

1 Northfields Cottages, Fontwell Avenue, Eastergate



Site Investigation Report Incorporating a Desk Study and Outline Remedial Proposals

Client



Hampshire Homes Group Limited

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1 Northfields Cottages, Fontwell Avenue, Eastergate

Site Investigation Report Incorporating a Desk Study and Outline Remedial Proposals

REPORT FON206.D/SI/001 CONTROL SHEET

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1 Northfields Cottages, Fontwell Avenue, Eastergate

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1 Northfields Cottages, Fontwell Avenue, Eastergate

Site Investigation Report Incorporating a Desk Study and Outline Remedial Proposals

EXECUTIVE SUMMARY

Area of interest	Summary of main text
Introduction	This report details the results of a Desk Study and the two phases of investigations (Soils Limited 2017 & FEML 2020) undertaken upon the proposed development site at 1 Northfields Cottages, Eastergate. The investigations were undertaken in order to establish the environmental conditions of the site prior to the proposed construction of 42No residential properties with private gardens
Site Location & Description	The current proposed development site is roughly rectangular in shape and occupies an area of approximately 1.34ha at National Grid Reference 494719 106271 on the A29 between Eastergate and Fontwell. The current postal address is 1 Northfields Cottages, Fontwell Avenue, Eastergate, Chichester, West Sussex PO20 3RX. The site comprised open pasture used for grazing horses and was relatively flat but with a gentle slope down to the south. Mature trees and vegetation occupied the east, north and west site boundaries. The site was surrounded by residential and fields to the north, residential to the east, residential to the south and open land to the west.
Geology	The published BGS maps indicate that the site is underlain by HEAD superficial deposits with the shallow bedrock comprising the Lambeth Group (gravel, sand, silt clay) overlying CHALK.
Hydrogeology	The underlying superficial HEAD and Lambeth Group bedrock have been classified as a Secondary (A) aquifer. The underlying chalk is a principal aquifer from which there is a potable water abstraction 154m to the north but although the site is within its designated SPZ1c as it is protected by the London Clay so is not considered to be viable receptor. Along the eastern boundary the site is considered to be at high of flooding from groundwater, this reduces to a moderate risk of flooding across the north-western corner, although anecdotal evidence from the site owner is that it has never flooded .
Hydrology	The nearest water course is the Lidsey Rife a river c.730m SW that has a Moderate overall quality rating. The site not in an area at risk of flooding from rivers.
Radon	No radon protection measures are deemed necessary in the construction of new dwellings.
Unexploded Ordnance	Based upon the Zetica Ltd online map the site is within a low risk area for unexploded ordnance.

Area of interest	Summary of main text
Nitrate Zone	The site is within a nitrate vulnerable zone for surface water (Aldingbourne Rife NVZ) and groundwater (Sussex Chalk).
Landfills	The EA records show a small gravel pit approximately 20m to the east was infilled between 1979 and 1981. However, due to the age of the fill and the size of the pit it is considered it will not be a significant source for on site migration of landfill gases. No other licensed landfills were identified within a 250m radius of the site. Based upon this the site is not considered to be at risk from the on-site migration of landfill gases and currently it is not proposed to undertake a period of gas monitoring. Although to confirm this one round of monitoring will be undertaken using the SOILS boreholes during the additional FEML investigations.
Site History	From a general web search there is evidence that the area around Eastergate was occupied in Roman times. From a review of the available historic maps for the area the site has been shown to have remained as undeveloped open land since the earliest available map (1876).
Preliminary Conceptual Site Model	Potential on-site contaminant sources include: 1. Possible presence of made ground of unknown source or impacted natural soils due historical human activity on the site. No potential off-site contamination sources with a viable mechanism of impacting upon the site were identified The above potential source has been determined to pose a very low to moderate risk to future occupiers, workmen or the environment if the site is to be developed for a residential end use and a burial area.
Previous Site Investigation Results	Over the winter of 2017/18 SOILS sunk 3No probe holes across the site and used them for groundwater level monitoring. No samples were collected for chemical analysis but the borehole logs confirmed that there was no made ground. However, the strata encountered was topsoil over the Head but this rested directly on the chalk at between 1.35 and 2.50m. The shallowest depth to groundwater was 2.96m.
Scope of Site Investigation Works	The investigation works undertaken by FEML comprised the following: - Excavation of 4No trial pits 1.9 to 2.2m deep, which were used for infiltration tests; - Chemical analysis of 8No. selected soils samples for a standard suite, including PAH's and TPHCWG; - One round of landfill gas levels within the SOILS boreholes. - Geotechnical testing of 4No. natural soil samples.
Identified Ground Conditions	Below the layer of topsoil (0.2m-0.6m thick) HEAD deposits, which varied from silty gravelly SAND to gravelly CLAY, rested on CHALK. From the winter groundwater monitoring undertaken by SOILS the shallowest depth the water table was encountered was 2.96m bgl
Human Health Risk Assessment	No elevated levels of contamination that pose a potential risk to human health were revealed in any of the samples tested. Therefore, no remedial measures will be necessary for the protection of human health.
Controlled Waters Risk Assessment	Due to the absence of any made ground or identified elevated concentrations of contamination within the soils the site is not considered to pose a significant risk to controlled waters.
Landfill Gas Risk Assessment	A round of gas monitoring confirmed the conclusion from the Desk Study that no gas protection measures will be required with the new properties.

Area of interest	Summary of main text
Risk Assessment of other Receptors	▪ No elevated sulphate levels were recorded and therefore the soils do not pose a risk to buried concrete and a DS1 design mix should be suitable for foundations. ▪ The soils across the site do not pose a risk to future plant growth. ▪ An elevated phenol with the topsoil has the potential to impact upon PVC pipework.
Outline Remedial Proposals	Due to the potential risk to buried water mains the Local Water Authority should be consulted and the appropriate pipework used for water mains.
Engineering Considerations	Traditional foundations with mesh reinforcement should be suitable for the proposed residential properties with a minimum founding depth of 0.70m.
Infiltration Testing	Three rounds of infiltration testing were undertaken with TP1, TP3 & TP4, which confirmed that soakaways are a viable option for the disposal of surface water with infiltration rates ranging from 1.33×10^{-3} to 8.22×10^{-4} m/s.
Waste Classification	The topsoil should be regarded as a resource and where possible be re-used on this or other developments. Based upon the soil solid and WAC test results any soils disposed of a licensed landfill facility would be classified as inert waste. Alternatively, any surplus soils could be used on other local developments in accordance with the Definition of Waste Code of Practice.
Recommendations	• This report should be forwarded to Council's Environmental Health Department for their assessment and to confirm that they are in agreement with the conclusions and recommendations. • Liaison with the statutory water supplier should be undertaken to determine the specification for underground water supply pipework across the site. • If soakaways are the preferred drainage solution it is recommended that this report is forwarded to the Council's Drainage Department for their review to support any future design proposals

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1.0 INTRODUCTION

1.1 Contract Details

Forge Environmental Management Ltd (FEML) were instructed by Hampshire Homes to review the available Soils Limited (SOILS) letter report, produce a Desk Study and undertake a supplementary site investigation on their proposed development site at 1 Northfields Cottages, Eastergate. These works were necessary in order to determine the environmental condition of the site and enable any necessary outline remedial proposals to be designed prior to its development.

