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# Proposed residential development
# Land east of Chipping Lane
# Longridge, Preston

## Ground Investigation Summary Report

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# Proposed residential development
# Phase 1
# Land East of Chipping Lane
# Longridge
# Preston
# PR3 2NA

# GROUND INVESTIGATION SUMMARY REPORT

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## Report originators

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# Aerial photograph of site

Approximate Phase 1 site boundaries edged in pink

# Report status and format

| Report section | Principal coverage | Report status | |
|---|---|---|---|
| | | Revision | Comments |
| 1 | Summary report | | |

# List of appendices

| Appendix | Content |
|---|---|
| A | Definitions of geo-environmental terms used in this report |

# 1 Summary report

## 1.1 Objectives

1.1.1 This report describes a ground investigation summary carried out for the Phase 1 area of a site located on land east of Chipping Lane, Longridge, Preston PR3 2NA.

1.1.2 This report has been prepared to support a planning application for the development and where possible address paragraphs 120 and 121 of the National Planning Policies framework.

## 1.2 Client instructions and confidentiality

1.2.1 This report was prepared in February 2016 acting on instructions received through our client Barratt Homes (Manchester).

1.2.2 This report has been prepared for the sole benefit of our above named instructing client.

## 1.3 Report format and investigation standards

1.3.1 This summary report has been produced to provide a brief technical summary of environmental/contamination and geotechnical issues at the site following completion of Phase 2 intrusive ground investigations to be used in support of an initial planning application for the site. The summary is intended to form preliminary information about the site only and does not provide a full detailed assessment of chemical/gaseous contamination or geotechnical aspects. It should be noted that Phase 1 preliminary desk study investigations have been previously undertaken for the site by Curtins Consulting Ltd (Ltd (ref EB1355/GL/3692 Rev A Issue 01 dated 14th April 2014)

1.3.2 This summary report identifies both preliminary contamination and geotechnical aspects of the site. The desk study process followed the principles of BS10175: 2011 *'Investigation of potentially Contaminated Sites – Code of Practice'* and limited to a preliminary investigation as described in this document.

## 1.4 Summary report

| Topic | Summary |
|---|---|
| **Site location** | Site located off Chipping Lane on the northern outskirts of Longridge, Preston PR3 2NA. National Grid Reference for the site is 360165, 438010. |
| **Site conditions** | Site currently comprises open fields consisting of 3 parcels of land 5.4Ha in size, separated by mature hedgerows and localised trees. Land is currently used to grow grass for animal feed/grazing. Topographical levels in the area are generally flat, with localised ponding of surface water evident across the site in addition to small ponds local to boundaries. The site is bound to north and east by further open grassed fields, with a cricket ground also present adjacent to the north. A small garage with fuel pumps, residential dwellings and a large supermarket are present to the south of the site, with Chipping Lane forming the western site boundary. Further recreational grounds are located beyond Chipping Lane. |
| **Proposals** | Development of up to 363 homes within what is termed Phases 1 and 2, with associated landscaping, gardens, hardstanding and access roads. This summary report refers to the Phase 1 area only (see aerial image above) in which 118 dwellings are proposed. |
| **Investigations** | Review of Phase 1 desk study information produced by Curtins Consulting Ltd (ref EB1355/GL/3692 Rev A Issue 01 dated 14th April 2014) and completion of Phase 2 intrusive ground investigations at the site by Soiltechnics Ltd comprising 20 trial pits and 7 boreholes excavated to depths of up to 4.5m. Installation of 4 gas and groundwater monitoring wells also undertaken as a precaution. |
| **History of the site** | Since the earliest historical map dated 1893 the site has been occupied by open fields and farmland. Approx. 50m-100m to the north and north east of the site are a number of small ponds bounded by embankments. The historical maps illustrate no existing buildings or developments and have remained unchanged up until the most recent historical maps.<br><br>Since 1893 the surrounding area adjacent to the site is bound by Chipping Lane to the east and Higher Lane to the south. Pit street mill is illustrated 20m to the south east of the site and a cluster of residential housing and farm houses, including Berry Farm and Crumpax Farm, are located approximately 50-60m from the site. Adjacent to the south west of the site are several buildings labelled Alston Arms and 50m to the west of the site is an iron and brass foundry. During 1895 the surrounding area illustrates the development of a number of works, mills and factories, including a gas works and a foundry circa 50m south west of the site. From 1913 onwards steady urban expansion continued within Longridge to the south, slowing by 1932. A brook is shown running adjacent to the western boundary from 1932. From 1961 to 1967 the surrounding area expanded significantly, with the closest developments occurring approximately 10-30m from the site (Frey Stocks) and a garage south east of the site. The pattern of redevelopment to the surrounding area continues, however not within close proximity of the site. The site remains predominantly unchanged up to the most recent historical maps. |

