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<https://www.groundsure.com/terms-and-conditions-may25-2018>

BJB Consulting Limited

Head Office, Unit 7, Calder Close, Calder Park,
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Groundsure
Reference:

GS-5187836

Your Reference: 2206

Report Date 2 Jul 2018

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Geo Insight

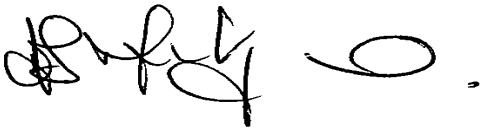
Address: 54 BROAD STREET MALL, BROAD STREET, READING, RG1 7QE

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geo Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,



Managing Director
Groundsure Limited

Enc.
Groundsure Geo Insight

Address: 54 BROAD STREET MALL, BROAD STREET, READING, RG1 7QE

Date: 2 Jul 2018

Reference: GS-5187836

Client: BJB Consulting Limited



Aerial Photograph Capture date: 20-Apr-2015

Grid Reference: 471248,173368

Site Size: 2.44ha

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Overview of Findings

The Groundsure Geo Insight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 and 1:10,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Non-coal mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Geology 1:10,000 Scale

1.1 Artificial Ground	1.1 Is there any Artificial Ground/ Made Ground present beneath the study site at 1:10,000 scale?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site at 1:10,000 scale?*	Yes
	1.2.2 Are there any records of landslide within 500m of the study site boundary at 1:10,000 scale?	No
1.3 Bedrock, Solid Geology and linear features	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale?	No

Section 2: Geology 1:50,000 Scale

2.1 Artificial Ground	2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	2.1.2 Are there any records relating to permeability of artificial ground within the study site*boundary?	No
2.2 Superficial Geology and Landslips	2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
	2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?	Yes
	2.2.3 Are there any records of landslide within 500m of the study site boundary?	No
	2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No

Section 2: Geology 1:50,000 Scale

2.3 Bedrock, Solid Geology and linear features

2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.

2.3.2 Are there any records relating to permeability of bedrock ground within the study site boundary?

Yes

2.3.3 Are there any records of linear features within 500m of the study site boundary?

No

Section 3: Radon

3. Radon

3.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

3.2 Radon Protection

No radon protective measures are necessary.

Section 4: Ground Workings

	On-site	0-50m	51-250	251-500	501-1000
4.1 Historical Surface Ground Working Features from Small Scale Mapping	0	0	0	Not Searched	Not Searched
4.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	0
4.3 Current Ground Workings	0	0	0	20	24

Section 5: Mining, Extraction & Natural Cavities

	On-site	0-50m	51-250	251-500	501-1000
5.1 Historical Mining	0	0	0	0	0
5.2 Coal Mining	0	0	0	0	0
5.3 Johnson Poole and Bloomer Mining Area	1	0	1	2	5
5.4 Non-Coal Mining*	1	0	5	29	13
5.5 Non-Coal Mining Cavities	0	0	0	11	22
5.5 Natural Cavities	0	1	5	18	18

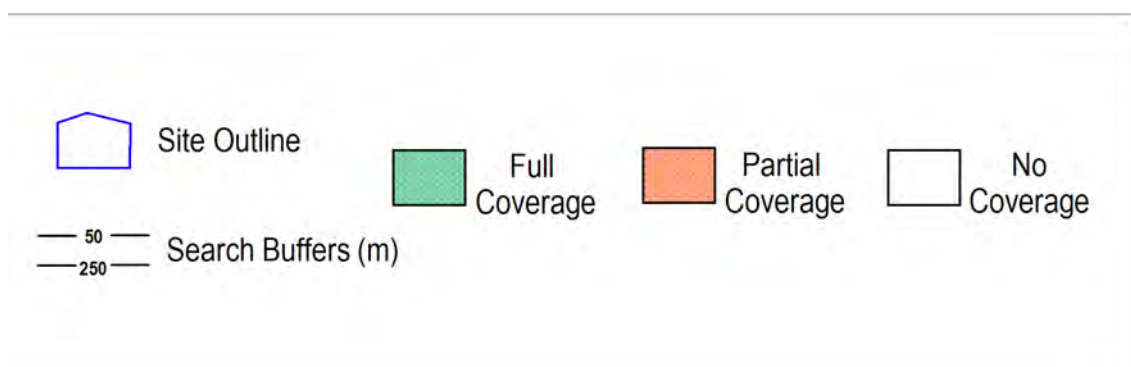
Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Tin Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0
Section 6: Natural Ground Subsidence	On-site				
6.1 Shrink-Swell Clay	Negligible				
6.2 Landslides	Very Low				
6.3 Ground Dissolution of Soluble Rocks	High				
6.4 Compressible Deposits	Negligible				
6.5 Collapsible Deposits	Very Low				
6.5 Running Sand	Very Low				
Section 7: Borehole Records	On-site	0-50m	51-250		
7 BGS Recorded Boreholes	14	16	96		
Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250		
8 Records of Background Soil Chemistry	1	0	0		
Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500	
9.1 Tunnels	0	0	0	Not Searched	
9.2 Historical Railway and Tunnel Features	0	0	0	Not Searched	
9.3 Historical Railways	0	0	0	Not Searched	
9.4 Active Railways	0	0	0	Not Searched	
9.5 Railway Projects	0	0	0	1	

1:10,000 Scale Availability



1_10,000 Availability Legend

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Availability of 1:10,000 Scale Geology Mapping

The following information represents the availability of the key components of the 1:10,000 scale geological data.

ID	Distance	Artificial Coverage	Superficial Coverage	Bedrock Coverage	Mass Movement Coverage
1	0.0	Some deposits are mapped	Full	Full	No coverage
2	1123.0	Some deposits are mapped	Full	Full	No coverage
N3	1567.0	Some deposits are mapped	Full	Full	No coverage
N4	1950.0	Some deposits are mapped	Full	Full	No coverage

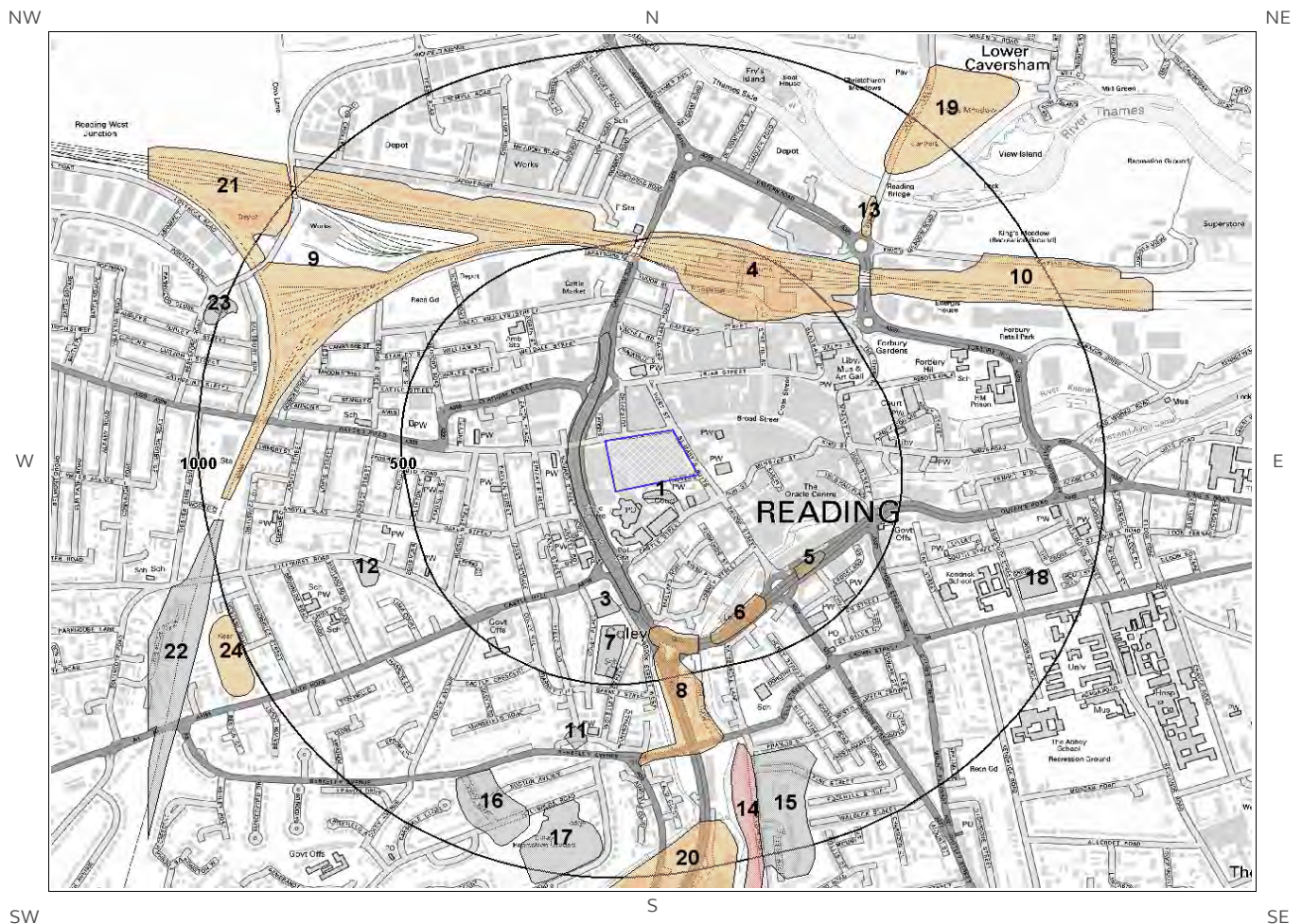
Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not all themes are mapped or available on every map sheet. Therefore a coverage layer showing the availability of the four themes is presented above.

The definitions of coverage are as follows:

Geology	Full Coverage	Partial Coverage	No Coverage
Bedrock	The whole tile has been mapped	Some but not all the tile has been mapped	No coverage
Superficial	The whole tile has been mapped	Some but not all of the tile has been mapped	No coverage
Artificial	Some deposits are mapped on this tile	-	No deposits are mapped
Mass Movement	Some deposits are mapped on this tile	-	No coverage

1 Geology (1:10,000 scale).

1.1 Artificial Ground map (1:10,000 scale)



Artificial Ground Legend

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1. Geology 1:10,000 scale

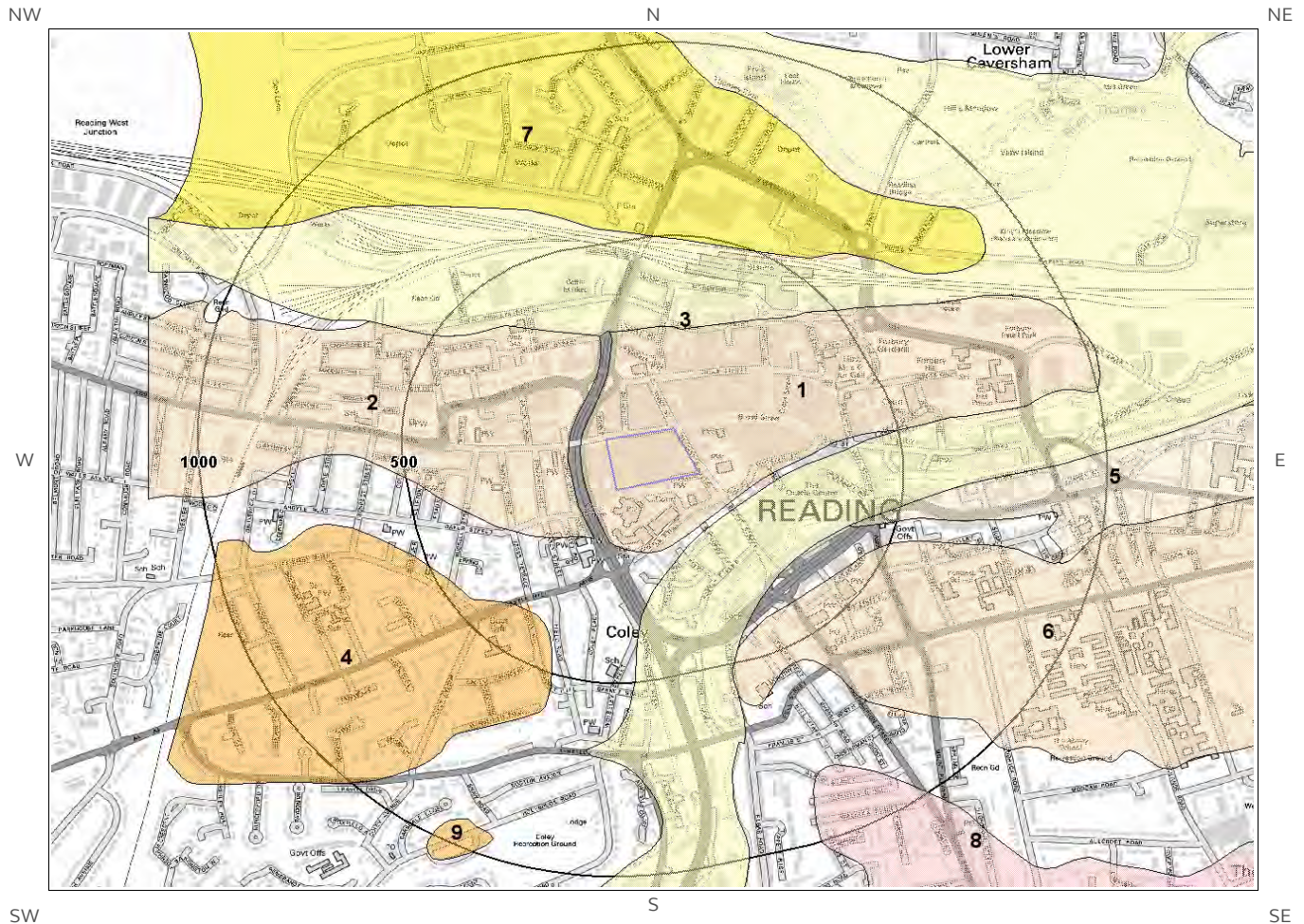
1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

Are there any records of Artificial/ Made Ground within 500m of the study site boundary at 1:10,000 scale? Yes

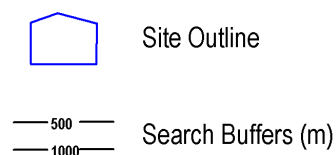
ID	Distance	Direction	LEX Code	Description	Rock Description
1	17.0	S	WGR-VOID	Worked Ground (Undivided)	Void
2	59.0	W	WGR-VOID	Worked Ground (Undivided)	Void
3	269.0	S	WGR-VOID	Worked Ground (Undivided)	Void
4	323.0	N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
5	337.0	SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
6	340.0	SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
7	347.0	S	WGR-VOID	Worked Ground (Undivided)	Void
8	360.0	S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
9	470.0	N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

1.2 Superficial Deposits and Landslips map (1:10,000 scale)



Artificial Ground Legend

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1.2 Superficial Deposits and Landslips

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary at 1:10,000 scale? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	TPGR-XSV	Taplow Gravel Formation - Sand And Gravel	Sand And Gravel
2	88.0	W	TPGR-XSV	Taplow Gravel Formation - Sand And Gravel	Sand And Gravel
3	124.0	SE	ALV-Z	Alluvium - Silt (unlithified Deposits Coding Scheme)	Silt
4	378.0	SW	LHGR-XSV	Lynch Hill Gravel Member - Sand And Gravel	Sand And Gravel
5	389.0	E	KPGR-XSV	Kempton Park Gravel Formation - Sand And Gravel	Sand And Gravel
6	405.0	SE	TPGR-XSV	Taplow Gravel Formation - Sand And Gravel	Sand And Gravel
7	486.0	N	LASI-XCZ	Langley Silt Member - Clay And Silt	Clay And Silt

1.2.2 Landslip

Are there any records of Landslip within 500m of the study site boundary at 1:10,000 scale?

