site is bounded by the campsite to the west, with a pond and fields beyond; fields and woods are located beyond the site to the north; to the east is Chapel Road, with the residential village of Barns Green beyond; and to the south is Sumners Lake and Farm Pond (part of the fishery), with fields and woods beyond.

2.2 History

The wider site was mapped as agricultural land from the earliest historical maps circa 1876, initially comprising three open fields. The northern site has remained as a field throughout the available

historical maps with the exception of a farm track along the western margin of the site and the access road aligned east to west separating the northern and southern sections of the site. Development was undertaken in the southern section of the site prior to early 1960s. The surrounding area largely remained as agricultural land, fields and woods until residential development took place by 1977 at Barns Green to the east. Two smaller ponds were mapped offsite to the southwest of the site until 2001, when one large pond was mapped in their place. Two other ponds appeared by 2010 to the south and northwest of the site, with a further two appearing to the west and northwest of the site by 2022.

2.3 Geology, Hydrogeology and hydrology

The geology of the site has been ascertained by reference to the 1:50,000 British Geological Survey sheet 302 'Horsham', solid and drift edition and the BGS website (www.bgs.ac.uk). The site is mapped as being underlain by the Weald Clay Formation Mudstone. No superficial deposits are mapped on site.

The hydrogeology information has been sourced from the Groundsure.io website. The Weald Clay Formation, which is mapped beneath the site, is classified as Unproductive Strata. The site is not situated within a Groundwater Source Protection Zone (SPZ).

The site is not located within a flood zone risk zone associated with river floodings. However, a small section of the north of the site is mapped as being at risk from surface water flooding.

2.4 Soil profile as encountered during site investigations

In the southern area, a total of 21 No. trial holes have been excavated comprising a combination of machine excavated trial pits, hand excavated trial pits and windowless sampler boreholes. The site has been further zoned based on the ground conditions encountered. A plan showing the location of all trial holes completed on site is presented in Drawing Refs. LP3834-LS-222-XX-D-G-22201-C01 and LP3834-LS-222-XX-D-G-22201-C02, **Appendix B.**

2.4.1 Commercial Area

In total seven trial holes (TP6, TP7, WS5, TP205, TP209, TP210 and TP211) were completed within the commercial area. The ground conditions generally comprised placed Type 1 made ground over made ground to depths between 0.25 and 0.45 m over natural Weald Clay deposits of greenish grey stiff slightly silty clay to a maximum depth of 2.8 mBGL. The made ground encountered included gravels of blacktop, brick, flint, chalk, clinker and occasional tile and metal. TP7 located at the southern site boundary did not encounter made ground and comprised topsoil to 0.1 mBGL over silty clay. WS5 encountered mudstone from 2.8 mBGL.

During the most recent visit this area comprised of a car park surfaced with type 1 gravel. However, during previous investigations this area was made up of a large mound covered with grass which was stepped to the top. TP210 and TP211 are positioned beneath the footprint of the previous soil mound.

2.4.2 Northwestern area

In total four trial holes (WS4, TP208, TP206 and TP301) were completed within the northwestern area. The ground conditions within the northwestern area generally comprised of gravelly sandy clay made ground to depths between 0.1m and 0.4m bgl over orange brown mottled stiff silty clay to a maximum proven depth of 2.4m bgl over silty mudstone. The made ground included gravels of

flint, concrete, brick, chalk and rare tile fragments. TP206, located north of the barn building on site, included a layer of chalk fill made ground to 0.4m depth comprising gravels of chalk, flint and brick.

WS4 is logged as topsoil between ground level and 0.1m bgl, but no topsoil was encountered with TP208 or TP206. During the most recent investigation, this area of the site is noted to being used as storage for construction site materials and possibly excavated materials and therefore it is assumed that the topsoil recorded within the previous investigation in 2022 has been removed or mixed in with such materials and is no longer present/ classified as topsoil.

2.4.3 Eastern hardstanding area

In total ten trial holes (WS1, TP5, TP201, TP203, TP204, TP302, TP304, TP305, TP306 and TP304) were completed within the eastern hardstanding area. The ground conditions within the eastern hardstanding area generally comprise of concrete hardstanding over clayey gravel made ground to proven depths between 0.2 m and 0.9 mBGL over firm blueish grey slightly gravelly silty clay. With the exception of WS1, located off the eastern site boundary, made ground is encountered to depths between 0.2 m and 0.35 mBGL. The made ground included gravels of flint, chalk, concrete and brick.

Dark staining with an organic odour was noted within the natural Weald Clay across the site, and was considered to be associated with historical root systems within the clay.

2.4.4 Groundwater

Groundwater strikes or seepages were encountered in four locations in total (WS1, WS5, TP203 and TP211) during previous intrusive investigations at depths ranging from 0.55 mBGL to 2.3 mBGL. The shallowest of these was recorded within TP211 and is considered to represent perched water within the made ground overlying the natural clays.

Subsequent groundwater monitoring of one well installed in WS5 was undertaken with access available between December 2022 and January 2023. The monitoring recorded resting groundwater levels between 0.45 m and 0.6 mBGL.

2.4.5 Visual and Olfactory Evidence

Made ground was encountered within the majority of the trial holes completed on site. Excluding anthropogenic materials the only visual and olfactory evidence of contamination noted were a slight hydrocarbon odour and black staining at the boundary between concrete and the natural strata in 2 No. locations close to the location of former above ground storage tanks (TP304 and TP307). Samples were collected from the potentially impacted soils for additional testing. Organic odours were noted within the natural clay, however samples where the organic odour was noted were tested for volatile compounds using the Photoionization Detector (PID) and negligible VOC concentrations were detected (maximum concentration of 0.5 ppm).

2.5 Human Health

Sampling and subsequent chemical analysis was undertaken on selected samples of the made ground and natural strata, with analysis selected to target contaminants of concern. The sample results were then assessed against generic assessment criteria (GACs) based on a residential setting where home grown produce was consumed. This was considered representative of the proposed residential area, and very conservative for the commercial area.

2.5.1 Petroleum hydrocarbons

8 No. samples of made ground and 9 No. samples of natural Weald Clay were tested for petroleum hydrocarbons. Samples were generally selected based on visual and olfactory evidence noted during excavations. Five samples (4 No. made ground and 1 No. natural) recorded total petroleum hydrocarbon (TPH) concentrations above the laboratory limit of detection. However none of the concentrations detected were above the assessment criteria for any hydrocarbon fractions.

2.5.2 Heavy Metals

27 No. soil samples were tested by LEAP, 15 No. of which comprised made ground and 12 No. comprised the natural underlying Weald Clay.

None of the made ground or natural soil samples analysed recorded any of the metals tested for at concentrations above the assessment criteria for a residential development with private gardens.

2.5.3 Polycyclic Aromatic Hydrocarbons (PAH)

Of the 27 No. samples tested for PAH compounds, elevated concentrations of marker compound benzo(a)pyrene (BaP) were detected in four samples of the made ground and one natural clay sample. Exceedances were encountered in the made ground within TP5 at 0.05 m (23.1 mg/kg), TP6 at 0.4 m (7 mg/kg), TP210 at 0.05 m (8.59 mg/kg) and TP205 at 0.2 m (26.9 mg/kg). Of these, TP6, TP205 and TP210 were located in the proposed commercial area, and were considered to be associated with fragments of blacktop/asphalt noted within the made ground. The concentrations detected in these locations didn't exceed the criterion for BaP based on a commercial end use (criterion of 77 mg/kg). However TP5 was located in the eastern hardstanding area where residential housing is proposed.

