

Land off Normandy Way, Hinckley

Mineral Resource Assessment

Richborough Estates

Table of Contents

1. Introduction	3
The Site	3
Proposed development.....	3
2. Mineral Resource.....	4
Type of mineral	4
Superficial Deposits	4
Bedrock Geology	4
Existing mineral exploration data	5
Further intrusive investigation data	5
Extent of mineral.....	5
Estimated tonnage of resource	5
Estimated economic value of mineral	5
3. Constraints on mineral extraction.....	6
4. Opportunities on mineral extraction	6
5. Conclusion	6
6. References	7
7. Appendices	8

1. Introduction

The Site

This report has been prepared by the Minerals Department of Fisher German LLP following instructions from Richborough Estates Ltd. The report is a Mineral Resource Assessment in support of a planning application for a proposed residential development on land off Normandy Way, Hinckley (the Site).

The national grid reference for the centre of the Site is SP 4295 1470. Appendix 1 - *Drawing Ref: 22-04_Richborough Est_Hinckley_Geo*, shows the Site location and extent. The indicative Site location is shown in Figure 1 below.

The Site falls within a sand and gravel Mineral Safeguarding Area identified by Leicestershire County Council, being the mineral planning authority for the area (Appendix 2 – MSA plan). Under policy M11 of the Leicestershire Minerals and Waste Local Plan up to 2031, planning applications for non-mineral development within a Mineral Safeguarding Area should be accompanied by a Mineral Resource Assessment of the effect of the proposed development on the mineral resource beneath or adjacent to it.



FIGURE 1. INDICATIVE SITE CENTRE LOCATION

Proposed development

An outline planning application for the proposed development on the Site was submitted in March 2022. The proposed development includes 475 dwellings, including affordable housing provision, public open space, land for a new primary school and drainage infrastructure. (Appendix 3 – Illustrative Layout).

2. Mineral Resource

Type of mineral

Information published by the British Geological Survey (BGS) on online resources, maps, geological memoirs, and other relevant literature has been reviewed. Where appropriate, published information and previous exploratory hole records have been referred to, to complement and assist with the interpretation of the data obtained from the ground investigation works. For this reference has been made to the following:

- British Geological Survey GeoIndex Onshore (British Geological Survey 2017a)
- British Geological Survey Scanned Records (British Geological Survey 2017b)

The 1:50,000 scale geological mapping has been obtained from the Onshore GeoIndex (British Geological Survey, 2018a). It has been digitised and the superficial and bedrock geology are presented in Appendix 1. The mapping indicates that the Site and surrounding area are underlain by the following materials as described by the British Geological Survey (2018b).

Superficial Deposits

The eastern and western flanks of the Site are underlain fine glacial material, referred to by the BGS as:

Bosworth Clay Member - Clay And Silt. *Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by ice age conditions (U)*

Setting : *ice age conditions (U). These sedimentary deposits are glacial in origin. They are detrital, created by the action of ice and meltwater, they can form a wide range of deposits and geomorphologies associated with glacial and inter-glacial periods during the Quaternary.*

The central belt of the Site is underlain by a broad band of diamicton, referred to by the BGS as:

Oadby Member - Diamicton. *Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by ice age conditions.*

Setting: *ice age conditions. These sedimentary deposits are glacial in origin. They are detrital, created by the action of ice and meltwater, they can form a wide range of deposits and geomorphologies associated with glacial and inter-glacial periods during the Quaternary.*

The central belt of diamicton is flanked by sand and gravel, referred to by the BGS as:

Wolston Sand And Gravel - Sand And Gravel. *Superficial Deposits formed up to 3 million years ago in the Quaternary Period. Local environment previously dominated by ice age conditions (U).*

Setting: *ice age conditions (U). These sedimentary deposits are glacial in origin. They are detrital, created by the action of ice and meltwater, they can form a wide range of deposits and geomorphologies associated with glacial and inter-glacial periods during the Quaternary.*

A plan showing the British Geological Survey 1:50,000 Superficial Deposits map is shown in Appendix 1.

Bedrock Geology

The BGS mapping confirms the Bedrock Geology for the entire Site to be:

Mercia Mudstone Group - Mudstone. *Sedimentary Bedrock formed approximately 201 to 252 million years ago in the Triassic Period. Local environment previously dominated by hot deserts.*

Setting: hot deserts. *These sedimentary rocks are fluvial, lacustrine and marine in origin. They are detrital, deposited in lagoons or shallow seas; where a hot, arid climate also leads to the precipitation of beds of evaporites.*

Existing mineral exploration data

Publicly available borehole data is not available for the Site however there are several boreholes within a mile of the Site – see Appendix 4.