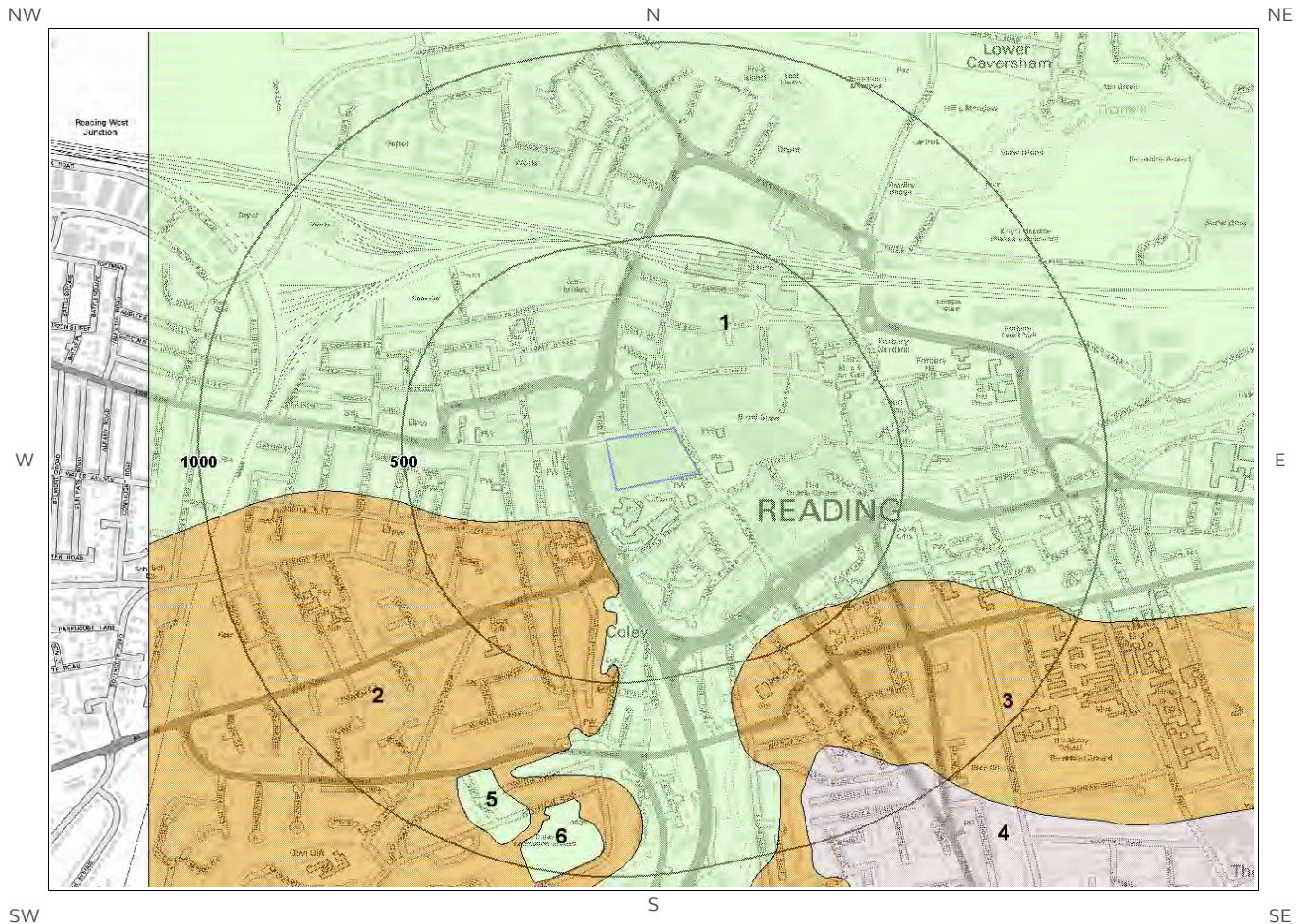
No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:10,000 scale

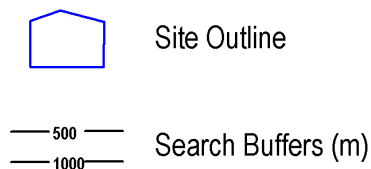
This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3 Bedrock and linear features map (1:10,000 scale)



Bedrock and linear features Legend

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1.3 Bedrock and linear features

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary at 1:10,000 scale.

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	LSNCK-CHLK	Lewes Nodular Chalk Formation, Seaford Chalk Formation And Newhaven Chalk Formation (undifferentiated) - Chalk	Campanian Age - Turonian Age
2	114.0	SW	LMBE-CLSISA	Lambeth Group - Clay, Silt And Sand	Paleocene Epoch
3	440.0	SE	LMBE-CLSISA	Lambeth Group - Clay, Silt And Sand	Paleocene Epoch

1.3.2 Linear features

Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale? No

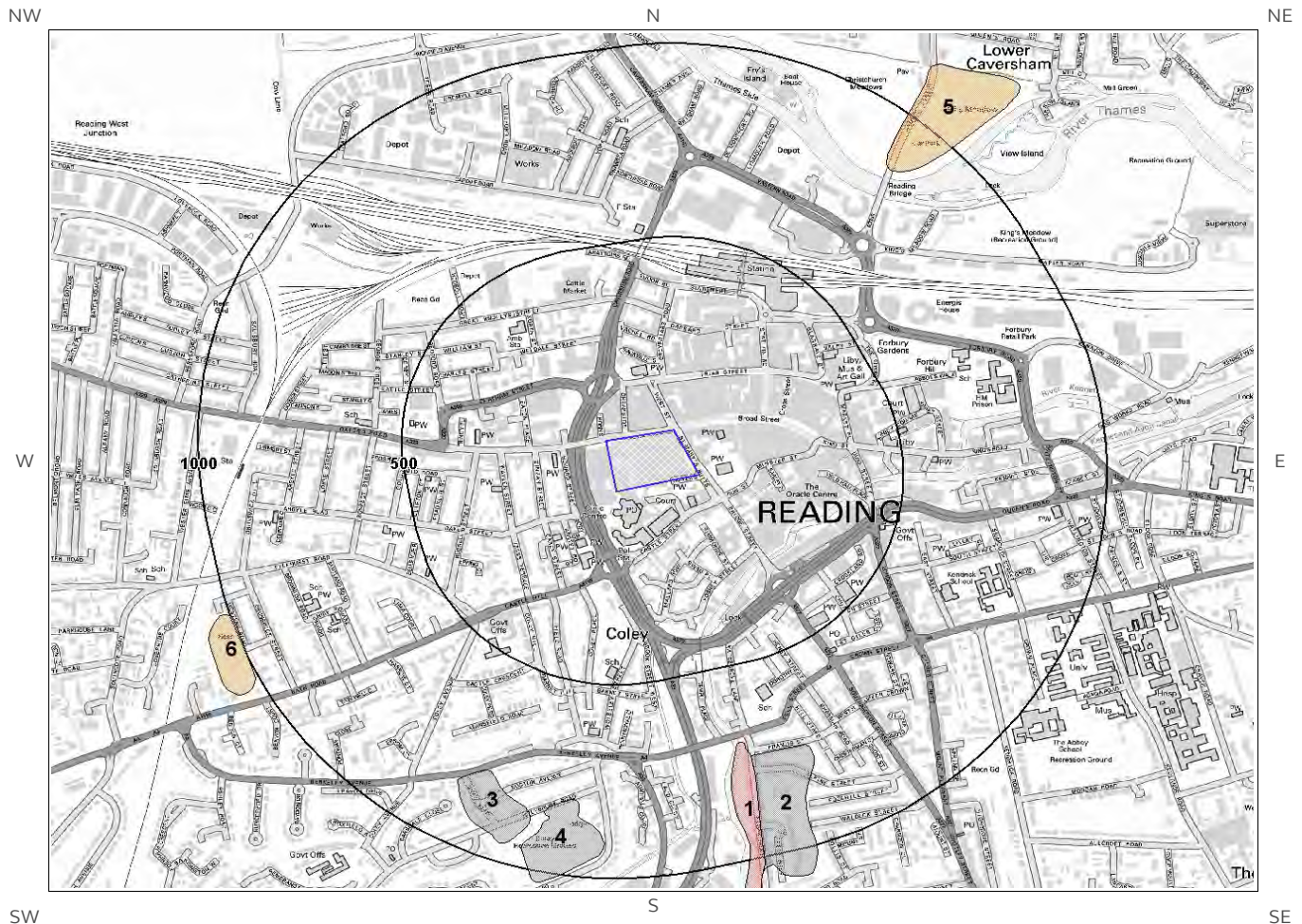
Database searched and no data found at this scale.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of great Britain at 1:10,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2 Geology 1:50,000 Scale

2.1 Artificial Ground map



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2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 268

2.1.1 Artificial/ Made Ground

Are there any records of Artificial/ Made Ground within 500m of the study site boundary? No

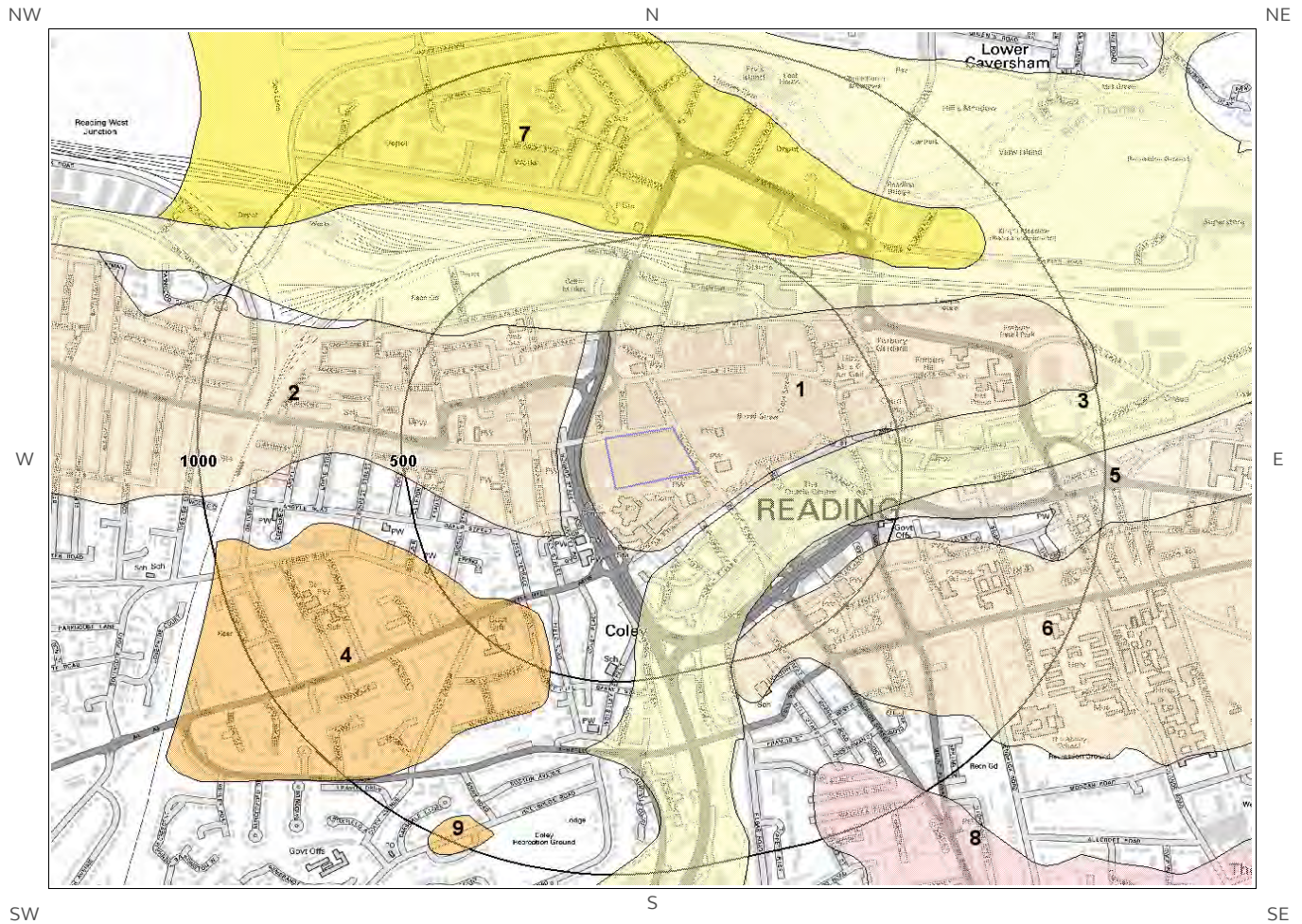
Database searched and no data found.

2.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.

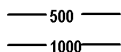
2.2 Superficial Deposits and Landslips map (1:50,000 scale)



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Site Outline



Search Buffers (m)

2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	TPGR-XSV	TAPLOW GRAVEL MEMBER	SAND AND GRAVEL
2	114.0	W	TPGR-XSV	TAPLOW GRAVEL MEMBER	SAND AND GRAVEL
3	125.0	SE	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
4	375.0	SW	LHGR-XSV	LYNCH HILL GRAVEL MEMBER	SAND AND GRAVEL
5	390.0	E	KPGR-XSV	KEMPTON PARK GRAVEL MEMBER	SAND AND GRAVEL
6	402.0	SE	TPGR-XSV	TAPLOW GRAVEL MEMBER	SAND AND GRAVEL
7	484.0	N	LASI-XCZ	LANGLEY SILT MEMBER	CLAY AND SILT

2.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	Very High	High

2.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

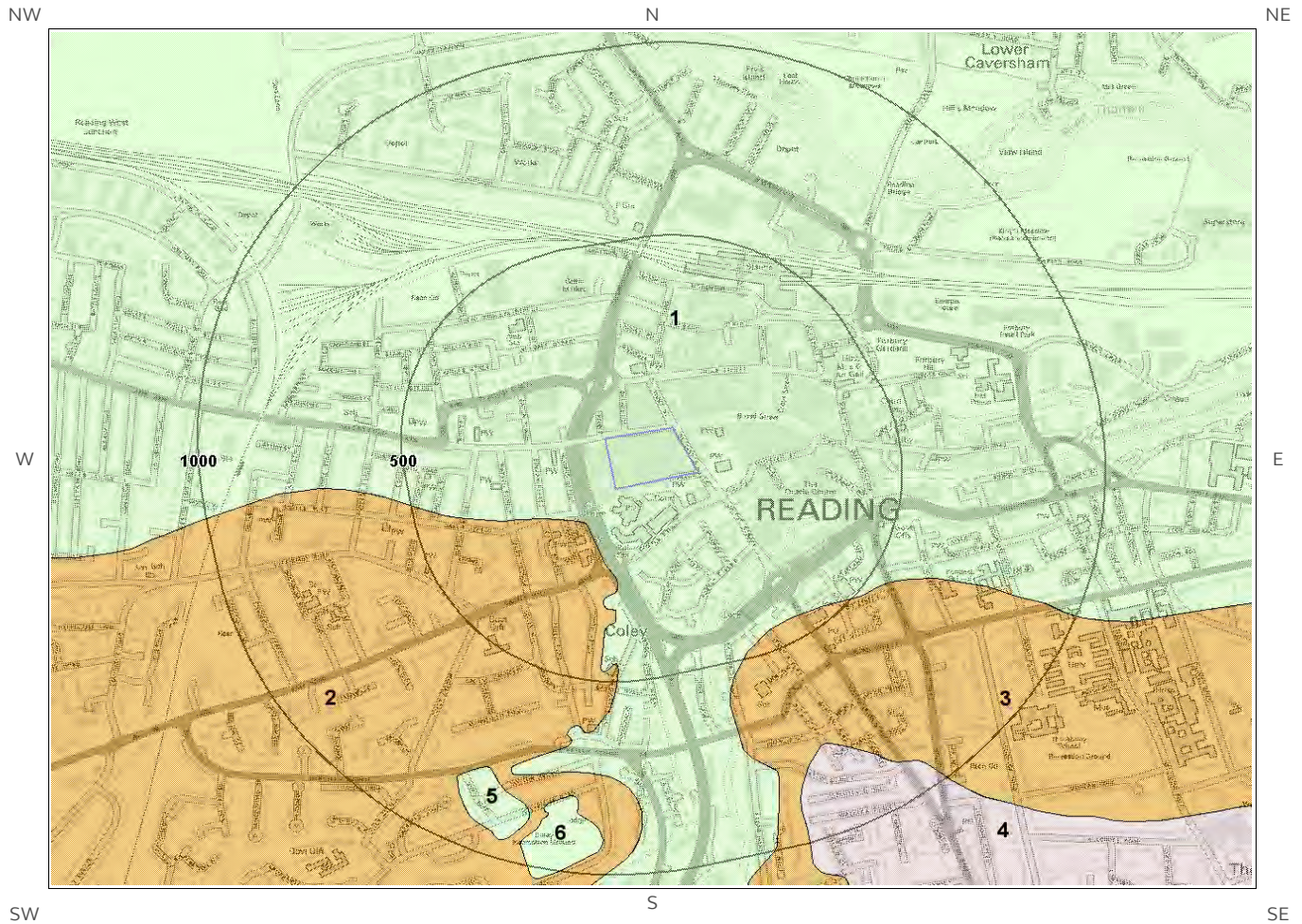
2.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site boundary?