A minor elevation of benzo(a)pyrene was detected within the top of the natural clay at TP205 where the boundary between the made ground and the natural was noted to be at 0.25 m depth. TP205 was also located within the proposed commercial building area of the site and also did not exceed commercial assessment criteria of 77 mg/kg for benzo(a)pyrene. Natural clays at 0.7 m within TP205 recorded benzo(a)pyrene elevations below the limit of detection, which further evidenced a lack of contamination at depth.

2.5.4 Asbestos

29 No. soil samples as well as two cement fragments identified as potential asbestos-containing materials (ACMs) were screened for the presence of asbestos.. Asbestos was positively identified in 1 No. made ground sample, TP301 at 0.2 m in the residential area, and was identified as chrysotile free fibres at a concentration of <0.001%..No further samples positively identified any asbestos fibres, and the potential ACMs were identified to be fabric and wood.

2.5.5 Pesticides

One sample of the topsoil (TP7 at 0.1 m) was tested for the presence of organochlorine and organophosphorus pesticides as well as triazine herbicides. None of the determinants tested for were recorded above the laboratory limit of detection.

2.6 Controlled Waters

No groundwater sampling has been carried out across the site. The underlying geology is classified as a non-aquifer and the site is not located within a groundwater Source Protection Zone. The site is underlain by variable but generally limited thickness of made ground (0.1 – 0.9 m). During LEAP's

LP3019 investigation infiltration testing was undertaken within the wider site boundary (north of the subject site) in two locations (TP1 and TP3). These recorded negligible infiltration rates of between 5x10-8 and 2x10-9 m/s. Given contamination was generally localised to shallow made ground and the very low permeability of the underlying soils contaminant migration through the subsurface is considered to be unlikely. Therefore, the risk of groundwater contamination from this site has been assessed as very low.

The nearby surface water receptors included an inland river to the north of the site and five fishing lakes to the south, west and northwest. Given the limited contamination encountered to date, the lack of visual or olfactory evidence for significant contamination or free product and the contamination identified being predominantly located in the south of the site (further from the watercourses) the risk to surface water receptors is considered to be low. The Environmental Health Officer (EHO) for Horsham District Council also identified a surface water drain in the east of the site, and was concerned there was a risk to this drain from contamination associated with the former above ground storage tanks via surface run off. Given the lack of significant visual and olfactory evidence of contamination in TP204 and TP307 located adjacent to the former tanks, and TP305 located further along the drain run, lack of mobile contamination noted within the soil samples collected from both the made ground and natural soils in the area, and the hardstanding proposed to be installed in this area, there was considered to be no risk to the surface water drain.

However, it was considered care should be taken to ensure that surface water runoff from the site during construction does not impact the adjacent fishery lakes from the perspective of silt management. It is recommended that a silt management plan (SMP) is prepared to ensure that the adjacent surface water features are not impacted.

2.7 Relevant Contamination Linkages to be Remediated

Based on the CSM outlined in the most recent investigation (report ref. LP3662-LP3834/Addendum SI- south/2)the following relevant contaminant linkages (RCL) have been identified that will pose an unacceptable risk to the identified receptors if they remain in the ground following development. These RCLs will be taken forward for site specific remediation:

- PAH and asbestos impacted soils.
    - Human health via dermal contact, soil / soil attached to home grown produce ingestion and dust inhalation.

It should be noted that this RMS relates to the residential portion of the southern site area only. A separate RMS for the northern area of the site has been issued and submitted to Horsham District Council for approval following site investigation. Should additional investigation and remedial measures be required in the commercial portion of the site, then separate documentation will be produced.

3 REMEDIATION STRATEGY

At this stage remediation is required to break the contaminant linkages between elevated concentrations of PAH compounds and asbestos fibres within the made ground. The proposed remediation of the residential area will comprise the following activities:

- In areas of proposed gardens where made ground is present, this made ground is to be excavated to 600 mm below finished level and to 450 mm below finished level for soft landscaped / public open space areas. Noting where made ground is shallower than 600 mm / 450 mm then the full depth of made ground shall be removed.
- Visual inspection of the exposed formation level to confirm that no gross contamination is present.
- Installation of 600 mm of clean soils in private garden areas and 450 mm in soft landscaped areas where made ground is present at formation level.
- Verification inspections to confirm that sufficient thicknesses of clean cover have been installed and chemical testing of the placed soils to confirm their chemical suitability.
- A discovery strategy outlining the actions to be taken in the event that unanticipated contamination is encountered.

As stated above this RMS only covers remedial works associated with the residential portion of the southern area of Sumners Pond, and does not include remediation associated with the commercial area in the south.

3.1 Clean Cover Systems in Soft Landscaped Areas

It is assumed that as part of the development works the existing topsoil will be stripped across the site to enable construction. In soft landscaped areas where made ground is encountered it is recommended that the soils are excavated to ~600 mm below finished level (in private gardens) and 450 mm (in public open space / soft landscaped areas) and replaced with a suitable clean cover system of a total thickness of 600 mm and 450 mm respectively including a minimum topsoil thickness of 150 mm.

Where made ground is shallower than 600 mm in gardens or 450 mm in public open space this made ground should be removed entirely and replaced with an equivalent thickness of clean capping. Where this occurs, this should be noted and the verification engineer informed of the reason for the depth reduction.

In soft landscaped areas, where made ground is not present, an appropriate thickness (for example 150 mm) of clean topsoil to provide a growing medium should be installed. The appropriate depth should be confirmed with the landscape architect.

Site-won natural soils may be suitable for reuse from areas on site not found to be impacted by contamination or made ground. To date three topsoil samples have been tested, and results indicate no significant contamination is present in this material. Additional inspection and testing would be required to determine suitability of this material for reuse once it has been excavated and the quantities are known.

Additional chemical analysis of site-won topsoil should include contaminants of concern highlighted in the CSM, including heavy metals, PAHs and asbestos, and the results assessed against the assessment criteria provided for site-won material in **Appendix C**.

Regardless of whether materials are intended for re-use or offsite disposal, materials should be stockpiled and segregated appropriately to prevent cross contamination. Care should be taken during excavation to prevent natural soils becoming combined with the overlying made ground soils.

Clean topsoil may be required to be imported to the soft landscaped areas if sufficient clean topsoil is not present on site. It is considered unlikely at this stage that subsoil will need to be imported; however, depending on final levels and the specific requirements of the development (landscape architecture for example) it is possible that imported subsoil may be required.

In general terms, all imported soils will be approved by LEAP prior to importation. The proposed sources will be assessed on the basis of either a detailed site investigation or laboratory test results in the case of a manufactured topsoil. In the absence of this data then LEAP will then advise what further testing, if any, is required prior to importation. However, it should be noted that based on the current volumes of material anticipated that importation of either topsoil or subsoil is considered unlikely.

The test frequency for imported greenfield or manufactured soils will be as follows (to be advised by LEAP on a source-by-source basis depending on the quality of data provided prior to importation).

