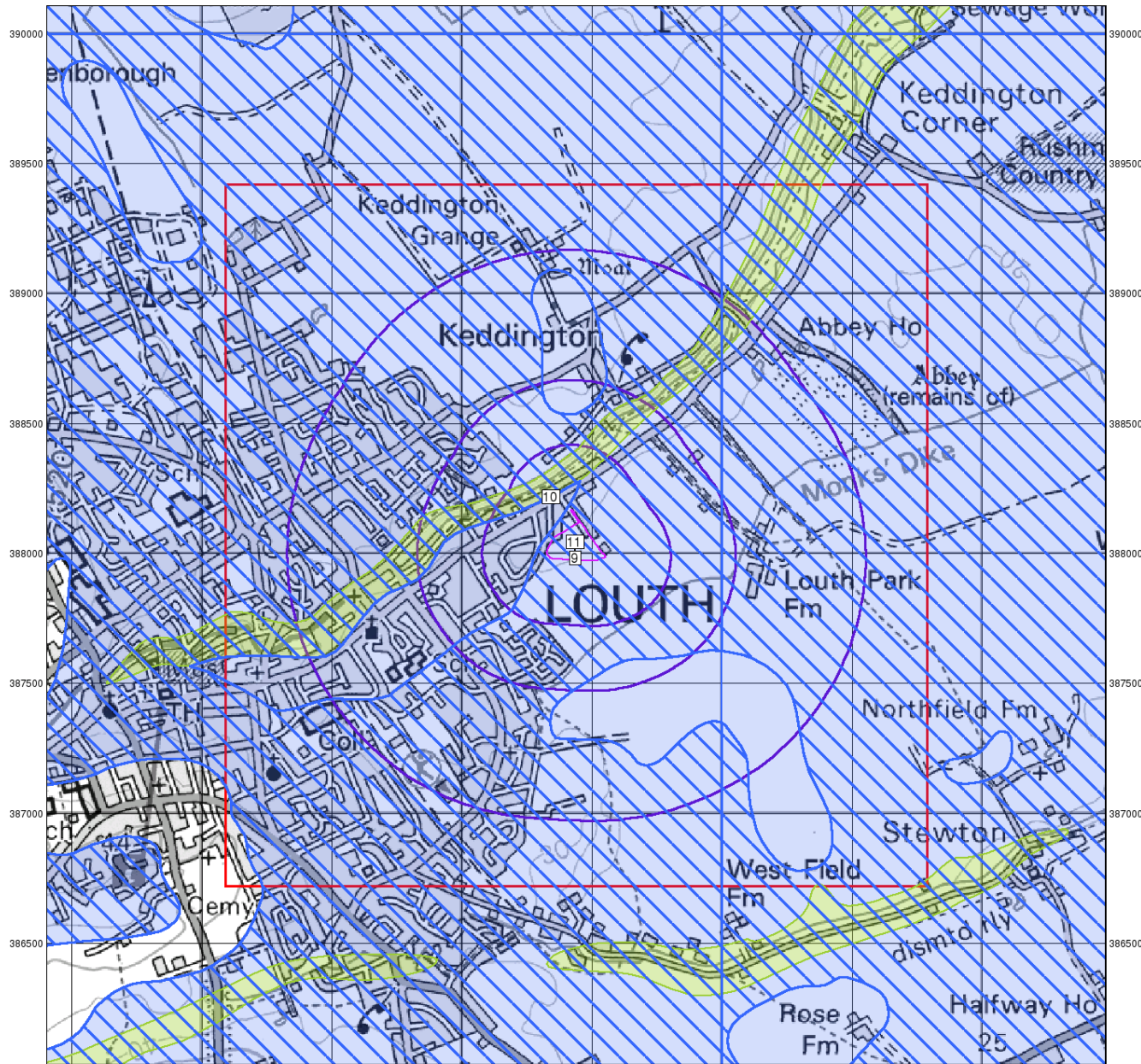


532500 533000 533500 534000 534500 535000 535500 536000



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0 1 km



Ground Stability Data (1:50,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