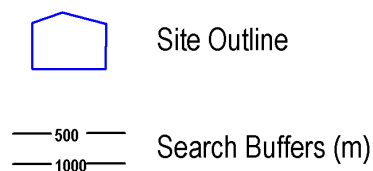
No

Database searched and no data found.

2.3 Bedrock and linear features map (1:50,000 scale)



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2.3 Bedrock, Solid Geology & linear features

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 268

2.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	SNCK-CHLK	SEAFORD CHALK FORMATION AND NEWHAVEN CHALK FORMATION (UNDIFFERENTIATED) - CHALK	CONIACIAN
2	116.0	SW	LMBE-XCZS	LAMBETH GROUP - CLAY, SILT AND SAND	THANETIAN
3	440.0	SE	LMBE-XCZS	LAMBETH GROUP - CLAY, SILT AND SAND	THANETIAN

2.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site boundary? Yes

Distance	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Very High	Very High

2.3.3 Linear features

Are there any records of linear features within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nation wide coverage.

3 Radon Data

3.1 Radon Affected Areas

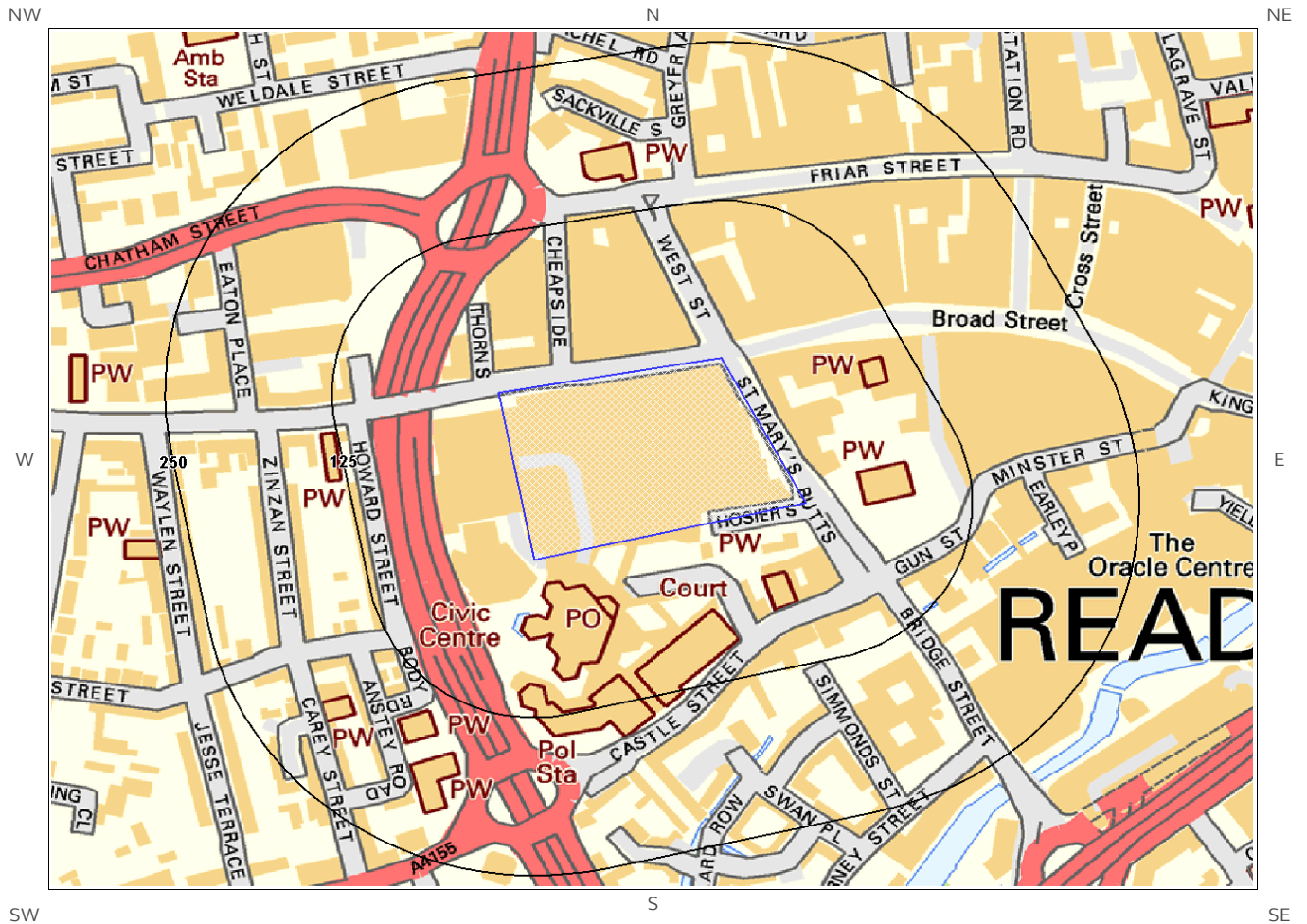
Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

3.2 Radon Protection

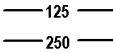
Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

4 Ground Workings map



Ground Workings Legend

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-  Site Outline
-  Historic Surface Ground Workings
-  Historic Underground Workings
-  Current Ground Workings
-  Search Buffers (m)

4 Ground Workings

4.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? No

Database searched and no data found.

4.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? No

Database searched and no data found.

4.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

The following Current Ground Workings information is provided by British Geological Survey:

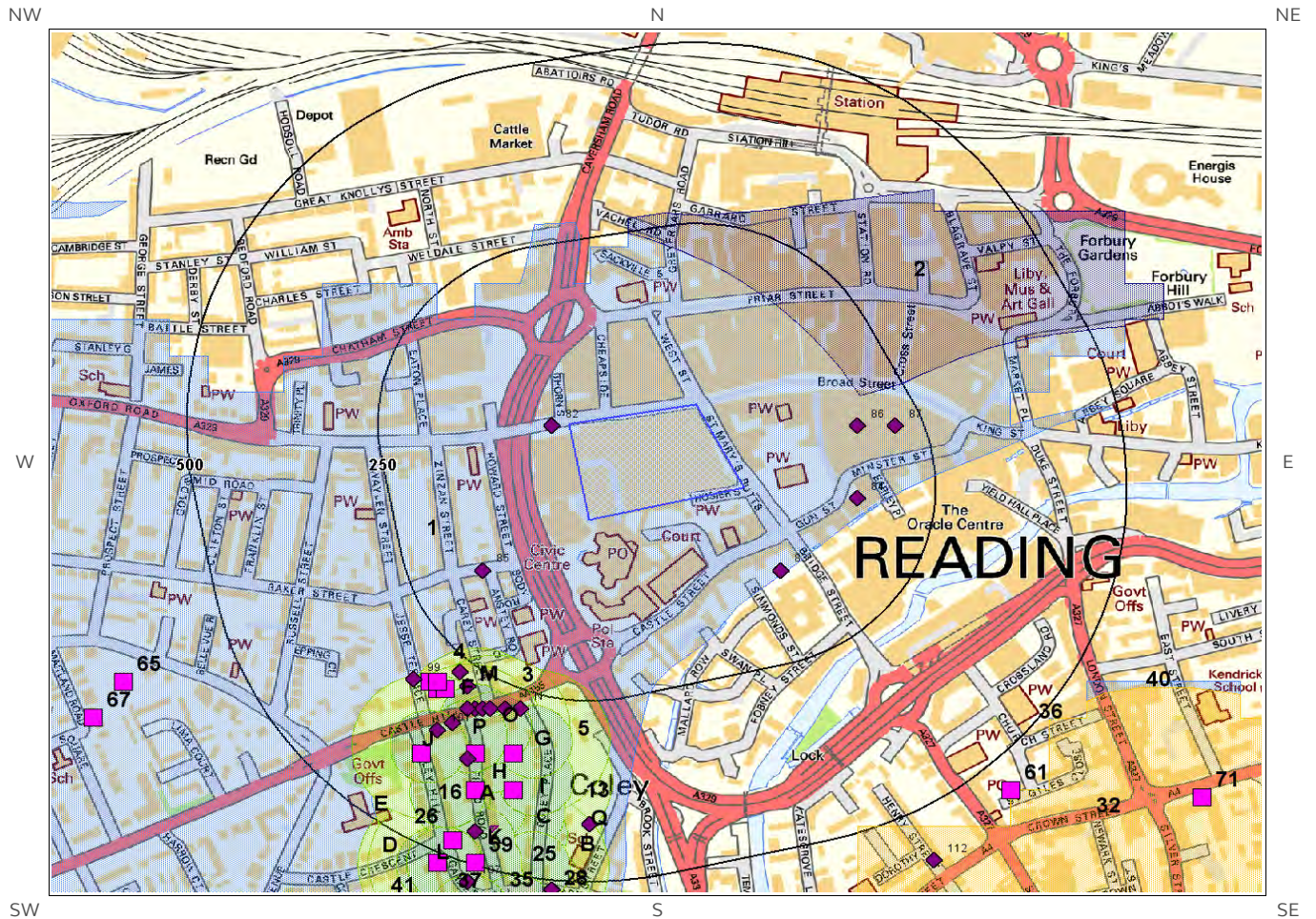
ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	314.0	SW	471023 172986	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	314.0	SW	471002 172996	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	316.0	S	471076 172966	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	338.0	SW	470991 172974	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	351.0	S	471021 172946	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	366.0	S	471079 172914	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	378.0	SW	470938 172960	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	411.0	SW	470981 172898	Chalk	Neuk & Bramley Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	413.0	S	471067 172868	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	418.0	S	471017 172877	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	418.0	SW	470964 172898	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	430.0	SW	470968 172883	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	442.0	S	471070 172838	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	470.0	S	471002 172827	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	470.0	S	471021 172821	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	471.0	S	471066 172810	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	478.0	S	470978 172827	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	484.0	S	471030 172804	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	487.0	S	471074 172792	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	495.0	S	471010 172798	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	503.0	S	471033 172784	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	512.0	S	470959 172798	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	518.0	SW	470946 172797	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	527.0	S	471018 172763	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	549.0	S	471053 172733	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	551.0	S	471031 172735	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	556.0	S	470985 172742	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased

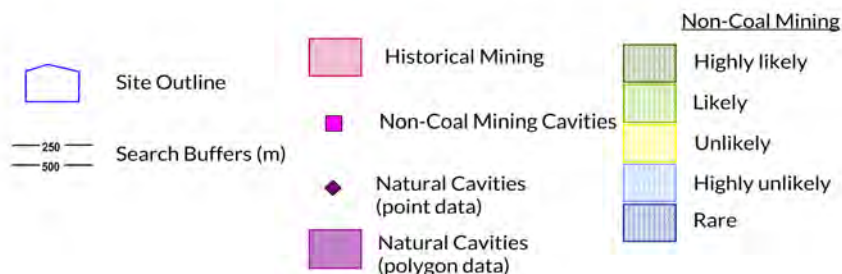
ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	561.0	S	471077 172717	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	563.0	S	470992 172733	Chalk	Reading Chalk Mine	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	581.0	SW	470915 172741	Gravel	Coley Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	588.0	S	470957 172717	Gravel	Coley Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	602.0	S	471044 172680	Clay & Shale	Coley Pottery	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	752.0	S	471540 172590	Clay & Shale	Katesgrove Kilns	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	826.0	S	471058 172452	Clay & Shale	Coley Kilns	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	838.0	SW	470815 172505	Clay & Shale	Avenue Works	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	847.0	S	471551 172495	Clay & Shale	Katesgrove Kilns	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	879.0	S	470881 172436	Clay & Shale	Avenue Works	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	915.0	S	471060 172362	Clay & Shale	Coley Kilns	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	922.0	S	471549 172417	Clay & Shale	Katesgrove Kilns	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	924.0	SE	471778 172498	Clay & Shale	Ivy Bridge Brick Field	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	928.0	S	471686 172452	Clay & Shale	Ivy Bridge Brick Field	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	958.0	S	471046 172321	Clay & Shale	Coley Kilns	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	959.0	S	470975 172330	Clay & Shale	Coley Kilns	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	973.0	SW	470502 172547	Gravel	Coley Park Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

5 Mining, Extraction & Natural Cavities map



Mining, Extraction and
Natural Cavities Legend

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5 Mining, Extraction & Natural Cavities

5.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? Yes

The following information provided by JPB is not represented on mapping: Whilst outside of an area where The Coal Authority have information on coal mining activities, Johnson Poole & Bloomer (JPB) have information such as mining plans and maps held within their archive of mining activities that have occurred within 1km of this property. Further details and a quote for services can be obtained by emailing this report to enquiries.gs@jpb.co.uk.

5.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? Yes

The following non-coal mining information is provided by the BGS:

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
1	0.0	On Site	Not available	Chalk	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
2	172.0	NE	Not available	Chalk	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered
3	213.0	SW	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
4	214.0	SW	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
5	215.0	S	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
6M	238.0	SW	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
7O	263.0	SW	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
8F	264.0	SW	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
9G	265.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
10	277.0	SW	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
11P	288.0	SW	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
12J	327.0	SW	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
13	328.0	S	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
14I	331.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
15H	354.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
16	376.0	SW	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
17A	391.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
18A	393.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
19C	394.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
20B	395.0	S	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
21Q	407.0	S	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
22B	410.0	S	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
23C	416.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
24K	419.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
25	436.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
26	459.0	SW	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
27L	461.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
28	469.0	S	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
29D	469.0	SW	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
30E	475.0	SW	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
31D	477.0	SW	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
32	491.0	S	Not available	Chalk	Small scale underground mining may have occurred; mine adits, shafts and tunnels may be present. Potential for localised difficult ground conditions are at a level where they should be considered
33D	496.0	SW	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
34E	498.0	SW	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
35	498.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
36	509.0	SE	Not available	Chalk	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
37	512.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
Not shown	516.0	S	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
Not shown	519.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
40	522.0	SE	Not available	Chalk	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
41	556.0	SW	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
Not shown	564.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
Not shown	593.0	S	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
Not shown	615.0	SW	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
Not shown	698.0	S	Not available	Chalk	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
Not shown	834.0	E	Not available	Chalk	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
Not shown	898.0	NW	Not available	Chalk	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered
Not shown	982.0	E	Not available	Chalk	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered

5.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled “Review of mining instability in Great Britain, 1990” PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? Yes

The following Non-Coal Mining Cavities information provided by Peter Brett Associates:

ID	Distance (m)	Direction	NGR	Address	Superficial Deposits	Bedrock Deposits	Extracted Mineral
49F	299.0	SW	470950 173050	Reading (Coley), Berkshire	-	Lambeth Group, Upper Chalk Formation	Chalk
50F	300.0	SW	470960 173040	Reading (Coley), Berkshire	-	Lambeth Group, Upper Chalk Formation	Chalk
51F	306.0	SW	470940 173050	Reading (Coley), Berkshire	-	Lambeth Group, Upper Chalk Formation	Chalk
52F	307.0	SW	470950 173040	Reading (Coley), Berkshire	-	Lambeth Group, Upper Chalk Formation	Chalk
53G	338.0	S	471050 172950	Reading (Coley), Berkshire	-	Lambeth Group, Upper Chalk Formation	Chalk
54H	356.0	SW	471000 172950	Reading (Coley), Berkshire	Lynch Hill Gravel	Lambeth Group, Upper Chalk Formation	Chalk
55I	386.0	S	471050 172900	Reading (Coley), Berkshire	-	Lambeth Group, Upper Chalk Formation	Chalk
56J	390.0	SW	470930 172950	Reading (Coley), Berkshire	Lynch Hill Gravels	Lambeth Group, Upper Chalk Formation	Chalk
57H	402.0	S	471000 172900	Reading (Coley), Berkshire	Lynch Hill Gravel	Lambeth Group, Upper Chalk Formation	Chalk
58K	478.0	S	470970 172830	Reading (Coley), Berkshire	Lynch Hill Gravel	Lambeth Group, Upper Chalk Formation	Chalk
59	496.0	S	471000 172800	Castle Hill Kiln, Reading (Coley), Berkshire	Lynch Hill Gravel	Lambeth Group, Upper Chalk Formation	Chalk
60L	513.0	SW	470950 172800	Reading (Coley), Berkshire	Lynch Hill Gravel	Lambeth Group, Upper Chalk Formation	Chalk
61	544.0	SE	471700 172900	Reading, Berkshire	Taplow Gravel	Lambeth Group, Upper Chalk Formation	Chalk
Not shown	559.0	S	470980 172740	Reading (Coley), Berkshire	-	Lambeth Group, Upper Chalk Formation	Chalk
Not shown	566.0	S	471030 172720	Reading (Coley), Berkshire	-	Lambeth Group, Upper Chalk Formation	Chalk
Not shown	575.0	S	471100 172700	Coley Potteries, Reading (Coley), Berkshire	-	Lambeth Group, Upper Chalk Formation	Chalk
65	649.0	W	470540 173050	Reading, Berkshire	Lynch Hill Gravel	Lambeth Group, Chalk Group	Chalk
Not shown	684.0	S	471500 172650	Katesgrove Kilns (1), Reading, Berkshire	Worked Ground	Lambeth Group, Upper Chalk Formation	Chalk
67	704.0	SW	470500 173000	Reading (West), Berkshire	Lynch Hill Gravel	Lambeth Group, Upper Chalk Formation	Chalk
Not shown	709.0	SE	471700 172700	Shearmans Brick Kiln, Reading, Berkshire	-	Lambeth Group, Upper Chalk Formation	Chalk

