CCG-C-21-12598

COMBINED PHASE I-II GEOENVIRONMENTAL REPORT FOR LAND AT TRANMERE ROVERS FC PRENTON ROAD WEST PRENTON CH42 9PY

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1.0 INTRODUCTION

CC GEOTECHNICAL LIMITED (***CCG***) is providing consultancy services to the ***TRANMERE ROVERS TRUST*** (the *Client*) in connection with the proposed redevelopment of land adjoining the existing Tranmere Rovers Recreation Centre at Tranmere Rovers Football Club, Woodchurch Lane, Birkenhead CH42.

It is understood that the site is to be redeveloped by the construction of a multi-functional fan park containing a licenced bar, catering / dining facilities, welfare facilities, communal gardens, and hard paved external car parking.

The existing and proposed layouts of the site are as shown on ***EDGE ARCHITECTS*** architectural drawings contained herein.

The proposed development falls within the administrative jurisdiction of ***WIRRAL BOROUGH COUNCIL.*** administered under Planning Application Reference No. APP/21/01442

A combined desk study and ground investigation report was prepared, to provide environmental and geotechnical data relevant to the planning, design, and construction of the project.

The findings of these studies and investigations are discussed hereunder.

This report should be read in conjunction with the Notes on Limitations, given in Appendix L.

2.0 PURPOSE & AIMS OF THE STUDY & INVESTIGATION

The primary aim of the Phase I Desk Study was to assess whether the site is likely to be affected by contamination, to an extent that it may pose a risk to human health and/or the built environment and/or the wider natural environment or is affected by any other natural or artificial feature which may impact on the proposed development. Specific tasks undertaken to achieve this were as follows:

- A review of available information including historical mapping, commercial environmental databases, and Environment Agency Data
- The undertaking of a site walkover
- The development of a Preliminary Conceptual Model

The main purpose of the Phase II Intrusive Investigation was to confirm the conclusions of the desk study, with reference to:

- The assessment of the nature and extent of contamination in relation to potential risks to human health for end users, construction workers, and worker occupants of adjacent properties
- The assessment of the nature and extent of contamination in relation to potential risks to controlled waters
- The assessment of the nature and extent of contamination in relation to potential risks to the fabric of buildings and services
- The refinement of the Preliminary Conceptual Model confirming pollution linkages that have been demonstrated to be present
- The identification of feasible remediation measures to remove or break the identified pollution linkages
- The provision of information and interpretative comment on ground conditions in relation to foundation selection, design, and construction

3.0 SITE DATA

3.1 Site Location

The study site is located on land immediately adjoining the existing Tranmere Rovers Recreation Centre at Tranmere Rovers FC, Prenton Road West, Prenton, CH42 9PY, as shown on ***CCG*** Drawing No. CCG-C-21-12598-1 and Aerial Plate No. CCG-C-21-12598-2 contained herein. The ***ORDNANCE SURVEY*** co-ordinates for the approximate site centre are 331385, 386754

3.2 Site Description & Walkover Observations

The site was visited in September 2021 on completion of a review of historical mapping and environmental data presented herein.

It was observed that the overall site is situated within a mixed commercial / residential context and comprises an irregular shaped parcel of land which extends to the approximate dimensions of c.229m x 196m, its long axis being on a northwest – southeast alignment.

The section of the overall site associated with this study comprises an approximate square shaped parcel of land located immediately south of the Tranmere Rovers Recreational Centre, the site being utilised as a car park.

The surface topography across the proposed redevelopment area was seen to be sensibly flat with surface cover comprising bituminous paving.

At the time of undertaking the site walkover survey, there was no visual evidence of the presence of non-native / native invasive plant species within or adjoining the site boundary.

Vehicle / pedestrian access to the site via Woodchurch lane.

The information obtained from the visit is summarised in Table 1 hereunder.

Table 1: Summary of Walkover Observations

FEATURE	OBSERVATION
Current use of proposed development Land	Former car parking facility
Context	Residential / commercial context
Surface & Topography	The surface topography across the proposed redevelopment area was seen to be sensibly flat with surface cover comprising black bituminous paving.
Dimensions	c.229m x 196m, its long axis being on a northwest – southeast alignment
Access	Vehicle / pedestrian access to the site via Woodchurch lane.
Buildings Adjacent to the Site	Tranmere Rovers Recreational Centre to the N
Services	Given that the land is adjoined by occupied structures, it is assumed that buried surfaces associated with these features extend beneath the site.
Material storage	None observed
Waste disposal	None observed
Other potential contamination	Hydrocarbons associated with former car parking facilities

4.0 SITE HISTORY

The history of the site and its immediate surrounds was investigated by consultation with a range of archive resources. Geographical information, historical mapping and environmental data were primarily based on a GroundSure Reports (CMAPS-AAG-989384-4165-090921) dated September 2021) presented in Appendix J, along with accompanying historical mapping data.

Table 2: Historical Map Review

YEAR	SCALE	ON SITE	ADJACENT TO SITE	<250M
1878 1890-92	1:2,500 1:10,560	Undeveloped / vacant land A pond is located in the SW portion of the site	N: Prenton Lane [later recognised as West Prenton Road E: Road later recognised as Borough Road	Much of the land surrounding the site is undeveloped / vacant land c.50m N: Pond c.60m S: Pond c.85m W: Pond c.140m SW: Pond
1897-98 1899 1899 1906-09	1:10,560 1:2,500 1:10,560 1:10,560	Unspecified property located in the S portion of the site	No significant change	c.30m N: Pavilion c.50m NE: Development of residential properties and associated gardens delineating West Prenton Road [extending to the E] c.60m N: Football Field [later recognised as Football Ground] c.85m W: Development of residential properties and associated gardens delineating West Prenton Road and Church Lane [extending to the W]
1909 1912	1:10,560 1:2,500	No significant change	N: Tramway established along Prenton Road West, turning N along Borough Road at the N corner of the site	c.90m NE: Development of residential properties and associated gardens [extending to the N/NE]

1924-25 1925 1925 1927	1:10,560 1:10,560 1:10,560 1:2,500	Football Ground recognised in the N portion of the site Undeveloped property in the S portion of the site no longer recognised Unspecified property recognised in the SW corner of the site	No significant change	c.30m N: Shaftesbury Recreation Ground c.75m N: 2nr Schools [former Football Ground] c.75m N: Development of residential properties and associated gardens [extending to the N] c.100m W: Allotment Gardens c.100m S: Allotment Gardens
1936 1936-38 1935-38 1938	1:2,500 1:10,560 1:10,560 1:10,560	Sports Ground recognised to the immediate S of the Football Ground	N: Tramway no longer recognised S: Pavilion recognised	Much of the land to the E of the site is developed for residential land use c.100m E: Birkenhead Institute Playing Fields with associated Pavilion to the E c.200m SW: Nursery
1954 1954 1954 1955 1956 1963 1966 1966	1:1,250 1:2,500 1:10,560 1:1,250 1:10,560 1:2,500 1:2,500 1:10,560	Football Ground recognised as Prenton Park (Tranmere Rovers FC) Car Park recognised in the W portion of the site [extending beyond the site boundary] Unspecified properties located to the S of the Football Ground [later expanded and recognised as Social Club	S: Drain recognised, running parallel with the site boundary W: Extension of Car Park	c.80m N: Garage recognised c.100m NW: Prenton Secondary School, adjacent Allotment Gardens to the W
1970-74 1977	1:1,250 1:1,250	Car Park recognised in the SE portion of the site	SE: Garage	c.50m E: Electric Sub-Station c.90m W: Works recognised
1982	1:10,000	Sports Centre located to the immediate W of the Social Club	No significant change	No significant change
1987-89 1991 1989-94	1:1,250 1:10,000 1:1,250	No significant change	W [N portion]: Road, associated with The Mersey Clipper [public house] to the W	c.20m W/NW: The Mersey Clipper [public house]
1993-95 1995 2001 2003 2010	1:1,250 1:1,250 1:10,000 1:1,250 1:10,000	Tank recognised as approximate site centre	No significant change	No significant change
2021	1:10,000	No significant change	No significant change	**Much of the land to the W of the site currently utilised for unspecified land uses**

5.0 ENVIRONMENTAL SETTING

5.1 Geology

The geology of the site was researched by reference to the 1:50000 scale ***BRITISH GEOLOGICAL SURVEY*** (***BGS***) Sheet 096 Liverpool (Solid and Drift Editions: 1977 1980) and Howard, A.S *et.al* (2007) 'Geology of the Liverpool district a brief explanation of the geological map Sheet 96 Liverpool – Sheet 97', Memoirs of the Geological Survey of Great Britain, England and Wales (Sheet - New Series). Her Majesty's Stationery Office, London.

The ***BGS*** 1:10, 000 Scale Drift Geological map indicate that the study site is underlain by impermeable diamicton (*boulder clay*) comprising gravel sand silt and clay deposits of glacial origin (*Pleistocene Epoch - Late Quaternary - Devensian Sub Age*).

The solid geology is documented as the Wilmslow Sandstone Formation (*formerly the Upper Mottled Sandstone*) of the Sherwood Sandstone Group comprising red brown to brick-red, fine- to medium-grained, generally pebble-free, cross-bedded sandstones, with sporadic siltstones and argillaceous mudstone horizons of the Early-Triassic Period (*Olenekian Sub-Age*).

The general dip of the solid geology within the surrounding area is documented to be in the order of c.11^0 in a north-easterly direction

The nearest geological line of weakness (normal fault - inferred), extending on a north-south alignment, lies c.58m west of the study site. Its displacement is seen to be to the west.

The '*Indicative Atlas of Radon in England and Wales*' (Miles. J.C.H *et.al*, 2007) Map 13 '*Northern Welsh Marches and Liverpool*', shows the site to be situated within an area where less than 1% of the properties within the area are affected by Radon, and hence no Radon Protection Measures will be required for new structures in contact with the ground.

As with many previously developed sites superficial made ground deposits of an unknown composition thickness and extent associated with the development of the site and its immediate environs may underlie the site.

Geological Information obtained from the GroundSure Environmental Report is presented in Appendix J, and summarised hereunder:

Table 3: Summary of Geological Data from GroundSure Report

GEOLOGY		
Data	**Distance**	**Comments**
Artificial Ground	On Site	Artificial ground and/or reworked ground deposits associated with the development of the site & its immediate surroundings.
Superficial Deposits / Drift Geology	On Site	Diamicton of glacial origin
Permeability of Diamicton	Maximum Permeability	High
	Minimum Permeability	Low
Bedrock and Solid Geology	On Site	Wilmslow Sandstone Formation
Permeability of Bedrock: On Site	Maximum Permeability	High
	Minimum Permeability	High
Geological Lines of Weakness	On Site	No records
	<250m	58m W.
Radon Affected Area	On Site	The site is not in a Radon Affected Area, as less than of properties are above the Action Level
Radon Protection	On Site	No radon protective measures are necessary
MINING, GROUNDWORKINGS AND NATURAL CAVITIES		
Data	**Distance**	**Comments**
Natural cavities	<500m	No records
BritPits	<500m	No records
Surface ground workings	<250m	On Site: Unspecified Heap On Site: Unspecified Ground Workings 66m W: Ponds 73-74m S: Ponds 76m W: Pond
Underground workings	<1000m	No records
Historical Mineral Planning Areas	<500m	No records
Non-coal mining	<1000m	No records
Mining cavities	<1000m	No records
Coal mining	On Site	No records
Brine areas	On Site	No records
Gypsum areas	On Site	No records
Tin mining	On Site	No records
Clay mining	On Site	No records

HAZARDS		
Data	**Distance**	**Comments**
Maximum shrink swell clays	On site	Very Low
Maximum running sands	On site	Very Low
Maximum compressible deposits	On site	Negligible
Maximum collapsible deposits	On site	Very Low
Maximum landslides	On site	Very Low
Maximum ground dissolution of soluble rocks	On site	Negligible

5.2 Mining

The appended environmental data, ***BGS*** mapping data and ***COAL AUTHORITY*** Gazetteer confirm that the site is not located within an area which is believed to be underlain by productive coal measures which may have been worked in the past and therefore a ***COAL AUTHORITY*** mining report was not procured.

5.3 Hydrology and Hydrogeology

Information on hydrology and hydrogeology obtained from a GroundSure Environmental Report is presented in Appendix J, and summarised hereunder:

Table 4: Summary of GroundSure Environmental Report

HYDROGEOLOGY AND HYDROLOGY		
Aquifer within Superficial Drift Deposits (Boulder Clay)	On site	**Diamicton: Secondary Undifferentiated:** Assigned where it is not possible to attribute either category A or B to a soil type. In general, these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the soil type
Aquifer within Bedrock Deposits	On site	**Wilmslow Sandstone Formation - Principal:** Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
Groundwater Abstraction Licenses	<1000m	No records
Surface Water Abstraction Licenses	<1000m	No records
Potable Water Abstraction Licences	<1000m	No records
Source Protection Zones	<500m	On Site: Type 3 [Total catchment]
Source Protection Zones (confined aquifer)	<500m	No records
Water Network (OS Mastermap)	<250m	On Site: Inland river not influenced by normal tidal action
Surface water features	<250m	1nr record
WFD Surface water body catchments	On Site	On Site: Coastal Catchment. Management catchment: Lower Mersey
WFD Surface water bodies	<250m	No records
WFD Groundwater bodies	<250m	On Site: Wirral and West Cheshire Permo-Triassic Sandstone Aquifers. Overall rating: Poor [2015 & 2016]
FLOODING		
Risk of Flooding from Rivers and Sea (RoFRaS)	<50m	No records
Historical Flood Events	<250m	No records
Flood Defences	<250m	No records
Areas Benefitting from Flood Defences	<250m	No records
Flood Storage Areas	<250m	No records
Flood Zone 2	<50m	No records
Flood Zone 3	<50m	No records
Surface water flooding: Highest risk	On Site	1 in 30 year, 0.3m – 1.0m
	<50m	1 in 30 year. 0.3m – 1.0m
Groundwater flooding: Highest risk	On Site	Low
	<50m	Low

For simplified interpretation, the geological succession underlying the site may be regarded as a series of discrete units in terms of their hydrogeological significance, as illustrated hereunder:

Table 5: Hydrogeological Interpretation

UNIT	PROPERTIES	HYDROGEOLOGICAL DESIGNATION
Made / Reworked Ground	If present, likely to be generally granular and permeable and will permit vertical and lateral transmission of groundwater.	Unproductive Aquifer
Diamicton	These are drift deposits with low permeability that have negligible significance for water supply or river base flow	Secondary Undifferentiated
Wilmslow Sandstone Formation	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers	Principal Aquifer

6.0 FURTHER ENVIRONMENTAL DATA

Environmental data was researched using several sources including Environment Agency Maps and GroundSure Envirosight Report presented in Appendix J and is summarised in Table 6 hereunder.

Table 6: Further Environmental Data

POTENTIALLY CONTAMINATIVE USES IDENTIFIED FROM 1:10,000 SCALE MAPPING		
Data	**Distance**	**Comments**
Historical industrial land uses	<250m	On Site: Unspecified Ground Workings [1925] 181m SW: Nursery [1936-49] 196m W: Telephone Exchange [1956-91]
Historical tanks	<250m	On Site: Unspecified Tank [1995]
Historical energy features	<250m	42m E: Electric Sub-Station [1974-95] 168m SE: Electric Sub-Station [1989] 174m N: Electric Sub-Station [1970-95]
Historical petrol stations	<250m	No records

Historical garages	<250m	On Site: Garage [1974-95] 61m N: Garage [1954] 67m N: Garage [1954-63] 108m N: Garage [1954]
Historical military land	<250m	No records
Records of Current Industrial Land Use		
Data	**Distance**	**Comments**
Recent industrial land uses	<250m	On Site: Tank [Tanks (Generic)] 46m E: Electric Sub-Station [Electrical Features] 84m W: Fabweld Fire Escapes [Access Equipment] 85m W: Works [Unspecified Works or Factories] 131m NE: The Rubbish Remover [Waste Storage, Processing and Disposal] 172m SE: Electric Sub-Station [Electrical Features] 177m N: Electric Sub-Station [Electrical Features] 216m W: Telephone Exchange [Telecommunications Features] 229m NE: Electric Sub-Station [Electrical Features]
Current or recent petrol stations	<250m	19m E: Obsolete
Electricity cables	<250m	8-14m NW 188-89m W
Gas pipelines	<250m	No records
Sites determined as Contaminated Land	<250m	No records
Control of Major Accident Hazards (COMAH)	<250m	No records
Regulated explosive sites	<250m	No records
Hazardous substance storage/usage	<250m	No records
Historical licensed industrial activities (IPC)	<250m	No records
Licenced industrial activities (Part A(1))	<250m	No records
Licensed pollutant release (Part A(2)/B)	<250m	11m E: Shell Prenton. Process: Petrol Vapour Recovery. Historical Permit – Part B
Radioactive Substance Authorisations	<250m	No records
Licensed Discharges to controlled waters	<250m	No records
Pollutant release to surface waters (Red list)	<250m	No records
Pollutant release to public sewer	<250m	No records
List 1 Dangerous Substances	<250m	No records
List 2 Dangerous Substances	<250m	No records
Pollution Incidents (EA/NRW)	<250m	No records
Pollution inventory substances	<250m	No records
Pollution inventory waste transfers	<250m	No records
Pollution inventory radioactive waste	<250m	No records
WASTE AND LANDFILL		
Data	**Distance**	**Comments**
Active or recent landfill	<500m	No records
Historical landfill (BGS records)	<500m	No records
Historical landfill (LA/mapping records)	<500m	No records
Historical landfill (EA/NRW records]	<500m	No records
Historical waste sites	<500m	No records
Licensed waste sites	<500m	No records
Waste exemptions	<500m	300m W: N/A. [Treating waste exemption]
ENVIRONMENTAL DESIGNATIONS		
Data	**Distance**	**Comments**
Sites of Special Scientific Interest (SSSI)	<500m	None
Conserved wetland sites (Ramsar sites)	<500m	None
Special Areas of Conservation (SAC)	<500m	None
Special Protection Areas (SPA)	<500m	None
National Nature Reserves (NNR)	<500m	None
Local Nature Reserves (LNR)	<500m	None
Designated Ancient Woodland	<500m	None
Biosphere Reserves	<500m	None
Forest Parks	<500m	None
Marine Conservation Zones	<500m	None
Green Belt	<500m	None

Proposed Ramsar sites	<500m	None
Possible Special Areas of Conservation (PSAC)	<500m	None
Potential Special Protection Areas (pSPA)	<500m	None
Nitrate Sensitive Areas	<500m	None
Nitrate Vulnerable Zones	<500m	None

7.0 ARCHAEOLOGICAL DATA

Examination of historical maps indicates no features of significant archaeological interest in the general vicinity of the site.

8.0 PREVIOUS SITE INVESTIGATIONS / REPORTS

Searches and consultations have not established evidence of previous site investigations having been undertaken at the study site.

9.0 PRELIMINARY QUALITATIVE RISK ASSESSMENT (TIER 1)

9.1 Introduction

The risk assessment methodologies adopted by ***CCG*** are based on current available guidance from several sources and are included in Appendix K.

The Tier 1 Risk Assessment and Preliminary Conceptual Model (PCM) were formulated using the information discussed above and based on the following assumptions:

- the site is to be redeveloped by the construction of a multi-functional fan park containing licenced bar, catering / dining facilities, welfare facilities and communal gardens and hard paved car parking facilities.

The existing and proposed layout of the development are as annotated on ***EDGE ARCHITECTS*** architectural drawings contained herein.

- Drinking water will be from a mains supply.

In constructing the Preliminary Conceptual Model (PCM)***, CCG*** applied the guidance contained in CIRIA C552: 2001. This recommends use of a Risk Matrix which classifies risk based on the product of Probability of a source being present, and the Consequence of receptors being exposed to the source. Guidance tables setting out the classifications of probability and consequence together with a risk matrix are given in Tables 7-9 hereunder. In using this approach ***CCG*** generally recommends actual intrusive investigation of any Risk Classification of "*Moderate*" or over. In the case of residential housing, risk ratings of `*Low*` may also warrant investigation.

Table 7: Matrix of consequences against probability to gain a risk classification [CIRIA C552, 2001]

		CONSEQUENCE			
		SEVERE	**MEDIUM**	**MILD**	**MINOR**
Probability	**High Likelihood**	Very High Risk	High Risk	Moderate Risk	Moderate / Low Risk
	Likely	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk

9.2 Preliminary Conceptual Model

By application of the risk assessment methodology outlined above, the following PCM was constructed.

Table 8: Preliminary Conceptual Model (PCM)

POLLUTANT LINKAGE	SOURCE	PATHWAY	RECEPTOR	PROBABILITY	CONSEQUENCE	RISK RATING
1	Broad spectrum of heavy metals, aggressive pH, hydrocarbons, PAH`s in Made Ground associated with the development of the site and immediately surrounding land uses	Soil and / or soil dust ingestion	Construction workers Future occupants (adults & infants) Offsite receptors Flora	Likely	Medium	**Moderate**
2	Asbestos containing materials (ACM) in made ground soils associated with the demolition / redevelopment of the site	Fibre Inhalation	Construction workers Future occupants (adults & infants) Offsite receptors	Likely	Severe (ACM)	**High**
3	Inhalation of vapours associated with potential made ground deposits etc.	Inhalation	Future residents	Unlikely	Medium	**Moderate**
4	Inhalation of ground gases from onsite or offsite sources i.e., made ground soils etc.	Inhalation	Future residents	Unlikely	Medium	**Moderate**
5	pH & Sulphate attack on concrete	Future building	Future building	Likely	Mild	**Moderate / Low**
6	Organic contamination associated with former car parking facilities	Direct contact with water mains	Potable water supply	Unlikely	Medium	**Moderate**

The contaminants of concern associated with those risks which require intrusive investigation were researched by reference to published industry profiles, and are summarised hereunder:

Table 9: Summary of Contaminants of Concern based on PCM

LINKAGE NO.	METALS	NON-METALS	ORGANICS	GASES	OTHERS
PL1, PL2, PL4, PL5	Cd, Cr, Ni, Cu, Pb, Hg, Se, Zn	As, sulphates	TPHCWG, PAH's, BTEX, Volatiles (by PID)	-	pH Asbestos
PL3	-	-	-	CH_4, CO_2, H_2S	-
PL1-PL5	Cd, Cr, Ni, Cu, Pb, Hg, Se, Zn	As, sulphates	TPHCWG, BTEX PAH's, Volatiles (by PID)	CH_4, CO_2, H_2S	pH Asbestos

9.3 Summary of Risks

The foregoing analysis identified several potential risks, and if present, these could adversely impact on human or environmental receptors. Since no previous site investigation has been undertaken, an intrusive phase of investigation was undertaken to determine whether the postulated pollutant linkages are present on site.

10.0 SCOPE OF PHASE II INTRUSIVE INVESTIGATION

Based on the findings of the Phase I desk study and taking account of the potential presence of pollution linkages an intrusive investigation was undertaken. The Phase II Intrusive Investigation provided for exploratory boreholes and trial pits to be excavated through made ground into the underlying natural strata to allow for sampling of soils and groundwater if present.

The primary objectives of the investigation were to obtain enough soil and groundwater contamination data to reliably assess risks to human and environmental receptors, and to provide engineering parameters on which suitable foundation solutions could be selected.

11.0 FIELDWORK

11.1 Introduction

A programme of fieldwork investigation was undertaken in September 2021. The combined programme works comprised:

- The manual excavation and CAT scanning of 5nr borehole starter extending from GL-1.2mbgl
- The subsampling of borehole arisings for soil contamination analyses
- The advancement of 4nr borehole starter pits using light dynamic sampling methods
- The advancement of 1nr borehole starter pit using light cable percussive boring methods
- The subsampling of borehole arisings for soil classification testing

- The installation of 50mm HDPE plain and slotted well-tube complete with non-lime pea gravel surround and bentonite seals together with associated headworks at 3nr borehole position
- The instigation of a gas – groundwater monitoring programme comprising 6nr rounds over a 3-month period

The fieldwork was planned in accordance with BS10175: 2011 and carried out in accordance with BS10175: 2011 and BS5930: 2015, and the sampling and monitoring methodologies employed by ***CCG*** as presented in Appendix C, insofar as they related to the scope of the investigation.

The layout of the proposed investigation is as annotated on ***EDGE ARCHITECTS*** Drawing No. 2019313-EDG-00-ZZ-DR-A-3001 '*Site Plan*' contained herein.

11.2 Borehole Drilling & Monitoring Installations

11.2.1 Light Dynamic Sampling Boreholes

In accordance with the ground investigation plan, 4nr boreholes were sunk using light dynamic sampling methods using a Dando Terrier 2000 rig deploying 100mm casings and associated tools.

Each borehole location was positioned clear of all overhead services and scanned for buried electrical services using CAT cable avoidance scanner before and during hand excavation of a starter pit extending to 1.2mbgl.

Boring tools were decontaminated prior to commencement.

In this method of investigation samples of subsoils are recovered by driving and extracting a series of reducing diameter 1m long steel tubes. Standard penetration test's (SPT's) were undertaken at regular depth increments. This method of sampling recovers relatively "*undisturbed*" soil profiles in Perspex tubes, which are used to line the steel tubes. The Perspex tubes were split and carefully logged and subsampled. Subsamples for potential chemical analysis were removed at appropriate positions from the profile and transferred to chilled amber glass jars and vials for laboratory analysis.

The logs of the light dynamic sampling boreholes, annotated with sampling details, SPT `N` values and details of standpipe construction, are presented in Appendix D.

11.2.2 Light Cable Percussive Boring

1nr borehole was sunk using cable percussive boring methods deploying 150mm casing and tools.

The location was positioned clear of known buried and overhead services and was scanned for buried services using a CAT cable avoidance scanner before and during hand excavation of a 1.2m deep borehole starter pit.

Boring tools were decontaminated prior to commencement of fieldworks.

Standard Penetration Tests (SPT) were carried out at regular intervals throughout the borehole depth with U100 samples recovered in cohesive strata where feasible.

Bulk disturbed, and small-disturbed glass amber jar/vial samples were recovered at regular incremental depths and at changes of stratum within the borehole.

A log of the cable percussive borehole, annotated with sampling details, and SPT `N` values, is given in Appendix D.

11.2.3 Monitoring Installations

Standpipes comprising 50mm diameter HDPE plain and slotted well-tube set in bentonite and non-limestone pea gravel surround were installed at 3nr borehole positions. Each standpipe was fitted with a gas valve connector and was protected by a flush cover set in concrete.

Details of standpipe installations are provided on the relevant borehole logs in Appendix D and summarised in the tabulation hereunder:

Table 10: Borehole Installation Details

BOREHOLE	DEPTH OF BOREHOLE (mbgl)	DEPTH OF STANDPIPE [mbgl]	RESPONSE ZONE	
			FROM [mbgl]	TO [mbgl]
WS1	5.0m	4.0m	0.5m	4.0m
WS3	5.0m	4.0m	0.5m	4.0m
WS4	5.0m	4.0m	0.5m	4.0m

The standpipe installations were periodically monitored for flow rate and composition of ground gas using a Geotechnical Instruments GA infra-red analyser. The installations were also monitored for standing water levels with an electronic dip meter.

The results of the gas and groundwater monitoring, together with calibration certificates of the monitoring instruments are given in Appendix E.

12.0 OBSERVED GROUND CONDITIONS

The stratigraphy of the boreholes was generally consistent with the documented geology. The succession may be generalised as tabulated hereunder:

Table 11: Observed Stratigraphy

Location	STRATIGRAPHY
WS1	Bituminous paving and associated sub-base overlying made ground deposits comprising grey / brown sands and gravel extending to 0.8mbgl. The sequence thereafter continues in natural drift deposits comprising firm becoming stiff boulder clay, proven to 5mbgl. Dynamic probing undertaken from the base of the borehole confirmed a significant increase in density to 7.6mbgl where refusal in rock head was encountered Borehole dry on completion
WS2	Bituminous paving and associated sub-base overlying made ground deposits comprising red / brown sands and gravel extending to 0.8mbgl. The sequence thereafter continues in natural drift deposits comprising firm becoming stiff brown boulder clay, proven to 5mbgl. Borehole dry on completion
WS3	Bituminous paving and associated sub-base overlying made ground deposits comprising red / brown sands and gravel with medium cobble content extending to 0.6mbgl then grey fine – medium grained gravels to 1mbgl. The sequence thereafter continues in natural drift deposits comprising firm becoming stiff brow boulder clay, proven to 5mbgl. Dynamic probing undertaken from the base of the borehole confirmed a significant increase in density to 8.7mbgl where refusal in rock head was encountered Borehole recovery from 0.6mbgl > 1mbgl reported to be wet (perched water)
WS4	Bituminous paving and associated sub-base overlying made ground deposits comprising red / brown sands and gravel with low cobble content extending to 0.5mbgl. The sequence thereafter continues in natural drift deposits comprising firm becoming stiff brown boulder thereafter, proven to 5mbgl Perched water reported to be sat at the interface of made ground > natural deposits
BH1	Bituminous paving and associated sub-base overlying made ground deposits comprising dark brown gravelly sand extending to 0.9mbgl. The sequence thereafter continues in natural drift deposits comprising firm becoming stiff brown boulder clay to 5mbgl, dense red gravelly clayey sands to 5.8mbgl, stiff red / brown clay to 6.8mbgl, then light brown fine and medium grained sandstone thereafter, recovered as very dense gravelly sand (drilling induced) proven to 7.2mbgl. Borehole reported to be dry on completion.

There was no visual evidence of contamination and/or biodegradable materials affecting the near surface soils at any exploratory position.

12.2 Groundwater Regime

Made ground deposits at 2nr sampling positions were reported to be wet with monitored standing water levels being in the order of 0.6m - 1.37mbgl during the ongoing gas – groundwater monitoring programme.

13.0 CONTAMINATION TESTING

13.1 Soil – Groundwater Contamination Analyses

A programme of soil chemical analyses was undertaken at a **UKAS** / **MCERTS** accredited laboratory:

- 4nr subsamples of made ground soils were analysed to a broad-spectrum suite of contaminants including metals, non-metals, heavy metals, speciated PAH's, hydrocarbons to the TPHCWG methodology.
- 4nr subsamples of made ground soils were screened for asbestos containing materials (ACM's)
- 4nr subsamples of soil were analysed for soil pH and water-soluble sulphate content.
- In the absence of adequate quantities of perched water during the intrusive ground investigation, a leachate

prepared on soil from 1nr borehole position (BH1) were analysed for a broad range of contaminants including metals, non-metals, heavy metals, speciated PAH's, hydrocarbons to the TPHCWG methodology.

The soil / soil leachate contamination test results and certificates are presented in Appendix F.

13.2 Soil Classification Testing

The following programme of soil geotechnical testing was undertaken at the **UKAS** laboratory associated with ***CCG.***

- Determination of Particle Size Distribution in accordance with BS 1377-2: 1990
- Determination of soil moisture content in accordance with BS: 1377: Part 2: 1990
- Determination of Atterberg Limits in accordance with BS: 1377: Part 2: 1990

The soil engineering test results are presented in Appendix I.

14.0 RISK ASSESSMENT FOR THE PROTECTION OF HUMAN HEALTH

14.1 Generic Quantitative Risk Assessment (Tier 2 / GQRA)

An assessment of the soil analysis data was carried out in accordance with the guidance presented in CLR11 and in accordance with current guidance and legislation.

The Human Health Risk Assessment was carried out in accordance with the ***CCG*** methodology for assessing soil contamination data as contained in Appendix K, and since it is proposed that the site be developed for continued commercial land use, the assessment was based on criteria contained in publication LQM/CIEH S4UL`s for Human Health Risk Assessment (2015) (***CCG*** licence S4UL3233), applicable to the "*Commercial* land use scenario'. This document does not provide criteria for Lead, for which the results were compared to the C4SL published by DEFRA SP1010 Development of Category 4 Screening Levels.

14.2 Assessment of Contamination Data

Based on a Soil Organic Matter content of 1.0%, the assessment of the soil data is summarised in the tabulations hereunder, and presented on the worksheets in Appendix G.

14.2.1 Assessment of Metal Data

The assessment of the metal data is presented hereunder:

Table 12: Assessment of Metal Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Cadmium	190	3.2	-	-
Chromium	8600	2150.0	-	-
Copper	68000	284.0	-	-
Lead	2300	882.0	-	-
Mercury	58	3.9	-	-
Nickel	980	99.8	-	-
Zinc	730000	1230.0	-	-

The above assessment confirms that no soil contaminant exceeds its respective soil guideline criteria and therefore no risk to human health is indicated.

14.2.2 Assessment of Non-Metal Data

The assessment of the non-metal data is presented hereunder:

Table 13: Assessment of Non-Metal Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Arsenic	640	42.3	-	-
Selenium	190	1.1	-	-
Total Cyanide	120	<1.0	-	-

The above assessment confirms that no soil contaminant exceeds its respective soil guideline criteria and therefore no risk to

human health is indicated.

14.2.3 Assessment of Polycyclic Aromatic Hydrocarbon [PAH's] Data

The assessment of the Polycyclic Aromatic Hydrocarbon (PAH's) data is presented hereunder:

Table 14: Assessment of PAH Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Naphthalene	190	0.1	-	-
Acenaphthylene	83000	<0.1	-	-
Acenaphthene	84000	<0.1	-	-
Fluorene	63000	<0.1	-	-
Phenanthrene	22000	0.7	-	-
Anthracene	190	0.2	-	-
Fluoranthene	23000	1.0	-	-
Pyrene	54000	1.0	-	-
Benz(a)anthracene	170	0.6	-	-
Chrysene	350	0.7	-	-
Benzo(b)fluoranthene	44	0.6	-	-
Benzo(k)fluoranthene	1200	0.7	-	-
Benzo(a)pyrene	35	0.6	-	-
Indeno(123-cd)pyrene	500	0.4	-	-
Dibenzo(ah)anthracene	3.5	0.1	-	-
Benzo(ghi)perylene	3900	0.5	-	-

The above assessment confirms that no soil contaminant exceeds its respective soil guideline criteria and therefore no risk to human health is indicated.

14.2.4 Assessment of Total Petroleum Hydrocarbon [TPH's] Data

The assessment of TPH data is presented hereunder:

Table 15: Assessment of Hydrocarbon Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Aromatic EC5-EC7	26000	<0.01	-	-
Aromatic EC7-EC8	56000	<0.01	-	-
Aromatic EC8-EC10	190	<1.0	-	-
Aromatic EC10-EC12	16000	<1.0	-	-
Aromatic EC12-EC16	36000	1.8	-	-
Aromatic EC16-EC21	28000	9.3	-	-
Aromatic EC21-EC35	28000	205.0	-	-
Aliphatic EC5-EC6	3200	<0.01	-	-
Aliphatic EC6-EC8	7800	<0.01	-	-
Aliphatic EC8-EC10	2000	<1.0	-	-
Aliphatic EC10-EC12	9700	1.2	-	-
Aliphatic EC12-EC16	59000	5.1	-	-
Aliphatic EC16-EC35	1600000	112.5	-	-

The above assessment confirms that no soil contaminant exceeds its respective soil guideline criteria and therefore no risk to human health is indicated.

14.2.5 Assessment of BTEX Data

All BTEX compounds were reported to be below their limit of detection and therefore no risk to human health is indicated.

14.2.6 Assessment of Asbestos Data

Asbestos containing materials (ACM's) were not detected in any soil analysed and therefore no risk to human health is indicated.

14.2.7 Summary of Human Health Risk Assessment

The above human health risk assessment confirms that no soil contaminant exceeds its respective commercial land use soil guideline criteria, hence no risk to human health is indicated

Notwithstanding the above, as with all developments, disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination insofar as the exposed conditions may have the potential to impact on receptors

including inter alia humans, animals, controlled waters, or the fabric of buildings. Any such encounters will require the contractor to halt work, isolate the risk area, and summon ***CCG*** to site to determine the nature of the exposure and to determine an appropriate course of action. Any such incidents will be fully documented in a detailed site Remediation Report.

15.0 POST INVESTIGATION CONCEPTUAL MODEL

Based on the findings of the investigation, a conceptual model could be constructed illustrating proven pollution linkages and summarising the conceptual remediation recommendations discussed above, as tabulated hereunder.

Table 16: Conceptual Model

Source	Pathway	Receptor	Remedial Options
The above human health risk assessment confirms that no soil contaminant exceeds its respective commercial land use soil guideline criterion, and hence no risk to human health is indicated	-	-	Notwithstanding the above, as with all developments, disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination insofar as the exposed conditions may have the potential to impact on receptors including inter alia humans, animals, controlled waters, or the fabric of buildings. Any such encounters will require the contractor to halt work, isolate the risk area, and summon ***CCG*** to site to determine the nature of the exposure and to determine an appropriate course of action. Any such incidents will be fully documented in a detailed site Validation Report.

16.0 SPECIFICATION OF BURIED CONCRETE

The data obtained in the investigations was assessed against the guidance given in BRE Special Digest 1: 2005, as summarised hereunder:

Table 17: Design Chemical Class Based on Soil Data

CONCRETE SPECIFICATION DATA SHEET		
Is the site Brownfield or Greenfield?	Brownfield	
Is the water table static or mobile?	Static	
Highest water-soluble Sulphate results	200mg/l	Design Sulphate Class of DS-1 Class of ***AC-1s***
Lowest pH result	10.9	
Intended Working Life	50 years	Adopt Design Chemical Classification of DC-1

Based on the foregoing assessment, concrete in the ground should be specified to conform to the compositional requirements of Design Chemical Class DC-1, as defined in BRE Special Digest 1: 2005.

17.0 CONTROLLED WATERS RISK ASSESSMENT

17.1 Assessment of Soil Leachate Metals, Non-Metals & Polycyclic Aromatic Hydrocarbon (PAH) Data

Groundwater recovered from 1nr borehole position (BH1) was analysed for a broad range of contaminants including speciated PAH and TPH concentrations. The results were assessed against Environmental Quality Standards (AA-EQS) for freshwater as shown hereunder.

Table 18: Assessment of Soil Leachate Data

Contaminant	BH1 Result (ug/l)	AA-EQS (ug/l)
Naphthalene	0.03	2.4
Lead	<5	20
Fluoranthene	<0.01	0.1
Phenanthrene	<0.01	-
Anthracene	<0.01	-
Acenaphthylene	<0.01	-
Pyrene	<0.01	-
Chrysene	<0.01	-
Fluorene	<0.01	-
Nickel	<5	150
Indeno(123-cd)pyrene	<0.01	0.02
Benzo(ghi)perylene	<0.01	0.02
Copper	5	40
Benzo[a]pyrene	<0.01	0.05
Benzo[a]anthracene	<0.01	0.05
Benzo[k]fluoranthene	<0.01	0.03

Benzo[b]fluoranthene	<0.01	0.03
Boron	22	1000
Cyanide	<5	-
Arsenic	8	25
Mercury	<0.1	1
Selenium	<5	-
Cadmium	<1	5
pH	6.4	-
Sulphate	16000	400000

The above assessment confirms that no leachable contaminant exceeds its respective AA-EQS guideline criteria for inland waters, hence no risk to controlled waters is indicated.

17.2 Assessment of Soil Leachate Hydrocarbon Data

Speciated hydrocarbon results were assessed by comparison with AA-EQS values for inland waters. In case of determinands not covered by AA-EQS values, results were compared to EQS Freshwater Criteria values or where no EQS Freshwater Criterion is available, then WHO guidelines for Drinking Water are adopted.

Table 19: Assessment of Soil Leachate Hydrocarbon Data

Contaminant	BH1 Result (ug/l	AA-EQS (ug/l)	WHO ug/l
Aromatic EC5-EC7 (benzene)	<1.0	10	10
Aromatic EC7-EC8 (toluene)	<1.0	-	700
Aromatic EC8-EC10 (ethyl benzene)	<5.0	-	300
Aromatic EC10-EC12	<5.0	-	100
Aromatic EC12-EC16	<5.0	-	100
Aromatic EC16-EC21	<5.0	-	90
Aromatic EC21-EC35	<5.0	-	90
Aliphatic EC5-EC6	<1.0	-	15000
Aliphatic EC6-EC8	<1.0	-	15000
Aliphatic EC8-EC10	6.6	-	300
Aliphatic EC10-EC12	15.2	-	300
Aliphatic EC12-EC16	20.8	-	300
Aliphatic EC16-EC21	19.9	-	(300)*
Aliphatic EC21-EC35	52.7	-	(300)*

The above assessment confirms that no contaminant exceeds its respective guideline criteria, hence no risk to controlled waters and/or human health is indicated.

17.3 Summary of Controlled Waters Risk Assessment

The above controlled waters risk assessment confirms that no contaminant exceeds its respective guideline criteria, hence no risk to controlled waters and/or human health is indicated.

18.0 ASSESSMENT OF RISK FROM GROUND GASES

Standpipes were constructed such that response zones were within the permeable made ground strata. Using the data gathered in the monitoring programme, a gas risk assessment was undertaken in accordance with the ground gas risk assessment methodology (See Appendix K) employed by ***CCG***. The ground gas risk assessment methodology conforms to current UK guidance on the assessment of risks posed by ground gases.

The potential sources of gas identified in the desk study were generally considered as sources of "*Low*" generation potential, and high sensitivity, resulting in a programme of monitoring comprising of 4nr rounds distributed over a 1-month period.

A gas risk assessment was undertaken in accordance with current UK guidelines set out in CIRCA C665 2007 "Assessing Risk Posed by Hazardous Gases to Buildings". The CIRIA risk assessment methodology uses typical maximum soil gas concentrations and worse case borehole flow rates to define a "Characteristic Situation" for the shallow gas regime.

The volumetric gas flow rate used by the risk assessment is termed "*Gas Screening Value* (GSV)" in the guidance and is defined below.

Where: GSV (litres/hr) = borehole flow rate (litres/hr) x gas concentration.

There are also two stages to the assessment method proposed in CIRIA C665; compliance with a GSV Threshold Value and secondly, compliance with additional factors such as maximum permissible gas concentration. A summary of the gas monitoring data is presented hereunder and presented in Appendix E.

Table 20: Summary of Gas Monitoring Data

Position	WS1	WS3	WS4
No Monitoring Visits	1	1	1
Highest CH_4 (%)	Nil	Nil	Nil
Highest CO_2 (%)	<0.1	<0.1	<0.1
18.1Lowest O_2 (%)	20.0	20.1	20.0
Highest H_2S (ppm)	Nil	Nil	Nil
Highest CO (ppm)	Nil	Nil	Nil
Highest Flow (l/hr)	<0.1	<0.1	<0.1
Water Levels (m)	0.80	0.60	1.37
Highest PID response	0.0	0.0	0.0
Pressure Range (mb)	1022mbar		

After 1nr round of monitoring, a preliminary Gas Screening Value (GSV) of 0.00001l/hrs is calculated for CO_2.

Using these GSV values, the risk to the proposed development was assessed in line with Situation A as defined in CIRIA C665, and on this basis the site complies with Characteristic Situation 1 and based on this classification gas protection measures are not required.

It must be borne in mind that the remaining 3nr monitoring visits will be required to conclude the assessment which will be documented via an addendum report.

19.0 PRELIMINARY WASTE CLASSIFICATION

A waste classification exercise was undertaken in relation to potential offsite disposal of excavation arisings. The first stage entailed the assessment of the basic soil contamination data via the ***HAZWASTE*** online program. The output data from this basic assessment is provided in Appendix H. This program generates the baseline '*Hazardous / Non-Hazardous'* classification of soils.

The appended ***HAZWASTE*** report classifies soil analysed from boreholes WS1 – WS3 to be '*Hazardous'* by virtue of elevated concentrations of Chromium (2150mg/kg), Zinc (1230mg/kg) and soil pH values.

Soils analysed from borehole WS4 classify as being '*Non-Hazardous'*. However, it should be noted that the final decision on waste classification is at the discretion of the accepting landfill, and it is recommended that consultation with landfill operators be undertaken during the development of the waste management plan.

20.0 NEW WATER MAINS SUPPLY

The specification for new water mains at this site was based on the criteria specified in Paper 10/WM/03/21 '*Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites*' published by UK Water Industry Research (UKWIR) January 2011.

Whilst the preliminary findings indicate that the soil concentrations of pertinent hydrocarbon contaminant species are below the threshold concentrations permitted under the UKWIR guidance for the adoption of normal polyethylene mains, and taking account of the history of the site, new water mains may be specified as standard PE pipe construction. Good practice requires that mains be laid in a remediated alignment comprising of clean granular fill extending to 600mm + pipe diameter and to 300mm below pipe underside.

Pipes should be laid in accordance with BS EN 12201-2 'Plastic piping systems for water supply, and for drainage and sewerage under pressure – Polyethylene (PE) as stated in UKWIR guidance.

Notwithstanding the above preliminary assessment, the developer should contact the relevant water supply company (***UNITED UTILITIES***) to obtain concurrence with the recommendations given above and may be required to return a completed Risk Assessment.

21.0 FOUNDATIONS & FLOOR SLABS RECOMMENDATIONS

21.1 Introduction

It is understood that the site be redeveloped by the construction of a multi-functional fan park containing a licenced bar, catering / dining facilities, welfare facilities and communal gardens and hard paved external car parking facilities.

The existing and proposed layout of the development are as annotated on ***EDGE ARCHITECTS*** architectural drawings contained herein.

21.2 Ground Conditions

The intrusive ground investigation confirms the presence of bituminous paving and associated sub-base overlying made ground deposits generally comprising dark brown gravelly sand extending to 0.9mbgl. The sequence thereafter continues in natural drift deposits comprising firm becoming stiff brown boulder clay to 6.8mbgl, locally interbedded at depth with dense red / brown sands, to 6.8mbgl, before continuing in light brown weathered fine and medium grained sandstone, proven to 7.2mbgl.

All borehole positions were reported to be dry on completion of works.

There was no visual evidence of contamination and/or biodegradable materials affecting the near surface soils at any exploratory position.

21.3 Foundations & Ground Slabs

Considering the observed ground conditions, *in-situ* SPT tests, and undrained shear strength data, spread (pad) foundations may be adopted for the proposed steel framed structure. Pads may be founded on the underlying firm becoming stiff brown boulder clay at a notional depth of 1.2mbgl, with depths being adjusted to suit any localised areas of weak ground, if encountered. Pads may be designed on a Presumed Bearing Value of 150kN/m^2.

Reinforced strips may be adopted for partition walls, similarly set a notional depth of 1.2mbgl and designed on a Presumed Bearing Value of 150kN/m^2.

In the observed ground conditions, ground bearing slabs may be considered subject to rigorous preparation of the subgrade. Such preparation should include as a minimum:

- Reduction in ground levels to 450mm below slab underside, ensuring all organic soils has been removed
- Thorough compaction at reduced level with any areas exhibiting excessive deflection being grubbed out in 200mm increments and in-filled with thoroughly compacted DTp Type 1 subbase
- Placement and compaction of 3 x 150mm layers DTp Type 1 subbase
- Construction of blinding sand, dpm, slab, screed, and finishes

21.4 Excavations

Excavations may be undertaken by light hydraulic excavators.

Excavations in excess of 1.2mbgl will require side support.

21.5 Groundwater Management

Made ground deposits at 2nr sampling positions were reported to be wet with monitored standing water levels being in the order of 0.6m - 1.37mbgl during the ongoing gas – groundwater monitoring programme. These levels are not indicative of a water-table but indicate accumulation of a body of rainwater infiltration perched on the clay stratum. Hence a prudent contractor would allow for some minor pumping to maintain dry working conditions during foundation construction / service installations particularly during heavy and/or prolonged periods of precipitation.

22.0 CONCLUSIONS & RECOMMENDATIONS

The conclusions and recommendations hereunder are based on the salient sections of the report and should not be referred to in isolation of the relevant sections of the text. All recommendations are subject to Regulatory Authority review.

Table 21: Conclusions & Recommendations

Soil Contamination	The above human health risk assessment confirms that no soil contaminant exceeds its respective commercial land use soil guideline criteria, hence no risk to human health is indicated. Notwithstanding the above, as with all developments, disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination insofar as the exposed conditions may have the potential to impact on receptors including inter alia humans, animals, controlled waters, or the fabric of buildings. Any such encounters will require the contractor to halt work, isolate the risk area, and summon CCG to site to determine the nature of the exposure and to determine an appropriate course of action. Any such incidents will be fully documented in a detailed site Remediation Report.
Controlled Waters	The above controlled waters risk assessment confirms that no contaminant exceeds its respective guideline criteria, hence no risk to controlled waters and/or human health is indicated.
Concrete Specification	Based on the foregoing assessment, concrete in the ground should be specified to conform to the compositional requirements of Design Chemical Class DC-1, as defined in BRE Special Digest 1: 2005.
Water Mains	The specification for new water mains at this site was based on the criteria specified in Paper 10/WM/03/21 'Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites' published by UK Water Industry Research (UKWIR) January 2011. Whilst the preliminary findings indicate that the soil concentrations of pertinent hydrocarbon contaminant species are below the threshold concentrations permitted under the UKWIR guidance for the adoption of normal polyethylene mains, taking account of the history of the site, it is strongly recommended that new water mains be specified as standard PE pipe construction. Good practice requires that mains be laid in a remediated alignment comprising of clean granular fill extending to 600mm + pipe diameter and to 300mm below pipe underside. Pipes should be laid in accordance with BS EN 12201-2 'Plastic piping systems for water supply, and for drainage and sewerage under pressure – Polyethylene (PE) as stated in UKWIR guidance. Notwithstanding the above preliminary assessment, the developer should contact the relevant water supply company (***United Utilities***) to obtain concurrence with the recommendations given above and may be required to return a completed Risk Assessment.
Gas Risk Assessment	After 1nr rounds of monitoring, a preliminary Gas Screening Value (GSV) of 0.0001l/hrs is calculated for CO_2. Using these GSV values, the risk to the proposed development was assessed in line with Situation A as defined in CIRIA C665, and on this basis the site complies with Characteristic Situation 1 and based on this classification gas protection measures are not required. It must be borne in mind that the remaining 5nr monitoring visits will be required to conclude the assessment which will be documented via an addendum report.
Waste Classification	A waste classification exercise was undertaken in relation to potential offsite disposal of excavation arisings. The first stage entailed the assessment of the basic soil contamination data via the ***Hazwaste*** online program. The output data from this basic assessment is provided in Appendix H. This program generates the baseline '*Hazardous / Non-Hazardous*' classification of soils. The appended ***Hazwaste*** report classifies soil analysed from boreholes WS1 – WS3 to be '*Hazardous'* by virtue of elevated concentrations of Chromium (2150mg/kg), Zinc (1230mg/kg) and soil pH values. Soils analysed from borehole WS4 classify as being '*Non-Hazardous'*. However, it should be noted that the final decision on waste classification is at the discretion of the accepting landfill, and it is recommended that consultation with landfill operators be undertaken during the development of the waste management plan.
Foundations & Ground Floor Slabs	See Section 21.0 for full discussion
Excavations	Excavations may be undertaken by light hydraulic excavators. Excavations more than 1.2mbgl will require side support.
Groundwater Management	Made ground deposits at 2nr sampling positions were reported to be wet with monitored standing water levels being in the order of 0.6m - 1.37mbgl during the ongoing gas – groundwater monitoring programme. These levels are not indicative of a water-table but indicate accumulation of a body of rainwater infiltration perched on the clay stratum. Hence a prudent contractor would allow for some minor pumping to maintain dry working conditions during foundation construction / service installations particularly during heavy and/or prolonged periods of precipitation
Further Work	• Complete the ongoing gas – groundwater monitoring programme • Update gas risk assessment • Prepare Phase III Remediation Strategy Report Prepare Phase IV Validation Report

APPENDIX A: DRAWINGS



DO NOT SCALE

Notes: Study Site

CC GEOTECHNICAL LIMITED
UNIT 1 DELTIC WAY
KNOWSLEY INDUSTRIAL ESTATE
LIVERPOOL
L33 7BA
0151 545 2750

Client:
Tranmere Rovers Trust

Project:
Phase I-II Geoenvironmental Report for Land at Tranmere Rovers FC, Prenton Road West

Title:
Aerial Photograph

Scale:	Issue:
NTS	01
Drawn by:	Date:
DG	September 2021
Project No.	Drawing No.
CCG-C-21-12598	01

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DO NOT SCALE

Notes: Study Site

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UNIT 1 DELTIC WAY
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Title:
Aerial Photograph

Scale:	Issue:
NTS	01
Drawn by:	Date:
DG	September 2021
Project No.	Drawing No.
CCG-C-21-12598	02

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REV.	DETAILS	BY	DATE

N

Prenton Park Stadium

Stand

Tranmere Rovers Recreation Centre

PARKING (96 spaces)

WS3/s

Garden WS4/s

WS1/s

Fan Park

Terrace

BH1

WS2

Stand

PARKING (54 spaces)

Statue

STAFF PARKING (13 spaces)

Parking (311 spaces)

The Birch Tree

Parking

Allotments

Allotments

SITE PLAN
NA

1
3001

0 20 40 60m

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PURPOSE OF ISSUE: INFORMATION
PROJECT: TRANMERE ROVERS FAN PARK
DRAWING TITLE: SITE PLAN

PROJECT #	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
2019.13 -	EDG -	00 -	ZZ -	DR -	A -	3001
DATE	STATUS	SCALE	DRAWN BY	CHECKED	REVISION	
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REV.	DETAILS	BY	DATE

Borough Road

Borough Road

Stand

Stand

Stand

Prenton Park Stadium

Tranmere Rovers Recreation Centre

Parking

Parkhurst Road

Prenton Road West

Stand

EXISTING PARKING (149 spaces)

Existing Fan Park

EXISTING PARKING (20 spaces)

Statue

Car Park Entrance

EXISTING PARKING (305 spaces)

STAFF PARKING (13 spaces)

Devonshire Park Primary School

36

The Birch Tree

Parking

Allotments

Allotments

Allotments

Allotments

Track

Track

Prenton Park Road

Woodchurch Lane

Prenton Road West

N

EXISTING SITE PLAN

1:500

1
1001

0 20 40 60 80 100m

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PURPOSE OF ISSUE: PLANNING

PROJECT: TRANMERE ROVERS FAN PARK

DRAWING TITLE: EXISTING SITE PLAN

PROJECT #	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
2020.14 -	EDG -	00 -	ZZ -	DR -	A -	1001

DATE	SCALE	DRAWN BY	STATUS	REVISION
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REV.	DETAILS	BY	DATE

Refuse Store

2 / 3003

escape

Tranmere Rovers Recreation Centre

1 / 3003

INDICATES PROPOSED EXTENSION OF RECREATION CENTRE BY OTHERS

Retaining Wall

Retaining Wall

escape

Service Drop off

Off Loading

Staff & Brewery BOH

Female WC

DDA WC

Male WC

Food Prep

Food Prep

Food Pod

Food Pod

Food Pod

Food Pod

Fermentation Tanks

Match Bar

Brewery

Canopy Over

Main Bar

Canopy Over

Garden

Main Entrance

Fan Zone

Garden Entrance

Garden Terrace

Food Pod

Food Pod

N

PROPOSED GROUND FLOOR PLAN

1:100

1 / 3001

0 2 4 6 8 10m

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PURPOSE OF ISSUE: PLANNING

PROJECT: TRANMERE ROVERS FAN PARK

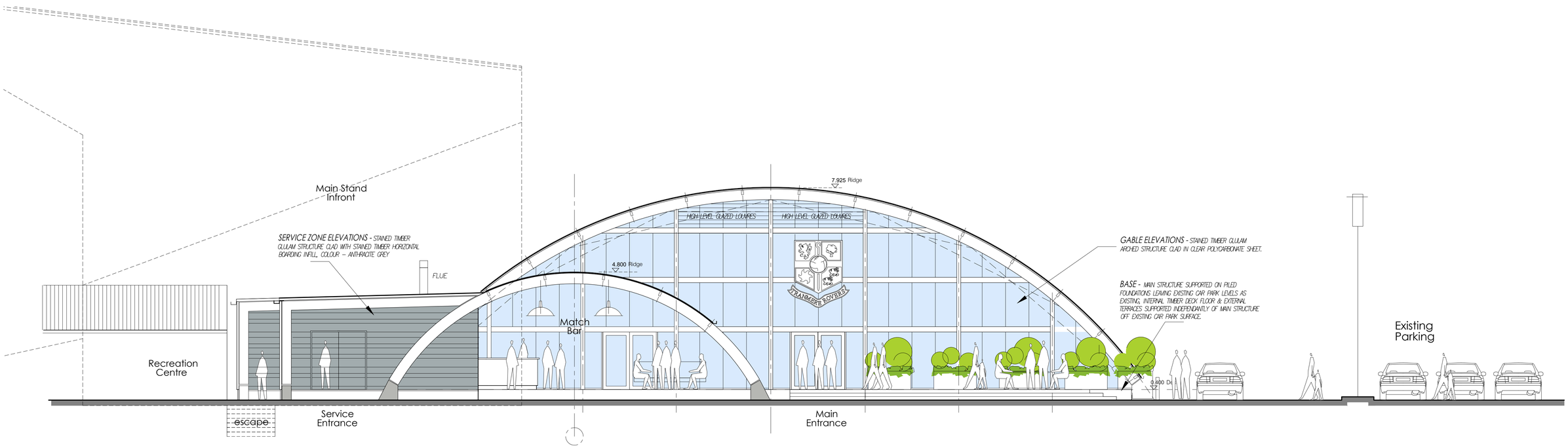
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PROJECT NO.	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
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DATE	SCALE	DRAWN BY	STATUS	REVISION
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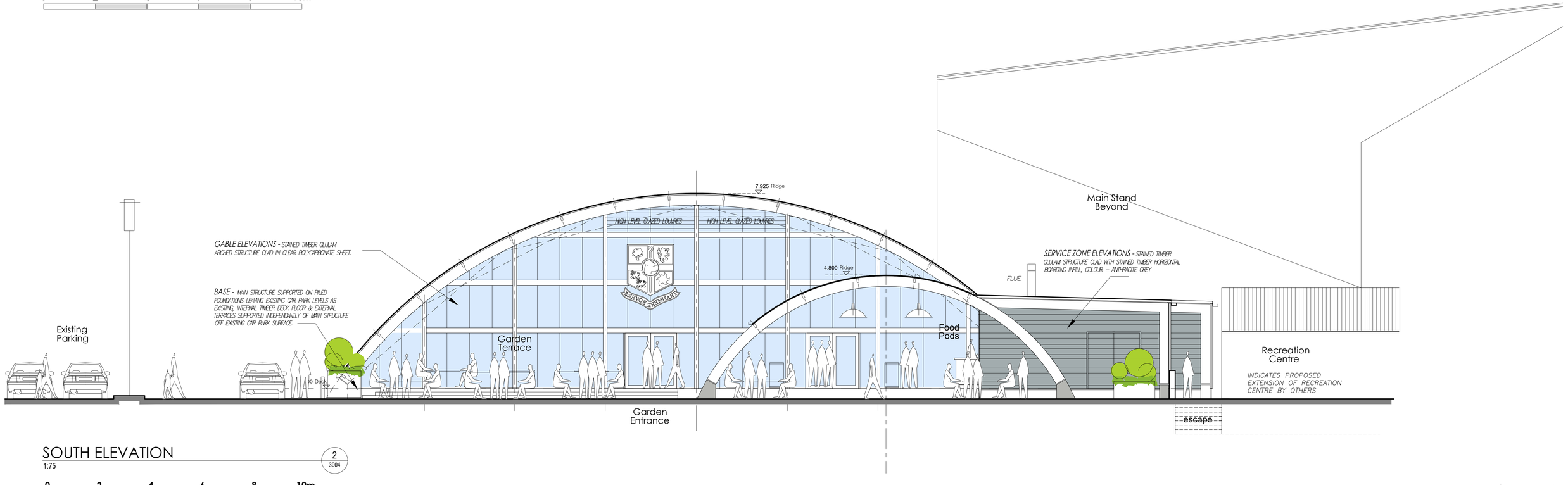
REV.	DETAILS	BY	DATE



NORTH ELEVATION

1:75 — 1 / 3004

0 2 4 6 8 10m



SOUTH ELEVATION

1:75 — 2 / 3004

0 2 4 6 8 10m

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PURPOSE OF ISSUE: PLANNING

PROJECT: TRANMERE ROVERS FAN PARK

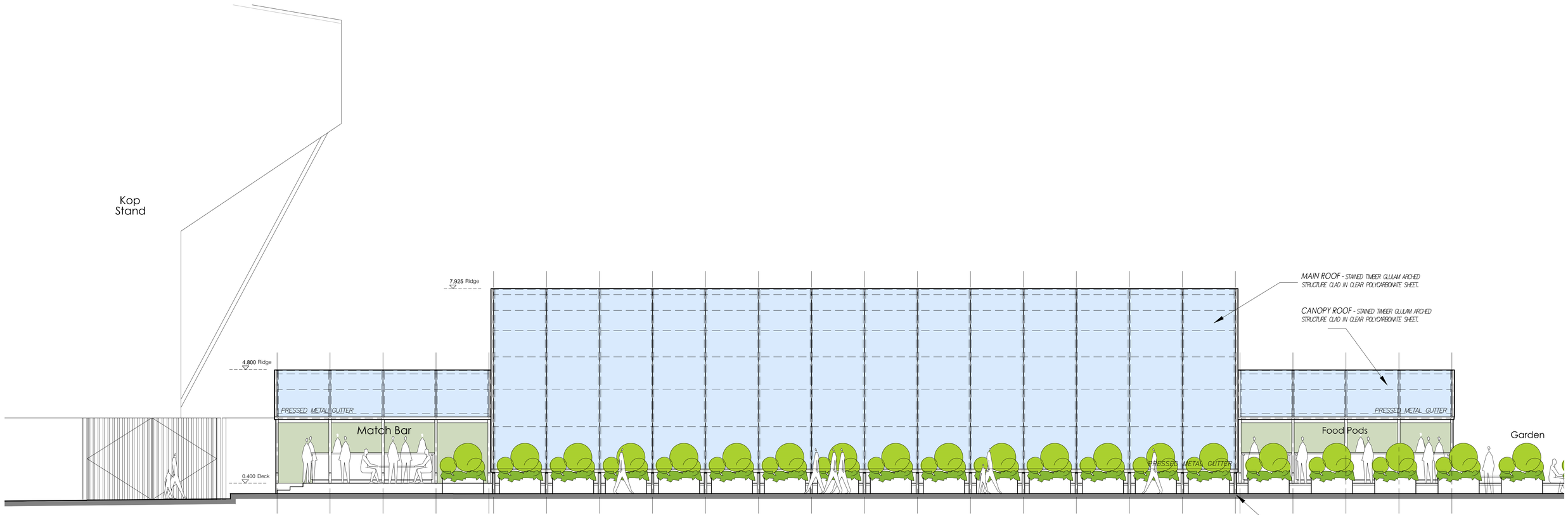
DRAWING TITLE: PROPOSED ELEVATIONS - SHEET 1

PROJECT ID	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
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DATE	SCALE	DRAWN BY	STATUS	REVISION
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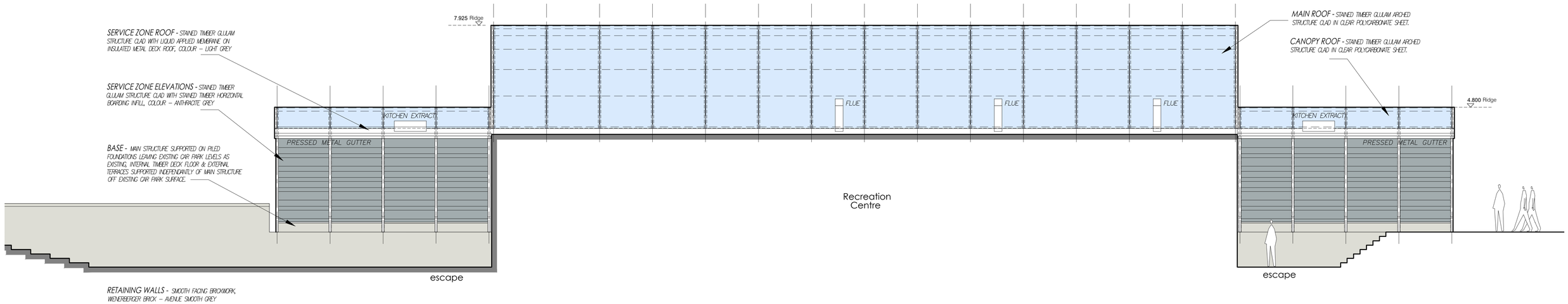
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REV.	DETAILS	BY	DATE



WEST ELEVATION
1:75
1 / 3005

0 2 4 6 8 10m



EAST ELEVATION
1:75
2 / 3005

0 2 4 6 8 10m

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PURPOSE OF ISSUE	PLANNING
PROJECT	TRANMERE ROVERS FAN PARK
DRAWING TITLE	PROPOSED ELEVATIONS - SHEET 2

PROJECT NO.	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
2020.14 -	EDG -	00 -	ZZ -	DR -	A -	3005

DATE	SCALE	DRAWN BY	STATUS	REVISION
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REV.	DETAILS	BY	DATE

Refuse Store

2 / 3003

Tranmere Rovers Recreation Centre

1 / 3003

INDICATES PROPOSED EXTENSION OF RECREATION CENTRE BY OTHERS

escape

escape

Service Drop off

PRESSED METAL GUTTER

PRESSED METAL GUTTER

PRESSED METAL GUTTER

SERVICE ZONE ROOF - STAINED TIMBER GLULAM STRUCTURE CLAD WITH LIQUID APPLIED MEMBRANE ON INSULATED METAL DECK ROOF, COLOUR – LIGHT GREY

KITCHEN EXTRACT

KITCHEN EXTRACT

FLUE

FLUE

FLUE

PRESSED METAL FLASHING

PRESSED METAL FLASHING

PRESSED METAL FLASHING

CANOPY ROOF - STAINED TIMBER GLULAM ARCHED STRUCTURE CLAD IN CLEAR POLYCARBONATE SHEET.