- Subsoil – I sample per 150-300 m^3
- Topsoil – 1 sample per 100-150 m^3

Soils imported from a brownfield source would be tested at the higher frequency of 1 sample per 50 m^3. However, as outlined above there is no intention for importing either topsoil or subsoil as part of the development. The testing regime for site won natural soils is one sample per 150 m^3 for topsoil and one sample per 300 m^3 for subsoil and “sources” should be considered to represent different soil types. All imported will be subject to the test parameters included in the specification for imported fill provided as **Appendix C** irrespective of the depth at which they are to be placed.

Further verification testing may be required once the material is imported to site.

3.2 Protection of Incoming Services

Given the concentrations of contaminants recorded by works completed thus far, the use of protective barrier pipes for incoming water may be required.

Ultimately the local water supply company will have their own specification and they should be consulted to confirm whether they will require protection measures to be adopted. It is our understanding that protective barrier piping is to be utilised on site.

3.3 Drainage

Although beyond the scope of this RMS it should be noted the underlying natural soils are of very low permeability and as such there exists the potential for private garden areas to become waterlogged. NHBC[1] guidance indicates that appropriate soil selection and management or if necessary, drainage should be installed should be undertaken to prevent waterlogging of gardens. It also notes that where topsoil and subsoil have been compacted during construction appropriate

[1] NHBC Standards (2024)

action should be undertaken to restore the physical condition and drainage characteristics of the material.

3.4 Discovery Strategy

It is considered possible that as yet unidentified contamination may be encountered during construction works. Where additional contamination is identified during works this will be subject to further assessment and documented accordingly. It may be necessary to recommend the removal of additional soils or to propose alternative remedial solutions.

Verification Engineers/Environmental Consultants are to be informed if any material suspected to be contaminated is encountered during the course of the development, so that appropriate revisions to remedial strategy can be implemented as required.

3.5 Waste Disposal

It is anticipated that the proposed development will generate waste soils and materials will need to be removed from site as part of the construction process.

In line with current European Commission Regulations including the Waste Framework Directive 2014 and The Waste (England and Wales) (Amendment) Regulations 2012, and Environment Agency Guidance (WM3 2015), waste holders and their advisors (producer, carrier or disposal facility) are required to make an assessment of waste materials and classify them as hazardous, non-hazardous waste or inert.

Once the waste has been classified as either hazardous or non-hazardous and prior to disposal, further analysis may be needed to confirm whether soils to be exported meet the proposed receiver landfill site's Waste Acceptance Criteria. Where a waste is classified as non-hazardous a Waste Acceptance Classification test (WAC) is required to determine whether the material can be accepted at either an inert or non-hazardous landfill. Where the WAC test results exceed hazardous waste WAC limits that waste cannot be accepted at a hazardous landfill site without prior treatment.

In accordance with WM3, wastes containing visible asbestos contamination or asbestos concentrations greater than 0.1% by volume are classified as Hazardous.

Where soils are to be disposed off-site, it is the duty of the waste producer, to ensure that all waste is disposed of appropriately and that any that is sent to landfill is sent to an appropriately licensed one.

Where made ground soil is to be re-used on site or natural clean soils may be suitable for re-use on another site, then it is recommended that this is carried out under the CL:AiRE Code of Practise for re-use of soils (see Section 10 below). It should be noted that if made ground is to be re-used the MMP outlining the proposed re-use must be in place prior to the materials excavation. Made ground soils excavated without an MMP outlining this proposed re-use would be classified as a waste and must be disposed of offsite. There are various forms of pre-treatment that are acceptable.

Waste soils awaiting testing, classification and disposal will be placed on plastic sheeting, segregated by fencing and labelled appropriately. Any potentially hazardous or inert soils will require waste acceptance criteria (WAC) testing.

Naturally occurring soils are anticipated to be classified as non-hazardous and potentially inert although confirmatory testing would be required to confirm this if they are deemed a waste and require disposal.

It is strongly advised that detailed discussions be held with remediation/groundworks contractors and that receiving landfill sites are identified in advance of commencing any waste removal.

3.6 CLAiRE Development Industry Waste Code of Practice

It is anticipated that clean natural soils generated from foundation and/or drainage excavations may be suitable for re-use on site within the cover layer system or as part of the ground relevelling.

Excavated made ground may be suitable for re-use for ground relevelling in hard landscaped areas subject to it meeting the geotechnical requirements of that re-use and provided that it is free of asbestos.

It is our understanding that no made ground is to be reused on site. However, if made ground soils were to be reused on-site then this should be undertaken in accordance with the DoWCoP. The Guidance presents key principals for demonstrating compliance with DoWCoP to reuse of soils as non-waste, this needs to be lines of evidence based to demonstrate that soils are not waste. Line of evidence must be set out in the Material Management Plan. Key principals to be met when reusing soils as non-waste are as follows:

- Reuse of material will not create unacceptable risk to human health or other identified receptors – i.e. risk assessment confirming suitability for reuse
- Suitability for reuse without further treatment – suitable chemically and geotechnically – must meet relevant specification – e.g. use as backfill beneath cover systems buildings or hardstanding or for site regrading
- Certainty of Use – must demonstrate that material will actually be used and is not just a probability – i.e. there is planning for the scheme and that backfill is required to make up levels or clean soils required for cover systems
- Quantities – materials used should only be in the quantities required – i.e. use of excessive material will = landfill on site as disposing waste soils that aren't required

A Material Management Plan should be submitted to a 'Qualified Person' (QP) for review and if appropriate the QP will sign a declaration that proposals within the MMP are in accordance with CoP. The QP must be independent from and have had no prior involvement with the project.

On completion a verification report must be produced documenting whether proposals set out in MMP were implemented on site – confirming volumes of material reused, reuse locations, and compliance with specifications.

4 VERIFICATION WORKS

4.1 Site Works

During the re-development works, the verification engineer will observe and verify the following:

- Visual inspection of the formation level soils prior to infilling;
- Verification of the chemical nature and thickness of the applied clean cover soils; and
- Verification of excavations where contaminated soils are deemed present.

The engineer will also be available to visit site and provide guidance should any previously undiscovered contamination be encountered.

Verification of the thickness of the clean cover will be undertaken at a frequency of 1 verification pit every two garden plots, and one verification pit in each significant open space area. The inspection pit excavated to the base of the clean cover soils to inspect both the thickness of the topsoil and the total clean cover, and will be located onsite based on the plots available at the time.

4.2 Verification Testing of Imported soils/Site-won soils

As stated in the remediation strategy above, the verification engineer will approve imported soil sources prior to use based on site investigation and/or test results as well as the reuse of site-won soils.

Once a source has been approved for importation the verification engineer will complete onsite inspection and verification testing. Where imported from a manufacturer or greenfield site topsoil will be tested at a minimum frequency of one sample per 150 m^3 imported and subsoil at a minimum frequency of one sample per 300 m^3 of imported soil with a minimum of three samples per source of material in both cases. Soils imported from brownfield site's would be tested at the high frequency of one per 50 m^3. Testing will be undertaken at a UKAS and MCERTS accredited laboratory.

All imported soils will be required to meet the specification as given in **Appendix C** irrespective of the depth at which they are to be placed. Any unsuitable material will be removed from site.

It is not proposed to re-use any made ground as part of the development although it is intended to re-use site won natural topsoil and subsoil. Site-won soils which are proposed for reuse will require verification testing following their excavation once exact quantities are known to confirm their chemical suitability. The testing regime for site won natural soils is one samples per 150 m^3 for topsoil and one sample per 300 m^3 for subsoil and "sources" should be considered to represent different soil types e.g. topsoil and subsoil.