ID	Distance (m)	Direction	NGR	Address	Superficial Deposits	Bedrock Deposits	Extracted Mineral
Not shown	717.0	SE	471790 172750	Reading, Berkshire	-	Lambeth Group, Upper Chalk Formation	Chalk
Not shown	733.0	S	471500 172600	Katesgrove Kilns (2), Reading, Berkshire	Worked Ground	Lambeth Group, Upper Chalk Formation	Chalk
71	735.0	SE	471950 172890	Jubilee Square, Reading, Berkshire	Taplow Gravel	Chalk Group	Chalk
Not shown	753.0	SE	471700 172650	Shearmans Brick Kiln, Reading, Berkshire	-	Lambeth Group, Upper Chalk Formation	Chalk
Not shown	826.0	SE	471900 172700	The Old Orchard Kiln, Reading, Berkshire	-	Lambeth Group, Upper Chalk Formation	Chalk
Not shown	838.0	W	470350 173020	Reading (West), Berkshire	Lynch Hill Gravel	Lambeth Group, Upper Chalk Formation	Chalk
Not shown	847.0	W	470300 173200	Coopers Brick & Lime Manufactory, Reading (West), Berkshire	Lynch Hill Gravel	Lambeth Group, Upper Chalk Formation	Chalk
Not shown	875.0	E	472200 173100	Reading, Berkshire	Taplow Gravel	Chalk Group	Chalk
Not shown	886.0	S	471000 172400	Wheeler Works, Reading (Coley), Berkshire	Worked Ground	Lambeth Group, Upper Chalk Formation	Chalk
Not shown	889.0	SE	471700 172500	Ivy Lodge Brickfield/ Southampton Kiln, Reading, Berkshire	Boyn Hill Gravel	London Clay, Lambeth Group, Upper Chalk Formation	Chalk
Not shown	890.0	S	471550 172450	Katesgrove Kilns (3), Reading, Berkshire	Worked Ground	Lambeth Group, Upper Chalk Formation	Chalk
Not shown	915.0	SW	470750 172450	Avenue Works, Reading (Coley), Berkshire	Worked Ground	Lambeth Group, Upper Chalk Formation	Chalk
Not shown	958.0	SE	471850 172500	The Upper Kiln, Reading, Berkshire	-	London Clay, Lambeth Group, Upper Chalk Formation	Chalk

5.6 Natural Cavities

This dataset provides information based on the Peter Brett Associates natural cavities database. The dataset is made up of points and polygons. Where polygons are used these represent an area in which it is expected the cavities could be found. It does not indicate that cavities are present everywhere within the polygon, and caution should be used in the interpretation of this data.

Are there any Natural Cavities within 1000m of the study site boundary? Yes

The following Natural Cavities information provided by Peter Brett Associates:

ID	Distance (m)	Direction	NGR	Superficial Deposits	Bedrock Deposits	Cavity Type and Number
82	23.0	W	471100 173400	Taplow Gravel	Chalk Group	Solution Pipe x 3
83	127.0	S	471400 173200	Taplow Gravel	Chalk Group	Solution Pipe x 2
84	149.0	E	471500 173300	Taplow Gravel	Chalk Group	Solution Pipe x 1

ID	Distance (m)	Direction	NGR	Superficial Deposits	Bedrock Deposits	Cavity Type and Number
85	157.0	SW	471010 173200	-	Chalk Group, Lambeth Group	Solution Widened Joint or Fissure x 3
86	169.0	NE	471500 173400	Taplow Gravel	Chalk Group	Solution Pipe x 3
87	214.0	NE	471550 173400	Taplow Gravel	Chalk Group	Solution Pipe x 5
88M	272.0	SW	470980 173060	-	Chalk Group, Lambeth Group	Solution Pipe x 1
89N	278.0	S	471060 173010	-	Chalk Group, Lambeth Group	Solution Widened Joint or Fissure x 1
90	282.0	SW	470990 173040	-	Chalk Group, Lambeth Group	Solution Pipe x 1
91N	285.0	SW	471040 173010	-	Chalk Group, Lambeth Group	Solution Pipe x 1
92O	293.0	SW	471020 173010	-	Chalk Group, Lambeth Group	Solution Pipe x 1
93P	298.0	SW	471010 173010	-	Chalk Group, Lambeth Group	Solution Widened Joint or Fissure x 1
94O	298.0	SW	471010 173010	-	Chalk Group, Lambeth Group	Solution Widened Joint or Fissure x 1
95O	303.0	SW	471000 173010	-	Chalk Group, Lambeth Group	Solution Widened Joint or Fissure x 1
96O	303.0	SW	471000 173010	-	Chalk Group, Lambeth Group	Solution Widened Joint or Fissure x 1
97O	303.0	SW	471000 173010	-	Chalk Group, Lambeth Group	Solution Widened Joint or Fissure x 1
98P	308.0	SW	470990 173010	-	Chalk Group, Lambeth Group	Solution Widened Joint or Fissure x 1
99	320.0	SW	470920 173050	-	Chalk Group, Lambeth Group	Solution Pipe x 1
100P	335.0	SW	470970 172990	-	Chalk Group, Lambeth Group	Solution Pipe x 1
101	354.0	SW	470950 172980	Lynch Hill Gravel	Chalk Group, Lambeth Group	Solution Pipe x 2
102H	369.0	SW	470990 172940	-	Chalk Group, Lambeth Group	Solution Pipe x 1
103Q	423.0	S	471150 172850	-	Chalk Group	Solution Widened Joint or Fissure x 1
104K	440.0	S	471022 172845	-	Chalk Group, Lambeth Group	Solution Pipe x 3
105K	458.0	S	471000 172840	-	Chalk Group, Lambeth Group	Solution Pipe x 1
106	515.0	S	471100 172760	-	Chalk Group, Lambeth Group	Solution Pipe x 1
107	528.0	S	470990 172770	-	Chalk Group, Lambeth Group	Solution Pipe x 1
Not shown	543.0	S	471140 172730	-	Chalk Group, Lambeth Group	Solution Pipe x 1
Not shown	543.0	S	471130 172730	-	Chalk Group, Lambeth Group	Solution Pipe x 1
Not shown	544.0	S	471000 172750	Lynch Hill Gravel	Chalk Group, Lambeth Group	Solution Pipe x 1

ID	Distance (m)	Direction	NGR	Superficial Deposits	Bedrock Deposits	Cavity Type and Number
Not shown	573.0	S	471000 172720	-	Chalk Group, Lambeth Group	Solution Pipe x 1
112	574.0	SE	471600 172800	-	Chalk Group, Lambeth Group	Unknown
Not shown	613.0	S	471040 172670	-	Chalk Group, Lambeth Group	Solution Pipe x 1
Not shown	633.0	S	471040 172650	-	Chalk Group	Solution Pipe x 1
Not shown	642.0	S	471040 172640	-	Chalk Group	Solution Pipe x 1
Not shown	646.0	S	471020 172640	-	Chalk Group, Lambeth Group	Solution Pipe x 1
Not shown	654.0	S	471030 172630	-	Chalk Group, Lambeth Group	Solution Pipe x 1
Not shown	820.0	W	470380 172990	Lynch Hill Gravel	Chalk Group, Lambeth Group	Solution Pipe x 1
Not shown	826.0	W	470370 173000	Lynch Hill Gravel	Chalk Group, Lambeth Group	Solution Pipe x 2
Not shown	880.0	SW	470490 172690	Lynch Hill Gravel	Chalk Group, Lambeth Group	Solution Pipe x 1
Not shown	904.0	W	470250 173160	-	Chalk Group, Lambeth Group	Solution Pipe x 1
Not shown	914.0	W	470240 173160	Lynch Hill Gravel	Chalk Group, Lambeth Group	Solution Pipe x 1
Not shown	916.0	W	470240 173150	Lynch Hill Gravel	Chalk Group, Lambeth Group	Solution Pipe x 1

5.7 Brine Extraction

This data provides information from the Coal Authority issued on behalf of the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level..

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.10 Clay Mining

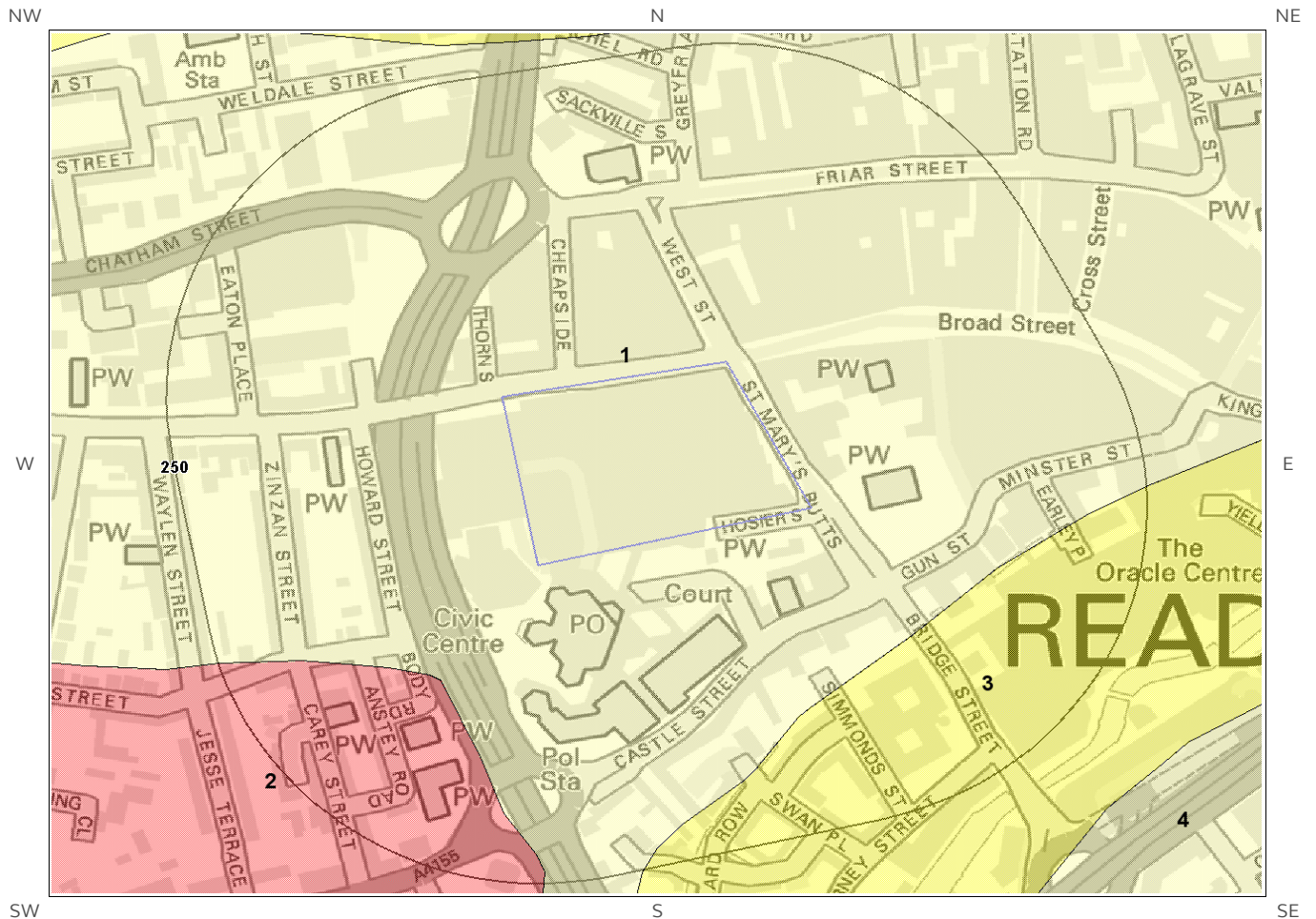
This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