CANOPY ROOF - STAINED TIMBER GLULAM ARCHED STRUCTURE CLAD IN CLEAR POLYCARBONATE SHEET.

PRESSED METAL GUTTER

PRESSED METAL GUTTER

MAIN ROOF - STAINED TIMBER GLULAM ARCHED STRUCTURE CLAD IN CLEAR POLYCARBONATE SHEET.

Garden

Main Entrance

Garden Entrance

Garden Terrace

PRESSED METAL GUTTER

N

PROPOSED ROOF PLAN

1:100

1 / 3002

0 2 4 6 8 10m

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PURPOSE OF ISSUE: PLANNING

PROJECT: TRANMERE ROVERS FAN PARK

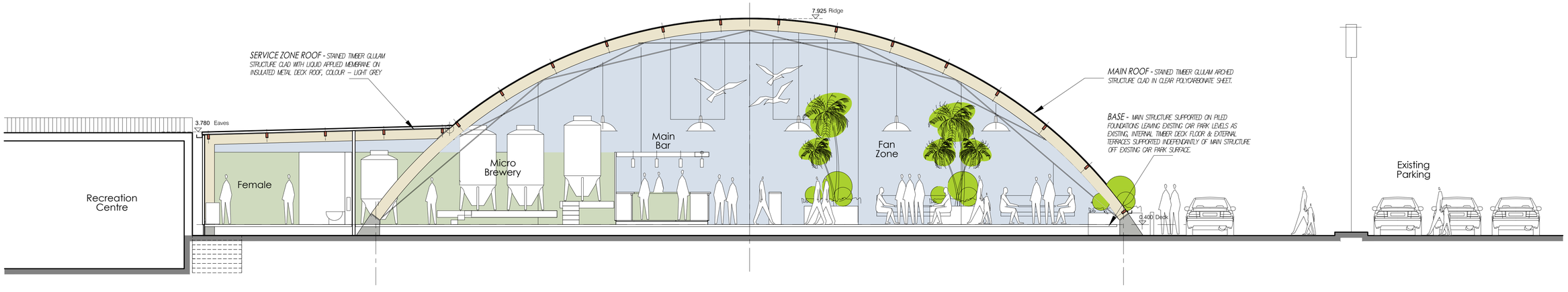
DRAWING TITLE: PROPOSED ROOF PLAN

PROJECT NO.	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
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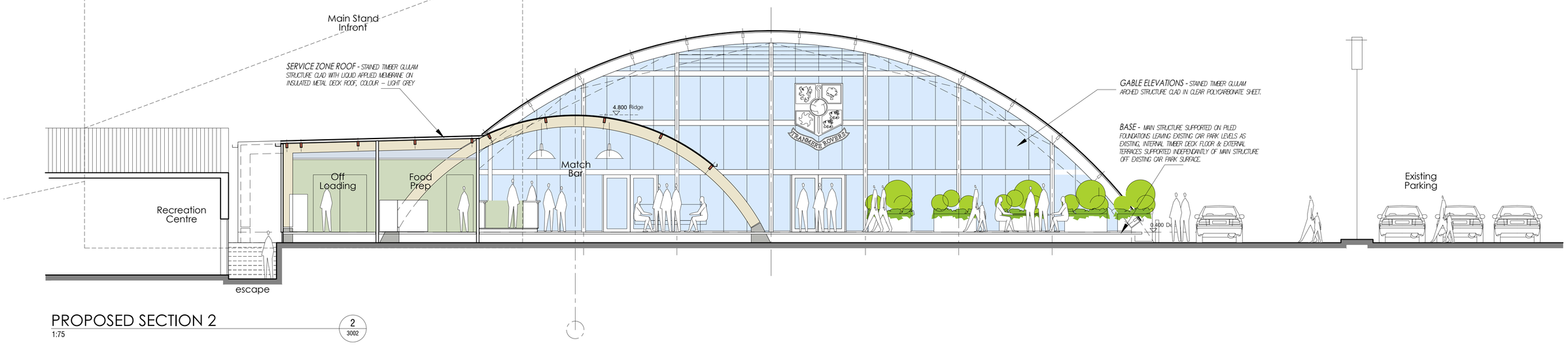


PROPOSED SECTION 1

1:75

1
3002

0 2 4 6 8 10m



PROPOSED SECTION 2

1:75

2
3002

0 2 4 6 8 10m

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PURPOSE OF ISSUE: PLANNING

PROJECT: TRANMERE ROVERS FAN PARK

DRAWING TITLE: PROPOSED SECTIONS

PROJECT	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	VOLUME
2020.14 -	EDG -	00 -	ZZ -	DR -	A -	3003

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REV.	DETAILS	BY	DATE

Tranmere Rovers FC and Tranmere Rovers Trust have ambitions to improve the existing hospitality facility at Prenton Park for home and away fans.

The existing "Fan-Park" is located within the fenced area fronting onto Prenton Road West and includes a temporary tent structure if 360sqm. The proposal is to replace this with a new purpose built facility designed to accommodate between 700-1000 people. It is expected that the facility will be used during the 25-30 home games but could also host other local community events including markets, festivals, conferences & celebrations.

With a total footprint of 800sqm, the building will be approximately 7.5m high to the eaves. A service block to the rear links with the existing sports hall and includes extract equipment on the flat roof above. Servicing will be via the main entrance & car park with a drop-off to the side allowing access to bar, kitchen, stores & refuse areas. The existing entrance from Prenton Road West is to be retained but the car park re-organised to maintain its current capacity of 429 spaces.

The building will be located at the centre of the site as far from surrounding properties as possible with the existing stand and sports hall providing additional acoustic shielding of houses on Borough Road.. A Noise Impact Assessment will be issued in support of a planning application and will inform the final envelope design, operating hours and volume control equipment.

Borough Road
Borough Road
Stand
Stand
Stand
Stand
Prenton Park Stadium
Tranmere Rovers Recreation Centre
Proposed extension to Recreation Centre indicated subject to application by others
Parking
Proposed external works indicated subject to application by others
PARKING (92 spaces)
Service Yard
Garden
Fan Park
Terrace
Main Entrance & Drop Off
PARKING (54 spaces)
Parking (319 spaces)
Statue
STAFF PARKING (13 spaces)
Parking
The Birch Tree
Allotments
Allotments
Allotments
Allotme
Track
Track
Parkhurst Road
Prenton Road West
Prenton Road West
Prenton Park Road
Woodchurch Lane
Devonshire Park
Primary School
36
N

PROPOSED SITE PLAN

1:500

1
3000

0 20 40 60 80 100m

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PURPOSE OF ISSUE	PLANNING
PROJECT	TRANMERE ROVERS FAN PARK
DRAWING TITLE	PROPOSED SITE PLAN

PROJECT NO	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
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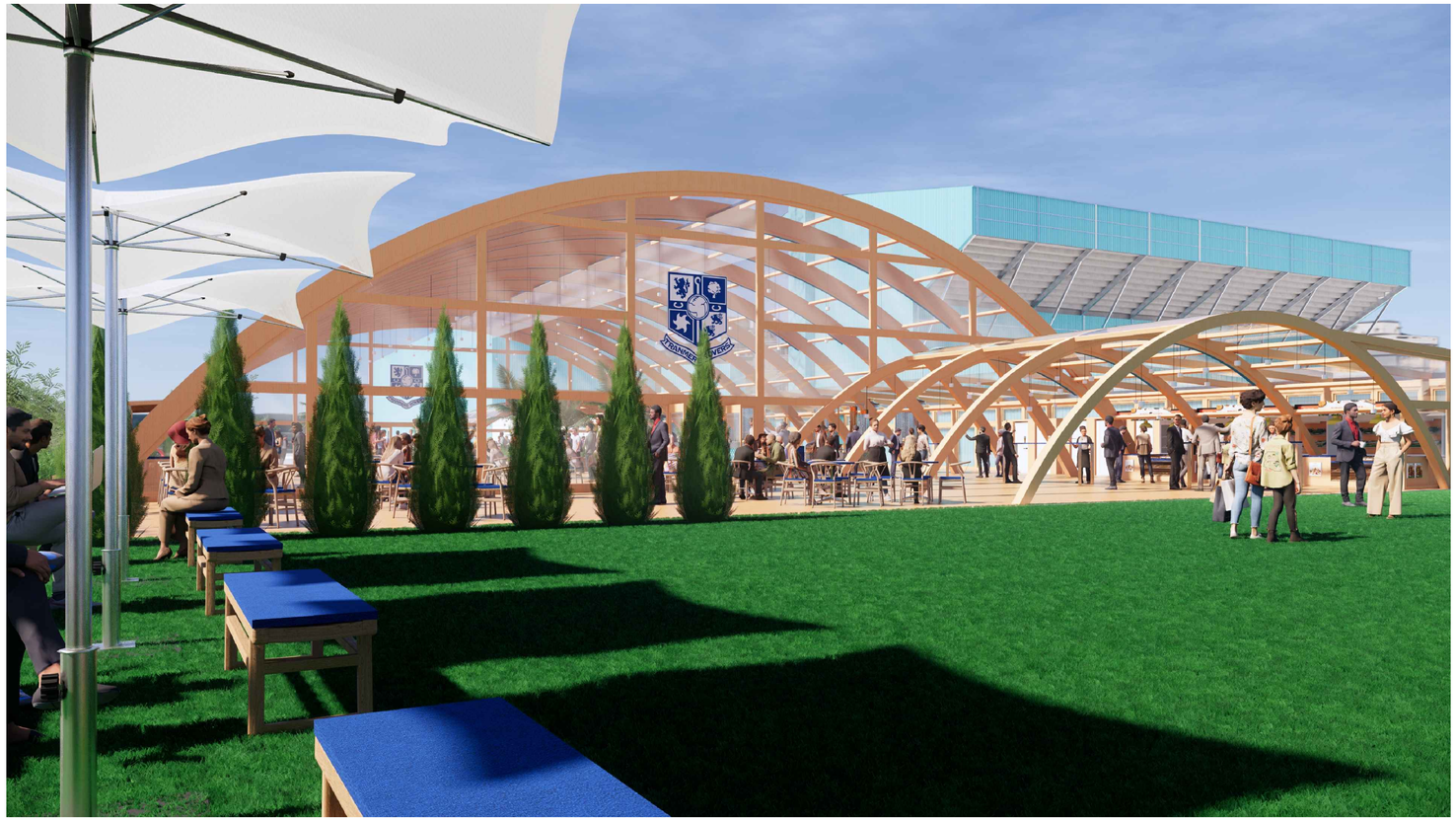
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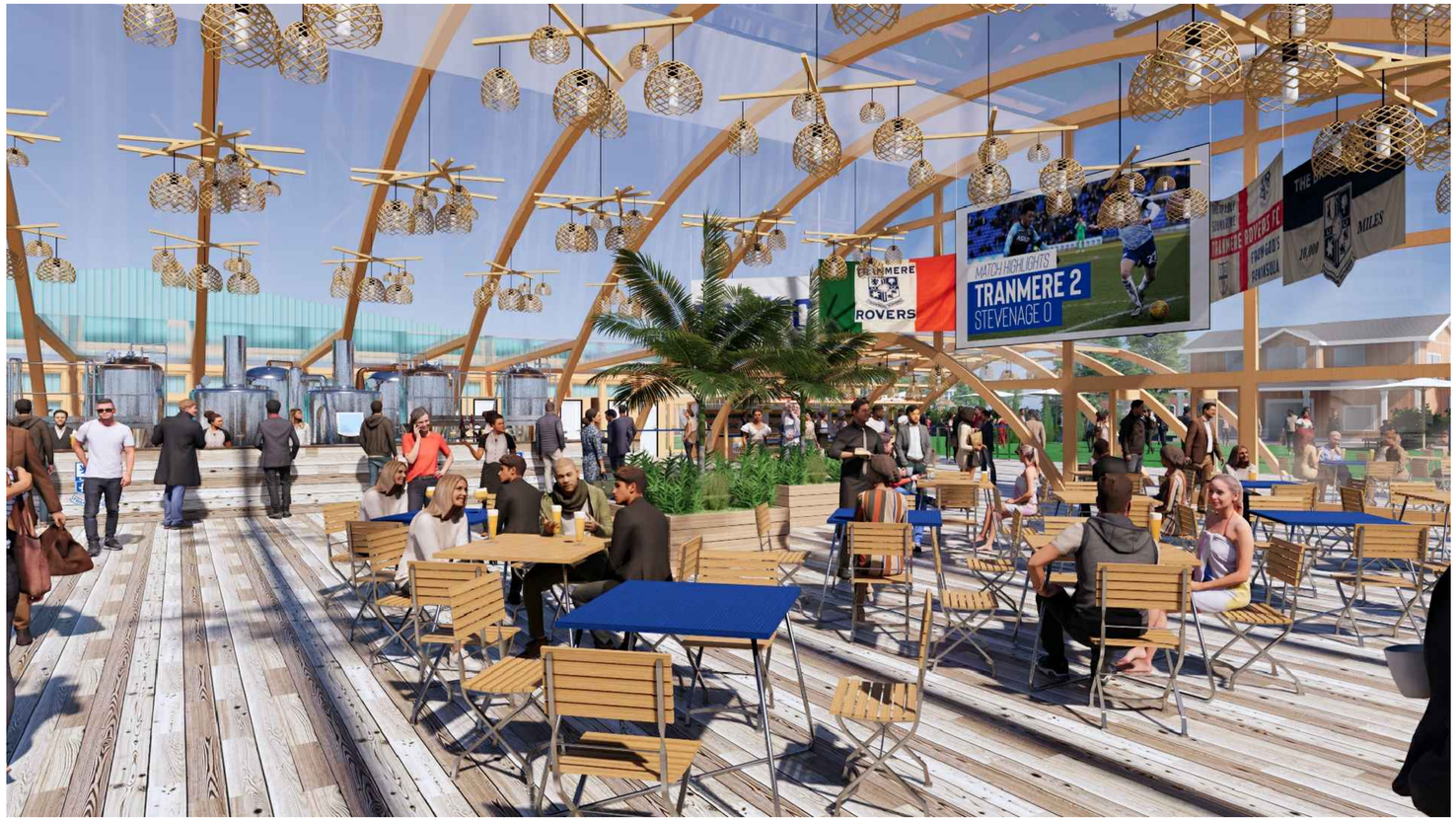
REV.	DETAILS	BY	DATE

GERMAN KRAFT

3D RENDERINGS PROVIDED
BY GERMAN KRAFT BEER



VIEW 6 - VIEW FROM GARDEN



VIEW 7 - FAN ZONE



VIEW 8 - GARDEN TERRACE



VIEW 9 - GARDEN TERRACE



VIEW 10 - BREWERY

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PURPOSE OF ISSUE	INFORMATION
PROJECT	TRANMERE ROVERS FAN PARK
DRAWING TITLE	PROPOSED VISUALS SHEET 2

PROJECT NO.	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
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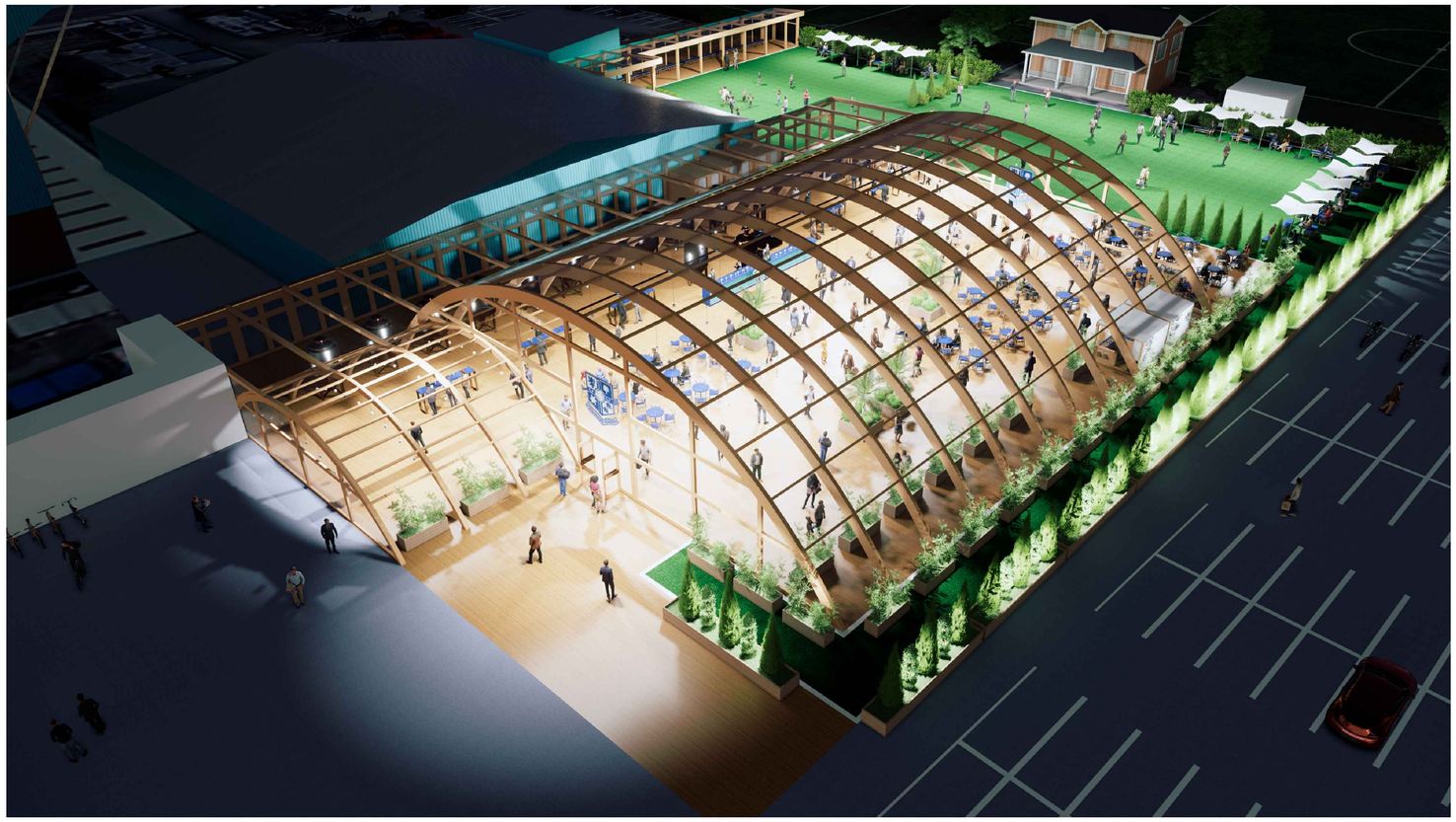
DATE	SCALE	DRAWN BY	STATUS	REVISION
08.05.21	NTS @A1	MR	S2	P1.1

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REV.	DETAILS	BY	DATE



VIEW 1 - APPROACH TO MAIN ENTRANCE



VIEW 2 - AERIAL VIEW FROM NORTH



VIEW 3 - FAN ZONE



VIEW 4 - MAIN BAR



VIEW 5 - FAN ZONE

GERMAN KRAFT

3D RENDERINGS PROVIDED
BY GERMAN KRAFT BEER

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PURPOSE OF ISSUE: INFORMATION

PROJECT: TRANMERE ROVERS FAN PARK

DRAWING TITLE: PROPOSED VISUALS SHEET 1

PROJECT NO.	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
2020.14 -	EDG -	00 -	ZZ -	DR -	A -	5000

DATE	SCALE	DRAWN BY	STATUS	REVISION
08.05.21 -	NTS @A1 -	MR -	S2 -	P1.1

APPENDIX B: SITE PHOTOGRAPHS

APPENDIX C: SAMPLING METHODOLOGIES

SAMPLING, SAMPLE TRANSPORTATION, AND FIELD MONITORING PROTOCOLS

Soil, water and gas sampling and monitoring methodologies employed by ***CC GEOTECHNICAL LTD*** are presented hereunder.

SAMPLING OF SOIL FOR CHEMICAL ANALYSIS

Soil samples may be recovered from a variety of intrusive investigation methods including *inter alia* dynamic sampling boreholes, cable percussion boreholes, machine or manual excavation of trial pits.

All equipment which has the potential to introduce extraneous materials into soils – borehole casings, sampling drilling rods, borehole sampling tools, hand tools such as trowels and spades etc. – must be cleaned by jet washing before initial use and between sampling positions.

Cable Percussion Boreholes

In this method of investigation disturbed bulk and small disturbed samples are recovered at regular depth increments throughout the length of the borehole. Each bulk/small disturbed sample is uniquely labelled with the Project Name / Project No / Borehole No / Depth / Date. Where possible, samples are immediately scanned by PID.

Light Dynamic Sampling Boreholes

In this method of investigation samples are recovered in relatively undisturbed 1m long Perspex liners. Each liner is uniquely labelled with the Project Name / Project No / Borehole No / Depth / Date. The liner tubes are sealed by air tight caps fitted at each end, and are temporarily stored out of sunlight. Where possible, samples are immediately split, scanned by PID, logged and subsampled. In the event that splitting and logging on site is not practicable, then the liners are immediately transported to the laboratory where they are immediately split, scanned by PID, logged and subsampled

Trial Pits

Samples are to be taken from the bucket of an excavator and placed in appropriate airtight containers. Each container is uniquely labelled with the Project No / Trial Pit No / Depth / Date. The samples are then immediately placed in a cool box chilled by ice packs, and the boxes are sealed for transportation to the chemical laboratory.

Sampling Containers

Containers used to store soil samples are selected dependant on the required analysis. The testing laboratory will be consulted should there be any doubt as to the correct sampling container. Typically, a minimum of 1nr 1kg plastic tub, 1nr 500g plastic tub, 1nr 250g amber glass jar and 2nr glass vials are taken at each sample depth. Samples held on site awaiting same day courier collection are stored at $4^{O}C$ in a cool box. Only in circumstances where same day collection cannot be arranged are samples held overnight, and in this event all samples are refrigerated at $4\ ^{O}C$ either on site (if a refrigerator is available) or at CC GEOTECHNICAL soil laboratory. Courier collection is then arranged for immediate pick up the following day.

Chain of Custody records

A Chain of Custody Record (CoC) is to be sent with each batch of samples submitted to the testing laboratory. A copy of the CoC will be made available for inspection by the client, their agents, or any requesting regulatory authority.

HEADSPACE ANALYSES

Duplicate subsamples of all soil samples selected for laboratory analysis may be taken for headspace analyses.

Headspace analysis is undertaken using a MiniRae 2000 Photo Ionisation Detector (PID). In the test method, an amber glass jar is half filled with soil, and the lid is sealed with aluminium foil secured by an elastic band. The jar and contents are agitated for 30 seconds and left for a minimum of 30 minutes out of direct sunlight for the headspace to achieve equilibrium. The PID then pierces the seal and the maximum reading is recorded. Prevailing weather conditions and ambient air temperature are also recorded.

The PID headspace results are recorded on the exploratory borehole or trial pit logs.

PID headspace data is then used to inform the chemical testing schedule for volatile organic compounds analyses.

SAMPLING OF GROUNDWATER FOR CHEMICAL ANALYSIS

Groundwater is sampled from standpipes or piezometers installed during borehole drilling. On completion of the construction of the standpipe, the installation is initially developed by removing up to 10 x the internal volume of the

installation. The volume of water purged is recorded. The installation is then typically left for a week for hydraulic equilibrium to be restored.

Prior to sampling the standpipe, the depth to the water table, and the depth to the base of the installation are monitored using an electronic dipmeter. In circumstances where free phase product is suspected to be present, then an 'Interface Meter' is used to determine the free phase film thickness.

A minimum of 3 x the installation volume is then removed. The pH of the water is then monitored and the sample is taken when the change in pH between any two consecutive extracts is less than 10%. The volume of water removed is recorded.

A sample comprises of a minimum of 3 litres. Two litres are taken in amber glass bottles, and one litre in a plastic bottle.

To avoid cross-contamination one bailer is used per position.

The samples are uniquely labelled with Project Name / Project No / Borehole No / Depth / Date Sampled. They are placed in a cool box chilled by ice packs, and the containers are sealed for transportation to the laboratory.

Once the samples are received in the ***CC GEOTECHNICAL LTD*** laboratory, the samples are stored in a refrigerator and returned to the cool boxes once collected.

Water taken from the installations are taken back to the ***CC GEOTECHNICAL LTD*** laboratory and disposed.

Other data recorded in the sampling comprises:

- Volume of water removed during development of well
- Volume of water removed during purging of the well
- Results of on-site pH analyses
- Sample appearance – colour, suspended solids

MONITORING OF GAS

Prior to embarking on a gas-monitoring round, all equipment is checked for functionality and the calibration status is confirmed.

At the commencement of the monitoring round, the prevailing weather conditions, air temperature, barometric pressure and direction of movement of barometric pressure are recorded.

The flow meter is first attached to the standpipe valve, and the flow rate is measured (peak and steady flow) for 1 minute. The results are recorded in $l.hr^{-1}$. The flow meter tube is protected from the effects of wind by aligning the exhaust downwind.

Following measurement of borehole flow rate, the installation is left for a minimum of 10 minutes for the headspace to restore equilibrium.

Once the gas in the installation has regained equilibrium, the gas analyser is connected and monitoring commences. The peak and steady state readings for CH_4, CO_2, CO, H_2S and CO are recorded. The steady state is monitored for a minimum of one minute, and possibly up to a maximum of 10 minutes where fluctuations continue.

When the monitoring is complete, the depth to the water table, and the depth to the base of the well are monitored using an electronic dipmeter. In circumstances where free phase product is suspected to be present, then an 'Interface Meter' is used to determine the free phase film thickness.

APPENDIX D: BOREHOLE LOGS

Contract Name: Tranmere Rovers Fan Park			Client: Dave Beckett	Borehole ID: **BH1**
Contract Number: CCG-C-21-12598	Date Started: 27/09/2021	Logged By: DK	Checked By: CB	Status: DRAFT — Sheet 1 of 1
Cable Percussion Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: Dando S&A — Rig Crew: AR/CMcG — Scale: 1:50
Weather: Dry	Termination: Refusal in rock head		SPT Hammer: N/R, Energy Ratio: N/R	

Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				0.15		Black TARMAC paving		
0.30	ES	PID 0.30m, 0.0ppm		0.25		Compacted grey slightly silty slightly sandy GRAVEL (sub-base). Gravel is fine to coarse angular of sandstone (MADE GROUND)		
0.50	B	PID 0.50m, 0.0ppm		(0.65)		Grey slightly silty sandy GRAVEL. Gravel is fine to coarse angular to subround of brick (MADE GROUND)		
0.50	ES							
0.80	ES	PID 0.80m, 0.0ppm		0.90				
1.00	B					Firm becoming stiff brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium sub-rounded mudstone and sandstone		
		SPT(S) 1.20m, N=8 (1,2/2,2,2,2)						
1.50	B							
2.00 - 2.45	U							
2.50	B							
		SPT(S) 3.00m, N=16 (3,4/3,4,4,5)		(4.10)				
3.50	B							
4.00 - 4.45	U							
4.50	B							
		SPT(S) 5.00m, N=32 (4,5/9,9,7,7)		5.00		Dense brown silty gravelly SAND. Gravel is fine to medium sub-rounded sandstone		
5.50	B			(0.80)				
				5.80		Stiff red / brown slightly gravelly sandy CLAY		
6.00	B							
		SPT(S) 6.50m, N=100 (6,8/100 for 275mm)		(1.00)				
				6.80		Light brown fine and medium grained SANDSTONE recovered at the surface as very dense gravelly sand (drilling induced)		
7.00	B			(0.40)				
		SPT(C) 7.20m, 100 (25 for 50mm/100 for 50mm)		7.20		End of Borehole at 7.20m		

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)

Borehole Diameter

Depth (m)	Dia (mm)
7.20	150

Casing Diameter

Depth (m)	Dia (mm)
7.20	150

Chiselling

From (m)	To (m)	Duration	Remarks
6.80	7.20	01:30	

Installation

Top (m)	Base (m)	Type	Dia (mm)

Remarks:

1.5hrs hand digging, CAT scanning borehole starter pit GI-1.2mbgl, & reinstatement

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Contract Name: Tranmere Rovers Fan Park			Client: Dave Beckett	Borehole ID: **WS1**
Contract Number: CCG-C-21-12598	Date Started: 01/10/2021	Logged By: DK	Checked By: CB	Status: DRAFT
Dynamic Sampling Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: Dando Terrier
Rig Crew: NW/AS	Scale: 1:25	Sheet 1 of 1		
Weather:	Termination: Scheduled depth	SPT Hammer: N/R, Energy Ratio: N/R		

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.00	U			0.15		TARMAC pavement		
0.30	ES			0.30		Grey slightly silty sandy GRAVEL (sub-base). Gravel is fine to coarse angular to subround of limestone (MADE GROUND)		
0.50	ES			(0.30)		Grey very sandy slightly silty GRAVEL. Gravel is fine to coarse angular to subround of limestone and coal (MADE GROUND)		
0.90	ES			0.60		Brown locally dark brown very sandy silty GRAVEL with low cobble content. Gravel is fine to coarse angular to subround of brick coal and ceramics (MADE GROUND)		
1.00 - 2.00	U	SPT(S)N=9 (1,2/2,2,2,3)		(0.40)				
		HVP=110		1.00		Firm becoming stiff brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium sub-rounded sandstone		
		HVP=110						
2.00 - 3.00	U	SPT(S)N=9 (1,1/1,1,2,5)						
		HVP=110						
		HVP=110						
3.00 - 4.00	U	SPT(S)N=18 (4,4/4,5,4,5)		(4.00)				
		HVP=110						
		HVP=110						
4.00 - 5.00	U	SPT(S)N=20 (5,4/5,5,5,5)						
		HVP=110						
		HVP=110		5.00		End of Borehole at 5.00m		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:

1.5hrs hand digging, CAT scanning borehole starter pit GI-1.2mbgl,

Chiselling			
From (m)	To (m)	Duration	Remarks

Installation			
Top (m)	Base (m)	Type	Dia (mm)
0.00	0.50	PLAIN	50
0.50	4.00	SLOTTED	50

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Contract Name: Tranmere Rovers Fan Park			Client: Dave Beckett	Borehole ID: **WS2**
Contract Number: CCG-C-21-12598	Date Started: 01/10/2021	Logged By: DK	Checked By: CB	Status: DRAFT
Dynamic Sampling Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: Dando Terrier
Rig Crew: NW/AS	Scale: 1:25	Sheet 1 of 1		
Weather:	Termination: Scheduled depth	SPT Hammer: N/R, Energy Ratio: N/R		

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.00	U			0.15		TARMAC paving		
0.30	ES			0.40		Grey slightly silty sandy GRAVEL (sub-base). Gravel is fine to coarse angular to subround of limestone (MADE GROUND)		
0.50	ES			(0.30)		Brown locally grey very sandy silty GRAVEL with low cobble content. Gravel is fine to coarse angular to subround of brick concrete and sandstone (MADE GROUND)		
0.70	ES			0.70		Firm becoming stiff brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium sub-rounded sandstone		
		HVP=100						
1.00 - 2.00	U							
		SPT(S)N=10 (2,2/2,3,2,3)						
		HVP=110						
		HVP=110						
2.00 - 3.00	U	SPT(S)N=18 (2,2/4,4,5,5)						
		HVP=110						
		HVP=110		(4.30)				
3.00 - 4.00	U	SPT(S)N=17 (3,4/4,4,4,5)						
		HVP=110						
		HVP=110						
4.00 - 5.00	U	SPT(S)N=16 (4,4/4,4,4,4)						
		HVP=110						
		HVP=110						
		SPT(S)N=19 (4,5/5,5,4,5)		5.00		End of Borehole at 5.00m		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:

1.5hrs hand digging, CAT scanning borehole starter pit GI-1.2mbgl,

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

	Contract Name: Tranmere Rovers Fan Park		Client: Dave Beckett		Borehole ID: **WS3**
	Contract Number: CCG-C-21-12598	Date Started: 01/10/2021	Logged By: DK	Checked By: CB	Status: DRAFT
					Sheet 1 of 1
Dynamic Sampling Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: Dando Terrier	Rig Crew: NW/AS
					Scale: 1:25
Weather:		Termination: Scheduled depth		SPT Hammer: N/R, Energy Ratio: N/R	

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.00	U			0.15		TARMAC paving		
0.30	ES			0.25		Grey slightly silty sandy GRAVEL (sub-base). Gravel is fine to coarse angular to subround of limestone (MADE GROUND)		
0.50	ES			(0.50)		Brown locally grey very sandy silty GRAVEL with low cobble content. Gravel is fine to coarse angular to subround of concrete brick coal and sandstone (MADE GROUND)		
0.80	ES			0.75		Loose brown very clayey very gravelly SAND. Gravel is fine to coarse sub-rounded sandstone		
		HVP=100						
1.00 - 2.00	U							
		SPT(S)N=8 (2,2/2,2,2,2)		(0.85)				
				1.60		Firm becoming stiff brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium sub-rounded sandstone		
		HVP=110						
		HVP=110						
2.00 - 3.00	U	SPT(S)N=19 (3,2/3,4,5,7)						
		HVP=110						
		HVP=110						
3.00 - 4.00	U	SPT(S)N=21 (4,4/3,5,6,7)						
				(3.40)				
		HVP=110						
		HVP=110						
4.00 - 5.00	U	SPT(S)N=26 (5,6/6,6,7,7)						
		HVP=110						
		HVP=110						
		SPT(S)N=30 (6,7/8,7,8,7)		5.00		End of Borehole at 5.00m		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:

1.5hrs hand digging, CAT scanning borehole starter pit GI-1.2mbgl,

Chiselling			
From (m)	To (m)	Duration	Remarks

Installation			
Top (m)	Base (m)	Type	Dia (mm)
0.00	0.50	PLAIN	50
0.50	4.00	SLOTTED	50

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
0.60			0		Slight seepage

	Contract Name: Tranmere Rovers Fan Park		Client: Dave Beckett		Borehole ID: **WS4**
	Contract Number: CCG-C-21-12598	Date Started: 01/10/2021	Logged By: DK	Checked By: CB	Status: DRAFT
					Sheet 1 of 1
Dynamic Sampling Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: Dando Terrier	Rig Crew: NW/AS
					Scale: 1:25
Weather:		Termination: Scheduled depth		SPT Hammer: N/R, Energy Ratio: N/R	

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.00	U			0.10		TARMAC pavement		
						Grey slightly silty sandy GRAVEL (sub-base). Gravel is fine to coarse angular to subround of limestone (MADE GROUND)		
0.30	ES			0.30		Dark brown very sandy silty GRAVEL with low cobble content. Gravel is fine to coarse angular to subround of brick sandstone coal and concrete (MADE GROUND)		
0.50	ES			(0.50)				
0.70	ES						▼	
				0.80		Firm becoming stiff brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium sub-rounded sandstone		
1.00 - 2.00	U							
		HVP=70						
		SPT(S)N=11 (2,2/4,3,2,2)						
		HVP=110						
		HVP=90						
2.00 - 3.00	U	SPT(S)N=17 (3,4/5,4,4,4)						
		HVP=110						
		HVP=110		(4.20)				
3.00 - 4.00	U	SPT(S)N=24 (4,5/6,6,5,7)						
		HVP=110						
		HVP=110						
4.00 - 5.00	U	SPT(S)N=21 (5,5/4,6,6,5)						
		HVP=110						
		HVP=110						
		SPT(S)N=25 (6,6/6,7,6,6)		5.00		End of Borehole at 5.00m		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:

1.5hrs hand digging, CAT scanning borehole starter pit GI-1.2mbgl,

Chiselling			
From (m)	To (m)	Duration	Remarks

Installation			
Top (m)	Base (m)	Type	Dia (mm)
0.00	0.50	PLAIN	50
0.50	4.00	SLOTTED	50

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
0.70			0		Slight seepage

APPENDIX E: GAS – GROUNDWATER MONITORING RESULTS

GAS AND WATER MONITORING RESULTS

	Date:	12-Oct-21											
	Visit Number	1											
	Atmos Press mb	1022											
	Pressure Trend	Steady											
	Air Temp °C	14											
	Cloud cover	Overcast											
	Wind velocity	Windy											
	Precipitation	Rain											
	State of Ground	Wet											
WS1	**CH4 (%):**	Nil											
	CO2 (%):	<0.1											
	O2 (%):	20.0											
	H2S (ppm):	Nil											
	CO (ppm):	Nil											
	PID (ppm):	0.0											
	Flow (l/hr):	<0.1											
	Water Level (mbgl):	0.80											
WS2	**CH_4 (%):**	Nil											
	CO_2 (%):	<0.1											
	O_2 (%):	20.1											
	H_2S (ppm):	Nil											
	CO (ppm):	Nil											
	PID (ppm):	0.0											
	Flow (l/hr):	<0.1											
	Water Level (mbgl):	0.60											
WS3	**CH4 (%):**	Nil											
	CO2 (%):	<0.1											
	O2 (%):	20.0											
	H2S (ppm):	Nil											
	CO (ppm):	Nil											
	PID (ppm):	0.0											
	Flow (l/hr):	<0.1											
	Water Level (mbgl):	1.37											

Job No: CCG-C-21-12598

Site: Tranmere Rovers FC

Instrument: GFM436

TEST DATE AND CONDITIONS		
Date	09/03/2021	
Atmospheric Pressure	1001	mB
Ambient Temperature	22.3	°C
Environics Serial No.	5089	

GFM436 Final Inspection & Calibration Check Certificate

GAS DATA LTD

Unit 4, Fairfield Court

Seven Stars Estate

Wheler Rd

Coventry

CV3 4LJ

Tel 02476303311 Fax 02476307711

Customer	C C Geotechnical
Certificate Number	122336
Order Number	327973

Serial Number	12667
Software Version	G436-00.0027/0010

Recalibration DUE Date
09/03/22

Instrument Checks					
Keyboard	✓		Display Contrast	✓	
Pump Flow In	450	*Accept > 200 cc/min*	Pump Flow @ -200mB	300	*Accept > 200 cc/min*
Clock Set / Running	✓		Labels Fitted	✓	

Gas Checks						
Sensor	CH_4		CO_2		O_2	
	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %
	59.7	60	40	40	20.9	20.9
	Accept ±3.0		*Accept ±3.0*		*Accept ±0.5*	
	5	5	4.9	5	6	6
	Accept ±0.3		*Accept ±0.3*		*Accept ±0.3*	
Zero Reading 100% N2	0	0	0	0	0	0
	Accept ±0.0		*Accept ±0.0*		*Accept ±0.1*	

Optional Gas Checks						
Applied Gas & Range		Concentration Tested @ (ppm)	Instrument Readings *(ppm)*			
			Zero Reading		Instrument Gas Reading	
Gas Type	Range *(ppm)*					
H2S	5000	*1500*	0	*Accept ±0.0*	1500	*Accept ±5.0*
CO	2000	*1000*	0	*Accept ±0.0*	999	*Accept ±5.0*
Hexane	*2.0%*	2.0%	0	*Accept ±0.0*	1.99	*Accept ±10.0*

Cross Gas Effects									
Applied Gas *(ppm)*		Instrument Readings *(ppm)*							
Gas Type	Concentration	Toxic 1:	H2S	Toxic 2:	CO	Toxic 3:			
H2S	*1500*	1500		0		0			
CO	*1000*	40		999		0			
Hexane	*2.0%*	0		0		1.99			

Pressure Checks			
Atmospheric Pressure [AP] *(mB)*			
Current Atmospheric Pressure (mB)		Instrument Atmospheric Pressure Reading (mB)	
AP Open Ports		1001	*Accept ±2.0*
AP Port (Internal)	*+800 mB*	800	*Accept ±5.0*
	+1200mb	1200	*Accept ±5.0*

Flow Checks					
Borehole Flow			Differential Pressure		
Applied Reading *(l/h)*	Instrument Reading *(l/h)*		Applied Pressure *(Pa)*	Instrument Reading *(Pa)*	
-30	-30	*Accept ±3.0*	*-476*	-484	*Accept ±50*
-3	-3	*Accept ±1.0*	*-17*	-17	*Accept ±6.0*
0	0	*Accept ±0.0*	*0*	0	*Accept ±0.5*
3	3	*Accept ±0.5*	*13*	12	*Accept ±3.0*
30	29.7	*Accept ±3.0*	*314*	312	*Accept ±50*
60	59.5	*Accept ±6.0*	*962*	953	*Accept ±130*
90	90.6	*Accept ±9.0*	*1915*	1951	*Accept ±250*

Temperature Checks		
Calibration Temperature Applied Temperature ^{0}C	Instrument Temperature Reading ^{0}C	
-10	-10	*Accept ±2.0*
0	0	*Accept ±1.0*
30	30	*Accept ±1.0*
60	60	*Accept ±1.0*
100	100	*Accept ±1.0*

Technician:	Date Tested:
Les Treece	*10/03/2021*

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2015 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated. The results displayed on the instrument at each stage are recorded above.

Gas Data Ltd is certified to BS EN ISO9001:2015. Certificate NQA 8374. Valid until 21/03/2022

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CERTIFICATE OF CALIBRATION
Phocheck Tiger

CALIBRATION CERTIFICATE NO: 71067

ISSUED BY: SHAWCITY LIMITED
DATE: 01-Jun-21

APPROVED SIGNATORY:

NAME: Dave Godfrey

CUSTOMER: CC Geotechnical Ltd
INSTRUMENT: PhoCheck Tiger
SERIAL NUMBER: T-110194

CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

Prior to calibration the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference value is that generated by the certified source and the indicated value is that measured by the instrument.

CALIBRATION RESULTS

GAS	LOT No	REF. VALUE	INDICATED VALUE
Isobutylene	WO297301-1	100 ppm	100 ppm
Isobutylene	WO188023-1	5000 ppm	5000 ppm

COMMENTS:
The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$.
This provides a level of confidence of uncertainty of approximately 95%.
The uncertainty of measurement is ±2 %
The results indicate that the instrument conforms to the applicable parts of the published specification.

HEALTH & SAFETY, OCCUPATIONAL HYGIENE AND ENVIRONMENTAL MONITORING INSTRUMENTS

Tel: 01793 780622
www.shawcity.co.uk

Instrument House, 91-92 Shrivenham Hundred Business Park
Watchfield, Oxfordshire, SN6 8TY

Fax: 01793 784466
service@shawcity.co.uk

PARTS REQUIRED FOR JOB NUMBER: 71067

DESCRIPTION	PART NO.	QTY	Serial No.	LOC
10.6 Lamp	LA4TM600			S4H B1
Lamp Stack	A-846267	1	070614	S4H B3
PTFE Filter Disk	A-861632	1		S4H B2
Probe O-Ring	5/OV-02			S4H B4
Sensor seal	A-861214	1		S4H B1
Probe	880207			S4E B1
Probe Kit	A-880210			S4H B4
Filter Clamp (black)	880201			S4E B1
Probe Seal	880202			S4E B5
Filter Clamp (clear)	861219			S4H B6
Pump	A-861298			S4F B2
Manifold	861213			S4E B6
Outlet Barbs	5/JHS-03			S4E B6
Nozzle O-Ring	5/OV-04			S4H B2
Probe pipe	A-861286a			S4G B5
Tubing Inv Cone	5/JO-01			S4D B1
Tiger Battery	A-861240			S4G B1
Inlet Outlet Seal	861215	2		S4H B5
Display	1/OM-05			S4E B3
Battery Charging Cradle/Dock	A-861220			S4F B2
Charger Lead	1/VS-22			S4F B3
Fuse FU100/101/103/105/106	1/FB-10			S4G B3
FU1 fuse	1/FB-12			S3A B1
Standard Top Housing	A-861551			service
LT Top Housing	A-880218			
Charging Dock Magnet	2/AP-08			S4C B2
Bottom Housing	861203-2			S4F B4
Pneumatics Kit	A-861509			S4F B3
Tiger Battery	A-861240			S4G B1
Sensor PCB	A-861103			S4E B5
Orange stack for Tiger LT	A-846496	1		S4C B1
PAT Test	PAT 1	1		
Mainboard Assembly	A-861120			

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Instrument House
91-92 Shrivenham Hundred Business Park
Watchfield
Oxfordshire
SN6 8TY
Fax: 01793 784466
service@shawcity.co.uk

SERVICE / INSPECTION SHEET

JOB NUMBER: 71067
INSTRUMENT: Phocheck Tiger

SERIAL NUMBER: T-110194
DATE RECEIVED: 28/05/2021

FIRMWARE: 5.12

CUSTOMER: CC Geotechnical Ltd

ITEMS RECEIVED	Received	RTN?
Instrument	YES	
Rubber Boot	YES	
Battery Charger		
Charging Cradle		
Operation Manual		
Quick Start Guide		
Spares Kit		
Comms Cable		
Probe FLEXI		
Peli Case		
Tubing		
Regulator		
Software (Memory Stick)		
PLASTIC CASE	YES	
	SIGNED:	

TESTS	Pre Service	Post Service
Charger Test		Ok
Battery charge Test		Ok
Lamp Test		Ok
Air Flow Test ≥ 220ml/min		274ml/min
Block Flow Test ≤ 15ml/min		10 ml/min
Moisture Sensitivity = 0.0ppm		0.0 ppm
Switch Test		Ok
Sensor Test		Ok
Alarm Test		Ok
PC Comms Test		Ok
Datalog Test		Ok
Display Test		Ok
Physical Inspection		Ok
PAT Test		Ok
Firmware Upgrade	n/a	
Software Upgrade (usb)	n/a	
Function Test		Ok
Run time	20hr49	

Comments:

Real Time Clock set
Replaced sensor stack and seal, PTFE filter and inlet/outlet seals as per annual maintenance
Replaced lamp as per biennial scheduled service.
Flow rate measured at 274 ml/min
Instrument calibrated and bump tested
Moisture sensitivity 0.0 ppm
Datalogging and pc transfer tested
Power supply output 11.95Vdc. PAT tested and labelled
Charger cradle output 5.52Vdc.o/cct

Please note: Zero at Power on is set to OFF, as received.

TECHNICIAN: Dave Godfrey

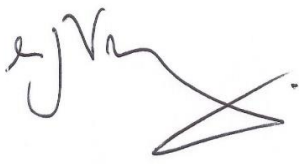
DATE: 01/06/2021

APPENDIX F: SOIL CONTAMINATION RESULTS

Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
Telephone: (01424) 718618

cs@elab-uk.co.uk
info@elab-uk.co.uk

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	21-36362
Issue:	1
Date of Issue:	13/10/2021
Contact:	Tony Gerrard
Customer Details:	CC Geotechnical Ltd Unit 1 & 2 Deltic Place Deltic Way Liverpool MersevsideL33 7BA
Quotation No:	Q14-00045
Order No:	Not Supplied
Customer Reference:	CCG-C-21-12598
Date Received:	07/10/2021
Date Approved:	13/10/2021
Details:	Tranmere Rovers Fan Park
Approved by:	

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

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Sample Summary

Report No.: 21-36362, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
253046	WS1 0.50	01/10/2021	07/10/2021	Sand	
253047	WS2 0.50	01/10/2021	07/10/2021	Loamy sand	
253048	WS3 0.50	01/10/2021	07/10/2021	Loamy sand	
253049	WS4 0.50	01/10/2021	07/10/2021	Loamy sand	

Results Summary

Report No.: 21-36362, issue number 1

				ELAB Reference	253046	253047	253048	253049
				Customer Reference				
				Sample ID				
				Sample Type	SOIL	SOIL	SOIL	SOIL
				Sample Location	WS1	WS2	WS3	WS4
				Sample Depth (m)	0.50	0.50	0.50	0.50
				Sampling Date	01/10/2021	01/10/2021	01/10/2021	01/10/2021
Determinand	**Codes**	**Units**	**LOD**					
Soil sample preparation parameters								
Material removed	N	%	0.1		60.0	64.3	65.5	63.5
Description of Inert material removed	N		0		Stones	Stones	Stones,brick,clinker	Stones,brick,clinker
Metals								
Antimony	N	mg/kg	2.5		< 2.5	8.8	10.7	12.3
Arsenic	M	mg/kg	1		4.4	17.9	19.1	42.3
Cadmium	M	mg/kg	0.5		< 0.5	2.3	3.2	2.3
Chromium	M	mg/kg	5		36.8	1280	2150	593
Copper	M	mg/kg	5		19.8	215	284	222
Lead	M	mg/kg	5		26.0	620	882	877
Mercury	M	mg/kg	0.5		< 0.5	2.5	3.9	3.1
Molydbenum	N	mg/kg	0.5		4.9	15.5	23.1	14.4
Nickel	M	mg/kg	5		18.5	73.2	99.8	79.1
Selenium	M	mg/kg	1		< 1.0	< 1.0	1.1	1.0
Zinc	M	mg/kg	5		53.5	794	1230	843
Anions								
Water Soluble Sulphate	M	g/l	0.02		0.04	0.07	0.04	0.20
Inorganics								
Free Cyanide	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8		< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2		< 2	< 2	< 2	< 2
Acid Soluble Sulphate (SO4)	U	%	0.02		0.32	0.27	0.28	0.26
Water Soluble Boron	N	mg/kg	0.5		0.6	7.8	8.0	7.0
Miscellaneous								
pH	M	pH units	0.1		12.9	11.5	11.7	10.9
Soil Organic Matter	U	%	0.1		0.4	2.1	1.6	3.5

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 21-36362, issue number 1

				ELAB Reference	253046	253047	253048	253049
				Customer Reference				
				Sample ID				
				Sample Type	SOIL	SOIL	SOIL	SOIL
				Sample Location	WS1	WS2	WS3	WS4
				Sample Depth (m)	0.50	0.50	0.50	0.50
				Sampling Date	01/10/2021	01/10/2021	01/10/2021	01/10/2021
Determinand	**Codes**	**Units**	**LOD**					
Polyaromatic hydrocarbons								
Naphthalene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	0.1
Acenaphthylene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1		< 0.1	0.3	0.3	0.7
Anthracene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	0.2
Fluoranthene	M	mg/kg	0.1		< 0.1	0.9	0.8	1.0
Pyrene	M	mg/kg	0.1		< 0.1	0.8	0.8	1.0
Benzo(a)anthracene	M	mg/kg	0.1		< 0.1	0.4	0.3	0.6
Chrysene	M	mg/kg	0.1		< 0.1	0.6	0.6	0.7
Benzo(b)fluoranthene	M	mg/kg	0.1		< 0.1	0.3	0.6	0.6
Benzo(k)fluoranthene	M	mg/kg	0.1		< 0.1	0.3	0.4	0.7
Benzo(a)pyrene	M	mg/kg	0.1		< 0.1	0.3	0.3	0.6
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1		< 0.1	0.3	0.2	0.4
Dibenzo(a,h)anthracene	M	mg/kg	0.1		< 0.1	0.1	0.1	0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1		< 0.1	0.3	0.5	0.3
Total PAH(16)	M	mg/kg	0.4		< 0.4	4.8	5.2	7.2
BTEX								
Benzene	M	ug/kg	10		< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10		< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10		< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10		< 10.0	< 10.0	< 10.0	< 10.0
TPH CWG								
>C5-C6 Aliphatic	N	mg/kg	0.01		< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01		< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1		1.2	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1		5.1	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1		2.0	5.6	7.5	4.7
>C21-C35 Aliphatic	N	mg/kg	1		47.5	73.0	105	49.7
>C35-C40 Aliphatic	N	mg/kg	1		14.6	14.6	31.9	6.8
>C5-C7 Aromatic	N	mg/kg	0.01		< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01		< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1		1.8	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1		3.0	7.1	9.3	5.5
>C21-C35 Aromatic	N	mg/kg	1		114	136	205	86.2
>C35-C40 Aromatic	N	mg/kg	1		51.1	52.7	85.5	24.2
Total (>C5-C40) Ali/Aro	N	mg/kg	1		240	289	445	177

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
Tel: +44 (0)1424 718618, Email: info@elab-uk.co.uk, Web: www.elab-uk.co.uk

Results Summary

Report No.: 21-36362, issue number 1

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
253046	0.50	WS1	Brown sandy Soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
253047	0.50	WS2	Brown sandy soil,stones	No asbestos detected	n/t	n/t	n/t	n/t
253048	0.50	WS3	Brown sandy Soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
253049	0.50	WS4	Brown sandy Soil,stones,Concrete,Clinker	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 21-36362, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Free cyanide	N	As submitted sample	08/10/2021	107	Colorimetry
Sulphide	N	As submitted sample	08/10/2021	109	Colorimetry
Hexavalent chromium	N	As submitted sample	08/10/2021	110	Colorimetry
pH	M	Air dried sample	13/10/2021	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	11/10/2021	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	08/10/2021	118	ICPMS
PAH (GC-FID)	M	As submitted sample	08/10/2021	133	GC-FID
Water soluble anions	M	Air dried sample	08/10/2021	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	11/10/2021	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	11/10/2021	181	GC-MS
BTEX in solids	M	As submitted sample	11/10/2021	181A	GC-MS
Water soluble boron	N	Air dried sample	08/10/2021	202	Colorimetry
Aliphatic hydrocarbons in soil	N	As submitted sample	08/10/2021	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	12/10/2021	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	08/10/2021	214	GC-FID
Asbestos identification	U	Air dried sample	11/10/2021	280	Microscopy
Soil organic matter	U	Air dried sample	13/10/2021	BS1377:P3	Titrimetry

Tests marked N are not UKAS accredited

Report Information

Report No.: 21-36362, issue number 1

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"
LOD	LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.

ELAB are unable to provide an interpretation or opinion on the content of this report.

The results relate only to the sample received.

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

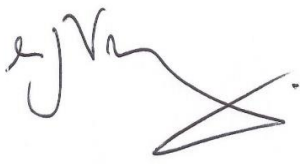
All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
Telephone: (01424) 718618

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info@elab-uk.co.uk

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	21-36251
Issue:	1
Date of Issue:	07/10/2021
Contact:	Tony Gerrard
Customer Details:	CC Geotechnical Ltd Unit 1 & 2 Deltic Place Deltic Way Liverpool MerseysideL33 7BA
Quotation No:	Q14-00045
Order No:	Not Supplied
Customer Reference:	CCG-C-21-12598
Date Received:	30/09/2021
Date Approved:	07/10/2021
Details:	Tranmere Rovers Fan Park
Approved by:	

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

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Sample Summary

Report No.: 21-36251, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
252338	BH1 Soil 0.50	27/09/2021	30/09/2021	Sandy loam	

Results Summary

Report No.: 21-36251, issue number 1

ELAB Reference	252338
Customer Reference	Soil
Sample ID	
Sample Type	SOIL
Sample Location	BH1
Sample Depth (m)	0.50
Sampling Date	27/09/2021

Determinand	Codes	Units	LOD	
Metals				
Arsenic 10:1 extract	N	ug/l	5	8
Boron 10:1 extract	N	ug/l	5	22
Cadmium 10:1 extract	N	ug/l	1	< 1
Calcium 10:1 extract	N	ug/l	100	14900
Chromium 10:1 extract	N	ug/l	5	< 5
Copper 10:1 extract	N	ug/l	5	5
Lead 10:1 extract	N	ug/l	5	< 5
Magnesium 10:1 extract	N	ug/l	100	1500
Mercury 10:1 extract	N	ug/l	0.1	< 0.1
Nickel 10:1 extract	N	ug/l	5	< 5
Selenium 10:1 extract	N	ug/l	5	< 5
Zinc 10:1 extract	N	ug/l	5	7
Anions				
Sulphate 10:1 extract	N	mg/l	1	16
Inorganics				
Free Cyanide	N	ug/l	5	< 5
Sulphide 10:1 extract	N	mg/l	0.1	< 0.1
Miscellaneous				
Dissolved organic carbon	N	mg/l	1.5	21.0
pH (10:1 extract)	N	pH units	0.1	g 6.4
Hardness (CaCO3)	N	mg/l CaCO3	0.1	43

Results Summary

Report No.: 21-36251, issue number 1

ELAB Reference	252338
Customer Reference	Soil
Sample ID	
Sample Type	SOIL
Sample Location	BH1
Sample Depth (m)	0.50
Sampling Date	27/09/2021

Determinand	Codes	Units	LOD	
Polyaromatic hydrocarbons				
Naphthalene Leachate GCMS	N	ug/l	0.01	0.03
Acenaphthylene Leachate GCMS	N	ug/l	0.01	< 0.01
Acenaphthene Leachate GCMS	N	ug/l	0.01	< 0.01
Fluorene Leachate GCMS	N	ug/l	0.01	< 0.01
Phenanthrene Leachate GCMS	N	ug/l	0.01	< 0.01
Anthracene Leachate GCMS	N	ug/l	0.01	< 0.01
Fluoranthene Leachate GCMS	N	ug/l	0.01	< 0.01
Pyrene Leachate GCMS	N	ug/l	0.01	< 0.01
Benzo (a) anthracene Leachate GCMS	N	ug/l	0.01	< 0.01
Chrysene Leachate GCMS	N	ug/l	0.01	< 0.01
Benzo (b) fluoranthene Leachate GCMS	N	ug/l	0.01	< 0.01
Benzo (k) fluoranthene Leachate GCMS	N	ug/l	0.01	< 0.01
Benzo (a) pyrene Leachate GCMS	N	ug/l	0.01	< 0.01
Indeno (1,2,3-cd) pyrene Leachate GCMS	N	ug/l	0.01	< 0.01
Dibenzo(a,h)anthracene Leachate GCMS	N	ug/l	0.01	< 0.01
Benzo(ghi)perylene Leachate GCMS	N	ug/l	0.01	< 0.01
Total PAH(16) Leachate GCMS	N	ug/l	0.01	0.07
TPH CWG				
>C5-C6 Aliphatic in Leachate	N	ug/l	1	< 1.0
>C6-C8 Aliphatic in Leachate	N	ug/l	1	< 1.0
>C8-C10 Aliphatic Leachate	N	ug/l	5	6.6
>C10-C12 Aliphatic Leachate	N	ug/l	5	15.2
>C12-C16 Aliphatic Leachate	N	ug/l	5	20.8
>C16-C21 Aliphatic Leachate	N	ug/l	5	19.9
>C21-C35 Aliphatic Leachate	N	ug/l	5	52.7
>C35-C40 Aliphatic Leachate	N	ug/l	5	< 5.0
Total (>C5-C40) Aliphatic Leachate	N	ug/l	5	115
>C5-C7 Aromatic in Leachate	N	ug/l	1	< 1.0
>C7-C8 Aromatic in Leachate	N	ug/l	1	< 1.0
>C8-C10 Aromatic Leachate	N	ug/l	5	< 5.0
>C10-C12 Aromatic Leachate	N	ug/l	5	< 5.0
>C12-C16 Aromatic Leachate	N	ug/l	5	< 5.0
>C16-C21 Aromatic Leachate	N	ug/l	5	< 5.0
>C21-C35 Aromatic Leachate	N	ug/l	5	< 5.0
>C35-C40 Aromatic Leachate	N	ug/l	5	< 5.0
Total (>C5-C40) Aromatic Leachate	N	ug/l	5	< 5.0
Total (>C5-C40) Ali/Aro Leachate	N	ug/l	5	115

Method Summary

Report No.: 21-36251, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Aliphatic hydrocarbons in leachate	N		07/10/2021		GC-FID
Aliphatic/Aromatic hydrocarbons in leach	N		07/10/2021		GC-FID
Aromatic hydrocarbons in leachate	N		07/10/2021		GC-FID
Carbon in leachates	N		07/10/2021		IR
Leachate cyanide 10:1 extract	N		07/10/2021		Colorimetry
Leachate sulphide 10:1 extract	N		06/10/2021		Colorimetry
pH of leachates	N		06/10/2021		Electromeric
Leachate metals 10:1 extract	N		06/10/2021	101	ICPMS
PAHs and/or PCBs in leachates	N		07/10/2021	135	GC-MS
Low range Aliphatic hydrocarbons leachat	N		07/10/2021	200	GC-MS
Low range Aromatic hydrocarbons leachate	N		07/10/2021	200	GC-MS
Anions in leachates	N		06/10/2021	270	Ion Chromatography
Water					
Hardness in soil leachates	N		07/10/2021	APHA	ICPMS

Tests marked N are not UKAS accredited

Report Information

Report No.: 21-36251, issue number 1

Key

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I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
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LOD	LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.