| Topic | | Summary | | | |
|---|---|---|---|---|---|
| **Environmental setting** | | The underlying Devensian Till is recorded as unproductive Strata and land immediately adjacent to the north east of the site is underlain by a Secondary A Aquifer, likely to represent the nearby Alluvium deposits. The underlying solid geology comprises of Mudstones and Siltstones acting as a Secondary A Aquifer.<br><br>The nearest surface water feature is a tertiary river (Higgin Brook) located along the field boundary to the central and eastern most parcels of land. The site lies in Flood Zone 1 and is therefore at no risk from flooding. There are no Pollution incidents, Discharge Consents, Local Authority Pollution Prevention and Controls permits arising from the site. Groundwater was not encountered in any excavations at the site to depths of 4.5m.<br><br>The Envirocheck report confirms that there are no BGS Recorded Landfill within 1000m of the site boundary. There are no historical landfill recorded within 1000m of the site. There are two recorded Registered Landfill site within 1000m of the site. The nearest is located 750m north west, the licence holder was William Pye Ltd at Lords Quarry, Longridge, the site is still in operation. | | | |
| **Ground conditions** | **Soils (geological sequence supplemented by intrusive observations)** | **Strata** | **Typical Soil type** | **Approximate depth to base** | |
| | | Topsoil | Sandy clays | 0.2m-0.5m | |
| | | Devensian Till | Clay with silt and sands | Not proven >4.5m | |
| | | Bowland Shale Formation | Mudstone and siltstone | >4.5m (not encountered) | |
| | **Groundwater and Geohydrology** | **Strata** | **Aquifer designation** | **Likely permeability** | **Groundwater** |
| | | Devensian Till | Unproductive strata | Low | None |
| | | Bowland Shale Formation | Secondary A aquifer | Low-moderate | Likely to be present in fractures |
| | | Site not recorded in source protection zone (SPZ).<br>There is one surface water abstraction within 1000m of the site located 445m south east which is a field drain located in Lyndhurst, Longridge. There are no potable water abstractions within 1000m of the site. There are two groundwater abstractions within 1000m of the site, the nearest is located at Mill Farm borehole located 889m north west of the site. | | | |
| **Land stability and coal mining** | | The Envirocheck Report confirms that there is a low risk to no hazard from the following ground stability hazards on and around the site; running sands, shrinking or swelling clay, collapsible ground, landslides and ground dissolution, however, there is a high risk potential for compressible ground stability hazards (associated with the Glacial clays).<br><br>The Envirocheck report confirms that the site is within an area which is highly unlikely to be affected by coal mining activity. The site lies outside a coal mining referral area, and as such, a Coal Authority report is not required. | | | |
| **Soil classification** | | Devensian Till likely to be shrinkable and medium plasticity based on intrusive investigations undertaken to date. Awaiting laboratory confirmation. | | | |

