

PROPOSED DEVELOPMENT

HIGHOVER FARM

HITCHIN

PHASE 1 DESKTOP STUDY

GROUND
SCIENCE
SOLUTIONS



FOR

GILL - HUDSON HOMES LTD

GROUND SCIENCE SOLUTIONS

78 Beckenham Road

REPORT 2025/1533

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This report presents the findings of a recent desktop/phase1 study by Ground Science Solutions, together with published historical, geological and environmental data, and a risk assessment based on the information presented. The comments given in this report, and the opinions expressed therein, are based on the ground conditions at the time of the investigation, together with any conjectural interpretations of conditions in areas between excavations. There may, however, be other conditions not revealed by the work discussed here, which have not been taken into account in this report. The conclusions reached are those that can reasonably be determined from the sources of information referred to in the report and from our knowledge of current professional practice and standards. Any limitations resulting from the data are identified where possible but both these and our conclusions may require amendment should additional information become available. Ground Science Solutions cannot accept any responsibility for any data derived from other reports used to produce this report. Descriptions of structures are limited due to access limitations.

The comments made on groundwater conditions are based on observations made at the time of the investigation. It should be noted that groundwater levels may vary due to seasonal and other causes.

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FIGURES

Figure 1 Site Location Plan

Figure 2 Layout Plan of the Proposed Development

APPENDICES

Appendix A Historical Maps (separate document)

Appendix B Groundsure Data (separate document)

1.0 INTRODUCTION AND SCOPE

In June 2025, Gill-Hudson Homes Ltd, instructed *Ground Science Solutions* (hereafter abbreviated to *GSS*) to carry out a desktop/phase1 of a proposed renovation and development of a farmstead, Highover Farm Hitchin SG4 0RQ. The site is accessed from Highover Way. The site is roughly an irregular square and is occupied at present by a listed Barn a number of other barns, stables and buildings.

2.0 SITE LOCATION AND DESCRIPTION

The site consists of a roughly square plot to the north east of Hitchin . It is bordered by agricultural fields, a number of domestic dwellings and small businesses.

Photo No.1 Access Road



Photo No.2 Grade 2 Listed Threshing Barn



3.0 GEOLOGY AND GROUND CONDITIONS

According to current information based on the British Geological Survey, the site is underlain by the Lowestoft Diamicton defined by BGS as:

The Lowestoft Formation forms an extensive sheet of chalky till, together with outwash sands and gravels, silts and clays. The till is characterised by its chalk and flint content. The carbonate content of the till matrix is about 30%, and tills within the underlying Happisburgh Formation have less than 20%.

Overlying the Hollywell Nodular Chalk Formation and the New Pit Chalk Formation (undifferentiated).

An on-site well record is available this was drilled before 1921 and is designated TL1980 3068 (TL13/48). This was drilled on the north western side of the house and fitted with a hand pump. The stratigraphy is as follows:

- 2.4 metres of clay/loam
- 2.4 metres sand and gravel

3.1 SOLUTION FEATURES AND MINING VOIDS

The risk from natural solution features is low as voids and frost wedges are generally filled with the Glacial soils(diamicton). Mining activities are also a low risk given the diamicton which is difficult to work, it is far easier to mine chalk from the surface where the Diamiction is not present locally.

4.0 HYDROLOGY AND HYDROGEOLOGY

The NRA groundwater vulnerability map, *Groundwater Vulnerability Map*, shows that the site is located on a highly permeable major aquifer, the Hollywell Nodular Chalk Formation and the New Pit Chalk Formation (undifferentiated). However, the map also indicates the presence of a secondary undifferentiated aquifer (the glacial soils), overlying the Chalk aquifer, this is also classed as highly vulnerable.

The site is not in a source protection zone; however the underlying Chalk is a principal aquifer and must be protected by good site practice. The secondary undifferentiated aquifer is also considered highly vulnerable and good site practices are essential.

5.0 FLOOD RISK

Flooding risk from all sources is considered to be low. Localised ponding is possible on the lowest south eastern area of the site due to surface water this will be dealt with by site drainage. The renovation and new build will not significantly alter the present catchment area.

6.0 LAND GAS

The site is in an area where Radon precautions are not required. Risk from other gas is considered to be low as the Diamiction effectively caps the site area. Gases will migrate if present from high to low pressure in this case through the shallow chalk off site.