Based upon the plans issued to FEML, copies of which are contained in Appendix A, it is proposed to develop the site for 42No residential properties with private gardens.

1.2 Previous Reports

In 2017 SOILS undertook an investigation comprising of 3No window sample probe holes, which were used for groundwater level monitoring between 22nd December 2017 and 18th April 2018. Although no soil or groundwater samples were collected during the drilling works or monitoring exercise the logs for the boreholes confirmed no made ground was present with:

- 300-600mm of "*slightly gravelly silty CLAY*"; resting on
- 1.05-2.0m thickness of HEAD described as "*gravelly CL:AY*"; over
- A weather structureless CHALK to the base of the boreholes (5mbgl).

A full copy of their June 2018 letter report is contained in Appendix D

1.3 Scope of Works

In general accordance with the FEML proposals, the scope of works comprised the following:

- Review the available information in the SOILS letter report
- Obtain a GroundSure Enviro Insight Report to provide environmental setting information for the site;
- Excavation of 4N^o trial pits;
- Undertake 3N^o infiltration tests within the trial pits;

-
- Preparation of engineering exploratory hole logs to record the observed ground conditions;
 - Chemical and geotechnical testing of selected samples;
 - Preparation of an interpretative report presenting the Desk Study information and findings of the investigations to determine general ground conditions and geochemistry of the soils for generic quantitative risk assessments. If any potentially unacceptable levels of contamination are identified the report is to include an outline remedial strategy to address any identified risks.

1.4 Report Limitations

The recommendations, interpretations and conclusions of this report are based on the historical/environmental information obtained relating to the site revealed during SOILS December 2017 investigations and the current site conditions observed during the intrusive investigations undertaken on the 13th August 2020 by FEML.

No responsibility can be accepted for the accuracy of third party investigation data, including the GroundSure Enviro Insight report that is referred to in this report.

Due to the inherent variability of the ground conditions between exploratory hole positions these conditions can only be interpreted and not defined and are accurate only for the date of the investigation works.

2.0 CURRENT SITE DESCRIPTION AND LOCATION

2.1 Site Location

The proposed development site occupies an area of approximately 1.34ha and is centred at National Grid Reference 494719 106271 (SU 947 062) on the western side of the A29 (Fontwell Avenue) approximately 800m to the north of Eastergate village centre. The current postal address for the site is 1 Northfields Cottages, Fontwell Avenue, Eastergate, Chichester, West Sussex PO20 3RX. A copy of the site location plan and the proposed development layout are presented in Appendix A.

2.2 Site Description

The site is roughly rectangular in shape with approximate maximum dimensions 185m north/south and 85m east/west and falls approximately 2m from the north (c.18m AOD) to south (16m AOD). At the time of the 2020 site works the site area was in use as paddocks for grazing horses and covered by grass.

Around the north, east and western boundaries there were mature trees, hedges and vegetation. To the south there was a ménage and tarmacked car parking area associated with the riding stables beyond. To the north-east there are residential properties and a caravan park. Immediately to the north, south-east and west there were open fields while to the north-west Fontwell Park horse racing track is present.

2.3 Potential Sources or Signs of Contamination

2.3.1 On Site

There was no obvious evidence of any contamination noted across the site during the site walkover.

The site has been used for grazing horses and probably agricultural purposes prior to that however, although it is possible that potentially harmful pest control substances may have sprayed over the area these are not considered to pose a potential risk to human health or controlled water. This conclusion is based upon the fact that the compounds used in pesticides and herbicides were not designed to be persistent in the environment and do not generally pose a long term risk as detailed in DEFRA publication CLAN4/04. Therefore, pesticides and herbicides have not been considered to be a potential risk at the site.

2.3.2 Surrounding Area

From walking around the area surrounding the site, which was predominately a mixture of horse grazing and residential properties no activities or lands usages that had potential to impact upon the quality of the soils or groundwater on or below the study area were noted.

Therefore, based upon the evaluation of the current use of the site and the surrounding area no potential sources of contamination have been identified.

3.0 ENVIRONMENTAL SETTING

3.1 Published Geology

The 1:50,000 BGS scale Digital Geological Map, as reported in the GroundSure Data, indicates that the site is underlain by HEAD superficial deposits over the Lambeth Group bedrock.

A full copy of the GroundSure Data report is contained in Appendix B but the anticipated ground conditions based upon it are summarised in Table 3.1.1 with further information provided in the following sub-sections.

Table 3.1.1: Summary Geology

Shallow depth soils anticipated	Topsoil anticipated
Superficial deposits	Head
Solid Geology	Lambeth Group – (clay, silt, sand and gravel).

3.1.1 Artificial and Made Ground

The BGS map that shows identified areas artificial ground or landslip material identified a small area of “worked ground (undivided)” covering an area 1,500m² 169m to the south on the eastern side of Fontwell Avenue (A29). Plus a larger L-shaped area measuring roughly 150m x 150m on the southern side of Eastergate Lane 337m to the south-east.

3.1.2 Topsoil

Based upon the site’s use as a field for grazing a layer of topsoil is anticipated across the area.

3.1.3 Superficial and Drift Ground

The maps included within the GroundSure report indicate that the site is underlain by different types of HEAD deposit with it being described across the majority of the site as “*gravel, sand, silt and clay*”. While the south-eastern section the head is anticipated as being more granular as it was described as “*clay, silt, sand and gravel*”.

From the BGS on-line Geology of Britain Viewer (www.bgs.ac.uk) this shows the Head deposits are present below site with the generic description “*gravel, sand, silt and clay*” and a lithological description in the BGS Lexicon of:

“Head is poorly sorted and poorly stratified, angular rock debris and/or clayey hillwash and soil creep, mantling a hillslope and deposited by solifluction and gelifluction processes. Solifluction is the slow viscous downslope flow of waterlogged soil and other unsorted and unsaturated superficial deposits. The term gelifluction is restricted to the slow flow of fluidized superficial deposits during the thawing of seasonally frozen ground. The flow is initiated by meltwater from thawing ice lenses. Polymict deposit: comprises gravel, sand and clay depending on upslope source and distance from source. Locally with lenses of silt, clay or peat and organic material”.