The reuse of any imported topsoil or subsoil 'site-won' from another site will require a Materials Management Plan (MMP) with a declaration signed by a Qualified Person (QP) in accordance with the CL:AiRE Definition of Waste Code of Practice (DoW CoP). Manufactured topsoil with appropriate end of waste certification is exempt from the CoP. The CoP cannot be used to import Made Ground.

4.3 Verification Report

All verification works will be presented in a final verification report upon completion. This report will comprise source certificates, delivery notes and test results of imported soils and photographic records showing any stockpiling areas and demonstrating the location and thickness of the applied clean cover soils. On receipt, the verification report should be submitted to the LPA to enable the discharge of planning conditions related to contaminated land.

All relevant information shall be collected during the remediation works and a validation report compiled on completion and comprise as a minimum:

- A summary of the background site information and the RMS;
- Parties involved in the works;
- Details of any hitherto undiscovered contamination along with its remediation and verification;
- Waste classification and management documents to include as a minimum:
  - Volumes and source of any materials removed from site, along with transfer tickets and acceptance notes at the relevant facilities.
- Laboratory validation test results and transfer notes for any imported materials;
- Formation level inspection records including site notes and photographs;
- Records of earthworks including as built drawings, photographs and quantities of materials;
- Records of any specialist remediation contractors works as a technical appendix if relevant (i.e. Japanese Knotweed / gas protection); and,
- Records of any variation to the agreed RMS including details of correspondence with statutory authorities.

The verification report will be submitted to local planning authority to discharge conditions.

APPENDIX A – SERVICE CONSTRAINTS

APPENDIX A
SERVICE CONSTRAINTS

1. Service Constraints for all Reports

1.1. This Report (the “Report”) and any study, inspection, investigation, sampling, testing and or interpretation carried out in connection with the Report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) trading as Carbon Zero Consulting, Leap Environmental or RSK Geosciences, for the Client named in the first paragraph of the Report (the "Client") in accordance with the terms of an RSK Fee Proposal including RSK Environment Standard Terms and Conditions (the “Appointment”) between RSK and the Client, unless otherwise stated in the first paragraph of the Report. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by a geo-environmental consultant at the time the Services were performed. Nothing in this Report shall be construed as imposing any fitness for purpose obligation. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the Client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.

1.2 Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services. RSK shall not be liable in respect of any action or proceedings arising out of or in connection with this Report whether in contract, in tort, for breach of statutory duty or otherwise after the expiry of six (6) years from either (i) the date of the Report or (ii) such earlier date as prescribed by law, unless varied in the terms of the Appointment.

1.3 Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent, or condone any party, other than the Client relying upon the Services. Should this Report or any part of this Report, or details of the Services or any part of the Services, be made known to any such party, and such party relies thereon, that party does so wholly at its own and sole risk, and RSK disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent geo-environmental consultant and/or lawyer.

1.4 The Client shall not, without the prior written consent of RSK, assign, transfer, charge, mortgage, subcontract, or deal in any other manner with all or any of the benefits provided in this Report. Unless specified in the Appointment, RSK shall not be obliged to assign the benefit of the Report whether by collateral warranty, third party rights pursuant to the Contracts (Rights of Third Parties) Act 1999, letter of reliance or otherwise. If RSK agrees to any assignment of the benefit of this Report, in whatever form, benefits to third parties through collateral warranties, third party rights or letters of reliance shall not be provided unless a fee for each right, warranty or letter is agreed. The form of wording used in the warranty or letter shall be provided by RSK for agreement by the Client. Any reasonable changes to the form of wording will be implemented by mutual agreement, however the terms in the warranty or letter cannot offer the third party any greater benefit than the Appointment offered to the Client.

1.5 It is the understanding of RSK that this Report is to be used for the purpose described in the introduction to the Report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the Report is used, or the proposed use of the site change, this Report may no longer be valid and any further use of or reliance upon the Report in those circumstances by the Client without the review and advice of RSK shall be at the Client's sole and own risk. RSK shall not be liable for any use of this Report for any purpose other than that for which it was provided.

1.6 The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the Report inaccurate or unreliable. The information and conclusions contained in this Report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the Report in the future shall be at the Client's own and sole risk.

1.7 The observations and conclusions described in this Report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out, or required by the Appointment between the Client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this Report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, fuel storage, persistent bio-accumulative or toxic chemicals (including PFAS and related compounds) or other radioactive or hazardous materials, unless specifically identified in the Services.

1.8 The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of desk based publicly available information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services and the limitations below:

a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.

b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.

c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the Client or third parties, including laboratories and information services, during the performance of the Services.

d. The Client has identified in writing to RSK, the information, reports, findings, surveys and preliminary works RSK may not rely upon when providing the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK, and including the doing of any independent investigation of the information provided to RSK, save as otherwise provided in the terms of the Appointment between the Client and RSK.

1.9 Any site drawing(s) provided in this Report is (are) not meant to be an accurate base plan for scale measurement but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for accurate setting out and should be considered indicative only.

1.10 Should RSK be requested to review the Report after the date of issue of this Report, RSK shall be entitled to additional payment at the existing rates, or such other terms as agreed between RSK and the Client.

2. Service Constraints where the Report provides an intrusive assessment of ground conditions:

2.1 The intrusive environmental ground investigation aspects of the Services are a limited sampling of soil from the site, at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this Report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together

with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope agreed between the Client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species (not tested) are not present.

2.2 The comments given in this Report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. The extent of the exploratory holes, laboratory testing and monitoring undertaken may have been restricted due to a number of factors including accessibility, the presence of buried or overhead services, current development, site usage, timescales or the Client's specification. The exploratory holes only assess a small proportion of the site area with respect to the site as a whole, and as such may only provide an indicative assessment of ground conditions on site. There may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised. The presence of hotspots of undisclosed contamination or exceptional and unforeseen ground conditions cannot be discounted.

2.3 Where the Services include Investigation of an exploratory nature or relating to physical ground works, any costings and prices provided in the Report are estimated and provided for guidance purposes only. The actual cost and time quantities shall be remeasured and shall be dependent upon the ground or other conditions, constraints present, and number and depth of the investigation locations, which shall influence the number of samples and tests required, and the quantities of soil being classified.

2.4 Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works. However, this Report does not constitute an asbestos survey. On this basis, the presence of asbestos on site cannot be discounted and a full asbestos survey should be undertaken.

2.5 Unless stated otherwise, only preliminary geotechnical recommendations are presented in this Report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed. Eurocode 7 gives guidance on the type of sampling, sample quality, number and spacing of intrusive investigations, and number of laboratory tests required. It is intended that the Geotechnical Information section of this Report will fulfil the general requirements of the Ground Investigation Report as set out in section 6 of Eurocode7, although this is subject to the restrictions imposed on the investigation, as listed above. For geotechnical design, Eurocode 7 requires the Geotechnical Design Report to address both the geotechnical and structural aspects of the geotechnical design for both the limit and serviceability states. The Geotechnical Appraisal section of this Report will not meet the requirements of a Geotechnical Design Report (GDR) and should therefore be used for preliminary guidance only.

3. Service Constraints where the Report relates to Surface Water Management:

3.1 The Surface Water Management Inspection (SWMI) Report, documents provided, observations, actions, and recommendations, with respect to the management of potential pollution issues to surface waters, made during the site Inspection visit, are those present at the time of the visit, and may not represent those recorded by others on the same day.