ELAB are unable to provide an interpretation or opinion on the content of this report.

The results relate only to the sample received.

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

APPENDIX G: SOIL CONTAMINATION SUMMARY TABLES

SOIL ASSESSMENT CRITERIA FOR COMMERCIAL LAND USE

Contaminant	Assessment Criteria for Commercial at 1% SOM (mg/kg)	Assessment Criteria for Commercial at 2.5% SOM (mg/kg)	Assessment Criteria for Commercial at 6% SOM (mg/kg)
Metals			
Arsenic	640	640	640
Boron	240000	240000	240000
Cadmium	190	190	190
Chromium III	8600	8600	8600
Chromium VI	33	33	33
Copper	68000	68000	68000
*Lead	2300	2300	2300
Mercury	58	58	58
Nickel	980	980	980
Selenium	12000	12000	12000
Vanadium	9000	9000	9000
Zinc	730000	730000	730000
Non-Metals			
Phenol	760	1500	3200
Polyaromatic Hydrocarbons (PAH)			
Acenaphthene	84000	97000	10000
Acenaphthylene	83000	97000	10000
Anthracene	520000	540000	540000
Benz[a[anthracene	170	170	180
Benzo[a]pyrene	35	35	36
Benzo[b]fluoranthene	44	44	45
Benzo[ghi]perylene	3900	4000	4000
Benzo[k]fluoranthene	1200	1200	1200
Chrysene	350	350	350
Dibenz[ah]anthracene	3.5	3.6	3.6
Fluoranthene	23000	23000	23000
Fluorene	63000	68000	71000
Indeno[123-cd]pyrene	500	510	510
Naphthalene	190	460	1100
Phenanthrene	22000	22000	23000
Pyrene	54000	54000	54000
Coal Tar [Bap as surrogate marker)	15	15	15
Petroleum Hydrocarbons			
Aliphatic EC 5-6	3200	5900	12000
Aliphatic EC >6-8	7800	17000	40000
Aliphatic EC>8-10	2000	4800	11000
Aliphatic EC>10-12	9700	23000	47000
Aliphatic EC>12-16	59000	82000	90000
Aliphatic EC>16-35	1600000	1700000	1800000
Aliphatic EC>35-44	1600000	1700000	1800000
Aromatic EC5-7 (Benzene)	26000	46000	86000
Aromatic EC>7-8 (Toluene)	56000	110000	180000
Aromatic EC>8-10	3500	8100	17000
Aromatic EC>10-12	16000	28000	34000
Aromatic EC>12-16	36000	37000	38000
Aromatic EC>16-21	28000	28000	28000
Aromatic EC>21-35	28000	28000	28000
Aromatic EC>35-44	28000	28000	28000
Aliphatic – Aromatic EC>44-70	28000	28000	28000

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The above is based on criteria contained in publication LQM/CIEH S4UL`s for Human Health Risk Assessment (2015) (***CCG*** Licence No. S4UL3233), applicable to the "Commercial" land use scenario for soil organic matter (SOM) content of 1% - 6%.

*This document does not provide criteria for Lead, for which the results were compared to the C4SL published by DEFRA SP1010 Development of Category 4 Screening Levels.

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

METALS DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: CCG-C-21-12598
Site name: Tranmere Rovers Fan Park

Prepared by: A. Gerrard
Authorised by: C. Bolan
Proposed land use: Commercial/Industrial
SOM % used: 1.0

= Threshold exceeded
= Below Limit of detection
n/t = Not tested

			Metals							
Contaminants			Cadmium	Chromium III	Chromium VI	Copper	Lead	Mercury (elemental)	Nickel	Zinc
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.5	5.0	0.8	5.0	5.0	0.5	5.0	5.0
Human Health Risk Assessment (GAC)			190	8600	33	68000	2300	58	980	730000
Sample Location	Sample Depth (m)	Sample type								
WS1	0.50	SOIL	< 0.5	36.8	< 0.8	19.8	26	< 0.5	18.5	53.5
WS2	0.50	SOIL	2.3	1280	< 0.8	215	620	2.5	73.2	794
WS3	0.50	SOIL	**3.2**	**2150**	< 0.8	**284**	**882**	**3.9**	**99.8**	**1230**
WS4	0.50	SOIL	2.3	593	< 0.8	222	877	3.1	79.1	843
Human Health Risk Assessment (GAC)			190	8600	33	68000	2300	58	980	730000

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

SEMI-METALS, NON-METALS, INORGANICS AND OTHER DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: CCG-C-21-12598
Site name: Tranmere Rovers Fan Park

Prepared by: A. Gerrard
Authorised by: C. Bolan
Proposed land use: Commercial/Industrial
SOM % used: 1.0

= Threshold exceeded
= Below Limit of detection
n/t = Not tested

			Semi/non-metals			Inorganics			Other	
Contaminants			Arsenic	Boron	Selenium	Cyanide (free)	Sulphate (water soluble)	Sulphate (water soluble)	pH (units)	Soil Organic Matter %
Units			mg/kg	mg/kg	mg/kg	mg/kg	g/l	mg/l	units	units
Limit of Detection			1.0	0.5	1.0	1.0	0.02	20.0	0.1	0.1
Human Health Risk Assessment (GAC)			640	240000	12000	120	NA	NA	NA	NA
Sample Location	Sample Depth (m)	Sample type								
WS1	0.50	SOIL	4.4	0.6	< 1.0	< 1.0	0.04	n/t	**12.9**	0.4
WS2	0.50	SOIL	17.9	7.8	< 1.0	< 1.0	0.07	n/t	11.5	2.1
WS3	0.50	SOIL	19.1	**8**	**1.1**	< 1.0	0.04	n/t	11.7	1.6
WS4	0.50	SOIL	**42.3**	7	1	< 1.0	0.20	n/t	10.9	**3.5**
Human Health Risk Assessment (GAC)			640	240000	190	120	NA	NA	NA	NA

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

SPECIATED PAH'S DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: CCG-C-21-12598
Site name: Tranmere Rovers Fan Park

Prepared by: A. Gerrard
Authorised by: C. Bolan
Proposed land use: Commercial/Industrial
SOM % used: 1.0

= Threshold exceeded
= Below Limit of detection
n/t = Not tested

Contaminants			PAH's															
			Acenapthene	Acenapthylene	Anthracene	Benz[a]anthracene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[ghi]perylene	Benzo[k]fluoranthene	Chrysene	Dibenzo[ah]anthracene	fluoranthene	fluorene	Indeno[123-cd]pyrene	Napthalene	Pheanthrene	Pyrene	Total PAH's
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4
Human Health Risk Assessment (GAC)			84000	83000	520000	170	35	44	3900	1200	350	3.5	23000	63000	500	190	22000	54000	NA
Sample Location	Sample Depth (m)	Sample type																	
WS1	0.50	SOIL	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.4
WS2	0.50	SOIL	< 0.1	< 0.1	< 0.1	0.4	0.3	0.3	0.3	0.3	0.6	**0.1**	0.9	< 0.1	0.3	< 0.1	0.3	0.8	4.8
WS3	0.50	SOIL	< 0.1	< 0.1	< 0.1	0.3	0.3	**0.6**	**0.5**	0.4	0.6	**0.1**	0.8	< 0.1	0.2	< 0.1	0.3	0.8	5.2
WS4	0.50	SOIL	< 0.1	< 0.1	**0.2**	**0.6**	**0.6**	**0.6**	0.3	**0.7**	**0.7**	**0.1**	**1**	< 0.1	**0.4**	**0.1**	**0.7**	**1**	**7.2**
Human Health Risk Assessment (GAC)			84000	83000	190	170	35	44	3900	1200	350	3.5	23000	63000	500	190	22000	54000	NA

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

SPECIATED TPH'S DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: CCG-C-21-12598
Site name: Tranmere Rovers Fan Park

Prepared by: A. Gerrard
Authorised by: C. Bolan
Proposed land use: Commercial/Industrial
SOM % used: 1.0

= Threshold exceeded
= Below Limit of detection
n/t = Not tested

			Speciated TPH's														
			Aromatics							Aliphatics							
Contaminants			EC5-7	EC7-8	EC8-10	EC10-12	EC12-16	EC16-21	EC21-35	EC35-44	EC5-6	EC6-8	EC8-10	EC10-12	EC12-16	EC16-35	EC35-44	TOTAL TPH'S
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.01	0.01	1.0	1.0	1.0	1.0	1.0	1.0	0.01	0.01	1.0	1.0	1.0	1.0	1.0	1.0
Human Health Risk Assessment (GAC)			26000	56000	3500	16000	36000	28000	28000	28000	3200	7800	2000	9700	59000	1600000	1600000	NA
Sample Location	Sample Depth (m)	Sample type																
WS1	0.50	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	**1.8**	3	114	51.1	< 0.01	< 0.01	< 1.0	**1.2**	**5.1**	49.5	14.6	240
WS2	0.50	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	7.1	136	52.7	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	78.6	14.6	289
WS3	0.50	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	**9.3**	**205**	**85.5**	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	**112.5**	**31.9**	**445**
WS4	0.50	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	5.5	86.2	24.2	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	54.4	6.8	177
Human Health Risk Assessment (GAC)			26000	56000	190	16000	36000	28000	28000	28000	3200	7800	2000	9700	59000	1600000	1600000	NA

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

BTEX DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: CCG-C-21-12598
Site name: Tranmere Rovers Fan Park

Prepared by: A. Gerrard
Authorised by: C. Bolan
Proposed land use: Commercial/Industrial
SOM % used: 1.0

= Threshold exceeded

= Below Limit of detection

n/t = Not tested

			BTEX			
Contaminants			**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**
Units			µg/kg	µg/kg	µg/kg	µg/kg
Limit of Detection			10	10	10	10
Human Health Risk Assessment (GAC)			27000	56000000	5700000	5900000
Sample Location	Sample Depth (m)	Sample type				
WS1	0.50	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
WS2	0.50	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
WS3	0.50	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
WS4	0.50	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
Human Health Risk Assessment (GAC)			27000	190	5700000	5900000

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

ASBESTOS ASSESSMENT SHEET

Job number: CCG-C-21-12598
Site name: Tranmere Rovers Fan Park
Prepared by: A. Gerrard
Authorised by: C. Bolan

Sample Location	Sample Depth (m)	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)	Assessment
WS1	0.50	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected
WS2	0.50	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected
WS3	0.50	No asbestos detected	n/t	n/t	n/t	0	No asbestos detected
WS4	0.50	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected

Job Number:	CCG-C-21-12598	Site Name:	Tranmere Rovers Fan Park
Prepared by:	A. Gerrard	Approved by:	C. Bolan

Sample Location	Sample Depth (m)	Sample type	Sulphate (water soluble) (mg/l)	Sulphate (water soluble) (mg/l)	pH (units)	pH (units)
			Soil	Water	Soil	Water
WS1	0.50	SOIL	40	n/t	12.9	n/t
WS2	0.50	SOIL	70	n/t	11.5	n/t
WS3	0.50	SOIL	40	n/t	11.7	n/t
WS4	0.50	SOIL	200	n/t	10.9	n/t
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

Soil Concrete Specification Data Sheet	
Is the site Brownfield or Greenfield?	Brownfield
Is the water table Static or Mobile	Static
Highest water-soluble Sulphate results	200
Lowest pH result	10.9
Design Sulphate Class	DS-1
ACEC Class	AC-1s
Intended Working Life	50 Years
Design Chemical Classification	DC-1

Water Concrete Specification Data Sheet	
Is the site Brownfield or Greenfield?	N/a
Is the water table Static or Mobile	N/a
Highest water-soluble Sulphate results	
Lowest pH result	
Design Sulphate Class	
ACEC Class	
Intended Working Life	N/a
Design Chemical Classification	

Conclusions
Based on the soil data, concrete should be specified to conform to the compositional requirements of DC-1 as defined in BRE Special Digest 1: 2005.
Based on the water data, concrete should be specified to conform to the compositional requirements of as defined in BRE Special Digest 1: 2005.

APPENDIX H: PRELIMINARY WASTE CLASSIFICATION REPORT

HazWasteOnline™

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

42L1E-DBVEU-70RCK

Job name

Tranmere Rovers FC

Description/Comments

Project

Site

Classified by

Name:
Tony Gerrard
Company:
CC Geotechnical Ltd
Date:
18 Oct 2021 13:52 GMT
Telephone:
0151 545 2750

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification: -

Course	Date
Hazardous Waste Classification	-

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS1	0.50	Hazardous	HP 8	2
2	WS2	0.50	Hazardous	HP 8	7
3	WS3	0.50	Hazardous	HP 8, HP 10, HP 14	12
4	WS4	0.50	Non Hazardous		17

Related documents

#	Name	Description
1	CCG SOIL A 2020	waste stream template used to create this Job

Report

Created by: Tony Gerrard
Created date: 18 Oct 2021 13:52 GMT

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	22
Appendix B: Rationale for selection of metal species	26
Appendix C: Version	26

Classification of sample: WS1

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS1
Sample Depth:
0.50 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 8: Corrosive "waste which on application can cause skin corrosion"

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 12.9 pH)

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		4.4	mg/kg	1.32	5.809	mg/kg	0.000581 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.5	mg/kg	1.142	<0.571	mg/kg	<0.0000571 %		<LOD
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		36.8	mg/kg	1.462	53.785	mg/kg	0.00538 %		
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		19.8	mg/kg	1.126	22.293	mg/kg	0.00223 %		
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	26	mg/kg	1.56	40.555	mg/kg	0.0026 %		
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.5	mg/kg	1.353	<0.677	mg/kg	<0.0000677 %		<LOD
7	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		18.5	mg/kg	2.976	55.061	mg/kg	0.00551 %		
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
9	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		53.5	mg/kg	1.245	66.592	mg/kg	0.00666 %		
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
11	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.8	mg/kg	1.923	<1.538	mg/kg	<0.000154 %		<LOD
12	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.6	mg/kg	3.22	1.932	mg/kg	0.000193 %		
13	pH			PH		12.9	pH		12.9	pH	12.9 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
15		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
16		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
17		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
18		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
19		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
20		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
21		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
22		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
27		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
28		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
29		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
30		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
31		benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
32		toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
33		ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
34		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
35		TPH (C6 to C40) petroleum group				240	mg/kg		240	mg/kg	0.024 %		
				TPH									
36		confirm TPH has NOT arisen from diesel or petrol				.1			.1				<LOD
37		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
38		polychlorobiphenyls; PCB				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
39		asbestos				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
40		antimony { antimony trioxide }				<0.1	mg/kg	1.197	<0.12	mg/kg	<0.000012 %		<LOD
		051-005-00-X	215-175-0	1309-64-4									
41		beryllium { beryllium oxide }				<0.1	mg/kg	2.775	<0.278	mg/kg	<0.0000278 %		<LOD
		004-003-00-8	215-133-1	1304-56-9									
42		manganese { manganese sulphate }				<0.1	mg/kg	2.749	<0.275	mg/kg	<0.0000275 %		<LOD
		025-003-00-4	232-089-9	7785-87-7									
43		molybdenum { molybdenum(VI) oxide }				<0.1	mg/kg	1.5	<0.15	mg/kg	<0.000015 %		<LOD
		042-001-00-9	215-204-7	1313-27-5									
44		1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			203-458-1, 200-863-5	107-06-2, 75-34-3									
45		tetrachloroethylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		602-028-00-4	204-825-9	127-18-4									
46		carbon tetrachloride; tetrachloromethane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		602-008-00-5	200-262-8	56-23-5									
47		trichloroethylene; trichloroethene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		602-027-00-9	201-167-4	79-01-6									
48		vinyl chloride; chloroethylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-023-00-7	200-831-0	75-01-4									
49		DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-045-00-7	200-024-3	50-29-3									
50		chlordane (ISO); 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-047-00-8	200-349-0	57-74-9									
51		hexachlorocyclohexanes, including lindane				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-043-00-6	210-168-9, 200-401-2, 206-270-8, 206-271-3	58-89-9, 319-84-6, 319-85-7, 608-73-1									
52		dieldrin (ISO)				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-049-00-9	200-484-5	60-57-1									
53		endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-051-00-X	200-775-7	72-20-8									
54		heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-046-00-2	200-962-3	76-44-8									
55		hexachlorobenzene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-065-00-6	204-273-9	118-74-1									
56		chlordecone (ISO); perchloropentacyclo[5,3,0,02,6,03,9,04,8]decan-5-one; decachloropentacyclo[5,2,1,02,6,03,9,05,8]decan-4-one				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		606-019-00-6	205-601-3	143-50-0									
57		aldrin (ISO)				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-048-00-3	206-215-8	309-00-2									
58		pentachlorobenzene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-074-00-5	210-172-0	608-93-5									
59		dodecachloropentacyclo[5.2.1.02,6.03,9.05,8]decane; mirex				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-077-00-1	219-196-6	2385-85-5									
60		camphechlor (ISO); toxaphene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-044-00-1	232-283-3	8001-35-2									
61		hexabromobiphenyl				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			252-994-2	36355-01-8									
62		2,3,7,8-TeCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
			217-122-7	1746-01-6									
63		1,2,3,7,8-PeCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				40321-76-4									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
64		1,2,3,4,7,8-HxCDD		39227-28-6		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
65		1,2,3,6,7,8-HxCDD		57653-85-7		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
66		1,2,3,7,8,9-HxCDD		19408-74-3		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
67		1,2,3,4,6,7,8-HpCDD		35822-46-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
68		OCDD		3268-87-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
69		2,3,7,8-TeCDF		51207-31-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
70		1,2,3,7,8-PeCDF		57117-41-6		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
71		2,3,4,7,8-PeCDF		57117-31-4		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
72		1,2,3,4,7,8-HxCDF		70648-26-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
73		1,2,3,6,7,8-HxCDF		57117-44-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
74		1,2,3,7,8,9-HxCDF		72918-21-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
75		2,3,4,6,7,8-HxCDF		60851-34-5		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
76		1,2,3,4,6,7,8-HpCDF		67562-39-4		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
77		1,2,3,4,7,8,9-HpCDF		55673-89-7		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
78		OCDF		39001-02-0		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
79		petrol (gasoline) petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
80		diesel petroleum group		68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
81		heavy/residual fuel oils petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
82		crude oils petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
83		kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened	232-366-4; 265-184-9; 294-799-5	8008-20-6; 64742-81-0; 91770-15-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
										Total:	0.0482 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Concentrations too low to be considered flammable risk

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.024%)

Classification of sample: WS2

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:	LoW Code:	
WS2	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.50 m	Entry:	17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 8: Corrosive "waste which on application can cause skin corrosion"

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 11.5 pH)

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		17.9 mg/kg	1.32	23.634 mg/kg	0.00236 %		
2	cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		2.3 mg/kg	1.142	2.627 mg/kg	0.000263 %		
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) } 215-160-9 / 1308-38-9		1280 mg/kg	1.462	1870.791 mg/kg	0.187 %		
4	copper { dicopper oxide; copper (I) oxide } 029-002-00-X / 215-270-7 / 1317-39-1		215 mg/kg	1.126	242.066 mg/kg	0.0242 %		
5	lead { lead chromate } 082-004-00-2 / 231-846-0 / 7758-97-6	1	620 mg/kg	1.56	967.085 mg/kg	0.062 %		
6	mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		2.5 mg/kg	1.353	3.384 mg/kg	0.000338 %		
7	nickel { nickel chromate } 028-035-00-7 / 238-766-5 / 14721-18-7		73.2 mg/kg	2.976	217.863 mg/kg	0.0218 %		
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		**<LOD**
9	zinc { zinc oxide } 030-013-00-7 / 215-222-5 / 1314-13-2		794 mg/kg	1.245	988.303 mg/kg	0.0988 %		
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5		<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		**<LOD**
11	chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.8 mg/kg	1.923	<1.538 mg/kg	<0.000154 %		**<LOD**
12	boron { diboron trioxide; boric oxide } 005-008-00-8 / 215-125-8 / 1303-86-2		7.8 mg/kg	3.22	25.115 mg/kg	0.00251 %		
13	pH PH		11.5 pH		11.5 pH	11.5 pH		

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14		phenol	604-001-00-2	203-632-7	108-95-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
15		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
16		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
17		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
18		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
19		phenanthrene		201-581-5	85-01-8		0.3	mg/kg		0.3	mg/kg	0.00003 %		
20		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21		fluoranthene		205-912-4	206-44-0		0.9	mg/kg		0.9	mg/kg	0.00009 %		
22		pyrene		204-927-3	129-00-0		0.8	mg/kg		0.8	mg/kg	0.00008 %		
23		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.4	mg/kg		0.4	mg/kg	0.00004 %		
24		chrysene	601-048-00-0	205-923-4	218-01-9		0.6	mg/kg		0.6	mg/kg	0.00006 %		
25		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.3	mg/kg		0.3	mg/kg	0.00003 %		
26		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.3	mg/kg		0.3	mg/kg	0.00003 %		
27		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.3	mg/kg		0.3	mg/kg	0.00003 %		
28		indeno[123-cd]pyrene		205-893-2	193-39-5		0.3	mg/kg		0.3	mg/kg	0.00003 %		
29		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.1	mg/kg		0.1	mg/kg	0.00001 %		
30		benzo[ghi]perylene		205-883-8	191-24-2		0.3	mg/kg		0.3	mg/kg	0.00003 %		
31		benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
32		toluene	601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
33		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
34		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
35		TPH (C6 to C40) petroleum group			TPH		289	mg/kg		289	mg/kg	0.0289 %		
36		confirm TPH has NOT arisen from diesel or petrol					.1			.1				<LOD
37		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
38		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
39		asbestos	650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
40		antimony { antimony trioxide }				<0.1	mg/kg	1.197	<0.12	mg/kg	<0.000012 %		<LOD
		051-005-00-X	215-175-0	1309-64-4									
41		beryllium { beryllium oxide }				<0.1	mg/kg	2.775	<0.278	mg/kg	<0.0000278 %		<LOD
		004-003-00-8	215-133-1	1304-56-9									
42		manganese { manganese sulphate }				<0.1	mg/kg	2.749	<0.275	mg/kg	<0.0000275 %		<LOD
		025-003-00-4	232-089-9	7785-87-7									
43		molybdenum { molybdenum(VI) oxide }				<0.1	mg/kg	1.5	<0.15	mg/kg	<0.000015 %		<LOD
		042-001-00-9	215-204-7	1313-27-5									
44		1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			203-458-1, 200-863-5	107-06-2, 75-34-3									
45		tetrachloroethylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		602-028-00-4	204-825-9	127-18-4									
46		carbon tetrachloride; tetrachloromethane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		602-008-00-5	200-262-8	56-23-5									
47		trichloroethylene; trichloroethene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		602-027-00-9	201-167-4	79-01-6									
48		vinyl chloride; chloroethylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-023-00-7	200-831-0	75-01-4									
49		DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-045-00-7	200-024-3	50-29-3									
50		chlordane (ISO); 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-047-00-8	200-349-0	57-74-9									
51		hexachlorocyclohexanes, including lindane				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-043-00-6	210-168-9, 200-401-2, 206-270-8, 206-271-3	58-89-9, 319-84-6, 319-85-7, 608-73-1									
52		dieldrin (ISO)				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-049-00-9	200-484-5	60-57-1									
53		endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-051-00-X	200-775-7	72-20-8									
54		heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-046-00-2	200-962-3	76-44-8									
55		hexachlorobenzene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-065-00-6	204-273-9	118-74-1									
56		chlordecone (ISO); perchloropentacyclo[5,3,0,02,6,03,9,04,8]decan-5-one; decachloropentacyclo[5,2,1,02,6,03,9,05,8]decan-4-one				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		606-019-00-6	205-601-3	143-50-0									
57		aldrin (ISO)				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-048-00-3	206-215-8	309-00-2									
58		pentachlorobenzene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-074-00-5	210-172-0	608-93-5									
59		dodecachloropentacyclo[5.2.1.02,6.03,9.05,8]decane; mirex				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-077-00-1	219-196-6	2385-85-5									
60		camphechlor (ISO); toxaphene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-044-00-1	232-283-3	8001-35-2									
61		hexabromobiphenyl				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			252-994-2	36355-01-8									
62		2,3,7,8-TeCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
			217-122-7	1746-01-6									
63		1,2,3,7,8-PeCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				40321-76-4									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
64		1,2,3,4,7,8-HxCDD		39227-28-6		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
65		1,2,3,6,7,8-HxCDD		57653-85-7		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
66		1,2,3,7,8,9-HxCDD		19408-74-3		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
67		1,2,3,4,6,7,8-HpCDD		35822-46-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
68		OCDD		3268-87-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
69		2,3,7,8-TeCDF		51207-31-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
70		1,2,3,7,8-PeCDF		57117-41-6		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
71		2,3,4,7,8-PeCDF		57117-31-4		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
72		1,2,3,4,7,8-HxCDF		70648-26-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
73		1,2,3,6,7,8-HxCDF		57117-44-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
74		1,2,3,7,8,9-HxCDF		72918-21-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
75		2,3,4,6,7,8-HxCDF		60851-34-5		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
76		1,2,3,4,6,7,8-HpCDF		67562-39-4		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
77		1,2,3,4,7,8,9-HpCDF		55673-89-7		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
78		OCDF		39001-02-0		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
79		petrol (gasoline) petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
80		diesel petroleum group		68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
81		heavy/residual fuel oils petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
82		crude oils petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
83		kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened	232-366-4; 265-184-9; 294-799-5	8008-20-6; 64742-81-0; 91770-15-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
										Total:	0.43 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Concentrations too low to be considered flammable risk

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0289%)

Classification of sample: WS3

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS3
Sample Depth:
0.50 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 8: Corrosive "waste which on application can cause skin corrosion"

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 11.7 pH)

HP 10: Toxic for reproduction "waste which has adverse effects on sexual function and fertility in adult males and females, as well as developmental toxicity in the offspring"

Hazard Statements hit:

Repr. 1B; H360FD "May damage fertility. May damage the unborn child."

Because of determinand:

chromium(III) oxide (worst case): (compound conc.: 0.314%)

HP 14: Ecotoxic "waste which presents or may present immediate or delayed risks for one or more sectors of the environment"

Hazard Statements hit:

Aquatic Chronic 1; H410 "Very toxic to aquatic life with long lasting effects."

Because of determinands:

chromium(III) oxide (worst case): (compound conc.: 0.314%)
zinc oxide: (compound conc.: 0.153%)

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		19.1 mg/kg	1.32	25.218 mg/kg	0.00252 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		3.2 mg/kg	1.142	3.655 mg/kg	0.000366 %		
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		2150 mg/kg	1.462	3142.345 mg/kg	0.314 %		
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		284 mg/kg	1.126	319.752 mg/kg	0.032 %		
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	882 mg/kg	1.56	1375.757 mg/kg	0.0882 %		
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		3.9 mg/kg	1.353	5.279 mg/kg	0.000528 %		
7	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		99.8 mg/kg	2.976	297.031 mg/kg	0.0297 %		

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1.1	mg/kg	1.405	1.546	mg/kg	0.000155 %		
9		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		1230	mg/kg	1.245	1530.998	mg/kg	0.153 %		
10		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
11		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.8	mg/kg	1.923	<1.538	mg/kg	<0.000154 %		<**LOD**
12		boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		8	mg/kg	3.22	25.759	mg/kg	0.00258 %		
13		pH			PH		11.7	pH		11.7	pH	11.7 pH		
14		phenol	604-001-00-2	203-632-7	108-95-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
15		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
16		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
17		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
18		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
19		phenanthrene		201-581-5	85-01-8		0.3	mg/kg		0.3	mg/kg	0.00003 %		
20		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
21		fluoranthene		205-912-4	206-44-0		0.8	mg/kg		0.8	mg/kg	0.00008 %		
22		pyrene		204-927-3	129-00-0		0.8	mg/kg		0.8	mg/kg	0.00008 %		
23		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.3	mg/kg		0.3	mg/kg	0.00003 %		
24		chrysene	601-048-00-0	205-923-4	218-01-9		0.6	mg/kg		0.6	mg/kg	0.00006 %		
25		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.6	mg/kg		0.6	mg/kg	0.00006 %		
26		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.4	mg/kg		0.4	mg/kg	0.00004 %		
27		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.3	mg/kg		0.3	mg/kg	0.00003 %		
28		indeno[123-cd]pyrene		205-893-2	193-39-5		0.2	mg/kg		0.2	mg/kg	0.00002 %		
29		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.1	mg/kg		0.1	mg/kg	0.00001 %		
30		benzo[ghi]perylene		205-883-8	191-24-2		0.5	mg/kg		0.5	mg/kg	0.00005 %		
31		benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
32		toluene	601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
33		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
34		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2]	95-47-6 [1] 106-42-3 [2]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
			203-576-3 [3] 215-535-7 [4]	108-38-3 [3] 1330-20-7 [4]									
35		TPH (C6 to C40) petroleum group		TPH		445	mg/kg		445	mg/kg	0.0445 %		
36		confirm TPH has NOT arisen from diesel or petrol				.1			.1				<**LOD**
37		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X	216-653-1	1634-04-4		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
38		polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
39		asbestos 650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
40		antimony { antimony trioxide } 051-005-00-X	215-175-0	1309-64-4		<0.1	mg/kg	1.197	<0.12	mg/kg	<0.000012 %		<**LOD**
41		beryllium { beryllium oxide } 004-003-00-8	215-133-1	1304-56-9		<0.1	mg/kg	2.775	<0.278	mg/kg	<0.0000278 %		<**LOD**
42		manganese { manganese sulphate } 025-003-00-4	232-089-9	7785-87-7		<0.1	mg/kg	2.749	<0.275	mg/kg	<0.0000275 %		<**LOD**
43		molybdenum { molybdenum(VI) oxide } 042-001-00-9	215-204-7	1313-27-5		<0.1	mg/kg	1.5	<0.15	mg/kg	<0.000015 %		<**LOD**
44		1,1-dichloroethane and 1,2-dichloroethane (combined)	203-458-1, 200-863-5	107-06-2, 75-34-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
45		tetrachloroethylene 602-028-00-4	204-825-9	127-18-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
46		carbon tetrachloride; tetrachloromethane 602-008-00-5	200-262-8	56-23-5		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
47		trichloroethylene; trichloroethene 602-027-00-9	201-167-4	79-01-6		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
48		vinyl chloride; chloroethylene 602-023-00-7	200-831-0	75-01-4		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
49		DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane 602-045-00-7	200-024-3	50-29-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
50		chlordane (ISO); 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan 602-047-00-8	200-349-0	57-74-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
51		hexachlorocyclohexanes, including lindane 602-043-00-6	210-168-9, 200-401-2, 206-270-8, 206-271-3	58-89-9, 319-84-6, 319-85-7, 608-73-1		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
52		dieldrin (ISO) 602-049-00-9	200-484-5	60-57-1		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
53		endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene 602-051-00-X	200-775-7	72-20-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
54		heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene 602-046-00-2	200-962-3	76-44-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
55		hexachlorobenzene 602-065-00-6	204-273-9	118-74-1		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
56		chlordecone (ISO); perchloropentacyclo[5,3,0,02,6,03,9,04,8]decan-5-one; decachloropentacyclo[5,2,1,02,6,03,9,05,8]decan-4-one				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		606-019-00-6	205-601-3	143-50-0									
57		aldrin (ISO)				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-048-00-3	206-215-8	309-00-2									
58		pentachlorobenzene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-074-00-5	210-172-0	608-93-5									
59		dodecachloropentacyclo[5.2.1.02,6.03,9.05,8]decane; mirex				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-077-00-1	219-196-6	2385-85-5									
60		camphechlor (ISO); toxaphene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-044-00-1	232-283-3	8001-35-2									
61		hexabromobiphenyl				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			252-994-2	36355-01-8									
62		2,3,7,8-TeCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
			217-122-7	1746-01-6									
63		1,2,3,7,8-PeCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				40321-76-4									
64		1,2,3,4,7,8-HxCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				39227-28-6									
65		1,2,3,6,7,8-HxCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				57653-85-7									
66		1,2,3,7,8,9-HxCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				19408-74-3									
67		1,2,3,4,6,7,8-HpCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				35822-46-9									
68		OCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				3268-87-9									
69		2,3,7,8-TeCDF				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				51207-31-9									
70		1,2,3,7,8-PeCDF				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				57117-41-6									
71		2,3,4,7,8-PeCDF				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				57117-31-4									
72		1,2,3,4,7,8-HxCDF				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				70648-26-9									
73		1,2,3,6,7,8-HxCDF				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				57117-44-9									
74		1,2,3,7,8,9-HxCDF				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				72918-21-9									
75		2,3,4,6,7,8-HxCDF				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				60851-34-5									
76		1,2,3,4,6,7,8-HpCDF				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				67562-39-4									
77		1,2,3,4,7,8,9-HpCDF				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				55673-89-7									
78		OCDF				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				39001-02-0									
79		petrol (gasoline) petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
80		diesel petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
				68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9									
81		heavy/residual fuel oils petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
82		crude oils petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
83		kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
			232-366-4; 265-184-9; 294-799-5	8008-20-6; 64742-81-0; 91770-15-9							
								Total:	0.669 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Concentrations too low to be considered flammable risk

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0445%)

Classification of sample: WS4

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS4
Sample Depth:
0.50 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		42.3 mg/kg	1.32	55.85 mg/kg	0.00558 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2.3 mg/kg	1.142	2.627 mg/kg	0.000263 %		
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		593 mg/kg	1.462	866.703 mg/kg	0.0867 %		
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		222 mg/kg	1.126	249.947 mg/kg	0.025 %		
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	877 mg/kg	1.56	1367.958 mg/kg	0.0877 %		
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		3.1 mg/kg	1.353	4.196 mg/kg	0.00042 %		
7	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		79.1 mg/kg	2.976	235.423 mg/kg	0.0235 %		
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1 mg/kg	1.405	1.405 mg/kg	0.000141 %		
9	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		843 mg/kg	1.245	1049.294 mg/kg	0.105 %		
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
11	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.8 mg/kg	1.923	<1.538 mg/kg	<0.000154 %		<LOD
12	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		7 mg/kg	3.22	22.539 mg/kg	0.00225 %		
13	pH			PH		10.9 pH		10.9 pH	10.9 pH		
14	phenol	604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15	naphthalene	601-052-00-2	202-049-5	91-20-3		0.1 mg/kg		0.1 mg/kg	0.00001 %		

#		Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number / EC Number / CAS Number							
16		acenaphthylene 205-917-1 / 208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
17		acenaphthene 201-469-6 / 83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
18		fluorene 201-695-5 / 86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
19		phenanthrene 201-581-5 / 85-01-8		0.7 mg/kg		0.7 mg/kg	0.00007 %		
20		anthracene 204-371-1 / 120-12-7		0.2 mg/kg		0.2 mg/kg	0.00002 %		
21		fluoranthene 205-912-4 / 206-44-0		1 mg/kg		1 mg/kg	0.0001 %		
22		pyrene 204-927-3 / 129-00-0		1 mg/kg		1 mg/kg	0.0001 %		
23		benzo[a]anthracene 601-033-00-9 / 200-280-6 / 56-55-3		0.6 mg/kg		0.6 mg/kg	0.00006 %		
24		chrysene 601-048-00-0 / 205-923-4 / 218-01-9		0.7 mg/kg		0.7 mg/kg	0.00007 %		
25		benzo[b]fluoranthene 601-034-00-4 / 205-911-9 / 205-99-2		0.6 mg/kg		0.6 mg/kg	0.00006 %		
26		benzo[k]fluoranthene 601-036-00-5 / 205-916-6 / 207-08-9		0.7 mg/kg		0.7 mg/kg	0.00007 %		
27		benzo[a]pyrene; benzo[def]chrysene 601-032-00-3 / 200-028-5 / 50-32-8		0.6 mg/kg		0.6 mg/kg	0.00006 %		
28		indeno[123-cd]pyrene 205-893-2 / 193-39-5		0.4 mg/kg		0.4 mg/kg	0.00004 %		
29		dibenz[a,h]anthracene 601-041-00-2 / 200-181-8 / 53-70-3		0.1 mg/kg		0.1 mg/kg	0.00001 %		
30		benzo[ghi]perylene 205-883-8 / 191-24-2		0.3 mg/kg		0.3 mg/kg	0.00003 %		
31		benzene 601-020-00-8 / 200-753-7 / 71-43-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32		toluene 601-021-00-3 / 203-625-9 / 108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
33		ethylbenzene 601-023-00-4 / 202-849-4 / 100-41-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
34		xylene 601-022-00-9 / 202-422-2 [1], 203-396-5 [2], 203-576-3 [3], 215-535-7 [4] / 95-47-6 [1], 106-42-3 [2], 108-38-3 [3], 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
35		TPH (C6 to C40) petroleum group TPH		177 mg/kg		177 mg/kg	0.0177 %		
36		confirm TPH has NOT arisen from diesel or petrol		.1		.1			<LOD
37		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X / 216-653-1 / 1634-04-4		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
38		polychlorobiphenyls; PCB 602-039-00-4 / 215-648-1 / 1336-36-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
39		asbestos 650-013-00-6 / - - - - - - - / 12001-28-4, 132207-32-0, 12172-73-5, 77536-66-4, 77536-68-6, 77536-67-5, 12001-29-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
40		antimony { antimony trioxide } 051-005-00-X / 215-175-0 / 1309-64-4		<0.1 mg/kg	1.197	<0.12 mg/kg	<0.000012 %		<LOD
41		beryllium { beryllium oxide } 004-003-00-8 / 215-133-1 / 1304-56-9		<0.1 mg/kg	2.775	<0.278 mg/kg	<0.0000278 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
42		manganese { manganese sulphate }				<0.1	mg/kg	2.749	<0.275	mg/kg	<0.0000275 %		<LOD
		025-003-00-4	232-089-9	7785-87-7									
43		molybdenum { molybdenum(VI) oxide }				<0.1	mg/kg	1.5	<0.15	mg/kg	<0.000015 %		<LOD
		042-001-00-9	215-204-7	1313-27-5									
44		1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			203-458-1, 200-863-5	107-06-2, 75-34-3									
45		tetrachloroethylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		602-028-00-4	204-825-9	127-18-4									
46		carbon tetrachloride; tetrachloromethane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		602-008-00-5	200-262-8	56-23-5									
47		trichloroethylene; trichloroethene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		602-027-00-9	201-167-4	79-01-6									
48		vinyl chloride; chloroethylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-023-00-7	200-831-0	75-01-4									
49		DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-045-00-7	200-024-3	50-29-3									
50		chlordane (ISO); 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-047-00-8	200-349-0	57-74-9									
51		hexachlorocyclohexanes, including lindane				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-043-00-6	210-168-9, 200-401-2, 206-270-8, 206-271-3	58-89-9, 319-84-6, 319-85-7, 608-73-1									
52		dieldrin (ISO)				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-049-00-9	200-484-5	60-57-1									
53		endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-051-00-X	200-775-7	72-20-8									
54		heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-046-00-2	200-962-3	76-44-8									
55		hexachlorobenzene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-065-00-6	204-273-9	118-74-1									
56		chlordecone (ISO); perchloropentacyclo[5,3,0,02,6,03,9,04,8]decan-5-one; decachloropentacyclo[5,2,1,02,6,03,9,05,8]decan-4-one				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		606-019-00-6	205-601-3	143-50-0									
57		aldrin (ISO)				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-048-00-3	206-215-8	309-00-2									
58		pentachlorobenzene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-074-00-5	210-172-0	608-93-5									
59		dodecachloropentacyclo[5.2.1.02,6.03,9.05,8]decane; mirex				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-077-00-1	219-196-6	2385-85-5									
60		camphechlor (ISO); toxaphene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		602-044-00-1	232-283-3	8001-35-2									
61		hexabromobiphenyl				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			252-994-2	36355-01-8									
62		2,3,7,8-TeCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
			217-122-7	1746-01-6									
63		1,2,3,7,8-PeCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				40321-76-4									
64		1,2,3,4,7,8-HxCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				39227-28-6									
65		1,2,3,6,7,8-HxCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
				57653-85-7									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
66		1,2,3,7,8,9-HxCDD		19408-74-3		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
67		1,2,3,4,6,7,8-HpCDD		35822-46-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
68		OCDD		3268-87-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
69		2,3,7,8-TeCDF		51207-31-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
70		1,2,3,7,8-PeCDF		57117-41-6		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
71		2,3,4,7,8-PeCDF		57117-31-4		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
72		1,2,3,4,7,8-HxCDF		70648-26-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
73		1,2,3,6,7,8-HxCDF		57117-44-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
74		1,2,3,7,8,9-HxCDF		72918-21-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
75		2,3,4,6,7,8-HxCDF		60851-34-5		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
76		1,2,3,4,6,7,8-HpCDF		67562-39-4		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
77		1,2,3,4,7,8,9-HpCDF		55673-89-7		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
78		OCDF		39001-02-0		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
79		petrol (gasoline) petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
80		diesel petroleum group		68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
81		heavy/residual fuel oils petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
82		crude oils petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
83		kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened	232-366-4; 265-184-9; 294-799-5	8008-20-6; 64742-81-0; 91770-15-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
										Total:	0.356 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Concentrations too low to be considered flammable risk

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0177%)

Appendix A: Classifier defined and non CLP determinands

- **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

CLP index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

- **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

- **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

- **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

- **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

- **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2 H351

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

confirm TPH has NOT arisen from diesel or petrol

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

polychlorobiphenyls; PCB (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s):
29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

1,1-dichloroethane and 1,2-dichloroethane (combined) (EC Number: 203-458-1, 200-863-5, CAS Number: 107-06-2, 75-34-3)

Description/Comments: Combines the hazard statements and risk phrases for 1,1-dichloroethane and 1,2-dichloroethane
Data source: N/a
Data source date: 14 Oct 2016
Hazard Statements: Flam. Liq. 2 H225 , Acute Tox. 4 H302 , Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 1B H350 , Aquatic Chronic 3 H412

hexabromobiphenyl (EC Number: 252-994-2, CAS Number: 36355-01-8)

Description/Comments:
Data source: POP specific threshold from ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004).
Data source date: 01 Jul 2013
Hazard Statements: POP >= 0.005 %

2,3,7,8-TeCDD (EC Number: 217-122-7, CAS Number: 1746-01-6)

Description/Comments: 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=1)

- **1,2,3,7,8-PeCDD** (CAS Number: 40321-76-4)

Description/Comments: 1,2,3,7,8-pentachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=1)

- **1,2,3,4,7,8-HxCDD** (CAS Number: 39227-28-6)

Description/Comments: 1,2,3,4,7,8-hexachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

- **1,2,3,6,7,8-HxCDD** (CAS Number: 57653-85-7)

Description/Comments: 1,2,3,6,7,8-hexachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

- **1,2,3,7,8,9-HxCDD** (CAS Number: 19408-74-3)

Description/Comments: 1,2,3,7,8,9-hexachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

- **1,2,3,4,6,7,8-HpCDD** (CAS Number: 35822-46-9)

Description/Comments: 1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.01)

- **OCDD** (CAS Number: 3268-87-9)

Description/Comments: octachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.0003)

- **2,3,7,8-TeCDF** (CAS Number: 51207-31-9)

Description/Comments: 2,3,7,8-tetrachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

- **1,2,3,7,8-PeCDF** (CAS Number: 57117-41-6)

Description/Comments: 1,2,3,7,8-pentachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.03)

- **2,3,4,7,8-PeCDF** (CAS Number: 57117-31-4)

Description/Comments: 2,3,4,7,8-pentachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.3)

- **1,2,3,4,7,8-HxCDF** (CAS Number: 70648-26-9)

Description/Comments: 1,2,3,4,7,8-hexachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

- **1,2,3,6,7,8-HxCDF** (CAS Number: 57117-44-9)

Description/Comments: 1,2,3,6,7,8-hexachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

1,2,3,7,8,9-HxCDF (CAS Number: 72918-21-9)

Description/Comments: 1,2,3,7,8,9-hexachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

2,3,4,6,7,8-HxCDF (CAS Number: 60851-34-5)

Description/Comments: 2,3,4,6,7,8-hexachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

1,2,3,4,6,7,8-HpCDF (CAS Number: 67562-39-4)

Description/Comments: 1,2,3,4,6,7,8-heptachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.01)

1,2,3,4,7,8,9-HpCDF (CAS Number: 55673-89-7)

Description/Comments: 1,2,3,4,7,8,9-heptachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.01)

OCDF (CAS Number: 39001-02-0)

Description/Comments: octachlorodibenzo[b,d]furan
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.0003)

petrol (gasoline) petroleum group

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 1 H224 , Skin Irrit. 2 H315 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , STOT SE 3 H336 , Asp. Tox. 1 H304 , Aquatic Chronic 2 H411

diesel petroleum group (CAS Number: 68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3 H226 , Skin Irrit. 2 H315 , Acute Tox. 4 H332 , Carc. 2 H351 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Aquatic Chronic 2 H411

heavy/residual fuel oils petroleum group

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Muta. 1B H340 , Carc. 1B H350 , Acute Tox. 4 H332 , Repr. 2 H361d , STOT RE 2 H373 , Aquatic Chronic 2 H411

crude oils petroleum group

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 2 H225 , Carc. 1B H350 , Eye Irrit. 2 H319 , Asp. Tox. 1 H304 , STOT RE 2 H373 , STOT SE 3 H336 , Aquatic Chronic 2 H411

kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened (EC Number: 232-366-4; 265-184-9; 294-799-5, CAS Number: 8008-20-6; 64742-81-0; 91770-15-9)

Description/Comments: Review of ECHA Registered Substances database; Concawe report: hazard classification and labelling of petroleum substances in the European Economic Area - 2012; REACH compliant SDS from Total, Petrobras; Petrochem; Shell; ESS
Data source: http://echa.europa.eu/information-on-chemicals/registered-substances; Hazard classification and labelling of petroleum substances in the European Economic Area - 2012 (CONCAWE); SDS: company websites
Data source date: 21 Jan 2014
Hazard Statements: Flam. Liq. 3 H226 , Skin Irrit. 2 H315 , Asp. Tox. 1 H304 , Aquatic Chronic 2 H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc oxide}

Not enough chromate present to warrant zinc chromate classification

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings (edit as required)

beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (edit as required)

manganese {manganese sulphate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2021.246.4869.9247 (05 Sep 2021)
HazWasteOnline Database: 2021.246.4869.9247 (05 Sep 2021)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2019 - UK: 2019 No. 720 of 27th March 2019
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

APPENDIX I: SOIL CLASSIFICATION TEST REPORT

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CC GEOTECHNICAL LTD
Consulting Geoenvironmental and Geotechnical Engineers

LABORATORY REPORT

CONTRACT NUMBER: CCG-C-21-12598

CONTRACT TITLE: TRANMERE ROVERS FAN PARK

CLIENT: DAVE BECKETT

DATE RECEIVED: 29/09/21
DATE COMMENCED: 29/09/21
DATE COMPLETED: 13/10/21
REPORT DATE: 14/10/21

Test Description	Qty
Determination of Moisture Content BS 1377-2:1990 (a)	7
Determination of Liquid & Plastic Limits BS 1377-2:1990 (a)	9
Particle Size Distribution BS 1377-2:1990 (a)	2
Unconsolidated Undrained Triaxial Compression BS1377-7:1990 (a)	2

Notes: Observations and interpretations are not accredited by UKAS
All testing undertaken at laboratory permanent facilities
# denotes non-accredited test
a denotes UKAS accredited test
s denotes test undertaken by approved subcontractor
Test results only relate to the samples tested

This report is issued in accordance with the requirements of the United kingdom Accreditation Services and EN ISO/IEC 17025:2017. The results reported herein relate only to the material supplied to the laboratory. This report shall not be reproduced except in full, without the prior written approval of the laboratory.
Approved Signatories: Chris Bolan (Managing Director) – Daniel Kerfoot (Laboratory Manager)

SUMMARY OF LABORATORY SOIL TEST RESULTS

BH / TP / WS Number	Sample Type	Depth From (m)	Depth To (m)	Moisture Content (%)	Bulk Density (Mg/m³)	Dry Density (Mg/m³)	Shear Strength (kN/m²)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425mm (%)	Soil Classification	UKAS accredited test (Y/N)	Description / Test Method Samples described in accordance with BS EN ISO 14688-2 2004
BH1	UT	2.00	2.45	18	2.19	1.86	180	37	17	20	94	CI	Y	Brown slightly sandy slightly gravelly silty CLAY of very high undrained shear strength. Gravel is fine to medium subrounded mudstone and sandstone. (BS1377Pt2:3.2,4.4,5,Pt7:8)
BH1	UT	4.00	4.45	19	2.19	1.85	183	39	17	22	91	CI	Y	Brown slightly sandy slightly gravelly silty CLAY of very high undrained shear strength. Gravel is fine to medium subrounded mudstone and sandstone. (BS1377Pt2:3.2,4.4,5,Pt7:8)
BH1	B	5.50	5.50	-	-	-	-	-	-	-	-	-	Y	Brown silty gravelly SAND. Gravel is fine to medium subrounded sandstone. (BS1377Pt2:9.2)
WS1	WS	1.20	1.20	21	-	-	-	36	17	19	93	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subrounded sandstone. (BS1377Pt2:3.2,4.4,5)
WS1	WS	1.90	1.90	20	-	-	-	37	17	20	95	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subrounded sandstone. (BS1377Pt2:3.2,4.4,5)
WS2	WS	1.20	1.20	21	-	-	-	36	18	18	95	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subrounded sandstone. (BS1377Pt2:3.2,4.4,5)
WS2	WS	1.90	1.90	19	-	-	-	38	18	20	90	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subrounded sandstone. (BS1377Pt2:3.2,4.4,5)
WS3	WS	1.20	1.20	-	-	-	-	-	-	-	-	-	Y	Brown very clayey very gravelly SAND. Gravel is fine to coarse subrounded sandstone. (BS1377Pt2:9.2)
WS3	WS	1.90	1.90	17	-	-	-	35	17	18	91	CL / CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subrounded sandstone. (BS1377Pt2:3.2,4.4,5)
WS4	WS	1.20	1.20	23	-	-	-	39	17	22	94	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subrounded sandstone. (BS1377Pt2:3.2,4.4,5)

SITE: TRANMERE ROVERS FAN PARK (CCG-C-21-12598) DATE: 14.10.21

CLIENT: DAVE BECKETT

UKAS TESTING 4514

Key:- BD = Bulk Disturbed; SD = Small Disturbed; U100 = Undisturbed 100mm; WS = Window Sample
CL = Low Plasticity; CI = Intermediate; CH = High; CV = Very high; CE = Extremely high; NP = Non-plastic
(* Denotes Hand Shear Vane test result)
Sample description not accredited by UKAS

SUMMARY OF LABORATORY SOIL TEST RESULTS

BH / TP / WS Number	Sample Type	Depth From (m)	Depth To (m)	Moisture Content (%)	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Shear Strength (kN/m^2)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425mm (%)	Soil Classification	UKAS accredited test (Y/N)	Description / Test Method Samples described in accordance with BS EN ISO 14688-2 2004
WS4	WS	1.90	1.90	22	-	-	-	37	17	20	93	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subrounded sandstone. (BS1377Pt2:3.2,4.4,5)

SITE: TRANMERE ROVERS FAN PARK (CCG-C-21-12598) DATE: 14.10.21

CLIENT: DAVE BECKETT

UKAS TESTING 4514

Key:- BD = Bulk Disturbed; SD = Small Disturbed; U100 = Undisturbed 100mm; WS = Window Sample
CL = Low Plasticity; CI = Intermediate; CH = High; CV = Very high; CE = Extremely high; NP = Non-plastic
(* Denotes Hand Shear Vane test result)
Sample description not accredited by UKAS

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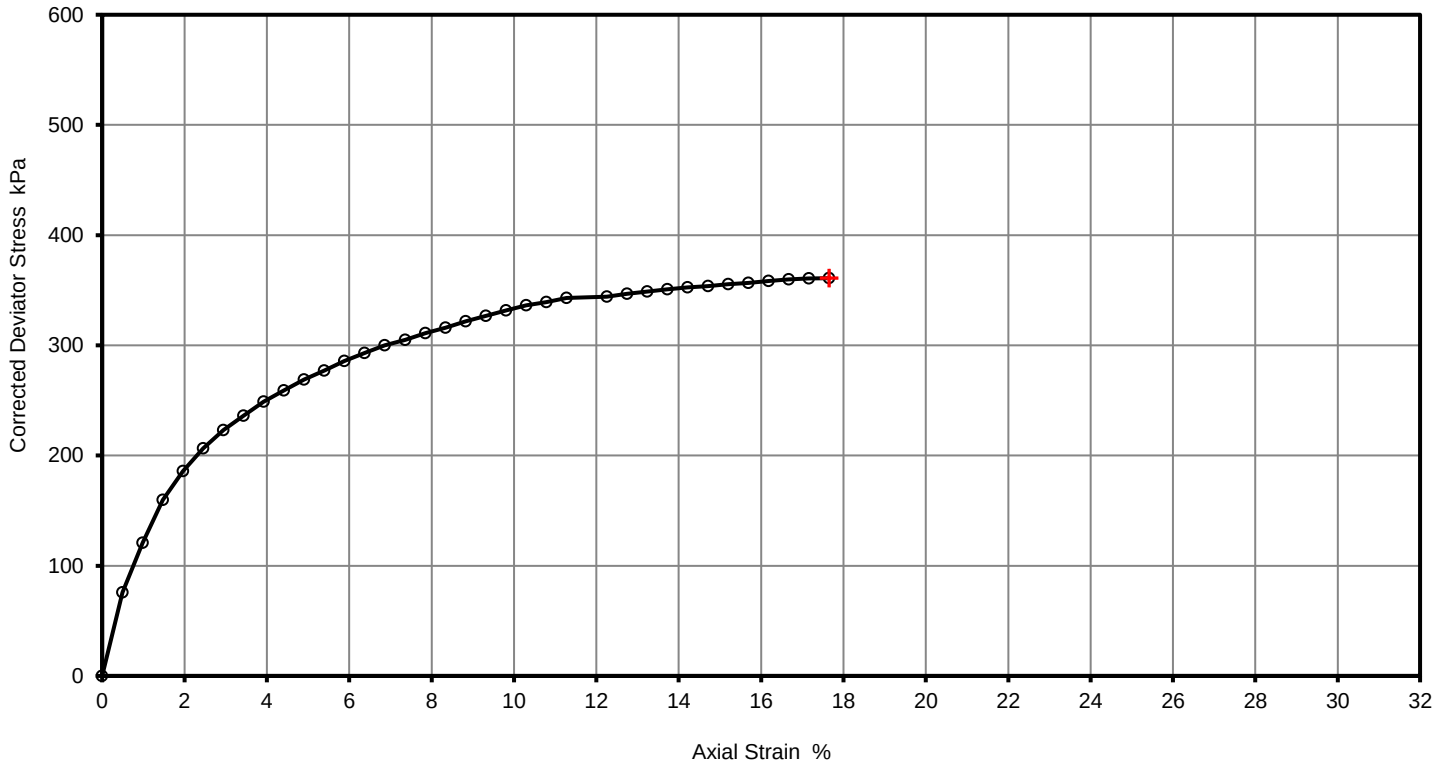
Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen

Job Ref	CCG-C-21-12598				
Borehole/Pit No.	BH1				
Site Name	TRANMERE ROVERS FAN PARK		Sample No.	1	
Soil Description			Depth	2.00	
Specimen Reference		Specimen Depth m	Sample Type	UT	
Specimen Description	Brown slightly sandy slightly gravelly silty CLAY		Date of test		
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen		29/09/2021		

UKAS TESTING 4514

Test Number		1	
Length		204.0	mm
Diameter		103.8	mm
Bulk Density		2.19	Mg/m3
Moisture Content		17.7	%
Dry Density		1.86	Mg/m3
Rate of Strain		2.0	%/min
Cell Pressure		40	kPa
At failure	Axial Strain	17.6	%
	Deviator Stress, (σ1 - σ3)f	361	kPa
	Undrained Shear Strength, cu	180	kPa ½(σ1 - σ3)f
	Mode of Failure	Plastic	

Deviator Stress v Axial Strain



Remarks

Approved: DanielKerfoot

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Fig. No. 1

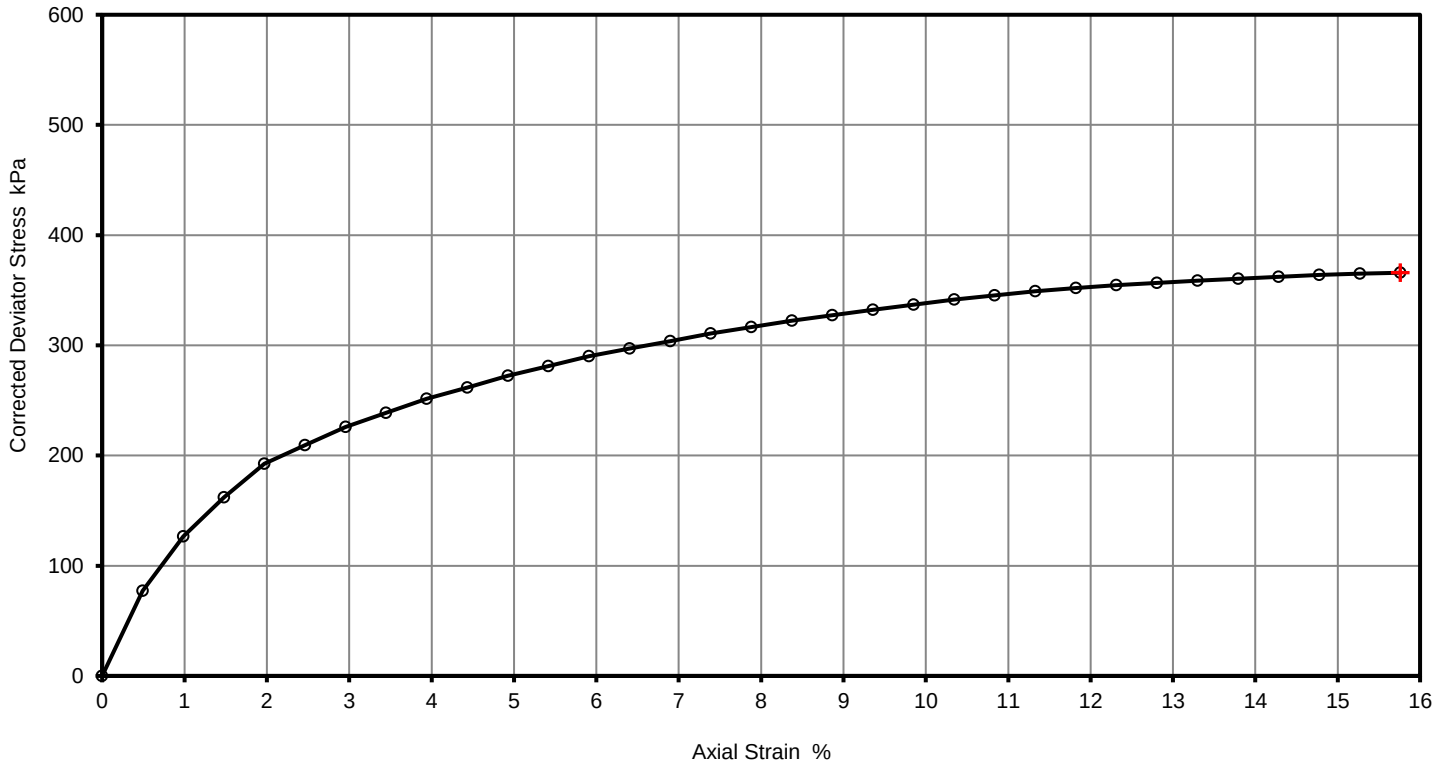
Sheet 1

CC Geotechnical Ltd Tel: 0151 545 2750 e: lab@ccgeotechnical.com	**Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen**			Job Ref	CCG-C-21-12598
				Borehole/Pit No.	BH1
Site Name	TRANMERE ROVERS FAN PARK			Sample No.	1
Soil Description				Depth	4.00
Specimen Reference		Specimen Depth	m	Sample Type	UT
Specimen Description	Brown slightly sandy slightly gravelly silty CLAY			Date of test	29/09/2021
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen				

UKAS TESTING 4514

Test Number		1	
Length		203.0	mm
Diameter		104.0	mm
Bulk Density		2.19	Mg/m3
Moisture Content		18.5	%
Dry Density		1.85	Mg/m3
Rate of Strain		2.0	%/min
Cell Pressure		80	kPa
At failure	Axial Strain	15.8	%
	Deviator Stress, (σ1 - σ3)f	366	kPa
	Undrained Shear Strength, cu	183	kPa ½(σ1 - σ3)f
	Mode of Failure	Plastic	