| Topic | | Summary |
|---|---|---|
| **Foundation solution** | | Site has remained undeveloped and comprises Topsoil overlying Devensian Till. Till typically comprising soft to firm, low to medium strength clays to depths of around 1m, with 60kPa typical of shear strength in such soils. Below such depths clays become stiff to very stiff and high to very high strength, with 100kPa-200kPa typically of insitu shear strength.<br><br>Traditional strip/trench fill foundations likely to be achievable, which may require deepening in close proximity to existing field boundaries where vegetation is to remain (mature hedgerows and trees up to 8m in height). If major vegetation is proposed this would need consideration. Consideration will also need to be given to farming history and whether near surface soils have supported growth of crops historically which could have an influence on overall foundation depths due to moisture depletion and seasonal shrinkage and swelling.<br><br>Ground bearing floor slabs can be adopted at this site where buildings are remote from trees and where Topsoil deposits are fully removed within the footprint of the building. In areas close to existing major vegetation at the site (or where ground floors are elevated requiring in excess of 600mm of fills) then we recommend the use of a suspended ground floor with a sub floor void determined following NHBC Standards, Chapter 4.2.<br><br>A CBR value of 2-3% likely based on likely plasticity of near surface clay and insitu shear strength measurements. Increased level of Design Class for concrete is not anticipated given geology. |
| **Soakaway feasibility** | | Based on a small number of infiltration tests undertaken during site investigations, near surface Devensian Till deposits are considered to be impermeable and soakaway systems are not considered feasible. Alternative drainage solutions will need to be sought, potentially discharging into Higgin Brook. |
| **Contamination** | **Chemical** | Potential sources of contamination have not been identified onsite. A series of potentially contaminative land uses have been established adjacent to the southern site boundary, associated with historic mills, dairy and a garage with filling pumps (the latter still present). No other significant offsite sources within 500m that are likely to affect near surface soils and groundwater. Basic suite of chemical testing has been scheduled on near surface soils across the site and TPHs and VOCs targeted in soil samples taken from exploratory positions immediately adjacent to the southern site boundary to establish potential migration of contaminants onto site. |
| | **Gas** | Closest landfill recorded approximately 750m to the north-east of the site which is considered remote and any gases unlikely to feasibly migrate to the subject site due to presence of cohesive Devensian Till deposits. Small localised, potentially backfilled, quarries unlikely to affect the site on same basis. Given size of localised historic ponds, it is considered unlikely that any gasses potentially produced from associated organic soils would affect the site. Site considered to be low risk. Standpipes have been installed at the site as a precaution, however, based on recommendations made by Curtins in their Phase 1 report and to avoid potential conflict/delays with planning at later stages. Confirmation currently being sought from LA to determine if they agree with our risk assessment and monitoring is not required. |
| | **Radon** | No protection required. |
| **Future works** | | Interpretative reporting of intrusive investigations undertaken on site currently underway and will be finalised following receipt of laboratory test data. |
| **Statement with respect to NPPF paragraphs 120 and 121** | | Site not considered to present unacceptable risk from land instability. Site considered not at risk of any manmade or natural hazards.<br>Possible risk of chemical/gaseous contamination is considered to be low.<br>Remediation to render the site fit for purpose with respect to chemical contamination is unlikely to be required. |

## 1.5 Risk summary

1.5.1 Based on the summary in Section 1.4, we have provided a table below which outlines the site conditions any associated hazard, level of risk to the proposed development based on likelihood and severity of any identified hazards and recommendations in relation to potential further investigations required to reduce the identified risk(s) to an acceptable level.

**Risk summary**

| Risks | Hazard and risk consideration | Likelihood of hazard occurring | Perceived risk | Recommendations if required |
|---|---|---|---|---|
| **Historical development** | No previous development recorded. Site investigations indicating Topsoil overlying Devensian Till clays. | Unlikely | Low | Intrusive investigations completed and risk omitted. |
| **Geological conditions – unsuitable founding strata** | Site underlain by Devensian Till clays. Likely that such soils will provide adequate support to traditional foundations, slabs and hardstanding subject to effects of historic cropping and existing vegetation at the site. Soakaway systems unlikely to be feasible. | Possible | Low/ Moderate | Intrusive investigations completed and detailed analysis now required. |
| **Land stability** | No hazard from ground dissolution, shrinking and swelling of clay, collapsible ground, occurrence of landslides and running sands. Site is however recorded in an area at high risk of compressible ground associated with near surface clays. | Likely | Low/ Moderate | Intrusive investigations completed and detailed analysis now required |
| **Coal mining** | Potential for coals to have been works at shallow levels that may not have been recorded. | Unlikely | Low | N/A |
| **Chemical contamination** | No sources identified onsite. Marginal risk from offsite sources adjacent to the south, samples have been collected and testing underway to confirm, or otherwise, that any associated contamination has not migrated to site. | Unlikely | Low | Intrusive investigations undertaken, no sources identified. |
| **Gaseous contamination** | Landfill sites, ponds and backfilled quarries remote and any gases unlikely to feasibly migrate to the site. No sources onsite and unlikely that there is any risk of causing harm to health of current/end users, construction operatives and buildings/structures. | Unlikely | Low | Confirmed by intrusive investigations and assessment requires agreement by LA. |