7.0 SITE HISTORY BASED ON AVAILABLE MAPS AND AERIAL PHOTOGRAPHS

The earliest map consulted is the 1:2,500 map dated 1881 shows the site area with a building layout similar to the present. Shallow chalk workings are shown close to the south east boundary. A pond to the north-east is bounded by trees. Another pond approximately 120 metres to the north with the surrounding land shown as marshy.

Trees are present on the eastern part of the site; allotments are present 200 metres to the south together with housing. The GNR railway is present 200 metres to the north-east.

The 1884 1:10,560 map shows the wider area, Greystone Lime Works is located approximately 700 metres to the east of the site. A sewage farm is also present approximately 1000 metres to the south east of the site. Walsworth village is present to the South- East with a significant number of pubs.

The 1884 1:10,560 shows a number of corn mills to the south with a number of corn mills to the south. More lime kilns are present to the south-west. A reservoir is shown to the south west by the railway. This is a water tank for steam engines not a water reservoir.

The 1897-1899 and 1899 1:10,560 maps show little change.

The 1898 1:2,500 map dated 1898, shows little change.

The 1921-22 1:10,560 map shows more developments in the general area shows an old chalk pit approximately 100 metres to the north-west. A tramway is now present on the Greystone lime works.

The 1922 1:2,500 map shows little change.

The 1938 1:10,560 maps show old chalk pits 1000 metres to the north-east and 600 m to the west. An isolation hospital is also approximately 1000 metres to the north-east.

The 1939 1:2,500 shows little change on site with a general increase in housing in the total area.

The 1946-1948 1:10,560 maps show little change on the site with the Greystone Works has expanded with a greatly expanded chalk quarry.

The 1959-1960 1:10,560 shows little change to the site area, there general urbanisation of the total area. Two children's are now present approximately 1000 metres to the north-east, one may have been the isolation hospital.

The 1964-1965 1:1,250 map shows the site generally similar to the present layout, however the field to the north is shown as forest. Grovelands Avenue, Highover Way, and Sturgeons Way housing developments are present. The chalk working to the east of the site appears to have been filled much earlier and has housing present. This therefore not an issue for the current development.

The 1970 1:10,560 map has limited coverage the Lime Works is still in operation.

The 1980-1982 1:10,560 maps show no significant changes to the site. The Lime Works to the south west has been replaced by housing and open space.

The 1992-1993 1:1,250 map shows no significant change.

The 1996 1:1,250 map shows no significant change.

The 1977-1981 1:2,500 map shows no significant change.

The 1986-1986 maps show no significant change other than the field to the north of the site is now shown without trees.

The 1999 aerial photograph show 5 silos in the field to the west of the site (only 1 is currently present). The field to the north east is forested.

The 2000 aerial photograph shows little change.

The 2003 1:2,500 shows the site in present layout.

The 1:10,560 2001, 2110,2025 show the site as at present.

The 2020 aerial photograph shows 3 silos in the field to the west of the site.

The 2023 aerial photograph shows little change.

8.0 WASTE EXEMPTIONS AND LANDFILLS

A number of on-site waste exemptions have been found mainly covering inert waste WEX 047505 covers on-site exemptions including a licence to burn farm and vegetation waste. The storage of sludge and the spreading of the sludge onto fields is covered by the same waste exemption licence which has been periodically modified

This waste exemption licence was replaced by EPRR/FF08335X/A001 which covered the same activities.

The practice of using freshwater water dredgings mainly from canals is considered acceptable for the reclamation of land and to improve soil elsewhere with little or no testing. This is discussed in a paper by Edwards P.R. Pomphrey N W J .(1979). In the proceedings of a conference in Eastbourne. "Preparations for the reclamation of a lagoon containing canal dredgings" in Reclamation of Contaminated Land, Society of Chemical Industry Eastbourne pub 1980.

This operation would not have impacted the site significantly as the sludge storage was most likely in the adjacent fields.

9.0 OTHER POTENTIALLY CONTAMINATIVE INDUSTRIAL ACTIVITIES

The data shows that no landfills or other major waste operations have taken place close to the site. No service stations or other contaminative operations are within 500 metres of the site. There are a significant number of small substations in the area as would be expected, these are not a hazard to the site. No other contaminative activities have been found within 500 metres of the site.

10.0 ON SITE POTENTIAL CONTAMINATIVE ACTIVITIES

Agricultural land can include the following:

- Fuel storage
- Filled pits
- Burning residues
- Chemical storage
- Foot and mouth burials
- Cess pits
- Asbestos

The above list is not exhaustive.

