



Geo-Environmental

ASBESTOS MANAGEMENT PLAN
for the land at
WOODCROFT FARM PHASES 2B & 3,
WOODCROFT LANE, LOVEDEAN,
HAMPSHIRE, PO8 9QA
on behalf of
VISTRY HOMES SOUTHERN



Asbestos Management Plan

Report:	ASBESTOS MANAGEMENT PLAN
Site:	WOODCROFT FARM PHASES 2B & 3, WOODCROFT LANE, LOVEDEAN, HAMPSHIRE, PO8 9QA
Client:	VISTRY HOMES SOUTHERN
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Prepared by:	 FIONA GOODE BSc (Hons), MSc, FGS, MEnvSc, RSoBRA SENIOR CONSULTANT ENGINEER
Reviewed by:	 LAURA LEGATE CGeol, CSci, BSc, (Hons), MSc, FGS REGIONAL MANAGER - WEST
Authorised by:	 GLYN EVANS BSc.,M.Sc.,FGS.,P.G.Dip.,MEnvSc MANAGING DIRECTOR

Geo-Environmental Services Limited

Unit 7, Danworth Farm, Cuckfield Road, Hurstpierpoint, West Sussex, BN6 9GL
+44(0)123 832972 www.gesl.net

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AMENDMENT RECORD

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1.0 INTRODUCTION

1.1 General

Geo-Environmental Services Limited (Geo-Environmental) was appointed by Vistry Homes Southern, to compile an Asbestos Management Plan (AMP) in relation to the proposed residential development on land at Woodcroft Farm Phases 2B and 3, Woodcroft Lane, Lovedean, Hampshire, PO8 9QA herein referred to as 'the site' (Figure 1). The AMP has been developed in conjunction with the Remediation Strategy and Verification Plans, and the Materials Management Plan also developed for the site as detailed below:

- Remediation Strategy and Verification Plan – Chalk Pit, ref: GE16943 – RSVP-CP-V5.0 - AUG20, dated August 2020
- Remediation Strategy and Verification – Farmyard, ref: GE16943 – RSVP-FY-V5.0 - AUG20, dated August 2020
- Remediation Strategy and Verification – Horse Arena, ref: GE16943 – RSVP-HA-V4.0 - AUG20, dated August 2020
- Materials Management Plan, ref: GE18761-MMP-AUG20, dated August 2020

1.2 Objectives

The Asbestos Management Plan (AMP) sets out the proposed methodology and best practice for works to be undertaken on the subject site to support its development for a residential end use to ensure that adequate protection is in place to mitigate potential risks to human health.

2.0 BACKGROUND

This AMP has been developed for the site from the findings of the various phases of assessment undertaken across the site. The presence of asbestos has been identified on the site within the farmyard area and the chalk pit area, both as ACMs and as loose fibres within the soil. As such it was considered that an Asbestos Management Plan (AMP) was required to support the ongoing works and development of the site.

The following reports detail the phases of site investigation works undertaken at the site:

- Geoenvironmental and Geotechnical Ground Investigation Report, undertaken by Peter Brett Associates LLP on behalf of Grainger PLC, Project ref: 21834/030, Doc ref: R02/rev01, Dated July 2013.
- Intrusive Site Investigation Letter Report ref: GE16662/FG02/170929 undertaken on behalf of Grainger PLC and Linden Homes South, Dated 29th September 2017
- Remediation Strategy and Verification Plan – Chalk Pit, ref: GE16943 – RSVP-CP-V5.0 - AUG20, dated August 2020
- Remediation Strategy and Verification – Farmyard, ref: GE16943 – RSVP-FY-V5.0 - AUG20, dated August 2020
- Remediation Strategy and Verification – Horse Arena, ref: GE16943 – RSVP-HA-V4.0 - AUG20, dated August 2020

A brief overview of salient findings of the reports is presented below. For further information, the individual reports (listed above) should be referred to directly.



2.1 Overview

The wider site's previous uses included use as a farm with associated barns and buildings, scrapyards, horse arena and a former chalk pit which was infilled as an inert landfill.

During the Geo-Environmental, August 2017, Ref: GE16662/FG02/170929 intrusive investigation, the farm complex area, shown in Figure 2, comprised a farm house located in the south east of the complex area, with private gardens to the front and rear of the property. To the north and west of the farm house were a number of stable blocks that at the time of the site investigation works were occupied by a number of horses. The stable blocks were constructed on hard standing, generally concrete, and comprised a mixture of wooden stables and stables constructed within breeze block barns. These barns were noted to have corrugated roofs that have the potential to contain asbestos.

In the central area and west of the farm complex area was an area utilised for parking, and the storage of scrap type items. This included engines, vehicles (in varying states of repair), a skip of metal, and other assorted metal items. There was also evidence of recent burning activities being undertaken within this area, piles of ash and blackened patches were noted. A manure heap was also located with the central northern part of this area.

This farmyard area was subsequently demolished with all buildings and areas of hardstanding being removed.

The Peter Brett, 2013 investigation, Ref: 21834/030 reported that Made Ground was encountered within all the locations investigated at the infilled pit where landfill materials were placed during the 1970s. The Made Ground (Landfill) was found to be variable in composition and comprised brown grey and black clay with variable proportions of sand and gravel. Some timber and organic matter were encountered within the Made Ground. Some of the clay materials within the landfill were noted to have organic odour. The Made Ground within the infilled pit locally contained fragments of concrete and brick sections up to 1.20m long and 0.20m thick. The Made Ground was encountered to between 0.60m (TP04) to a maximum depth of 5.80m below ground level (WS02) in the infilled pit. A fragment of cement bound tile suspected to contain asbestos that was detected in TP02 within the infilled pit.

Asbestos screening identified detectable asbestos fibres within the Made Ground from one location. Asbestos fibres were identified within the Made Ground in the landfill area and the horse arena. It was also considered likely that asbestos would be identified within the Made Ground in the vicinity of the farm buildings.

A supplementary geotechnical and geo-environmental investigation was undertaken by Geo-Environmental Services Limited in August 2017, Ref: GE GE16662/FG02/170929. Encountered ground conditions were found to comprise a mantle of Topsoil and/or Made Ground overlying, clay, gravelly clay and sandy clay, with bands of flint cobbles and bands of sandy clay in certain locations. Chalk was encountered within boreholes BH301 and BH303 at depths of 12.90m bgl and 1.90m bgl respectively. Made Ground was encountered within all the trial pits located within the farmyard complex area and was also encountered in TP211, TP213 and TP214. The Made Ground was found to comprise bricks, brick fragments, chalk of cobble and gravel size, ashy deposits, plastic, wood, possible asbestos (tiles and sheets), concrete, tarmac, and charcoal. Made Ground was encountered to a maximum depth of 2.30m bgl, although TP225 was terminated within the Made Ground at 0.60m bgl so the full depth of Made Ground in this location was not established. Due to the use of the farm buildings as stables, and horses being present at the time of the investigation, it was not possible to investigate beneath these existing farm/stable buildings.

Soil samples collected during this investigation were submitted for asbestos screening and where asbestos



was identified quantification testing was carried out. Asbestos was identified within 3No. locations within the farmyard area. Given the age of the buildings still present on site at the time of the intrusive investigation works it was considered that there was the potential for asbestos to be present within the building fabric. Previous investigations undertaken by third parties also identified the presence of asbestos within soils within the farmyard complex area.

Due to the restriction in access to some areas of the farmyard complex during the initial investigation works, it was recommended that following demolition of the buildings on site, further intrusive investigations were carried out to identify and delineate the location of asbestos within the Made Ground within the farmyard area.