## Definition of geo-environmental terms used in this report

***Conceptual model***
Textual and/or schematic hypothesis of the nature and sources of contamination, potential migration pathways (including description of the ground and groundwater) and potential receptors, developed on the basis of the information obtained from the investigatory process.

***Contamination***
Presence of a substance which is in, on or under land, and which has the potential to cause harm or to cause pollution of controlled water.

***Controlled water***
Inland freshwater (any lake, pond or watercourse above the freshwater limit), water contained in underground strata and any coastal water between the limit of highest tide or the freshwater line to the three mile limit of territorial waters.

***Harm***
Adverse effect on the health of living organisms, or other interference with ecological systems of which they form part, and, in the case of humans, including property.

***Pathway***
Mechanism or route by which a contaminant comes into contact with, or otherwise affects, a receptor.

***Receptor***
Persons, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by the contaminant(s).

***Risk***
Probability of the occurrence of, and magnitude of the consequences of, an unwanted adverse effect on a receptor.

***Risk Assessment***
Process of establishing, to the extent possible, the existence, nature and significance of risk.

# Definition of environmental risk/hazard terms used in this report.

**Based on CIRIA report C552 *'Contaminated land risk assessment – A guide to good practice'.***

**Potential hazard severity definition**

| Category | Definition |
|---|---|
| **Severe** | Acute risks to human health, catastrophic damage to buildings/property, major pollution of controlled waters |
| **Medium** | Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures. |
| **Mild** | Pollution of non sensitive waters, minor damage to buildings or structures. |
| **Minor** | Requirement for protective equipment during site works to mitigate health effects, damage to non sensitive ecosystems or species. |

**Probability of risk definition**

| Category | Definition |
|---|---|
| **High likelihood** | Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor. |
| **Likely** | Pollutant linkage may be present, and it is probable that the risk will occur over the long term |
| **Low likelihood** | Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so. |
| **Unlikely** | Pollutant linkage may be present, but the circumstances under which harm would occur are improbable. |

**Level of risk for potential hazard definition**

| Probability of risk | Potential severity | | | |
|---|---|---|---|---|
| | Severe | Medium | Mild | Minor |
| **High Likelihood** | Very high | High | Moderate | Low/Moderate |
| **Likely** | High | Moderate | Low/Moderate | Low |
| **Low Likelihood** | Moderate | Low/Moderate | Low | Very low |
| **Unlikely** | Low/Moderate | Low | Very low | Very low |

Refer sheet 2 for definitions of 'very high' to 'low'

# Definition of environmental risk/hazard terms used in this report.

**Based on CIRIA report C552 '*Contaminated land risk assessment – A guide to good practice'.***

**Risk classifications and likely action required**:

***Very high risk***
High probability that severe harm could arise to a designated receptor from an identified hazard OR there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised is likely to result in substantial liability. Urgent investigation and remediation are likely to be required.

***High risk***
Harm is likely to arise to a designated receptor from an identified hazard. This risk, if realised, is likely to result in substantial liability. Urgent investigation is required and remedial works may be necessary in the short term and are likely over the long term.

***Moderate risk***
It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is likely that the harm would be relatively mild. Investigation is normally required to clarify risks and to determine potential liability. Some remedial works may be required in the long term.

***Low risk***
It is possible that harm could arise to a designated receptor from an identified hazard but it is likely that this harm, if realised, would at worst normally be mild.

***Very low risk***
It is a low possibility that harm could arise to a designated receptor. On the event of such harm being realised it is not likely to be severe.