6 Natural Ground Subsidence

6.1 Shrink-Swell Clay map

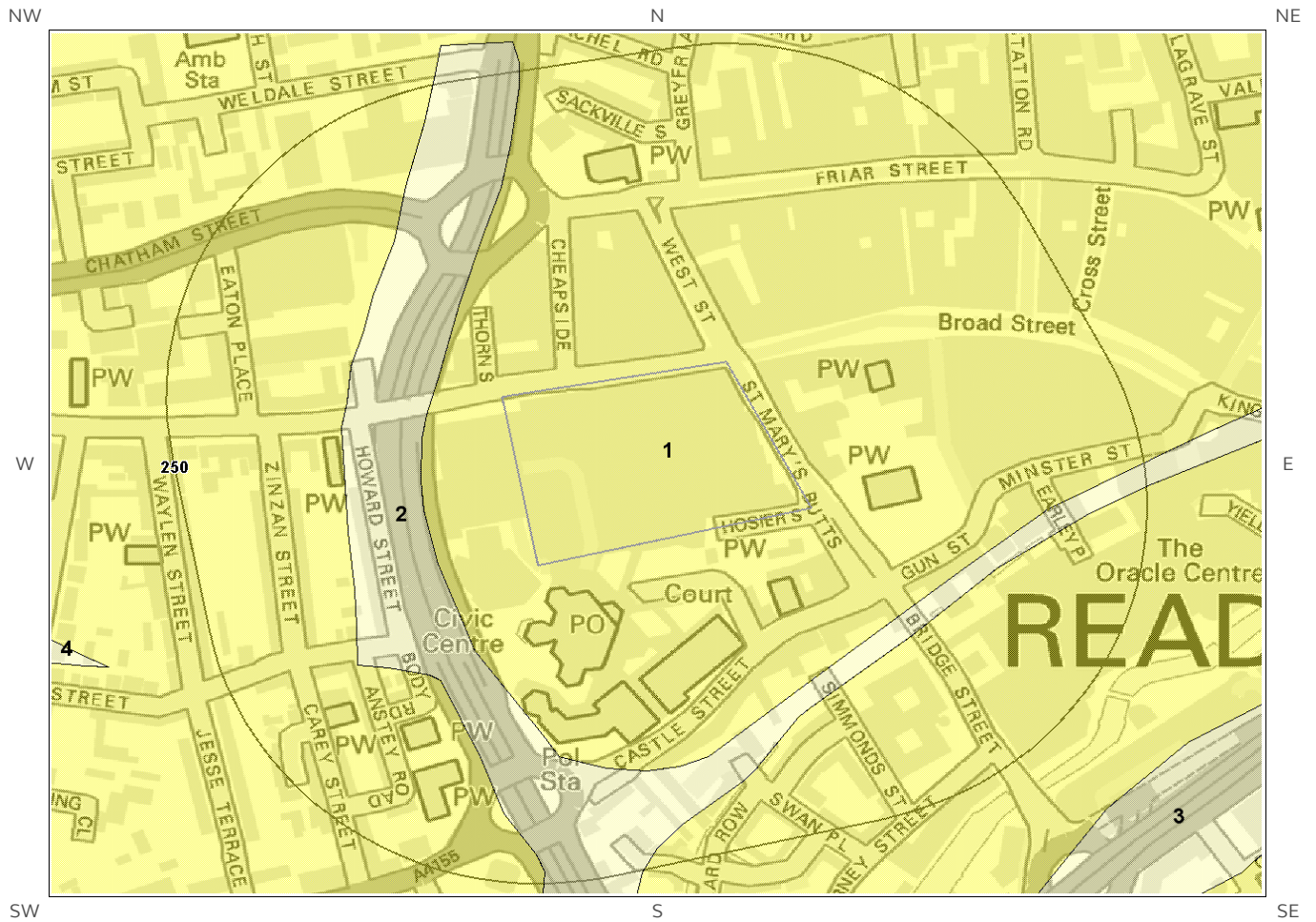


Shrink Swell Clay Legend

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6.2 Landslides map

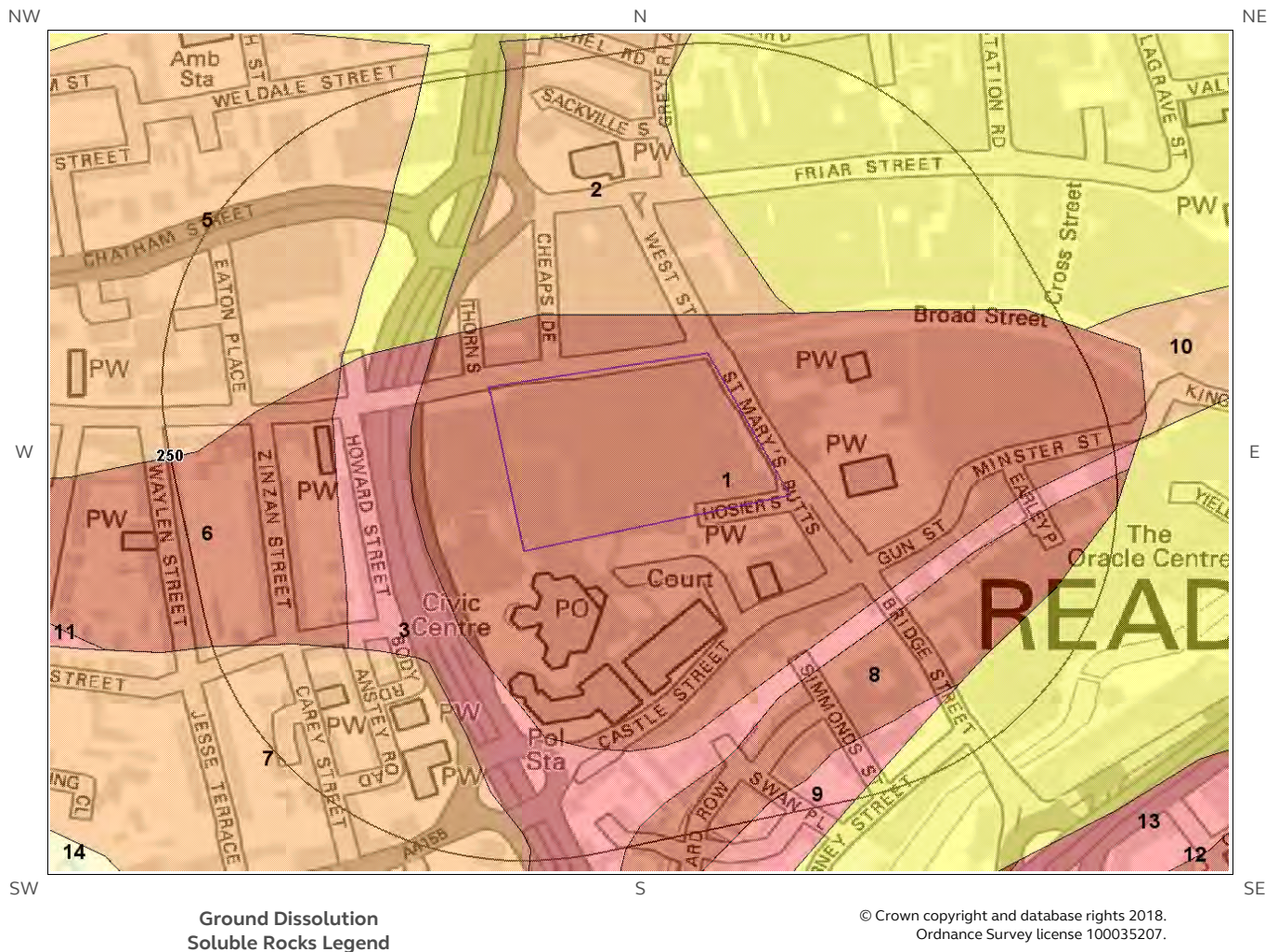


Landslides Legend

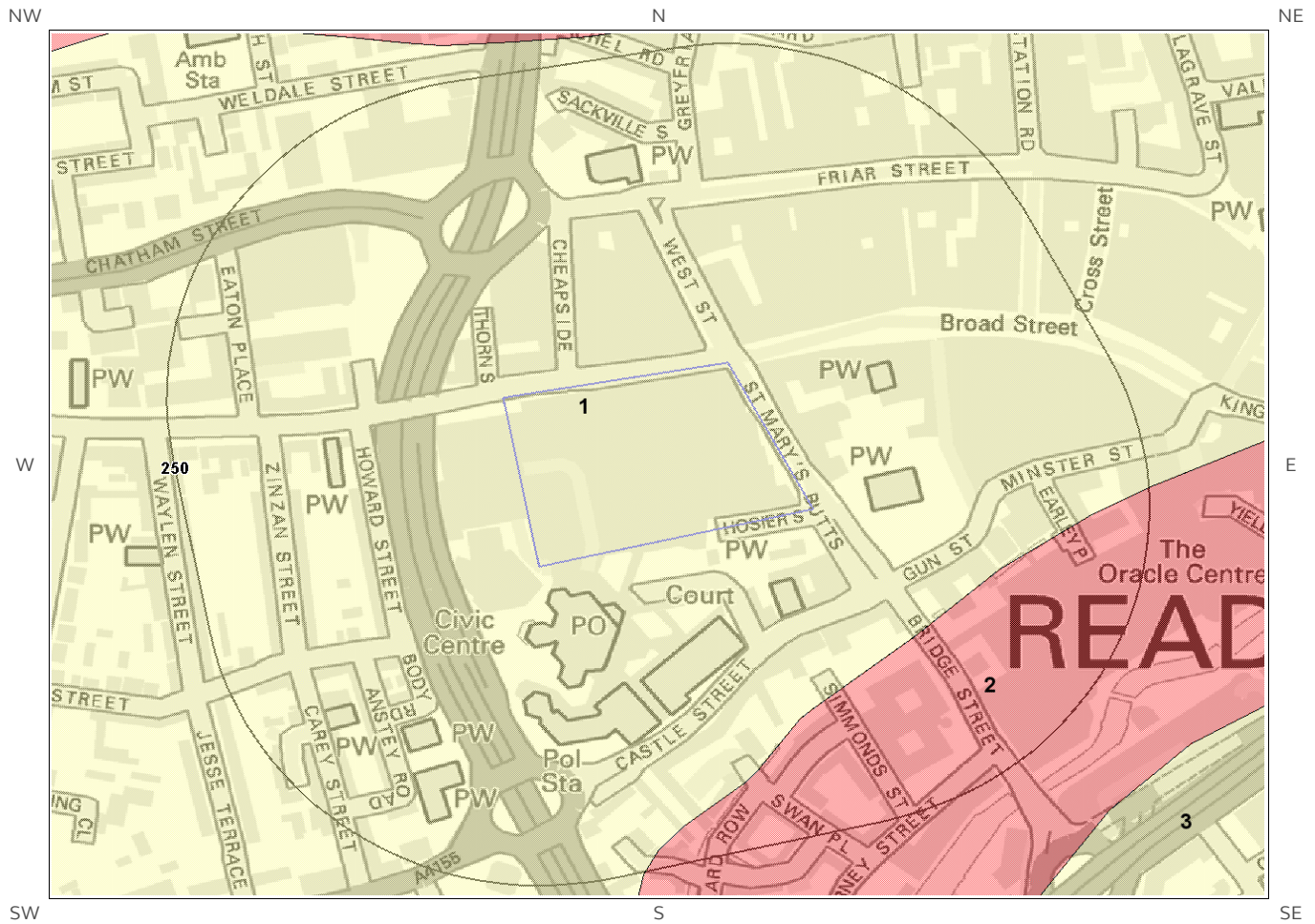
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6.3 Ground Dissolution of Soluble Rocks map



6.4 Compressible Deposits map

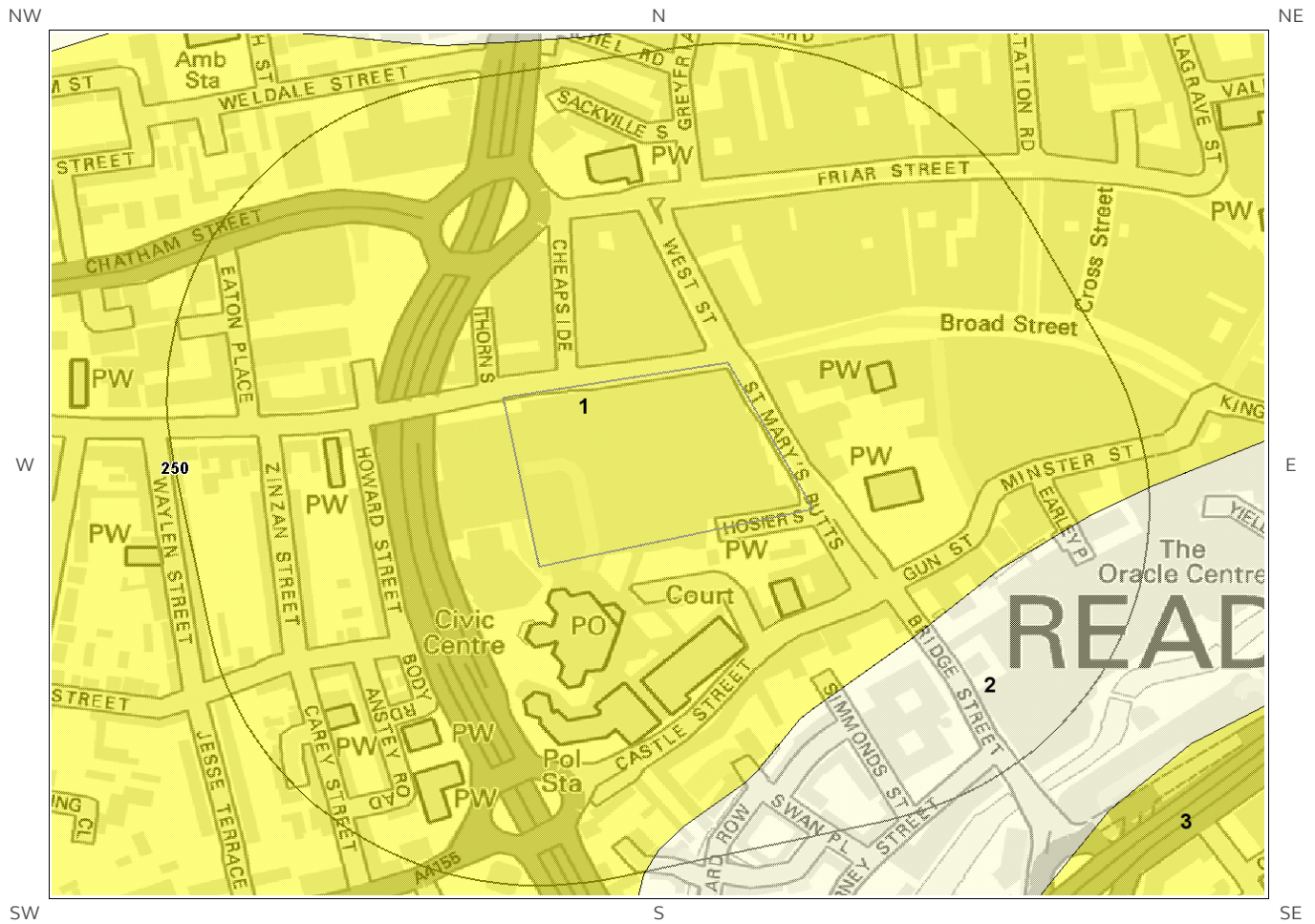


Compressible Deposits Legend

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6.5 Collapsible Deposits map

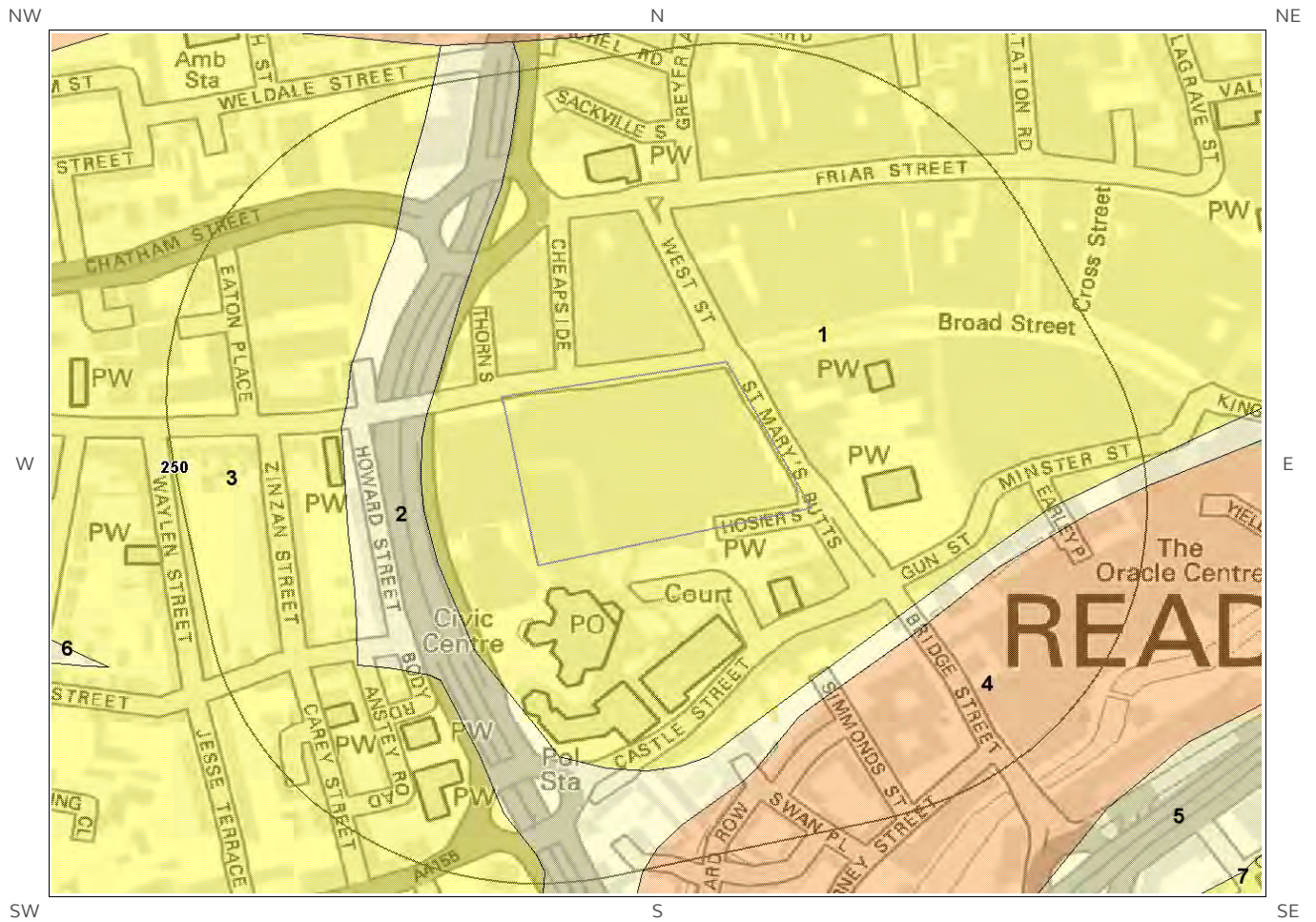


Collapsible Deposits Legend

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6.6 Running Sand map



Running Sand Legend

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6 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site** boundary? High

6.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.
2	50.0	W	Negligible	No indicators for slope instability identified. No special actions required to avoid problems due to landslides. No special ground investigation required and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

* This includes an automatically generated 50m buffer zone around the site

6.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	High	Very significant soluble rocks are present, with a high possibility of localised subsidence occurring naturally or in adverse conditions such as high surface or subsurface water flow. Obtain specialist advice to advise on need for stabilisation work and/or land management plan to maintain stability. Do not dispose of drainage into the ground. For new build - a specialist land stability assessment is necessary. Investigation, remediation and/or mitigation works may be necessary to stabilise the area. Construction work may cause subsidence. Surface drainage must not affect the karst system or groundwater. Increased construction costs are likely. For existing property - increase in insurance risk due to potential soluble rocks hazards. Potential of groundwater pollution.
2	31.0	N	Low	Significant soluble rocks are present. Low possibility of subsidence occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow. Consider implications for stability when changes to drainage or new construction are planned. For new build - site investigation should consider potential for dissolution problems on the site and its surroundings. Care should be taken with local drainage into the bedrock. Some possibility groundwater pollution. For existing property - possible increase in insurance risk due to soluble rocks.
3	50.0	W	Moderate	Very significant soluble rocks are present, with a moderate possibility of local natural subsidence due to high surface or subsurface water flow. Do not load the land or undertake building work before obtaining specialist advice. Do not dispose of drainage to the ground. Some possibility groundwater pollution. Maintain drainage infrastructure. For new build - specialist site investigation and stability assessment may be necessary before construction. Construction work may cause subsidence. Increased construction costs are likely. For existing property - probable increase in insurance risk due to soluble rocks.