All the boreholes penetrate the Oadby Member Diamicton and are believed to continue through to the Wolston Sand and Gravel should it exist beneath. The boreholes prove 11m of glacial tills and clays, with only the occasional sand interval observed.

Further intrusive investigation data

At the time of writing, no intrusive borehole data is available for the Site. It is recommended a site investigation is carried out in order to discount the presence of any worked mineral deposit.

Extent of mineral

Based on the information available, we do not believe mineral of sufficient quality or quantity exists beneath the Site. The thick seam of glacial till overlies the central portion of the Site, bringing into question the viability of sand and gravel should it exist beneath the glacial till. There are no superficial deposits on the eastern and western boundaries of the Site, with the basement geology of the Bosworth Clay Member being present at the surface.

The geological map describes the deposits on the Site as glaciogenic in origin; such deposits are generally high in fine material content. The nearby borehole data further supports this, displaying clays down to a depth of 11m with no seams of viable sand and gravel mineral present.

Estimated tonnage of resource

In accordance with the PERC Reporting Standard (Pan European Reserves and Resources Reporting Committee, 2021) the assessment can only be an **Inferred Mineral Resource**.

An **Inferred Mineral Resource** is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity.

An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with a detailed site-specific investigation.

Estimated economic value of mineral

Given the quality concerns around the high clay content of the mineral beneath the Site, the economic value of the minerals is considered to be: **Low**.

3. Constraints on mineral extraction

Should intrusive surveys confirm the presence of economic grade mineral, the below standoff distances would typically be employed. They may, however, be subject to change following detailed assessment in subsequent development stages.

TABLE 1. DEVELOPMENT CONSTRAINTS

Constraint	Value
Max overburden to mineral ratio	1:1
Standoff to external highway boundaries	30m
Standoff to significant hedgerow	15m
Standoff to residential dwellings	100m

Given there are no quarries adjacent to the Site, if a mineral deposit was encountered, it would need to be significant in size to enable it to be extracted as a standalone development.

4. Opportunities on mineral extraction

As indicated in Section 2 above, we do not believe there is commercially viable mineral beneath the Site due to the depth of glacial till present and clay on the eastern and western boundaries.

If economic mineral was confirmed by an intrusive investigation, prior extraction may not be deemed feasible as it would reduce the level of the land making it potentially unsuitable for house building.

Prior extraction would also cause significant delays to the delivery of the housing development due to the time required to extract the mineral and restore the land.