Subsequent investigations undertaken by Geo-Environmental in May 2018 (investigation findings reported in reports, GE16943 – RSVP-CP-V5.0 - AUG20, GE16943 – RSVP-FY-V5.0 - AUG20 and GE16943 – RSVP-HA-V4.0 - AUG20) were to carry out additional targeted investigation works within specific areas of the site including, but not exclusive to, the farmyard area (following demolition of the buildings), the chalk pit/ landfill area and the horse arena.

Intrusive investigation works undertaken within the farmyard area were undertaken following the demolition of the existing farm buildings. Soil samples were submitted for asbestos screening and where asbestos was identified quantification testing was carried out. Three samples within the farmyard area identified the presence of asbestos. The asbestos identified within TP230 was in the form of asbestos tiling. The tile fragments discovered were relatively intact within the ground. During the additional delineation investigation work carried out in May 2018, potential asbestos containing materials (ACM) were observed within stockpile demolition material associated with the demolition of the farmyard buildings. In addition, sporadic ACM's were observed within the surface soils across the farmyard area.

Additional intrusive investigation works were also undertaken within the chalk pit/ former landfill area of the site. Soil samples collected during this phase of investigation works were submitted for asbestos screening and where asbestos was identified quantification testing was undertaken. Three samples identified the presence of asbestos, in addition due to the extent and variation of the Made Ground/ landfill materials encountered within this area of the site it was considered prudent to assume the potential for sporadic presence of ACM within the Made Ground across the chalk pit/ former landfill area.

Asbestos was not identified elsewhere across the site.

2.2 Proposed Site Use

The proposed development comprises a development of up to 288No. homes with, a new access road from Eagle Avenue, internal access roads, associated car parking, open space and landscaping (private gardens and communal). Should the proposed development proposals change the Asbestos Management Plan (AMP) would remain valid for construction works undertaken on the site, subject to a review of the risk assessment.

2.3 Conceptual Site model

Remediation works are proposed to break the identified plausible pollutant linkages associated with respect to the presence of asbestos within specific areas of the site.

This would be undertaken as several phases of works on site and only within the specific areas identified:



- 1) Reduced dig to the minimum depths indicated on Figure 9 within the Farmyard area only to achieve the required formation level to accommodate the required soil cover thickness, or the full extent of the Made Ground where Made Ground is shallower.
- 2) It is proposed to retain and re-use the excavated soils (without treatment) within garden plots (at depth beneath the soil cover system) where levels require raising to achieve development levels and hence the requirement for the volume of excavated soil being generated from the reduced dig. These works would be undertaken inline within the Materials Management Plan (MMP) ref: GE18761-MMP-AUG20.
- 3) If excavated soils are to be stored on site prior to their removal they will need to be placed on and covered with sheeting to prevent the spread of any asbestos or asbestos containing material. It is preferable for excavated soils from the reduced dig to be relocate directly to the final re-use location without stockpiling so as to avoid double handling, stockpile controls and the like.
- 4) Material re-use is subject to the requirements of this and associated remedial strategies which apply to the development within the overall site boundary and no materials are to be excavated or moved until a Materials Management Plan is in place and the required QP Declaration has been submitted to CLAIRE as required under the DOWCOP. This will include agreement in principal for the proposed re-use and agreement of the RSVPs for the site with the regulators (Local Authority and Environment Agency. Movement of materials outside of these protocols would be considered an illegal waste process and subject to legal action and financial penalties applied by the regulators to the developer and/or groundworks contractor.

Farmyard Area (FY) – Phase 2B and 3:

- 5) Installation of a soil cover system in garden areas and areas of soft landscaping to break the pollutant linkage for the contaminants identified within the Made Ground soils in the farmyard area, and to also provide suitable growing media. Where the reduced dig does not remove all of the Made Ground and hence the cover system is to be laid over Made Ground, it shall incorporate a 150mm thick break layer formed of stone or crushed concrete with a geotextile membrane laid above and beneath, and overlain by a deter to dig geofabric to act as a visible deterrent overlain by a minimum 300mm thickness of subsoil and a minimum of 300mm of Topsoil. Where the reduced dig removes all Made Ground and exposes uncontaminated natural strata and is validated as such, the soil cover system shall comprise clean subsoil and a minimum 300mm of suitable Topsoil, the thickness of subsoil in this scenario will defined by the difference between the finished garden level (minus 300mm Topsoil) and the reduced dig level. The cover system is likely to be completed with Topsoil placement towards the end of plot specific development with the placement of Topsoil.

Chalk Pit/ Former Landfill Area (CP)- Phase 3:

- 6) Installation of a soil cover system in private garden areas and areas of soft landscaping to break the source, pathway receptor pollutant linkage for the contaminants identified within the chalk pit and landfill area, and to also provide suitable growing media. The cover system is to comprise a 150mm thick break layer formed of stone and crushed concrete with a geotextile membrane laid above and beneath, overlain by a deter-to-dig membrane, such as an Alert Geofabric to act as a visible barrier to excavation, 600mm thickness of subsoil and Topsoil to include a minimum of 300mm of Topsoil. The cover system is likely to be completed with Topsoil placement towards the end of plot specific development with the placement of Topsoil on given plots.

The proposed capping system would be achieved by undertaking a reduced dig within identified specific Plots within the farmyard area only and the installation of a capping system within all Plots in the identified



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Farmyard and Chalk Pit areas. These works would be monitored through observations and records providing a documentary evidence trail of the materials if removed from site. Validation works would be undertaken upon completion of the remediation works to demonstrate the depth of reduced dig and the thicknesses and composition of the capping layer installed.

The aim of the remediation is not to remove all contamination identified on site but to reduce the identified risk to an acceptable level with respect to human health in terms of asbestos.



3.0 ASBESTOS

Asbestos is a naturally occurring mineral which was used as a building material up until 2000 and is commonly found as either free fibres or as part of asbestos-containing material (ACMs) in the ground during site development.

Three main types of asbestos are commonly used in the UK:

- 1) Crocidolite – commonly known as blue asbestos;
- 2) Amosite – commonly known as brown asbestos and
- 3) Chrysotile – commonly known as white asbestos.

Asbestos is responsible for over 5000 deaths every year. Younger people, if routinely exposed to asbestos fibres over time, are at greater risk of developing asbestos-related disease than older workers. This is due to the time it takes for the body to develop symptoms after exposure to asbestos (latency). Exposure to asbestos can cause four main diseases:

- Mesothelioma (a cancer of the lining of the lungs; it is always fatal and is almost exclusively caused by exposure to asbestos)
- Asbestos-related lung cancer (which is almost always fatal)
- Asbestosis (a scarring of the lungs which is not always fatal but can be a very debilitating disease, greatly affecting quality of life)
- Diffuse pleural thickening (a thickening of the membrane surrounding the lungs which can restrict lung expansion leading to breathlessness.)

Hodgeson and Darton (2000) epidemiological studies reported:

"At exposure levels seen in occupational cohorts it is concluded that the exposure specific risk of mesothelioma from the three principal commercial asbestos types is broadly in the ratio 1:100:500¹ for chrysotile, amosite and crocidolite, respectively". Amosite or crocidolite (amphipoles) pose a greater risk than that from the same level of exposure to chrysotile"

(¹ 1:100:500 relates to the risk rating, a factor of 1 for chrysotile, 100 for amosite, 500 for crocidolite. In essence at exposure to the same fibre levels you are 500 more times likely to get mesothelioma from exposure to crocidolite than to chrysotile.)