6.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

6.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

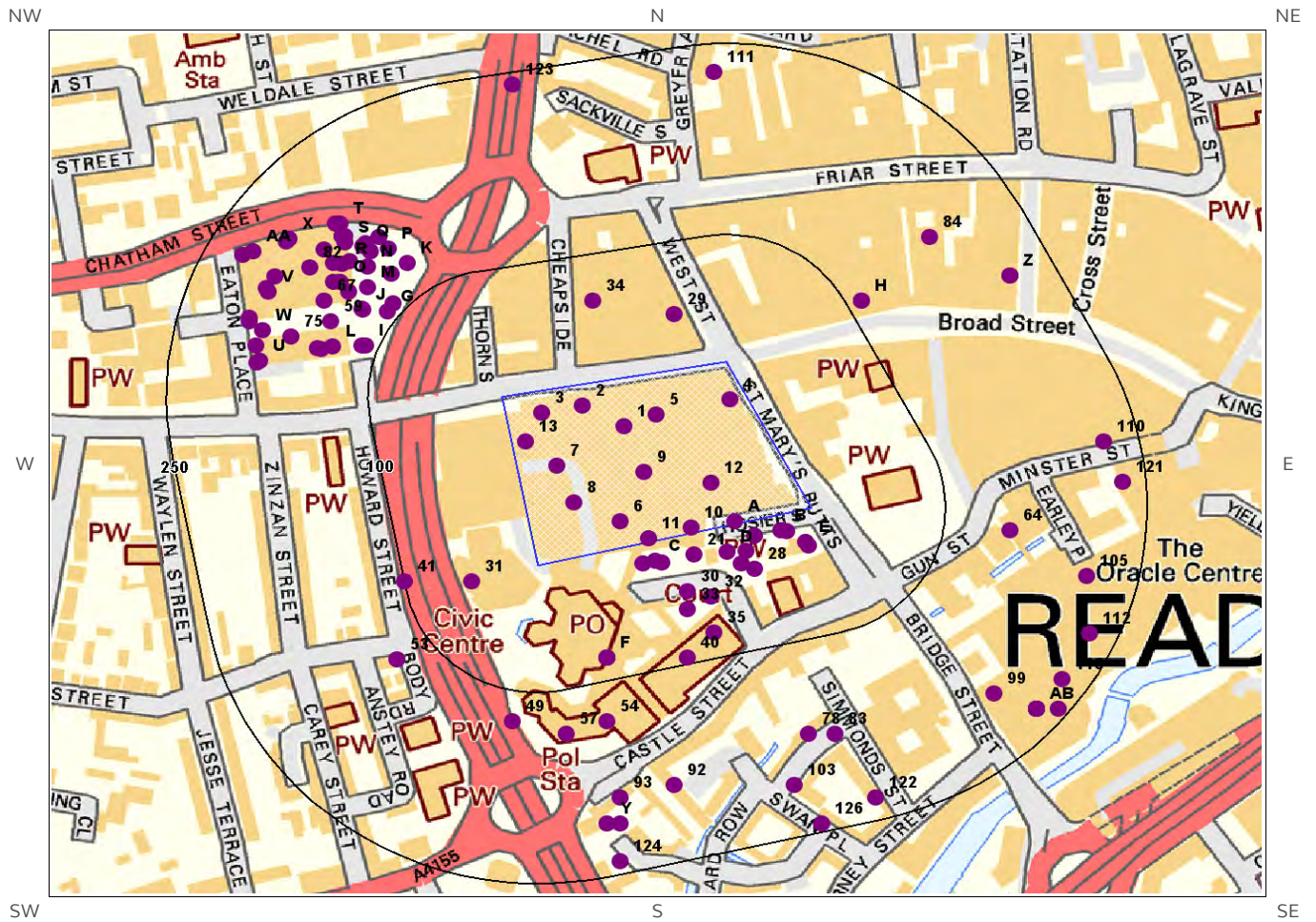
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

6.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

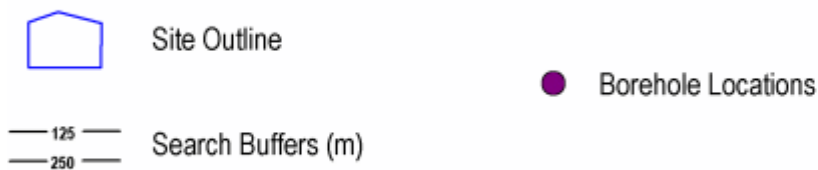
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	50.0	W	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

7 Borehole Records map



Borehole Records Legend

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7 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

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ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	0.0	On Site	471213 173382	SU77SW867	9.0	READING COMMERCIAL CENTRE 4
2	0.0	On Site	471182 173398	SU77SW866	9.0	READING COMMERCIAL CENTRE 3
3	0.0	On Site	471152 173392	SU77SW864	15.0	READING COMMERCIAL CENTRE 1
4	0.0	On Site	471292 173403	SU77SW872	7.0	READING COMMERCIAL CENTRE 9
5	0.0	On Site	471237 173391	SU77SW871	9.0	READING COMMERCIAL CENTRE 8
6	0.0	On Site	471210 173307	SU77SW869	9.0	READING COMMERCIAL CENTRE 6
7	0.0	On Site	471163 173351	SU77SW865	5.0	READING COMMERCIAL CENTRE 2
8	0.0	On Site	471176 173322	SU77SW868	5.0	READING COMMERCIAL CENTRE 5/5A
9	0.0	On Site	471228 173346	SU77SW870	8.0	READING COMMERCIAL CENTRE 7
10	0.0	On Site	471263 173302	SU77SW1150	-1.0	READING CIVIC CENTRE WS112
11	0.0	On Site	471231 173294	SU77SW1149	-1.0	READING CIVIC CENTRE WS111
12	0.0	On Site	471278 173337	SU77SW873	9.0	READING COMMERCIAL CENTRE 10
13	0.0	On Site	471140 173370	SU77SW690	18.0	READING CIVIC CENTRE BH1
14A	0.0	On Site	471295 173307	SU77SW1151	-1.0	READING CIVIC CENTRE WS113
15A	12.0	S	471310 173296	SU77SW1143	-1.0	READING CIVIC CENTRE TP104
16B	13.0	S	471330 173300	SU77SW1135	-1.0	READING CIVIC CENTRE 103
17B	13.0	S	471330 173300	SU77SW1136	-1.0	READING CIVIC CENTRE 104
18B	15.0	S	471334 173299	SU77SW1148	-1.0	READING CIVIC CENTRE WS105
19C	16.0	S	471236 173276	SU77SW1133	-1.0	READING CIVIC CENTRE 101
20C	16.0	S	471227 173274	SU77SW1147	-1.0	READING CIVIC CENTRE TP110
21	17.0	S	471265 173281	SU77SW1140	-1.0	READING CIVIC CENTRE TP101
22C	18.0	S	471241 173275	SU77SW1141	-1.0	READING CIVIC CENTRE TP102

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
23D	21.0	S	471290 173283	SU77SW1142	-1.0	READING CIVIC CENTRE TP103
24D	23.0	S	471304 173284	SU77SW1134	-1.0	READING CIVIC CENTRE 102
25E	25.0	S	471348 173291	SU77SW1138	-1.0	READING CIVIC CENTRE 107
26E	29.0	S	471350 173288	SU77SW1137	-1.0	READING CIVIC CENTRE 106
27D	32.0	S	471300 173274	SU77SW1144	-1.0	READING CIVIC CENTRE TP105
28	38.0	S	471310 173270	SU77SW693	18.0	READING CIVIC CENTRE BH4
29	43.0	N	471250 173470	SU77SW668	9.0	WEST STREET READING
30	45.0	S	471260 173252	SU77SW1145	-1.0	READING CIVIC CENTRE TP106
31	51.0	W	471100 173260	SU77SW691	18.0	READING CIVIC CENTRE BH2
32	52.0	S	471278 173248	SU77SW1146	-1.0	READING CIVIC CENTRE TP107
33	58.0	S	471260 173238	SU77SW1139	-1.0	READING CIVIC CENTRE 108
34	63.0	N	471190 173480	SU77SW47	46.0	CHEAPSIDE READING
35	80.0	S	471280 173220	SU77SW108	9.0	READING MAGISTRATES CRT M1
36F	82.0	S	471200 173200	SU77SW104	30.0	READING CIVIC OFFICES 1
37F	82.0	S	471200 173200	SU77SW107	20.0	READING CIVIC OFFICES 4
38F	82.0	S	471200 173200	SU77SW106	20.0	READING CIVIC OFFICES 3
39F	82.0	S	471200 173200	SU77SW105	20.0	READING CIVIC OFFICES 2
40	95.0	S	471260 173200	SU77SW109	7.0	READING MAGISTRATES CRT M2A
41	100.0	W	471050 173260	SU77SW694	18.0	READING CIVIC CENTRE BH5
42G	109.0	NW	471037 173472	SU77SW1118	2.0	CHATHAM PLACE READING TP07
43I	109.0	W	471021 173445	SU77SW1093	11.0	CHATHAM PLACE READING 8
44G	109.0	NW	471041 173478	SU77SW1101	12.0	CHATHAM PLACE READING 14
45H	111.0	NE	471390 173480	SU77SW191	22.0	BROAD STREET READING 1
46H	111.0	NE	471390 173480	SU77SW192	18.0	BROAD STREET READING 2
47I	112.0	W	471018 173445	SU77SW1109	30.0	CHATHAM PLACE READING 8R
48J	124.0	NW	471019 173473	SU77SW1091	11.0	CHATHAM PLACE READING 6
49	125.0	S	471130 173150	SU77SW692	18.0	READING CIVIC CENTRE BH3
50J	125.0	NW	471018 173474	SU77SW1107	40.0	CHATHAM PLACE READING 6R
51K	126.0	NW	471052 173510	SU77SW1116	2.0	CHATHAM PLACE READING TP05

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
52K	127.0	NW	471040 173501	SU77SW1123	1.0	CHATHAM PLACE READING TP12
53	129.0	SW	471044 173199	SU77SW844	15.0	3 BAKER STREET READING 1
54	131.0	S	471200 173150	SU77SW111	20.0	READING MAGISTRATES CRT P2
55M	132.0	NW	471022 173491	SU77SW1126	1.0	CHATHAM PLACE READING TP15
56L	133.0	W	470996 173444	SU77SW1119	3.0	CHATHAM PLACE READING TP08
57	135.0	S	471170 173140	SU77SW110	10.0	READING MAGISTRATES CRT P1
58L	140.0	W	470988 173442	SU77SW1094	11.0	CHATHAM PLACE READING 9
59	141.0	NW	470995 173464	SU77SW1130	1.0	CHATHAM PLACE READING TP19
60M	141.0	NW	471008 173487	SU77SW1127	2.0	CHATHAM PLACE READING TP16
61L	143.0	W	470985 173443	SU77SW1110	30.0	CHATHAM PLACE READING 9R
62N	143.0	NW	471022 173507	SU77SW1125	1.0	CHATHAM PLACE READING TP14
63P	143.0	NW	471038 173521	SU77SW1122	1.0	CHATHAM PLACE READING TP11
64	149.0	E	471500 173300	SU77SW52	20.0	READING BH1&2
65O	150.0	NW	471002 173495	SU77SW1105	50.0	CHATHAM PLACE READING 4R
66N	151.0	NW	471024 173519	SU77SW1115	2.0	CHATHAM PLACE READING TP04
67	152.0	NW	470990 173480	SU77SW1132	1.0	CHATHAM PLACE READING TP21
68O	154.0	NW	470997 173495	SU77SW1089	11.0	CHATHAM PLACE READING 4
69P	155.0	NW	471031 173530	SU77SW1121	3.0	CHATHAM PLACE READING TP10
70N	155.0	NW	471009 173511	SU77SW810	30.0	CHATHAM STREET - READING 2
71Q	157.0	NW	471019 173523	SU77SW1098	11.0	CHATHAM PLACE READING 12A
72Q	157.0	NW	471021 173525	SU77SW1097	11.0	CHATHAM PLACE READING 12
73R	158.0	NW	471003 173509	SU77SW1124	1.0	CHATHAM PLACE READING TP13
74R	164.0	NW	470997 173510	SU77SW1117	2.0	CHATHAM PLACE READING TP06
75	165.0	W	470965 173452	SU77SW1120	2.0	CHATHAM PLACE READING TP09
76S	169.0	NW	471005 173526	SU77SW1100	11.0	CHATHAM PLACE READING 13A
77S	172.0	NW	471005 173531	SU77SW1099	4.0	CHATHAM PLACE READING 13
78	173.0	S	471350 173140	SU77SW671	34.0	COURAGE BREWERIES NO 8 READING
79S	174.0	NW	471003 173531	SU77SW1114	4.0	CHATHAM PLACE READING TP03
80S	174.0	NW	471003 173531	SU77SW1113	1.0	CHATHAM PLACE READING TP02

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
81R	175.0	NW	470990 173520	SU77SW1096	11.0	CHATHAM PLACE READING 11
82	176.0	NW	470979 173506	SU77SW1131	1.0	CHATHAM PLACE READING TP20
83	178.0	S	471370 173140	SU77SW277	15.0	FOBNEY STREET READING 3
84	179.0	NE	471440 173530	SU77SW45	26.0	UNION STREET READING
85T	182.0	NW	471002 173541	SU77SW1112	3.0	CHATHAM PLACE READING TP01
86U	183.0	W	470942 173433	SU77SW1095	10.0	CHATHAM PLACE READING 10
87T	184.0	NW	470999 173541	SU77SW1086	12.0	CHATHAM PLACE READING 1
88T	184.0	NW	470998 173541	SU77SW1102	60.0	CHATHAM PLACE READING 1R
89U	185.0	W	470940 173432	SU77SW1111	31.0	CHATHAM PLACE READING 10R
90W	186.0	W	470944 173457	SU77SW1129	2.0	CHATHAM PLACE READING TP18A
91U	188.0	W	470939 173445	SU77SW811	30.0	CHATHAM STREET - READING 3
92	191.0	S	471250 173100	SU77SW279	15.0	FOBNEY STREET READING 6
93	192.0	S	471210 173090	SU77SW775	6.0	55-61 CASTLE STREET READING 3/3A
94V	193.0	NW	470948 173487	SU77SW1090	11.0	CHATHAM PLACE READING 5
95V	194.0	NW	470953 173499	SU77SW1128	3.0	CHATHAM PLACE READING TP17
96V	195.0	NW	470947 173490	SU77SW1106	42.0	CHATHAM PLACE READING 5R
97W	198.0	W	470934 173464	SU77SW1108	38.0	CHATHAM PLACE READING 7R
98W	199.0	W	470934 173467	SU77SW1092	10.0	CHATHAM PLACE READING 7
99	199.0	SE	471488 173172	SU77SW329	13.0	THE ORACLE READING 3
100X	201.0	NW	470964 173529	SU77SW1103	30.0	CHATHAM PLACE READING 2R
101X	202.0	NW	470962 173527	SU77SW1087	3.0	CHATHAM PLACE READING 2
102Y	209.0	S	471200 173070	SU77SW774	8.0	55-61 CASTLE STREET READING 2
103	210.0	S	471340 173100	SU77SW278	10.0	FOBNEY STREET READING 4
104Y	211.0	S	471210 173070	SU77SW773	14.0	55-61 CASTLE STREET READING 1
105	212.0	E	471557 173264	SU77SW346	30.0	THE ORACLE READING 13
106Z	217.0	NE	471500 173500	SU77SW628	6.0	147 FRIARS STREET READING
107Z	217.0	NE	471500 173500	SU77SW629	12.0	22/24 CROSS STREET READING
108A A	218.0	NW	470937 173519	SU77SW1088	3.0	CHATHAM PLACE READING 3
109A A	223.0	NW	470929 173516	SU77SW1104	48.0	CHATHAM PLACE READING 3R