Deviator Stress v Axial Strain



Remarks

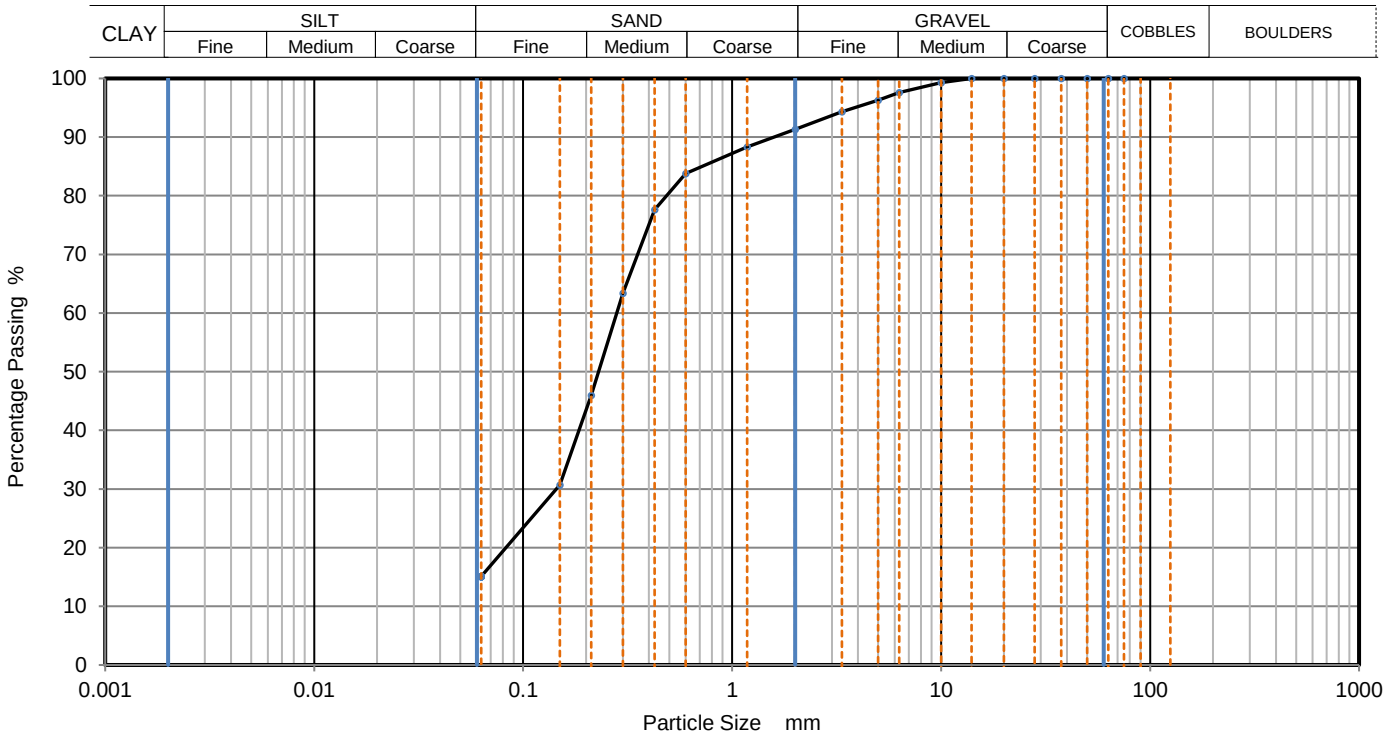
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DanielKerfoot	07/10/2021 11:10

Fig. No. 1

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PARTICLE SIZE DISTRIBUTION

Job Ref	CCG-C-21-12598		
Borehole/Pit No.	BH1		
Site Name	TRANMERE ROVERS FAN PARK	Sample No.	1
Specimen Description	Brown silty gravelly SAND	Depth, m	5.50
Specimen Reference	Specimen Depth: m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2	KeyLAB ID	CCGL202110072



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	98		
5	96		
3.35	94		
2	91		
1.18	88		
0.6	84		
0.425	78		
0.3	63		
0.212	46		
0.15	31		
0.063	15		

Dry Mass of sample, g

Sample Proportions	% dry mass
Very coarse	0
Gravel	9
Sand	76
Fines <0.063mm	15

Grading Analysis		
D100	mm	
D60	mm	0.28
D30	mm	0.145
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

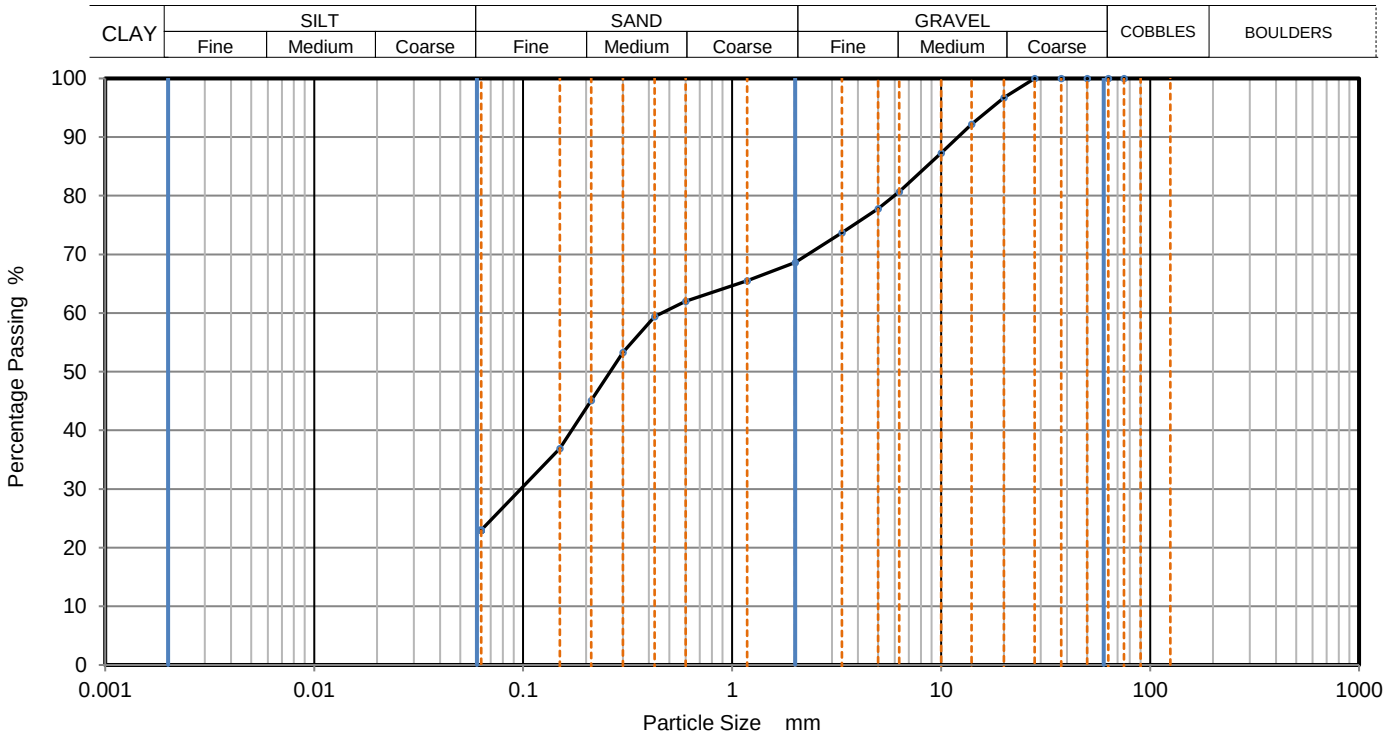
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	Approved	Sheet printed	Fig 1
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PARTICLE SIZE DISTRIBUTION

Job Ref	CCG-C-21-12598		
Borehole/Pit No.	WS3		
Site Name	TRANMERE ROVERS FAN PARK	Sample No.	1
Specimen Description	Brown very clayey very gravelly SAND	Depth, m	1.20
Specimen Reference	Specimen Depth: m	Sample Type	WS
Test Method	BS1377:Part 2:1990, clause 9.2	KeyLAB ID	CCGL202110073



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	92		
10	87		
6.3	81		
5	78		
3.35	74		
2	69		
1.18	66		
0.6	62		
0.425	59		
0.3	53		
0.212	45		
0.15	37		
0.063	23		

Dry Mass of sample, g

Sample Proportions	% dry mass
Very coarse	0
Gravel	31
Sand	46
Fines <0.063mm	23

Grading Analysis		
D100	mm	
D60	mm	0.462
D30	mm	0.0973
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

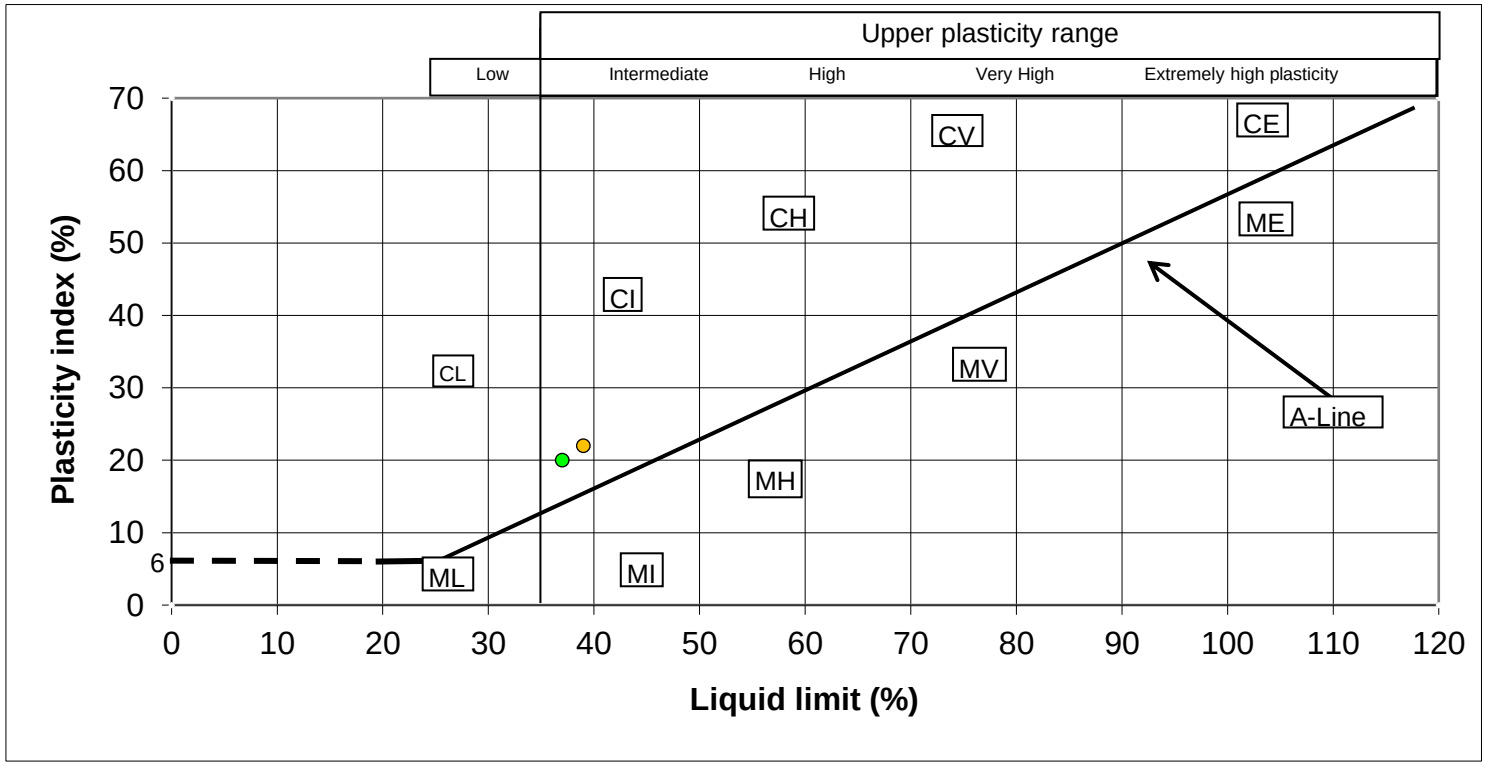
Remarks

Preparation and testing in accordance with BS1377 unless noted below

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JE	DK	DK	07/10/2021 11:27	Sheet

ATTERBERG TEST RESULT SHEET
BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
BH1	2.00	37.0	20.0
BH1	4.00	39.0	22.0

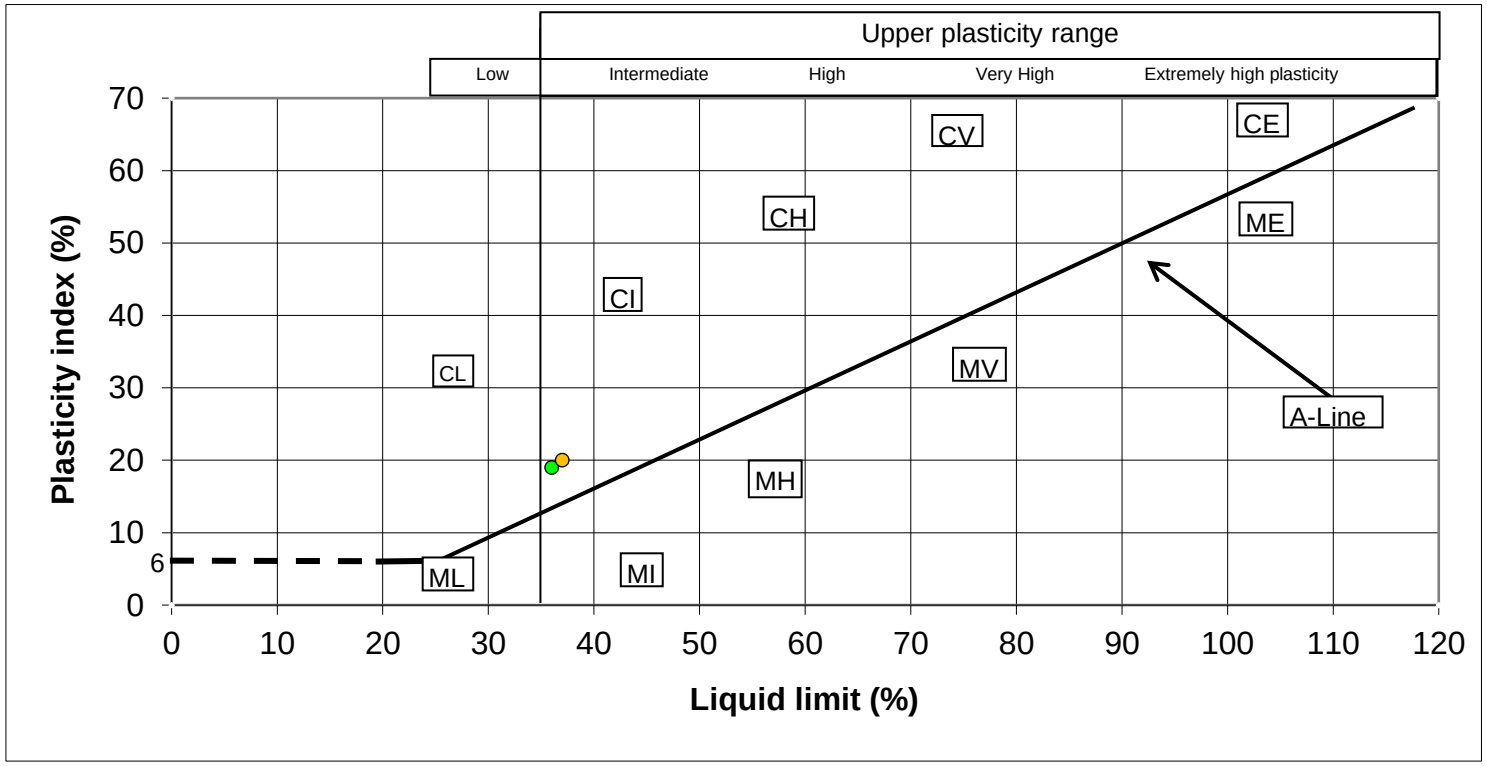
UKAS TESTING
4514

APPROVED BY	DK

CLIENT: DAVE BECKETT	SITE: TRANMERE ROVERS FAN PARK (CCG-C-21-12598)

ATTERBERG TEST RESULT SHEET
BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
WS1	1.20	36.0	19.0
WS1	1.90	37.0	20.0

UKAS TESTING
4514

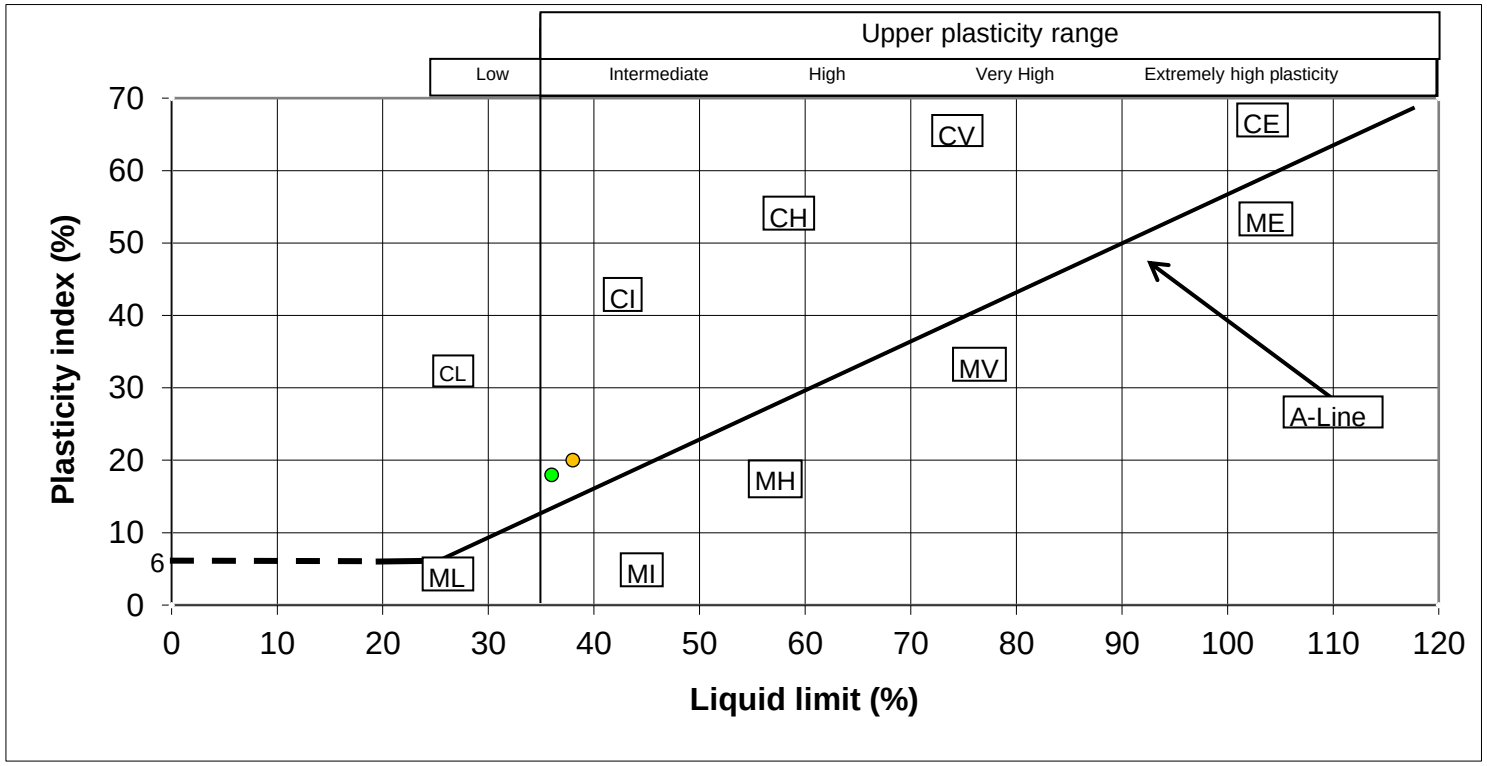
APPROVED BY	DK

CLIENT: DAVE BECKETT	SITE: TRANMERE ROVERS FAN PARK (CCG-C-21-12598)

ATTERBERG TEST RESULT SHEET

BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
WS2	1.20	36.0	18.0
WS2	1.90	38.0	20.0

UKAS TESTING
4514

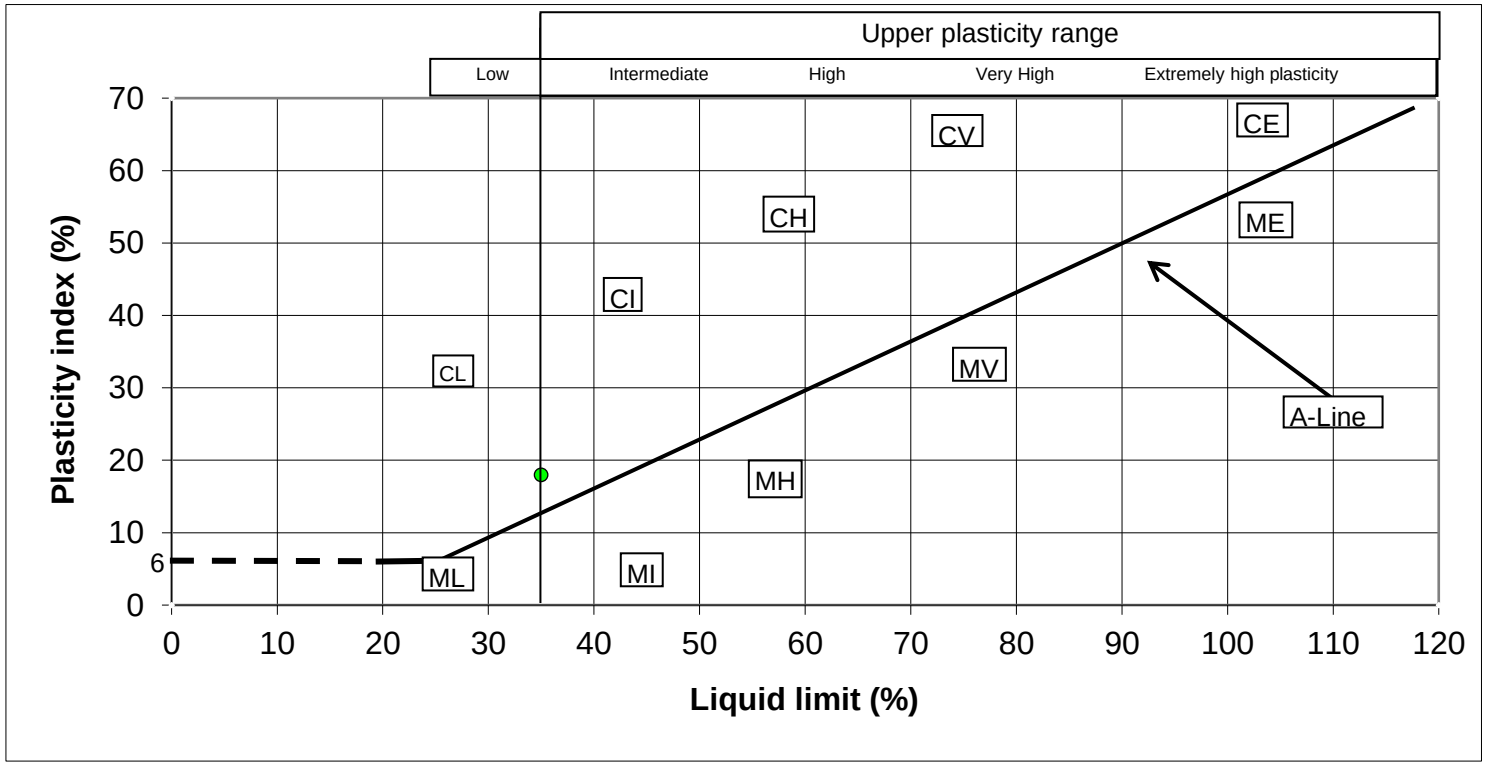
APPROVED BY	DK

CLIENT: DAVE BECKETT	SITE: TRANMERE ROVERS FAN PARK (CCG-C-21-12598)

ATTERBERG TEST RESULT SHEET

BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
WS3	1.90	35.0	18.0

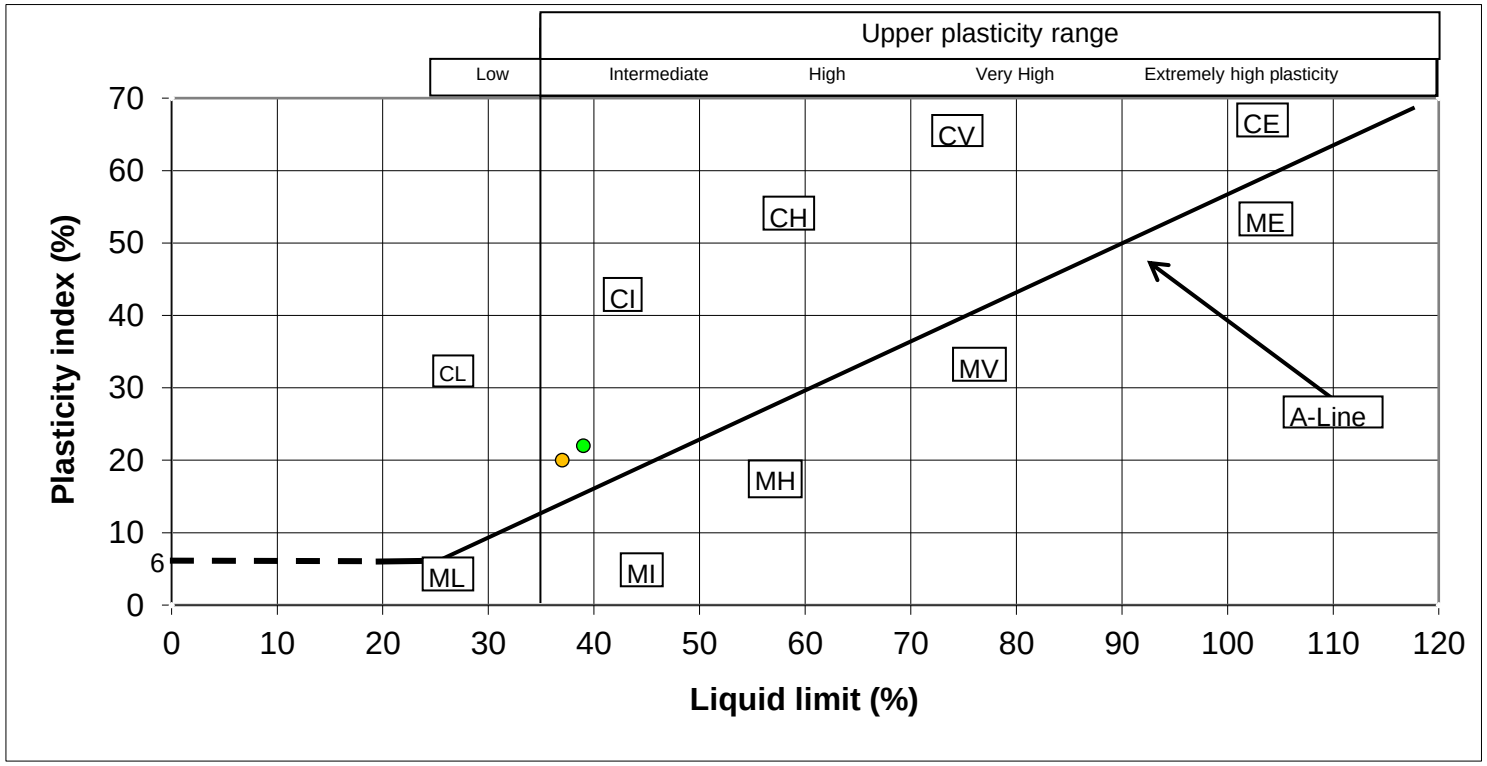
UKAS TESTING 4514

APPROVED BY	DK

CLIENT: DAVE BECKETT	SITE: TRANMERE ROVERS FAN PARK (CCG-C-21-12598)

ATTERBERG TEST RESULT SHEET
BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



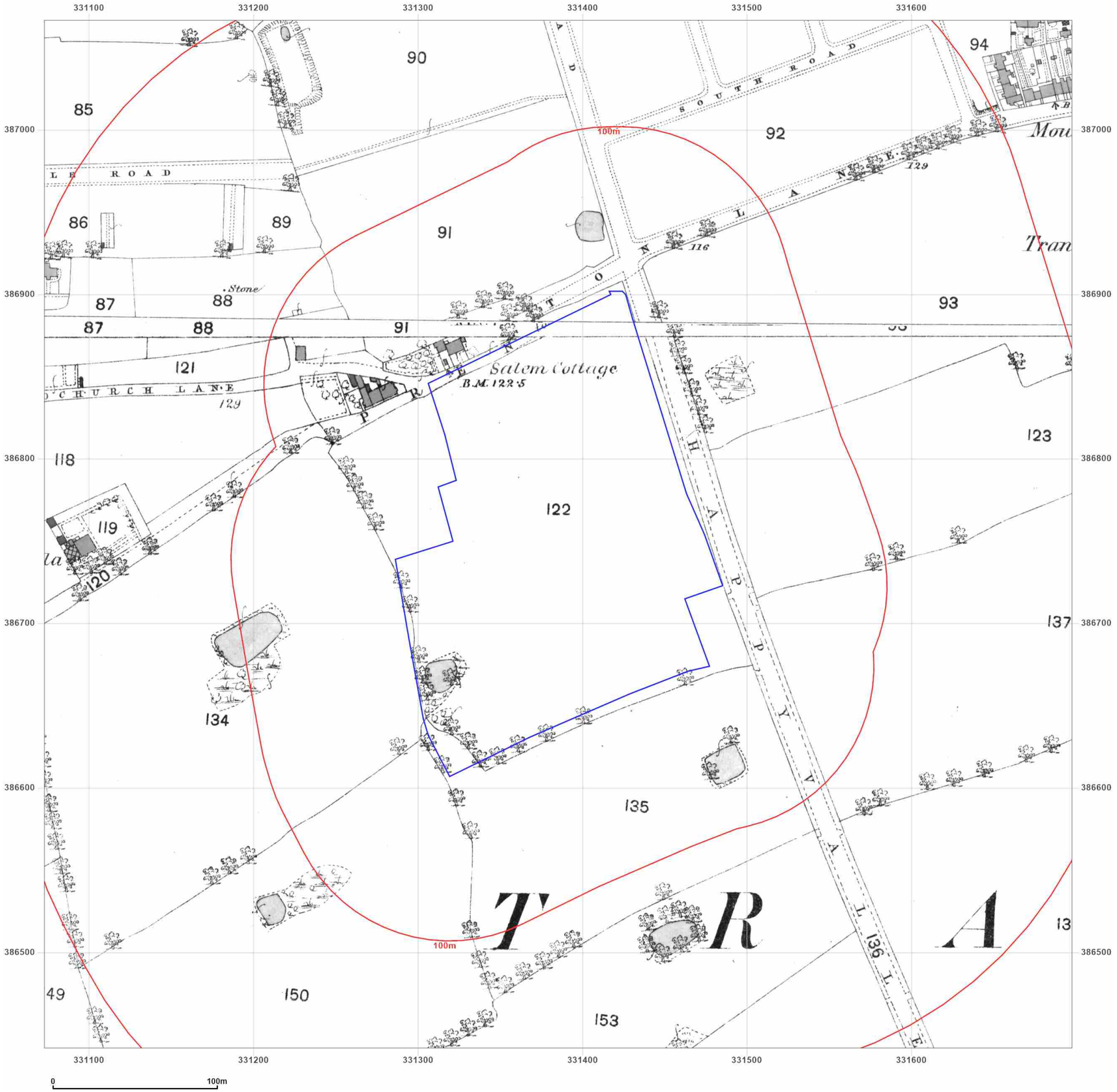
BH	Sample Depth	Liquid limit	Plasticity index
WS4	1.20	39.0	22.0
WS4	1.90	37.0	20.0

UKAS TESTING
4514

APPROVED BY	DK

CLIENT: DAVE BECKETT	SITE: TRANMERE ROVERS FAN PARK (CCG-C-21-12598)

APPENDIX J: ENVIRONMENTAL DATA REPORT



Site Details:

Tranmere Rovers F C, Prenton Park Stadium Prenton Road West, Birkenhead, Prenton, CH42 9PY

Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: County Series

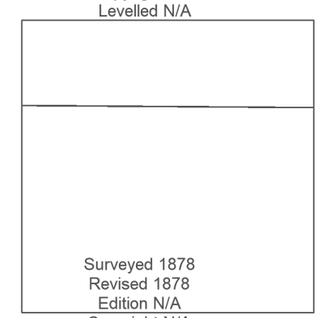
Map date: **1878**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1878
Revised 1878
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1878
Revised 1878
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 09 September 2021

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Site Details:

Tranmere Rovers F C, Prenton Park Stadium Prenton Road West, Birkenhead, Prenton, CH42 9PY

Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: County Series

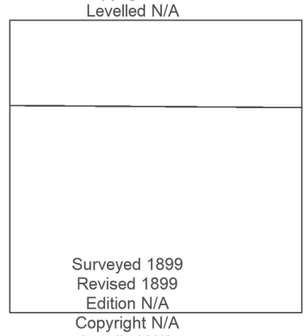
Map date: **1899**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1899
Revised 1899
Edition N/A
Copyright N/A
Levelled N/A



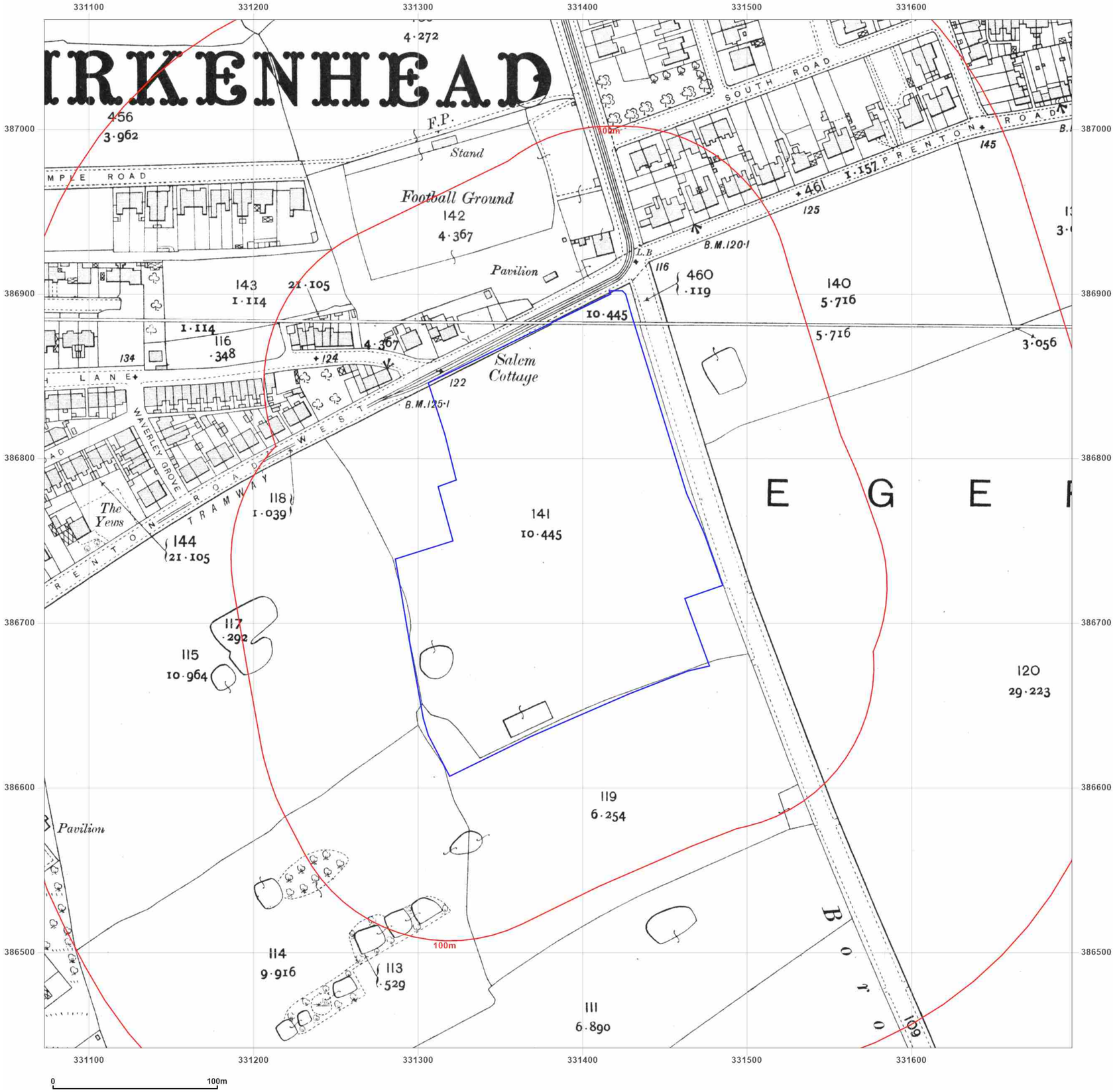
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CCG

Site Details:

Tranmere Rovers F C, Prenton Park Stadium Prenton Road West, Birkenhead, Prenton, CH42 9PY

Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: County Series

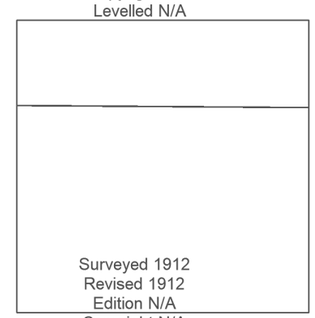
Map date: **1912**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1912
Revised 1912
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1912
Revised 1912
Edition N/A
Copyright N/A
Levelled N/A

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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: County Series

Map date: **1927**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1927
Revised 1927
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1927
Revised 1927
Edition N/A
Copyright N/A
Levelled N/A

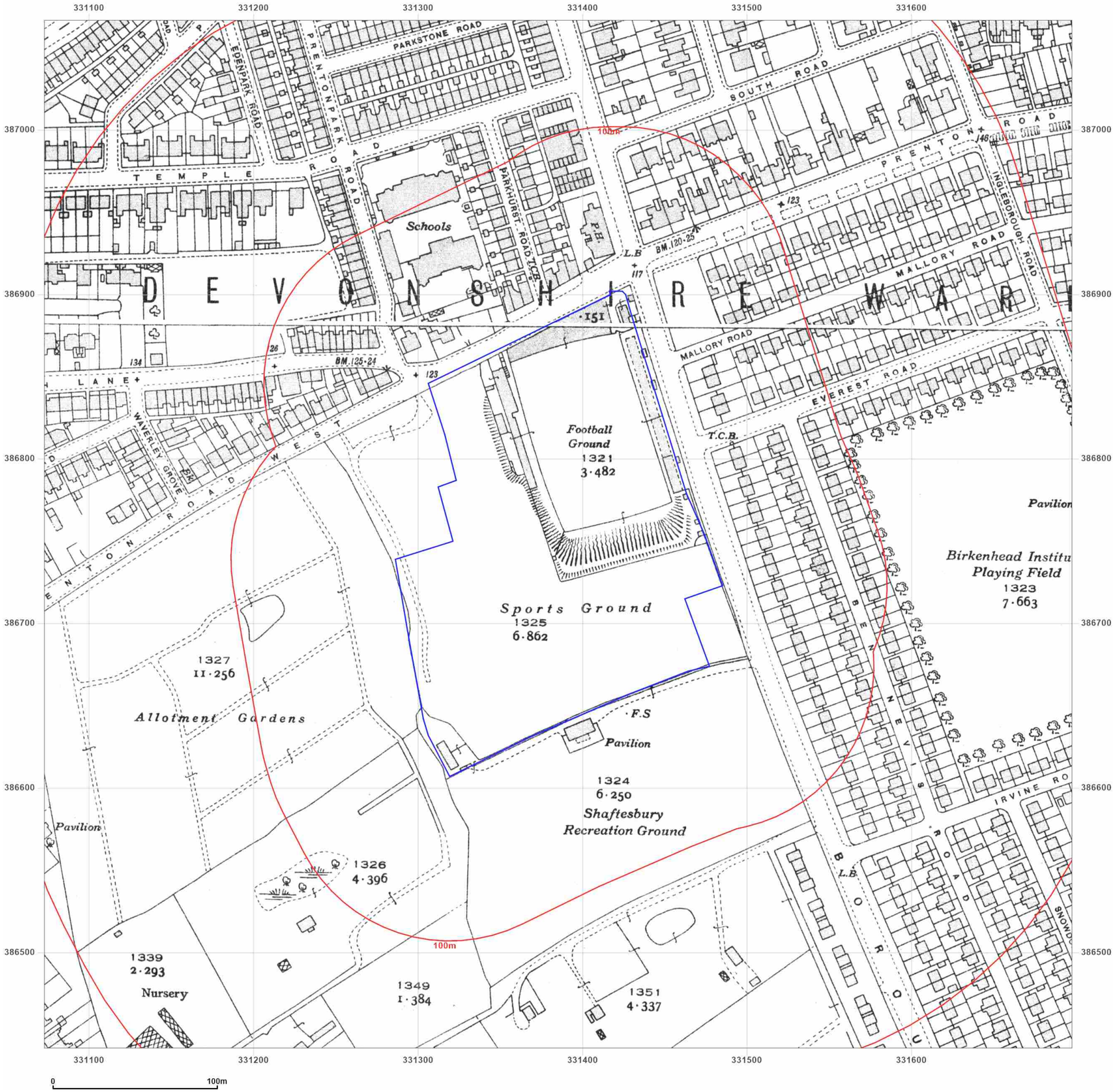
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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: County Series

Map date: **1936**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1936
Revised 1936
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1936
Revised 1936
Edition N/A
Copyright N/A
Levelled N/A

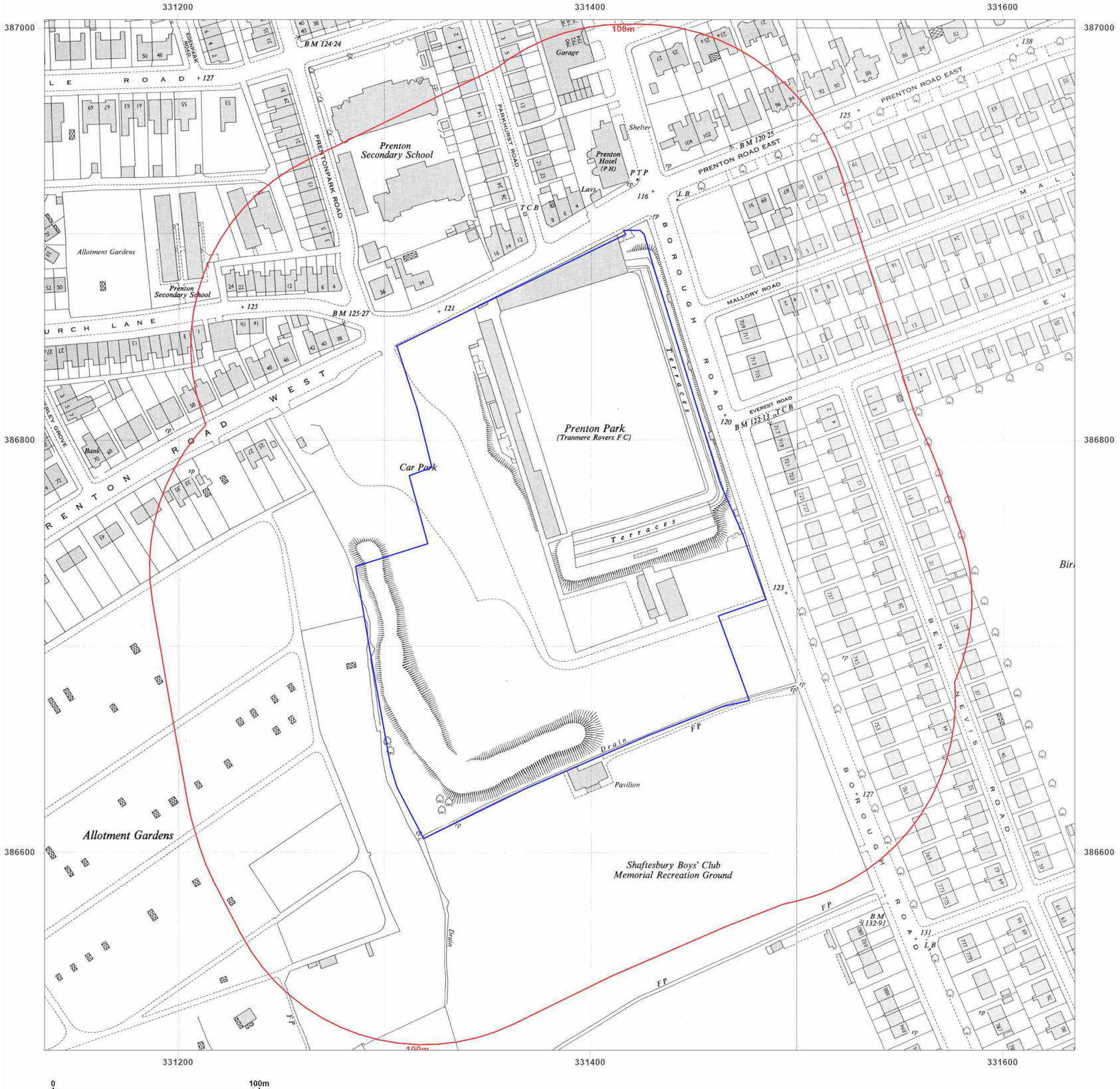
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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

Map date: **1954**

Scale: 1:1,250

Printed at: 1:2,000

N
W E
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Surveyed 1954
Revised 1954
Edition N/A
Copyright N/A
Levelled 1947

Surveyed 1954
Revised 1954
Edition N/A
Copyright N/A
Levelled 1947

Surveyed 1954
Revised 1954
Edition N/A
Copyright N/A
Levelled 1947

Surveyed 1954
Revised 1954
Edition N/A
Copyright N/A
Levelled 1947

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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

Map date: **1954**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1954
Revised 1954
Edition 1955
Copyright N/A
Levelled 1947

Surveyed 1954
Revised 1954
Edition 1955
Copyright N/A
Levelled 1947

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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

Map date: **1955**

Scale: 1:1,250

Printed at: 1:2,000

N
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Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

Map date: **1963**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1963
Revised 1963
Edition N/A
Copyright 1966
Levelled 1947

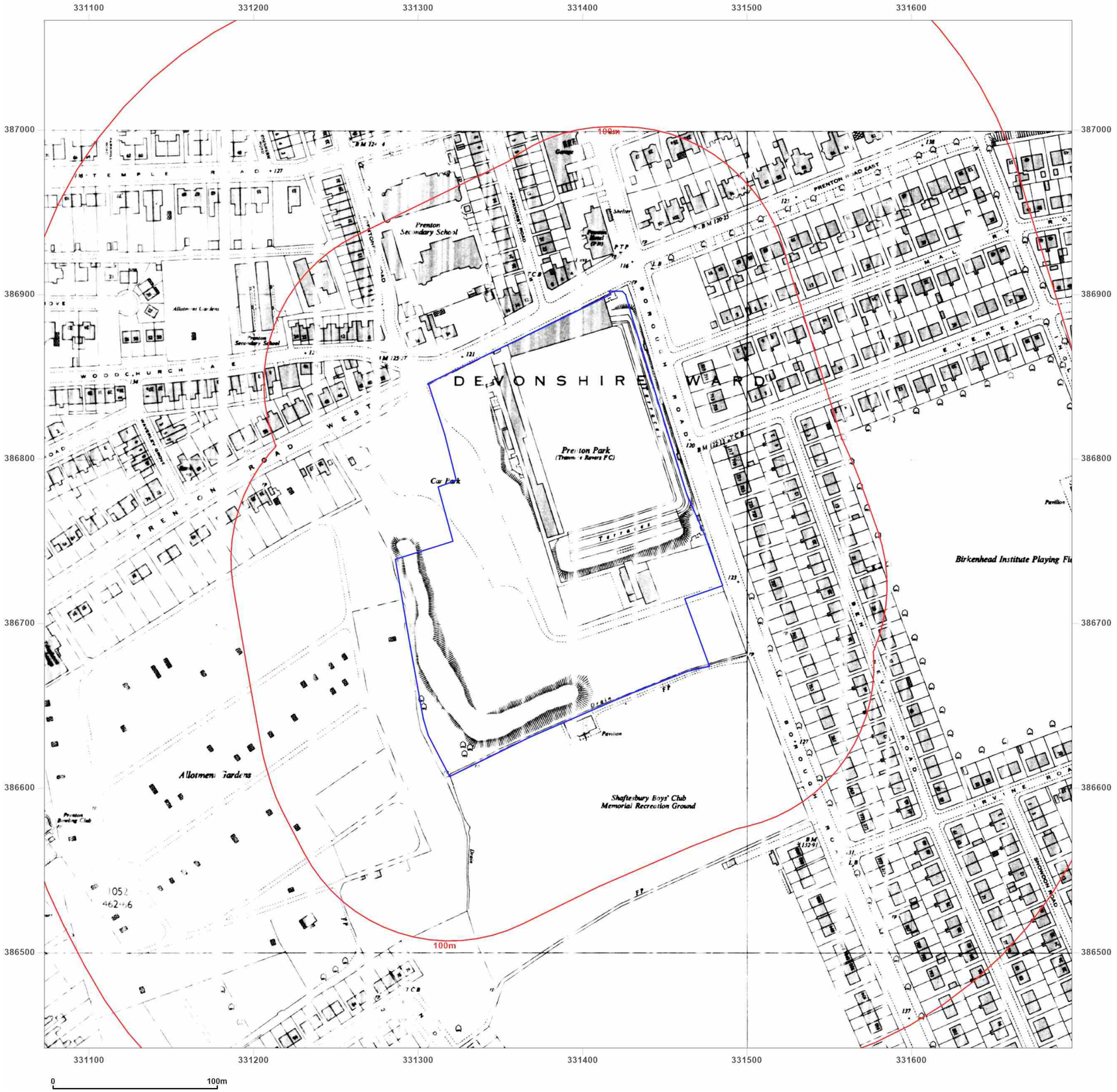
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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

Map date: **1966**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

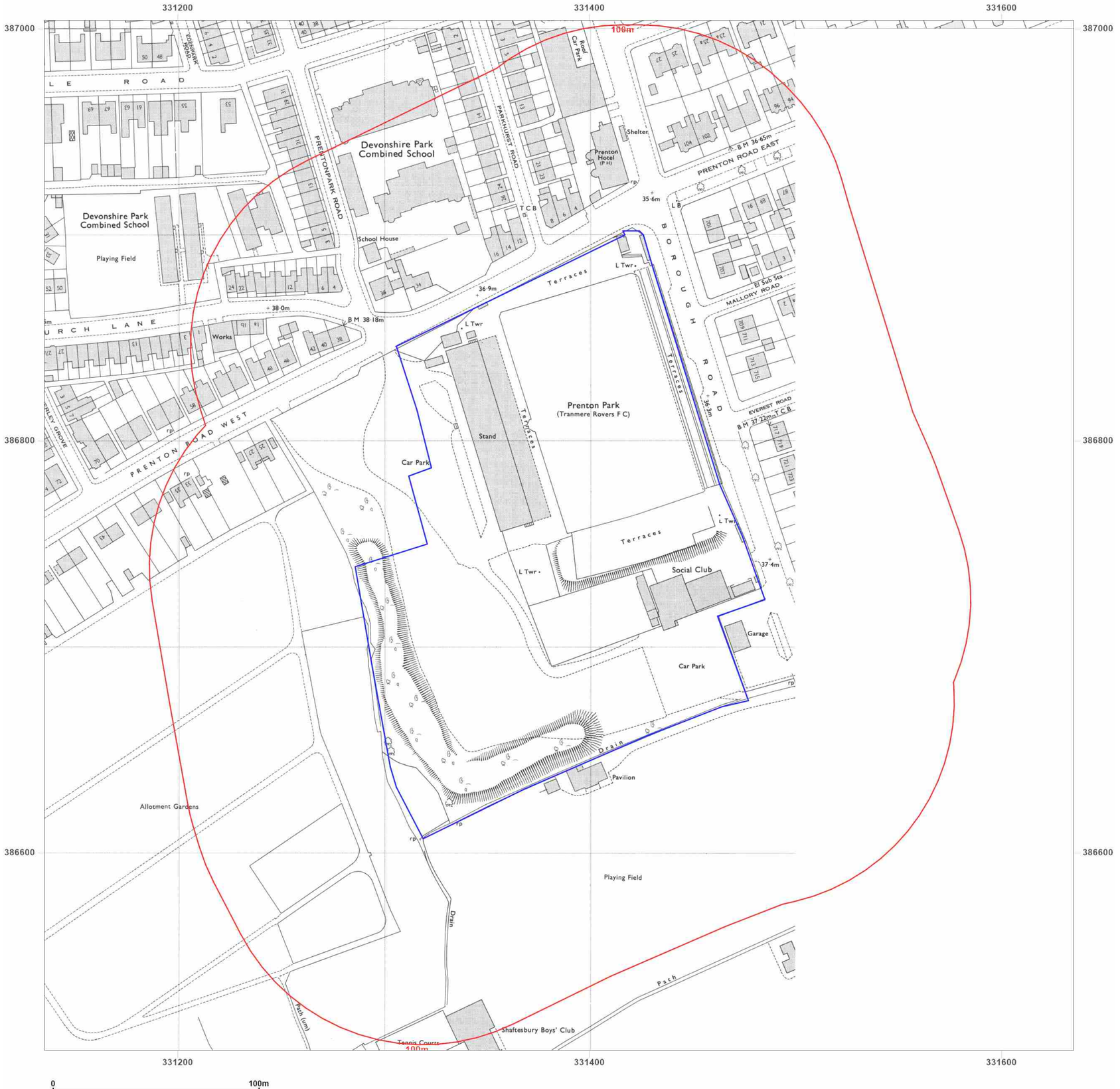
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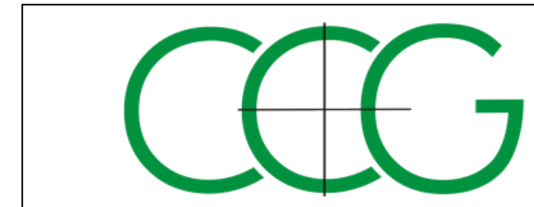
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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

Map date: **1970-1974**

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1954
Revised 1970
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1954
Revised 1969
Edition N/A
Copyright 1970
Levelled 1966

Surveyed 1954
Revised 1973
Edition N/A
Copyright 1974
Levelled 1966

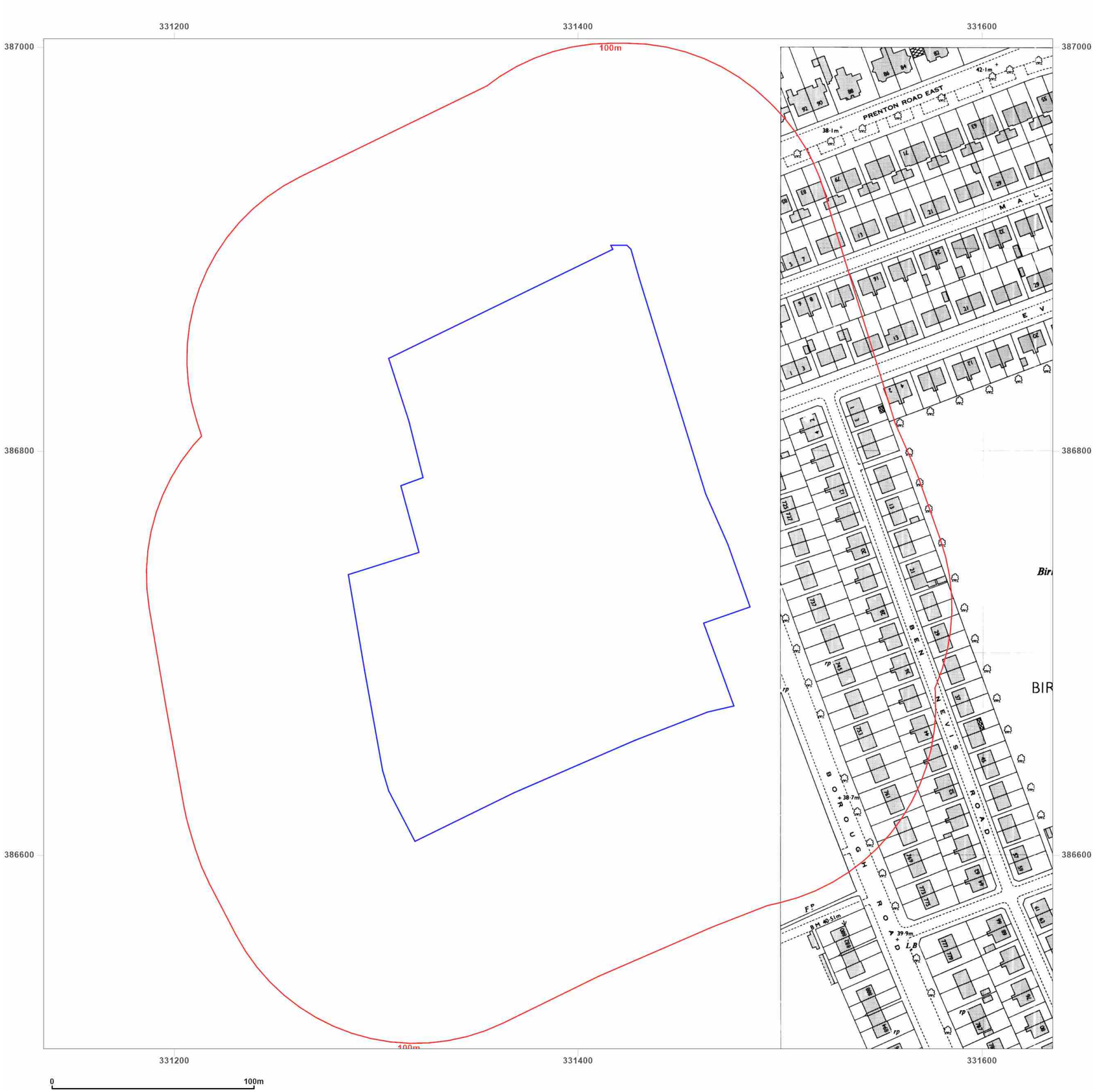
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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

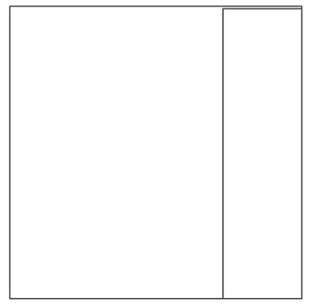
Map Name: National Grid

Map date: **1977**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

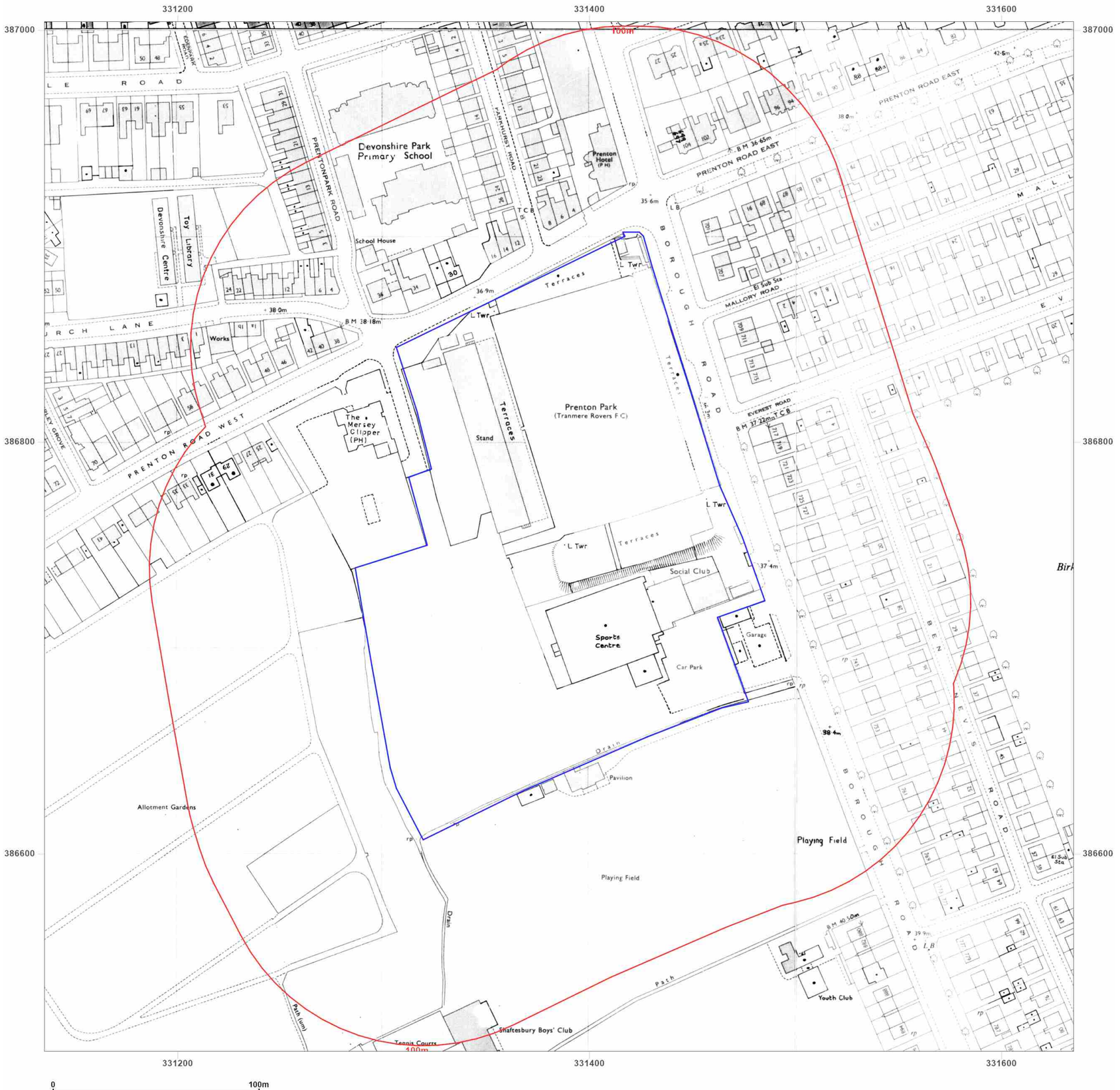
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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