No evidence of fuel storage was found on site, however historical photographs show vehicles parked in an area to the west of the site which also contained a number of tanks or silos, in our opinion vehicles were probably fuelled at this location.

No evidence of pits was found on site which is largely hardstanding.

The burning allowed under the waste exemption licence again was likely to have been carried out in the area to the west of the site, as there is not enough space clear of the buildings on the development site.

Chemical storage of pesticides and herbicides

Access to all buildings was not possible due to safety considerations some were examined from access points. All the buildings appear to have either concrete, slabs or cobbled floors which would make the penetration into the subsoil of any leaking herbicides unlikely. None of the floors examined showed any significant staining other than an accumulation of bird droppings.

Pesticides are unlikely to have been used as the farm did not include orchards. Herbicides may have been used these will have increased the levels of various metals and metalloids in the subsoil, so comprehensive chemical analyses are needed. But again the site is the barn/housing part of the site and unlikely to have deliberately applied.

During the second world war years DDT was used rather liberally, This would have degraded to potentially more dangerous DDE and daughter products, in this case specific analysis of subsoils is required. But again DDT was more commonly used in orchards.

The presence of stables for horses would mean that any toxic substances would have been strictly controlled.

No cess pits were found however a drain linking into the main drainage network was found in building 6.

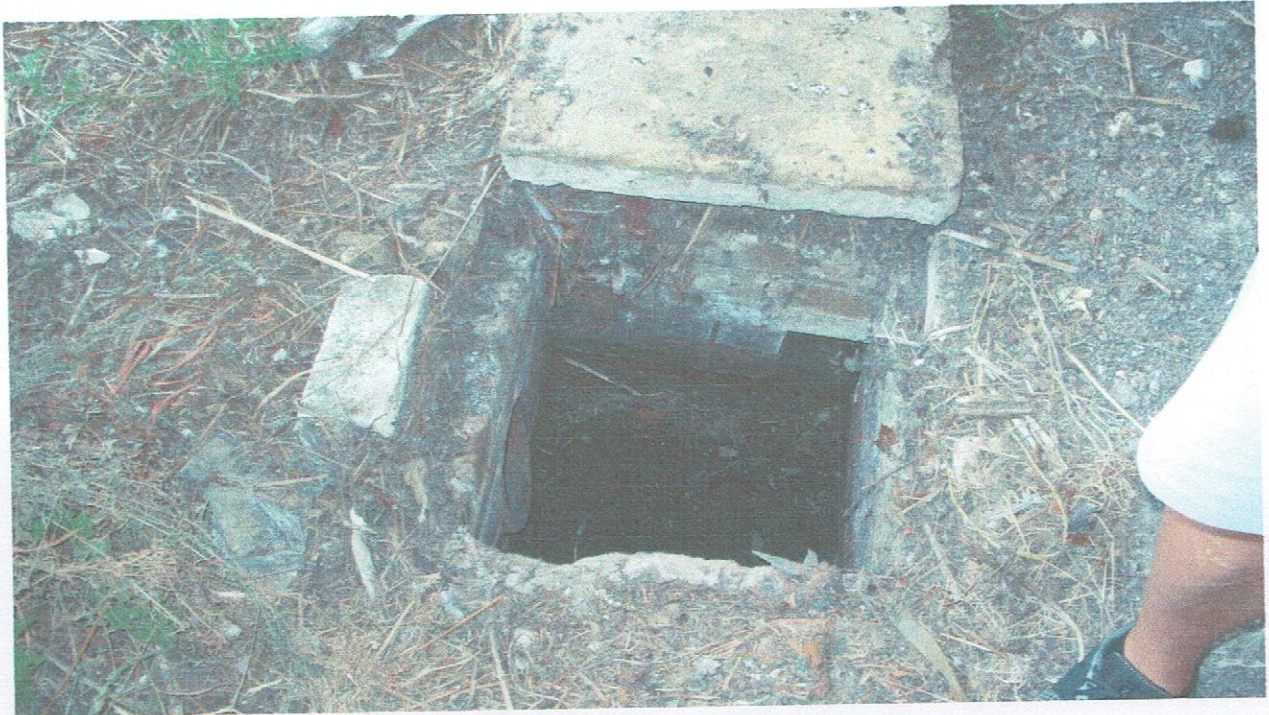


PHOTO No. 3 Existing Drain

It is likely given the age site which has been recorded in 1287-1294 with a roughly similar layout to the present since 1767 or earlier, that a long disused cess pit could be present. It is likely that any old cess pit may well have been removed in more recent times.