3.1.4 Bedrock and Solid Geology

The shallow bedrock beneath the majority of the site has been identified as being the Lambeth Group, which is described by the BGS Lexicon as:

“Vertically and laterally variable sequences mainly of clay, some silty or sandy, with some sands and gravels, minor limestones and lignites and occasional sandstone and conglomerate.”

With the London Clay outcropping to the south, which may encroach onto the south-western section of the site, for which the lithological description is:

“The London Clay mainly comprises bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay. It commonly contains thin courses of carbonate concretions (‘cementstone nodules’) and disseminated pyrite. It also includes a few thin beds of shells and fine sand partings or pockets of sand, which commonly increase towards the base and towards the top of the formation. At the base, and at some other levels, thin beds of black rounded flint gravel occurs in places. Glauconite is present in some of the sands and in some clay beds, and white mica occurs at some levels”.

The BGS also contains details of historic boreholes in the vicinity which has identified 3 No 30+m boreholes within c.900m of the site to the north-west, south-east and south west. These revealed that below the clay chalk was present at c.50m NW, 26m SW & c.20m SE. Based upon the SOILS letter report the anticipated chalk was described as “undifferentiated Lewes Nodular, Seaford and Newhaven Formation” which were further detailed as::

“Lewes Nodular Chalk Formation is composed of hard to very hard nodular chalks and hardgrounds (which resist scratching by finger-nail) with interbedded soft to medium hard chalks (some grainy) and marls; some griotte chalks. The softer chalks become more abundant towards the top. Nodular chalks are typically lumpy and iron-stained (usually marking sponges). Brash is rough and flaggy or rubbly, and tends to be dirty. First regular seams of nodular flint, some large, commence near the base and continue throughout.

“Seaford Chalk Formation can be described as firm white chalk with conspicuous semicontinuous nodular and tabular flint seams. Hardgrounds and thin marls are known from the lowest beds. Some flint nodules are large to very large.

“The Newhaven Chalk Formation is a soft white friable microporous limestone composed of coccolith biomicrites with a varying proportion of larger shell fragments. At various levels clay sized material occurs as marl seams and partings. Close to the surface the upper few metres are invariably discoloured brown, due to leaching from the overlying strata. The interface with any overlying stratum is invariably extremely irregular as a result of localised weathering and general solution. Weathering by frost action may extend to a depth of several metres.”

3.2 Background Soil Chemistry

From the BGS on-line Contamination Distribution in Soil maps the estimated natural soils background chemistry values, as can be seen from the table overleaf, are all below their corresponding S4UL or C4SL threshold values for a residential end use.

Table 3.2.1 Estimated Natural Soil Concentrations

Determinant	Estimated concentration (mg/kg)	Published Threshold Value (mg/kg)	Source
Arsenic	15	37	LQM S4UL
Cadmium	1.8	11	LQM S4UL
Chromium	60-90	910	LQM S4UL
Lead	100	200	DEFRA C4SL
Nickel	15-30	180	LQM S4UL

Key

LQM S4UL = values sourced from the LQM/CIEH Suitable 4 Use Levels (S4UL) 2015
DEFRA C4SL = value sourced from DEFRA research project Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination.

3.3 Hydrogeology

With reference to the GroundSure Data the superficial deposits covering the majority of the site has been designated as a Secondary (A) aquifer the definition of which is:

“Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers”.

Although the thin band of more granular head deposits running along the eastern boundary has been designated as a Secondary Undifferentiated aquifer which is:

“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 nonaquifer in different locations due to the variable characteristics of the rock type.”

The Lambeth Group Formation has also been assigned Secondary A aquifer designation but the London Clay to the south due to its higher clay content is considered to be Unproductive Strata, which is described as:

“These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.”

However, the deeper chalk is a Principal Aquifer (i.e. capable of providing a high level of water storage) from which there is a drinking water abstraction 154m to the north operated by Portsmouth Water Ltd at Eastergate Pumping Station for the abstraction of 10,357,800m³/year. As a result the deeper chalk aquifer, which is considered to be protection from the downward migration of contamination/leachate by the overlying London Clay, has been designated as a Source Protection Zone (confined aquifer) 1c. This is defined as an *“Inner catchment within confined aquifer”*, which is within 50 day travel time of the abstraction point but for confined aquifers it would only become a sensitive receptor if deep boreholes are proposed, which is unlikely for tradition two storey residential properties.

The nearest active abstraction from the superficial deposits is likely to be at Stoneyfields Nurseries approximately 900m to the east where 9,092m³/year is used for *“spray irrigation - direct”*

There were three licensed discharge consents onto land within a 500m of the site all of which were for *“final/treated effluent – not water company”*. All were on Northfield Farm 122m – 140m to the south-west/west but have all now lapsed.

The eastern edge of the site, along the band of the more granular HEAD deposits, has been designated as being at a High risk (1 in 100 year return period) of groundwater flooding, which reduces to a moderate risk moving north-westwards across the area. However, anecdotal information provided is by the current landowner is that the site has never flooded during the period of their ownership.

3.4 Hydrology

From the information provided by Ordnance Survey Mastermap Water Network Map (contained in the Groundsure report) no water courses or features were identified within 250m of the site. From the Ordnance Survey maps a water course there is a tributary of the Lidsey Rife c.730m to the south where it flows southwards to join the main river about 4km from the site. This water course in 2016 was given an overall Moderate Rating based upon a Good chemical and Moderate ecological ratings.

The Environment Agency flood map show the site is not within an area that is considered to be at risk of flooding from rivers.

There are no licensed surface water abstractions within 1km.

There are no licensed discharge consents to surface waters within 500.

There have been no recorded pollution releases to surface waters (red list) within 500m radius of the site.

3.5 Radon

Based upon the radon potential dataset from the Health Protection Agency (HPA) interactive maps (www.ukradon.org) the site is within an area <1% of homes are above the Action Level.

Therefore, no radon protection measures are considered necessary in the construction of the new properties.

3.6 Unexploded Ordnance

From a web search there is no record of the area around Eastergate being bombed during the war. A detailed UXO risk assessment in line with CIRIA C681 is beyond the scope of this report but from the Zetica Ltd online unexploded ordnance UXO map (<https://zeticauxo.com>), as shown in Appendix A, it shows that although there was a Luftwaffe target to the north-west the site is within an area deemed to be at low risk from unexploded ordnance.

3.7 Designated Environmentally Sensitive Sites

The GroundSure Data contains data from various sources to identify environmentally sensitive areas in the vicinity of the site and Table 3.7.1 below summarises the key points.