5. Conclusion

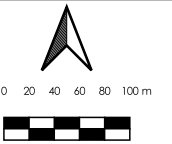
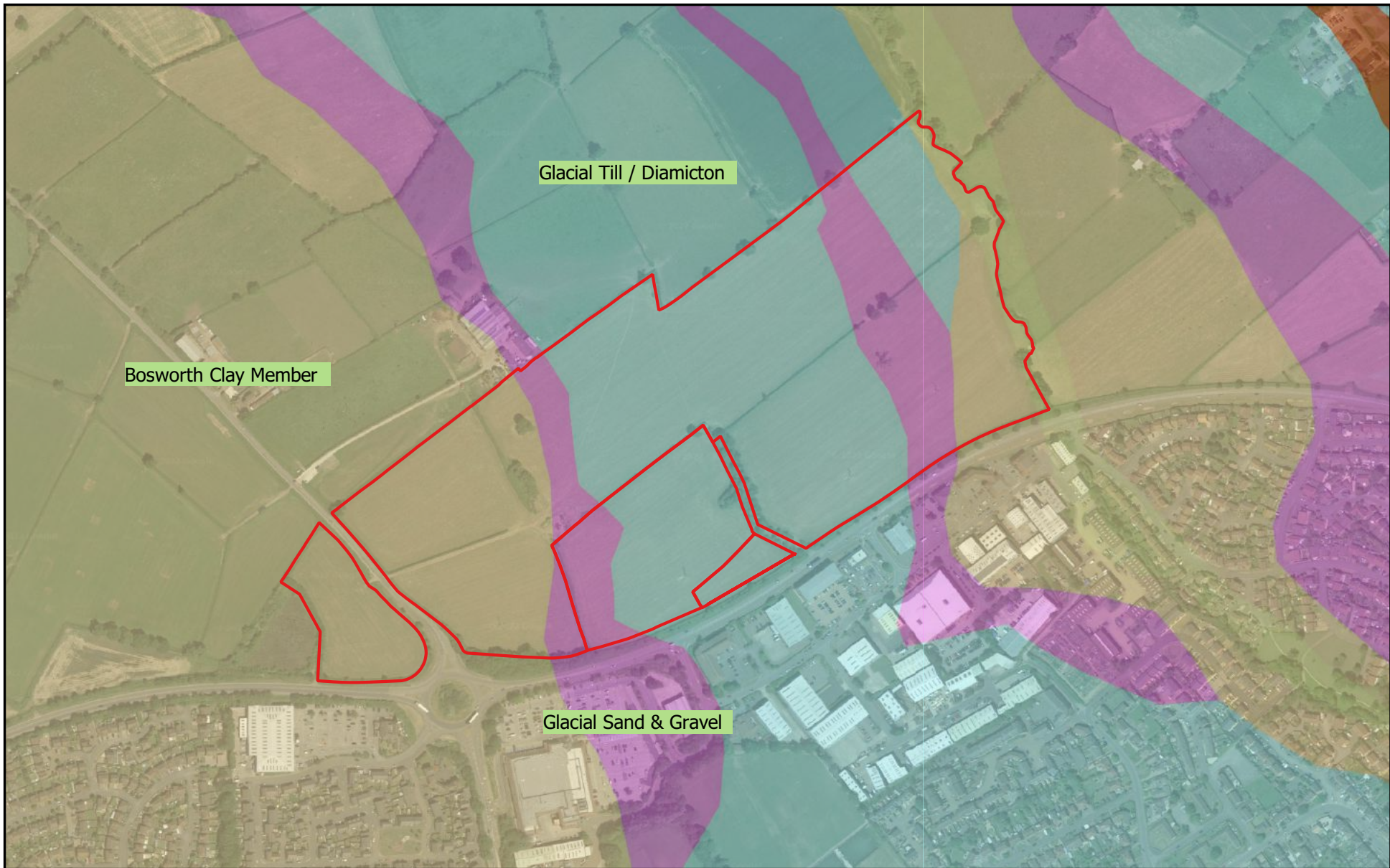
- The Site falls within a sand and gravel Mineral Safeguarding Area identified by Leicestershire County Council
- Following analysis of publicly available geological information, it is concluded that there are no economically viable deposits of sand and gravel present beneath the Site.
- The economic value of the minerals (if present on the Site) is considered to be low due to the fine sandy nature and the high silt content of glacial sands and gravels present in the local district.
- It is recommended that a site-specific intrusive investigation is carried out to prove there are no economically viable sand and gravel deposits present.

6. References

- Leicestershire Minerals and Waste Local Plan up to 2031 [online]
<https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2019/10/3/Leicestershire-Minerals-and-Waste-Local-Plan-Up-to-2031-Adopted-2019.pdf>
- British Geological Society (2018a) *GeoIndex Onshore* [online] <http://mapapps2.bgs.ac.uk/geoindex/home>
(accessed on 30th April 2018)
- British Geological Society (2018b) *Lexicon of named rock units* [online] <http://www.bgs.ac.uk/lexicon>
(accessed 30 April 2018)
- Pan European Reserves and Resources Reporting Committee (2021) PERC Reporting Standard for Reporting of Exploration Results, Mineral Resources and Reserves. PERC, Brussels

7. Appendices

See following pages.