Asbestos, in general the buildings have natural slate roofs with no underfelt. No asbestos was observed in any of the buildings other than the main house that has a sloping roofing at the rear with asbestos sheets. This asbestos will need to be identified and removed under controlled conditions.



PHOTO No.4 Rear of house with sloping asbestos roof.



PHOTO No.5 Asbestos roof looking north

11.0 BUILDING DESCRIPTIONS

The buildings have been broadly described and given numbers as shown in Figure 2. These descriptions are brief as in the case of the Threshing Barn it has been described in detail by Heritage Consulting, in Condition Survey Threshing Barn June 2025 as it is a grade 2 listed building. Other descriptions are brief due safety considerations limiting access. The access to the site is via a gravelled track/road.

11.1 BUILDINGS B1 TO B3

Building B1 is a two-storey brick structure with a slate roof without underlay and a timber double door at ground level and single timber door centrally at ground level.

The building has plastic guttering and appears to be in reasonable condition with no significant signs of subsidence or heave.

This buildings floor level is higher than the two attached buildings.



PHOTO No.6 Building B1



PHOTO No.7 Building B2

Building B2 is a stables with a typical split door the lower half of which has been repaired with wiggly tin. Brickwork is in good condition the interior has a clean paviour floor. Roof is slate with no felt with plastic guttering some of which is missing.

Building 3 is also a stable generally similar but with a concrete rendering on the lower walls. Several holes in roof doors are all timber. Floor is concrete with no sign of spillages.

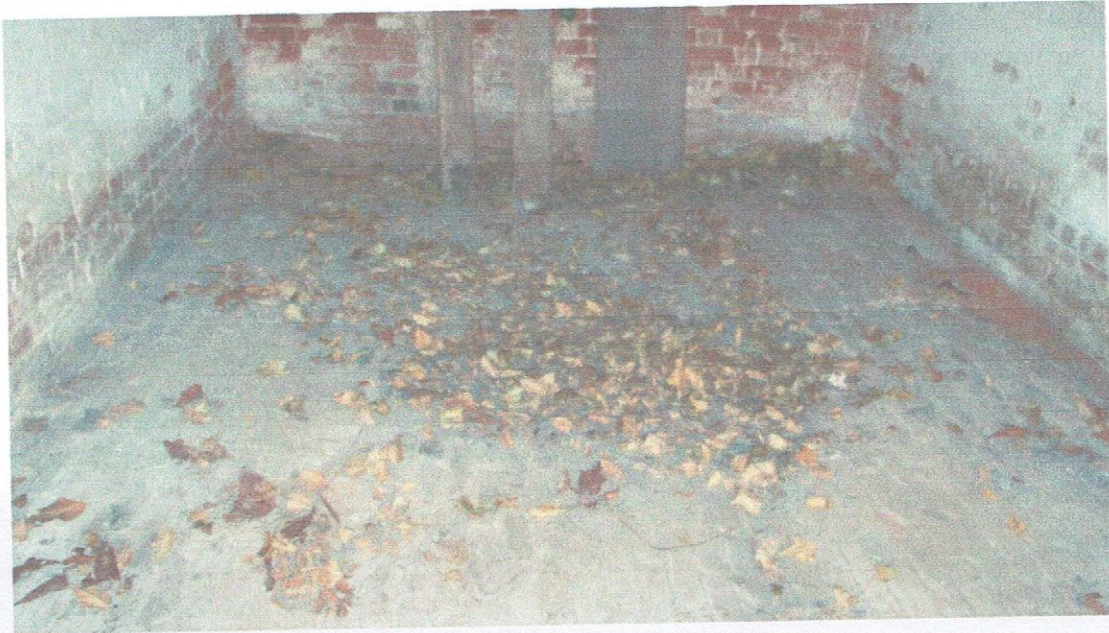


PHOTO No. 8 Interior of Building B2 with clean brick pavior floor



PHOTO No.9 Interior of Building B3

Buildings B4

A timber framed, timber clad barn in poor condition, slate roof incomplete plastic guttering with some metal downpipes. Double timber doors interior has thick coating of bird droppings.