Table 3.7.1: Summary of the GroundSure Environmentally Sensitive Site Searches

Data Type	On Site	0m to 250m	251m to 2,000m	Discussion/Comments
<i>Sites of Special Scientific Interest (SSI)</i>	0	0	0	-
<i>Conserved wetland sites (Ramsar sites)</i>	0	0	0	-
<i>Special Areas of Conversation (SAC)</i>	0	0	0	-
<i>Special Protection Areas (SPA)</i>	0	0	0	-
<i>National Nature Reserves</i>	0	0	0	-

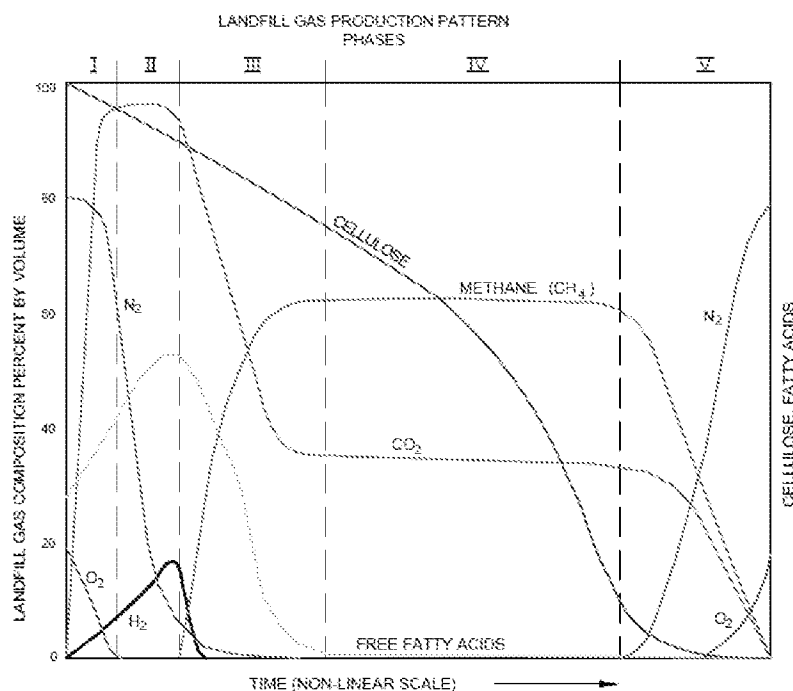
Data Type	On Site	0m to 250m	251m to 2,000m	Discussion/Comments
(NNR)				
Local Nature Reserves (LNR)	0	0	0	-
Designated Ancient Woodlands	0	0	18	The nearest is Wandley's Copse 830m to the east, which is a small area c.100m x 50m designated as "Ancient & Semi-Natural Woodland"
Biosphere Reserves	0	0	0	-
Forest Parks	0	0	0	-
Marine Conservation Zones	0	0	0	-
Proposed Ramsar sites	0	0	0	-
Possible Special Areas of Conservation (pSAC)	0	0	0	-
Potential Special Protection Areas (pSPA)	0	0	0	-
Nitrate Sensitive Zone	0	0	0	-
Nitrate Vulnerable Zone	2	1	4	Surface water in Aldomgbourne Rife and the groundwater within the Sussex Chalk are at risk of agricultural nitrate pollution
SSSI Impact Risk Zones	1	-	-	Although the site is within an area requiring consultation for certain developments the proposed construction of residential properties does not require Natural England to be consulted.

3.8 Waste and Landfill Activities

As can be seen from the table 3.8.1, overleaf, the nearest area of landfill based upon the Environment Agency records was 19m to the east of the site. From the Waste and Landfill map contained within the GroundSure report and the historical maps reviewed in the following section this is known to be the filling of a small triangular former "Gravel Pit" located at the junction of Fontwell Avenue and Wandley's Lane covering an area of approximately 1,250m². This was operated by Eastergate Parish Council and was licensed to accept inert waste between 14th March 1979 and 13th March 1981.

As can be seen from the graph below there are five typical phases of landfill gas production during the decomposition of any organic material within a landfill. Therefore, as the fill will have been in place for 30 years and as the landfill is unlikely to have been sealed it will have had a readily available supply of oxygen to maintain a high rate of bacterial activity. Based upon this it is considered the landfill will be in stage V and that the majority of waste within it will have completed its degradation phase.

Phase	Description	Landfill Gases Produced	Length of time
I	Initial – aerobic conditions	Only CO ₂ by anaerobic bacteria	Up to a 1 week
II	Transition – O ₂ is gradually used up and facultative organisms begin to thrive	Minimal methane production -only in anoxic pockets	1 to 6 months
III	Acid forming – landfill ecology is dominated by acid-forming anaerobic and facultative bacteria. pH drops	Methane production increases as additional years anoxic pockets spawn methanogenic colonies.	3 months to 3
IV	Methane formation – methanogenic bacteria predominate after entire landfill becomes anoxic and much organic matter decomposed to sugars and acids	Maximum methane production	8 or more years
V	Maturation – available organic substrates becomes limited and biological activity declines	Landfill gas production goes into a long declining closure phase, asymptotically of landfill approaches zero.	Through post-closure period



Therefore, due to the cohesive nature of the shallow soils (Head over the Lambeth Group) when considered in conjunction with the size, age and type of material (inert) deposited within the historic landfill on the opposite side of Fontwell Avenue it is not considered to be a significant source of landfill gas that could migrate onto the site.

Table 3.8.1: Summary of the GroundSure Waste and Landfill Searches

Data Type	0n Site	0m to 250m	251m to 500m	Discussion/Comments
Active or recent landfill	0	0	0	-
Historic landfill (BGS records)	0	0	0	-
Historical landfill (LA/mapping records)	0	0	0	-
Historical landfill (EA records))	0	1	1	The nearest was 19m to the east but was completed by 1981 and therefore is not considered to be a significant source of landfill gases. Other was 330m SE that was permitted to take inert, commercial and household between 1949-1963.
Historical waste site	0	4	5	The nearest of these was 36m to the east and is described as "ground workings and refuse heap". The others include more refuse heaps car breakers and scrape yards
Licensed waste sites	0	3	0	All three relate to a metal recycling site (vehicle dismantler) 185m to the SE.
Waste exemptions	0	0	12	The nearest 8No relate to Swallowfield 281m SE and are for disposing of waste, treating waste and using waste on a farm

3.9 Current Industrial Land Uses Searches

The GroundSure database search, presented in Appendix B, provides details of information collated from various regulatory bodies, local authorities and other organisations. In addition to the items discussed above Table 3.9.1 below summaries other salient points identified.