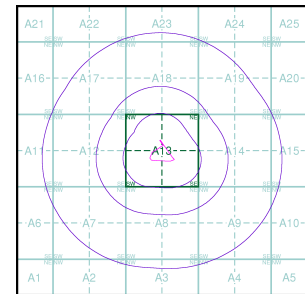
Potential for Running Sand Ground Stability Hazards

- High
- Low
- Moderate
- Very Low

Potential for Shrinking or Swelling Clay Ground Stability Hazards

- High
- Low
- Moderate
- Very Low

Mining and Ground Stability - Slice A



Order Details

Order Number: 295697994_1_1
 Customer Ref: 22069
 National Grid Reference: 534440, 388040
 Slice: A
 Site Area (Ha): 2.08
 Search Buffer (m): 1000

Site Details

Briggs Meadows, LOUTH



Tel: 0844 844 9952
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APPENDIX 9

GIA Risk Assessment Methodology

A1 RISK ASSESSMENT METHODOLOGY FOR CONCEPTUAL SITE MODELS

A1.1 Conceptual Site Models (CSMs)

In order to convey the key geo-environmental issues pertaining to a particular site, based on the engineering judgement of the individual preparing the assessment, the use of a Conceptual Site Model (CSM) is widely adopted. The CSM identifies the potential sources of contamination present at a site (i.e. hazards), identifies the potential exposure mechanisms applicable to the identified possible contaminant source(s) and identifies the receptors plausibly affected by any contamination. Together, this is known as the Source-Pathway-Receptor model and informs the likelihood of a contaminant linkage being present.

The production of a CSM is undertaken as an iterative process, where the CSM is updated following acquisition of additional site-specific information and following resolution of identified uncertainties. As noted in BS EN ISO 21365:2020 *'Soil quality – Conceptual site models for potentially contaminated sites'*: *'The complexity of a CSM should be consistent with the complexity of the site and available data and the purpose for which it is developed.'*

A1.2 Preliminary and Revised CSMs

Preliminary CSMs (pCSMs) are initially derived at the Phase 1 Desk Study stage and aim to identify the key plausible contaminant linkages potentially applicable to a given site. The derivation of these plausible linkages should take account of the uncertainties associated primarily with reliance on literature and desk based information, and are generally refined following acquisition of site-specific information following ground investigation works.

In order to provide an initial risk assessment and qualitative appraisal of the identified plausible contaminant linkages, consideration of the following is required:

- The probability/likelihood of the linkage occurring (See A1.3);
- The severity of the potential consequences of the contaminant linkage (see A1.4);
- The receptor sensitivity within the context of the proposed end use (See A1.5).

Unless otherwise stated in the Objectives section of our report, consideration of the plausible contaminant linkages has been undertaken in the context of the planning regime (i.e. in consideration of the requirements of the National Planning Policy Framework document).

Where the pCSM identifies the requirement for further consideration of one or more plausible contaminant linkages, further lines of evidence are required to provide additional context and clarity over the linkage components. The collation and collection of this additional information is subsequently used to refine the existing linkages detailed within the pCSM, with the refinement(s) detailed within a Revised CSM.

The CSM should be updated after each phase of investigation (i.e. Exploratory, Main or Supplementary Phases as detailed within BS10175:2011+A2:2017 *'Investigation of potentially contaminated sites. Code of practice'*).

A1.3 Assessment of Probability/Likelihood

In determining the terminology used in informing the classification of probability applicable to an identified plausible contaminant linkage, GIA has made reference to CIRIA C552 ‘Contaminated Land Risk Assessment, A Guide to Good Practice’, 2001 and EA R&D publication 66 ‘Guidance for the Safe Development of Housing on Land Affected by Contamination’, 2008.

Table A1-1 details the terms and definitions used in the production of a CSM.