PHOTO No.10 Exterior of Building B4

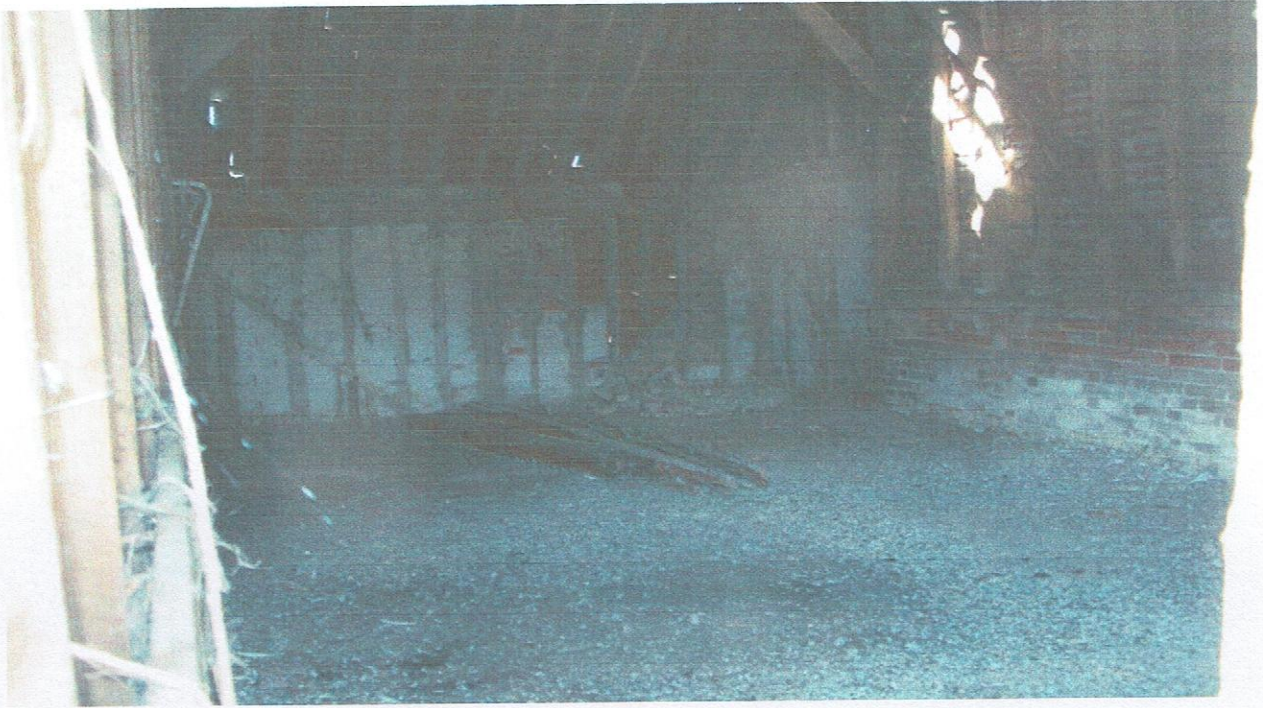


PHOTO No.11 Interior of Building B4



Photo No. 12 is the Grade 2 listed building described in detail elsewhere.



PHOTO No.13 Part of the interior of the splendid Threshing Barn currently in a sad state.



PHOTO No.14 Building B8 open timber frame with some metal support (assumed repairs), wiggly tin roof. Poor condition



PHOTO No. 15 Building B9 front elevation



PHOTO No. 16 Building B9 rear with small out building with toilet and kitchen assumed access to basement
no further access.

12.0 PRELIMINARY CONCEPTUAL MODEL

The conceptual model is quite simple, as most of the work involves renovation a limited amount of new build in place of building B8 close to many trees.

The site has a 4 to 5 metre thickness of low permeability post glacial clay with silty sand in some areas weakly indurated by secondary iron solutions, the estimated permeability would be in the order of 10^{-8} to 10^{-7} m/sec. This will lead to poor drainage and would impede flow of ground gas.

The proposed conversion will not involve exposure of the vulnerable chalk aquifer and only shallow work in the Glacial sediments.

13.00 CONCLUSIONS

The Barns when in use in a farming context were also used as stables, the interior is clean. Organic matter arising from horses is a lucrative commodity being sold as fertiliser for domestic gardens or spread on fields. We do not consider the waste from the horses as a plausible risk.

We are of the opinion that the site poses a very low environmental risk, this should be confirmed by a limited intrusive investigation to obtain samples for both chemical analysis and geotechnical assessment. This investigation should consist of a mix of boreholes and trial pits.