Table 3.9.1: Summary of the GroundSure Current Industrial Land Uses Searches

Data Type	0n Site	0m to 250m	251m to 500m	Discussion/Comments
<i>Recent Industrial land uses</i>	0	8	-	3m N is an electrical substation 98m N is a small solar panel farm The others include further electrical sub-stations, a water pumping station, a catering business and an animal feed distributor.
<i>Current or recent petrol stations</i>	0	0	0	-
<i>Electricity cables</i>	0	0	0	-
<i>Gas pipelines</i>	0	0	0	-
<i>Sites determined as Contaminated Land</i>	0	0	0	-
<i>Control of Major Accident Hazards (COMAH)</i>	0	0	0	-
<i>Regulated explosive sites</i>	0	0	0	-
<i>Hazardous substances storage/usage</i>	0	0	0	-
<i>Historical licensed industrial activities (IPC)</i>	0	0	0	-
<i>Licensed industrial activities (Part A(1))</i>	0	0	0	-
<i>Licensed pollution release (Part A(2)/B)</i>	0	0	0	-
<i>Radioactive Substance Authorisation</i>	0	0	0	-
<i>Pollution released to public sewer</i>	0	0	0	-
<i>List 1 Dangerous Substances</i>	0	0	0	-
<i>List 2 Dangerous Substances</i>	0	0	0	-
<i>Pollution Incidents</i>	0	1	1	163m W on the 13 th June 2003 solid manure had a minor (category 3) impact on land and air. 353m SW on 22 nd April 2002 noise pollution had a category 3 (minor) impact on air.
<i>Pollution inventory substances</i>	0	0	0	-
<i>Pollution inventory waste transfers</i>	0	0	0	-
<i>Pollution inventory radioactive waste</i>	0	0	0	-

3.10 Summary Sources On and Off Site Determined From Environmental Setting

The natural soils are not anticipated to contain elevated levels of contamination as the BGS estimated soil background contamination been shown to be lower than the published assessment criteria for a residential development.

Although a small area of fill has been identified 19m east of the site due to the cohesive nature of the natural shallow soils, the size of the landfill and the age of the fill it is not considered to be a viable source of landfill gas that could migrate onto the site. No other landfills have been identified within 250m of the site therefore the on-site migration of landfill gases is not considered to represent a risk at the future development. Based upon this assessment gas monitoring is not currently deemed to be necessary as part of any future site investigations. However, as there are already probe holes on the site during the further investigation a round of gas monitoring will be undertaken to confirm there are no elevated levels of methane or carbon dioxide within the soils. If the monitoring results reveal the presence of landfill gases or the trial pits reveal deep made organic/deleterious ground then this assessment will reviewed and a period of gas monitoring will be undertaken if deemed necessary.

An electricity substation has been identified 3m to the north of the site, which from the historical maps, detailed in Section 4, was first identified on the 1973 edition. Therefore, it is considered that is highly unlikely PCB's will have been used in the transformers as its was already known by then to be a carcinogen and its manufacture ceased in 1977 in the United Kingdom. Also, research has shown that PCB's are not very soluble and therefore are not readily transported by surface water or groundwater.

None of the businesses or activities identified within the vicinity of the site are considered to have the potential to cause pollution that could impact upon the site.

Therefore, no new potential sources of contamination have been identified from the review of the site's environmental setting.

4.0 SITE HISTORY

4.1 Review of the Published Historical Maps

From an internet search (<https://www.british-history.ac.uk/vch/sussex/vol5/pt1/pp148-160>) it is known that there is evidence of Roman occupation, including possibly a villa in the area. During the Middle Ages the area was predominantly in pastoral agricultural use and being farmed by tenant farmers. However, by the 1840's arable land was more important than meadows and pastures with the large fields being divided into smaller holdings. In the early 1900's market gardening was the main form of farming in the area with many orchards, greenhouses and nurseries.

In addition to the web search the GroundSure report, as shown in Appendix D, contains copies of maps of the available historic maps, which as detailed below in Table 4.1.1, confirmed the site area was undeveloped fields in 1876 and it has remained undeveloped until the present day.

Table 4.1.1: Key points noted from the Historic Maps

Map edition & scale	Date	On Site	Surrounding area
Country Series 1: 2,500 1: 10,560	1876 1876	<i>The majority of site was within a large field with the northern, eastern and western boundaries as they are today. The southern most edge of the site extended onto the adjacent field although the southern boundary was unmarked</i>	<i>The surrounding area was in agricultural use with a few orchards. However, on the opposite side of the road to the east was a "Gravel Pit" although the area is shown to be rough pasture. c.80m to the south there was a building, probably a residential property. 100m to the south-west was Northfields Farm</i>
Country Series 1: 10,560 1: 2,500	1896 1897	<i>The only change in the site layout was that the large field had been split east/west across the bottom third to create two fields</i>	<i>The main part of the gravel pit opposite the site was not labelled but still shown as rough pasture. Although a small extension of the pit to the north was still identified as a "gravel pit" and another small area to the east was called "old gravel pit". Another "old gravel pit" was shown c.175m to the south. A pumping station was shown approximately 150m to the north,</i>
Country Series 1: 10,560	1910	<i>The layout of the study area did not appear to have changed</i>	<i>None of the gravel pits identified previously near the site were labelled. To the south some of fields had been divided into smaller sections and planted with orchards. Around the village of Easterfield c.750m to the south-west there were a number of nurseries identified.</i>

Map edition & scale	Date	On Site	Surrounding area
<i>Country Series</i> 1:2,500 1: 10,560	1937-39 1940	<i>The large field was no longer split into two area</i>	<i>Fontwell Park race course was present c.50m to the north-west. Possibly a large pond was present c.10m north of the site with tress around it. New residential properties were present to the north-east on the opposite side of Fontwell Avenue. The former gravel pit opposite the site was shown as being covered with "bushwood" (e.g. dense growth of bushes, coppice trees and thickets). The pumping station to the north was shown to have a number of circular and rectangular tanks. Within the general area there were many orchards.</i>
<i>Provisional</i> 1:1,10,560	1961& 1966-1969	<i>The site had remained unchanged</i>	<i>A large building was present within the northern section of the former gravel pit opposite the site</i>
<i>National Grid</i> 1: 2,500 1:1,10,000	1973 1979	<i>The smaller field to the south of the site was no longer separated. So, the site occupied the northern three quarters of a larger field.</i>	<i>A small electricity sub-station was shown midway along the northern site boundary. The suspected pond 10m to the north was no longer shown. Another large residential property was opposite the site in the vicinity of the former gravel pit. The large building on the former gravel pit had been extended and was identified as a "works". Opposite this was a "caravan park". A large former gravel pit c.350m to the south west was identified as being disused. In the general area there were many new nurseries with large greenhouses identified.</i>
<i>National Grid</i> 1:1,250 <i>Aerial photograph in GroundSure Report</i>	1991-1994 1999	<i>No changes within the site layout was noted. The aerial photography shows the site had been divided into three fields east/west with the southern most one split into threesub-parcels running north/south.</i>	<i>No major new developments were noted in the vicinity of the site. The 1999 aerial photograph showed a ménage immediately adjacent the southern boundary with a car parking area next to it. It also showed the works and residential properties opposite the site, with possibly a swimming pool in the garden within the former gravel pit area.</i>
<i>Landline</i> 1: 10,000 1:1,250	2001 2003	<i>As shown on the 1999 aerial photograph the map shows the site had been divided east/west into three fields, which is the layout as it is today.</i>	<i>The plan shows the ménage identified by the aerial photograph to the south with a number of small buildings around it, which are assumed to be stables.</i>