TABLE A1-1 – TERMS USED FOR THE ASSESSMENT OF PROBABILITY		
Classification	Definition	Likelihood
High Likelihood	There is a pollutant linkage and an event is highly likely to occur in the short-term, and is almost inevitable over the long-term OR there is evidence at the receptor of harm or pollution occurring.	>95% likelihood of Consequence Occurring
Likely	There is a pollutant linkage and it is probable that an event will occur. It is not inevitable, but possible in the short-term and likely over the long-term.	50 – 95% likelihood of Consequence Occurring
Low Likelihood	There is a pollutant linkage and circumstances are possible under which an event could occur. It is by no means certain that even over a longer period such an event would take place, and less likely in the short-term.	5 – 49% Likelihood of Consequence Occurring
Unlikely	There is a pollutant linkage and it is improbable that an event would occur even in the very long-term.	<5% likelihood of Consequence Occurring

It should be noted that only plausible contaminant linkages should be included within a CSM. Where there is no plausible source, pathway or receptor applicable to a contaminant linkage, these should be detailed prior to the CSM being prepared.

A1.4 Assessment of Severity

GIA has utilised the definitions of consequence severity detailed within the CIRIA C552 document. These are detailed in Table A1-2 below.

TABLE A1-2 – TERMS USED FOR THE ASSESSMENT OF SEVERITY

Term	Definition
Severe	<ul style="list-style-type: none"> • Acute risks to human health. • Short-term risk of pollution of controlled waters or significant impact on controlled waters; e.g. large-scale pollution or very high levels of contamination. • Catastrophic damage to buildings or property (such as building explosion causing collapse). • Ecological system effects – immediate risks of major damage which is likely to result in irreversible substantial adverse changes in the functioning of the ecosystem or harm to a species of special interest that endangers the long-term maintenance of the population.
Medium	<ul style="list-style-type: none"> • Chronic risks to human health. • Pollution of sensitive water resources (such as leaching of contaminants into controlled waters) causing a significant effect on water quality. • Ecological system effects – Immediate risks of significant damage which may result in substantial adverse changes to the ecosystems functioning or harm to a species of special interest that may endanger the long-term maintenance of the population. • Significant damage to buildings, structures and services (for example foundation damage or rendering the building unsuitable for habitation).
Mild	<ul style="list-style-type: none"> • Non-permanent health effects to human health (i.e. exposure is unlikely to lead to 'significant harm' in the context of Part 2A of the Environmental Protection Act 1990). • Pollution of controlled waters or non-sensitive water resources (for example non-classified groundwater) that results in a short-lived effect to water quality or a marginal effect on amenity value, agriculture or commerce. • Minor damage to buildings, structures and services. • Ecological system effects – Minor or short-term damage which is unlikely to result in substantial adverse changes to the ecosystems functioning or harm to a species of special interest. • Substantial damage to non-sensitive environments (such as arable farmland for example).
Minor	<ul style="list-style-type: none"> • No measurable effects on human health including non-permanent health effects to human health that are easily preventable by appropriate use of PPE/RPE. • Minor pollution of controlled waters including non-sensitive water resources with no discernible effects on water quality or ecosystems. • Minor damage to non-sensitive environments (including arable farmland for example). • Easily repairable effects of damage to buildings, structures, services or the environment (for example discolouration of concrete, loss of plants in a landscaping scheme etc.).

A1.5 Risk Classification

Once the engineering judgment assessment of probability and severity has been provided based on the information available, overall risk associated with that plausible contaminant linkage can be established. The terms detailed in Tables A1-3 and A1-4 have been used by GIA, which are largely based on those provided within CIRIA C552.