3.1 Control of Asbestos Regulations

The Control of Asbestos Regulations 2012 came into force on 6th April 2012. The following section summarises the main requirements of the regulations, reference to the regulations is needed to understand the detailed requirements.

"Control measure" means a measure taken to prevent or reduce exposure to asbestos (including the provision of systems of work and supervision, the cleaning of workplaces, premises, plant and equipment, and the provision and use of engineering controls and personal protective equipment).

The "control limit" refers to the concentration of asbestos fibres in any localised atmosphere, measured and averaged over a continuous period of four hours, in accordance with the 1997 World Health Organisation's recommended method. At the moment, the control limit is 0.1 asbestos fibres per cubic



centimetre of air (0.1 f/cm^3). The control limit is not a 'safe' level and work activities involving asbestos should be designed to be as far below the control limit as possible. HSE has progressively tightened the control limit since 1987.

The Control of Asbestos Regulations 2012 identifies two scenarios for consideration and where control is necessary:

Designated Asbestos Areas – Any area where work with asbestos is being carried out and should be isolated with suitable barriers and warning notices identifying the area as an asbestos area. However, this requirement does not apply to non-licensable work where asbestos fibres will be much lower than the asbestos in an air control limit.

A Respirator Zone – is an area within an asbestos area where exposure may exceed the asbestos control limit. Typically a respirator zone will be a designated area within an enclosure. Only employees who have been suitably trained in the use of RPE (Respiratory Protective Equipment) and have other relevant health and safety training can enter the respirator zone. This includes not only employees engaged in the asbestos work but also personnel carrying out other activities such as air monitoring, emergency services etc.

Neither of these descriptions are considered to apply to this site, however, should conditions change with the release of excessive fibres these scenarios may become relevant.

Work involving some lower risk asbestos-containing materials (e.g. asbestos cement products and textured decorative coatings, among others) can be carried out if a risk assessment demonstrates that the control limit will not be exceeded and that any exposure to asbestos is expected to be 'sporadic and of low intensity'. The control limit for this type of non-licensed work is $0.6 \text{ asbestos fibres per cubic centimetre of air}$ (0.6 f/cm^3), measured over a ten-minute period. Any work which is likely to result in exposures at or above this level cannot be considered to be sporadic and of low intensity and should therefore only be carried out by a licensed contractor.

For the purposes of the Regulations, work with asbestos is not "short duration work" if, in any seven day period

- work, including any ancillary work liable to disturb asbestos, takes more than two hours; or
- any person carries out that work for more than one hour.

The Regulations state no exposure to asbestos will be "sporadic and of low intensity" if the concentration of asbestos in the atmosphere exceeds the control limit.

Notification of work with asbestos, establishment of "designated areas" and creation of health records and medical surveillance do not apply where the exposure to asbestos of employees is sporadic and of low intensity; and it is clear from the risk assessment that the exposure to asbestos of any employee will not exceed the control limit.

A Risk Assessment of the proposed work which potentially exposes employees to asbestos must be carried out by the employer and identify the steps needed to protect the workers from the identified type(s) of asbestos, determine the nature and degree of exposure which may occur and consider the effects of control measures which have been or will be taken.



The employer must consider the results of monitoring of exposure, set out the steps to be taken to prevent that exposure or reduce it to the lowest level reasonably practicable. The employer must consider the results of any medical surveillance that is relevant; and include such additional information needed in order to complete the risk assessment.

The risk assessment must be reviewed regularly, and immediately if:

- There is reason to suspect that the existing risk assessment is no longer valid;
- There is a significant change in the work to which the risk assessment relates; or
- The results of any monitoring carried out show it to be necessary, and where, as a result of the review, changes to the risk assessment are required, those changes must be made and, where they relate to the significant findings of the risk assessment or are themselves significant they must be recorded.

A written plan of work must be produced that details the work to be carried out and a copy of the plan of work must be kept at those premises where the work is being carried out and must set out the methods to be applied where the work involves the handling of asbestos or materials containing asbestos, relating to the equipment to be used for:

- i. Protection and decontamination of those carrying out the work, and
- ii. Protection of other persons on or near the worksite.

The employer must prevent as is reasonably practicable or reduce exposure to asbestos where it is not reasonably practicable to prevent such exposure and take the measures necessary to reduce exposure to asbestos of any such employee to the lowest level reasonably practicable by measures other than the use of respiratory protective equipment, and ensure that the number of any such employees exposed to asbestos at any one time is as low as is reasonably practicable.

Where it is not reasonably practicable to prevent the exposure to asbestos in order of priority employers must:

- Design and use appropriate work processes, systems and engineering controls and provide and use of suitable work equipment and materials in order to avoid or minimise the release of asbestos, and
- Control exposure at source, including adequate ventilation systems and appropriate organisational measures, and the employer must so far as is reasonably practicable provide any employee concerned with suitable respiratory protective equipment

Where it is not reasonably practicable for the employer to reduce the exposure to asbestos to below the control limit by the measures referred to above then, in addition to taking those measures, the employer must provide that employee with suitable respiratory protective equipment which will reduce the concentration of asbestos in the air inhaled by that employee (after taking account of the effect of that respiratory protective equipment) to a concentration which is:

- below the control limit; and
- as low as is reasonably practicable.



Personal protective equipment provided must be suitable for its purpose and comply with any provision of the Personal Protective Equipment Regulations 2002; or in the case of respiratory protective equipment be of a type approved, or must conform to a standard, approved by the HSE. In this case the Health and Safety Executive Equipment and Method sheet EM6 "Asbestos Essential – Non Licensed tasks" is appropriate and can be found at:

<http://www.hse.gov.uk/pubns/guidance/em6.pdf>

Employers must ensure that no employee is exposed to asbestos in a concentration in the air inhaled which exceeds the control limit. If the control limit is exceeded employers must immediately inform any employees concerned and their representatives and ensure that work does not continue in the affected area until adequate measures have been taken to reduce exposure to asbestos below the control limit, and ensure a very clean working environment.

Employers must ensure, so far as is reasonably practicable, that the plan is carried out in accordance with that plan and any subsequent written changes to it.

Employees must be given the appropriate level of information, instruction and training, and use any control measures provided and maintain safety equipment, including PPE and PRE in a clean condition.

The regulations impose a duty that asbestos is not spread (i.e. uncontrolled spreading/release, rather than controlled relocation of Made Ground as proposed for this site)

The area of working has to be designated and if respiratory equipment is to be used, that area has to be specifically designated.

If the control limit is likely to be exceeded air monitoring is required. In relation to work carried out indoors, or enclosed spaced, a "certificate of reoccupation" is required, prior to any persons entering without the use of control measures. The person carrying out such monitoring has to be appropriately qualified.

For licensed and notifiable non-licensed work with asbestos, health records and medical surveillance is required for any persons undertaking that work.

Adequate washing and changing facilities must be provided for employees who are exposed to asbestos. When protective clothing is issued relating to asbestos adequate facilities for the storage of that protective clothing, and personal clothing not worn during working hours must be provided where an employer is required to provide respiratory protective equipment, adequate facilities for the storage of that equipment must be provided. The facilities for the storage of personal protective clothing, personal clothing not worn during working hours and respiratory protective equipment must be separate from each other.