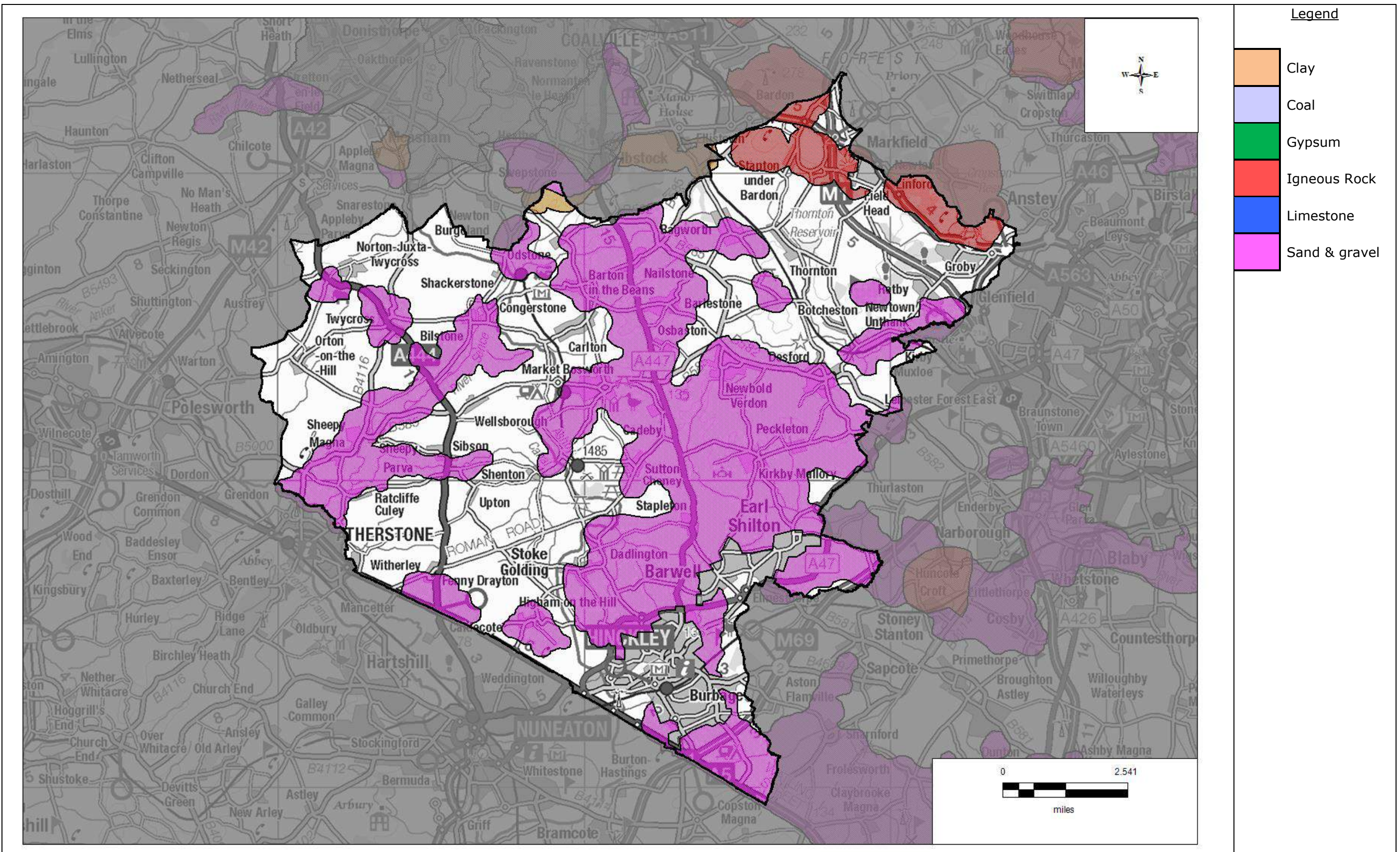


Key :
 Site Boundary

Revision: A
Client: Richborough Estates
Scheme: Hincley
Title: Plan 1 - Superficial Geology
FP: TRG
Scale: 1:6,000 Date: 17/05/2022
© Crown copyright and database rights 2018 Ordnance Survey License Number AL10005237

THIS DRAWING IS PROTECTED BY COPYRIGHT. IT MAY NOT BE REPRODUCED IN ANY FORM OR BY ANY MEANS FOR ANY PURPOSE WITHOUT WRITTEN PERMISSION OF FISHER GERMAN LLP CHARTERED SURVEYORS
 The Estates Office, Norman Court Ashby de la Zouch, Leicestershire, LE65 2UZ 01530 412821 https://www.fishergerman.co.uk ashby@fishergerman.co.uk
Drawing Ref: 22-04_Richborough Est_Hincley