Map edition & scale	Date	On Site	Surrounding area
National Grid 1: 10,000 Aerial photograph in GroundSure Report	2010 2012, 2013, 2015 & 2018	The site layout was not indicated in detail on this map	A new road "Holmdale" with houses along it was shown in the area of the former works and gravel pit. The aerial photographs shown the three main fields (east/west) at different times had been sub- divided, possibly as grazing areas for horses. They also show the works had been replaced with private properties, which also occupy the area of the former gravel pit A small solar farm with three rows of panels was present from 2012.
National Grid 1: 10,000	2020	Again, due to the scale of the map the no filed layout details were shown.	A further two large residential properties were present with large gardens covering the former gravel pit opposite the site.

4.2 Groundsure Historical Industrial Sites Search

The GroundSure report also includes a summary of identified locations of potential contaminative past uses and historical tanks in the vicinity of the site. The full report is contained in Appendix B but Table 4.2.1 below contains a summary of these search results.

Table 4.2.1: Key points noted within 250m of the site by the GroundSure database search

Description	Location	Date	Discussion
Historic Industrial land uses.	39-59m E 46m E 105-111m N 116-121m N 121m N 130m E 160m S	1876-1977 1977 1896-1977 1940-1969 1910 1977 1896-1910	Gravel/unspecified pit Unspecified Works Pumping Station Unspecified tank Gravel pits Nursery Old gravel/unspecified pit
Historical Tanks	122m N 156m N 160m W 167-168m N	1939-1973 1939-1973 1973-1994 1939	Unspecified tank Unspecified tank Unspecified tank Tanks
Historical Energy Features	On northern edge 115m E	1973-1994 1973-1994	Electricity sub-station Electricity sub-station
Historical Petrol Stations	none	None	-
Historical Garage	None	None	
Historical military sites			Many military installations are not shown on historic maps for security reasons. However, from the information available to Groundsure no data has been found that identifies any historical military use of the site

4.3 Potential Historical Contaminative Sources

Although there is no evidence to indicate the site has been developed in recent times (post 1876) it is known that there has been human activity in the area since at least the Roman period. Therefore, it is possible that at some point there could have been some usage that may

have resulted in the introduction of contamination (e.g. made ground either impacted natural soils or imported from an unknown contaminated source).

The historical maps have reidentified a former gravel pit on the opposite of Fontwell Avenue, which from the environmental search was identified as having been infilled between 1979 and 1981. However, this is not considered to be a significant source of contamination due to the age of the fill, which was inert, and because the area has undergone a number of phases of development firstly; as a works and then residential properties with it currently being within the grounds to a large property with a swimming pool. Therefore, it is considered that there is not source for on site migration of landfill gases that could pose a risk to any future development

Resulting from the evaluation of the historic activities on site and the surrounding area the identified potential source of contamination as discussed above has been listed in Table 4.3.1 below.

Table 4.3.1: Potential Sources of Contamination on and off site identified from the Historic Site usage.

APC N°	Details	Metals, semi-metals, non-metals, inorganic chemicals and others	Organic chemicals	Landfill gases/vapours
1	<u>On site</u> Possible presence of made ground of unknown source or impacted natural soils due historical human activity on the site	Possible	Possible	Unlikely

5.0 PRELIMINARY CONCEPTUAL SITE MODEL: POTENTIAL SOURCE-PATHWAY-RECEPTOR RELATIONSHIPS

5.1 General

Prior to commencing any intrusive site investigation works it is appropriate to undertake a qualitative risk assessment with respect to any potential sources, pathways and receptor relationships which may exist on site. A guide to Qualitative Risk Assessment is provided in 'Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66: 2008'. This approach is comparable to a Tier 1 human health risk assessment and identifies where a potential pollutant linkage relationship exists and if present, an estimate of the risk that defined receptors will suffer harm.

The current proposed development is the construction 42No residential property across the site. Therefore, it is considered appropriate to adopt the "**Residential with the consumption of homegrown vegetables**" end use threshold values for any future assessment of chemical test data.

5.2 Contaminant Sources

▪ Site Sourced Contamination

The following has been identified through the desk study phase of this report as the only area of potential concern (APC):

1. Possible presence of made ground of unknown source or impacted natural soils due to historical human activity on the site;

▪ Cross Boundary Contaminant Migration

No sources of contamination with a viable mechanism for impacting upon the site were identified.

5.3 Potential Receptors

The likely receptors identified from the desk study based upon the proposed development have been detailed below.

- Human Health
 - 0-6 year old child residing in one of the new residential property – **critical receptor for residential area.**
 - Adult resident within proposed property;
 - Neighbours including the residents in the adjacent property;
 - Site operatives and general public during the construction phase.

- Controlled Waters

- Surface water, - although there were no surface water features/courses identified within the immediate vicinity of the site it is within c.730m of the Lidsey Rife, which was given a Moderate overall rating in 2016.

Based upon the above and with reference to the "*Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66: 2008*", as the site relatively close (<1km) of a moderate quality watercourse surface waters are considered to have a Moderate (M2) sensitivity.

- Groundwater – although the deep chalk is classified as a Principal aquifer and is a SPZ1c it is protected by the overlaying London Clay therefore the most accessible groundwater is within the drift and shallow Lambeth Group strata. These are both designated as Secondary A aquifers from which the nearest abstraction is 900m from the site where the water is used of irrigation.

Therefore, in accordance with the "*Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66: 2008*", as there are no identified uses for the water within the secondary A aquifer in the vicinity of the site groundwater is considered to have a Low (L1) sensitivity.

- Other Receptors

- Flora and fauna
 - Buried building materials
 - Buried service mains and supplies

5.4 Potential Pathways

- Human Health

- Soil ingestion.
 - Dermal contact.
 - Consumption of soil on vegetables – Residential area only
 - Inhalation of contaminant vapours/dust.

5.4.1 Buildings and Services

- Direct contact with underlying contaminants.

- Groundwater

- Migration of any contamination via groundwater.

- Surface water

- Risk of uncontrolled surface water runoff entering the local watercourses;

-
- Downward migration into the groundwater prior to lateral migration into the water courses is possible.