Map date: **1987-1989**

Scale: 1:1,250

Printed at: 1:2,000

N
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Surveyed 1966
Revised 1989
Edition N/A
Copyright 1989
Levelled 1966

Surveyed 1966
Revised 1987
Edition N/A
Copyright 1987
Levelled 1966

Surveyed 1966
Revised 1989
Edition N/A
Copyright 1989
Levelled 1966

Surveyed 1966
Revised 1989
Edition N/A
Copyright 1989
Levelled 1966

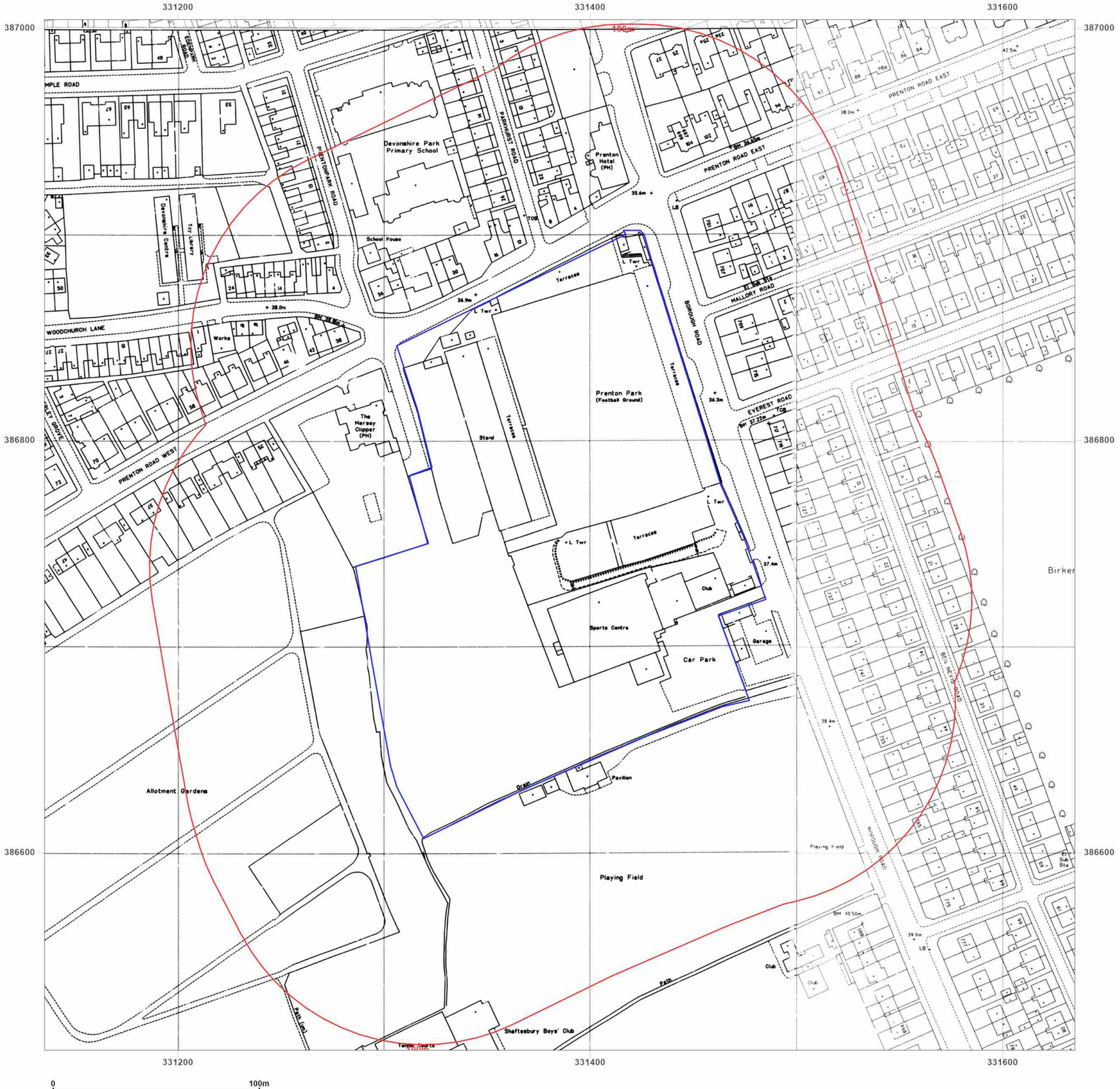
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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

Map date: **1989-1994**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1966 Revised 1989 Edition N/A Copyright 1989 Levelled 1966		Surveyed N/A Revised N/A Edition N/A Copyright 1993 Levelled N/A
Surveyed N/A Revised N/A Edition N/A Copyright 1993 Levelled N/A		Surveyed N/A Revised N/A Edition N/A Copyright 1994 Levelled N/A

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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

Map date: **1993-1995**

Scale: 1:1,250

Printed at: 1:2,000

N
W E
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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1995
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CCG

Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

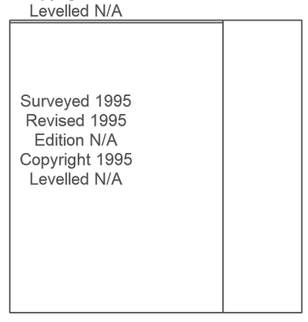
Map date: **1995**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1995
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CCG

Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: LandLine
Map date: **2003**
Scale: 1:1,250
Printed at: 1:1,250

N
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2003

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Groundsure
LOCATION INTELLIGENCE

Enviro+Geo
Insight

Tranmere Rovers F C, Prenton Park Stadium Prenton Road West, Birkenhead, Prenton, CH42 9PY

Order Details

Date: 09/09/2021

Your ref: 4165

Our Ref: CMAPS-AAG-989384-4165-090921EDRGEO

Client: CENTREMAPS

Site Details

Location: 331385 386754

Area: 3.71 ha

Authority: Wirral Council



Summary of findings p. 2

OS MasterMap site plan p.13

Aerial image p. 8

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Contact us with any questions at:
info@groundsure.com
08444 159 000

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
14	1.1	Historical industrial land uses	2	0	6	20	-
16	1.2	Historical tanks	1	0	0	6	-
16	1.3	Historical energy features	0	1	2	14	-
17	1.4	Historical petrol stations	0	0	0	0	-
17	1.5	Historical garages	3	0	3	4	-
18	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
19	2.1	Historical industrial land uses	2	0	6	28	-
21	2.2	Historical tanks	2	0	0	7	-
22	2.3	Historical energy features	0	5	6	31	-
23	2.4	Historical petrol stations	0	0	0	0	-
24	2.5	Historical garages	5	0	5	5	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
25	3.1	Active or recent landfill	0	0	0	0	-
25	3.2	Historical landfill (BGS records)	0	0	0	0	-
26	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
26	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
26	3.5	Historical waste sites	0	0	0	0	-
26	3.6	Licensed waste sites	0	0	0	0	-
26	3.7	Waste exemptions	0	0	0	1	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
28	4.1	Recent industrial land uses	1	1	7	-	-
29	4.2	Current or recent petrol stations	0	1	0	1	-
29	4.3	Electricity cables	0	10	5	10	-
32	4.4	Gas pipelines	0	0	0	0	-
32	4.5	Sites determined as Contaminated Land	0	0	0	0	-

32	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
32	4.7	Regulated explosive sites	0	0	0	0	-
32	4.8	Hazardous substance storage/usage	0	0	0	0	-
33	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
33	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
33	**4.11**	**Licensed pollutant release (Part A(2)/B)**	0	1	0	2	-
34	4.12	Radioactive Substance Authorisations	0	0	0	0	-
34	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
34	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
34	4.15	Pollutant release to public sewer	0	0	0	0	-
34	4.16	List 1 Dangerous Substances	0	0	0	0	-
35	4.17	List 2 Dangerous Substances	0	0	0	0	-
35	4.18	Pollution Incidents (EA/NRW)	0	0	0	0	-
35	4.19	Pollution inventory substances	0	0	0	0	-
35	4.20	Pollution inventory waste transfers	0	0	0	0	-
35	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
36	**5.1**	**Superficial aquifer**	Identified (within 500m)				
37	**5.2**	**Bedrock aquifer**	Identified (within 500m)				
38	**5.3**	**Groundwater vulnerability**	Identified (within 50m)				
39	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
39	5.5	Groundwater vulnerability- local information	None (within 0m)				
40	**5.6**	**Groundwater abstractions**	0	0	0	0	7
42	5.7	Surface water abstractions	0	0	0	0	0
43	**5.8**	**Potable abstractions**	0	0	0	0	5
44	**5.9**	**Source Protection Zones**	1	0	0	0	-
44	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
45	**6.1**	**Water Network (OS MasterMap)**	1	0	0	-	-

46	**6.2**	**Surface water features**	1	0	0	-	-
46	**6.3**	**WFD Surface water body catchments**	1	-	-	-	-
46	6.4	WFD Surface water bodies	0	0	0	-	-
47	**6.5**	**WFD Groundwater bodies**	2	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
48	7.1	Risk of Flooding from Rivers and Sea (RoFRaS)	None (within 50m)				
48	7.2	Historical Flood Events	0	0	0	-	-
48	7.3	Flood Defences	0	0	0	-	-
48	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
49	7.5	Flood Storage Areas	0	0	0	-	-
50	7.6	Flood Zone 2	None (within 50m)				
50	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
51	**8.1**	**Surface water flooding**	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding					
53	**9.1**	**Groundwater flooding**	Low (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
54	**10.1**	**Sites of Special Scientific Interest (SSSI)**	0	0	0	0	1
55	**10.2**	**Conserved wetland sites (Ramsar sites)**	0	0	0	0	1
55	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
55	**10.4**	**Special Protection Areas (SPA)**	0	0	0	0	3
56	10.5	National Nature Reserves (NNR)	0	0	0	0	0
56	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
56	10.7	Designated Ancient Woodland	0	0	0	0	0
57	10.8	Biosphere Reserves	0	0	0	0	0
57	10.9	Forest Parks	0	0	0	0	0
57	10.10	Marine Conservation Zones	0	0	0	0	0
57	**10.11**	**Green Belt**	0	0	0	0	1
58	10.12	Proposed Ramsar sites	0	0	0	0	0

58	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
58	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
58	10.15	Nitrate Sensitive Areas	0	0	0	0	0
59	**10.16**	**Nitrate Vulnerable Zones**	0	0	0	0	1
60	**10.17**	**SSSI Impact Risk Zones**	2	-	-	-	-
62	**10.18**	**SSSI Units**	0	0	0	0	1
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
63	11.1	World Heritage Sites	0	0	0	-	-
63	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
63	11.3	National Parks	0	0	0	-	-
63	11.4	Listed Buildings	0	0	0	-	-
64	11.5	Conservation Areas	0	0	0	-	-
64	11.6	Scheduled Ancient Monuments	0	0	0	-	-
64	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
65	**12.1**	**Agricultural Land Classification**	Urban (within 250m)				
66	12.2	Open Access Land	0	0	0	-	-
66	12.3	Tree Felling Licences	0	0	0	-	-
66	12.4	Environmental Stewardship Schemes	0	0	0	-	-
66	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
67	13.1	Priority Habitat Inventory	0	0	0	-	-
67	13.2	Habitat Networks	0	0	0	-	-
67	13.3	Open Mosaic Habitat	0	0	0	-	-
67	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
68	**14.1**	**10k Availability**	Identified (within 500m)				
69	**14.2**	**Artificial and made ground (10k)**	0	0	0	1	-
70	**14.3**	**Superficial geology (10k)**	1	0	0	0	-

71	14.4	Landslip (10k)	0	0	0	0	-
72	14.5	Bedrock geology (10k)	1	0	1	3	-
73	14.6	Bedrock faults and other linear features (10k)	0	0	1	2	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
74	15.1	50k Availability	Identified (within 500m)				
75	15.2	Artificial and made ground (50k)	0	0	0	0	-
75	15.3	Artificial ground permeability (50k)	0	0	-	-	-
76	15.4	Superficial geology (50k)	1	0	0	0	-
77	15.5	Superficial permeability (50k)	Identified (within 50m)				
77	15.6	Landslip (50k)	0	0	0	0	-
77	15.7	Landslip permeability (50k)	None (within 50m)				
78	15.8	Bedrock geology (50k)	1	0	1	3	-
79	15.9	Bedrock permeability (50k)	Identified (within 50m)				
79	15.10	Bedrock faults and other linear features (50k)	0	0	1	2	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
80	16.1	BGS Boreholes	9	2	0	-	-
Page	Section	Natural ground subsidence					
82	17.1	Shrink swell clays	Very low (within 50m)				
83	17.2	Running sands	Very low (within 50m)				
84	17.3	Compressible deposits	Negligible (within 50m)				
85	17.4	Collapsible deposits	Very low (within 50m)				
86	17.5	Landslides	Very low (within 50m)				
87	17.6	Ground dissolution of soluble rocks	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
88	18.1	Natural cavities	0	0	0	0	-
89	18.2	BritPits	0	0	0	0	-
89	18.3	Surface ground workings	2	0	10	-	-
90	18.4	Underground workings	0	0	0	0	0
90	18.5	Historical Mineral Planning Areas	0	0	0	0	-

90	18.6	Non-coal mining	0	0	0	0	0
90	18.7	Mining cavities	0	0	0	0	0
90	18.8	JPB mining areas	None (within 0m)				
91	18.9	Coal mining	None (within 0m)				
91	18.10	Brine areas	None (within 0m)				
91	18.11	Gypsum areas	None (within 0m)				
91	18.12	Tin mining	None (within 0m)				
91	18.13	Clay mining	None (within 0m)				

Page	Section	Radon	
92	**19.1**	**Radon**	Less than 1% (within 0m)

Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
93	**20.1**	**BGS Estimated Background Soil Chemistry**	1	1	-	-	-
93	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
93	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-

Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
94	21.1	Underground railways (London)	0	0	0	-	-
94	21.2	Underground railways (Non-London)	0	0	0	-	-
95	21.3	Railway tunnels	0	0	0	-	-
95	**21.4**	**Historical railway and tunnel features**	1	0	0	-	-
95	21.5	Royal Mail tunnels	0	0	0	-	-
95	21.6	Historical railways	0	0	0	-	-
96	21.7	Railways	0	0	0	-	-
96	21.8	Crossrail 1	0	0	0	0	-
96	21.9	Crossrail 2	0	0	0	0	-
96	21.10	HS2	0	0	0	0	-

Recent aerial photograph



Capture Date: 22/04/2019

Site Area: 3.71ha

Recent site history - 2016 aerial photograph



Capture Date: 21/04/2016

Site Area: 3.71ha

Recent site history - 2009 aerial photograph



Capture Date: 24/06/2009

Site Area: 3.71ha

Recent site history - 2005 aerial photograph



Capture Date: 15/05/2005

Site Area: 3.71ha

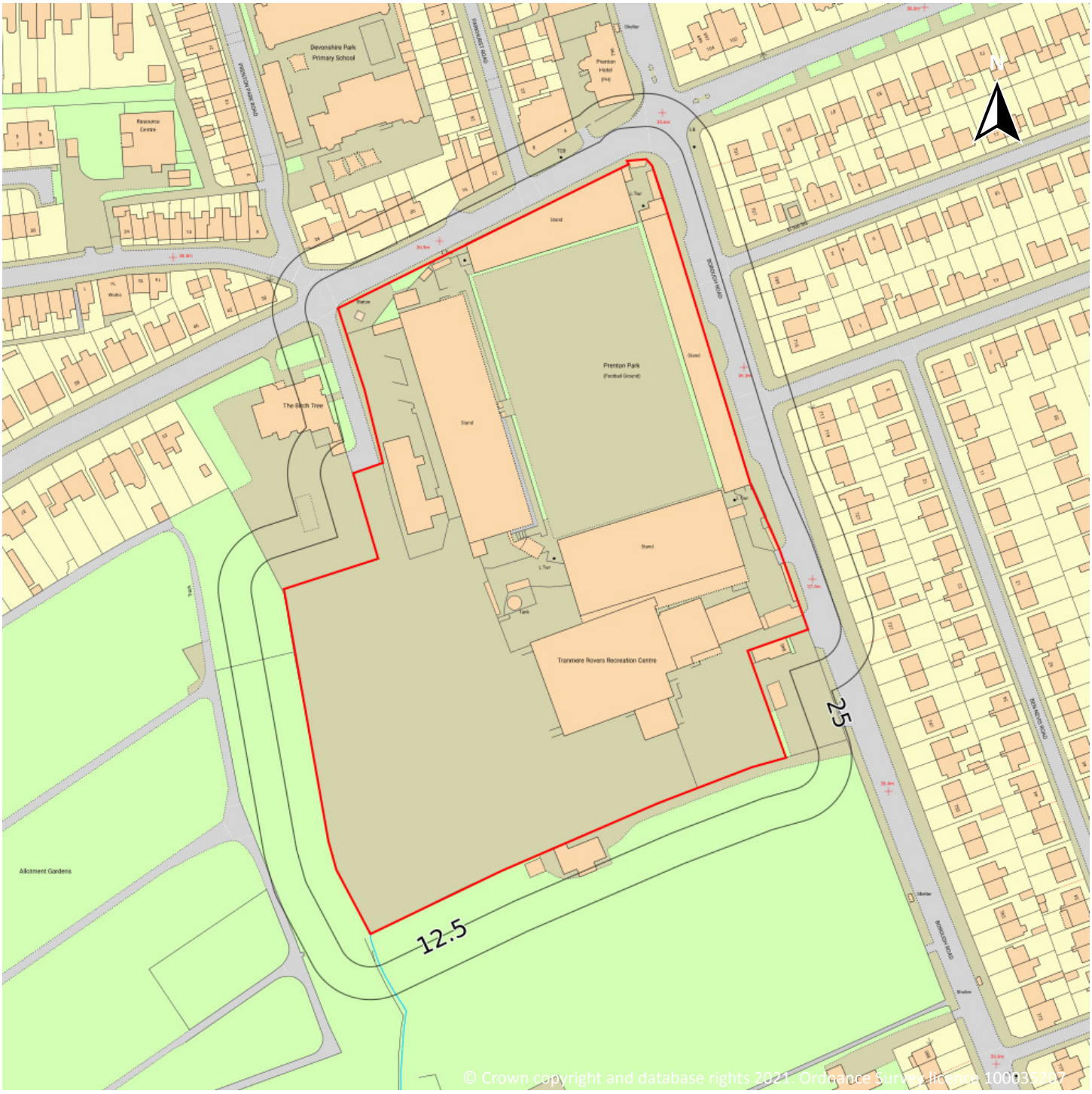
Recent site history - 2000 aerial photograph



Capture Date: 22/07/2000

Site Area: 3.71ha

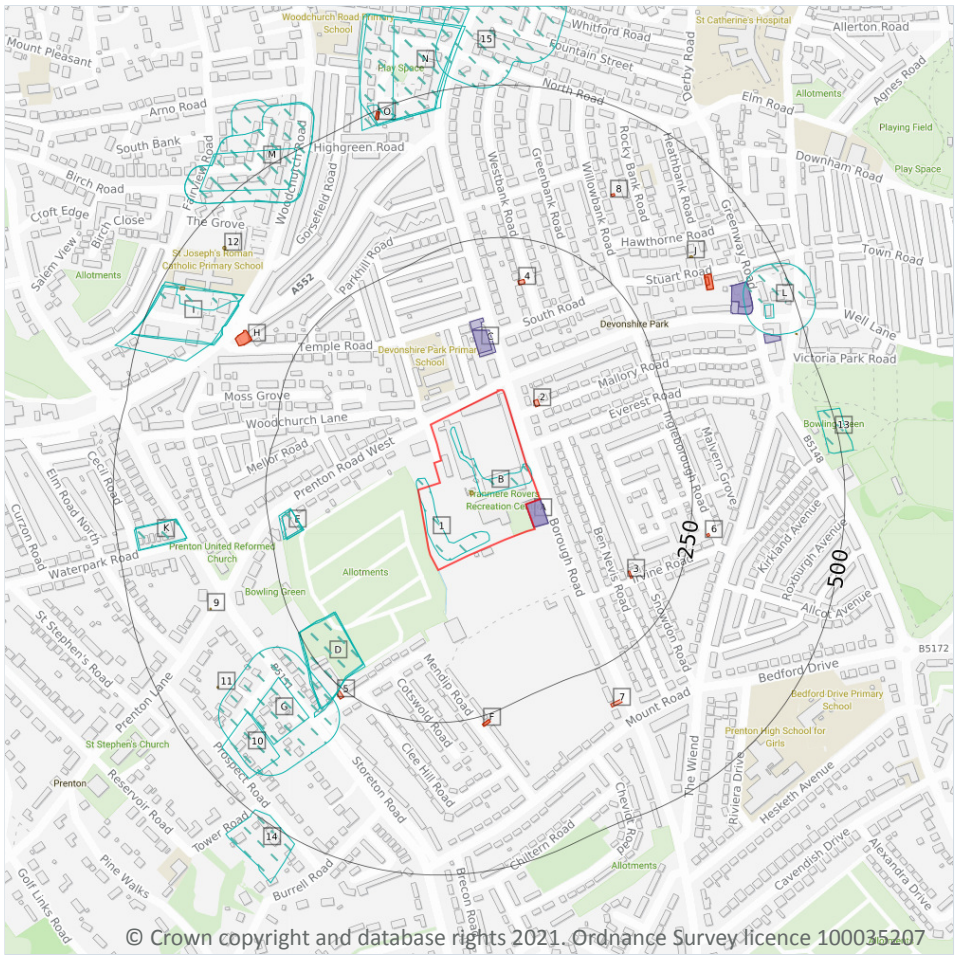
OS MasterMap site plan



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Site Area: 3.71ha

1 Past land use



1.1 Historical industrial land uses

Records within 500m	28

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
1	**On site**	**Unspecified Heap**	**1966**	**803201**

ID	Location	Land use	Dates present	Group ID
B	**On site**	**Unspecified Ground Workings**	**1925**	**799714**
D	181m SW	Nursery	1936	851950
D	181m SW	Nursery	1949	854023
D	183m SW	Nursery	1938	898610
E	196m W	Telephone Exchange	1978	857078
E	196m W	Telephone Exchange	1991	914286
E	198m W	Telephone Exchange	1956	891722
G	267m SW	Nursery	1909	913897
G	315m SW	Nursery	1925	933668
I	370m NW	Nursery	1925 - 1938	930673
I	371m NW	Nursery	1949	846913
I	373m NW	Nursery	1956 - 1966	968583
K	387m W	Nursery	1925	971309
K	387m W	Nursery	1909 - 1925	845468
10	389m SW	Nursery	1898	871327
L	418m E	Smithy	1906	963497
M	429m NW	Nursery	1956 - 1966	969379
M	431m NW	Nursery	1949	931626
L	446m E	Smithy	1899	966087
M	451m NW	Nursery	1899 - 1938	916251
N	471m N	Water Works	1906	916807
N	471m N	Brick Field	1899	817870
N	473m N	Water Works	1909	975746
O	477m N	Unspecified Pit	1899	839438
13	477m E	Unspecified Heaps	1909	831249
14	488m SW	Nursery	1898	831778
15	496m N	Water Works	1899	956131

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	7

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
B	**On site**	**Unspecified Tank**	**1995**	**148827**
9	369m W	Unspecified Tank	1927	112266
J	376m NE	Tank or Trough	1878	121155
11	408m SW	Unspecified Tank	1927	112267
12	442m NW	Unspecified Tank	1927 - 1936	136778
I	460m NW	Unspecified Tank	1878	112669
L	485m E	Tank or Trough	1878	121154

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	17

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
2	42m E	Electricity Substation	1974 - 1995	78089
3	168m SE	Electricity Substation	1989	60673
4	174m N	Electricity Substation	1970 - 1995	66297
5	255m SW	Electricity Substation	1975 - 1989	81113

ID	Location	Land use	Dates present	Group ID
F	259m S	Electricity Substation	1989	69216
F	259m S	Electricity Substation	1975	74319
6	279m E	Electricity Substation	1989	60671
7	312m SE	Electricity Substation	1971	60672
H	325m NW	Electricity Substation	1993 - 1995	74916
H	325m NW	Electricity Substation	1974 - 1979	77246
H	325m NW	Electricity Substation	1954 - 1995	81425
8	365m NE	Electricity Substation	1970 - 1987	69775
J	372m NE	Electricity Substation	1954	78409
J	374m NE	Electricity Substation	1987	66674
J	375m NE	Electricity Substation	1954 - 1970	72701
O	485m NW	Electricity Substation	1970 - 1989	74425
O	485m NW	Electricity Substation	1995	68932

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m	0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m	10

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Garage**	**1989**	**20817**
A	**On site**	**Garage**	**1974**	**21491**
A	**On site**	**Garage**	**1993 - 1995**	**26271**
C	61m N	Garage	1954	23986
C	67m N	Garage	1954 - 1963	25225
C	108m N	Garage	1954	26395
L	394m E	Garage	1954 - 1987	27722
L	401m E	Garage	1970	21517
L	402m E	Garage	1954	20761
L	433m E	Garage	1989	20100

This data is sourced from Ordnance Survey / Groundsure.

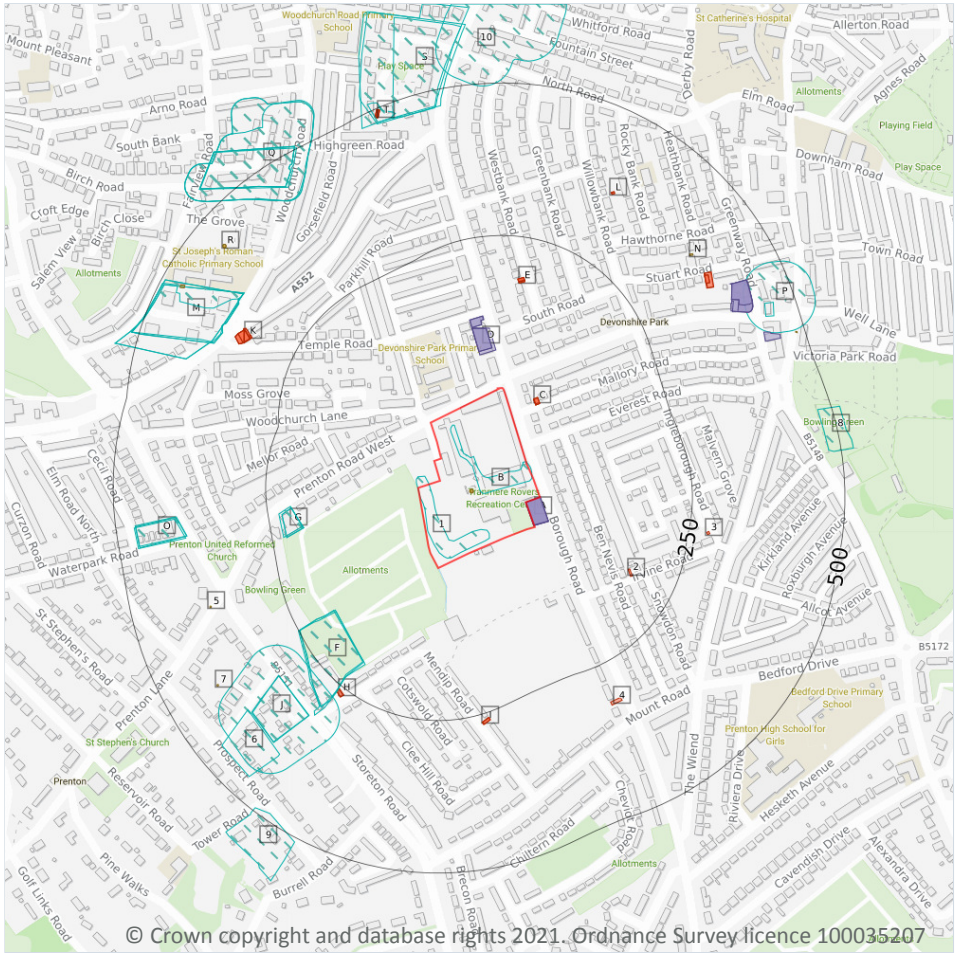
1.6 Historical military land

Records within 500m	**0**

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.

2 Past land use - un-grouped



2.1 Historical industrial land uses

Records within 500m	36

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19**

ID	Location	Land Use	Date	Group ID
1	**On site**	**Unspecified Heap**	**1966**	**803201**
B	**On site**	**Unspecified Ground Workings**	**1925**	**799714**
F	181m SW	Nursery	1936	851950

ID	Location	Land Use	Date	Group ID
F	181m SW	Nursery	1949	854023
F	183m SW	Nursery	1938	898610
G	196m W	Telephone Exchange	1991	914286
G	196m W	Telephone Exchange	1978	857078
G	198m W	Telephone Exchange	1956	891722
J	267m SW	Nursery	1909	913897
J	315m SW	Nursery	1925	933668
J	315m SW	Nursery	1925	933668
M	370m NW	Nursery	1938	930673
M	370m NW	Nursery	1925	930673
M	371m NW	Nursery	1949	846913
M	373m NW	Nursery	1966	968583
M	373m NW	Nursery	1956	968583
O	387m W	Nursery	1925	971309
O	387m W	Nursery	1925	845468
6	389m SW	Nursery	1898	871327
O	390m W	Nursery	1909	845468
P	418m E	Smithy	1906	963497
Q	429m NW	Nursery	1966	969379
Q	429m NW	Nursery	1956	969379
Q	431m NW	Nursery	1949	931626
P	446m E	Smithy	1899	966087
Q	451m NW	Nursery	1899	916251
Q	454m NW	Nursery	1938	916251
Q	454m NW	Nursery	1925	916251
Q	454m NW	Nursery	1909	916251
S	471m N	Water Works	1906	916807
S	471m N	Brick Field	1899	817870

ID	Location	Land Use	Date	Group ID
S	473m N	Water Works	1909	975746
T	477m N	Unspecified Pit	1899	839438
8	477m E	Unspecified Heaps	1909	831249
9	488m SW	Nursery	1898	831778
10	496m N	Water Works	1899	956131

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m **9**

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19**

ID	Location	Land Use	Date	Group ID
B	**On site**	**Unspecified Tank**	**1995**	**148827**
B	**On site**	**Unspecified Tank**	**1995**	**148827**
5	369m W	Unspecified Tank	1927	112266
N	376m NE	Tank or Trough	1878	121155
7	408m SW	Unspecified Tank	1927	112267
R	442m NW	Unspecified Tank	1927	136778
R	442m NW	Unspecified Tank	1936	136778
M	460m NW	Unspecified Tank	1878	112669
P	485m E	Tank or Trough	1878	121154

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	42

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19**

ID	Location	Land Use	Date	Group ID
C	42m E	Electricity Substation	1989	78089
C	42m E	Electricity Substation	1995	78089
C	42m E	Electricity Substation	1993	78089
C	42m E	Electricity Substation	1995	78089
C	43m E	Electricity Substation	1974	78089
2	168m SE	Electricity Substation	1989	60673
E	174m N	Electricity Substation	1995	66297
E	174m N	Electricity Substation	1995	66297
E	176m N	Electricity Substation	1970	66297
E	176m N	Electricity Substation	1989	66297
E	176m N	Electricity Substation	1989	66297
H	255m SW	Electricity Substation	1975	81113
H	256m SW	Electricity Substation	1989	81113
I	259m S	Electricity Substation	1989	69216
I	259m S	Electricity Substation	1989	69216
I	259m S	Electricity Substation	1975	74319
3	279m E	Electricity Substation	1989	60671
4	312m SE	Electricity Substation	1971	60672
K	325m NW	Electricity Substation	1954	81425
K	325m NW	Electricity Substation	1974	77246
K	325m NW	Electricity Substation	1993	74916
K	325m NW	Electricity Substation	1995	74916
K	326m NW	Electricity Substation	1954	81425

ID	Location	Land Use	Date	Group ID
K	327m NW	Electricity Substation	1995	81425
K	327m NW	Electricity Substation	1989	81425
K	333m NW	Electricity Substation	1979	77246
K	333m NW	Electricity Substation	1989	81425
K	333m NW	Electricity Substation	1989	81425
K	333m NW	Electricity Substation	1991	81425
K	333m NW	Electricity Substation	1954	81425
K	333m NW	Electricity Substation	1954	81425
L	365m NE	Electricity Substation	1970	69775
L	366m NE	Electricity Substation	1987	69775
N	372m NE	Electricity Substation	1954	78409
N	374m NE	Electricity Substation	1987	66674
N	375m NE	Electricity Substation	1954	72701
N	375m NE	Electricity Substation	1970	72701
T	485m NW	Electricity Substation	1970	74425
T	485m NW	Electricity Substation	1995	68932
T	485m NW	Electricity Substation	1989	74425
T	485m NW	Electricity Substation	1989	74425
T	485m NW	Electricity Substation	1995	68932

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m	0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m	15

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19**

ID	Location	Land Use	Date	Group ID
A	**On site**	**Garage**	**1989**	**20817**
A	**On site**	**Garage**	**1993**	**26271**
A	**On site**	**Garage**	**1995**	**26271**
A	**On site**	**Garage**	**1995**	**26271**
A	**On site**	**Garage**	**1974**	**21491**
D	61m N	Garage	1954	23986
D	67m N	Garage	1963	25225
D	67m N	Garage	1954	25225
D	108m N	Garage	1954	26395
D	108m N	Garage	1954	26395
P	394m E	Garage	1987	27722
P	396m E	Garage	1954	27722
P	401m E	Garage	1970	21517
P	402m E	Garage	1954	20761
P	433m E	Garage	1989	20100

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



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3.1 Active or recent landfill

Records within 500m	0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m	0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	0

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m	0

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m	0

Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m	0

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m	1

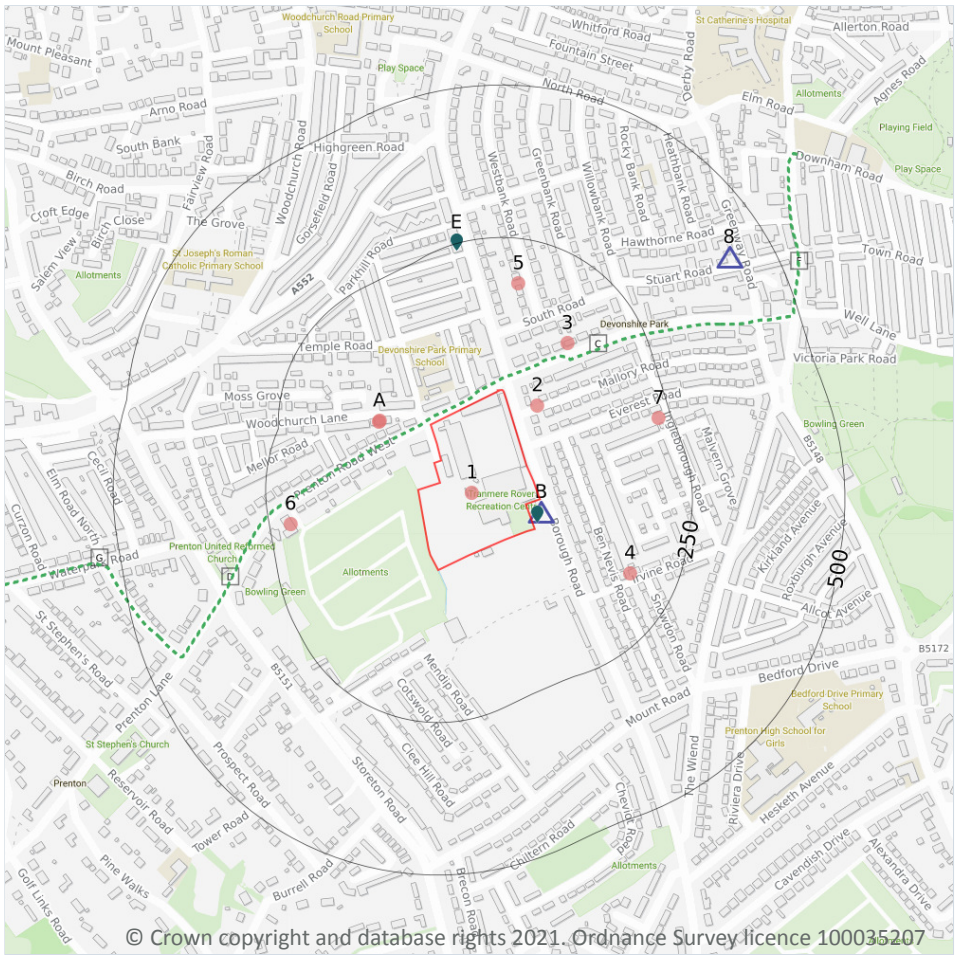
Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on **page 25**

ID	Location	Site	Reference	Category	Sub-Category	Description
1	300m W	-	WEX261679	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal

This data is sourced from the Environment Agency and Natural Resources Wales.

4 Current industrial land use



4.1 Recent industrial land uses

Records within 250m	9

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 28**

ID	Location	Company	Address	Activity	Category
1	**On site**	**Tank**	**Merseyside, CH42**	**Tanks (Generic)**	**Industrial Features**
2	46m E	Electricity Sub Station	Merseyside, CH42	Electrical Features	Infrastructure and Facilities
A	84m W	Fabweld Fire Escapes	1c, Woodchurch Lane, Birkenhead, Merseyside, CH42 9PJ	Access Equipment	Industrial Products

ID	Location	Company	Address	Activity	Category
A	85m W	Works	Merseyside, CH42	Unspecified Works Or Factories	Industrial Features
3	131m NE	The Rubbish Remover	88, Prenton Road East, Birkenhead, Merseyside, CH42 7LH	Waste Storage, Processing and Disposal	Infrastructure and Facilities
4	172m SE	Electricity Sub Station	Merseyside, CH42	Electrical Features	Infrastructure and Facilities
5	177m N	Electricity Sub Station	Merseyside, CH42	Electrical Features	Infrastructure and Facilities
6	216m W	Telephone Exchange	Merseyside, CH42	Telecommunications Features	Infrastructure and Facilities
7	229m NE	Electricity Sub Station	Merseyside, CH42	Electrical Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	**2**

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on **page 28**

ID	Location	Company	Address	LPG	Status
B	19m E	OBSOLETE	840, Borough Road, Birkenhead, Merseyside, CH42 6QW	Not Applicable	Obsolete
8	430m NE	OBSOLETE	Greenway Road, Prenton East, Birkenhead, Merseyside, CH42 0NE	Not Applicable	Obsolete

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	**25**

High voltage underground electricity transmission cables.

Features are displayed on the Current industrial land use map on **page 28**

ID	Location	Cable Set	Cable Route	Details	
A	8m NW	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
A	8m NW	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
A	9m NW	BIRK2 - LISD2 1 CABLE SECTION 07	BIRKENHEAD - LISTER DRIVE	Cable Make: PIRELI 275KV O Cable Type: A/C Operating Voltage (kV): 275	Year of installation: 1993 Cable in tunnel? No
A	9m NW	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
A	10m NW	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
C	12m NW	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
C	13m NW	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
C	13m NW	BIRK2 - LISD2 1 CABLE SECTION 08	BIRKENHEAD - LISTER DRIVE	Cable Make: PIRELI 275KV O Cable Type: A/C Operating Voltage (kV): 275	Year of installation: 1993 Cable in tunnel? No
C	14m NW	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
C	14m NW	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
D	188m W	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
D	188m W	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
D	188m W	BIRK2 - LISD2 1 CABLE SECTION 06	BIRKENHEAD - LISTER DRIVE	Cable Make: PIRELI 275KV O Cable Type: A/C Operating Voltage (kV): 275	Year of installation: 1993 Cable in tunnel? No

ID	Location	Cable Set	Cable Route	Details	
D	189m W	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
D	189m W	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
F	371m E	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
F	371m E	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
F	371m E	BIRK2 - LISD2 1 CABLE SECTION 09	BIRKENHEAD - LISTER DRIVE	Cable Make: PIRELI 275KV O Cable Type: A/C Operating Voltage (kV): 275	Year of installation: 1993 Cable in tunnel? No
F	371m E	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
F	371m E	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
G	462m W	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
G	463m W	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
G	463m W	BIRK2 - LISD2 1 CABLE SECTION 05	BIRKENHEAD - LISTER DRIVE	Cable Make: PIRELI 275KV O Cable Type: A/C Operating Voltage (kV): 275	Year of installation: 1993 Cable in tunnel? No
G	464m W	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified
G	464m W	-	-	Cable Make: - Cable Type: PILOT Operating Voltage (kV): -	Year of installation: Not specified Cable in tunnel? Not specified

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m	0

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m	0

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m	0

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m	0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m	0

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m	0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m	0

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m	3

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on **page 28**

ID	Location	Address	Details	
B	11m E	Shell Prenton, Borough Rd, Prenton, Wirral, CH44 2AQ	Process: Petrol Vapour Recovery Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
E	251m N	Cleanerama, 752 Borough Road, Prenton, CH42 8PG	Process: Dry Cleaning Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
E	251m N	Personal Pride, 752 Borough Road, Prenton, Wirral, Merseyside, CH42 9JF	Process: Dry Cleaning Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	0

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m	0

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m	0

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m	0

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m	0

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m	0

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m	0

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m	0

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m	0

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

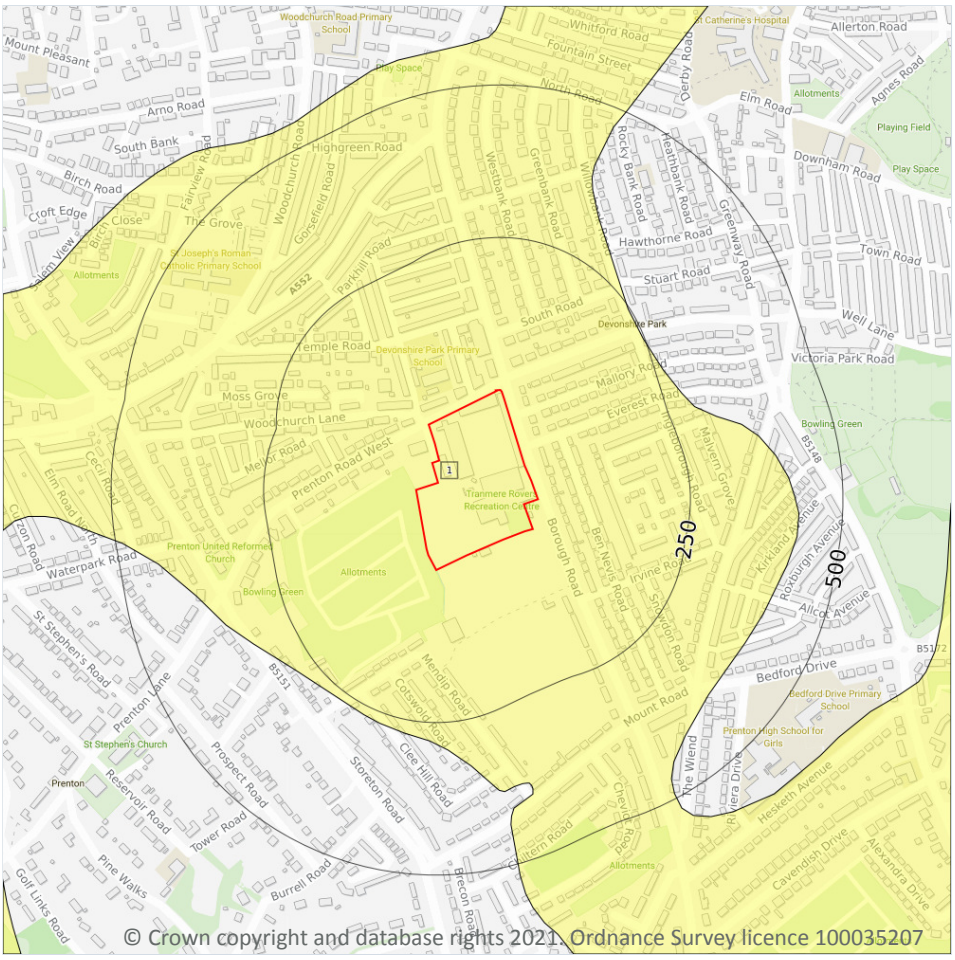
4.21 Pollution inventory radioactive waste

Records within 500m	0

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

5 Hydrogeology - Superficial aquifer



5.1 Superficial aquifer

Records within 500m	1

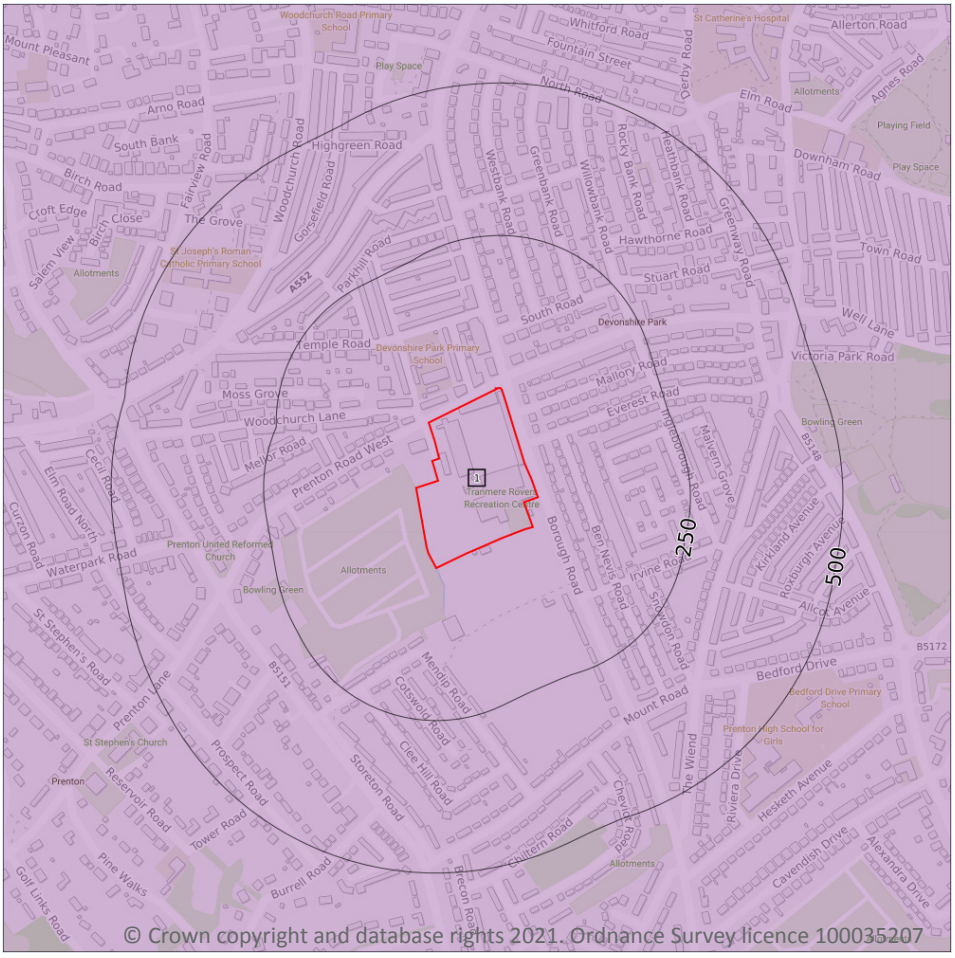
Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 36**

ID	Location	Designation	Description
1	**On site**	**Secondary Undifferentiated**	**Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type**

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Bedrock aquifer



5.2 Bedrock aquifer

Records within 500m	1

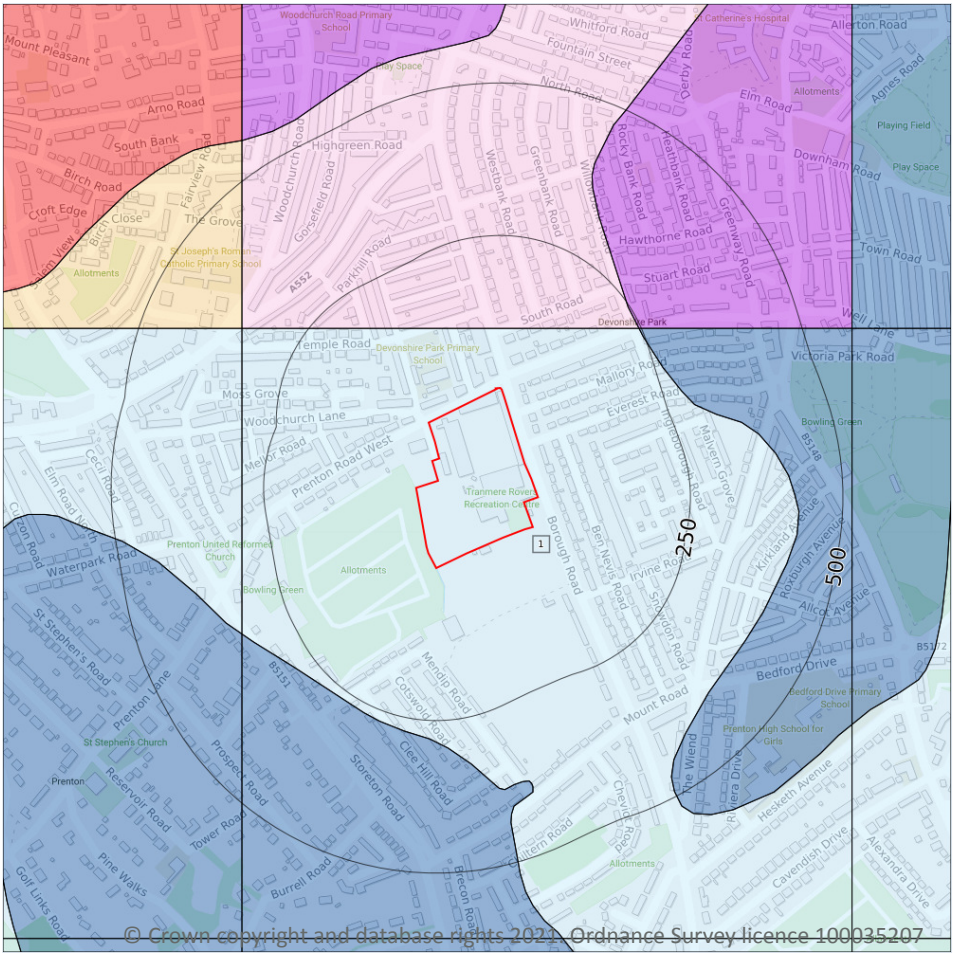
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 37**

ID	Location	Designation	Description
1	**On site**	**Principal**	**Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers**

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m	1

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 38**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	**On site**	**Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer**	**Leaching class: Low Infiltration value: <40% Dilution value: 300-550mm/year**	**Vulnerability: Low Aquifer type: Secondary Thickness: 3-10m Patchiness value: <90% Recharge potential: Low**	**Vulnerability: Low Aquifer type: Principal Flow mechanism: Mixed**

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site	**0**

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

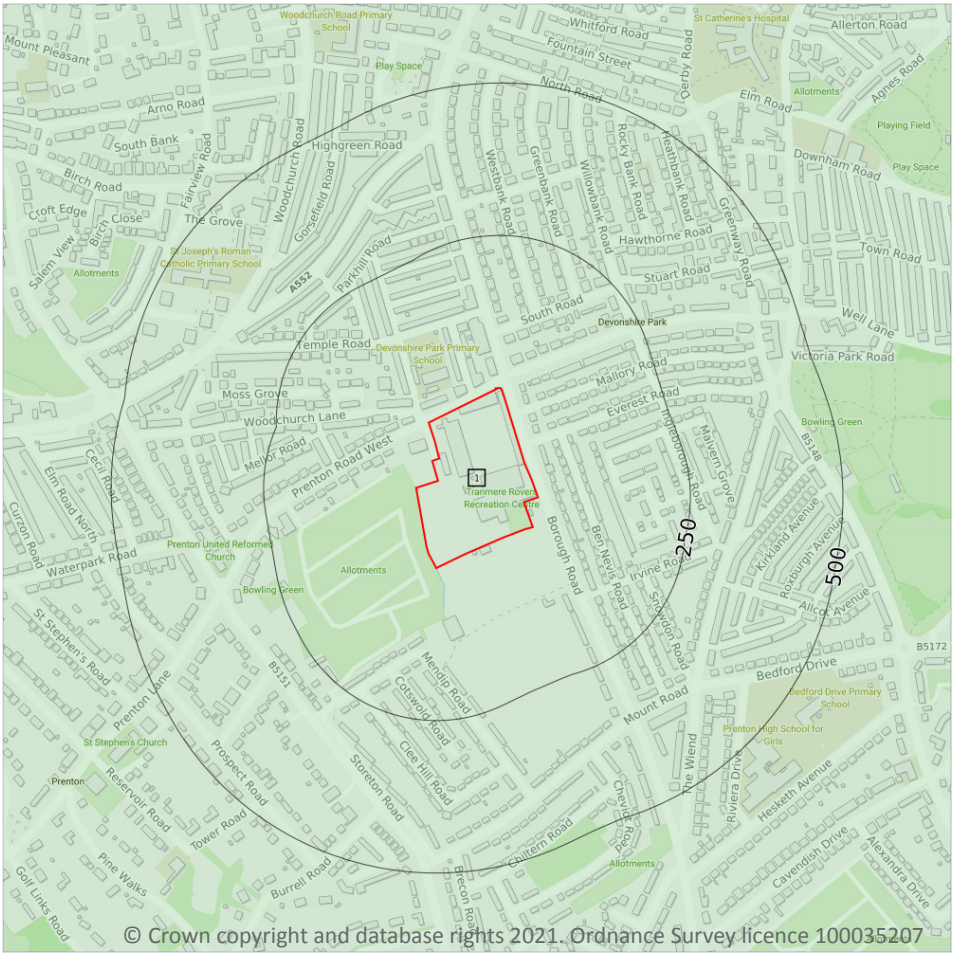
5.5 Groundwater vulnerability- local information

Records on site	**0**

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

This data is sourced from the British Geological Survey and the Environment Agency.

Abstractions and Source Protection Zones



5.6 Groundwater abstractions

Records within 2000m	7

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 40**

ID	Location	Details	
-	1268m N	Status: Historical Licence No: 2568008021 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: "WELL WITH BOREHOLE AT SPRINGHILL P S, BIRKENHEAD" Data Type: Point Name: UNITED UTILITIES WATER PLC Easting: 331000 Northing: 388100	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 14/06/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/09/1973 Version End Date: -
-	1268m N	Status: Active Licence No: 2568008021 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: WELL WITH BOREHOLE AT SPRINGHILL P S, BIRKENHEAD Data Type: Point Name: United Utilities Water Ltd Easting: 331000 Northing: 388100	Annual Volume (m^3): 1,426,248.40 Max Daily Volume (m^3): 6,819 Original Application No: - Original Start Date: 14/06/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/09/1973 Version End Date: -
-	1347m SW	Status: Historical Licence No: 2568008033 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PRENTON GOLF CLUB, PRENTON, BIRKENHEAD" Data Type: Point Name: PRENTON GOLF CLUB LTD Easting: 330350 Northing: 385670	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 24/10/1996 Expiry Date: - Issue No: 102 Version Start Date: 30/04/2002 Version End Date: -
-	1347m SW	Status: Active Licence No: 2568008033 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: BOREHOLE AT PRENTON GOLF CLUB, PRENTON, BIRKENHEAD Data Type: Point Name: PRENTON GOLF CLUB LTD Easting: 330350 Northing: 385670	Annual Volume (m^3): 14,000 Max Daily Volume (m^3): 70 Original Application No: - Original Start Date: 24/10/1996 Expiry Date: - Issue No: 102 Version Start Date: 01/04/2008 Version End Date: -

ID	Location	Details	
-	1736m W	Status: Historical Licence No: 2568008018 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: BOREHOLES (4) AT PRENTON P.S., BIRKENHEAD Data Type: Point Name: NORTH WEST WATER LTD Easting: 329600 Northing: 386300	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 07/03/1966 Expiry Date: - Issue No: 100 Version Start Date: 07/03/1966 Version End Date: -
-	1736m W	Status: Historical Licence No: 2568008018 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: "BOREHOLES (4) AT PRENTON P.S., BIRKENHEAD" Data Type: Point Name: UNITED UTILITIES WATER PLC Easting: 329600 Northing: 386300	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 07/03/1966 Expiry Date: - Issue No: 100 Version Start Date: 07/03/1966 Version End Date: -
-	1750m W	Status: Active Licence No: 2568008018 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: BOREHOLES (3) AT PRENTON, BIRKENHEAD Data Type: Point Name: United Utilities Water Ltd Easting: 329580 Northing: 386330	Annual Volume (m^3): 3,982,400 Max Daily Volume (m^3): 12,500 Original Application No: - Original Start Date: 07/03/1966 Expiry Date: - Issue No: 102 Version Start Date: 02/05/2014 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m	**0**

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m	5

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 40**

ID	Location	Details	
-	1268m N	Status: Historical Licence No: 2568008021 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: "WELL WITH BOREHOLE AT SPRINGHILL P S, BIRKENHEAD" Data Type: Point Name: UNITED UTILITIES WATER PLC Easting: 331000 Northing: 388100	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 14/06/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/09/1973 Version End Date: -
-	1268m N	Status: Active Licence No: 2568008021 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: WELL WITH BOREHOLE AT SPRINGHILL P S, BIRKENHEAD Data Type: Point Name: United Utilities Water Ltd Easting: 331000 Northing: 388100	Annual Volume (m^3): 1,426,248.40 Max Daily Volume (m^3): 6,819 Original Application No: - Original Start Date: 14/06/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/09/1973 Version End Date: -
-	1736m W	Status: Historical Licence No: 2568008018 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: BOREHOLES (4) AT PRENTON P.S., BIRKENHEAD Data Type: Point Name: NORTH WEST WATER LTD Easting: 329600 Northing: 386300	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 07/03/1966 Expiry Date: - Issue No: 100 Version Start Date: 07/03/1966 Version End Date: -

ID	Location	Details	
-	1736m W	Status: Historical Licence No: 2568008018 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: "BOREHOLES (4) AT PRENTON P.S., BIRKENHEAD" Data Type: Point Name: UNITED UTILITIES WATER PLC Easting: 329600 Northing: 386300	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 07/03/1966 Expiry Date: - Issue No: 100 Version Start Date: 07/03/1966 Version End Date: -
-	1750m W	Status: Active Licence No: 2568008018 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: BOREHOLES (3) AT PRENTON, BIRKENHEAD Data Type: Point Name: United Utilities Water Ltd Easting: 329580 Northing: 386330	Annual Volume (m^3): 3,982,400 Max Daily Volume (m^3): 12,500 Original Application No: - Original Start Date: 07/03/1966 Expiry Date: - Issue No: 102 Version Start Date: 02/05/2014 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m	**1**

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

Features are displayed on the Abstractions and Source Protection Zones map on **page 40**

ID	Location	Type	Description
1	**On site**	**3**	**Total catchment**

This data is sourced from the Environment Agency and Natural Resources Wales.

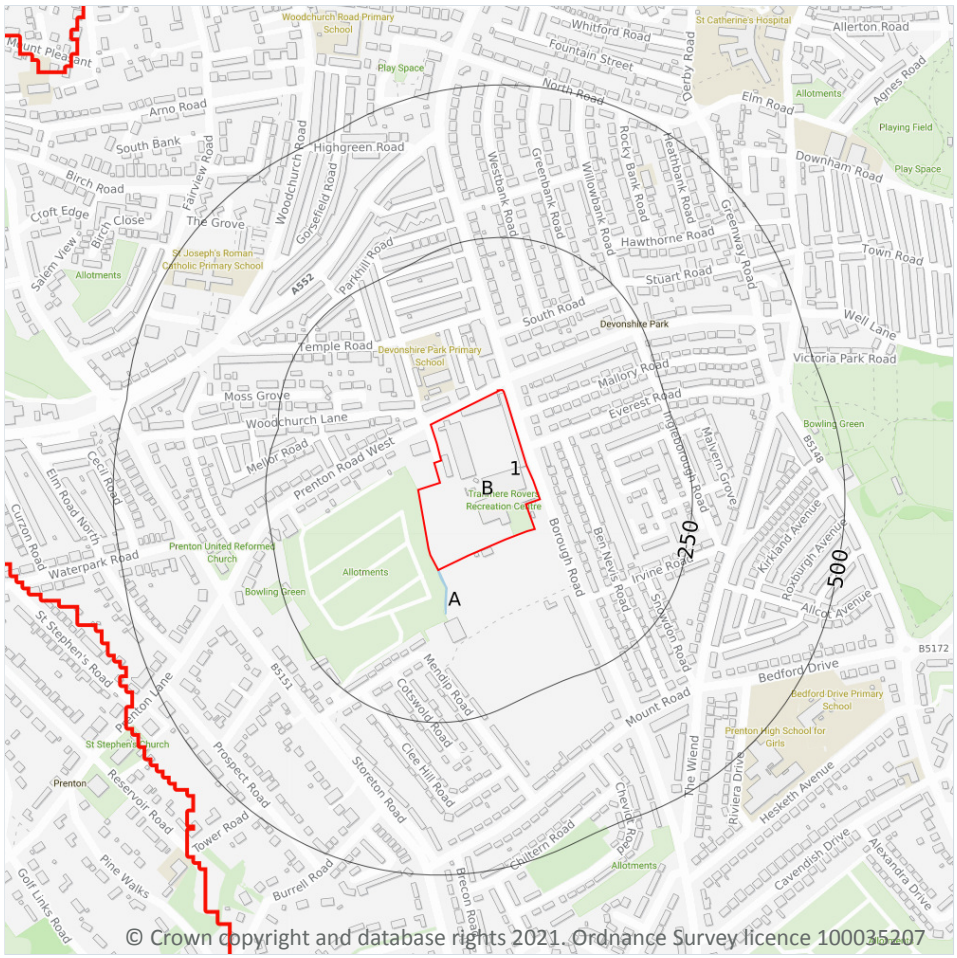
5.10 Source Protection Zones (confined aquifer)

Records within 500m	**0**

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.