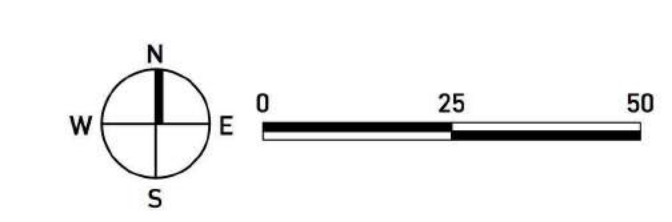
Figure HK1: Areas of borough/district for mineral safeguarding, categorised by mineral type





- KEY**
- SITE LOCATION
25.39 HECTARES / 62.74 ACRES
 - PROPOSED RESIDENTIAL DEVELOPMENT
 - PROPOSED 1 HECTARE FOR 1 FORM ENTRY SCHOOL + 1 HECTARE SAFE GUARDED LAND
 - PUBLIC OPEN SPACE (INCLUDING SuDS) - 8.08 HA / 19.97 ACRES
 - RETAINED EXISTING LANDSCAPE
 - ADDITIONAL/ REINSTATED VEGETATION
 - PRIMARY STREET / AVENUE
 - KEY FOCAL JUNCTION
 - SECONDARY STREET
 - SIDE STREET / SHARED SURFACE
 - PRIVATE LANES
 - RETAINED PUBLIC OF RIGHT OF WAY
 - KEY PEDESTRIAN MOVEMENT WITHIN SITE
 - SUSTAINABLE URBAN DRAINAGE
 - NEIGHBOURHOOD EQUIPPED AREA OF PLAY
 - LOCALLY EQUIPPED AREA OF PLAY
 - LOCAL AREA OF PLAY/ NATURAL PLAY SPACE
 - KEY VISUAL CORRIDORS

- KEY PRINCIPLES**
1. PROPOSED NEW ACCESS VIA HIGHWAYS IMPROVEMENTS TO STOKE ROAD;
 2. PRIMARY STREET PROVIDING VEHICULAR, PEDESTRIAN AND CYCLE MOVEMENT;
 3. SECONDARY MOVEMENT ROUTES PROVIDING A LOOPED INFRASTRUCTURE TO PRIMARY MOVEMENT ROUTES;
 4. SHARED SURFACE ROUTES SERVING CLUSTERS OF DEVELOPMENT;
 5. PRIVATE LANES SERVING OUTWARD FACING DEVELOPMENT PROVIDING PASSIVE SURVEILLANCE OVER NEWLY CREATED OPEN SPACE;
 6. HIGHWAYS IMPROVEMENTS ALONG NORMANDY ROAD PROVIDING DEDICATED CROSSING POINTS TO EXISTING DEVELOPMENT;
 7. RETAINED PUBLIC RIGHT OF WAY RUNNING NORTH-SOUTH THROUGH DEVELOPMENT, PICKING UP KEY EAST-WEST MOVEMENT ROUTES;
 8. KEY PEDESTRIAN MOVEMENT ROUTES RUNNING IN A NORTH-SOUTH AND EAST-WEST MOVEMENT ROUTES OFFERING FULL PEDESTRIAN PERMEABILITY;
 9. KEY MEETING POINT AT HIGHEST POINT OF DEVELOPMENT PROVIDING KEY VISUAL CORRIDORS TO SURROUNDING CONTEXT;
 10. KEY PLAY SPACES ALONG PEDESTRIAN MOVEMENT ROUTES SERVING MAXIMUM RESIDENTS
 11. MAXIMUM RETENTION OF EXISTING FIELD BOUNDARIES AND WOODED AREAS;
 12. CREATION OF COMMUNITY SPACES IN THE FORM OF COMMUNITY ORCHARDS AND INFORMAL KICK ABOUT AREAS;
 13. CREATION OF A SERIES OF GREENWAYS PROVIDING A KEY WILDLIFE NETWORK THROUGHOUT DEVELOPMENT;
 14. PROPOSED ADDITIONAL PLANTING TO THE NORTHERN EDGE TO AID BIO-DIVERSITY AND WILDLIFE OPPORTUNITIES;
 15. POTENTIAL SCHOOL SITE WITH SAFE GUARDED LAND FOR FUTURE SCHOOL EXPANSION;
 16. KEY (PEDESTRIAN MEETING POINTS PROVIDING RESIDENTS OPPORTUNITIES WITH SOCIAL INCLUSION;
 17. SITE LOW POINTS UTILISED FOR SUSTAINABLE URBAN DRAINAGE AIDING WETLAND HABITATS ALONG EXISTING WATERCOURSES;
 18. MAXIMUM CONTINUOUS FRONTAGE ALONG DEVELOPMENT ABUTTING NORMANDY WAY TO REDUCE IMPACT OF ACOUSTIC INTERFERENCE TO REAR GARDEN SPACES;
 19. STREETS AND DEVELOPMENT ORIENTATED TO RUN WITH CONTOURS REDUCING IMPACT OF RETAINING STRUCTURES ON STREET SCENE;
 20. 2M HIGH PLANTED BUND TO REDUCE ANY POTENTIAL ACOUSTIC DISTURBANCE; AND
 21. POTENTIAL ACCESS POINT FOR FUTURE DEVELOPMENT.