3.2 CAR-SOIL

The Control of Asbestos Regulations 2012 applies to all work with asbestos but focuses on exposure to asbestos from ACM within buildings. CAR-SOIL ('Control of Asbestos Regulations 2012 - Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials: Industry guidance') published in 2016 provides guidance to assist employers with compliance with CAR2012 when undertaking work on soils and construction and demolition materials which contain or may contain asbestos. (see <https://www.claire.co.uk/component/phocadownload/category/36-asbestos-in-soil?download=545:jiwg-car->

soil-guidance)

This guidance includes advice for ascertaining whether the proposed work with asbestos containing soils is non-licensed work, notifiable non-licensed work or licensed work. CAR-SOIL also provides useful guidance for the interpretation of asbestos quantification testing results with regard to ascertaining whether asbestos is present in large, moderate, low or very low quantities in terms of the regulations.

Given the site investigation findings detailed earlier, it is considered that the work with the asbestos containing soils at the site would be non-licensed work. This decision has been reached with reference to Figure 2 on page 42 of CAR-SOIL as follows:

- The work on asbestos contaminated soil is 'Ground Remediation Works'
- The work with asbestos will be unlikely to generate fibre release which will exceed the control limit
- The work is not with 'clearly identifiable' insulation or AIB ('clearly identifiable' in this context means the ACM form could be identified *in situ* by a competent and trained person, the insulation/lagging encountered by the previous investigations was identified as such by laboratory testing)
- The work is with fibrous 'debris' and all other ACMs (i.e. asbestos cement)
- The asbestos material is degraded at the outset of the work
- The asbestos is present in low levels (maximum asbestos quantification result of 0.018% w/w)

This decision has also been considered within the Joint Industry Working Group's 'Decision Support Tool for the Categorisation of Work Activities Involving Asbestos in Soil and Construction & Demolition Materials in accordance with the Control of Asbestos Regulations 2012: v2.1 March 2017'. This spreadsheet tool provides a decision support platform to aid the categorisation of work under CAR2012 and supports the CAR-SOIL guidance.

The decision support tool indicated that the work with the Made Ground soils at this site would be non-licensed work. A copy of this decision support tool and its results for the site is included in Appendix A.

3.3 Site Investigation Findings

The ground conditions on site have been established through several phases of intrusive investigation. Encountered soils comprised a mantle of Topsoil and/ or Made Ground overlying Head Deposits and/ or soils of the Lambeth Group which in turn in some locations overlay the Tarrant Chalk.

The ground conditions were observed to vary over relatively short distances, i.e. within the extent of some of the trial pits/trenches excavated. In addition, the depth to the Chalk was observed to vary significantly such that whilst Chalk was encountered at relatively shallow depth in some of the exploratory holes, it was not encountered in others.

Representative environmental soil testing was carried out based on the land use assessment for the site. It was considered that remedial action would be warranted in specific areas of the site; the farmyard, the chalk pit/ former land and the horse arena. Remedial action was not considered necessary for the majority of the site.

Based on the soil analysis undertaken and the presence/quantification of asbestos. The results show only a small percentage of samples were recorded as containing asbestos, these samples were located within the Farmyard and Chalk Pit areas only. However given that ACMs were potentially noted to be present within stockpiles in the farmyard area and the nature of the fill/ Made Ground material encountered within the chalk



pit area, it was considered that there was the potential for further asbestos to be present within the Made Ground across both the farmyard area and the chalk pit area of the site. Chrysotile was positively identified in six locations on site, three within the farmyard area and three within the chalk pit area, in TP225 at 0.25m bgl (August 2017), TP239 at 0.50m bgl (August 2017), TP315 at 0.20m bgl (May 2018), TP213 at 1.00m bgl (August 2017), TP302 at 0.20m bgl (May 2018) and WS407 at 3.00-4.00m bgl (May 2018) and Crocidolite in TP213 at 1.00m bgl (August 2017).

Quantification testing for asbestos was not undertaken during both the August 2017 and May 2018 investigations undertaken for the site. The results are summarised in Table 1.

From a risk assessment point of view it has to be assumed that the results reported are representative of the levels present within the Made Ground across the site (that is unless further quantification was to be carried out. However, further quantification may not be appropriate if the chosen control method is clean capping or off-site disposal. It may be appropriate if selective hot spot removal was considered, but this is considered inappropriate for this site).

Above concentrations of 0.1% w/w asbestos in soil these materials are considered to be hazardous waste and would have to be treated as such if disposed of off-site. The quantification result from TP225, TP239, TP213 and WS407 shows the materials identified within these locations to be above this level.

Location	Depth (m bgl)	Type	Free Fibres (%)	Total (%)
TP225	0.25	Chrysotile	<0.001	3.54
TP239	0.50	Chrysotile	<0.001	25.0
TP315	0.20	Chrysotile (fibre bundle)	<0.001	<0.001
TP213	1.00	Chrysotile and Crocidolite	<0.001	2.66
TP302	0.20	Chrysotile	<0.001	0.726
WS407	3.00-4.00	Chrysotile	<0.001	0.147

Table 1 Asbestos Results Reported for the site.

3.4 Conceptual Site Model - For Asbestos Only

For a human health risk to exist there needs to be one or more contaminant- pathway-receptor linkages i.e. a “pollutant linkage”, by which a relevant receptor might be affected by the contaminants in question. In other words, for a risk to exist there must be contaminants present in, on or under the land in a form and quantity that pose a hazard, and one or more pathways by which they might pollute controlled waters or harm human health.

Defra (2012) in Environmental Protection Act Part: 2a – Contaminated Land Statutory Guidance provides the following definitions:

- “contaminant” is a substance which is in, on or under the land and which has the potential to cause significant harm to a relevant receptor, or to cause significant pollution of controlled waters.
- A “receptor” is something that could be adversely affected by a contaminant, for example a person, an organism, an ecosystem, property, or controlled waters.



- c) A “pathway” is a route by which a receptor is or might be affected by a contaminant.

The term “pollutant linkage” means the relationship between a contaminant, a pathway and a receptor. All three elements of a contaminant linkage must exist for there to be a risk to the identified receptor.

The conceptual site model summarises what is known about the ground conditions at the site, then goes on to describe potential sources, pathways and receptors and identify viable pollutant linkages.

Asbestos has been identified to be the source of contamination on the site. The plausible pathways are summarised in Table 2. These pathways are based on the proposed end use to comprise a residential land use, including communal gardens and soft landscaping.

Pathway	Description
Inhalation	Inhalation of asbestos fibres by site worker(s)
	Inhalation of asbestos fibres by off-site receptors e.g. adjacent land owners/users
	Inhalation of asbestos fibres by site users/residents
Windblown fibres	Offsite receptors exposed to windblown asbestos fibres

Table 2 Contaminant Pathways for Asbestos post development

Asbestos does not have an adverse effect on surface water, ground water, vegetation or building materials, therefore these receptors can be discounted from this assessment (but please note the Geo-Environmental report identified other chemical contaminants, but they are not repeated here being outside the scope of this report).



4.0 ASBESTOS RISK ASSESSMENT

The risk assessment has been undertaken in general accordance with Defra / Environment Agency's guidance Model Procedures for the Management of Land Contamination (2004).

There are currently no UK Soil Guideline Values relating to asbestos. The Control of Asbestos Regulations 2012 specify a limit for worker exposure to all types of asbestos of 100 000 fibres per m³ averaged over four hours. This "control limit" is described as not a "safe" level, and exposure from work activities involving asbestos should be reduced to as low as reasonably practicable.

Furthermore, it should be noted that industry experts have stated:

"Currently there is neither a standard method for determining the amount of asbestos present in soil or even an agreed minimal risk level or generic assessment criterion for asbestos in soil. This means that the legal and practical position is unclear on what steps should be taken and to what extent to remove the asbestos. (Asbestos: The hidden hazard on brownfield sites" (Evolution Magazine CIRIA - Joane Kwan, Paula Whitell and Paul Nathaniel 2012)

The distribution of asbestos is considered to be wide spread throughout the Made Ground within the farmyard and chalk pit areas of the site only, and quantified at a level that merits control measures being employed to remove the ACMs identified at ground level and where the ground is to be disturbed.