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
110	224.0	E	471570 173370	SU77SW29	26.0	BROAD STREET READING
111	228.0	N	471280 173660	SU77SW16	12.0	16 GREYFRIARS ROAD READING
112	229.0	SE	471559 173219	SU77SW347	25.0	THE ORACLE READING 15
113	230.0	SE	471539 173183	SU77SW335	13.0	THE ORACLE READING 9
114A B	230.0	SE	471520 173160	SU77SW669	4.0	COURAGE BREWERIES NO 2 READING
115A B	230.0	SE	471520 173160	SU77SW42/D	37.0	COURAGE BREWERIES 6 READING
116A B	230.0	SE	471520 173160	SU77SW670	4.0	COURAGE BREWERIES NO 5 READING
117A B	230.0	SE	471520 173160	SU77SW42/B	46.0	COURAGE BREWERIES 4 READING
118A B	230.0	SE	471520 173160	SU77SW624	116.0	COURAGE BREWERIES NO 1 READING
119A B	230.0	SE	471520 173160	SU77SW42/A	105.0	COURAGE BREWERIES 1 READING
120A B	230.0	SE	471520 173160	SU77SW42/C	37.0	COURAGE BREWERIES 3 READING
121	232.0	E	471584 173338	SU77SW328	30.0	THE ORACLE READING 2
122	233.0	S	471400 173090	SU77SW43	89.0	COURAGE BREWERIES 7 READING
123	240.0	N	471130 173650	SU77SW682	12.0	READING CO-OP SACKVILLE STREET
124	241.0	S	471210 173040	SU77SW695	9.0	READING CIVIC CENTRE BHD1
125A B	242.0	SE	471536 173160	SU77SW348	30.0	THE ORACLE READING 16
126	244.0	S	471360 173070	SU77SW280	12.0	FOBNEY STREET READING 7

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

#1: scans.bgs.ac.uk/sobi_scans/boreholes/15639757
#2: scans.bgs.ac.uk/sobi_scans/boreholes/15639740
#3: scans.bgs.ac.uk/sobi_scans/boreholes/15639724
#4: scans.bgs.ac.uk/sobi_scans/boreholes/15639890
#5: scans.bgs.ac.uk/sobi_scans/boreholes/15639888
#6: scans.bgs.ac.uk/sobi_scans/boreholes/15639766
#7: scans.bgs.ac.uk/sobi_scans/boreholes/15639728
#8: scans.bgs.ac.uk/sobi_scans/boreholes/15639760
#9: scans.bgs.ac.uk/sobi_scans/boreholes/15639772
#12: scans.bgs.ac.uk/sobi_scans/boreholes/15639895
#13: scans.bgs.ac.uk/sobi_scans/boreholes/428842
#28: scans.bgs.ac.uk/sobi_scans/boreholes/428845
#29: scans.bgs.ac.uk/sobi_scans/boreholes/428820
#31: scans.bgs.ac.uk/sobi_scans/boreholes/428843
#34: scans.bgs.ac.uk/sobi_scans/boreholes/428199
#35: scans.bgs.ac.uk/sobi_scans/boreholes/428260
#36F: scans.bgs.ac.uk/sobi_scans/boreholes/428256
#37F: scans.bgs.ac.uk/sobi_scans/boreholes/428259
#38F: scans.bgs.ac.uk/sobi_scans/boreholes/428258
#39F: scans.bgs.ac.uk/sobi_scans/boreholes/428257
#40: scans.bgs.ac.uk/sobi_scans/boreholes/428261
#41: scans.bgs.ac.uk/sobi_scans/boreholes/428846
#42G: scans.bgs.ac.uk/sobi_scans/boreholes/18382989
#43I: scans.bgs.ac.uk/sobi_scans/boreholes/18381994
#44G: scans.bgs.ac.uk/sobi_scans/boreholes/18382006
#45H: scans.bgs.ac.uk/sobi_scans/boreholes/428343
#46H: scans.bgs.ac.uk/sobi_scans/boreholes/428344
#47I: scans.bgs.ac.uk/sobi_scans/boreholes/18382966
#48J: scans.bgs.ac.uk/sobi_scans/boreholes/18381992
#49: scans.bgs.ac.uk/sobi_scans/boreholes/428844
#50J: scans.bgs.ac.uk/sobi_scans/boreholes/18382963
#51K: scans.bgs.ac.uk/sobi_scans/boreholes/18382984
#52K: scans.bgs.ac.uk/sobi_scans/boreholes/18383004
#53: scans.bgs.ac.uk/sobi_scans/boreholes/15631833
#54: scans.bgs.ac.uk/sobi_scans/boreholes/428263
#55M: scans.bgs.ac.uk/sobi_scans/boreholes/18383043
#56L: scans.bgs.ac.uk/sobi_scans/boreholes/18382990
#57: scans.bgs.ac.uk/sobi_scans/boreholes/428262
#58L: scans.bgs.ac.uk/sobi_scans/boreholes/18381995
#59: scans.bgs.ac.uk/sobi_scans/boreholes/18383047
#60M: scans.bgs.ac.uk/sobi_scans/boreholes/18383044
#61L: scans.bgs.ac.uk/sobi_scans/boreholes/18382969
#62N: scans.bgs.ac.uk/sobi_scans/boreholes/18383042
#63P: scans.bgs.ac.uk/sobi_scans/boreholes/18383002
#64: scans.bgs.ac.uk/sobi_scans/boreholes/428204
#65O: scans.bgs.ac.uk/sobi_scans/boreholes/18382594
#66N: scans.bgs.ac.uk/sobi_scans/boreholes/18382983
#67: scans.bgs.ac.uk/sobi_scans/boreholes/18383049
#68O: scans.bgs.ac.uk/sobi_scans/boreholes/18381990
#69P: scans.bgs.ac.uk/sobi_scans/boreholes/18382993
#70N: scans.bgs.ac.uk/sobi_scans/boreholes/15616939
#71Q: scans.bgs.ac.uk/sobi_scans/boreholes/18381999
#72Q: scans.bgs.ac.uk/sobi_scans/boreholes/18381998
#73R: scans.bgs.ac.uk/sobi_scans/boreholes/18383005
#74R: scans.bgs.ac.uk/sobi_scans/boreholes/18382987
#75: scans.bgs.ac.uk/sobi_scans/boreholes/18382991

#76S: scans.bgs.ac.uk/sobi_scans/boreholes/18382003
#77S: scans.bgs.ac.uk/sobi_scans/boreholes/18382001
#78: scans.bgs.ac.uk/sobi_scans/boreholes/428823
#79S: scans.bgs.ac.uk/sobi_scans/boreholes/18382982
#80S: scans.bgs.ac.uk/sobi_scans/boreholes/18382981
#81R: scans.bgs.ac.uk/sobi_scans/boreholes/18381997
#82: scans.bgs.ac.uk/sobi_scans/boreholes/18383048
#83: scans.bgs.ac.uk/sobi_scans/boreholes/428429
#84: scans.bgs.ac.uk/sobi_scans/boreholes/428197
#85T: scans.bgs.ac.uk/sobi_scans/boreholes/18382980
#86U: scans.bgs.ac.uk/sobi_scans/boreholes/18381996
#87T: scans.bgs.ac.uk/sobi_scans/boreholes/18381987
#88T: scans.bgs.ac.uk/sobi_scans/boreholes/18382007
#89U: scans.bgs.ac.uk/sobi_scans/boreholes/18382978
#90W: scans.bgs.ac.uk/sobi_scans/boreholes/18383046
#91U: scans.bgs.ac.uk/sobi_scans/boreholes/15616943
#92: scans.bgs.ac.uk/sobi_scans/boreholes/428431
#93: scans.bgs.ac.uk/sobi_scans/boreholes/15043365
#94V: scans.bgs.ac.uk/sobi_scans/boreholes/18381991
#95V: scans.bgs.ac.uk/sobi_scans/boreholes/18383045
#96V: scans.bgs.ac.uk/sobi_scans/boreholes/18382962
#97W: scans.bgs.ac.uk/sobi_scans/boreholes/18382965
#98W: scans.bgs.ac.uk/sobi_scans/boreholes/18381993
#99: scans.bgs.ac.uk/sobi_scans/boreholes/428481
#100X: scans.bgs.ac.uk/sobi_scans/boreholes/18382009
#101X: scans.bgs.ac.uk/sobi_scans/boreholes/18381988
#102Y: scans.bgs.ac.uk/sobi_scans/boreholes/15043362
#103: scans.bgs.ac.uk/sobi_scans/boreholes/428430
#104Y: scans.bgs.ac.uk/sobi_scans/boreholes/15043358
#105: scans.bgs.ac.uk/sobi_scans/boreholes/428498
#106Z: scans.bgs.ac.uk/sobi_scans/boreholes/428780
#107Z: scans.bgs.ac.uk/sobi_scans/boreholes/428781
#108AA: scans.bgs.ac.uk/sobi_scans/boreholes/18381989
#109AA: scans.bgs.ac.uk/sobi_scans/boreholes/18382123
#110: scans.bgs.ac.uk/sobi_scans/boreholes/428177
#111: scans.bgs.ac.uk/sobi_scans/boreholes/428163
#112: scans.bgs.ac.uk/sobi_scans/boreholes/428499
#113: scans.bgs.ac.uk/sobi_scans/boreholes/428487
#114AB: scans.bgs.ac.uk/sobi_scans/boreholes/428821
#115AB: scans.bgs.ac.uk/sobi_scans/boreholes/428194
#116AB: scans.bgs.ac.uk/sobi_scans/boreholes/428822
#117AB: scans.bgs.ac.uk/sobi_scans/boreholes/428192
#118AB: scans.bgs.ac.uk/sobi_scans/boreholes/428776
#119AB: scans.bgs.ac.uk/sobi_scans/boreholes/428191
#120AB: scans.bgs.ac.uk/sobi_scans/boreholes/428193
#121: scans.bgs.ac.uk/sobi_scans/boreholes/428480
#122: scans.bgs.ac.uk/sobi_scans/boreholes/428195
#123: scans.bgs.ac.uk/sobi_scans/boreholes/428834
#124: scans.bgs.ac.uk/sobi_scans/boreholes/428847
#125AB: scans.bgs.ac.uk/sobi_scans/boreholes/428500
#126: scans.bgs.ac.uk/sobi_scans/boreholes/428432

8 Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

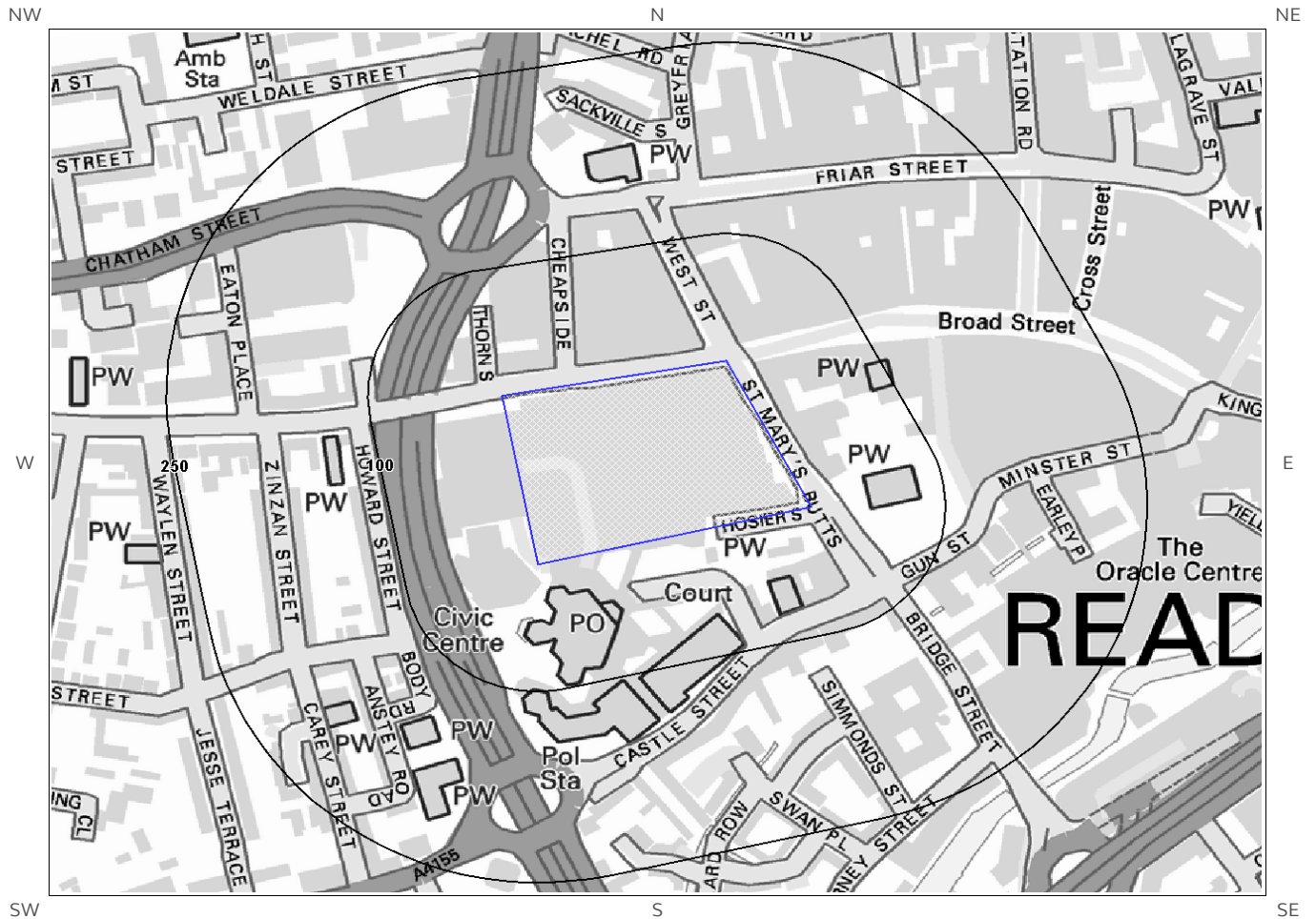
1

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg

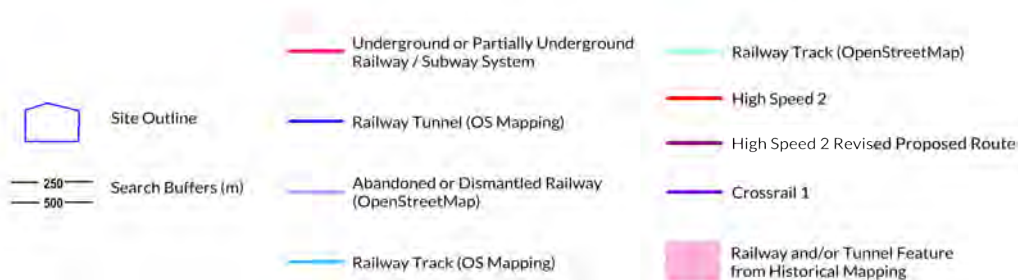
*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

9 Railways and Tunnels map



Railways and Tunnels Legend

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9 Railways and Tunnels

9.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

9.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? No

Have any historical railway or tunnel features been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

9.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project? No

Is the study site within 500m of the route of the Crossrail 1 rail project? Yes

Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a Groundsure HS2 and Crossrail 1 Report.

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.