6 Hydrology



Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

WFD River, canal and surface water transfer water bodies

WFD Lake water bodies

WFD Transitional and coastal water bodies

WFD Surface water body catchments boundaries

WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m	1

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 45**

ID	Location	Type of water feature	Ground level	Permanence	Name
A	**On site**	**Inland river not influenced by normal tidal action.**	**On ground surface**	**Watercourse contains water year round (in normal circumstances)**	**-**

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	1

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 45**

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 45**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	**On site**	**Coastal Catchment**	**Not part of a river WB catchment**	**171**	**Wirral**	**Lower Mersey**

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified	0

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site	2

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 45**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
B	**On site**	**Wirral and West Cheshire Permo-Triassic Sandstone Aquifers**	**GB41101G202600**	**Poor**	**Poor**	**Good**	**2015**
B	**On site**	**Wirral and West Cheshire Permo-Triassic Sandstone Aquifers**	**GB41101G202600**	**Poor**	**Poor**	**Good**	**2016**

This data is sourced from the Environment Agency and Natural Resources Wales.

7 River and coastal flooding

7.1 Risk of Flooding from Rivers and Sea (RoFRaS)

Records within 50m	0

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance).

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m	0

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m	0

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m	0

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m	0

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.

River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m	0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

This data is sourced from the Environment Agency and Natural Resources Wales.

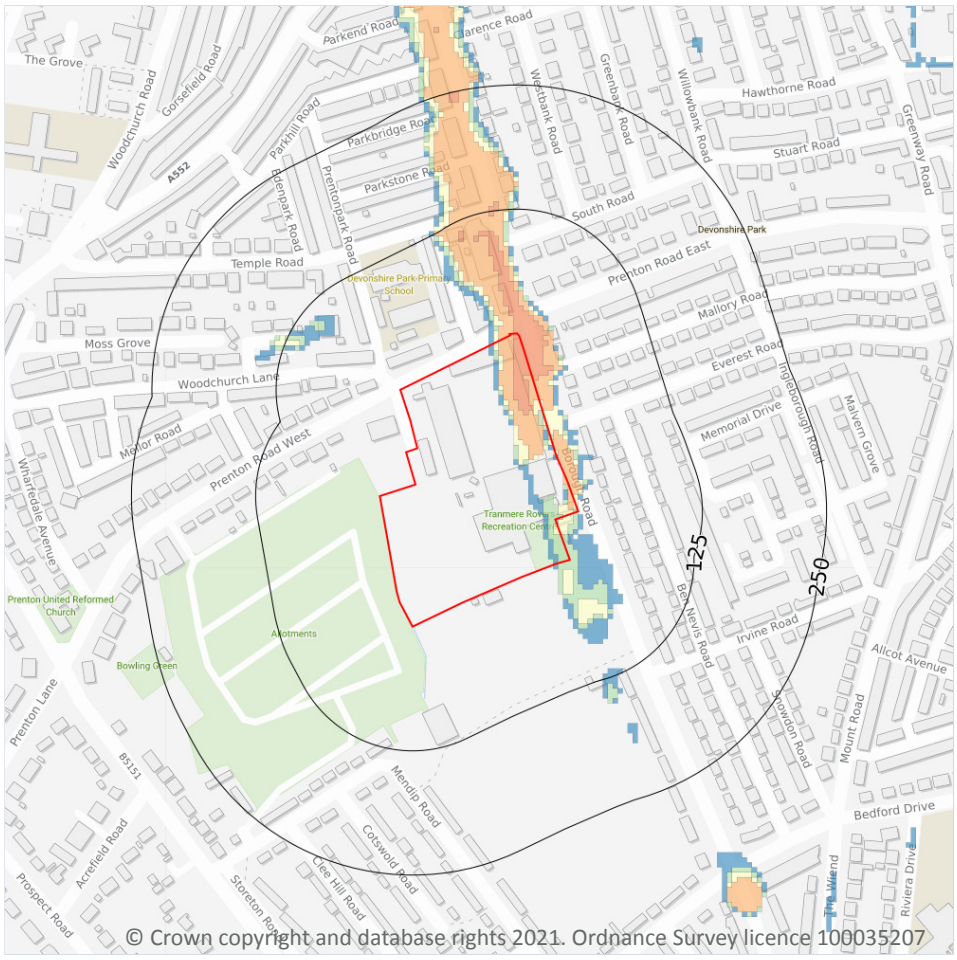
7.7 Flood Zone 3

Records within 50m	0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

8 Surface water flooding



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Site Outline

Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

8.1 Surface water flooding

Highest risk on site	**1 in 30 year, 0.3m - 1.0m**
Highest risk within 50m	**1 in 30 year, 0.3m - 1.0m**

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 51**

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Between 0.3m and 1.0m
1 in 250 year	Between 0.3m and 1.0m
1 in 100 year	Between 0.3m and 1.0m
1 in 30 year	Between 0.3m and 1.0m

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding



Site Outline

Search buffers in metres (m)

- High
- Moderate - High
- Moderate
- Low
- Negligible

9.1 Groundwater flooding

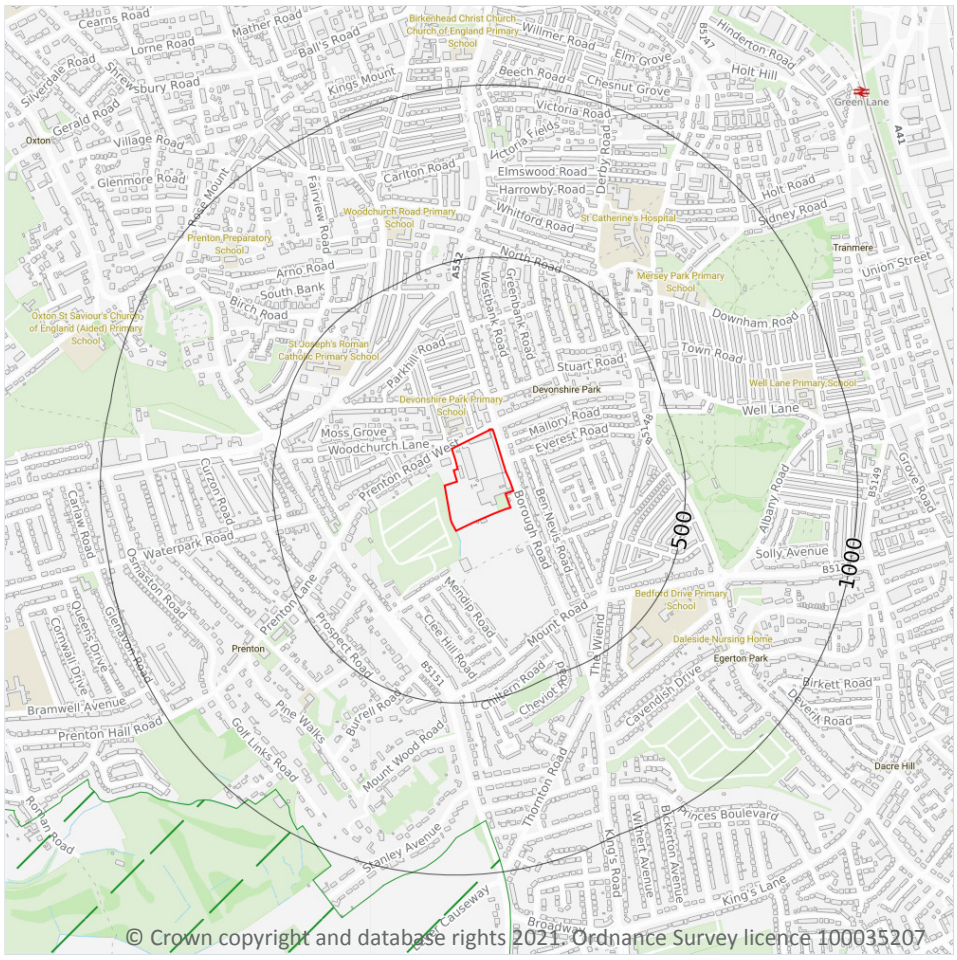
Highest risk on site	**Low**
Highest risk within 50m	**Low**

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 53**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



Site Outline

Search buffers in metres (m)

Sites of Special Scientific Interest (SSSI)

Conserved wetland sites (Ramsar sites)

Special Protection Areas (SPA)

Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	1

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on **page 54**

ID	Location	Name	Data source
-	1971m E	New Ferry	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	1

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

Features are displayed on the Environmental designations map on **page 54**

ID	Location	Site	Details
-	1970m E	Name: Mersey Estuary Site status: Listed Data source: Natural England	Overview: The Mersey is a large, sheltered estuary which comprises large areas of saltmarsh and extensive intertidal sand and mudflats, with limited areas of brackish marsh, rocky shoreline and boulder clay cliffs, within a rural and industrial environment. The intertidal flats and saltmarshes provide feeding and roosting sites for large and internationally important populations of waterfowl. During the winter, the site is of major importance for duck and waders. The site is also important during spring and autumn migration periods, particularly for wader populations moving along the west coast of Britain. Ramsar criteria: -

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m	0

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m	3

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

Features are displayed on the Environmental designations map on **page 54**

ID	Location	Name	Species of interest	Habitat description	Data source
-	1871m E	Liverpool Bay / Bae Lerpwl (England)	Red-throated diver; Black (common) scoter; Little gull; Common tern; Little tern	Marine areas, Sea inlets; Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	
-	1871m E	Liverpool Bay	Red-throated diver; Black (common) scoter; Little gull; Common tern; Little tern	Marine areas, Sea inlets; Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	Natural England
-	1971m E	Mersey Estuary	Great crested grebe; Common shelduck; Eurasian wigeon; Eurasian teal; Northern pintail; Ringed plover; European golden plover; Grey plover; Northern lapwing; Eurasian curlew; Common redshank; Common redshank; Black-tailed godwit; Dunlin	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Salt marshes, Salt pastures, Salt steppes	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m	0

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m	0

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m	0

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m	0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m	0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m	0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m	1

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on **page 54**

ID	Location	Name	Local Authority name
1	846m S	Merseyside and Greater Manchester	Wirral

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m	0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m	0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m	0

Special Protection Areas (SPAs) are areas designated (or ‘classified’) under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m	0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

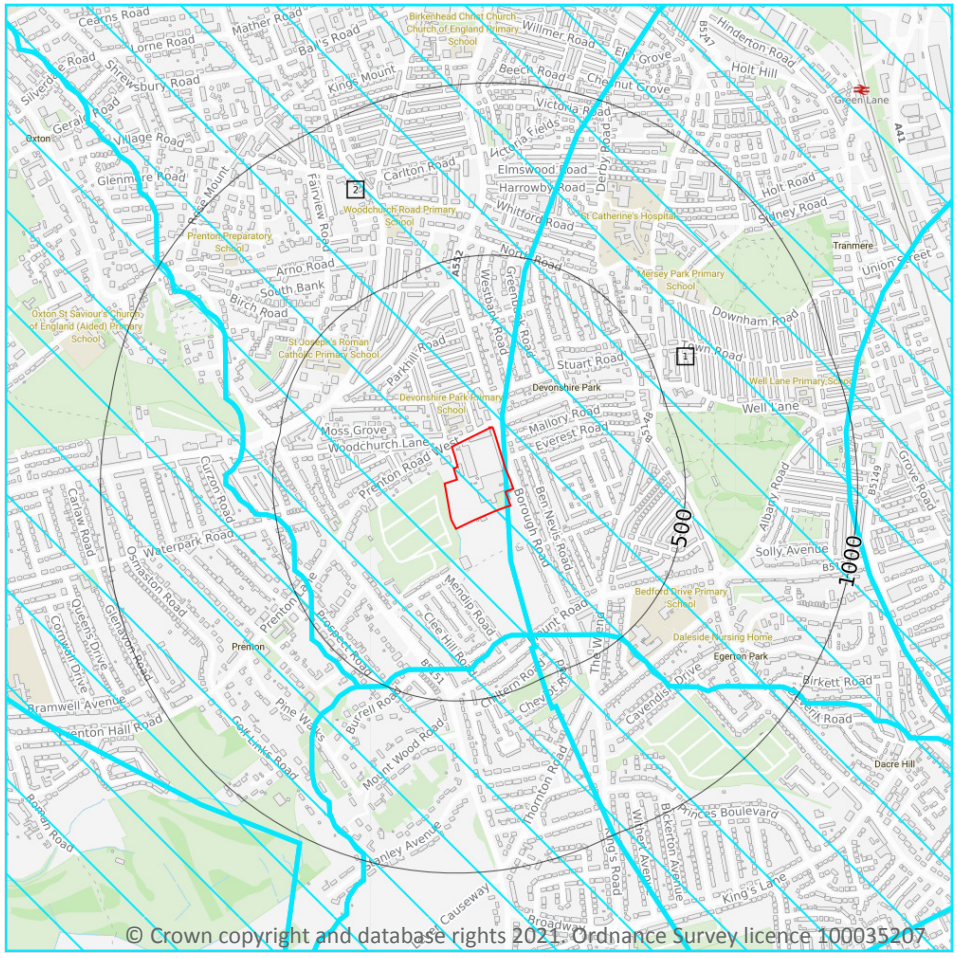
Records within 2000m	1

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
825m S	Also includes Clatter Brook. NVZ	Surface Water	S631	Existing

This data is sourced from Natural England and Natural Resources Wales.

SSSI Impact Zones and Units



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- Site Outline

Search buffers in metres (m)

- SSSI Impact Risk Zones

SSSI Units

- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

10.17 SSSI Impact Risk Zones

Records on site	2

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 60**

ID	Location	Type of developments requiring consultation
1	On site	**Infrastructure - Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines Minerals, Oil and Gas - Planning applications for quarries: new proposals or extensions, outside or extending outside existing settlements/urban areas affecting greenspace, farmland or semi natural habitats. Oil & gas exploration/extraction Rural non-residential - Large non residential developments outside existing settlements/urban areas where net additional gross internal floorspace is > 1,000m² or footprint exceeds 0.2ha Residential - Residential development of 50 units or more. Rural residential - Any residential development of 10 or more houses outside existing settlements/urban areas. Air pollution - Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons > 750m² & manure stores > 3500t) Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion Waste - Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill. Notes: New residential developments in this area should consider recreational disturbance impacts on the coastal designated sites. Please consider this issue in the HRA screening.**
2	On site	**Infrastructure - Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines Minerals, Oil and Gas - Planning applications for quarries: new proposals or extensions, outside or extending outside existing settlements/urban areas affecting greenspace, farmland or semi natural habitats. Oil & gas exploration/extraction Rural non-residential - Large non residential developments outside existing settlements/urban areas where footprint exceeds 1ha. Rural residential - Any residential development of 50 or more houses outside existing settlements/urban areas. Air pollution - Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons > 750m² & manure stores > 3500t) Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion Waste - Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill. Notes: New residential developments in this area should consider recreational disturbance impacts on the coastal designated sites. Please consider this issue in the HRA screening.**

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	1

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

Features are displayed on the SSSI Impact Zones and Units map on **page 60**

ID: -
Location: 1971m E
SSSI name: New Ferry
Unit name: Crown Estate Land
Broad habitat: Littoral Sediment
Condition: Favourable
Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of non-breeding birds - Black-tailed godwit, Limosa limosa islandica	Not Recorded	01/01/1900
Aggregations of non-breeding birds - Pintail, Anas acuta	Not Recorded	01/01/1900
Littoral sediment	Not Recorded	01/01/1900

This data is sourced from Natural England and Natural Resources Wales.

11 Visual and cultural designations

11.1 World Heritage Sites

Records within 250m	0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m	0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m	0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m	0

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m	0

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m	0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

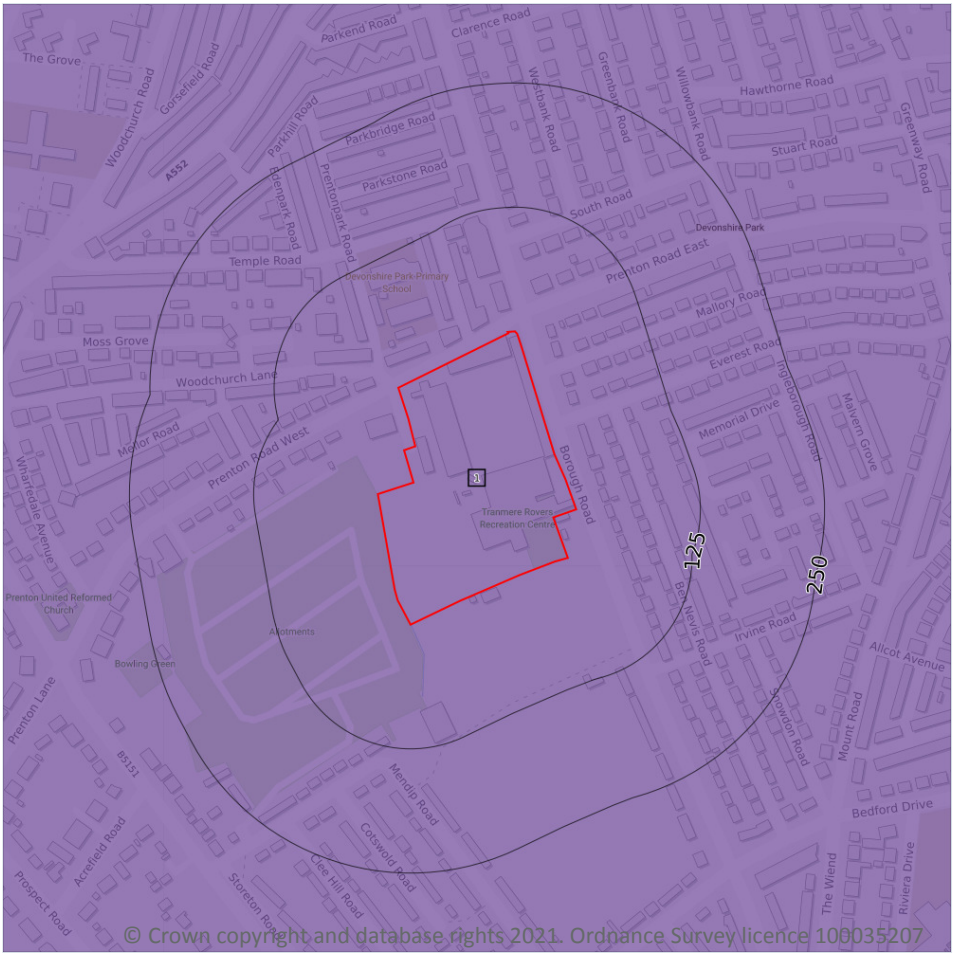
11.7 Registered Parks and Gardens

Records within 250m	0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

12 Agricultural designations



Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m	1

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 65**

ID	Location	Classification	Description
1	**On site**	**Urban**	-

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m	0

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m	0

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m	0

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

This data is sourced from Natural England.

13 Habitat designations

13.1 Priority Habitat Inventory

Records within 250m	0

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m	0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

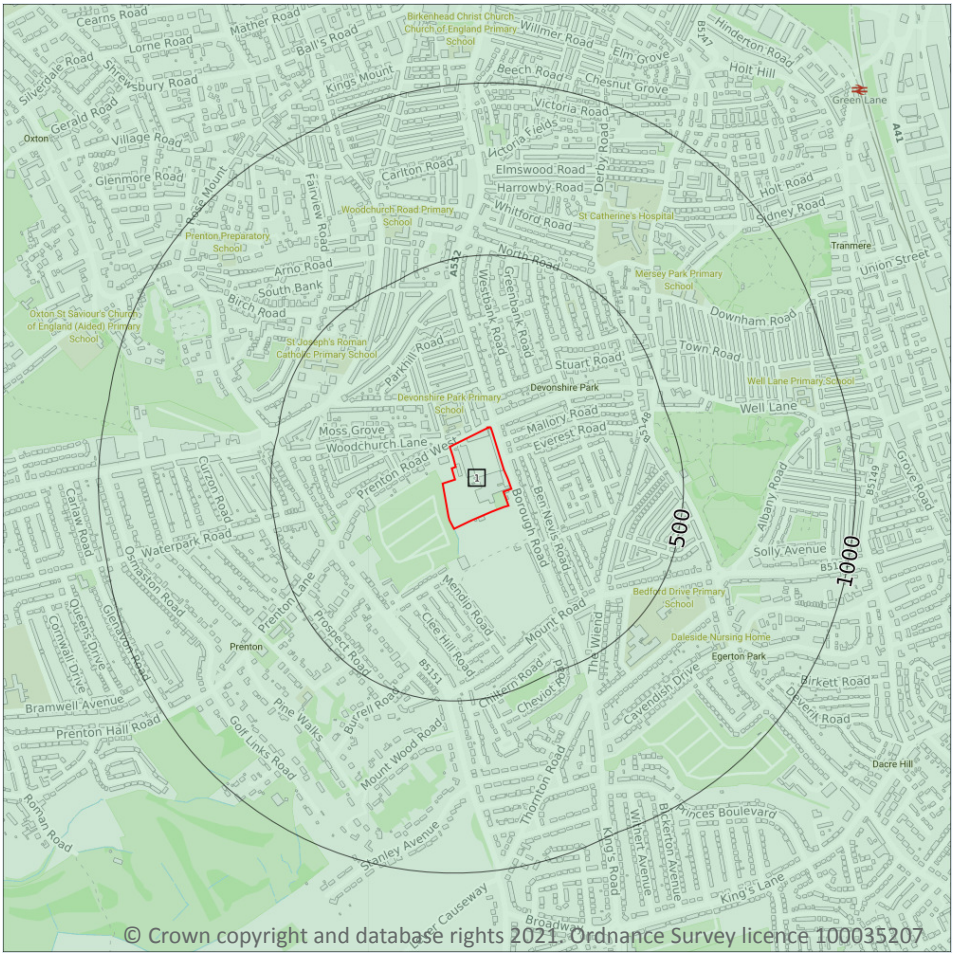
13.4 Limestone Pavement Orders

Records within 250m	0

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.

14 Geology 1:10,000 scale - Availability



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Site Outline

Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

14.1 10k Availability

Records within 500m	1

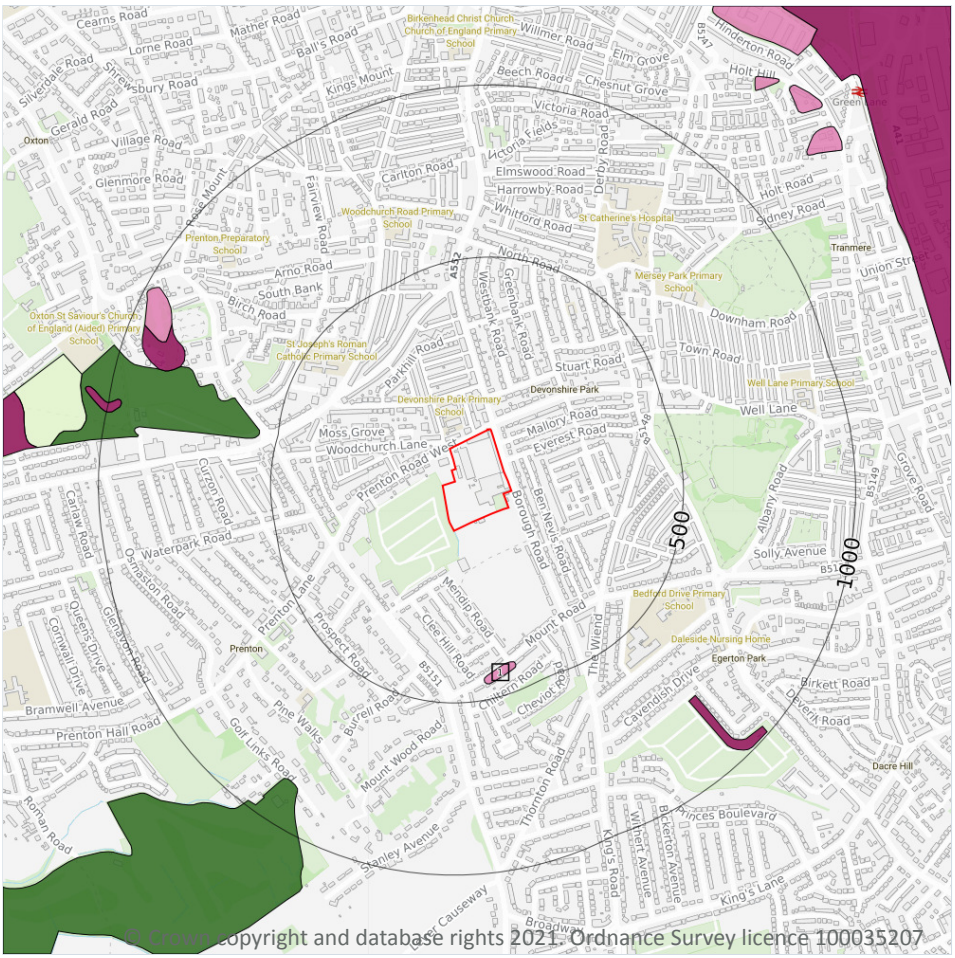
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 68**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**Full**	**SJ38NW**

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Artificial and made ground



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Site Outline

Search buffers in metres (m)

- Reclaimed ground
- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

14.2 Artificial and made ground (10k)

Records within 500m	1

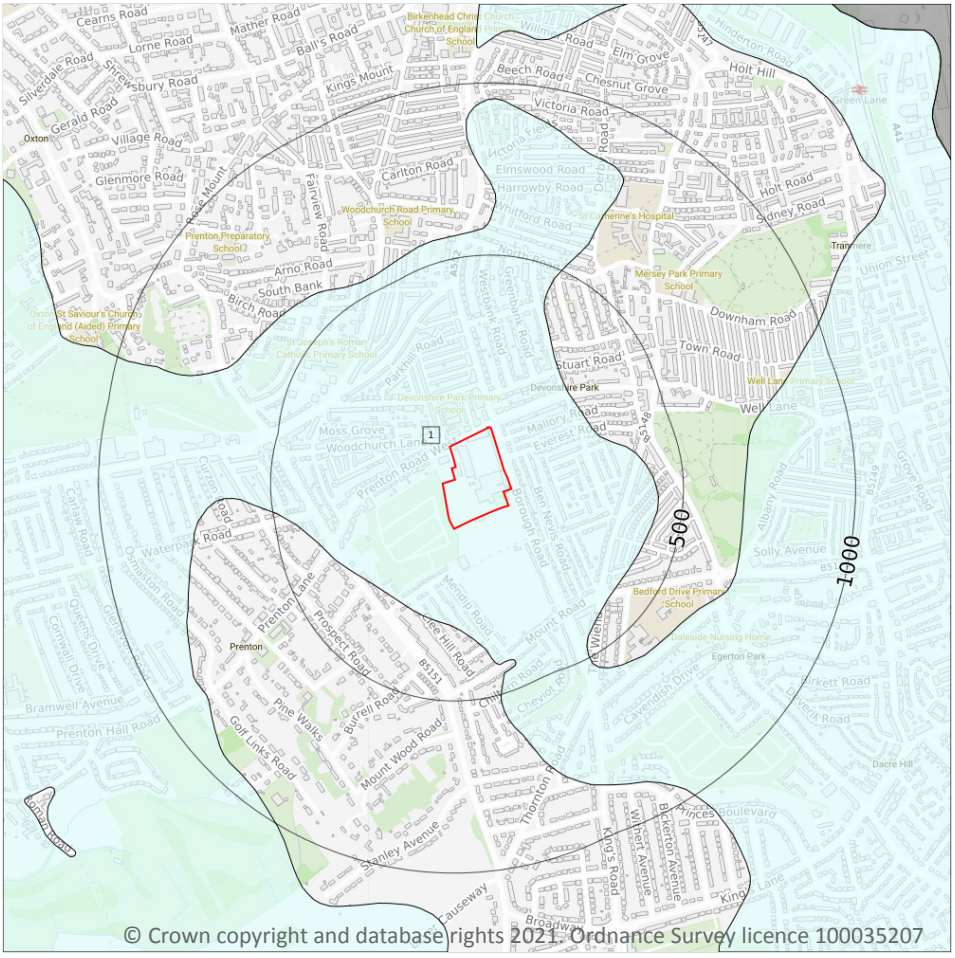
Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 69**

ID	Location	LEX Code	Description	Rock description
1	413m S	WGR-VOID	Worked Ground (Undivided)	Void

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m	1

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 70**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**TILLD-CSVL**	**Till, Devensian - Sandy Gravelly Cobbly Clay**	**Clay, Sandy, Gravelly, Cobbly**

This data is sourced from the British Geological Survey.

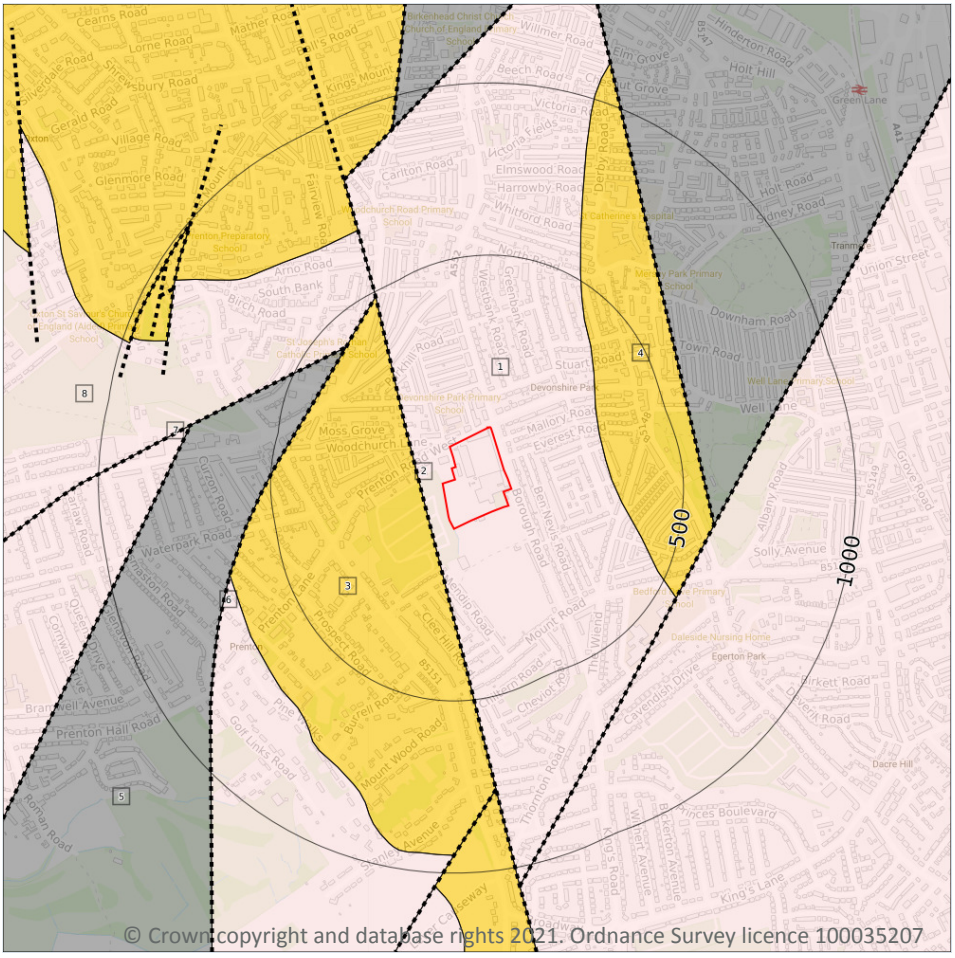
14.4 Landslip (10k)

Records within 500m	0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m	5

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 72**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**WLSF-SDST**	**Wilmslow Sandstone Formation - Sandstone**	**Early Triassic Epoch**
3	58m W	HEY-SDST	Helsby Sandstone Formation - Sandstone	Anisian Age - Early Triassic Epoch
4	287m E	HEY-SDST	Helsby Sandstone Formation - Sandstone	Anisian Age - Early Triassic Epoch
5	406m NW	CPB-SDST	Chester Pebble Beds Formation - Sandstone	Early Triassic Epoch

ID	Location	LEX Code	Description	Rock age
8	418m NW	WLSF-SDST	Wilmslow Sandstone Formation - Sandstone	Early Triassic Epoch

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m	**3**

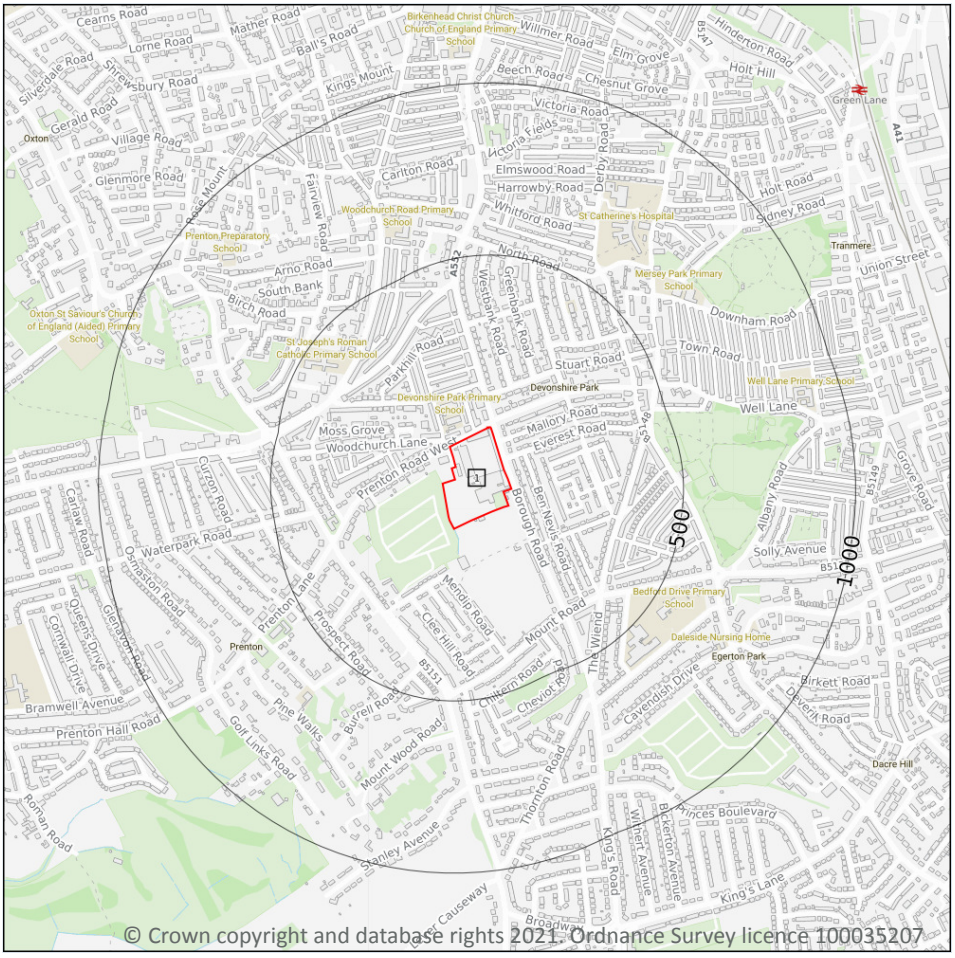
Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 72**

ID	Location	Category	Description
2	58m W	FAULT	Normal fault, inferred
6	406m NW	FAULT	Normal fault, inferred
7	418m NW	FAULT	Normal fault, inferred

This data is sourced from the British Geological Survey.

15 Geology 1:50,000 scale - Availability



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Site Outline

Search buffers in metres (m)

Geological map tile

15.1 50k Availability

Records within 500m	1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 74**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**Full**	**EW096_liverpool_v4**

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Artificial and made ground

15.2 Artificial and made ground (50k)

Records within 500m	0

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

This data is sourced from the British Geological Survey.

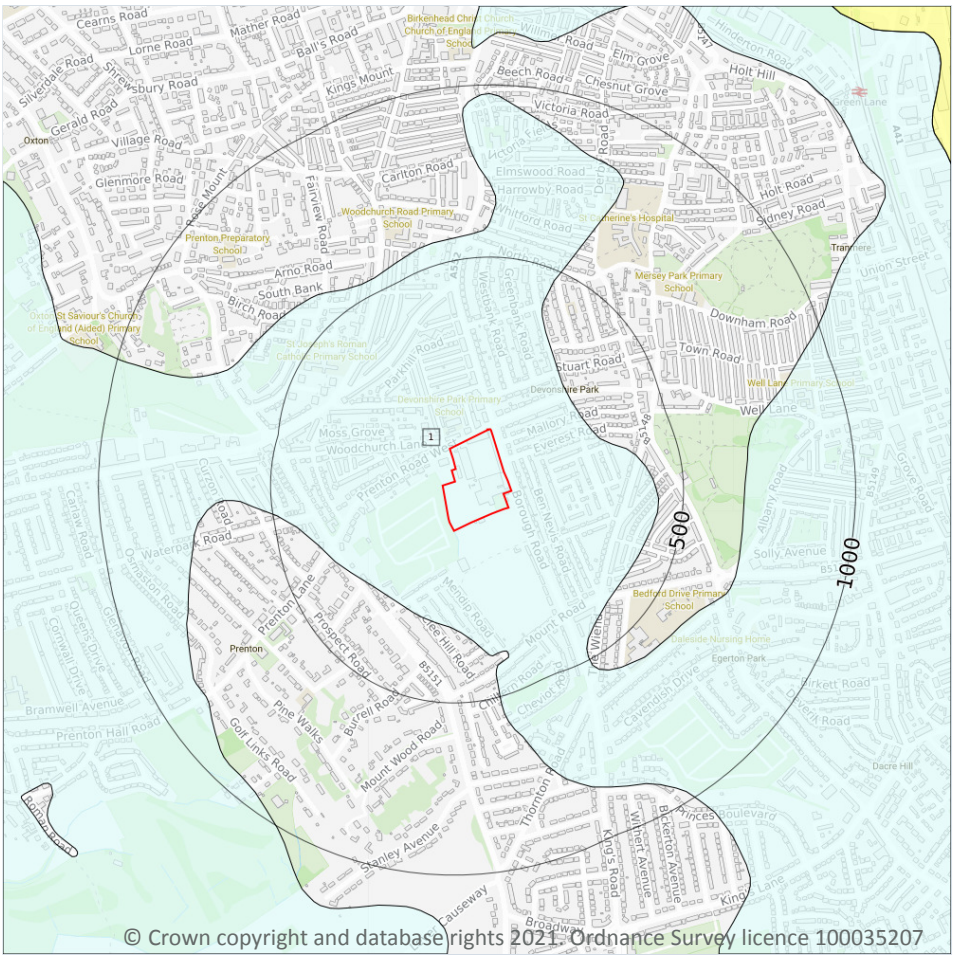
15.3 Artificial ground permeability (50k)

Records within 50m	0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m	1

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 76**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**TILLD-CSVL**	**TILL, DEVENSIAN**	**CLAY, SANDY, GRAVELLY, COBBLY**

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	1

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Mixed**	**High**	**Low**

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	0

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

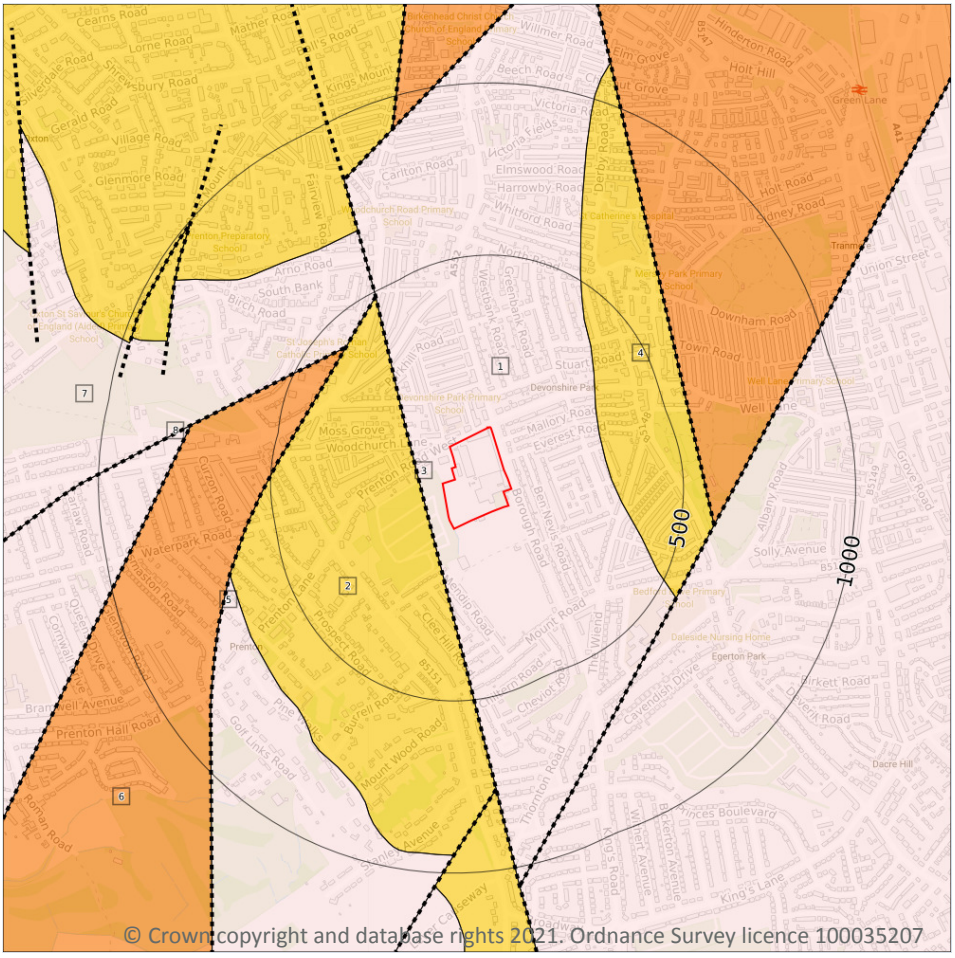
15.7 Landslip permeability (50k)

Records within 50m	0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m **5**

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 78**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**WLSF-SDST**	**WILMSLOW SANDSTONE FORMATION - SANDSTONE**	**-**
2	58m W	HEY-SDST	HELSBY SANDSTONE FORMATION - SANDSTONE	ANISIAN
4	286m E	HEY-SDST	HELSBY SANDSTONE FORMATION - SANDSTONE	ANISIAN
6	407m NW	CHES-PESST	CHESTER FORMATION - SANDSTONE, PEBBLY (GRAVELLY)	OLENEKIAN

ID	Location	LEX Code	Description	Rock age
7	418m NW	WLSF-SDST	WILMSLOW SANDSTONE FORMATION - SANDSTONE	-

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	**1**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Intergranular**	**High**	**High**

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m	**3**

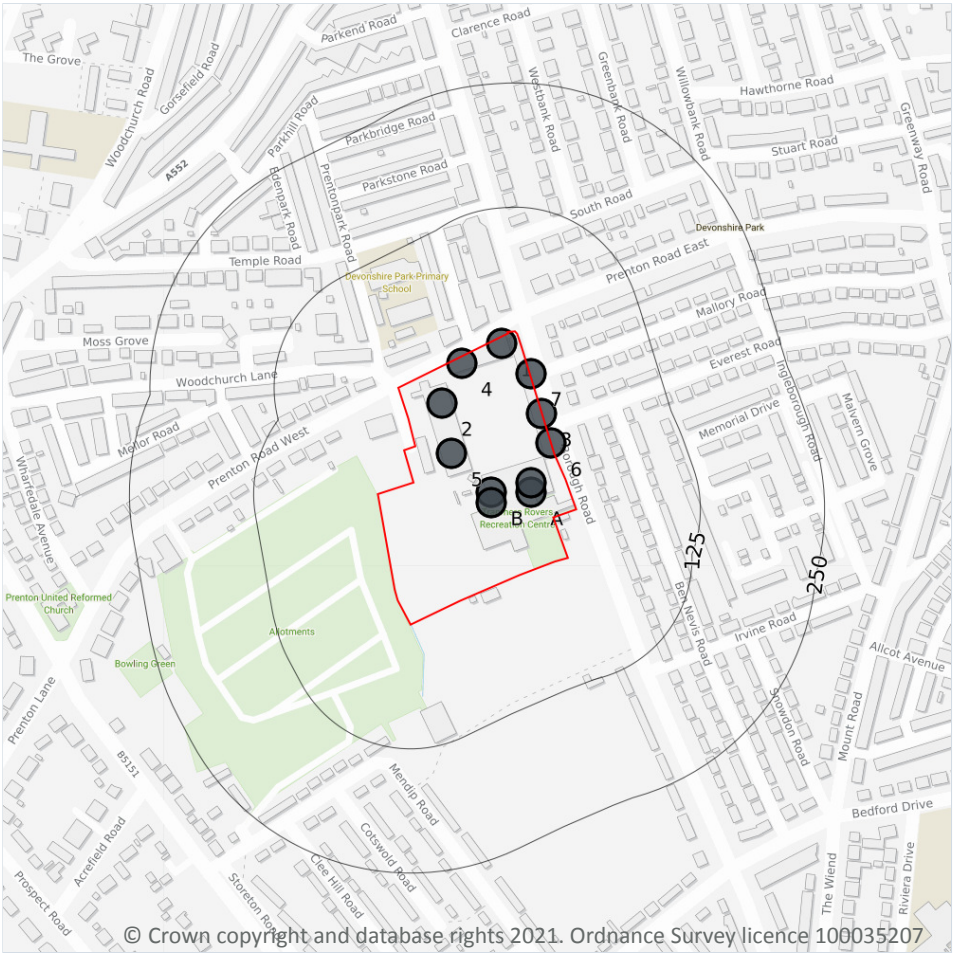
Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 78**

ID	Location	Category	Description
3	58m W	FAULT	Fault, inferred
5	407m NW	FAULT	Fault, inferred
8	418m NW	FAULT	Fault, inferred

This data is sourced from the British Geological Survey.

16 Boreholes



16.1 BGS Boreholes

Records within 250m	11

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

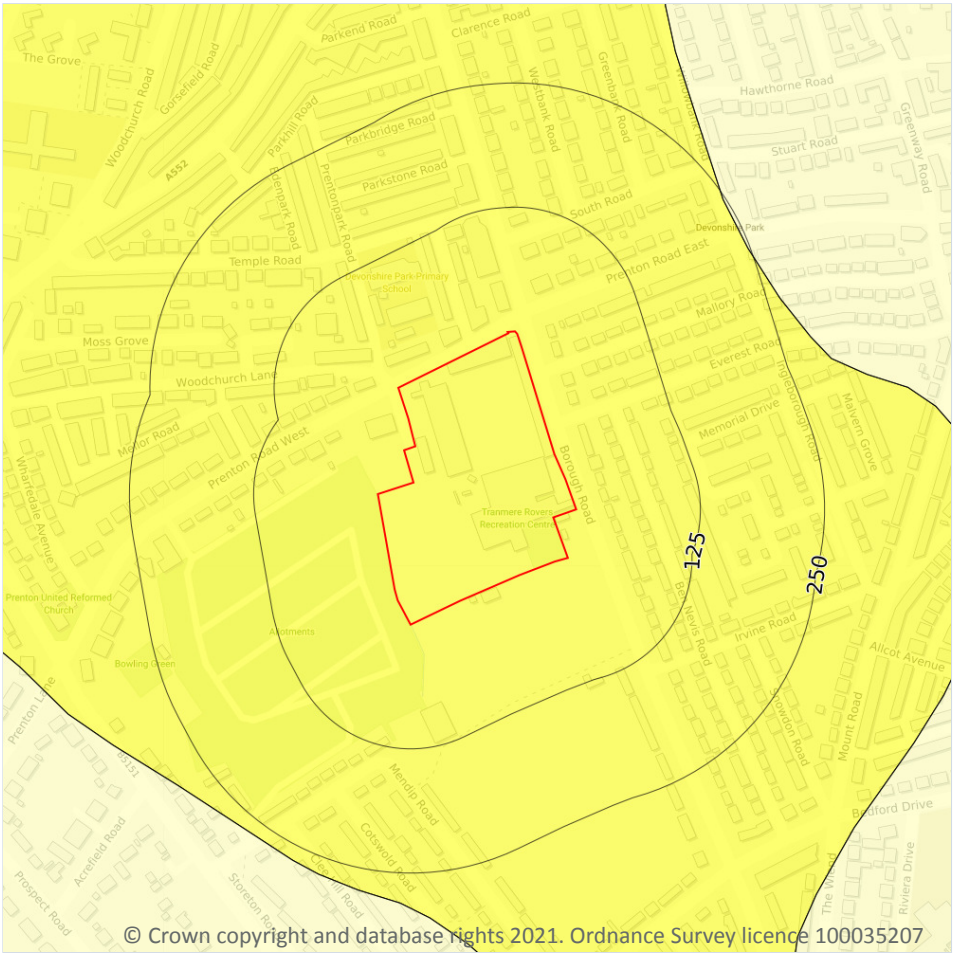
Features are displayed on the Boreholes map on **page 80**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	On site	331410 386890	TRANMERE ROVERS FOOTBALL CLUB 4	-	Y	N/A
2	On site	331350 386830	TRANMERE ROVERS FOOTBALL CLUB 2	-	Y	N/A
3	On site	331450 386820	TRANMERE ROVERS FOOTBALL CLUB 6	-	Y	N/A

ID	Location	Grid reference	Name	Length	Confidential	Web link
4	**On site**	**331370 386870**	**TRANMERE ROVERS FOOTBALL CLUB 3**	**-**	**Y**	**N/A**
5	**On site**	**331360 386780**	**TRANMERE ROVERS FOOTBALL CLUB 1**	**-**	**Y**	**N/A**
A	**On site**	**331440 386740**	**TRANMERE ROVERS FOOTBALL CLUB 9**	**-**	**Y**	**N/A**
A	**On site**	**331440 386750**	**TRANMERE ROVERS FOOTBALL CLUB 11**	**-**	**Y**	**N/A**
B	**On site**	**331400 386740**	**TRANMERE ROVERS FOOTBALL CLUB 10**	**-**	**Y**	**N/A**
B	**On site**	**331400 386730**	**TRANMERE ROVERS FOOTBALL CLUB 8**	**-**	**Y**	**N/A**
6	0m E	331460 386790	TRANMERE ROVERS FOOTBALL CLUB 7	-	Y	N/A
7	2m E	331440 386860	TRANMERE ROVERS FOOTBALL CLUB 5	-	Y	N/A

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.1 Shrink swell clays

Records within 50m	1

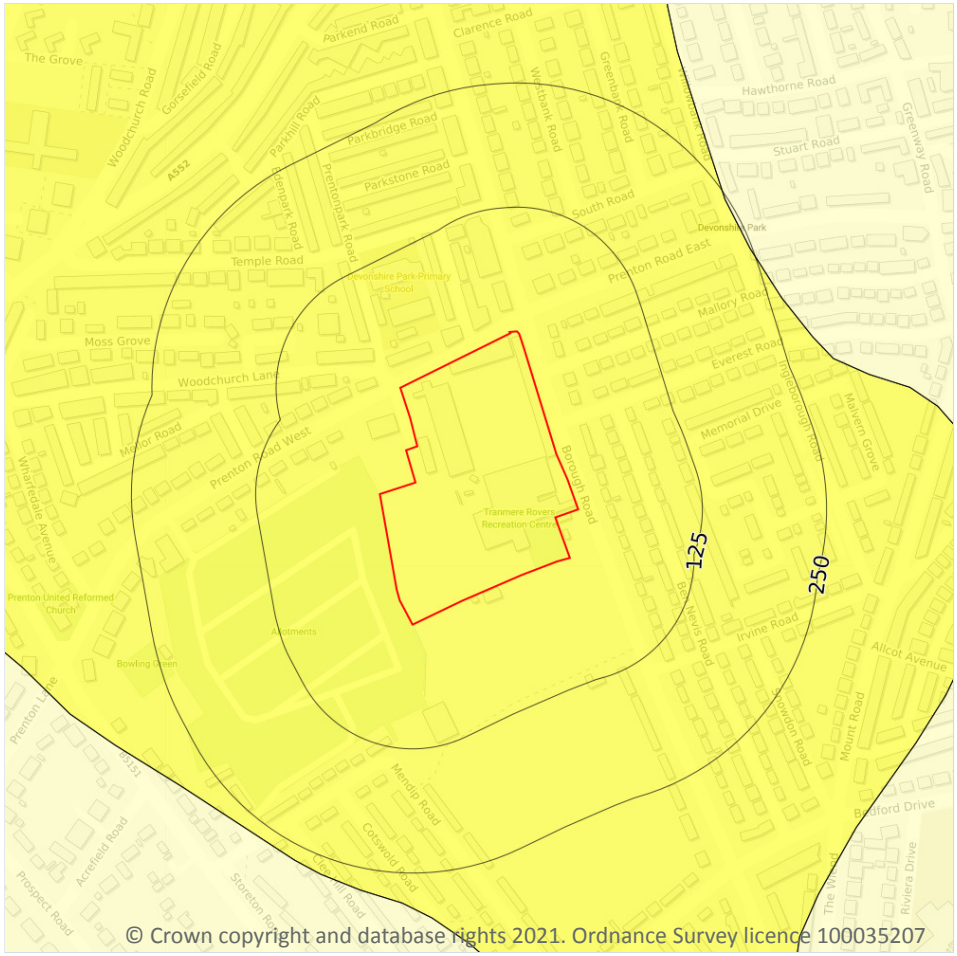
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 82**

Location	Hazard rating	Details
On site	**Very low**	**Ground conditions predominantly low plasticity.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.2 Running sands

Records within 50m	1

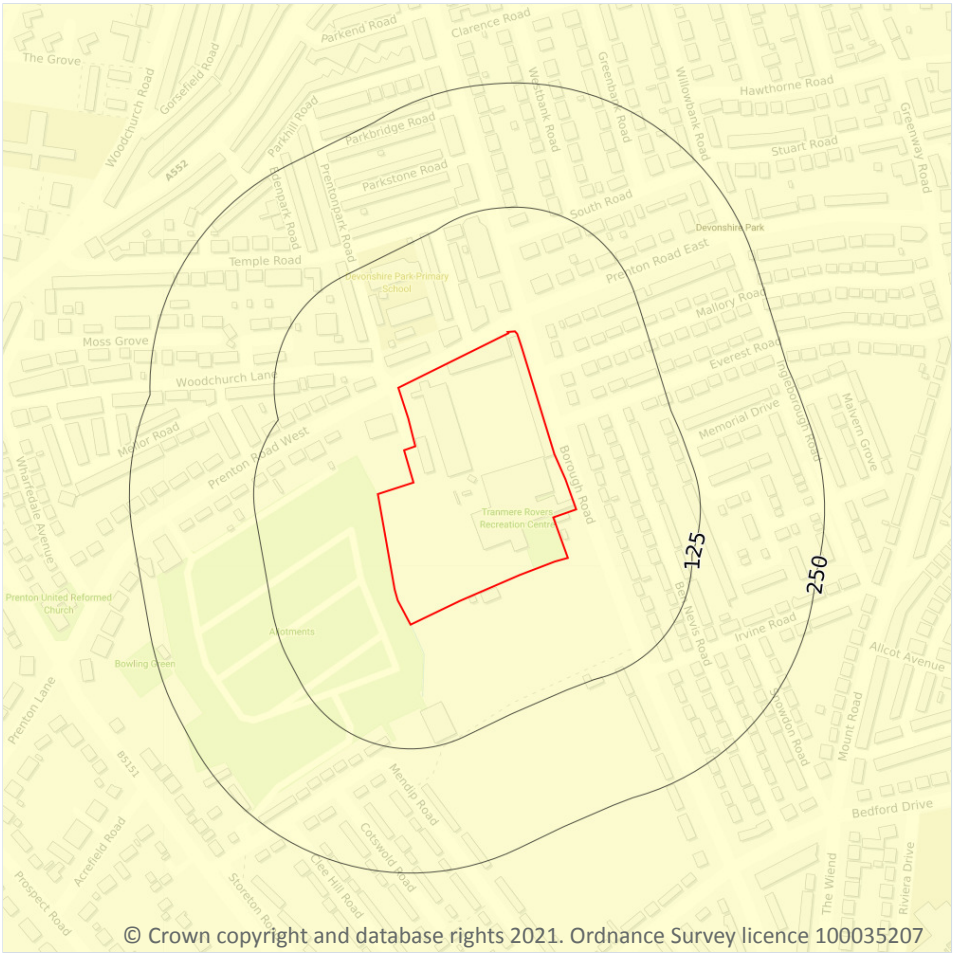
The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on **page 83**

Location	Hazard rating	Details
On site	**Very low**	**Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.3 Compressible deposits

Records within 50m	1

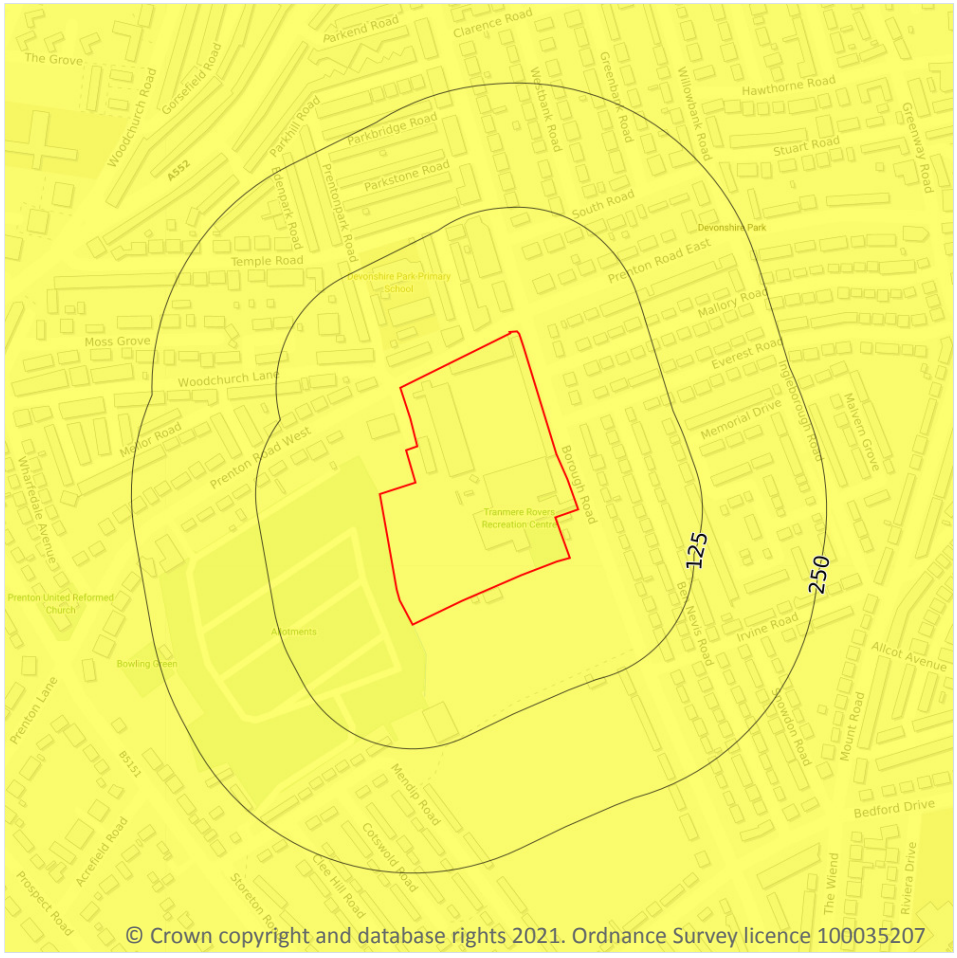
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 84**

Location	Hazard rating	Details
On site	**Negligible**	**Compressible strata are not thought to occur.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.4 Collapsible deposits

Records within 50m	1

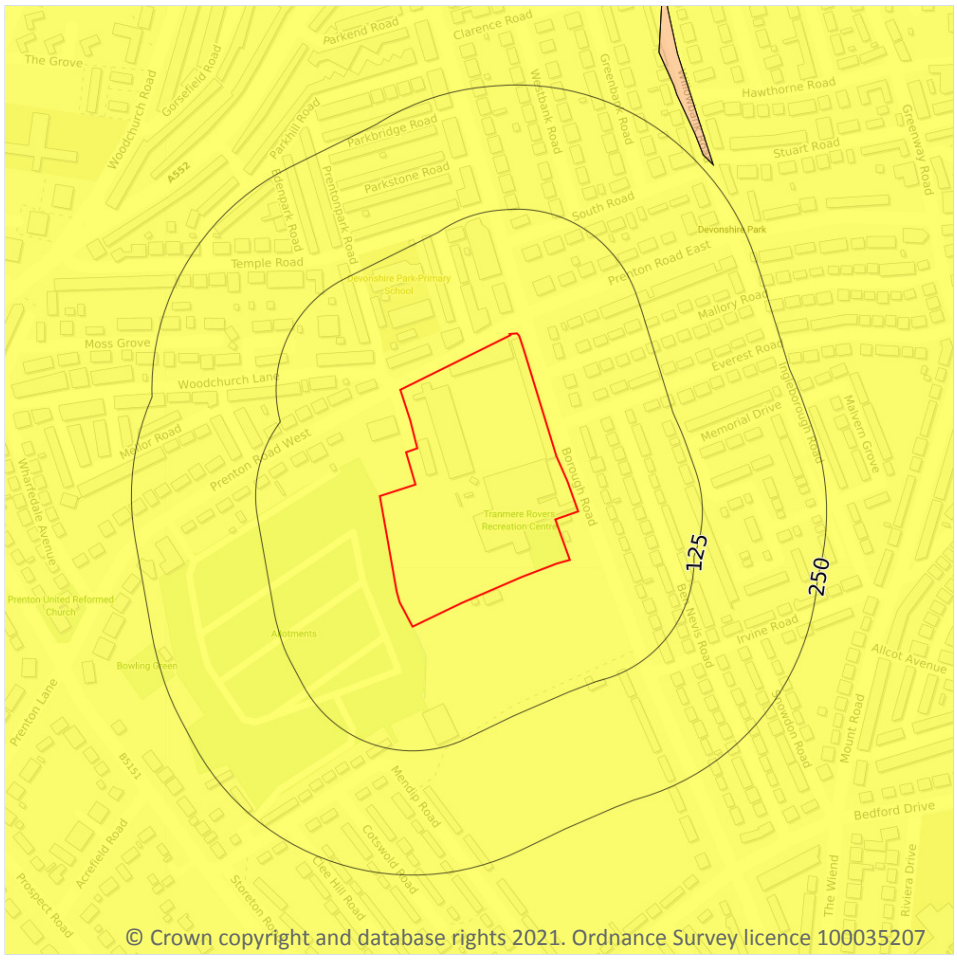
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 85**

Location	Hazard rating	Details
On site	**Very low**	**Deposits with potential to collapse when loaded and saturated are unlikely to be present.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



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Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.5 Landslides

Records within 50m	1

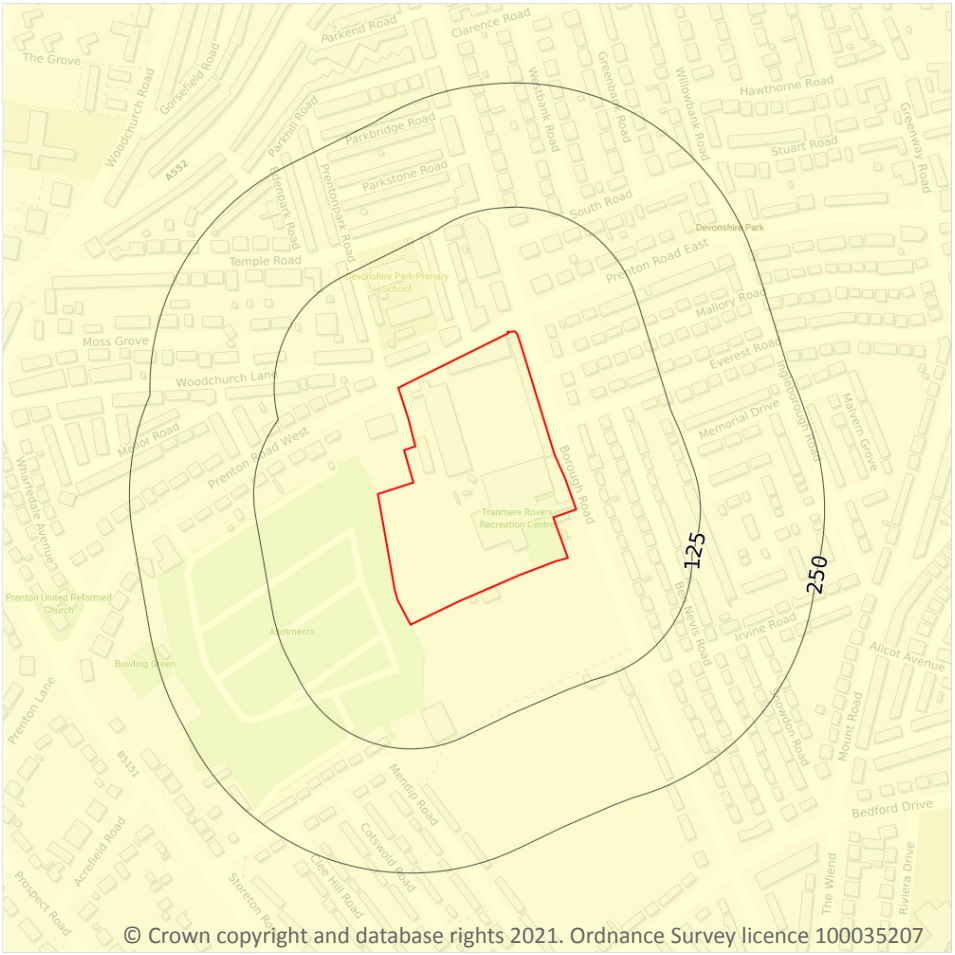
The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 86**

Location	Hazard rating	Details
On site	**Very low**	**Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Ground dissolution of soluble rocks



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Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.6 Ground dissolution of soluble rocks

Records within 50m	1

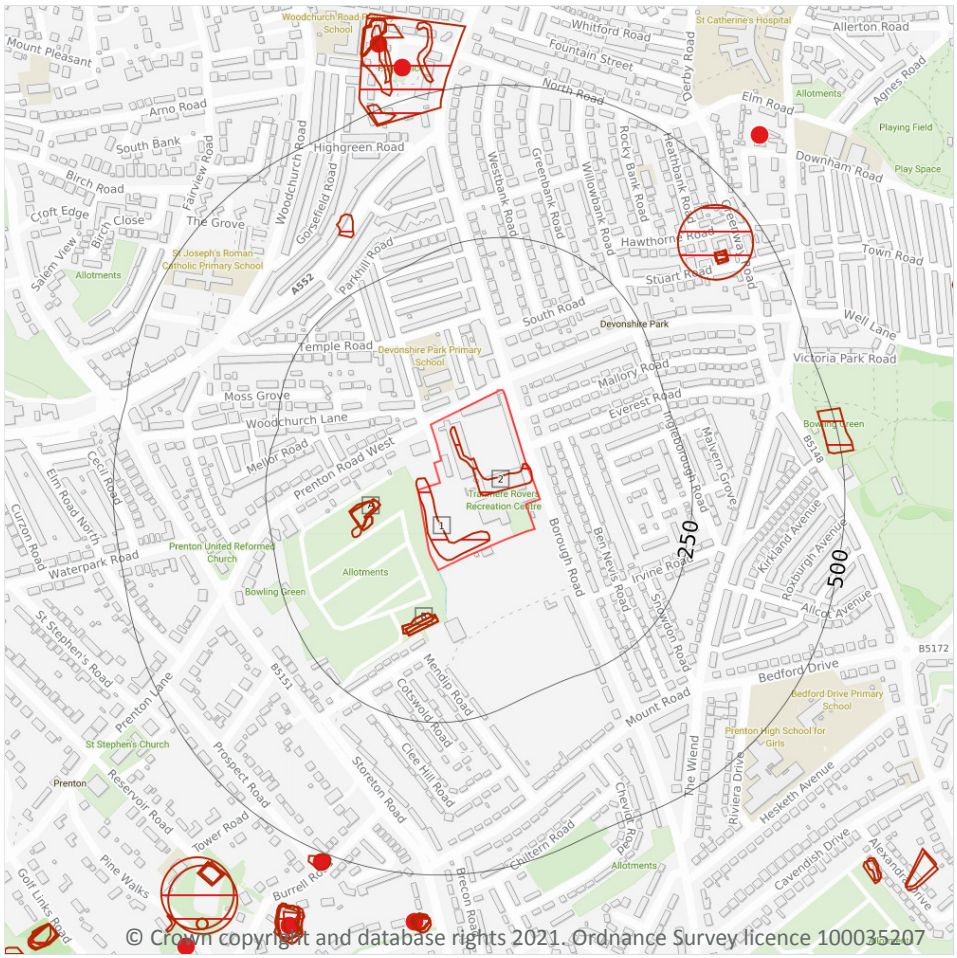
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 87**

Location	Hazard rating	Details
On site	**Negligible**	**Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.**

This data is sourced from the British Geological Survey.