The quantification test undertaken on site identified total levels of between <0.001% and 25% and free fibre levels of <0.001% with both chrysotile and Crocidolite being identified on the site.

Given that asbestos fibres and ACMs have been identified within the shallow soils within the farmyard and chalk pits areas of the site from ground level to 4.0m below ground level it is considered that there is a potential risk to on site users and people off site, given that the asbestos could potentially be entrained in the wind. At these shallow depths it is considered that the material could be exposed by rutting if the site is traversed in wet weather (followed by subsequent drying out) by demolition and constructions vehicles. As such vehicle movements should be limited and undertaken across designated paths on site, where clean materials have been lain to cover the Made Ground and prevent the spread of fibres.

In addition, a hand pick exercise should be undertaken to remove the visible ACM materials evident within the shallow soils on site, in order to prevent them being broken up and further fibres released during demolition and construction traffic around the site.

4.1 Options Appraisal - Risks to End Users Following Construction

There are limited options associated with the remediation of land affected by contamination hence the brevity of this section.

Hot spot removal

This is not considered practical given the distribution of the asbestos identified visually and through analysis on the site.

Remove all Made Ground from site

This would not be economically viable and not necessarily required by the regulatory authorities. Given the proposed development and depth of Made Ground identified across parts of the site, together with the subsequent requirement for disposal this is not considered to be the most cost effective or viable option for the site.

Barrier / cover layers

- 1) Geomembranes – these are expensive and likely to be damaged during construction phases, thereby limiting the protection provided. This area also unsuitable in areas of proposed gardens and soft landscaping where digging in the garden or root zones of trees and vegetation's could penetrate through the geomembrane.
- 2) Soil cover system - Comprising a crushed concrete capillary break layer sandwiched between two geotextiles, overlain by a suitable thickness of subsoil and Topsoil. This represents the most practical and robust solution ensuring that the source, pathway, receptor linkage is broken and Asbestos is isolated from end uses. This forms the most common approach in the UK for management of asbestos and contaminated soil/material that are to remain on site.

4.2 Options Appraisal – Risks to Human Health During ConstructionProposed Control Measures

The primary objective of the proposed control measures is to mitigate the potential for airborne release of asbestos at the point of excavation, in transit, stockpiling and during final deposition.

- Site specific asbestos training/briefing for all workers involved in the project.
- Establishing areas where the work with asbestos containing soils is taking place and excluding other personnel and plant from this area to avoid the spread of asbestos (any site compound/cabins should be separated from these areas). These areas would include the area where excavation is taking place, the stockpiling area and the area where deposition is taking place.
- Dust suppression with sprayed water of all disturbed and exposed Made Ground soils – to prevent asbestos fibre release from soils. This includes the excavation area, exposed soils on stockpiles and the area of deposition.
- Where asbestos containing soils are stockpiled, exposed soils should be covered immediately with sheeting that is adequately anchored so it is not blown off – to prevent the spread of asbestos fibres. Any temporary stockpile location will be on an hardstanding where possible and this will mitigate the potential for stockpiled soils impacting the ground in the stockpile location. Nonetheless, subject to an inspection of the stockpile location prior to stockpiling commencing, the Contractor should also make provision for placing a polythene membrane across the proposed stockpile area.
- Once stockpiling is completed, including the placement of sheeting, the stockpile should be fenced off with Heras-type fencing (or other fencing which is not easily removed, plastic mesh or Chapter 8 pedestrian barriers are not acceptable). Signage should be placed at regular intervals indicating that the stockpile contains asbestos and entry is prohibited. This is to prevent inadvertent reuse of the soils.



- Regular inspection of the stockpile should take place to ensure the sheeting, fencing and signage remains in place. Any repairs to damaged sheeting should be made using the control measures and PPE listed in this section.
- When sheeting is removed from the stockpile prior to the transportation and final placement of the soils, dust suppression should recommence, and the sheeting should be disposed of as asbestos waste.
- Use of washable boots, without laces, and provision of boot washing facilities at exit of the working area – to prevent mud being tracked into site cabins, vehicles etc. where it could dry and generate inhalable dust.
- Use of disposable coveralls with elasticated cuffs and collars within the working area only – to protect workers clothes from asbestos fibres or asbestos containing soil which could then be transferred to locations off the site.
- Provision for washing plant prior to removal from the excavation area site paying special attention to tracks, wheels, buckets, cab floors, steps and footplates – to prevent the transfer of asbestos containing soils off the site and around the site.
- Provision for avoiding the spread of asbestos containing soils during transportation between the area of excavation, the stockpile and the area of proposed re-use particularly. Measures should include:
 - not overloading transportation plant to prevent spillage of soils
 - sheeting all loads prior to them departing the excavation area
 - washing wheels of transportation plant on leaving the excavation area
 - careful management of the cleanliness of the stockpiling and deposition area to ensure that transportation plant is not tracking asbestos containing soils across the site on leaving these areas.

Rejected Control Measures

Respiratory protective equipment (RPE) has been considered to protect groundworkers. However, the measures set out above represent the primary control measures to mitigate release of asbestos to the air thereby protecting the site workforce and occupants/residents of properties and land around the development. The control measures detailed above are considered sufficient to control asbestos fibre release such that RPE is not required as a mandatory, or primary control. In addition, groundworkers may not be accustomed to wearing masks and there is an increased health and safety risk associated with the use (or ineffective use) of unfamiliar masks and heavy plant. However, this should be revised if further ACM is discovered during the works or reassurance air monitoring indicates the control limit has been exceeded.

Notwithstanding the above, the Contractor should utilise PPE (including RPE and eye protection) additional to that listed in this section for additional precautionary protection. However, the use of PPE additional to that listed in the control measures would not replace any control measure. For example, the use of RPE would not remove the requirement for dust suppression as it would not mitigate the risk to adjacent land users and thus cannot be a primary control measure. The contractor should also utilise PPE for non-asbestos hazards such as hard hats and gloves in line with the relevant health and safety legislation.



5.0 REMEDIATION STRATEGY

5.1 Risk Mitigation Activities

The following risk mitigation activities are proposed at the site on the basis that the Made Ground within the farmyard and chalk pit areas is to remain as the preferred option:

Soft landscaping and gardens

- Hand pick exercise to remove the visible ACM materials evident within the shallow soils on site.
- Within specifically identified Plots within the farmyard area only a reduced level dig, depths as specified in Figure 9, is required in order to allow for the installation of a soil cover system so as to be inline within proposed final site levels.
- A cover system comprising a crushed concrete capillary break layer sandwiched between two geotextiles, overlain by a suitable thickness of subsoil and Topsoil. In total a placement of 600mm of clean soils as cover to limit exposure to asbestos from the Made Ground (The thickness proposed would also serve to be protective of other chemical contaminants identified within the Made Ground and Shallow soils on the site), This thickness should be agreed with the Local Authority specific to asbestos.
- Locally thickened for tree roots

Building footprint

The base of the building itself can act as a barrier to asbestos release. The difficulty of relying on this is that the owners may build extensions and penetrate below the building base. This is less likely for proposed higher rise buildings. However, documentation of the presence of asbestos within the Made Ground and shallow soils beneath building footprints and areas of hard standing should be recorded in case of future proposals. Whilst there is no specific requirement to remove asbestos containing materials where located beneath areas of hard standing and building footprint, the NHBC will not permit the re-use of soils containing asbestos beneath building footprints due to the potential ongoing maintenance issued associated with building which may subsequently expose the asbestos.