 - Flora and fauna
 - Plant root uptake

5.5 Summary of Source – Pathway – Receptor Relationships

Table 5.5.1, overleaf, highlights the source-pathway-receptor relationships that are considered viable across the site based upon the Desk Study information. This assessment forms the basis of the Tier 1 risk assessment that is detailed later in this report. Qualitative risk estimation has been included in the table, the risk estimation as per 'Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66: 2008'.

Table 5.5.1: Potential Source – Pathway – Receptor Relationships

APC Nº	Source	Pathway (s)	Receptor	Classification of Consequence	Classification of Probability	Classification of Risk
1	On site Possible presence of made ground of unknown source or impacted natural soils due historical human activity on the site	Oral ingestion	Future Occupiers/Workmen/Visitors	Medium	Low likelihood	Moderate/Low risk
		Vapour and dust inhalation	Future Occupiers/Workmen/Visitors	Medium	Low likelihood	Moderate/Low risk
		Dermal contact	Future Occupiers/Workmen/Visitors	Medium	Low likelihood	Moderate/Low risk
		Landfill gases/vapours	Future Occupiers/Workmen (confined spaces)	Medium	Unlikely	Low Risk
		Downward migration	Groundwater (Secondary A aquifer)	Medium	Unlikely	Low Risk
		Via groundwater/runoff	Surface Water (Lidsey Rife - Moderate)	Medium	Low likelihood	Moderate/Low risk
		Direct contact	Buildings – natural sulphate levels in the clay	Medium	Likely	Moderate Risk
		Direct contact	Underground Services	Medium	Unlikely	Moderate/Low risk
		Uptake via root systems	On-site flora	Mild	Unlikely	Very Low risk

5.6 Site Zones and Averaging Areas – Human Health Risk Assessment

Under current UK Legislation and Environment Agency guidance, consideration must be given to the most appropriate method of grouping the data, both of which must relate to the conceptual model. For instance, the data can be grouped spatially (i.e. for individual areas/zones within a site) or by particular strata. Zones can be used to delineate a site to facilitate cost effective site characterisation during the site investigation phase. The qualitative risk estimation with respect to contamination ranges from 'very low' to 'moderate' but generally most of the APC's were deemed to be 'Moderate/Low'

Based upon the size of the site, its proposed development with residential properties when considered with the known historic past use it is deemed appropriate, as discussed in Section 5.1, that it should be assessed as **a single zone**.

Zone 1 Site area;

A zone can be further divided into "averaging areas" which will enable the site to be more accurately assessed based on soil/made ground type, current process operations and exposure pathways. However, the determination as to whether the use of separate averaging areas will be appropriate for the site will depend upon the findings of a site investigation.

5.7 Uncertainties and Assumptions

Although no evidence of recent human development or activity on the site has been identified as being potentially contaminative as the area has been occupied since the Roman period there is the possibility contaminated made ground could be present.

Therefore, based upon the proposed future end use of the site this potential contaminant source and associated exposure scenarios are considered to warrant an intrusive investigation. The results of which will enable adequate characterisation as to whether the risk actually exists (i.e. contaminated made ground is present) and if so whether mitigation works will be required for the protection of human health and/or the environment.

Generally, due to the site being greenfield with no known contaminative usages an investigation comprising exploratory located on a 50m grid, which would equate to 7No positions, would be sufficient to provide robust site coverage.

However, in 2017 SOILS drilled 3No probe holes, the results of which are summarised in Section 6. Therefore, prior to determining the scope of the additional works the findings of the previous investigations have been assessed.

6.0 PREVIOUS SITE INVESTIGATION RESULTS

As identified previously SOILS undertook a period of winter groundwater monitoring between December 2017 and April 2018 using 3No probe holes they had drilled to 5.0m and installed with standpipes to their full depth.

Appendix D contains a copy of the report letter, with drawing and logs but the findings from these investigations is summarised below with further more detailed discussions in Section 7.

6.1 Window Sample Probe Holes

The 3No probe holes were sunk in a rough triangle pattern with one located in the north-eastern corner of the site (WS3) and the other two were approximately mid-way along the western boundary (WS2) and in the south-eastern area WS1).

From the logs it can be seen that no made ground was encountered with:

- a layer of gravelly silty CLAY topsoil ranging from 300-600mm thick;
- resting directly on c.1-2m of very gravelly CLAY, which was considered to be the superficial HEAD deposits; immediately underlying this was
- a structureless CHALK to the base of the boreholes (5m bgl).

Therefore, it is considered the Lambeth Group clay was absent across the site.

6.2 Chemical Analysis

No samples of soil or groundwater were collected or subjected to chemical analysis although from the bore logs there was no olfactory or visual evidence of contamination noted within any of the soils.

6.3 Groundwater

Although none of the boreholes encountered groundwater whilst being driven the subsequent water table level monitoring over the following four months revealed the minimum water standing depths of:

- WS1 = 2.96m bgl
- WS2 = 4.01m bgl
- WS3 = 3.51m bgl

Although the borehole locations were not surveyed within their letter SOILS concluded that:

“The difference in groundwater levels across the site may be accounted for by change in ground elevation. The topography was noted to slope down to the south”.

6.4 Proposed Scope of Additional Site Investigations

As previously discussed based upon the site's history and usages it is considered a 50m for the exploratory holes will provide a sufficient level of information to provide a high degree of confidence in the findings and any subsequent assessments.

Therefore, as the SOILS investigation included 3No 5m deep window sample probe holes it is proposed further investigations should comprise of:

- 4No trial pits at the positions shown on the drawing in Appendix A to supplement the SOILS window sample probe holes;
- Chemical analysis of 8No soils samples and any groundwater if encountered;
- One round of gas monitoring of the SOILS boreholes - if any elevated levels or flow rates are recorded then further visits will be undertake as deemed necessary.
- For foundation design 4No bulk samples will be collected for geotechnical testing;
- To support further drainage design infiltration testing will be undertaken within the 3No. trial pits.

7.0 GROUND INVESTIGATION WORKS

7.1 SOILS 2017 Field Work

On the 21st December 2017 SOILS attended site for an investigation comprising of:

- 3No window sample probe holes WS1-3 to 5m, which were installed with standpipes for

Although the subsequent letter report does not provide a rationale for the probe hole locations it can be seen that they are in rough triangle pattern giving general coverage of the site:

7.2 FEML 2020 Field Work

FEML attended site on Thursday 13th August 2020, a hot sunny day with a maximum temperature of 23°C but with heavy rain in the late afternoon, to undertake an investigation comprising of:

- excavation of 4N° trial pits (TP1 – TP4) to between 1.9m and 2.2m, three of which were also used for infiltration testing;

The rationale for the locations of the trial pits is also presented below in Table 7.2.1

Table 7.2.1 Rationale/Targeting of the Trial Pit Locations

<i>Exploratory Hole</i>	<i>Target</i>
TP1	general coverage to achieve a 50m grid for the investigation holes across the site
TP2	general coverage to achieve a 50m grid for the investigation holes across the site
TP3	general coverage to achieve a 50m grid for the investigation holes across the site
TP4	general coverage to achieve a 50m grid for the investigation holes across the site

All the trial pits excavated were photographed and logged by an experienced geo-environmental engineer with the photographs and logs being present within Appendices E and F, respectively. An exploratory hole location plan is also presented in Appendix A.