3.2 The comments given in this Report and the opinions expressed are based on the weather, ground and ground water conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not

been disclosed by the inspection and therefore could not be taken into account. In addition, groundwater levels and flows, may vary from those Reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.

3.3 RSK places a degree of dependence upon oral information provided by site representatives, which is not readily verifiable through visual inspection, or supported by any available written documentation. RSK shall not be held responsible for conditions or consequences arising from relevant facts that were not fully disclosed by facility or site representatives at the time this Report was prepared.

3.4 This Report is a live document, to be continually reviewed and updated as the development progresses or other changes occur on site. RSK can only maintain the currency of this Report through the Client requesting support with supplementary site visits or attendance at meetings ahead of key stages of the development in relation to surface water management. Our risk rating assesses a number of risk factors in line with the source-pathway- receptor model and is therefore subject to constant change.

3.5 Standard design drawings are indicative. Material types, dimensions and construction details will need to be adjusted by the Client to suit the specific conditions / flows on Site.

3.6 The full responsibly for implementing the site-specific protection and maintenance measures to protect the surface water system as stated in this Report, remains with the Client and their site management team. Additional control measures may be required to achieve the objectives set out in the Surface Water Management Plan to be implemented and financed by the Client.

4. Service Constraints where the Report relates to Waste Management:

4.1 In accordance with the definition provided in the Waste Framework Directive (WFD), materials are only considered waste if 'they are discarded, intended to be discarded or required to be discarded, by the holder'. Naturally occurring soils are not considered waste if re-used on the site of origin for the purposes of development. Soils such as made ground that are not of clean and natural origin (irrespective of whether they are contaminated or not) and other materials such as recycled aggregate, do not necessarily become waste until the criteria above are met. Excavation arisings from the development may therefore be classified as waste if surplus to requirements and/or unsuitable for re-use.

4.2 It is the duty of the waste producer, to ensure that all waste is accurately classified prior to waste disposal. Technical Guidance WM3 (EA, 2018) sets out in its Appendix D requirements for waste sampling. It is a legal requirement to correctly assess and classify waste. The level of sampling should be proportionate to the volume of waste and its heterogeneity. Unless otherwise stated, the waste assessment presented in this Report should be considered as preliminary and further testing and assessment of the waste under the provisions of a Waste Sampling Plan may be required to obtain the necessary level of data required for basic characterisation of the waste in support of disposal.

4.3 Unless stated otherwise in the Report, information relating to historical operations at the site was not reviewed as part of the assessment by RSK. In addition, unless otherwise stated in the Services, RSK was not present during the collection of the samples nor had any input on the chemical testing suite. Therefore, the waste assessment and classification detailed in this Report are based solely on any information that were provided to RSK (e.g., laboratory chemical data, exploratory hole records) and were completed without prejudice for our Client.

4.4 RSK's assumes that any ground investigation data, chemical testing results etc., that were provided by the Client to inform the waste assessment and supporting review were carried out in accordance with current best practice and relevant guidance/ standards, where applicable. Thus, the comments given in this Report and the opinions expressed are based solely on the information provided by the Client. However, it is noted that there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account as part of the RSK assessment.

5. Service Constraints for Construction Environmental Management Plan Reports:

5.1 This Report should be considered in the light of any changes in legislation, statutory requirement or industry practices that may have occurred subsequent to the date of issue.

5.2 The measures and comments outlined in this Report and any opinions expressed are based on the plans provided at the time and discussions with relevant parties. However, there may be conditions pertaining to the site that have not been disclosed by investigations and therefore could not be taken into account.

5.3 This CEMP is a live document and is subject to change throughout the project, as and when necessary, to ensure management of environmental aspects remains relevant, and to ensure continued compliance with legislation and commitments as they may change. RSK understands that this CEMP will be reviewed by the Client every six months and updated as and when necessary.

5.4 It is the full responsibility of the Principal Contractor/ Client to ensure that their works do not contravene legal requirements, and adherence to this CEMP alone cannot be a full defence regarding legal action against the Principal Contractor.

6. Service Constraints where the Report relates to Ground Gas Membrane Verification:

6.1 This Report is limited to the verification of the gas resistant membrane/vapour membrane/ radon barrier after installation and no inspections were undertaken of the substrate (i.e. prepared ground). The Report therefore does not constitute as a full verification of ground gas protection system.

6.2 The comments given in this Report and the opinions expressed, are based on the condition of the ground gas membrane as encountered at the time of inspection by suitably qualified personnel. RSK cannot accept liability for any subsequent change to the status of the gas membrane by follow-on trades or other construction activity.

6.3 Where not designed by RSK, the verification of protection measures is carried out with reference to the gas protection design provided by the Client. RSK assume the scope of gas protection measures as determined by third parties to be correct and to have achieved any required approval from authorities.

6.4 The Ground Gas Design Report/Remediation Strategy and Verification Plan contains details of the procedures to be adopted for inspection and validation of the works. However, it should be noted that responsibility for the correct implementation of the strategy lies with the appointed contractor. RSK cannot be held responsible for any remedial works that are carried out without the agreed procedures involving either direct supervision by RSK, or inspection and validation of the works by a representative from RSK.

7. Service Constraints for Environmental Due Diligence (EDD)Reports:

7.1 The comments given in this Report and the opinions expressed are based on the information obtained and reviewed as part of the desk-based assessment. However, there may be conditions pertaining to the Site that have not been disclosed by the assessment and therefore could not be taken into account. Furthermore, no intrusive investigations, monitoring or sampling have been undertaken to confirm the environmental status of the site, therefore any comments relating to ground conditions and subsurface contamination are based solely on a review of desk-based information.

7.2 This Report describes the results of the EDD exercise. The scope of this EDD Report, where appropriate, covers legal or regulatory compliance with respect to UK or international regulations associated with environmental matters.

7.3 As with any EDD exercise, there is a certain degree of dependence upon information provided by the target company. The EDD does not include a site walkover / visit or liaison with site representatives unless identified in the Services. Therefore, the assessment is based on the available desk study information. Also, there is a certain degree of dependence upon oral information provided

by site representatives, which is not readily verifiable through visual inspection, or supported by any available written documentation. RSK shall not be held responsible for conditions or consequences arising from relevant facts that were not fully disclosed by facility or site representatives at the time this EDD exercise was performed.

7.4 This Report, including all supporting data and notes (collectively referred to hereinafter as "information"), was prepared or collected by RSK for the benefit of its Client.

7.5 The comments given in this Report and the opinions expressed are based on the information obtained and reviewed as part of the desk-based assessment and the site inspection visit. However, there may be conditions pertaining to the Site that have not been disclosed by the assessment and therefore could not be taken into account. Furthermore, no intrusive investigations, monitoring or sampling have been undertaken to confirm the environmental status of the Site therefore any comments relating to ground conditions and subsurface contamination are based solely on a review of desk-based information and observations collected during the site inspection visit.

8. Service Constraints for Ground source heat energy Reports:

8.1 It is understood that this is a desktop survey only and that there are no requirements for a site walkover, service utility survey, or provision of service plans. These services can be provided upon request if required.