Piled Foundations

Should piling be proposed the piling mechanism should be one that results in the lowest level of disturbance to the Made Ground. Any pile arising should be segregated in terms of Made Ground and natural material to minimise the spread of asbestos to the natural arisings. Alternatively, continuous helical displacement piles (CHD) could be utilised to minimise arising's.

Excavations through Made Ground

Provided suitable precautions (i.e. damping down) are taken in excavating and placing material to prevent windblown fibres there is unlikely to be a risk to human health on or off site during these works.

Entry into excavations within Made Ground e.g. retaining walls with shallow foundations

Workers should be prevented from entering into excavations in the Made Ground. Excavations should be left open for as short a time period as possible. Therefore, work should be planned to minimise the length of open trenches for the installation of services. All services should be backfilled with clean gravel, or similar. Where Made Ground is to remain in the base of trenches, a marker plastic sheet should be placed at the base of the trenches. Where trenches are excavated through the whole depth of Made Ground a marker sheet is not required.



With regards to workers on the site, suitable Health and Safety precautions should be employed to minimise exposure to free fibres. Where this is not possible it is assumed that suitable PPE would need to be employed. As a minimum workers should be briefed on the risks associated with asbestos inhalation, suitable gloves should be worn and consideration should be given to the wearing of one piece overalls with elasticated sleeves and respiratory protective equipment, with a facility also provided to wash exposed areas of skin.

5.2 Refined Conceptual Model

Potential Source/media	Potential Receptors	Potential Pathways	Likelihood	Consequence	Mitigation and Risk
Construction Phase (Asbestos)	Site Workers	Air (indirect)	Likely	Medium	Moderate Site works are likely to come into contact with soils via direct contact during development and construction works. Utilising mitigation measures to include: • Damping Down with water. • Facilities for washing and drying. • No smoking, drinking, eating on the site. Would serve to reduce the risk. As such the consequence would be reduced to low to moderate.
	Neighbouring Land (residents)	Air (indirect)	Likely	mild	Moderate to Low The surrounding land uses comprise a mixture of woodland, agricultural land and residential development. As such whilst there is a potential for materials to be mobilised by the wind the number of potential residents that may be affected is limited. In addition, appropriate controls on the site would serve to reduce the potential for fibre mobilisation. As such the consequence with appropriate mitigation would be low.
	Residents	Air (indirect)	Unlikely	Medium	Low It is proposed to cap all areas of gardens and soft landscaping with a



Potential Source/media	Potential Receptors	Potential Pathways	Likelihood	Consequence	Mitigation and Risk
Post Construction Phase (Asbestos)					suitable capping system to break the source pathway receptor linkage from the site. In addition, it is proposed to undertake a hand picking exercise across the site to remove visible ACMs within the shallow soils on the site. As such the consequence following the proposed remediation measures on site would be very low.
	Maintenance workers	Air (indirect)	Low	Medium	Moderate to Low Services installed onsite would be constructed within clean backfill and covered with a clean capping layer. Where it is unavoidable to install services within Made Ground these should be backfilled with clean gravel or similar with marker warnings. As such with appropriate good practice construction methods the risk for ongoing maintenance workers on the site would be low.

Table 3 Refined Conceptual Model

During excavation or loading of vehicles and if necessary, placing the material back on the ground/unloading, the material should be damped down to prevent windblown release. Covering of vehicles transporting material around the site should be considered. Any vehicles leaving the site and using the public highway should be sheeted. In addition, the storage of Made Ground materials within stockpiles on site should be covered.



6.0 ASBESTOS MANAGEMENT PLAN

The excavation and placement of Made Ground contaminated with asbestos is not considered a licensable activity, nor is the removal of the Made Ground from site.

Most higher-risk work with asbestos must only be done by a licensed contractor. Licensable work with asbestos is work defined by the Health and Safety Executive as:

- where worker exposure to asbestos is not sporadic and of low intensity; or
- where the risk assessment cannot clearly demonstrate that the control limit will not be exceeded i.e. 0.1 asbestos fibres per cubic centimetre of air (0.1 f/cm^3) (averaged over a four hour period); or
- on asbestos coating; or
- on asbestos insulation or asbestos insulating board where the risk assessment demonstrates that the work is not short duration work, e.g. when work with these materials will take no more than two hours in any seven day period, and no one person works for more than one hour in that two hour period.

As identified earlier in this document general earthworks onsite are not considered to be licensable and hence not an asbestos designated area or a respirator zone. As such, the Health and Safety Executive will not require notification of the work before it begins. The employer should, however, ensure that all workers on the site have received site specific asbestos training/briefing.

Stripping of asbestos, if present, from the former buildings is likely to be a licensable activity as above. The consultant carrying out the asbestos survey prior to demolition should be asked to advise on this on the basis of the nature of the asbestos present (e.g. fibrous compared with ACM ceiling tiles).

A handpicking exercise to remove visible ACMs within the Made Ground and shallow soils on site, may be licensable subject to the type of materials and length of time required to complete the works. Confirmation should be obtained of this as part of the quote obtained for undertaking these works.

All work is to be carried out in external areas. Therefore, it is unlikely that the "control limit" will be exceeded. The work that could potentially release fibres is excavation and placement of the Made Ground, with this work being of a limited duration. Therefore, normal earthworks PPE should be sufficient. RPE should not be required, however the use of a type P3 disposable respirator by workers would be good practice. See:

<http://www.hse.gov.uk/pubns/guidance/em6.pdf>

Any stockpiling of Made Ground should be kept to a minimum and any stockpile should be covered immediately with clean soil or sheeting that is adequately anchored so it is not blown off to prevent the spread of asbestos fibres.

Services should be laid in the clean capping layer wherever possible. Backfill should be with clean gravel or similar. Trenches in Made Ground should be closed over as quickly as possible. Where man entry is necessary then the contractor should carry out their own risk assessment, the control measures are likely to include the wearing of hooded disposable one piece suits with elasticated apertures, disposable respirator (Type P3) and non-laced foot wear.



Personal exposure monitoring for workers should be carried out to confirm fibre concentrations in the air, analysis should be carried out by an UKAS accredited laboratory for fibres and the analyst should have successfully completed P403: "Asbestos Fibre Counting (PCM)". In addition, there may still be circumstances where samples need to be taken, for instance where quantities of ACM's are discovered, previously not identified. Bulk analysis should be carried out by an UKAS accredited laboratory and the analyst should have successfully completed P401: "Identification of Asbestos in Bulk Samples (PLM)".

Dust suppression and management techniques should include:

- Only working on manageable small areas during each working day.
- Management of dust levels via careful excavation and deposit.
- Use of aqueous direct suppression methods using sprayed water or water/PVA mixtures, if deemed necessary at the time.

Proof of control should be demonstrated by workers wearing personal monitoring equipment (a single test each day should be sufficient as long as the excavation area is limited as above).

In addition to this "reassurance" air testing should be carried out along the site boundaries. This should be carried out at two locations per day and at the same time as the personal monitors are worn by workers. At least one round of this particular type of monitoring should be carried out before excavation works commence in order to identify "baseline" and the ideal sampling interval. It is suggested this is done on a dry day. The air monitoring shall have a minimum limit of detection of 0.001f/ml and be undertaken in accordance with the protocols contained within CIRIA C733 "Asbestos in soil and made ground: a guide to understanding and managing risks"

Management data should include a plan and records of daily excavations, use of suppression techniques and personal and reassurance air testing results will need to be included in a management report at the end of the project.