BOREHOLE RECORD				Ground Level 20.0 ft. O.D.		BOREHOLE 2 Sheet 1 of 1	
DRILLING			SAMPLES		STRATA SP 49 NW 1		
Rate	Casing	Water	Depth	Type	Key	Depth	Level
14.12 69	8" dia.		2'0"	D		1'0"	19.0
			3'6"-5'0"	U(31)		(0.30m)	
			6'0"	D		5'0"	15.0
			8'0"-9'6"	U(101)		(1.53m)	
9'6"	8'0"		12'0"	D			
15.12 69			14'0"-15'6"	U(177)			
			17'0"	D			
			18'0"-20'0"	S(50)D			
			21'6"	D			
			23'0"-25'0"	S(51)D			
25'0"	14'0"	nil				25'0"	5.0
						(7.62m)	
							End of borehole
Canal Water level 10.1 ft. O.D. (3.07m)							
O/H Open hole rotary drilling R Rotary core size (%) Rotary core (recovery) D Disturbed soil sample B Bulk soil sample W Groundwater sample				√ Ground water first encountered U () 4 in. dia. undisturbed sample (blows/penetration) ✕ Sample not recovered S () Standard Penetration test (blows/foot) C () Cone penetration test (blows/foot)			
DADLINGTON WHARF				5/002/010/86921.			

BOREHOLE RECORD

Contract No. 13869/94

Client Leicestershire County Council

Ground Level

Location Hinckley Magistrates Courthouse 442571

BOREHOLE No. 1

Date November 1994

294282

Depth	Thick-ness	Legend	Description of Strata	Type of Sample	C kN/m ²	M %	Ø	Density kg/m ³	N
0.100	0.100		Made up ground, tarmac						
0.700	0.600		Made up ground, compact stone fill						
				1.000 U	244.3	17		2235	
				2.000 U	219.3	16		2205	
				3.000 U	242.3	13		2270	
	7.300		Very stiff grey and brown boulder clay	4.000 U	241.5	15		2220	
				5.000 U	256.4	15		2280	
				6.000 P					36
8.000				7.500 P					40

Water Struck at

Standing Water Level

Undisturbed Sample
Disturbed Sample
Penetration Test
Cohesion
Angle of Internal Friction
Moisture Content %
Standard Penetration Value

U
O
P
C
Ø
M
N

J. T. HYMAS (Site Investigation) LTD.

12 Yarm Road, Stockton-on-Tees,
Cleveland TS18 3NE
Tel. 0642 607083 Fax. 0642 612355



BOREHOLE RECORD

Contract No. 13869/94

Client Leicestershire County Council

Ground Level

Location Hinckley Magistrates Courthouse 442577

BOREHOLE No. 4

Date November 1994

294352

Depth	Thick-ness	Legend	Description of Strata	Type of Sample	C kN/m ²	M %	Ø	Density kg/m ³	N
0.200	0.200		Made up ground, concrete						
0.600	0.400		Made up ground, rubble fill						
				1.000 U	19.0	22		2040	
				2.000 P					25
				3.000 U	212.2	14		2280	
				4.000 U	228.4	14		2325	
				5.000 U	236.0	13		2270	
				6.000 U	213.2	13		2330	
				7.500 P					44
				9.500 P					45
11.000				10.500 U					58

Water Struck at Standing Water Level

Undisturbed Sample
Disturbed Sample
Penetration Test
Cohesion
Angle of Internal Friction
Moisture Content %
Standard Penetration Value

U
O
P
C
Ø
M
N

J. T. HYMAS (Site Investigation) LTD.

12 Yarm Road, Stockton-on-Tees,
Cleveland TS18 3NE
Tel. 0642 607083 Fax. 0642 612355