18 Mining, ground workings and natural cavities



18.1 Natural cavities

Records within 500m	0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

18.2 BritPits

Records within 500m	0

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m	12

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 88**

ID	Location	Land Use	Year of mapping	Mapping scale
1	**On site**	**Unspecified Heap**	**1966**	**1:10560**
2	**On site**	**Unspecified Ground Workings**	**1925**	**1:10560**
A	66m W	Pond	1925	1:10560
A	66m W	Ponds	1925	1:10560
B	73m S	Ponds	1925	1:10560
B	73m S	Ponds	1909	1:10560
B	73m S	Ponds	1898	1:10560
B	74m S	Ponds	1938	1:10560
B	74m S	Ponds	1906	1:10560
B	74m S	Ponds	1924	1:10560
A	76m W	Pond	1909	1:10560
A	76m W	Pond	1898	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m	0

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

This is data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m	0

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m	0

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m	0

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

18.8 JPB mining areas

Records on site	0

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site	0

Areas which could be affected by past, current or future coal mining.

This data is sourced from the Coal Authority.

18.10 Brine areas

Records on site	0

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.11 Gypsum areas

Records on site	0

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	0

Generalised areas that may be affected by historical tin mining.

This data is sourced from Mining Searches UK.

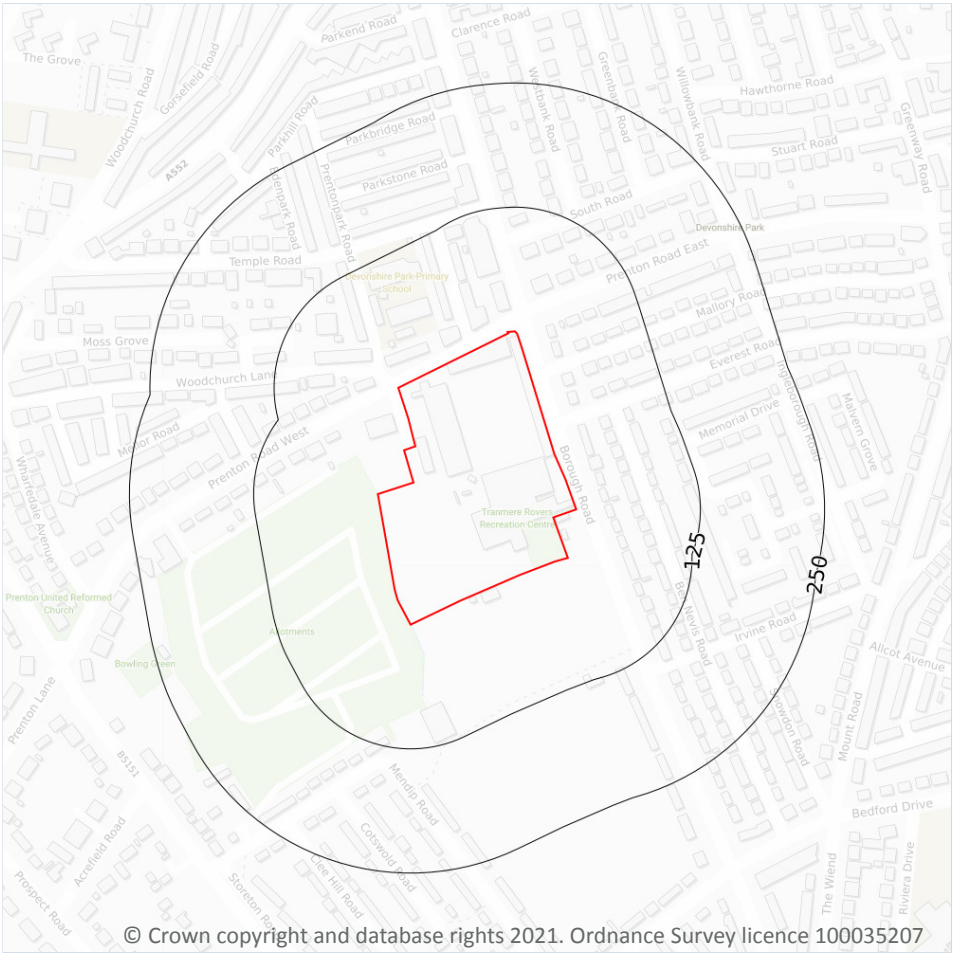
18.13 Clay mining

Records on site	0

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).

19 Radon



Site Outline

Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

19.1 Radon

Records on site	1

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 92**

Location	Estimated properties affected	Radon Protection Measures required
On site	**Less than 1%**	**None****

This data is sourced from the British Geological Survey and Public Health England.

20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m	2

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km^2. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km^2; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**90 - 120 mg/kg**	**15 - 30 mg/kg**
15m E	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m	0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km^2).

This data is sourced from the British Geological Survey.

20.3 BGS Measured Urban Soil Chemistry

Records within 50m	0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km^2.

This data is sourced from the British Geological Survey.

21 Railway infrastructure and projects



21.1 Underground railways (London)

Records within 250m	0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m	0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m	0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m	1

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on **page 94**

Location	Land Use	Year of mapping	Mapping scale
On site	**Tramway Sidings**	**1912**	**2500**

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m	0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m	0

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m	0

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m	0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m	0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m	0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

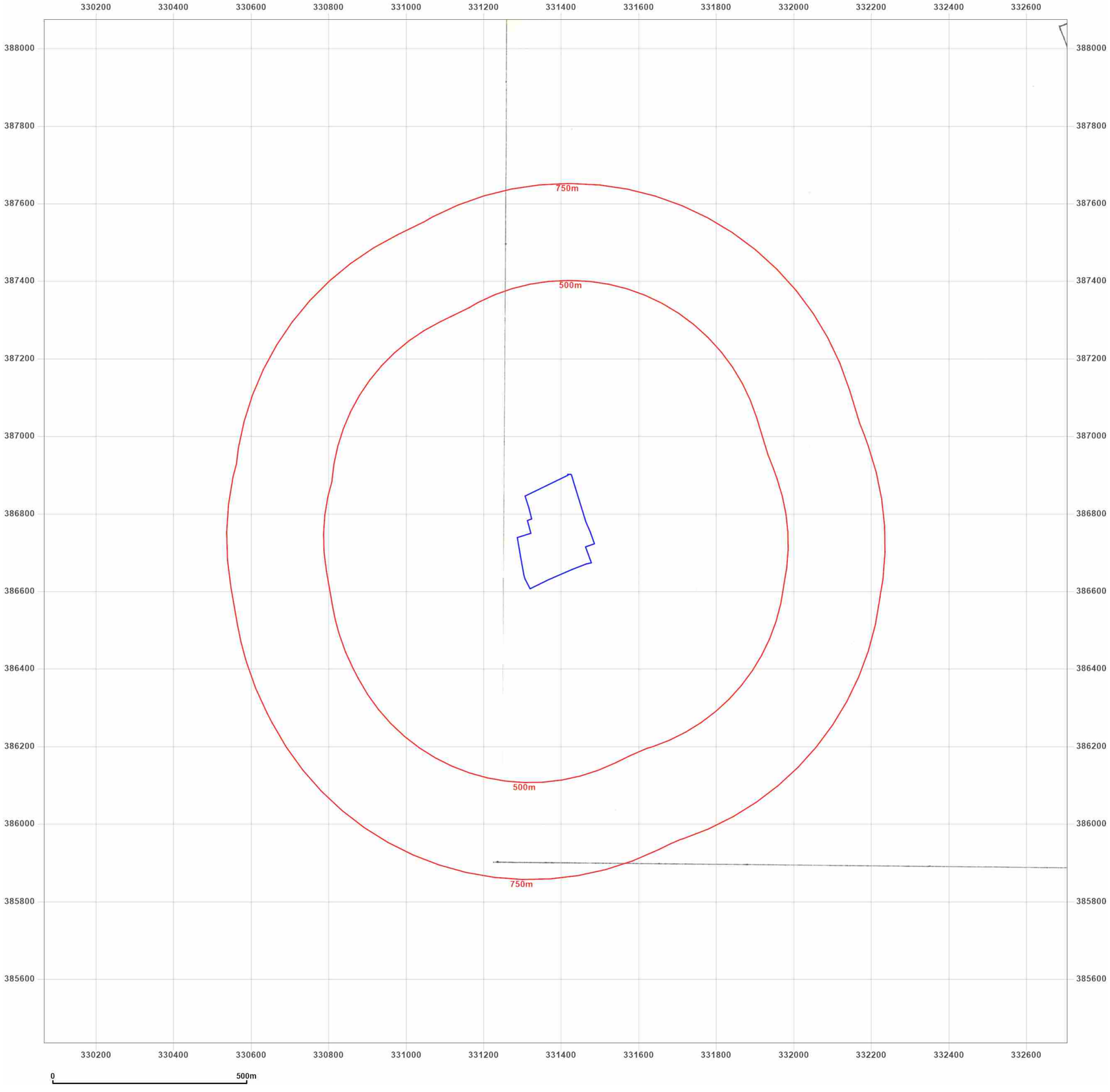
This data is sourced from HS2 ltd.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference.

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

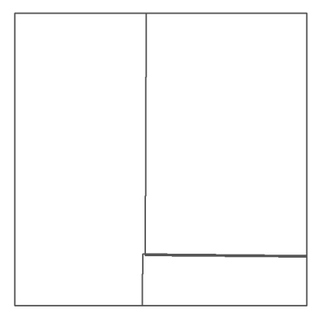
Map Name: County Series

Map date: **1890-1892**

Scale: 1:10,560

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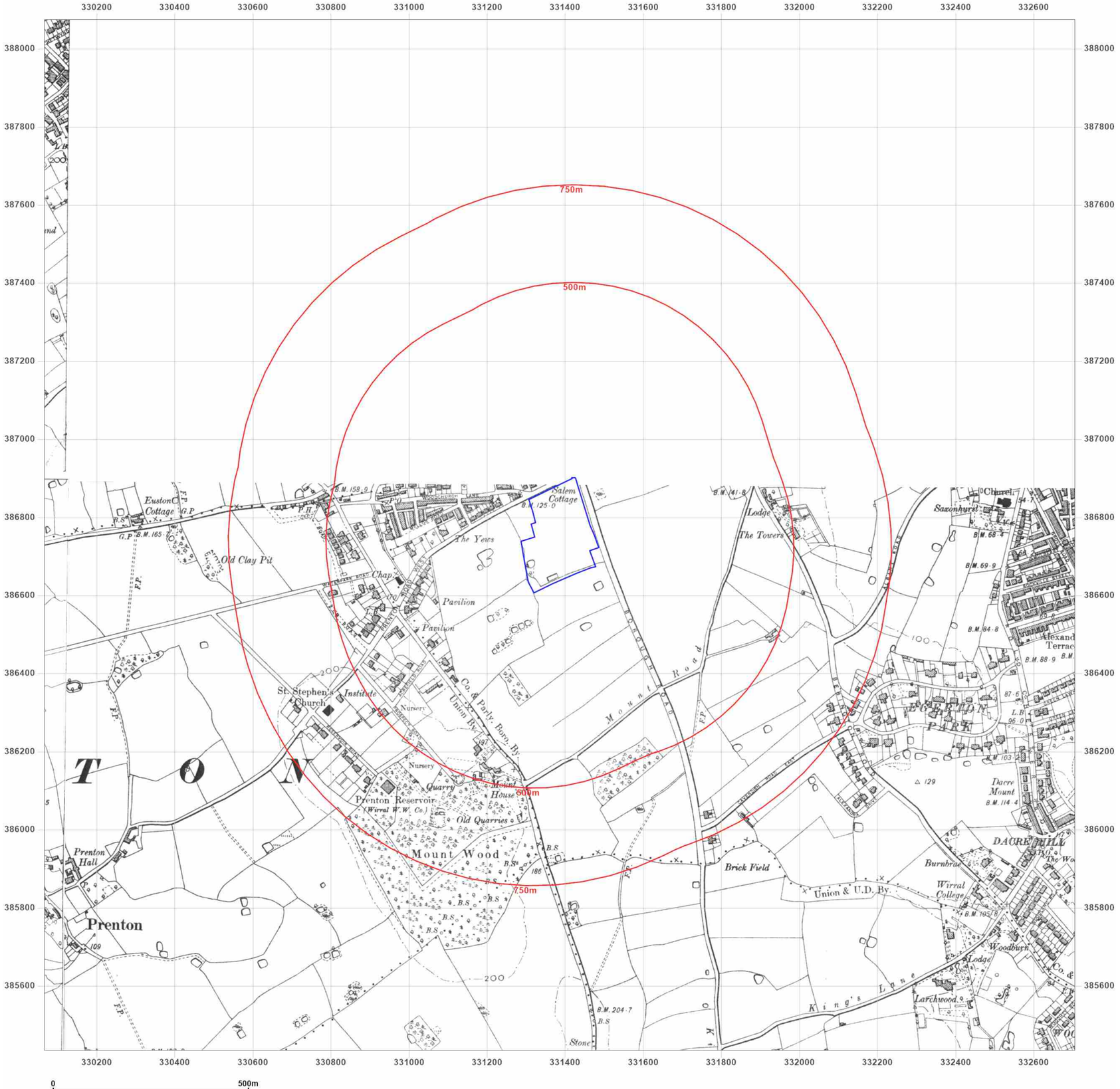
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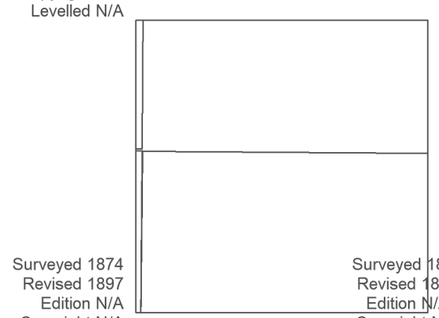
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Scale: 1:10,560

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Revised 1897
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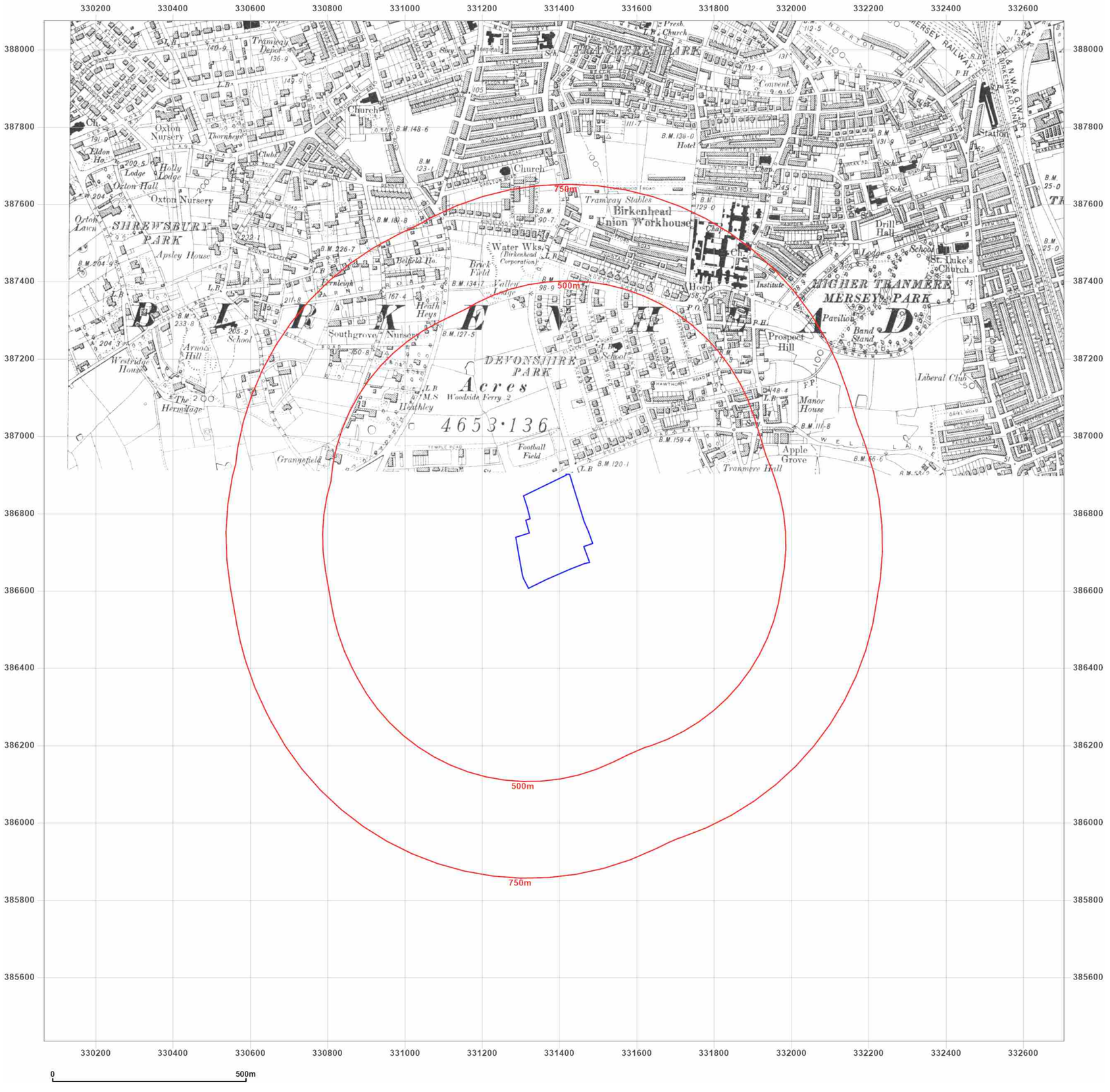
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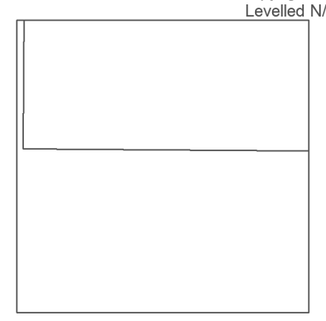
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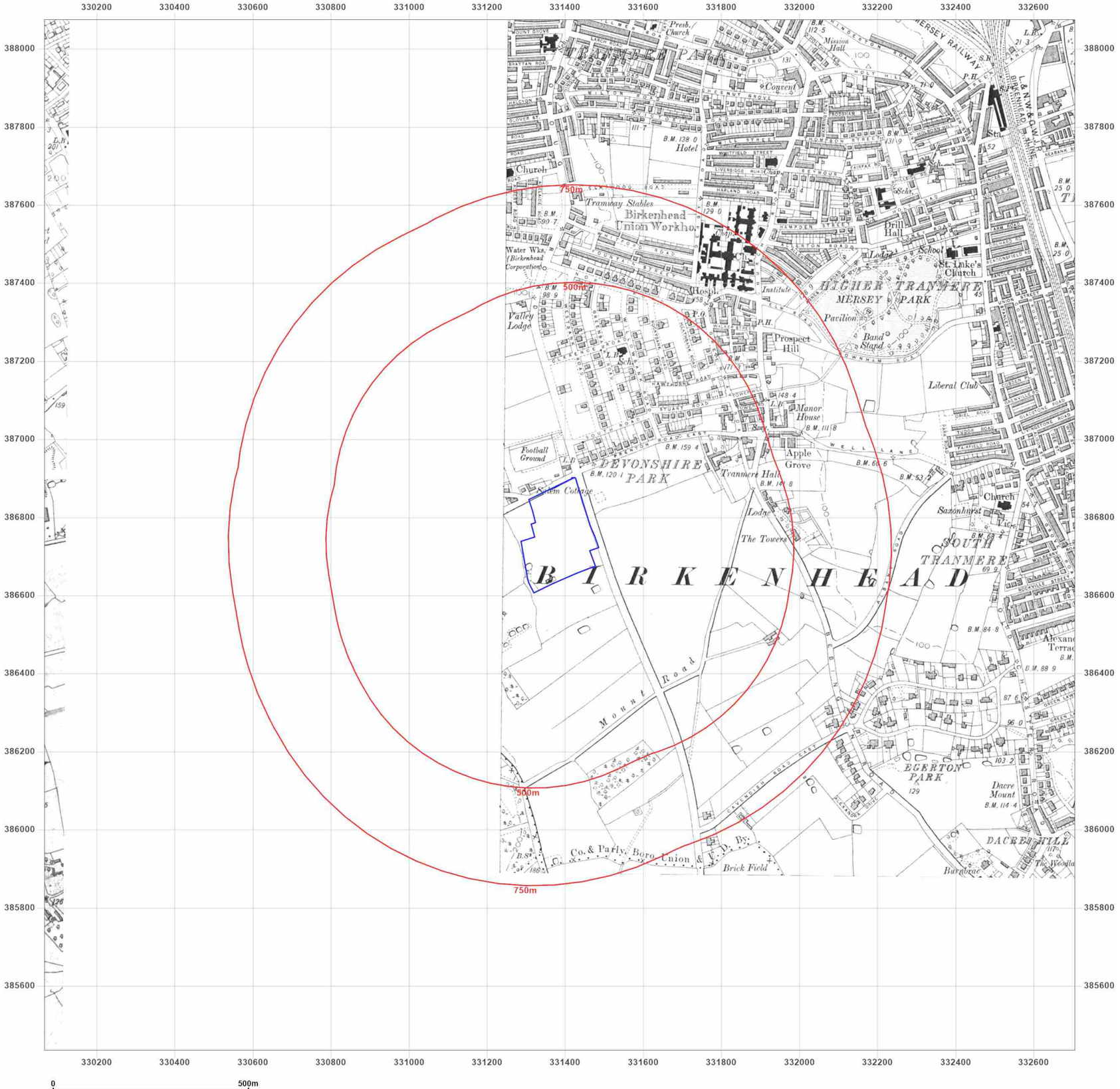
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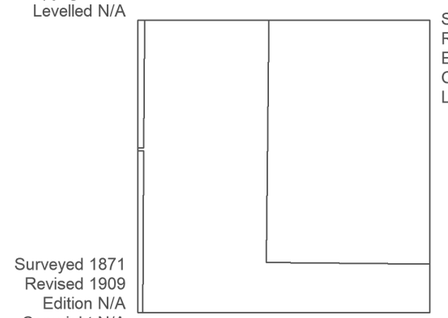
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Scale: 1:10,560

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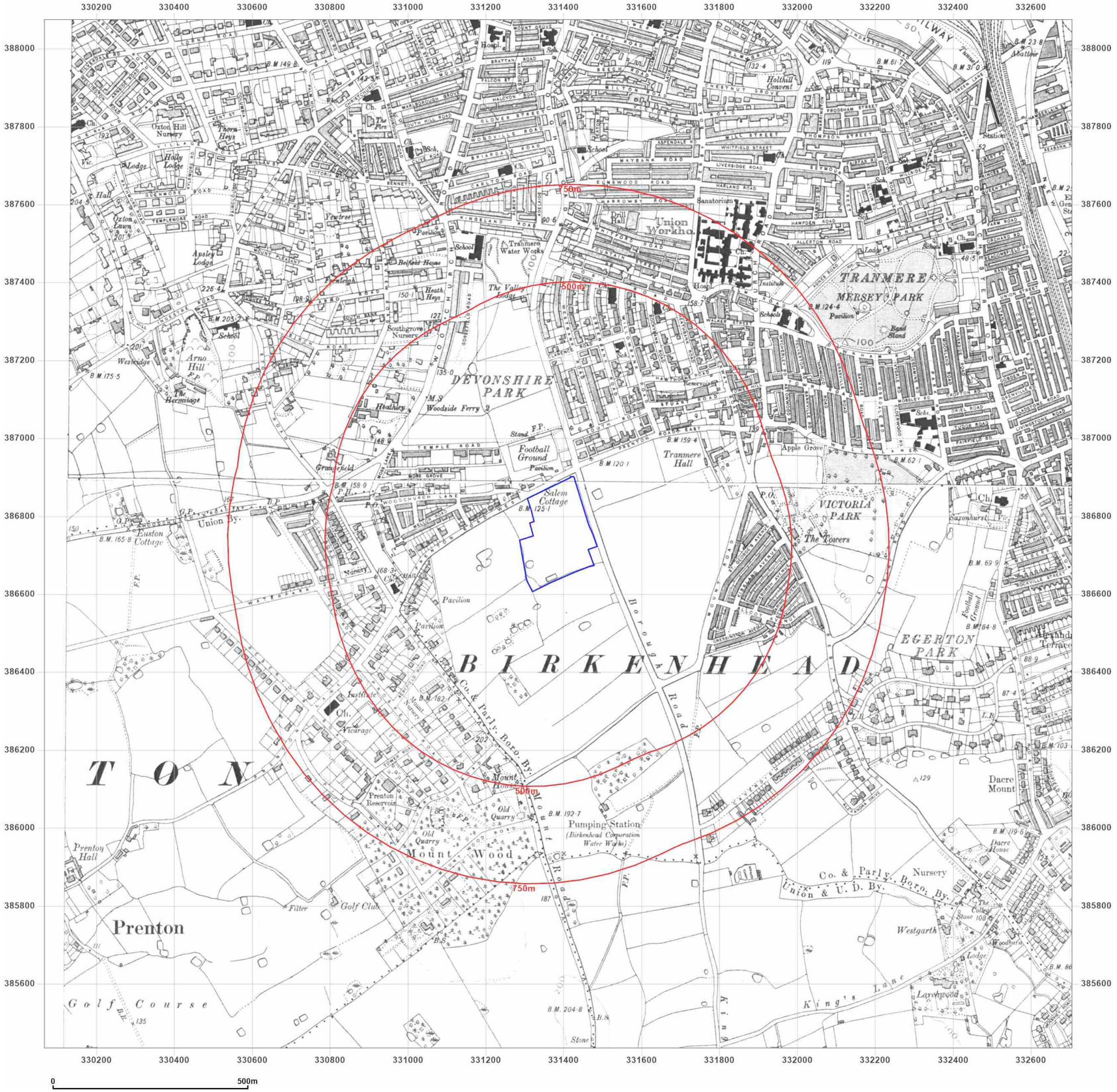
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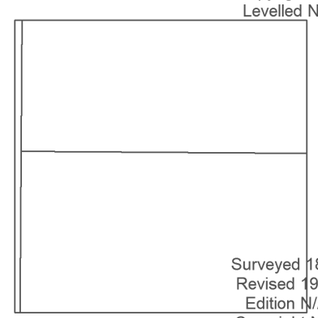
Map date: **1909**

Scale: 1:10,560

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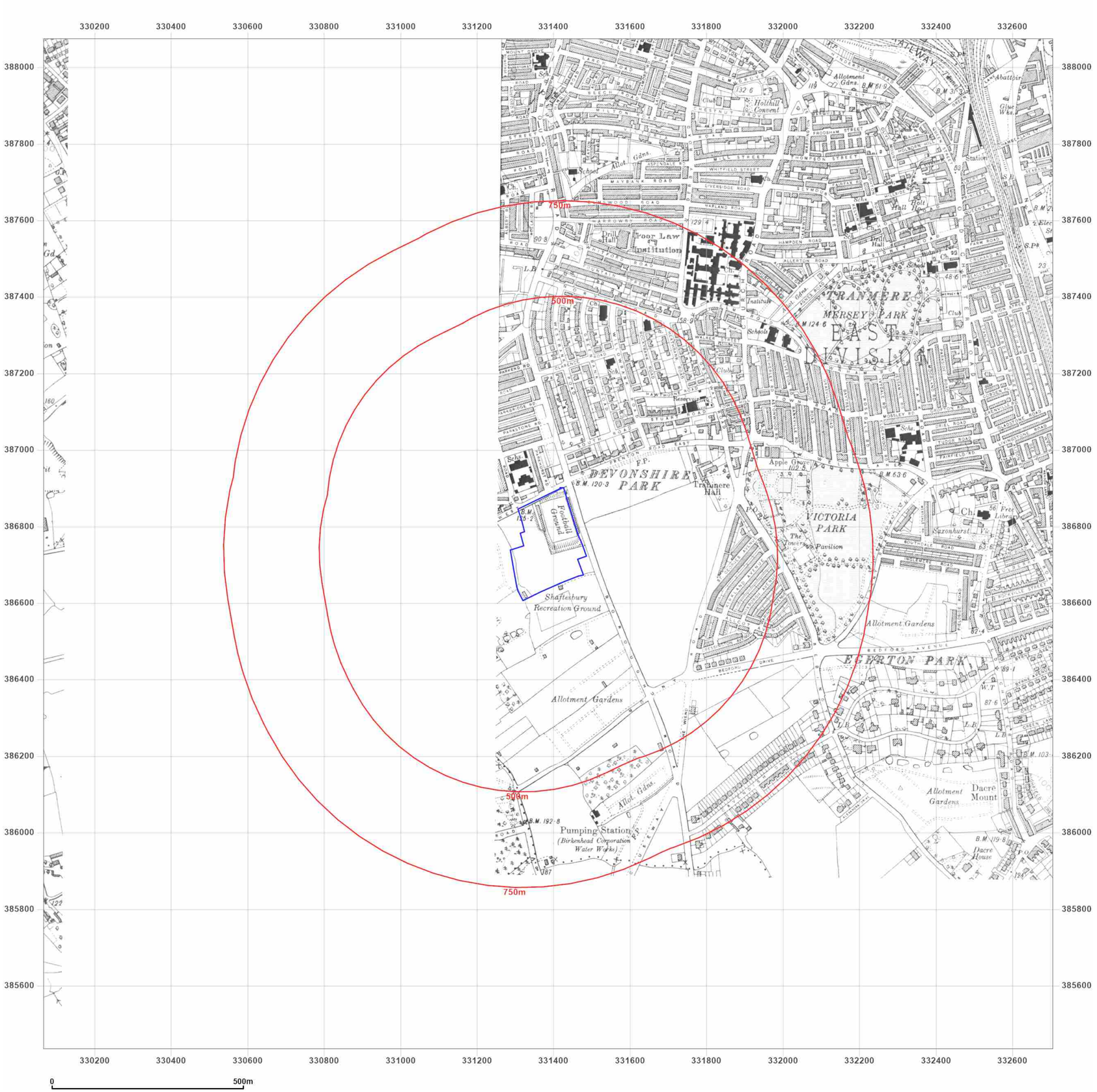
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Map Name: County Series

Map date: **1924-1925**

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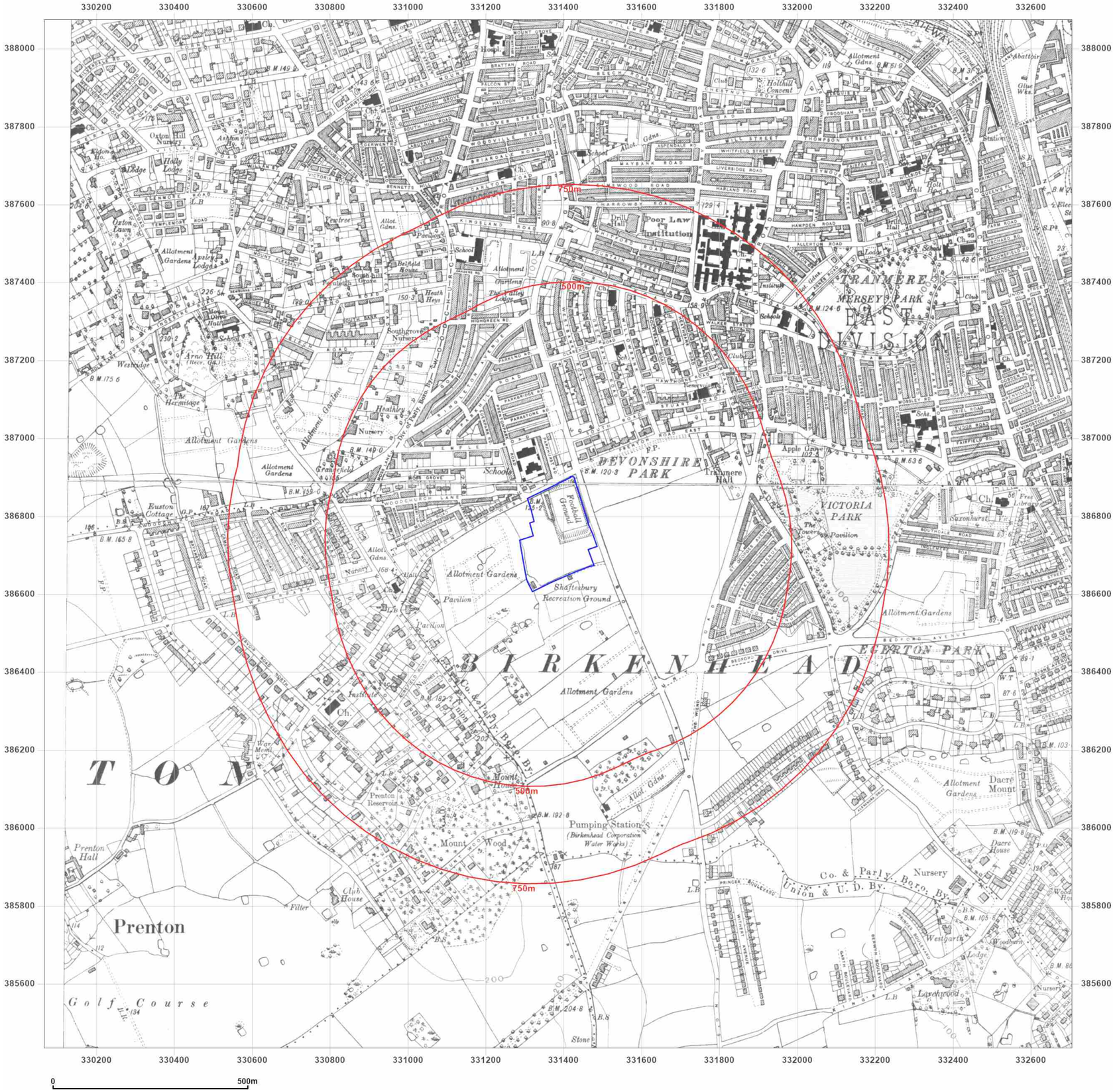
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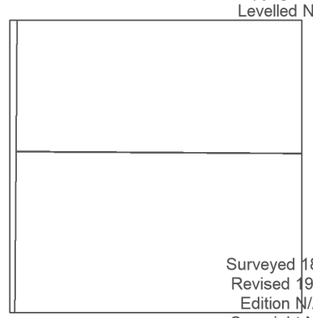
Map date: **1925**

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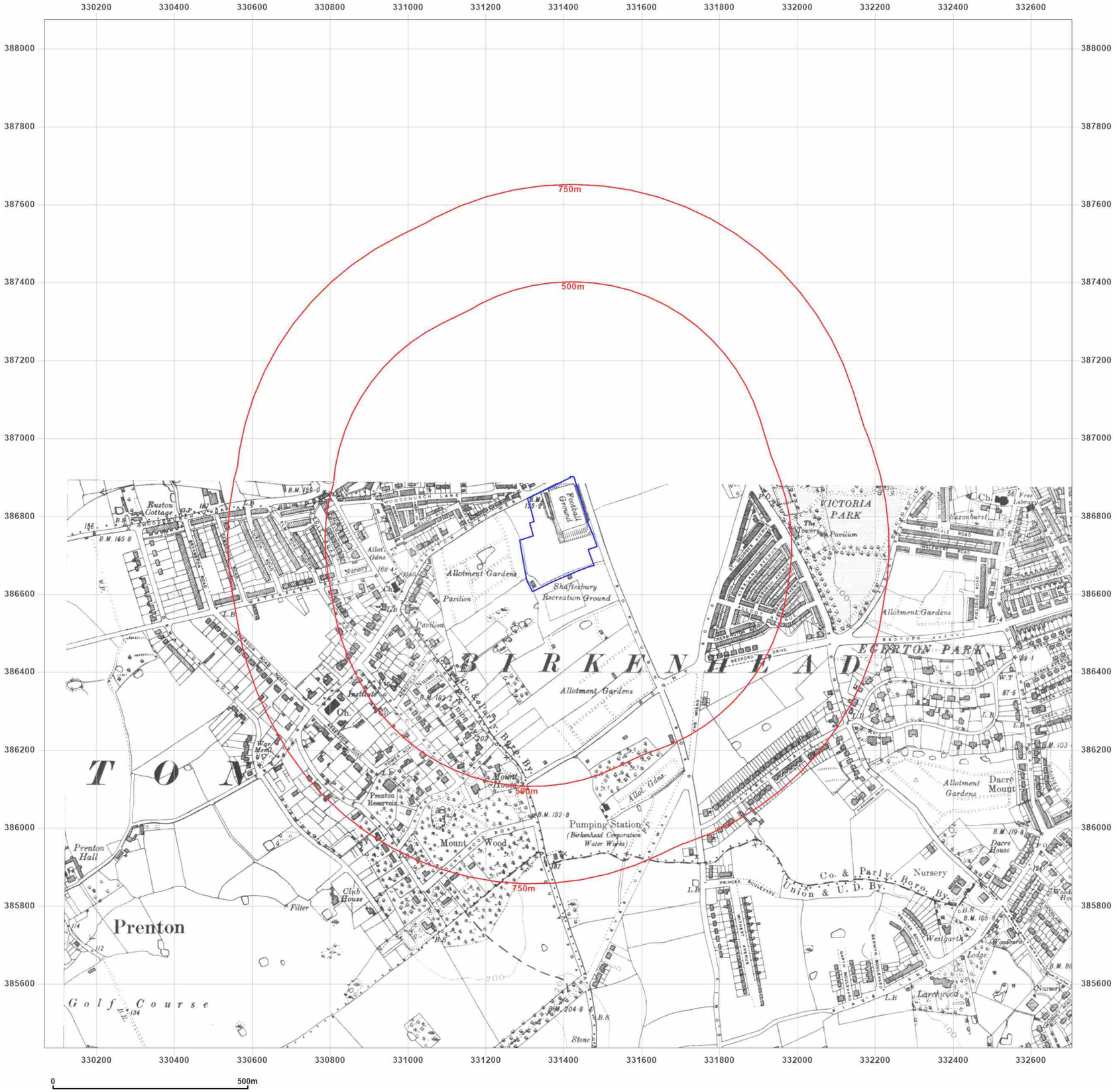
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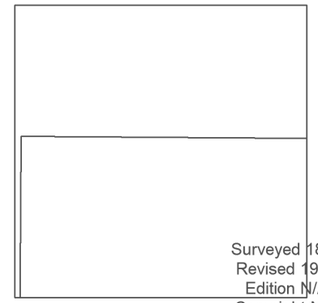
Map Name: County Series

Map date: **1925**

Scale: 1:10,560

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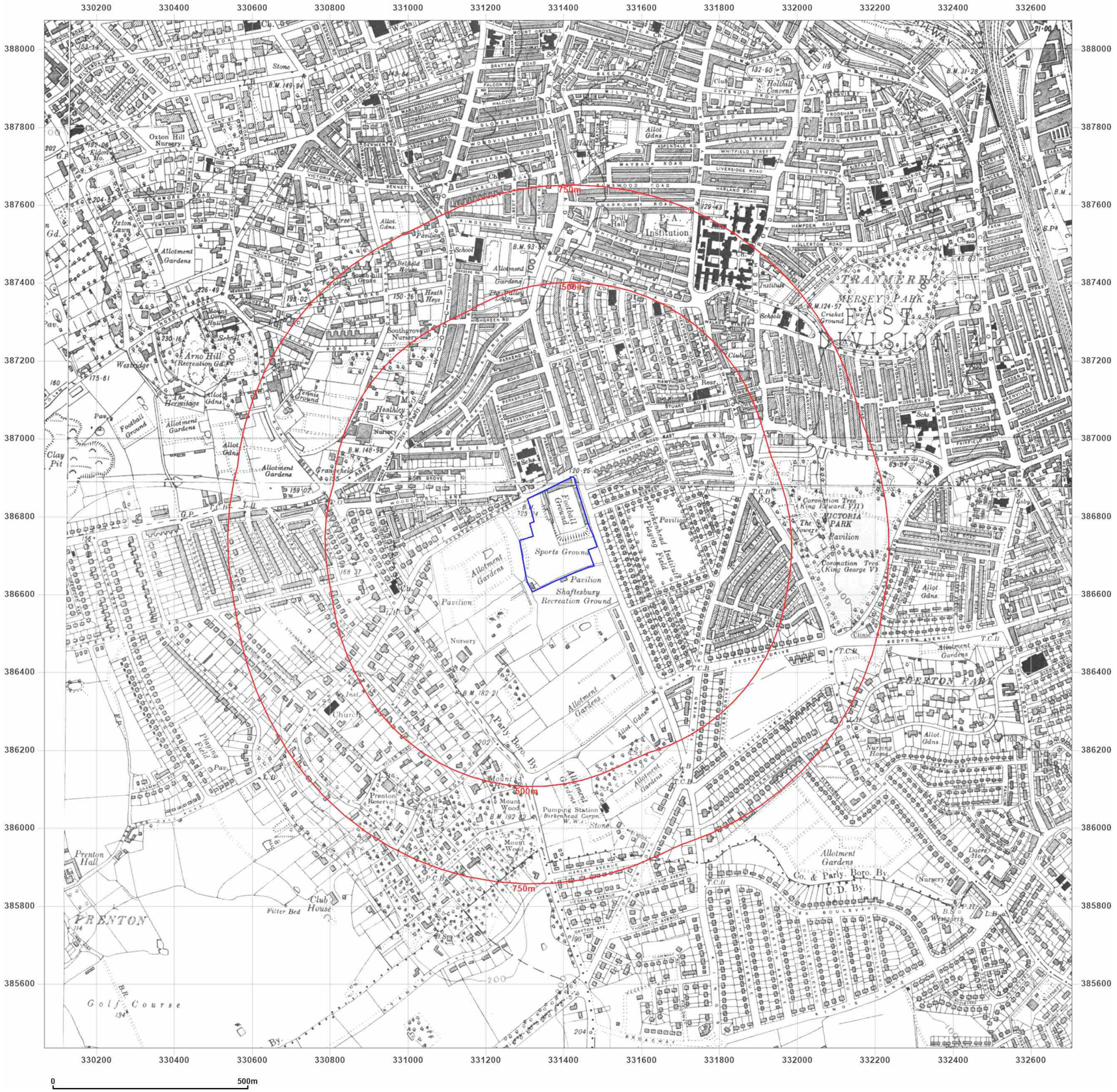
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Grid Ref: 331385, 386754

Map Name: County Series

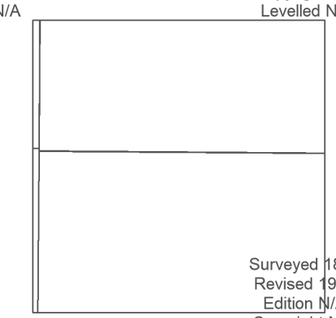
Map date: **1936-1938**

Scale: 1:10,560

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Grid Ref: 331385, 386754

Map Name: County Series

Map date: **1935-1938**

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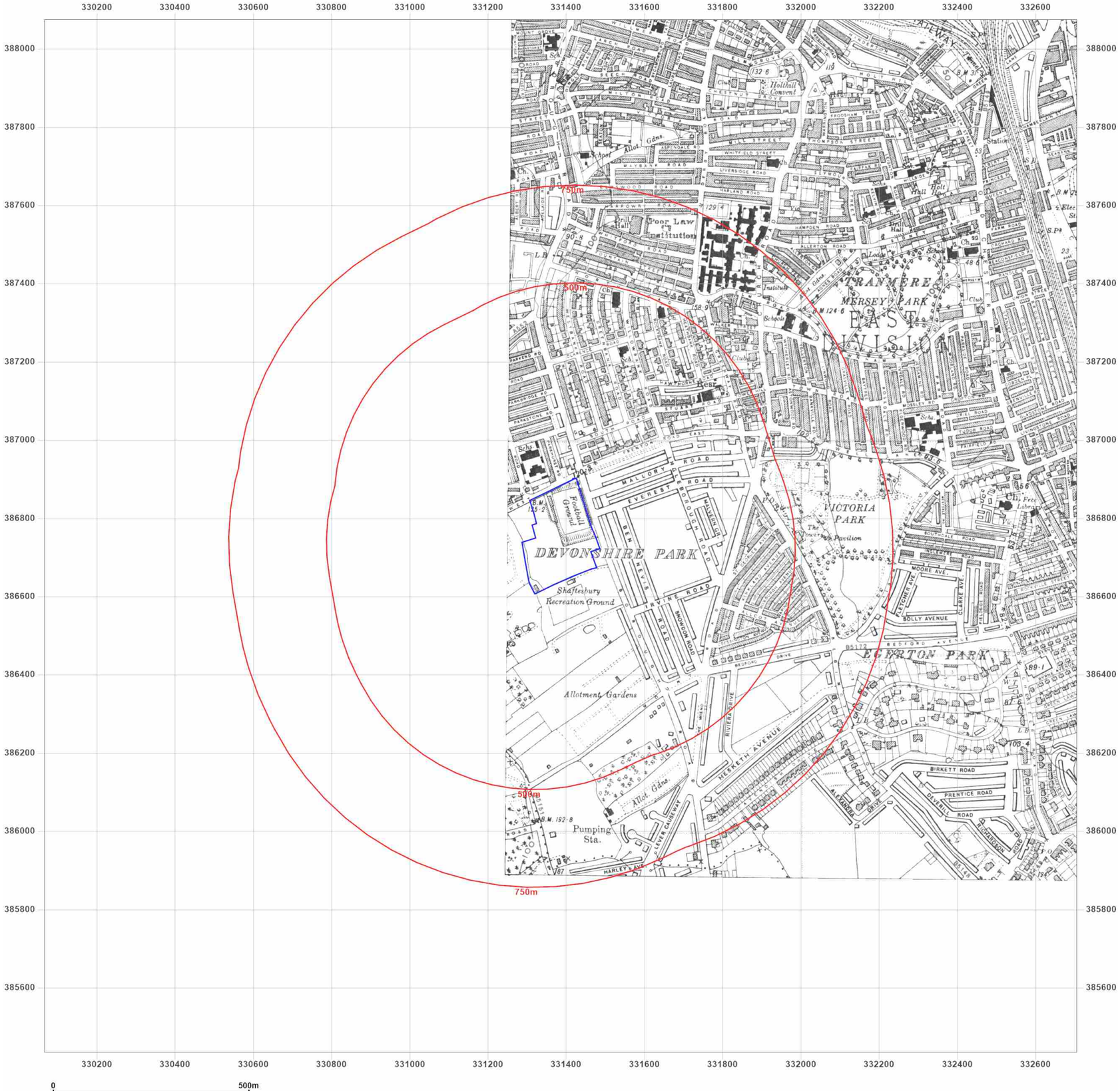
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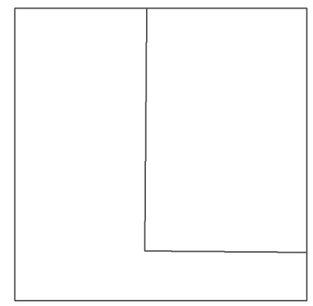
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Map Name: County Series
Map date: **1938**
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Grid Ref: 331385, 386754

Map Name: Provisional

Map date: **1954**

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Map Name: Provisional

Map date: **1956**

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Site Details:

Tranmere Rovers F C, Prenton Park Stadium Prenton Road West, Birkenhead, Prenton, CH42 9PY

Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: Provisional

Map date: **1966**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1966
Revised 1966
Edition N/A
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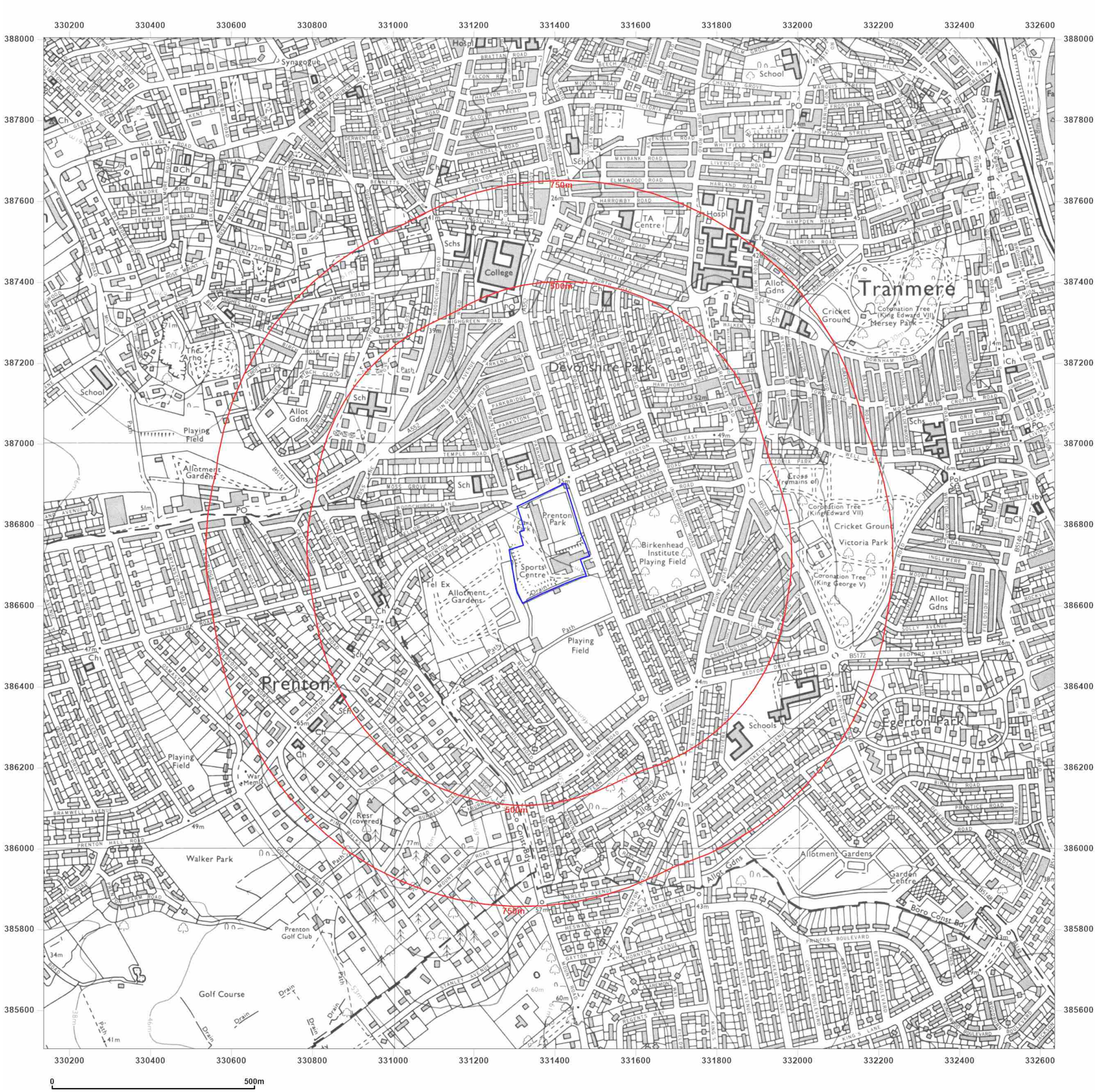
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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

Map date: **1982**

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Printed at: 1:10,000

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Surveyed 1978
Revised 1982
Edition N/A
Copyright 1982
Levelled 1955

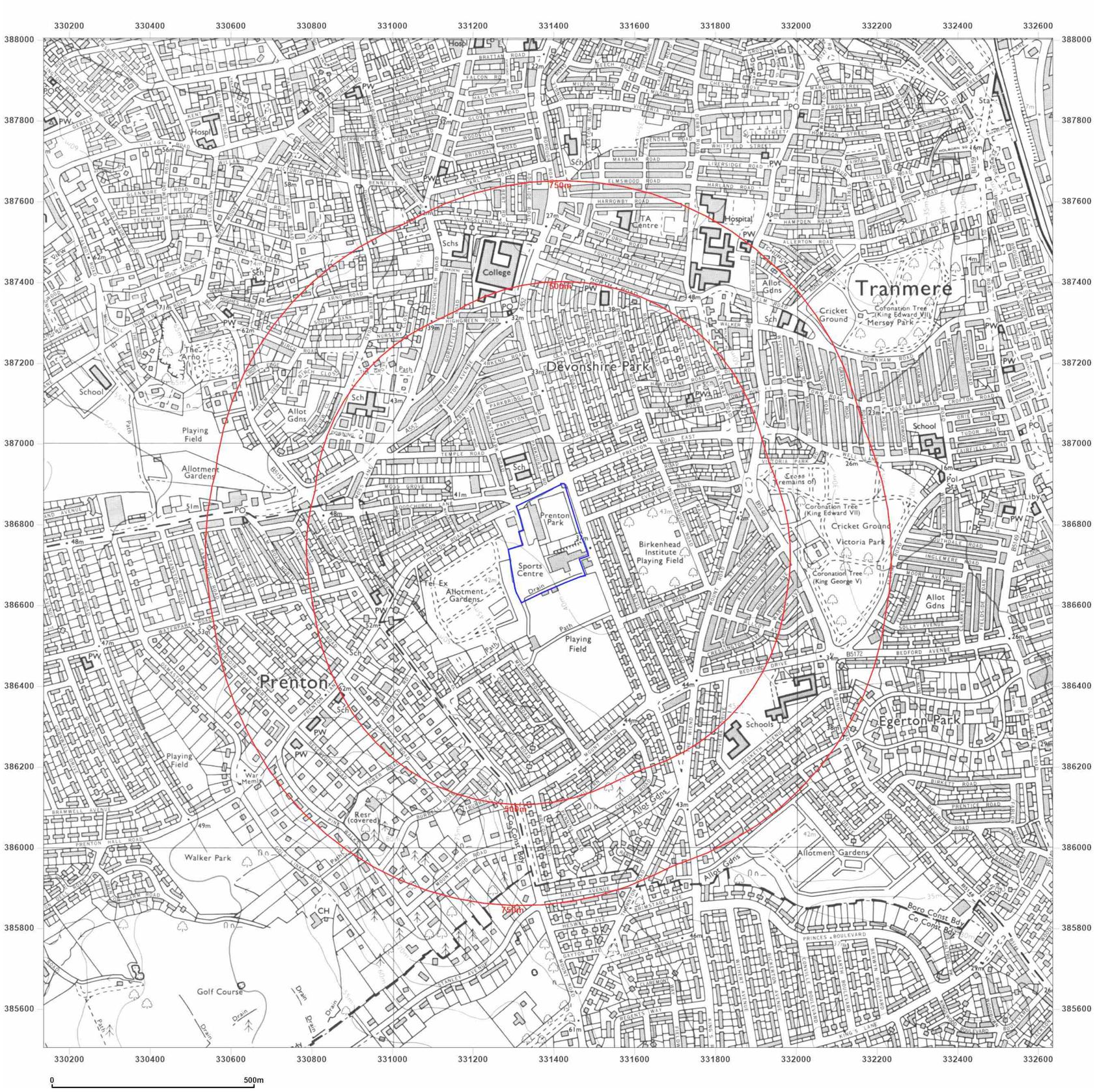
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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

Map date: **1991**

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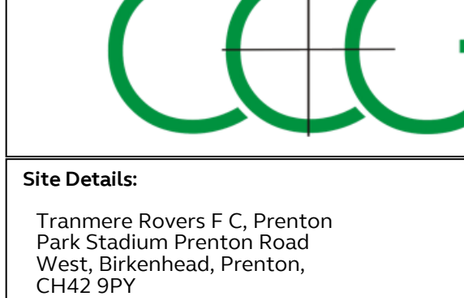
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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

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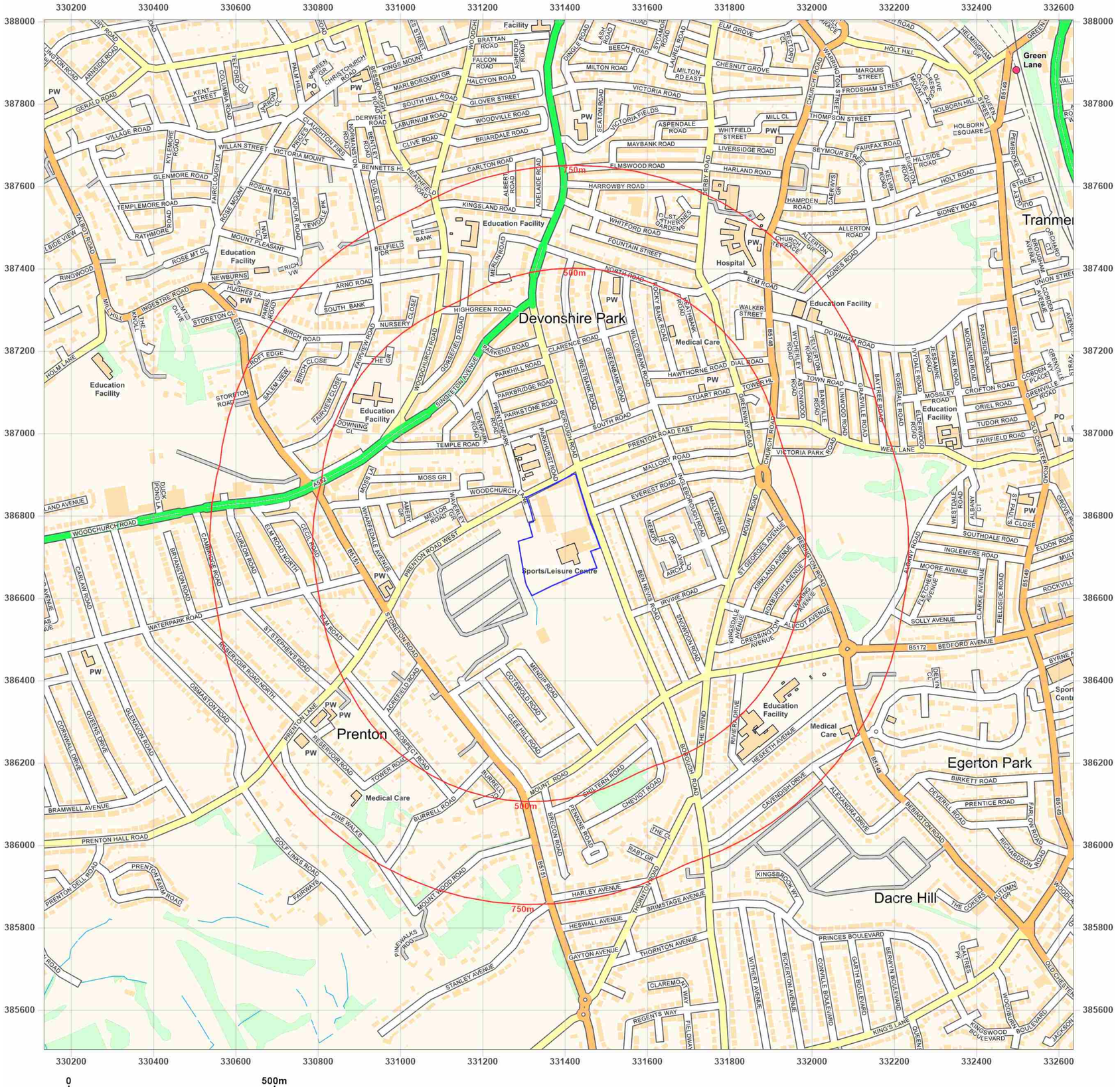
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Client Ref: 4165
Report Ref: CMAPS-AAG-989384-4165-090921HIS
Grid Ref: 331385, 386754

Map Name: National Grid

Map date: **2021**

Scale: 1:10,000

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APPENDIX K: CURRENT GUIDANCE & LEGISLATIONS

CURRENT CONTAMINATED LAND LEGISLATION / GUIDANCE & ENVIRONMENTAL RISK ASSESSMENT METHODOLOGY

LEGISLATION OVERVIEW

This report includes hazard identification and risk assessment in line with the risk-based methods referred to in relevant UK legislation and guidance. Government environmental policy is based upon a "suitable for use approach". When considering the current use of land, Part IIA of the Environment Protection Act 1990 (EPA 1990) provides the regulatory regime, which was introduced by Section 57 of the Environment Act 1995, which came into force in England on 1 April 2000. The main objective of introducing the Part IIA regime is to provide an improved system for the identification and remediation of land where contamination is causing unacceptable risks to human health or the wider environment given the current use and circumstances of the land.