It is recommended that a groundworks contractor with appropriate experience and prepared procedures that can be reviewed by the client prior to the further works on site, are used at the site.

It is recommended that the Environment Health Department of the Local Authority are consulted to confirm they are content with the proposed clean capping approach and the risk mitigation measures discussed above.

The H&S file for the site should document the presence of asbestos.

6.1 Re-use of on-site Material and Importation of Clean Capping Material

The Environment Agency classifies excavated contaminated soils as waste. As such its reuse on the site has to be carried out under an Environmental Permit or waste exemption. That is unless the reuse is carried out under the Definition of Waste: Development Industry Code of Practice (CL:AIRE 2011) where it can be demonstrated that there is a need or requirement for use, that the risk is acceptable, the quantities for re-use are no more than required and the use is guaranteed. It is recommended that the reuse of excavated material will be undertaken via the Site of Origin scenario where Made Ground is excavated and reused. A



number of sites with asbestos contamination have been successfully remediated via this route.

In addition, the Environment Agency classifies clean soil as waste upon leaving the site of excavation i.e. where it is surplus to requirements at that site. Hence the reuse of imported clean soil needs to be carried out under an Environmental Permit or exemption. That is unless the material is used under the Definition of Waste: Development Industry Code of Practice. It is recommended that such material is brought to the site and reused under the Direct Transfer scenario. Both the Direct Transfer and Site of Origin reuses need to be covered by one Materials Management Plan, but subject to two separate Declarations completed by a registered independent Qualified Person.

If Made Ground is to be removed from site it will be classified as waste and will need to be taken to an appropriately authorised facility. Once materials for disposal have been identified further WAC and asbestos testing should be undertaken to classify the material for the purpose of disposal. Materials containing asbestos would only be classified as Hazardous where the concentration of asbestos within a sample of ACM material is less than 0.1% the material. In terms of the percentage total asbestos identified in the soils these have been shown to be at a level of between <0.001% and 25%, and therefore it is likely that some Made Ground material will need to be disposed of as hazardous waste, in addition visually evident ACM removed (handpicked) from the soil would also need to be disposed of as Hazardous waste.



Figures





Project:	Woodcroft Farm, Lovedean, PO8 9QA			Title	Site Location Plan	
Client:	Vistry Homes Southern			Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net  Geo-Environmental		
Ref No:	GE18761	Revision:	0			
Drawn:	FG	Date:	11/05/2018			
Figure:	1	Scale:	Not To Scale			



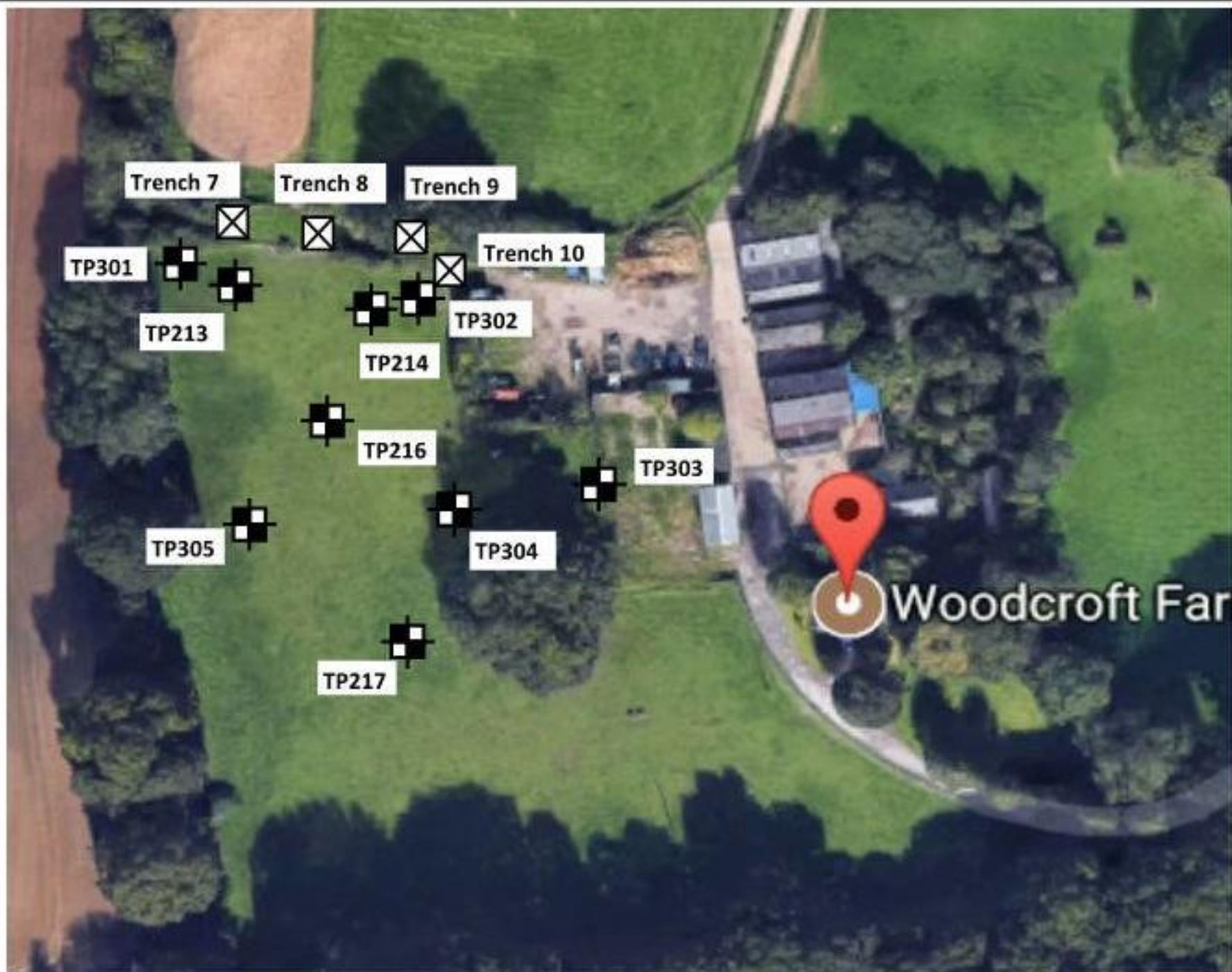
Project:	Woodcroft Farm, Lovedean, PO8 9QA			Title	Location of Farmyard Area	
Client:	Vistry Homes Southern			Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net  Geo-Environmental		
Ref No:	GE18761	Revision:	0			
Drawn:	FG	Date:	25/06/2018			
Figure:	2	Scale:	Not To Scale			



Project:	Woodcroft Farm, Lovedean, PO8 9QA			Title	Location of Former Chalk Pit and Landfill Area	
Client:	Vistry Homes Southern			 Geo-Environmental Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net		
Ref No:	GE18761	Revision:	0			
Drawn:	FG	Date:	25/06/2018			
Figure:	3	Scale:	Not To Scale			



Project: Woodcroft Farm, Lovedean, PO8 9QA		Title Exploratory Hole Locations - Farmyard Area	
Client: Vistry Homes Southern		 Geo-Environmental	
Ref No: GE18761	Revision: 0		
Drawn: FG	Date: 11/05/2018		
Figure: 4	Scale: Not To Scale		
		Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net	



Project:	Woodcroft Farm, Lovedean, PO8 9QA			Title	Exploratory Hole Locations - Trial Pit and Trenches - Landfill Area	
Client:	Vistry Homes Southern			Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net		 Geo-Environmental
Ref No:	GE18761	Revision:	0			
Drawn:	FG	Date:	22/06/2018			
Figure:	5	Scale:	Not To Scale			