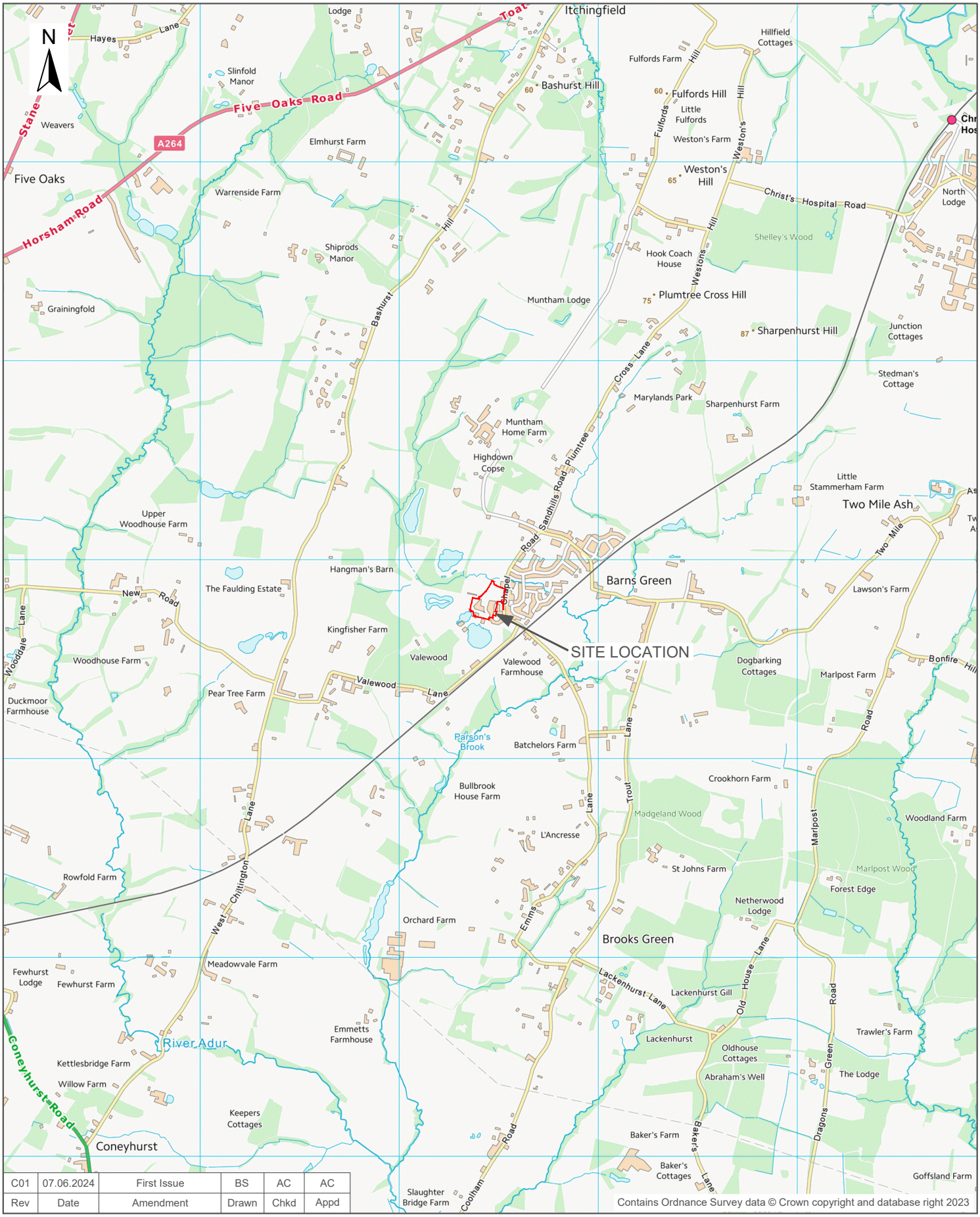
8.2 At a later stage, it is possible that a thermal response test (TRT) will need to be completed, for which a test borehole will have to be drilled, and these would be costed at the time. RSK can provide all aspects of subsequent site work for a GSHP system if required.

9. Service Constraints for Water Abstraction Borehole Reports:

9.1 The Report aims principally to only identify and assess the suitability of the site for a water abstraction borehole. This Report should be considered in the light of any changes in legislation, statutory requirements, and industry practices, that have occurred subsequent to the date of the Report.

9.2 Unless stated in the Report, the opinions expressed in this Report including all comments and recommendations provided are on the basis of the information obtained from a desk-based assessment.

APPENDIX B – FIGURES AND DRAWINGS



Rev	Date	Amendment	Drawn	Chkd	Appd
C01	07.06.2024	First Issue	BS	AC	AC

leap environmental
an RSK company
Premier House, 46 Victoria Rd,
Burgess Hill, RH15 9LR