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BGS Geological Hazards Reports and general geological enquiries

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The Coal Authority

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APPENDIX F

Borehole Records

RECORD OF BOREHOLE NO. 1

4711S2
173392

Ground level : 147.0ft above O.D. (approx)

Dia. of boring : 8in to 50ft

Type of boring : Shell and Auger

Lining tubes : 8in to 35ft 6in

Daily Progress	Samples		Change of Strata		Description of Strata	
	Depth	Type	Legend	Depth		
18.9.68	1'0" 3'0" - 3'9"	BD BD C(3)			FILL (brick rubble, loose gravel and brown clay)	
19.9.68	6'0" - 7'6"	U(4) D		6'0" 8'0"	141.0 139.0	Soft brown silty CLAY
	9'0" - 9'6"	C(50) BD				Loose to dense medium to large flint GRAVEL
	14'0"	BD				
	14'6" - 15'6"	C(4)		16'6"	130.5	
	17'0" - 18'6"	U(4) D				Angular CHALK fragments in a matrix of clayey chalk (solifluction chalk)
	18'6" - 19'6"	D				
	21'0"	BD				
	21'6" - 22'6"	C(31)				
	25'0" - 26'6"	U(4) D				
	26'6" - 27'6"	D				
	29'0" - 29'6"	D				
	29'6" - 30'6"	C(19)			30'0"	117.0
20.9.68	33'0" - 34'6"	U(4) D				Very fissured white CHALK, rather hard and fine grained, becoming less fissured with depth
	34'6" - 35'6"	D				
	37'6" - 38'6"	C(38)				
	41'0" - 42'6"	U(4) D				
	42'6" - 43'0"	BD				
	43'6" - 44'6"	C(52)				
	47'6" - 49'0"	U(4) D				
	49'0" - 50'0"	D		50'0"	97.0	
Key to type of sample :			Remarks : (Observations on ground-water, etc.)			
U (4) — 4 in. dia. undisturbed sample.			Water was added on 19.9.68 at 8ft below ground level to assist boring.			
U (1½) — 1½ in. dia. " "			Ground water was first encountered in the morning of 20.9.68 at 33ft.			
D — disturbed sample. " "			After withdrawal of casing to 20ft ground-water stood at 28ft.			
BD — bulk disturbed sample.						
V — vane test.						
S () — standard penetration test.						
C () — dynamic cone penetration test.						
Figure in brackets is No. of blows for penetration given in depth column (see Notes, page 1).						
READING COMMERCIAL CENTRE						Lab Ref No. S/6823
						FIG. I

RECORD OF BOREHOLE NO. 9

471292
173403

Ground level : 142.0ft above O.D. (approx)

Dia. of boring : 8in to 22ft

Type of boring : Shell and Auger

Lining tubes : 8in to 16ft 6in

Daily Progress	Samples		Change of Strata			Description of Strata
	Depth	Type	Legend	Depth	O.D. Level	
	2'6" - 3'0"	BD C(32)		0'4"	141.7	Concrete
	5'6" - 6'0"	BD C(29)				Medium dense to dense fine to coarse sandy GRAVEL
	8'6"	BD		11'6"	130.5	
	12'6" - 14'0"	U(4) D				Broken and fissured CHALK with clayey chalk in fissured (possibly solifluction chalk)
	14'0" - 15'0"	D				
	17'0" - 18'0"	S(20)				
	19'0"	D				
15.11.68	20'6" - 22'0"	U(4) D		22'0"	120.0	
Key to type of sample : U (4) — 4 in. dia. undisturbed sample. U (1½) — 1½ in. dia. " " D — disturbed sample. BD — bulk disturbed sample. V — vane test. S () — standard penetration test. C () — dynamic cone penetration test. Figure in brackets is No. of blows for penetration given in depth column (see Notes, page 1). Remarks : (Observations on ground-water, etc.) Water was added on 15.11.68 at 2ft 6in below ground level to assist boring. Ground-water was encountered at 11ft 6in and again at 20ft 6in. In the evening ground-water stood at 21ft. In the morning of 16.11.68 ground-water stood at 18ft 9in. A sample of ground-water was taken on 18.11.68.						
READING COMMERCIAL CENTRE						Lab Ref No. S/6823
						FIG. 9

471228
-173346

^aBritish Geological Survey

Dia. of boring : SF (4⁷/₁₆) to 26ft

Lining tubes : 5½ in to 19ft

Scale :

 Drawing No :
 S/R/

RECORD OF BOREHOLE NO. 5

471176
173322

Ground level : 130.5ft above O.D. (approx)

Dia. of boring : SF (4 7/8) to 7ft 11in

Type of boring : Rotary Core Drilling

Lining tubes : SF to 8ft

Daily Progress	Core Recovery		Change of Strata			Description of Strata
	Depth	%	Legend	Depth	O.D. Level	
	0'0"	Not Cored		3'0"	127.5	Light grey clayey CHALK with flints
30.10.68	7'11"			7'11"	122.6	White clayey CHALK with flints (solifluction chalk)

RECORD OF BOREHOLE NO. 5A

Ground level : 130.5ft above O.D. (approx)

Dia. of boring : SF (4 7/8) to 8ft 4in

Type of boring : Rotary Core Drilling

Lining tubes : SF to 8ft 2in

	2'6"	Not Cored		2'6"	128.0	Brown clayey CHALK with flints
	4'4"	100%		6'5"	124.0	CHALK and FLINT fragments in matrix of grey-brown clayey CHALK (solifluction chalk)
	6'5"	100%		6'8"	123.8	Fine to coarse broken FLINT
	7'2"	100%		7'6"	123.0	Clayey CHALK with coarse broken flint
31.10.68	8'4"	100%		8'4"	122.2	CHALK (possibly in-situ) with large flint fragments
2.11.68	10'0"	Nil				
	13'6"	21%				
		16%				
4.11.68	17'7"			17'7"	112.9	White CHALK with flints

Remarks:

READING COMMERCIAL CENTRE

Lab Ref No.
S/6823

FIG. 5

RECORD OF BOREHOLE NO. 10

471278
173337

Ground level : 145.0ft above O.D. (approx)

Dia. of boring : 8in to 30ft

Type of boring : Shell and Auger

Lining tubes : 8in to 19ft

Daily Progress	Samples		Change of Strata			Description of Strata
	Depth	Type	Legend	Depth	O.D. Level	
				0'2"	144.9	Wood flooring
				0'8"	144.3	Concrete
				1'0"	144.0	FILL (bricks)
	3'6" - 5'0"	U(4) D		4'0"	141.0	Brown clayey SILT and fine SAND
	5'0" - 6'6"	U(4) D				Brown sandy CLAY with fine coarse GRAVEL
	6'6" - 8'6"	D		9'6"	135.5	
	10'0"	BD				
	10'6" - 11'6"	C(93)				
	13'6" - 14'6"	BD C(24)				Dense to very dense fine to coarse SAND and fine to coarse GRAVEL
	16'0"	BD				
	16'6" - 17'6"	C(91)		18'6"	126.5	
16.11.68	19'6" - 21'0"	U(4) D				
	23'0"	D				CHALK fragments in matrix of clayey CHALK (solifluction chalk)
	24'0" - 25'0"	S(8)				
18.11.68	28'6" - 30'0"	U(4) D		30'0"	115.0	
	30'0"					
Key to type of sample : U (4) — 4 in. dia. undisturbed sample. U (1½) — 1½ in. dia. " " D — disturbed sample. " " BD — bulk disturbed sample. V — vane test. S () — standard penetration test. C () — dynamic cone penetration test. Figure in brackets is No. of blows for penetration given in depth column (see Notes, page 1). Remarks : (Observations on ground-water, etc.) Water was added at 9ft 6in below ground level on 16.11.68 to assist boring. Ground-water was first encountered on 16.11.68 at 18ft 6in below ground level. In the evening the borehole was found to be dry. A further reading was taken on the morning of 18.11.68 when the borehole was again found to be dry.						
READING COMMERCIAL CENTRE						Lab Ref No. S/6823
						FIG. 10

APPENDIX F – Mitigation Register – Water Resources

397. Table F.1 provides a list of potential water resource mitigation measures which could be included in the final Proposed Development.

Table F.1 Water Resource Mitigation Register

WATER RESOURCES, DRAINAGE AND FLOOD RISK: MITIGATION MEASURES
Through the design of the Proposed Development, the adoption of best practice construction methods, and management controls once the Proposed Development is complete and occupied there are various measures that can be considered as embedded mitigation which will reduce the risk and hence likelihood that some potential effects on water resources or flood risk would occur. Best practice construction methods and other measures will be developed and detailed in the Construction Environmental Management Plan (CEMP) for the Proposed Development which will be prepared and agreed with the RBC in advance of construction.
Sediment in Runoff
• The following mitigation measures for sediment in runoff will be embedded within the CEMP and implemented during the Site works: • Site access points will be regularly cleaned to prevent build-up of dust and mud; • Earth movement will be controlled to reduce the risk of construction silt combining with the Site surface water runoff; • Properly contained wheel wash facilities will be used where required, to isolate sediment rich runoff; and • Drainage of surface runoff and de-watering effluents to settling tanks to remove suspended solids prior to discharge to sewer or removal by a suitably licenced waste operator.
Leaks and Spillages of Contaminants
The following measures will be implemented, where possible: • Implementing control procedures during delivery or movement of service materials; • The drainage system will have cut-off measures that will allow a spill to be contained within the Site, so that it can be effectively controlled and managed without leading to off-site effects; • An Emergency Response Plan will be put in place; • Education / information on waste treatment / emergency events/spills etc. can be provided to the building servicing staff and building occupants as appropriate; and • Oil interceptors would be used in association with the drainage network in high-risk areas to reduce the potential risk for contamination. The appropriate utility company would be consulted on the potential requirement for an oil interceptor at the point where site surface water runoff enters the combined sewer.
The following mitigation measures will be embedded within the CEMP and implemented during the Site works: • Spillages and leakages will be immediately contained in line with an emergency response plan and managed through the use of geotextile bunding of adequate capacity (110%) to isolate and minimise the ingress of surface water runoff to non-decommissioned boreholes or exposed surface water drainage pipes. Valves and trigger guns will be protected from vandalism and kept locked when not in use; • An emergency spillage action plan will be produced, which site staff will have read and understood. On-site provisions will be made to contain a serious spill or leak through the use of booms, bunding and absorbent material; • Wherever possible, plant and machinery will be kept away from the drainage system and will have drip trays beneath oil tanks/engines/gearboxes/hydraulics which will be checked and emptied regularly via a licensed waste disposal operator; • Following the discharge of surface runoff and de-watering effluents to settling tanks the drainage would be routed to oil interceptors prior to discharge to sewer; • The majority of concrete used will be pre-mixed and delivered from an off-site source, thereby negating the need to mix concrete on-site and reducing the creation of alkaline wastewater. Any mixing and handling of wet concrete on-site will be undertaken in designated impermeable areas, away from any drainage channels or surface water; • A designated impermeable area will be used for any washing down or equipment cleaning associated with concrete or cementing processes and wastewater will be discharged to the foul drainage system (with approval from TWUL) or contained and removed by tanker to a suitable discharge location by a suitably licenced waste operator; and • The proposed drainage/service runs will be surrounded by appropriate granular bedding materials and located above the static level of any shallow groundwater. The drainage network installed as part of the Proposed Development will be constructed to meet with Building Regulations 2000, Part H.
All liquids and solids of a potentially hazardous nature (e.g. diesel fuel, oils and solvents) are to be stored in designated locations with specific measures to prevent leakage and release of their contents, include the siting of storage area away from surface water drains, on an impermeable base with an impermeable bund that has no outflow and is of adequate capacity to contain 110% of the contents, in accordance with the EA's requirements. Any tanks storing more than 200 litres of oil on-site, would have secondary bunding. All storage will be protected from vandalism and kept locked up when not in use. Wherever possible, plant and machinery will have drip trays beneath oil tanks/engines/gearboxes/hydraulics, which will be checked and emptied regularly via a licensed waste disposal operator.

On-site provisions will be made to contain a serious spill or leak through the use of booms, bunding and absorbent material in accordance with an Emergency Response Plan (ERP).
Refuelling and delivery areas will be located away from the local sewer network drains.
Disturbance of Existing Drainage Systems and Water Supply Network
The following mitigation measures will be embedded within the CEMP and implemented during the Site works: • All existing utilities will be identified and marked prior to works commencing; • Signs will be used to warn of the presence of utility infrastructure; and • Any damage to the drainage network will be immediately repaired.
Groundwater Flow and Quality
The preparation of a Piling Method Statement which will detail the depth and type of piling to be undertaken and the methodology by which such piling will be carried out, including measures to prevent and minimise the potential for damage to subsurface sewerage and water infrastructure and to demonstrate appropriate design and piling methods to avoid linking shallow and deep groundwater. The following mitigation measures will be embedded within the CEMP and implemented during the Site works: • Pile casing will be used during piling and the area around the piling will be isolated from surface water until piling is complete; • Any existing boreholes found on-site would be decommissioned; • If perched groundwater is encountered during establishment of basement and core foundations dewatering may be required. The most appropriate methods to dewater excavations will be selected, for example, prior to dewatering the perimeter of the excavation could be enclosed with either sheet-pile or a diaphragm wall. Piezometers (standpipes) could then be placed outside the sheet pile wall to monitor groundwater levels; • In the event that ground contamination is discovered, work will stop immediately and measures will be taken to prevent disturbance and mobilisation of contaminants, until the contamination has been treated in-situ or removed for off-site disposal or treatment; • If contaminated soils are encountered at the position where piling is due to be undertaken, then these materials should be removed prior to piling in order to prevent the dragging of contaminated soils with the piles to depth; • Contaminated soil requiring disposal will be excavated and kept separate from other soil and waste materials in protected temporary stockpiles prior to disposal; • Water arising from excavations will be disposed of to the local sewer network (subject to agreement with the appropriate authority) if uncontaminated and following the removal of silt via settlement ponds or alternative measures. All existing utilities will be identified and marked prior to works commencing; and • Damp-proof membranes will be incorporated into the construction. These membranes will prevent the ingress of groundwater and reduce the risk of contaminants from reaching underground strata or groundwater. The watertight basement will therefore prevent any interior leaks or spillages from freely percolating into the shallow groundwater. Appropriate methods to dewater excavations are to be selected to ensure that groundwater does not drop below the critical level. Groundwater level monitoring will be undertaken as necessary to assess deformation and stability of surrounding structures, including neighbouring property. Seepage analysis and groundwater level monitoring will be carried out as appropriate to assess deformation and stability of surrounding structures, including neighbouring property, as considered necessary.
Temporary Settlement and Surface Water Drainage
Temporary drainage facilities will be provided during the construction phase, where necessary, to ensure controlled discharge of surface water runoff. It will be a requirement to ensure that runoff from the Site does not cause pollution or flooding. Measures that will be considered for implementation for temporary drainage through the construction design and/ or CEMP include: Site access points will be regularly cleaned to prevent build-up of dust and mud: • Oil interceptors to be installed (notably the outflow from the settlement pond/ tank) to reduce the potential risk for contamination of groundwater and surface water; and • All potentially polluted waters (including washdown areas, stockpiles and other areas of risk for water pollution) to have separate drainage and to be tankered away from the Site. In addition, if monitoring demonstrates unsatisfactory levels of solids or other pollutants, measures will be implemented to control suspended solids or other polluted discharge to watercourses (e.g. changes to Site drainage and settlement facilities and/or use of flocculants).
Foul Drainage
A connection to the foul sewer will be needed for sanitary connection from offices/admin/welfare facilities. It is possible this connection may also be licensed for discharge of process effluent in abnormal circumstances if required.
Flood Risk
The CEMP will incorporate measures to prevent an increase in flood risk or pollution during the construction works, in addition to the provision of temporary settlement and drainage measures (where required).

Water Demand
The following measures will be implemented: • Selection and specification of equipment to reduce the amount of water required; • Implementation of staff-based initiatives such as turning off taps, plant and equipment when not in use both on-site and within Site offices; • Use of recycling water systems such as wheel washes, Site toilets hand wash; and • Use of a rainwater harvesting system for use in equipment and vehicle washing.
The water consumption throughout the construction works will be monitored, either through sub-metering or reading of utility bills, to allow comparison against best practice benchmarks and improvements to be made.
Wastewater Generation
The installation of water efficient fixtures and fittings can help further reduce the volume of foul water generated on-site.
Any waste effluent will be tested and any water that may have come into contact with contaminated materials or be identified as being contaminated, will be disposed of appropriately and, to the satisfaction of the EA and/or TWUL; and where necessary, disposed of at the correctly licensed facility by a licensed specialist contractor/s.

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