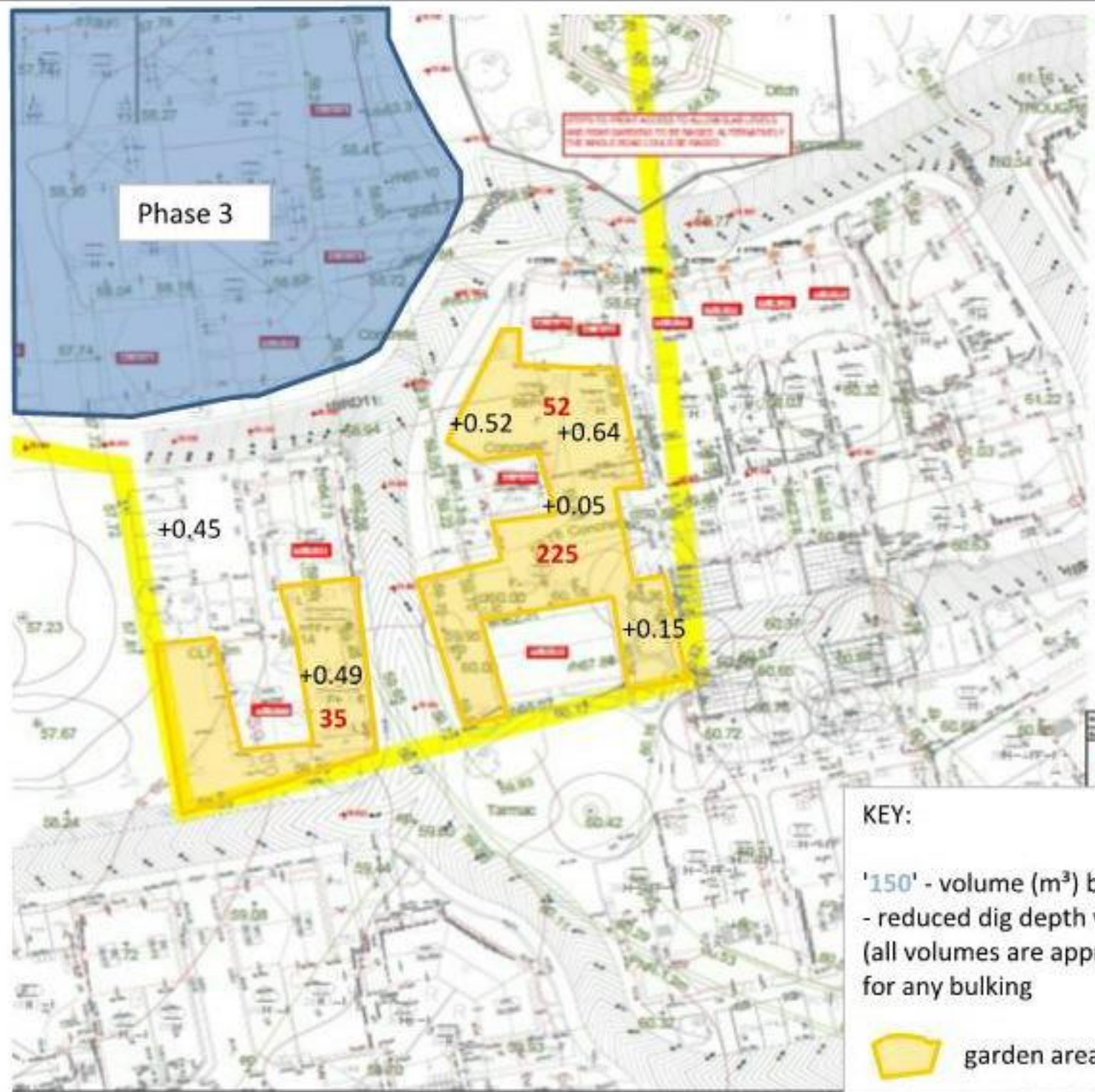
Project:	Woodcroft Farm, Lovedean, PO8 9QA			Title	Extent of Made Ground - Window Sampler Boreholes - Landfill Area	
Client:	Vistry Homes Southern			Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net		 Geo-Environmental
Ref No:	GE18761	Revision:	0			
Drawn:	FG	Date:	22/06/2018			
Figure:	6	Scale:	Not To Scale			



Project:	Woodcroft Farm, Lovedean, PO8 9QA			Title	Soil Contamination Exceedances - Farmyard Area	
Client:	Vistry Homes Southern			Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net  Geo-Environmental		
Ref No:	GE18761	Revision:	0			
Drawn:	FG	Date:	11/05/2018			
Figure:	7	Scale:	Not To Scale			



Project:	Woodcroft Farm, Lovedean, PO8 9QA			Title	Soil Contamination Exceedances - Landfill Area	
Client:	Vistry Homes Southern			Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net  Geo-Environmental		
Ref No:	GE18761	Revision:	0			
Drawn:	FG	Date:	25/06/2018			
Figure:	8	Scale:	Not To Scale			



Project:	Woodcroft Farm Lovedean PO8 9QA			Title	Remediation Strategy Plan - Phase 2B Farmyard Volumes	
Client:	Vistry Homes Southern			Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net		
Ref No:	GE18761	Revision:	0			
Drawn:	FG	Date:	21/08/2020			
Figure:	9	Scale:	Not To Scale			
				 Geo-Environmental		



APPENDIX A

CAR-SOIL2012 Decision Support Tool





Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Project Reference

GE18761

Site Name

Woodcroft Farm (Phases 2B and 3)

Client

Vistry Homes Southern

Run by

FG

Date

28-Aug-20

Scenario details

Decision Support Tool for CAR2012 Work Categories

Stage 1

Hazard Factors

Score

Select ACM type (run model for each type to generate 'Worst Case' output)

Loose fibrous asbestos debris

3

Extent of degradation of ACMs at outset of work

Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)

4

Friability and degree of bonding by matrix (ACM matrix, not ground materials)

Friable ACM or ACM with fibres not firmly linked in a matrix

2

Distribution of Visible Asbestos Across Affected Area

Occasional/random occurrences of visible contamination by ACMs

1

Amount of asbestos fibre in selected ACM/fibre type as % of host material

Trace quantities - <0.0001 to 0.001 %wt/wt

0

Sub-total

0

Note: the asbestos licensing regime is unaffected by the type of asbestos fibre present in ACMs

Hazard ranking

Negligible

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.

It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

Stage 2

Exposure Factors

Score

Anticipated airborne fibre concentration - Control Limit or SALI?	<0.001 fibres/ml	0
Anticipated duration of exposure to asbestos	< 1 hour for any one person in any week (e.g. Short Duration Work)	1
Activity type and effect on deterioration of ACMs during work	Sampling, manual or mechanical (no or minimal deterioration expected)	0
Best description of primary host material matrix (soil/made ground)	Fine Silt and/or Clay	1
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Medium	3

Sub-total	5
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Exposure ranking	Very low
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Combined hazard and exposure ranking	5	Very Low
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Stage 3

Risk Assessment Outputs

Probable Licensing Status	CAR do not apply
RPE*	None
Dust Suppression**	None
Hygiene/Decontamination***	None

*Where RPE has to be worn continuously for long periods (e.g. more than 1-hour), then powered RPE may be necessary.

**Reduction in control measures possible if natural mitigation factors are present (e.g. raining, wet ground)

***Guide only; suitability of selected personal hygiene measures may be reviewed on a site/contamination-specific basis