Part IIA provides a statutory definition of contaminated land under Section 78A(2) as:

"any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances in, on, or under the land, that:

(a) Significant harm is being caused or there is a significant possibility of such harm being caused;
or
(b) Pollution of controlled waters is being, or is likely to be, caused."

Part IIA provides a statutory definition of the pollution of controlled waters under Section 78A(9) as:

*"the entry into controlled waters of **any** poisonous, noxious or polluting matter or **any** solid waste matter"*.

In order to assist in establishing if there is a "significant possibility of significant harm" there must be a "significant pollutant linkage" for potential harm to exist. That means there must be a source(s) of contamination, sensitive receptors present and a connection or pathway between the two. This combination of source-pathway-receptor is termed a "pollutant linkage or SPR linkage."

Part IIA of The Environmental Protection Act 1990 is supported by a substantial quantity of guidance and other Regulations, especially DEFRA Circular 01/2006 Contaminated Land (this replaces DETR Circular 02/2000). Part IIA defines the duties of Local Authorities in dealing with it. With the exception of situations of very high pollution risk, Part IIA places contaminated land responsibility on thee planning and redevelopment process. In situations where there is very high pollution risk direct action from the Local Authority is usually necessary. Planning Policy Statement 23 (PPS23) provides guidance on the planning process and requires that sites which have been developed shall not be capable of being determined "contaminated land" under Part IIA.

The criteria for assessing levels of pollutants and hence determining whether a site represents a hazard are based on a range of techniques, models and guidance. Within this context it is relevant to note that Government objectives are:

(a) to identify and remove unacceptable risks to human health and the environment;
(b) to seek to bring damaged land back into beneficial use;
(c) to seek to ensure that the cost burdens faced by individuals, companies and society as a whole are proportionate, manageable and economically sustainable.

These three objectives underlie the "suitable for use" approach to remediation of contaminated land. The "suitable for use" approach focuses on the risks caused by land contamination. The approach recognises that the risks presented by any given level of contamination will vary greatly according to the use of the land and a wide range of other factors, such as the underlying geology of the site. Risks therefore should be assessed on a site-by-site basis.

The "suitable for use" approach then consists of three elements:

(a) ensuring that land is suitable for its current use - in other words, identifying any land where contamination is causing unacceptable risks to human health and the environment, assessed on the basis of the current use and circumstances of the land, and returning such land to a condition where such risks no longer arise; the contaminated land regime provides the regulatory mechanisms to achieve this;

(b) ensuring that land is made suitable for any new use, as planning permission is given for that new use - in other words, assessing the potential risks from contamination, on the basis of the proposed future use and circumstances, before official permission is given for the development and, where necessary to avoid unacceptable risks to human health and the environment, remediating the land before the new use commences; this is the role of the town and country planning and building control regimes; and

(c) limiting requirements for remediation to the work necessary to prevent unacceptable risks to human health or the environment in relation to the current use or future use of the land for which planning permission is being sought - in other words, recognising that the risks from contaminated land can be satisfactory assessed only in the context of specific uses of the land (whether current or proposed), and that any attempt to guess what might be needed at some time in the future for other uses is likely to result either in premature work (thereby running the risk of distorting social, economic and environmental priorities) or in unnecessary work (thereby wasting resources).

The mere presence of pollutants does not therefore necessarily warrant action, and consideration must be given to the scale of risk involved for the current and proposed end use of the site.

RISK ASSESSMENT METHODOLOGY

Current practice recommends that the determination of potential liabilities that could arise from land contamination be carried out using the process of risk assessment, whereby "risk" is defined as:

"(a) The probability, or frequency, or occurrence of a defined hazard; and
(b) The magnitude (including the seriousness) of the consequences."

The UK's approach to the assessment of environmental risk is set out in by the Department of the Environment (2000) publication "A Guide to Risk Assessment and Risk Management for Environmental Protection." This established an iterative, systematic staged process which comprises:

(a) Hazard identification
(b) Hazard assessment
(c) Risk estimation
(d) Risk evaluation
(e) Risk Assessment

At each stage during the investigation process the above steps are repeated as more detailed information becomes available for the site.

CLR11- 'Model Procedures for the Management of Land Contamination', a document published by the Department for Environment, Food and Rural Affairs (DEFRA) and the Environment Agency (EA) outlines a tiered approach to the assessment of risks posed by contaminated land, as summarised hereunder:

Tier 1: Preliminary Risk Assessment

A Preliminary Risk Assessment is usually undertaken as part of a desk study, outlines potential risks posed by potential contamination to all receptors by defining plausible "pollution linkages" and developing a preliminary conceptual model (PCM). The purpose of this model is to define all possible complete pollution linkages, where the requisite source – pathway – target elements are present, and these elements being defined as:

- a contaminant (source) is a hazardous substance or agent, present at levels that have the potential to cause harm or damage a receptor
- a pathway is the means by or through which a contaminant comes into contact with, or otherwise affects, the receptor
- a receptor (target) is an entity (human being, aquatic environment, flora and fauna etc) that is vulnerable to the adverse effects of the contaminant

This relationship is termed a "pollution linkage". It should be recognised that for a health or environmental risk to exist, all three elements of the relationship or linkage must be present, i.e.

- if there is no contaminant, or contaminant present at levels below those considered to be harmful or damaging to a receptor, then there can be no adverse effect on a receptor
- if there is no receptor present that can be adversely affected by a contaminant, no harm or damage can arise
- even where both a contaminant and a receptor are present, no harm or damage will occur if there is no pathway by or through which a linkage between the two can be established

The absence of one or more of each component (source, pathway, receptor) would prevent a pollutant linkage being established and there would be no significant environmental risk.

The PCM is subject to continual refinement as additional data becomes available. As part of a Phase I Investigation (Desk Study and site walk over) a PCM is formed. Based on the PCM, potential pollutant linkages can be assessed. If the PCM and hazard assessment indicate that a pollution linkage is not of significance then no further assessment or action is required due to this linkage. For each significant and possible linkage a risk assessment is carried out. The linkages which potentially pose significant risks may require a variety of responses ranging from immediate remedial action or risk management or, more commonly, further investigation and risk assessment. This next stage is usually termed a Phase II Main Site Investigation and should provide additional data to allow refinement of the PCM and assess the level of risk from each pollutant linkage. Risk assessment will usually include Tier 2 Generic Quantitative Risk Assessment and / or, if necessary, a Tier 3 Detailed Quantitative Risk Assessment.

Tier 2: Generic Quantitative Risk Assessment (GQRA)

GQRA requires an intrusive investigation in order to characterise the site assisting in the re-assessment of the source-pathway receptor linkage. The conceptual model should be refined accordingly.

Upon completion of an intrusive investigation a it must be decided whether Generic Assessment Criteria (GAC) are suitable for assessing the risk posed by potential contaminantion at the site. If GAC are deemed unacceptable for risk assessment purposes or cannot be developed a Tier 3 Detailed Quantitative Risk Assessment (DQRA) is required.

If GQRA reveals that unnacceptable risks are not present then no further action is required. If GQRA identifies a possibility of risk, a decision must be made whether further work is required or necessary for the purposes of risk assessment. If further risk assessment is is deemed not suitable not required an Options Appraisal should be undertaken. If further risk assessment is required, the scope nature of further risk assessment must be decided – it is possible that a Tier 3 DQRA will be undertaken in this scenario.

Where the Environment Agency have published an SGV for a contaminant, this will be used in lieu, if the SGV is suitable for the subject site, of the GAC derived by ***CC GEOTECHNICAL LTD.*** For contaminants where an SGV has not been published

and a GAC has been published by LQM, then this GAC will be used. In house derived GAC's will only be used for contaminants where there is no SGV or LQM GAC.

Tier 3: Detailed Quantitative Risk Assessment (DQRA)
DQRA is used when pollutant linkages require further assessment. DQRA is often undertaken for pollutant linkages where GAC are unavailable or inappropriate for or more conservative than the actual circumstances of the site. Site specific data is used to create Site Specific Assessment Criteria (SSAC) and enable a more accurate assessment of the risks. Further investigation may or may not be required to formulate SSAC depending on the site specific conditions and information alrerady obtained.

If DQRA reveals that unnacceptable risks are not present then no further action is required. If DQRA identifies a possibility of risk, a decision must be made whether further work is required or necessary for the purposes of risk assessment. If further risk assessment is is deemed not suitable not required an Options Appraisal should be undertaken. If further risk assessment is required, the scope and nature of further risk assessment must be decided at this point.

NOTE: A Tier 1 Preliminary Risk Assessment is undertaken as part of a Desk Study Report and a Preliminary Conceptual Model is devloped for all pollutant linkages. However, the methodologies for assessing the risks to human health, risks to controlled waters and risk posed by ground gas using quantative techniques vary considerably, therefore GQRA and DQRA for human health, controlled waters and ground gas must be undertaken seperately. The risk assessment methodologies where quantative assessment is used for risks to human health, risks to controlled waters and risks posed by ground gas, if relevant, are described hereunder.

BACKGROUND INFROMATION, CURRENT GUIDANCE AND RISK ASSESSMENT METHODOLOGY FOR RISKS POSED TO HUMAN HEALTH

Background
In March 2002, the Department for Environment, Food and Rural Affairs (DEFRA) and the EA published the Contaminated Land Exposure Assessment (CLEA) Model and a series of related reports. These were designed to provide a scientifically based framework for the assessment of chronic risks to human health from contaminated land. These reports (CLR7-10) together with associated "SGV" documents have since been withdrawn (August 2008) and the following documents have been published as revised guidance to the CLEA assessment:

- Environment Agency : 2008: Updated Technical Background to the CLEA model Science Report SC050021/SR3
- Environment Agency : 2008: Human Health Toxicological Assessment of Contaminants in Soil SC050021/SR2

Additional guidance on statistical assessment replacing CLR 7 is provided in:

- CL:AIRE :2008 Guidance on Comparing Data With a Critical Concentration

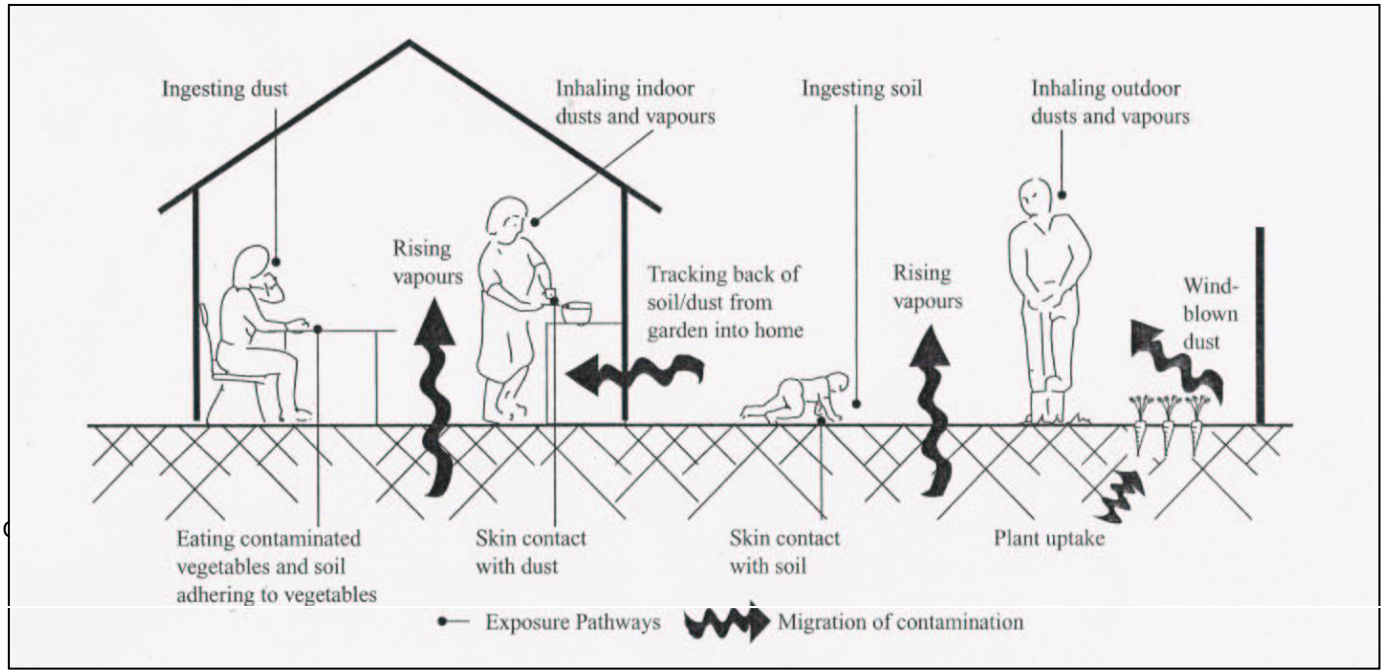
Other guidance/software used in spatial / statistical assessment is provided in:

- USEPA 2006: Data Quality Assessment: Statistical Methods for Practitioners
- Spatial Analysis and Decision Assistance (SADA) – The University of Tennessee

A different approach to the statistical appraisal of data is required depending on whether the assessment of risk is to assess whether land is Contaminated Land in accordance with regulations, or whether the assessment is to determine whether the site is suitable for new development in according with Planning guidance. This is discussed further in CL:AIRE :2008 "Guidance on Comparing Data With a Critical Concentration".

A program for the derivation of GAC`s based on the above guidance is provided by the Environment Agency and is entitled "CLEA Software Version 1.06".

The CLEA model has been developed to calculate an estimated tolerable daily soil intake (TDSI) for site users given a set 'default' exposure pathways. Ten human exposure pathways are covered in the CLEA model as presented below:



Ingestion
- ingestion of outdoor soil
- ingestion of indoor dust
- ingestion of home grown produce
- ingestion of soil attached to home grown produce

Dermal Contact
- dermal contact with outdoor soil
- dermal contact with indoor dust

Inhalation
- inhalation of outdoor dust
- inhalation of indoor dust
- inhalation of outdoor soil vapour
- inhalation of indoor soil vapour

It should be noted that there are other potential exposure pathways on some sites not included in the CLEA model e.g. certain organic compounds can pass through plastic water pipes into drinking water supply.

Where contaminated water is present at a depth less than 2.00mbgl and there is a potential risk of inhalation of vapours (only when volatile compounds are present) the risk from inhalation of vapours from soil water will be assessed using a UK compliant version of BP Risc v4.02.

The presence and/or significance of each of the above exposure pathways are dependent on the type of land use being considered and the nature of the contaminant under scrutiny. Accordingly, the CLEA model considers for principle 'default' land use types and makes a series of 'default' assumptions with regard to human exposure frequency, duration and critical human target groups for each land use considered:

- residential
- allotments
- commercial / industrial land use

The above land use categories defined in the CLEA are detailed below:

Residential: This generic scenario assumes a typical residential property consisting of a two-storey house built on a ground-bearing slab with a private garden consisting of lawn, flowerbeds, and a small fruit and vegetable patch. The occupants are assumed to be parents with young children, who make regular use of the garden area.

Allotments: This generic scenario assumes a plot of open space (about 250 m2), commonly made available by the local authority to tenants to grow fruit and vegetables for their own consumption. There are usually several plots to a site and the overall site area may cover more than a hectare. The tenants are assumed to be parents or grandparents and that young children make occasional accompanied visits to the plot.

Commercial/Industrial: There are many different kinds of workplace and work-related activities. This generic scenario assumes a typical commercial or light industrial property consisting of a threestorey building at which employees spend most time indoors and are involved in officebased or relatively light physical work.

Human Health Risk Assessment Methodolgy
Assessment of risk for the protection of human health is undertaken using the methodology as outlined previously, and summarised hereunder:

- Tier 1 Preliminary Risk Assessmnent
- Tier 2 Generic Quantitative Risk Assessment
- Tier 3 Detailed Quantitative Risk Assessment

The Tier 1 Preliminary Risk Assessment is undertaken as part of the desk study report and includes the development of a Preliminary Conceptuel Model. Tier 2 and Tier 3 Quantitative Risk Assessments are undertaken in order to develop and refine the Preliminary Conceptual Model aiding a more detailed assessment of the risk posed by contaminants revelaed by site investigation and soil / soil water chemical analyses.

The methods used by ***CC GEOTECHNICAL LTD*** to derive assessment criteria, to statistically analyse chemical data and to compare chemical data to the derived assessment criteria are discussed herunder.

Derivation of Generic Assessment Criteria (GAC) and Site Specific Assessment Criteria (SSAC)
GAC`s are derived on the basis of the proposed land use and the associated applicable exposure pathways. It should be noted that there are difficulties in establishing soil concentrations of contaminants beyond which risks from exposure to these contaminants would be 'unacceptable' and the GAC value does not necessarily equate to the level for "significant possibility of significant harm" as defined in Part IIA of The Environmental Protection Act (1990) to determine whether land is "contaminated." This ultimately requires detailed 'toxicological' information of the health effects of individual contaminants and also a scientific judgement on what constitutes an 'unacceptable' risk. The primary purpose of the CLEA derived GAC's are as 'minimal risk thresholds' for the assessment of human health risks in relation to land use.

Minimal risk thresholds calculated using generic input parameters for each of the above land uses are termed Generic Assessment Criteria (GAC) and are used for Generic Quanatative Risk Assessment (GQRA). However, further assessment may be required taking into consideration site specific factors such as the way the land is used, the soil type, the building

characteristics and the exact nature of the receptor, to determine whether there is a significant possibility of risk to human health to site users. Such an assessment is known as a Detailed Quantitative Risk Assessment (DQRA) and the resultant threshold concentrations are known as Site Specific Assessment Criteria (SSAC). Such assessments should be conducted with the agreement of the local authority (or the Environment Agency) since it is the authority that determines whether land is Contaminated Land or whether Planning Permission for a new development may be granted.

For the purposes of this report, assessment criteria have been derived in accordance with current guidance based on the conceptual model for the proposed land use using the CLEA v1.06 software. These criteria are not intended to indicate whether the site may be contaminated land nor do they replace any published soil guideline values. However, the values are intended to provide guidance for the local authority on whether the site may be considered uncontaminated. If, based on the site's proposed future use, the site would be considered by the local authority to be uncontaminated and therefore, on the basis of soil concentrations, fit for purpose, then no further risk assessment based on soil concentrations and the risk to human health would be necessary. However, should these criteria be exceeded or the conceptual site model vary from the model used in the risk assessment to derive these values then the risk assessment should be updated accordingly.

For contaminants routinely analysed where inhalation is a significant pathway (naphthalene, phenanthrene, Aromatic EC5-EC7, Aromatic EC7-EC8, Aromatic EC8-EC10, Aromatci EC10-EC12, Aromatic EC12-EC16, Aliphatic EC5-EC6, Aliphatic EC8_EC10, Aliphatic EC10-EC12, Aliphatic EC12-EC16), plots of the GAC as a function of Soil Organic Matter (SOM) are used to determine if they pose a potential risk to human health, which are presented hereunder. Where there is an exceedance further assessment may be undertaken.

Statistical Assessment of Soil Contamination Data & Comparison of Contamination Data to Threshold Values
In any site investigation only a small fraction of the soil on the site is analysed. Therefore the mean derived from the contamination data for a contaminant may not be the same as the true mean for the contaminant distribution on the site. To improve the reliability of any assessment a statistical analyses is undertaken in line with the CL:AIRE document "Guidance on Comparing Soil Contamination Data with a Critical Concentration".

Statistical assessment of soil data is undertaken using programs based on the guidance in the CL:AIRE document or the USEPA software ProUCL v4.0.

Where the number of results in a dataset is less than four, a statistical assessment is not undertaken, and the assessment is performed by comparison of the maximum value(s) with a Health Criteria Value (HCV), such as Generic Assessement Criteria value(s).

For the Planning situation, the regulator needs to check whether the concentration of contaminants is low compared to the HCV. This decision is based on whether there is at least a 95% confidence level that the true mean of the dataset is lower than the HCV.

For the Part IIA scenario the regulator needs to determine whether the concentration of contaminants is greater than the HCV. This decision is based on whether there is at least a 95% confidence level that the true mean of the dataset is higher than the HCV. However, the regulator may proceed with determination if there is just a 51% probability, "on the balance of probabilities".

The Outlier Test used in the statistical assessment may not be able identify separate populations if numerous populations are present. Inorder to ensure that this is not the case a spatial assessment of the data will be undertaken using SADA.

If the screening levels are exceeded then more sophisticated quantitative risk assessment or remedial action may be undertaken. The benefits of undertaking a quantitative risk assessment must be weighed against the likelihood that it will bring about cost savings in the proposed remediation.

BACKGROUND INFORMATION, CURRENT GUIDANCE AND RISK ASSESSMENT METHODOLOGY FOR RISKS POSED TO CONTROLLED WATER

Definition of Controlled Waters
The term 'controlled waters' is defined in Section 104 of the Water Resources Act 1991 as:

"Territorial Waters…which extend seawards for three miles…, coastal waters…, inland freshwaters, waters in any relevant lake or pond or of so much of any relevant river or watercourse as is above the freshwater limit, and ground waters, that is to say, any waters contained in underground strata."

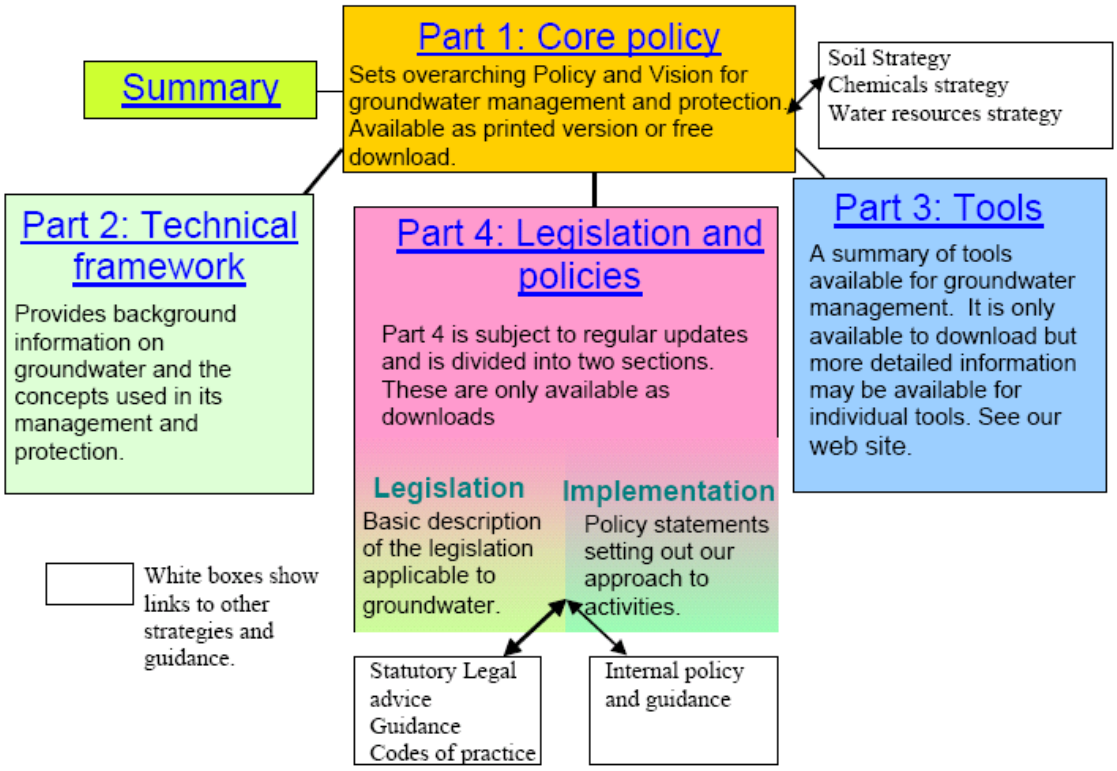
Note that the definition of groundwater under the Water Resources Act 1991 includes all water within underground strata (including soil / pore water in the unsaturated zone). The definition of groundwater under the Groundwater Directive however is limited to water in the saturated zone. For the purposes of Part IIA of the Environmental Protection Act 1990, the Environment Agency recommends that the groundwater within the saturated zone only is considered as the receptor (rather than soil / pore water).

Environment Agency Guidance
Legislation and guidance surrounding the protection of controlled waters in the UK is abundant and can be complex. The Environment Agency's overall position on groundwater is *"To protect and manage groundwater resources for present and future generation in ways that are appropriate for the risks that we identify"* (Groundwater Protection : Policy and Practice GP3, 2006). In brief, the core objectives of the existing legislation serve to enforce this position.

In 1992, the National Rivers Authority published their Policy and Practice for the Protection of Groundwater (PPPG), this document was influential as it provided a focus for key developments such as Source Protection Zones (SPZs) and

Groundwater Vulnerability Maps. The Policy was then revised in 1998, since which there have been substantial changes in legislation, driven by Europe. Key European Directives relating to groundwater include the Groundwater Directive (80/68/EEC) and the Water Framework Directive (2000/60/EC). Aspects of these directives are controlled by primary UK legislation such as the Water Resources Act 1991. Further to legislative changes, gaps identified in the 1998 PPPG required addressing. These changes are reflected in the forthcoming Environment Agency Policy document entitled *Groundwater Protection : Policy and Practice (GP3)*, a draft version of which was available for public consultation (Parts 1 to 3) ending July 2006 with Part 4 issued in March 2008. Part 4 includes a section on key groundwater legislation and the Environment Agency's interpretation of it.

The following gives a breakdown of the structure of the document (taken from the Environment Agency GP3 draft consultation document, 2006)



Controlled Water Risk Assessment Methodology
The risk posed to controlled water is assessed by ***CC GEOTECHNICAL*** in accordance with current guidance as outlined hereunder.

In order for a developer of a potentially contaminated site to fulfil their obligations under the legislation, a site assessment would be required to be undertaken in order to identify any potential risks to controlled waters and to derive suitable clean-up criteria if necessary to ensure the protection of controlled waters. The general approach for Groundwater Protection is detailed further in Part 3 of GP3.

When assessing groundwater impact the Environment Agency advocate the application of their framework methodology "Remedial Targets Methodology – Hydrogeological Risk Assessment for Land Contamination" Environment Agency (2006). The methodology has four levels of assessment as described below:

- **Level 1** considers whether contaminant concentrations in "pore water" in contaminated soil are sufficient to impact on the receptor, ignoring dilution, dispersion and attenuation along the pathway. The "pore water" concentration is determined from:

  i) measured "pore water" concentrations or perched water quality
  ii) soil leaching tests
  iii) theoretical calculations based on soil/water partitioning equations

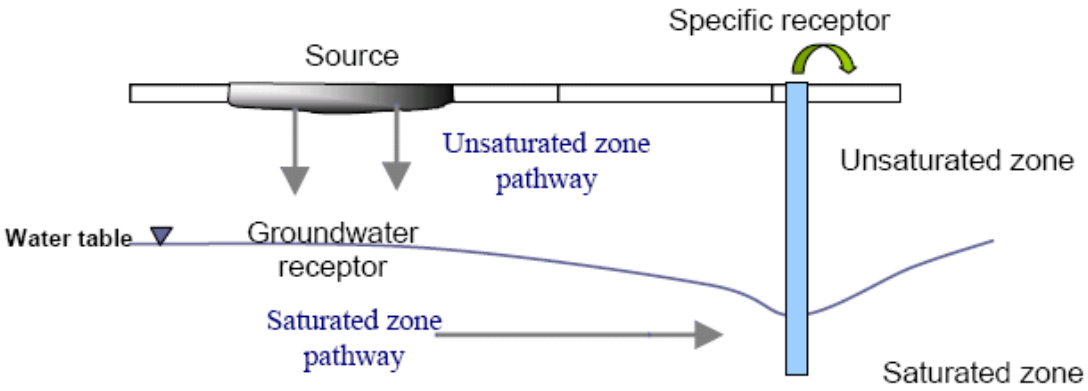
- **Level 2** considers dilution by the receiving groundwater or surface water body and whether this is sufficient to reduce contaminant concentrations to acceptable levels. The remedial target is defined as the target concentration multiplied by a dilution factor (DF).

- **Levels 3 and 4** consider whether natural attenuation (including dispersion, retardation and degradation) of the contaminant as it moves through the unsaturated and saturated zones to the receptor are sufficient to reduce contaminant concentrations to acceptable levels. The remedial target is defined as target concentration multiplied by a dilution factor (DF) and attenuation factor (AF). In **Level 3** simple analytical models are used to calculate the significance of attenuation. The Environment Agency has released a "Remedial targets worksheet v3.1" to carry out basic calculations using a conservative approach up to **Level 3** using basic principles assuming a simple migration of contaminants from the

source zone into the aquifer receptor. **Level 4** assessment uses more sophisticated numerical models, and allows for the introduction of additional geological horizons and is used mainly to determine whether soil contaminants will reach their target within a specified timeframe. Use of such software should only be used once agreement has been obtained from the Environment Agency.

Three main stages apply to any risk assessment of controlled waters, these are:

1. **Risk Screening (Tier 1 Preliminary Risk Assessment):** The understanding of the Conceptual Site Model (CSM) is the key to assessing any site. Using a robust CSM, potential pathways or receptors may be screened out from any further assessment at an early stage. For example if the pathway through the unsaturated zone is blocked by the presence of a significant thickness of low permeability clay. A greater understanding of the CSM is achieved with each tier of risk assessment. An example of a basic CSM is given below (taken from the Environment Agency GP3 draft consultation document, 2006):



2. **Generic Hydrogeological Risk Assessment (EA Remedial Targets Methodology Level 1):** When undertaking the Generic Hydrogeological Risk Assessment (EA Remedial Targets Methodology Tier 1), comparison of chemical analytical results is made with screening criteria. Published values of screening criteria with which chemical test results can be compared are published in the following guidance:

   - Water Supply (Water Quality) Regulations 2000
   - The Private Water Supplies Regulations 1991
   - Environmental Quality Standards for surface waters based on The EC Dangerous Substnaces Directive (76/464/EEC and Daughter Directives)
   - The Surface Waters(Abstraction for Drinking Water Classification) Reguslations 1996
   - World Health Organisation Drinking Water Standards 2004

   Should the Level 1 assessment indicate threshold levels to be exceeded, then there are three alternative ways in which to proceed:

   - To devise suitable remedial solutions
   - To carry out more investigation, sampling and analysis
   - To conduct a site specific Detailed Quantitative Risk Assessment (DQRA) to determine determine if the materials are suitable for thair proposed use, or devise site specific clean-up level

3. **Detailed Quantitative Risk Assessment (EA Remedial Targets Methodology Levels 2 to 4):** The decision to carry out a DQRA will be dependant on the extent and implications of the initial qualitative and generic assessment. The scope of any such assessment will be accurately defined by the outcomes of the previous levels of assessment. The conceptual model will be sufficiently refined by this stage that only certain contaminants of concern, certain pathways and certain receptors will require further assessment, the remainder having been screened out.

   Additional site specific data is normally required for this stage of assessment, as explained above, more processes that are capable of affecting contaminant concentrations are considered (such as dilution and attenuation).

   Remediation criteria, if derived, will therefore be specific to each site and will be based on a detailed assessment of the potential impact at the identified receptor or *compliance point*. A greater level of confidence can be placed on the predicted impact on the compliance point following a DQRA.

BACKGROUND INFORMATION, CURRENT GUIDANCE AND RISK ASSESSMENT METHODOLOGY FOR RISKS POSED BY GROUND GAS

Background

Origin of Ground and Landfill Gases

When carrying out a ground gas risk assessment, the origin or source of the gases is important as potential risks will vary depending on the source. This Appendix relates to the risk of the two main ground gases of concern; methane and carbon dioxide, and does not apply to other ground gases (e.g. radon or vapours from hydrocarbon spills). Methane and carbon dioxide are major constituents of landfill gas but can also occur from a variety of anthropogenic and natural sources, as summarised in Table 5 below:

Gas	Source	Comments
Landfill Gas	Anaerobic decomposition of degradable waste within landfill sites. Typically 60% methane and 40% carbon dioxide during methanogenic phase.	Composition varies over time, particularly in early stages. Contains a range of minor constituents (particularly carbon monoxide and hydrogen sulphide).
Landfill Associated Gases	- Anaerobic degradation of leachate external to the site; - Degassing of dissolved gases in groundwater; - Evolution of gases following interaction between leachate and groundwater	Can result in secondary (external) production of methane or carbon dioxide.
Made Ground	Anaerobic degradation of organic components	Very variable depending on source
Sewer Gas, Cess Pits	Anaerobic degradation of organic components of sewage producing methane and carbon dioxide.	Often characterised by hydrogen sulphide odour.
Mains Gas	Leakage from underground pipework or storage tanks. Mainly methane but often contains higher alkanes.	An odouriser is added to permit detection of leaks. Typically 90% CH_4, but 1 to 27% C_2-C_4 alkanes, May also contain other trace gases e.g. CO, helium and CO_2 (from degradation of CH_4 in the ground).
Other Anthropogenic Sources	- Degradation of leaked or spilled hydrocarbons or other industrial chemicals; - Anaerobic degradation of organic contaminants in groundwaters (e.g. silage liquor); - Reactions between monitoring well construction components and environment; - Burial grounds/cemeteries.	Hydrocarbon spillages often have an 'oily' odour. Fuel spillages common – Petrol or Diesel and can contain a wide range of VOC's. Can degrade to produce methane / carbon dioxide.
Alluvium / Marsh / Peat Gas	Anaerobic microbial degradation of organic material (usually waterlogged vegetation / peat). Often associated with the presence of alluvial deposits or dredgings.	
Geogenic Gas	Natural seepages of carbon dioxide and hydrocarbon gases derived from geologic sources such as coal seams and deep oil / gas source formations. Can be present in solution in groundwaters.	Methane most common but can contain carbon dioxide and higher alkanes.
Mine Gases	Various types. Most common is "fire damp" with high methane, produced by the desorption of gas trapped in coal. "Black damp" (Stythe gas) with high carbon dioxide and denser than air. "White damp" is high in carbon monoxide.	Methane most common. Can contain higher alkanes, carbon dioxide and carbon monoxide. Often low in oxygen.
Natural Shallow Ground Gas	Various types - high carbon dioxide formed by subsurface aerobic activity leading to depleted oxygen and elevated carbon dioxide; - chemical degradation of rocks (e.g. carbonates) producing carbon dioxide; - carbon dioxide production in root zone of soils by plants.	Gases can be emitted from ground under falling barometric pressure conditions.

Table 5. Potential Sources of Ground Gases

This Appendix does not provide guidance for the assessment of risk when other gases are present due to 'Other Sources' from the above table (particularly organic compounds such as BTEX and VOC's or for the risk from radon or hydrogen sulphide).

To determine the origin of the gas a range of factors must be considered together, including;

1. Proximity of likely sources
2. Ground conditions (geology, hydrogeology, anthropogenic pathways etc)
3. Properties of gases present including:
   - Chemical composition
   - Physical properties
   - Ratios of components e.g. methane : carbon dioxide
4. Timeframe of activities such as infilling periods, capping works, installation of gas control systems etc

Identification of the originating source may be problematic given that there may be more than one source present and trace gas analysis may be required. Identification of the sources of the gases encountered during monitoring is usually carried out through a process of eliminating the most unlikely potential sources (given the site setting) and selecting those which are most likely.

Hazards Associated with Presence of Methane

Methane gas is combustible and potentially explosive. When the concentration of methane in air is between the limits of 5.0%v/v and 15.0%v/v an explosive mixture is formed. The Lower Explosive Limit (LEL) of methane is 5.0%v/v, which is equivalent to 100% LEL. The 15.0%v/v limit is known as the Upper Explosive Limit (UEL), but concentrations above this level cannot be assumed to represent safe concentrations. Further, the LEL and UEL will vary (up and down) depending upon the proportion of other gases (including oxygen). However, the fact that methane is a colourless, odourless gas means that there

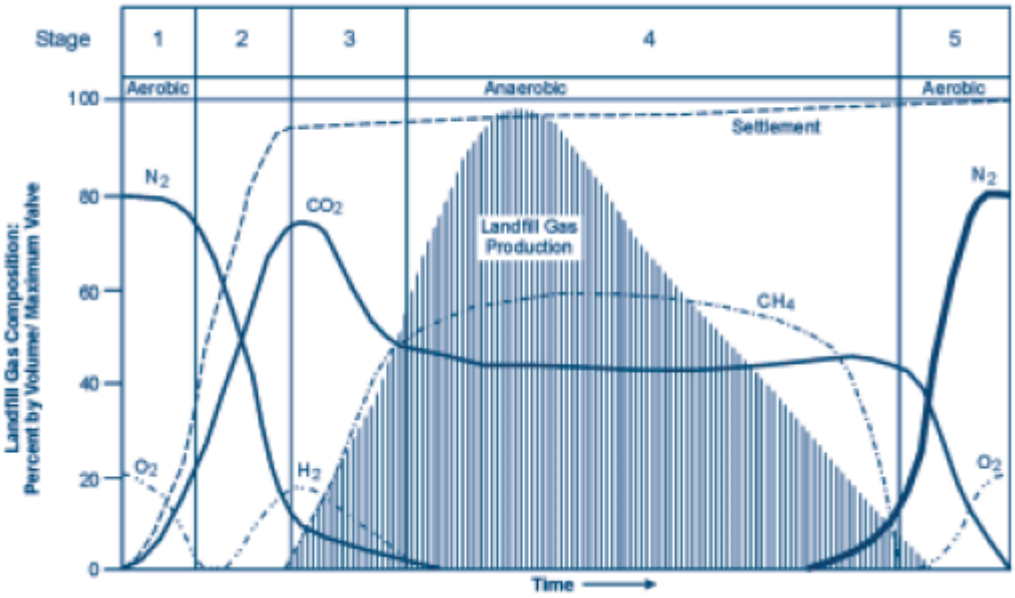
is no simple indicator of the presence of the gas until such a time as explosive limits are reached and an incident occurs. Methane is lighter than air and has a low toxicity. However, at high concentrations it can result in asphyxiation due to oxygen displacement.

Hazards Associated with Presence of Carbon Dioxide

Carbon dioxide is a colourless, odourless gas, which, although non-flammable, is both toxic and an asphyxiant. As carbon dioxide is denser than air, it will collect in low points and depressions. The UK Health & Safety Executive (HSE) has published information relating to concentrations of carbon dioxide that humans may be exposed to, which uses concentrations contained in the Control of Substances Hazardous to Health Regulations 2002 (as amended). These are the Long Term Occupational Exposure Limit (LTOEL, 8 hour period) and the Short Term Occupational Exposure Limit (STOEL, 15 minute period), which are 0.5% and 1.5% carbon dioxide, respectively.

Parameters Influencing the Rate of Ground Gas Production

The figure below is taken from EA guidance document LFTGN 03 illustrates typical ground gas generation curves from biodegradable materials:



The production of methane and carbon dioxide at a landfill site may be expected to be considerable and ongoing. Concentrations of methane will eventually decrease, followed by concentrations of carbon dioxide, but the duration and rate of gas production can vary markedly between sites. Five distinct phases of gas production occur during the process which are, in order of event as marked above, as follows:

1. An aerobic phase involving oxygen depletion and temperature increase through aerobic respiration;
2. The establishment of anaerobic conditions and the evolution of carbon dioxide and hydrogen through acidogenic activity;
3. Commencement of methanogenic activity; the establishment of populations of methanogenic bacteria;
4. A phase of stable methanogenic activity, which may go on for many tens of years;
5. A phase of decreasing methanogenic activity, representing depletion of the organic material and a return to aerobic conditions.

The time scale for the return to the normal ground gas concentrations will be highly variable, depending upon the types and quantities of materials present. In addition, the optimum parameters influencing the rate of decomposition and ground gas production within the ground at a site are as follows:

- High water content with adequate rainfall and water infiltration to provide moisture content between approximately 20 to 26%;
- Conditions that either are or are very close to anaerobic;
- High proportion of biodegradable materials;
- A pH between 6.5 and 8.5, ideally verging slightly on the acidic between pH 6 to 7;
- Temperature between 25°C and 55°C;
- The ratio of the biochemical and chemical oxygen demands (BOD:COD);
- High permeability;
- Small particle size, as finer subsurface materials possess a greater surface area to provide a growing 'face' for the micro-organisms but high fines levels reduces permeability and reduces decomposition rate.

For this reason, it is vital that sources of methane and carbon dioxide are identified prior to the commencement of any work on a construction site, and that the ground gas regime is characterised at the worst temporal conditions a site may experience. From this, a risk assessment is carried out to identify the risk at the site from ground gases so that suitable protection measures can be designed and incorporated into a development to prevent a dangerous build-up of gas occurring.

Factors Influencing the Migration and Behaviour of Ground Gases

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There are many factors that influence the migration of ground gases which can effect the risk from a gassing source:

- driving force – pressure differential along a pathway, diffusion and dissolved in solution;
- meteorological conditions – short term and seasonal conditions including atmospheric pressure changes (e.g. rapidly falling pressure causes gas to expand increasing emission rates), rainfall, frozen ground and thawing, temperature;
- geological and groundwater conditions – these can have the over riding influence on the direction/pathways and quantity of migrating gas;
- anthropogenic influences – man-made pathways include mine shafts, service runs/drains, foundation piles, underground voids/pits/basements, foundation/building design/construction

Current Guidance
Previous versions of Building Regulations Approved Document C provided statutory guidance stating that consideration should be given to appropriate action and / or specific solutions in situations where methane concentration exceeded 1%v/v or carbon dioxide concentrations exceeded 5%v/v. The latest Building Regulations Approved Document C (DoE 2004) no longer endorses this approach and recommends the use of a risk based approach to interpreting a gas monitoring survey. This is in line with current EA guidance for landfill gas (LFTGN 03, 2004) which recommends the use of a structured risk based approach similar to that outlined in CLR 11. On this basis, recent guidance has been produced in 2006 and 2007 with the aim of providing up to date advice in relation to residential and commercial development. The guidance does not address issues associated with gas derived from landfills, for this refer to *"Guidance on the Management of Landfill Gas"* (Environment Agency 2004) for an overview.

Recent guidance relevant to gas assessments for residential and commercial development includes;

- **Wilson *et al.* (CIRIA C665, December 2007) *"Assessing Risks Posed by Hazardous Ground Gases for Buildings."***
  This document provides up to date advice on all aspects of ground gas risk assessment such as investigation, monitoring programmes, data collection and interpretation. The guidance presents separate methodologies for the characterisation of:
  - All development types except low rise housing with gardens (Situation A)
  - Low rise housing with gardens (Situation B)

- **Boyle and Witherington (NHBC / RSK Group, Report 10627-R01(04) January 2007) *"Guidance on the Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present."***
  This document presents the "Traffic Lights System" detailed below and is relevant only for low rise properties (e.g. bungalows and town houses) that have a ventilated sub-floor void (i.e. Situation B as described in CIRIA C665).

- **British Standard (BS 8485, December 2007) *"Code of Practice for the Characterization and Remediation from Ground Gas in Affected Developments"***
  This document provides an overview of gas characterisation and assessment. The Standard is intended to be used by designers of gas protection measures and regulators involved in the assessment of design solutions.

Further guidance, **Wilson and Card (CIEH) *"Ground Gas Handbook for Designers and Regulators"*** providing practical guidance on ground gas assesments and the design and evaluation of protection measures, is expected to be published in March 2009.

Each of these documents continues to highlight the importance of, and give further guidance towards, carrying out a tiered risk-based decision-making process in accord with government policy on dealing with contamination from historic or natural sources and highlight the importance of the Conceptual Model in site characterisation.

Ground Gas Risk Assessment Methodology
Assessment of risk posed by ground gas is undertaken using the methodology as outlined previously, and summarised hereunder:

- Tier 1 Preliminary Risk Assessmnent
- Tier 2 Generic Quantitative Risk Assessment
- Tier 3 Detailed Quantitative Risk Assessment

The methodology used in each of the above assessments with concern to ground gas is discussed hereunder.

<u>Tier 1 Preliminary Risk Assessment</u>
All potential sources of methane and carbon dioxide are identified in the Preliminary Conceptual Model and the generation potential determined. The background information discussed earlier is referred to in order to determine the potential for a source to generate ground gas.

CIRIA C665 provides idealised monitoring frequency / period dependant upon generation potential of gas source and sensitivity of the proposed land use as below:

Idealised Frequency and Period of Monitoring (after Table 5.5a and 5.5b, CIRIA C665)

		Generation Potential of Source				
		Very Low	**Low**	**Moderate**	**High**	**Very High**
Sensitivity of Development	**Low** (Commercial)	4/1	6/2	6/3	12/6	12/12
	Moderate (Flats)	6/2	6/3	9/6	12/12	24/24
	High (Residential with Gardens)	6/3	9/6	12/6	24/12	24/24

Notes
1. First number is the number of readings and the second is the minimum period in months (e.g. 6/2 – six sets of readings over two months).
2. At least two sets of readings must be at low (preferably under 1,000 mb) and falling pressure.

The monitoring programme is decided using the above table prior to the intrusive site investigation. However, if the intrusive investigation reveals that a the potential source is better or worse than anticipated the monitoring programme should be modified accordingly. For example, if the made ground contains no evidence of organic material and comprises entirely granular brick fill, the potential for that made ground to generate ground gas is reduced considerably.

Tier 2 Generic Quantitative Risk Assessment
Generic Quantitiative Risk Assessment is undertaken upon completion of the required gas monitoring period.

All three current guidance documents propose that both ground gas concentrations and flow rates are used to calculate the limiting gas well gas volume flow rates for methane and carbon dioxide, based on the ground gas conditions monitored for during the worse-case temporal conditions. This limiting gas well volume flow rate is termed the Gas Screening Value (GSV, note that this was termed borehole gas volume flow), and is calculated as follows:

$$\textbf{GSV}\ (\text{l/hr}) = \frac{[\text{gas well gas concentration (\%v/v)}] \times [\text{gas well flow rate (l/hr)}]}{100}$$

GSV's are compared to typical max concentrations and limiting gas screening values derived for either Situation A - All development except low rise housing with gardens, or Situation B low rise housing with gardens (NHBC Traffic Light System). Table 8.5 from CIRIA C665 is used for comparison of gas screening values for "Situation A Developments" and is presented hereunder:

Characteristic Situation (CIRIA R149)	**Comparable Partners in Technology gas Regime (see Box 8.2)**	**Risk Classification**	**Gas Screening Value (CH_4 or CO_2) (l/hr)[1]**	**Additional Factors**	**Typical Source of Generation**
1	A	Very low risk	<0.07	Typically methane ≤ 1% and/or carbon dioxide ≤ 5%. Otherwise consider increase to Situation 2	Natural soils with low organic content "Typical" made ground
2	B	Low risk	<0.7	Borehole air flow rate not to exceed 70l/hr. Otherwise consider increase to characteristic Situation 3	Natural soil, high peat/organic content. "Typical" made ground
3	C	Moderate risk	<3.5		Old landfill, inert waste, mineworking flooded
4	D	Moderate to high risk	<15	Quantitative risk assessment required to evaluate scope of protective measures.	Mineworking susceptible to flooding, completed landfill (WMP 26B criteria)
5	E	High risk	<70		Mineworking unflooded inactive with shallow workings near surface
6	F	Very high risk	>70		Recent landfill site

Table 8.5 from CIRIA C665 Modified Wilson and Card Classification

Table 8.7 is used for comparison of gas screening values for "Situation B Developments" and is presented herunder:

Traffic Light	Methane[1]		Carbon Dioxide[2]	
	Typical max concentration[3] (% by volume)	Gas screening value[2,4] (litres/hour)	Typical max concentration[3] (% by volume)	Gas screening value[2,4] (litres/hour)
Green	1	0.13	5	0.78
Amber 1	5	0.63	10	1.60
Amber 2	20	1.60	30	3.10
Red				

Notes:
1. The worst-case ground gas regime identified on the site, either methane or carbon dioxide, at the worst-case temporal conditions that the site may be expected to encounter will be the decoder as to what Traffic Light is allocated;
2. Borehole Gas Volume Flow Rate, in litres per hour as defined in Wilson and Card (1999), is the borehole flow rate multiplied by the concentration in the air stream of the particular gas being considered;
3. The Typical Maximum Concentration can be exceeded in certain circumstances should the Conceptual Site Model indicate it is safe to do so;
4. The Gas Screening Value thresholds should not generally be exceeded without the completion of a detailed ground gas risk assessment taking into account site-specific conditions.

Table 8.7 from CIRIA C665 - NHBC Traffic light system for 150 mm void

Dependant on the outcome of the assessment of risk posed by ground gas it is determined whether gas protection measures are required for the proposed development, and or whether a detailed quantitative risk assessment is required for the site.

Selection & Design of Protective Measures
Table 8.6 and Box 8.4 of CIRIA C665 contain information on the detailed design of protection measures and were initially intended for the purposes of determining then level of protection measures a development requires. These tables and related text include some useful information on the design of gas protection measures, however BS84845:2007, which supersedes the guidance included within CIRIA C665, is used for selection of gas protection measures.

BS8485: 2007 uses a scoring system dependant on the Characteristic Situation / NHBC Traffic Light and proposed end use of the site. The scoring system is summarised in BS8485:2015 Table 2 as presented hereunder:

Characteristic gas situation, CS	NHBC traffic light	Required gas protection			
		Non-managed property e.g. private housing	Public building (a)	Commercial buildings	Industrial buildings (b)
1	*Green*	0	0	0	0
2	*Amber 1*	3	3	2	1 (c)
3	*Amber 2*	4	3	2	2
4	*Red*	6 (d)	5(d)	4	3
5			6(e)	5	4
6				7	6

NOTE *Traffic light indications are taken from NHBC Report no.:10627-RO1 (04) and are mainly applicable to low-rise residential housing[1]. These are for comparative purposes but the boundaries between the traffic light indications and CS values do not coincide.*

a) Public buildings include, for example, managed apartments, schools and hospitals.
b) Industrial buildings are generally open and well ventilated. However, areas such as office pods might require a separate assessment and may be classified as commercial buildings and require a different scope of gas protection to the main building.
c) Maximum methane concentration 20% otherwise consider and increase to CS3.
d) Residential building on higher traffic light/CS sites is not recommended unless the type of construction or site circumstances allow additional levels of protection to be incorporated, e.g. high-performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system, e.g. in institutional and/or fully serviced contractual situations.
e) Consideration of issues such as ease of evacuation and how false alarms will be handled are needed when completing the design specification of any gas protection scheme

[1] The NHBC guidance and CIRIA C665 guidance refers to low rise housing (which is up to three storeys without lifts) that is constructed with a 150mm ventilated sub-floor void.

BS8485:2007 Table 2 Required gas protection by characteristic gas situation and type of building

Once a score is assigned, a combination of protection systems / elements is chosen from BS8485:2007 Table 3 shown below:
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PROTECTION ELEMENT/SYSTEM		SCORE	COMMENTS
a) Venting/dilution (See Annex A BS8485)			
Passive sub floor ventilation (venting layer can be a clear void or formed using gravel, geocomposites, polystyrene void formers, etc.)[A]	Very good performance	2.5	*Ventilation performance in accordance with Annex A (BS8485)*
	Good performance	1	*If passive ventilation is poor this is generally unacceptable and some form of active system will be required.*
Subfloor ventilation with active abstraction/pressurization (venting layer can be a clear void or formed using gravel, geocomposites, polystyrene void formers, etc.)[A]		2.5	*There have to be robust management systems in place to ensure the continued maintenance of any ventilation system. Active ventilation can always be designed to meet good performance.*
Ventilated car park (basement or undercroft)		4	*Mechanically assisted systems come in two forms: extraction and positive pressurization.*
b) Barriers			
Floor slabs			
Block and beam floor slab		0	*It is good practice to install ventilation in all foundation systems to effect pressure relief as a minimum. Breaches in floor slabs such as joints have to be effectively sealed against gas ingress in order to maintain these performances.*
Reinforced concrete ground bearing slab		0.5	
Reinforced concrete ground bearing foundation raft with limited service penetrations that are cast into slab		1.5	
Reinforced concrete cast in situ suspended floor slab with minimal service penetrations and water bars around all slab penetrations and at joints		1.5	
Fully tanked basement		2	
c) Membranes			
Taped and sealed membrane to reasonable levels of workmanship/in line with current good practice with validation [B,C]		0.5	*The performance of membranes is heavily dependent on the quality of design of the installation, resistance to damage after installation, and the integrity of joints.*
Proprietary gas resistant membrane to reasonable levels of workmanship /in line with good practice under independent inspection (CQA)[B,C]		1	
Proprietary gas resistant membrane installed to reasonable levels of workmanship/in line with current good practice under CQA with integrity testing and independent validation		2	
d) Monitoring and detection (not applicable to non-managed property, or in isolation)			
Intermittent monitoring using hand held equipment		0.5	*Where fitted, permanent monitoring systems ought to be installed in the underfloor venting/dilution system in the first instance but can also be provided within the occupied space as a fail safe.*
Permanent monitoring and alarm system [A]	Installed in the underfloor venting/dilution system	2	
	Installed in the building	1	
e) Pathway Intervention			
Pathway intervention		-	*This can consist of site protection measures for off-site or on-site sources (see Annex A, BS8485)*
NOTE In practice the choice of materials might well rely on factors such as construction method and the risk of damage after installation. It is important to ensure that the chosen combination gives an appropriate level of protection			
A) It is possible to test ventilation systems by installing monitoring probes for post installation validation. *B) If a 1 200g DPM material is to function as a gas barrier it should be installed according to BRE 212 /BRE 414 being taped and sealed to all penetrations* *C) Polymeric Materials> 1200 g (proportional to thickness) but their physical properties mean that they are more robust and resistant to damage.*			

BS8485:2007 Table 3 Solution Scores

Where the gas situation is 4 or more (and for NHBC Red situations) the site requires a comprehensive risk assessment to confirm the scope of protection measures. These are higher risk sites and reliance on Table 2 and 3 alone is not sufficient.

For a site which is impacted by migratory gases from an off site source, the development may be protected by imposing pathway intervention methods, which if successfully validated, could also remove the need for further analysis. It is essential that the gas regime in these circumstances has been fully characterised and that the only source impacting the site is located off site and that the pathway is clearly defined and its interception equally proven before construction commences. Pathway intervention methods may include vertical membrane installations, venting trenches, rows of stone columns, activated trenches and various proprietary systems. These systems are particularly relevant to domestic housing where there is limited scope for foundation type solutions.

CURRENT GUIDANCE ON REMEDIATION

When risk assessment of the site has been completed and it indicates that remedial works are required, the main guidance in managing this process is set out in the DEFRA/EA publication CLR11 (2004) "Model Procedures for the Management of Land Contamination." The stages of managing remediation are as follows:

(a) Options Appraisal and develop Remediation Strategy;
(b) Develop Implementation Plan and Verification Plan;
(c) Remediation, Verification and Monitoring.

The Remediation Strategy sets out the remediation targets, identifies technically feasible remedial solutions and presents an evaluation of the options so that these can be assessed enabling that the most suitable solution is adopted. An outline of the proposed remedial method should be presented. Agreement should be sought of the appropriate statutory bodies for the Remediation Strategy before proceeding to the next stage.

The Implementation Plan is a detailed method statement setting out how the remediation is to be carried out including stating how the site will be managed, welfare procedures, health and safety considerations together with practical measures such as details of temporary works, programme of works, waste management licences and regulatory consents required. Agreement should again be sought of the appropriate statutory bodies for this Plan.

The Verification Plan sets out the requirements for gathering data to demonstrate that the remediation has met the required remediation objectives and criteria. The Verification Plan presents the requirements for a wide range of issues including the level of supervision, sampling and testing regimes for treated materials, waste and imported materials, required monitoring works during and post remediation, how compliance with all licenses and consents will be checked etc. Agreement should again be sought of the appropriate statutory bodies for the Verification Plan. On completion of the remediation a Verification Report should be produced to provide a complete record of all remediation activities on site and the data collected as required in the Verification Plan. The Verification Report should demonstrate that the remediation has met the remedial targets to show that the site is suitable for the proposed use.

APPENDIX L: NOTES ON LIMITATIONS

Standard Terms and Conditions of Engagement

Notes on Limitations For Geoenvironmental and Geotechnical Consultancy Services

General

CC GEOTECHNICAL LTD has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from CC GEOTECHNICAL LTD and a charge may be levied against such approval.

CC GEOTECHNICAL LTD accepts no responsibility or liability for:

the consequences of this document being used for any purpose or project other than for which it was commissioned

and/or

the consequences of use of this document by any party with whom an agreement has not been executed.

Phase I Environmental Audits / Desk Studies

The work undertaken to provide the basis of a Phase 1 Desk Study report comprises a study of available documented information from a variety of sources (including the client), together with (where appropriate) a walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in a Desk Study report have been dictated by finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in the report, CC GEOTECHNICAL LTD reserves the right to review such information and to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Phase II Environmental Audits

The investigation of the site has been carried out with the intention of providing sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated to potential human targets, building materials, the environment (including adjacent land), and surface and groundwater.

The amount of exploratory work and chemical testing undertaken may have been restricted by the timescale available, and the locations of the exploratory holes may have been restricted to areas unoccupied by the building(s) on the site, and further restricted by the existence of buried services. A more comprehensive investigation may be required if the site is to be redeveloped as, in addition to risk assessment, a number of important engineering and environmental issues may need to be resolved.

For those reasons, if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of site conditions. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised “hotspots” of contamination where concentrations may be significantly higher than those actually encountered.

Geoenvironmental Ground Investigations

The investigation of the site has been carried out to provide sufficient information within the agreed scope of the investigation, under the general headings of type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions, to provide a reasonable assessment of the environmental risks together with engineering and development implications.

If costs have been included in relation to the site remediation, these must be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of the site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be ground conditions present on the site which have not been disclosed by this investigation, and which have therefore not been taken into account in this report.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal, weather, or other effects.

The risk assessment and opinions provided, inter alia, take into consideration currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.