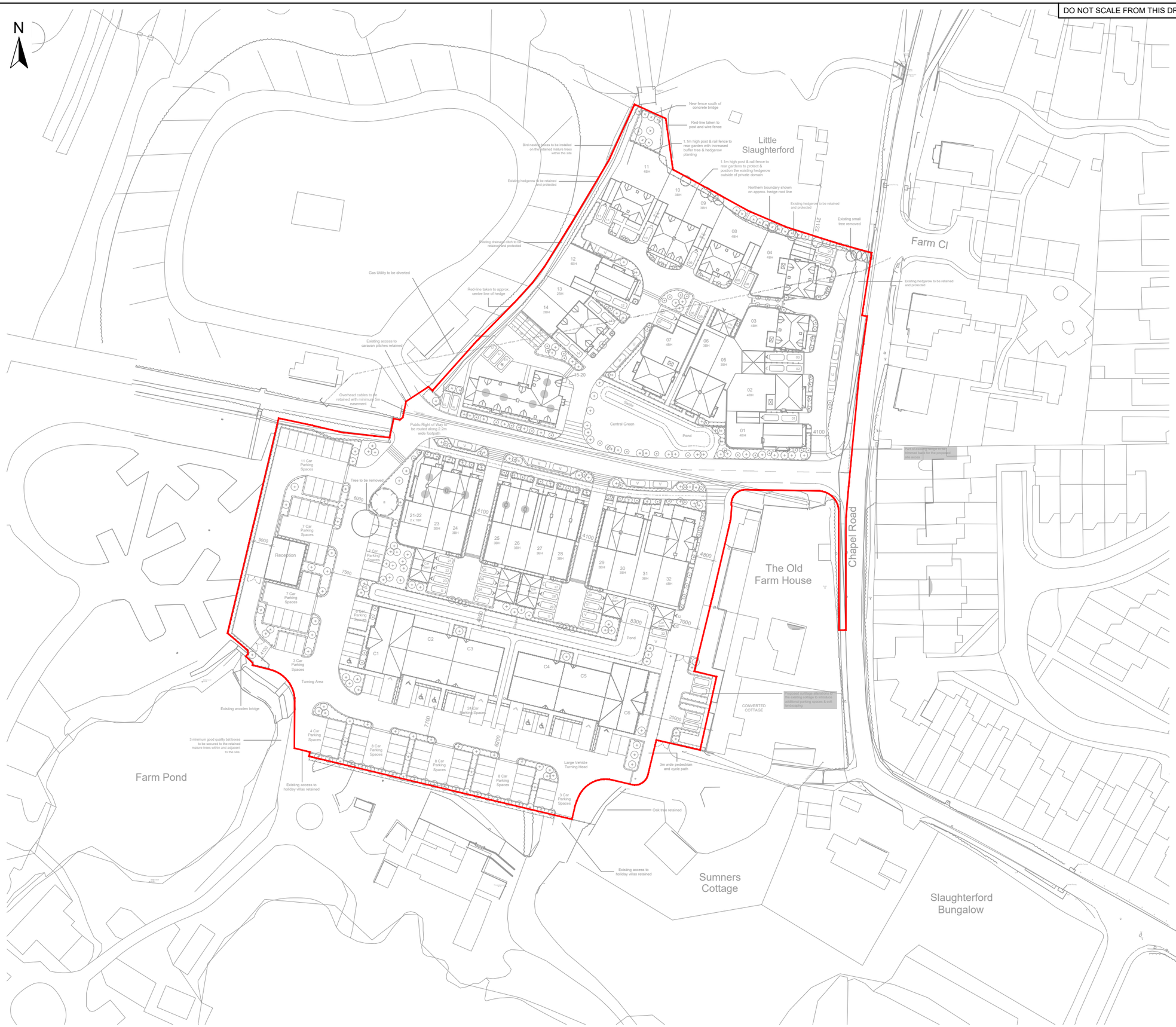
Client: Sigma Homes Ltd

Project Name: Sumners Pond

Description: Site Location Plan

Dimension	Size	Scale	Geolocation	Project ID	Drawing no.	Rev	File name
m	A4	1:25,000	512460,126770	LP3662	11101	C01	LP3662-LW-111-XX-D-G-11101-C01

DO NOT SCALE FROM THIS DRAWING



LEGEND

Site boundary

Notes:

Base plan provided by Client
Drawing Ref: ECE Architecture- 6991-001-N

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	07.06.2024	First Issue	BS	AC	AC

leap environmental an RSK company

Premier House, 46 Victoria Rd,
Burgess Hill, RH15 9LR

Client
Sigma Homes Ltd

Project Name
Sumners Pond

Description
Proposed Development Plan

Project ID	Drawing no.	Revision
LP3662	11601	C01

File name
LP3662-LW-116-XX-D-G-11601-C01

Dimensions	Scale	Size
m	1:1000	A3

0 10 20 30 40 50m

DO NOT SCALE FROM THIS DRAWING

N

WS2

Little Slaughterford

TP8

TP2

TP1

FARM CL

Farm Close

North Cottage

Field - Level Detail Recorded Only

TP4

South Cottage

Applemead

TP3

SHED

El Sub Sta

TP9

TP208

WS4

TP203

TP305

TP301

TP201

CHAPEL ROAD

TP306

TP302

TP206

TP5

WS1

The Old Farm House

TP304

TP307

WS5

TP204

TP210

TP209

TP205

The Barn

TP6

TP7

TP211

FINIANS FIELD

1 2 3 4 5a 5b 5c 5d 14 16 28 42 42a 52

LEGEND

- Site Boundary
- Trial Pit (October 2024)
- Trial Pit (July 2024)
- Trial Pit (2022)
- WS Borehole (2022)
- Approximate Location of Inspection Pit
- Approximate Location of Former AG Tanks

Notes:

Base plan provided by Energeyes
Drawing Ref: SVSG0208-001 'Service_Location_Drawing'

Rev	Date	Amendment	Drawn	Chkd	Appd
C02	18.11.24	First Issue	MW	LS	LS

leap environmental
part of RSK Geosciences
1 Forest Park Way, Pease Pottage,
West Sussex, RH11 9ZG

Client
Sigma Homes Ltd

Project Name
Southern Arwa – Sumners Pond, Barns Green

Description
Trial Hole Locations over Previous Site Layout

Project ID	Drawing no.	Revision
LP3834	22201	C02

File name
LP3834-LS-222-XX-D-G-22201-C02

Dimensions	Scale	Size
m	1:650	A3

0 7 14 21 28 35 m

DO NOT SCALE FROM THIS DRAWING

N

Little Slaughterford

Farm Cl

Chapel Road

The Old Farm House

m Pond

TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
TP201
TP203
TP204
TP205
TP206
TP208
TP209
TP210
TP211
TP301
TP302
TP304
TP305
TP306
TP307

WS1
WS2
WS4
WS5

New fence south of concrete bridge
Red-line taken to post and wire fence
1.1m high post & rail fence to rear garden with increased buffer tree & hedgerow planting
1.1m high post & rail fence to rear gardens to protect & position the existing hedgerow outside of private domain
Bird nesting boxes to be installed on the retained mature trees within the site
Existing hedgerow to be retained and protected
Northern boundary shown on approx. hedge root line
Existing small tree removed
Existing drainage ditch to be retained and protected
Gas Utility to be diverted
Red-line taken to approx. centre line of hedge
Existing access to caravan pitches retained
Overhead cables to be retained with minimum 5m easement
Trees to be removed
Part of existing hedge to be trimmed back for the proposed site access
Proposed curtilage alterations to the existing cottage to introduce additional parking spaces & soft landscaping
3m wide pedestrian and cycle path
Oak tree retained
Existing wooden bridge
3 minimum good quality bat boxes to be secured to the retained mature trees within and adjacent to the site.
Existing access to holiday villas retained

21122
4100
4800
5000
7500
4650
8300
7000
20000
7700
6200
4120

LEGEND

- Site Boundary
- Trial Pit (October 2024)
- Trial Pit (July 2024)
- Trial Pits (2022)
- WS Boreholes (2022)
- Approximate Location of Inspection Pit
- Approximate Location of Former AG Tanks

Notes:

Base plan provided by ECE Architecture
Drawing Ref: 6691-001 'Proposed Site Plan Residential and Commercial Scheme'

Rev	Date	Amendment	Drawn	Chkd	Appd
C02	18.11.24	First Issue	MW	LS	LS

leap environmental
part of RSK Geosciences
1 Forest Park Way, Pease Pottage,
West Sussex, RH11 9ZG

Client
Sigma Homes Ltd

Project Name
Southern Arwa – Sumners Pond, Barns Green

Description
Trial Hole Location over Proposed Site Layout

Project ID	Drawing no.	Revision
LP3834	22202	C02

File name
LP3834-LS-222-XX-D-G-22202-C02

Dimensions	Scale	Size
m	1:750	A3

0 8 16 24 32 40 m

APPENDIX C – SPECIFICATION FOR SITE WON AND IMPORTED SOILS

LEAP SPECIFICATION FOR PLACEMENT OF IMPORTED FILLS AND PROCUREMENT OF IMPORTED TOPSOIL AND SUBSOIL

1 Fills

1.1 General

Filling shall be carried out in accordance with the recommendations of BS 6031:2009[1] and the CL:AIRE Definition of Waste Code of Practice (DoWCoP)[2].

Fill shall be maintained and protected in a satisfactory condition at all times until final completion.

Any material rendered unsuitable or unsatisfactory after being placed in the works shall be repaired or replaced as appropriate so that all the completed filling is in accordance with the specification.

1.2 Dimensions

Fills shall be constructed to achieve the finished levels of the development with an allowance for shrinkage and consolidation of the material subsequent to completion, and in order that the minimum clean cover as specified in the remediation method statement is achieved.

The excavated levels shall be recorded before the commencement of filling. The level of the filled areas shall be taken and recorded after filling.