TABLE A1-3 - RISK MATRIX

Classification	Consequence of Risk			
	Severe	Medium	Mild	Minor
High Likelihood	Very High	High	Moderate	Moderate/Low
Likely	High	Moderate	Moderate/Low	Low
Low Likelihood	Moderate	Moderate/Low	Low	Negligible
Unlikely	Moderate/Low	Low	Negligible	Negligible

TABLE A1-4 - RISK MATRIX DEFINITIONS

Risk	Definition
Very High	There is a high probability that severe harm will arise to a designated receptor from an identified hazard OR there is evidence that severe harm to a designated receptor is currently happening. Urgent investigation/intervention and remediation are likely to be required.
High	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard (source). However, there is a low likelihood that such harm would be severe, or if any harm were to occur it is more likely that the harm would be mild. Further lines of evidence are normally required to clarify the risk. Some remedial works may be required in the longer term.
Moderate/Low	It is possible that harm could arise to a receptor. However, a combination of likelihood and consequence results in a risk that is above low but is not of sufficient concern to be classified as moderate. It can be driven by cases where there is an acute risk which carries a severe consequence, but where the exposure is unlikely. Such harm would at worst normally be mild. The risk is unlikely to present a substantial liability. Some limited further investigation may be required to clarify the risk and any associated liability. If subsequent remediation works are necessary, they are likely to be limited in extent.
Low	It is possible that harm could arise to a receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Negligible	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is unlikely to be any worse than mild.

In consideration of the overall risk to the site from each identified contaminant linkage, GIA has typically considered risks above Low to require further investigation or intervention to mitigate risks to the identified receptor. Further site-specific detail is provided within our report for the identified contaminant linkages.



APPENDIX 10

GIA Limitations

Limitations

- Ground Investigation Associates Limited (GIA) has prepared this report for the sole use of the Client, showing reasonable skill and care, for its intended purpose and in accordance with our Quotation, Terms and Conditions and Instruction Form. This report may not be relied upon by any third party without the express agreement of the Client and GIA. No other warranty, expressed or implied, is made as to the professional advice included in this report.
- The scope of the investigation was designed based on the development proposed by the Client and taking into account the indicated site boundary. The scope is inappropriate for any other form of development or land not included in the site boundary as originally supplied.
- The report should be read in its entirety, including all associated drawings and appendices. GIA cannot be held responsible for any misinterpretations arising from the use of extracts that are taken out of context.
- Although every reasonable effort has been made to gather relevant and available information, not all potential geotechnical or environmental constraints or liabilities associated with the site may have been revealed by the works undertaken.
- Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.
- GIA disclaim any responsibility to the Client and others in respect of any matters outside the scope of this report.
- This report is confidential to the Client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.
- The findings and opinions conveyed in any Desk Study section of the report (including review of any third party reports) are based on information obtained from the sources listed, which GIA understands are reliable. Reasonable skill, care and diligence has been applied in examining the information obtained. However, GIA accept no responsibility for inaccuracies in the data supplied or for opinions based on any such inaccurate data.
- A Phase I Desk Study collates available information to generate a preliminary Conceptual Site Model (pCSM). The actual geotechnical and environmental considerations can only be fully quantified by intrusive investigation works to confirm the accuracy of the pCSM.
- Where chemical analysis was carried out, this was targeted to identified key contaminants of potential concern based on our understanding of the available information. It should not be inferred that other chemical species are not present.
- Groundwater observations relate to conditions encountered at the time of investigation. It must be understood that groundwater levels may vary as a result of recent climatic conditions, tidal influence, seasonal variation and longer-term trends.
- Comments relating to ground conditions between, and below the base of, those encountered by GIA in exploratory holes are for guidance purposes only. No liability can be given for the accuracy of those comments.
- The works completed may be limited by the timeframe available and any restrictions associated with access, services and obstructions.
- GIA is a geo-environmental consultancy. The scope of our works specifically excludes formal surveys relating to archaeological sites, asbestos-containing materials, invasive weeds, radioactive substances or Unexploded Ordnance.
- Drawings included in this report do not comprise an accurate base plan and are used to present the general relative locations of features on and in the immediate vicinity of the site. Such features should not be used for setting out and should be considered indicative only.
- This report has been prepared in accordance with our understanding of industry good practice guidance at the time of report production. Changes to good practice, guidance or legislation after the report date will necessitate a review and amendment of our report.
- Should any new information be provided relating to the environmental or geotechnical site conditions it will be necessary to review our report to assess whether it remains applicable.
- The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of GIA.