2 Types of Fill

There are potentially two types of fill to be used. These are as follows:

- Topsoil
- Subsoil

The capping of landscaped areas will comprise a minimum of 150 mm of topsoil and a maximum of 300 mm to finished garden or landscaped area level. Underlying subsoil thicknesses will be as required to achieve the overall finished levels and to provide the required cover layer thicknesses as detailed in the main body of this report.

[1] BS6031:2009 Code of practice for earthworks
[2] CL:AIRE The Definition of Waste: Development Industry Code of Practice Version 2, March 2011

2.1 Topsoil

It is recommended that imported topsoil complies with the requirements of BS 3882:2015[3] for a Multipurpose Purpose Grade material.

The topsoil shall be free from fragments of glass, bricks, concrete, wire or other potentially hazardous matter.

Manufactured topsoil shall not be made from waste materials.

The topsoil shall be subject to the additional limitations set out below.

2.2 Subsoil

Imported manufactured or modified subsoil shall comprise certified clean material which satisfies the conditions set out in BS8601:2013[4]. Subsoil arising from site or from a certified direct transfer (e.g. under DoWCoP) shall comprise clean natural arisings from construction activities which have been confirmed acceptable by the Engineer.

2.3 Sources of Materials

Imported materials may be obtained from any source unless otherwise stated in the Drawings or in the Specification.

It shall remain the responsibility of the Contractor to obtain only fill material complying with the Specification and Method Statement, notwithstanding any tests which may be accepted by the Engineer.

The Contractor shall demonstrate to the Validation Engineer's satisfaction that the fill materials from each source are uncontaminated by submitting to the Validation Engineer a chemical analysis of material or evidence of such other tests as the Validation Engineer may require for all proposed sources of fill, and if necessary sampling and analysing materials as they are delivered to stockpiles or the fill location on site.

Sampling rates shall be a typical of one sample per 150 cubic metres of imported soil – as per the frequencies stated in the main body of the report - with a minimum of three samples per source of material, unless otherwise agreed with the Engineer. Such tests for chemical composition as may be agreed by the Engineer shall be carried out on each sample and the results of tests shall be forwarded to the Engineer. Testing for contamination on samples taken shall be carried out at a testing laboratory approved by the Engineer and shall be to appropriate MCERTS standards. The Contractor shall maintain records of the location in the Works of fill from each source and the date of delivery to the site, and shall submit these records to the Engineer as requested. Chemical analysis on the imported fill material shall

[3] BS3883:2015 Specification for topsoil
[4] BS8601:2013 Specification for subsoil and requirements for use

include testing for the contaminants listed in Table 1 as a minimum. Contaminant concentrations shall be below those listed in Table 1 (attached) unless agreed otherwise by the Engineer. Additional analyses may be requested depending on the source and nature of the material. The concentrations in Table 1 are derived from available assessment criteria which are considered to represent uncontaminated concentrations of soil - Suitable for Use Levels (S4ULs)[5] for a residential land use with private gardens where produce may be grown and, in the case of the phytotoxic metals copper, nickel and zinc, the topsoil specification in BS3883:2015. The concentrations in Table 1 assume that no significant contaminant linkage to controlled waters exists that could pose an unacceptable risk.

The S4ULs represent near-minimal risk to human health. In the case of cadmium, hexavalent chromium and benzo(a)pyrene, Category 4 Screening Levels (C4SLs)[6] also exist which are higher than minimal risk but are still strongly precautionary. In instances of persistent failures of the S4ULs for these chemicals, regulators may allow the C4SL to be used instead. This approach shall require regulatory agreement before being implemented. In addition, the following shall be deemed as unacceptable for replacement fills:

- Peat, materials from swamps, marshes and bogs.
- Logs, stumps and perishable material.
- Materials in a frozen condition.
- Clay having a liquid limit determined in accordance with BS17892-12:2018[7];, exceeding 90% or plasticity index determined in accordance with BS17892-12:2018, exceeding 65%.
- Material susceptible to spontaneous combustion.

2.4 Practical Considerations

2.4.1 Formation Level / Subgrade Testing

Where made ground from previous site usage remains present at formation level then subgrade / formation level testing will be required to confirm the necessary thickness of subsoil and / or topsoil to be placed, as per the agreed remediation method statement. Sufficient time should be allowed in the programme for this testing to be completed prior to the requirement for clean cover to be laid. The standard turnaround for laboratory testing is 5 working days from the date of receipt at the laboratory.

2.4.2 Preparation of Subgrade

All pile mat, scaffold base and/or waste materials must be removed in their entirety from the surface of areas to become gardens or public open space / soft landscaping prior to the

[5] The LQM/CIEH S4ULs for Human Health Risk Assessment, Nathaniel P et al, 2015. Copyright Land Quality Management Ltd, reproduced with permission: Publication Number S4UL3509

[6] Defra 'SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document' December 2014.

[7] BS EN ISO 17892 Geotechnical investigation and testing. Laboratory testing of soil. Determination of liquid and plastic limits

application of clean cover soils. This aspect of the works will be inspected and validated by the Engineer.

2.4.3 Out of Specification Materials

Notwithstanding the specification for maximum allowable contaminant concentrations provided in Table 1, no materials will be accepted that are odorous, stained or contain visible product as is required by DoWCoP.

Should the Contractor proceed with stockpiling or spreading of fill prior to receiving approval from the Engineer of results for the above tests, and the results of such tests show that the fill is contaminated above acceptable levels, the Contractor shall remove all contaminated material and replace it with acceptable material at his own cost as part of the main contract.

2.4.4 Suitability of Materials in Gardens

Materials laid as clean cover in private gardens must not only meet the requirements to be protective against land contamination but they must also be suitable for gardening. Hence, topsoil should not contain more than the British Standard-specified percentage of clay as exceeding this value may result in poor drainage and the failure of turf to establish. Subsoil should contain sufficient nutrition and be of sufficient depth to allow for the establishment of larger shrubs and trees and hence, a subsoil exceeding the British Standard-specified percentage of sand (i.e. an as-dug sand) would be unsuitable.

TABLE 1: CHEMICAL CONTAMINANT SPECIFICATION FOR IMPORTED MATERIALS

Determinant	Assessment Criteria mg/kg
Arsenic	37
Cadmium	11[1]
Trivalent Chromium	910
Hexavalent Chromium	6[1]
Copper	100
Lead	200
Mercury (inorganic)	40
Nickel	60
Selenium	250
Zinc	200
Benzo(a)pyrene[2]	0.79[3]
Naphthalene[2]	2.3[3]
Asbestos	No asbestos detected

Notes to table

1. *C4SL also available.*
2. *Surrogate markers for all PAHs.*
3. *Higher assessment criteria are possible and may be agreed with the regulator on a case by case basis, for example, depending on the Soil Organic Matter content of the imported material.*

TABLE 2: CHEMICAL CONTAMINANT SPECIFICATION FOR SITE WON SOILS

Determinant	Assessment Criteria mg/kg
Arsenic	37
Cadmium	22
Trivalent Chromium	910
Hexavalent Chromium	21
Copper	2,400
Lead	200
Mercury (inorganic)	40
Nickel	130
Selenium	250
Zinc	3,700
Benzo(a)pyrene[2]	5.0
Naphthalene[2]	2.3
Asbestos	No asbestos detected

Notes to table

1. *Surrogate markers for all PAHs.*
2. *Higher assessment criteria are possible and may be agreed with the regulator on a case by case basis, for example, depending on the Soil Organic Matter content of the imported material.*