Selected disturbed soil samples of the topsoil and natural soil were obtained from the trail pits for chemical and/or geotechnical analysis.

7.3 Trial Pits

FEML oversaw the excavation by an JCB 3ex excavator of 4N° trial pits, (TP1–TP4), to depths between 1.9 and 2.2m bgl with them all being terminated in the natural ground.

Trial pits TP1, TP3 & TP4 were also used for infiltration testing, which required TP3 to be moved further westwards as the paddock fencing prevented the tractor and bowser from entering any of the fields from the access track.

7.4 Soil Geochemical Testing

FEML scheduled chemical analysis upon selected samples of made ground and natural soils which were forwarded to the UKAS/MCERTS accredited laboratory of The Environmental Laboratory (E.Lab) for analysis in accordance with the suites presented in Table 7.4.1. The chemical analysis results are provided in Appendix G.

Table 7.4.1: Soil Schedule of Chemical Testing

Test Type	Number of Samples Tested
<i>Arsenic, Cadmium, Chromium, Hexavalent Chromium, Lead, Mercury, Nickel, Copper, Zinc, Selenium, Water Soluble Boron, Total Cyanide, Free Cyanide, pH, Water Soluble Sulphate, Sulphide, Elemental Sulphur, Total Monohydric Phenols, Organic Content and Speciated Polyaromatic Hydrocarbons</i>	<i>8Nº soil</i>
<i>TPHCWG & BTEX</i>	<i>8Nº soil</i>
<i>Waste Acceptance Criteria (WAC)</i>	<i>2Nº soil</i>

7.5 Soil Geotechnical Testing

FEML also scheduled geotechnical analysis upon samples of the natural soils that were forwarded to the laboratory of Geo Site & Testing Services (GSTL) for analysis in accordance with the suites presented in Table 7.4.1. The results from which are provided in Appendix H.

Table 7.4.1: Soil Schedule of Chemical Testing

Test Type	Number of Samples Tested
<i>Moisture Content</i>	<i>4Nº soil</i>
<i>4 Point Liquid & Plastic Limit (Atterberg)</i>	<i>4Nº soil</i>
<i>Particle size distribution (PSD)</i>	<i>4Nº soil</i>
<i>BRS sulphate</i>	<i>4Nº soil</i>

7.6 Groundwater Testing

Groundwater was not encountered within any of the trial pits or two of the existing SOILS probe holes although in WS1 standing water was encountered at 4.65m bgl. However, due to the narrow standpipe diameter it was not possible to use a bailer to collect a water sample.

7.7 Landfill Gas Monitoring

As previously discussed although it was not considered there was a viable source of landfill that could migrate onto the site as the boreholes were present during the site works undertaken by FEML on the 13th August 2020 a round a gas monitoring was undertaken.

8.0 SUMMARY OF GROUND CONDITIONS

8.1 Introduction

The discussions below consider the soils revealed within the trial pits TP1-TP4 excavated by FEML on the 13th August 2020 in conjunction with the logs for the window sample probe holes WS1-WS3 sunk by SOILS on the 21st December 2017.

The shallow strata revealed was generally as indicated on the geological maps with topsoil over HEAD deposits, which varied from silty gravelly SAND to gravelly CLAY. Although from the deeper probe holes this rested directly on CHALK with the anticipated Lambeth Group (Woolwich and Reding Beds) between the HEAD and CHALK being absent.

8.2 Recorded Ground Conditions - General

All the exploratory holes revealed a layer of gravelly clay topsoil, which in the trial pits was noted as being 200mm thick but in the window sample holes it was noted as being thicker ranging from 300 to 600mm. Below the topsoil from the trial pit logs the superficial HEAD deposits were generally described as a silty gravelly SAND tending to a clayey GRAVEL with depth. Whilst the shallow soils revealed in the probe holes were also identified as HEAD but they were described as being a more cohesive gravelly CLAY. The deeper probe holes also encountered a structureless chalk immediately below the superficial deposits. Table 8.2.1 below summaries the strata revealed within the exploratory holes.

Table 8.2.1: Summary of Strata Encountered

Depth (m bgl)		Exploratory Holes Identified	Soil Type	General Description/Comments
From	To			
GL	0.20-0.60	TP1, TP2, TP3, TP4, WS1, WS2 & WS3	Topsoil	brown gravelly silty clay.
0.20	0.60-2.10 base of pit	TP1, TP2, TP3 & TP4,	Natural Soils Head Deposits	Light brown silty gravelly SAND
0.30-0.60	0.90-1.90	WS1, WS2 & WS3	Natural Soils Head Deposits	Light brown gravelly CLAY
0.60-1.10	1.90-2.20 base of pits	TP1, TP2 & TP4,	Natural Soils Head Deposits	Dark brown sandy clayey GRAVEL
0.90	2.50 base of probe hole	WS2	Natural Soils Head Deposits	Dark brown very gravelly CLAY
1.35-2.50	5.00 base of probe holes	WS1, WS2 & WS3	Undifferentiated Lewes Nodular, Seaford and Newhaven Chalk Formation	Off white weathered structureless CHALK

8.2.1 Topsoil

The topsoil across the site ranged from 0.2 to 0.60m thick and comprised a brown silty sandy clay. The gravel was fine to medium sub-angular flint

8.2.2 Made Ground

No made ground was encountered within any of the exploratory holes.

8.2.3 Superficial Deposits

Below the topsoil within all the exploratory holes the HEAD deposits were encountered although the strata varied and was present in bands consisting of a silty gravelly SAND tending to a sandy clayey GRAVEL within the trial pits. Whilst in the window sample probe holes it was noted as being more cohesive and was described as a gravelly CLAY tending locally to a very gravelly CLAY with depth. The gravel was noted as being a fine to coarse sub-angular flint with occasional cobbles

8.2.4 Natural Soils

The published BGS maps indicate the shallow bedrock should be sandy silty CLAY of the Lambeth Group however this was not present within any of the deeper probe holes as these encountered the weather CHALK of the Undifferentiated Lewes Nodular, Seaford and Newhaven Chalk Formation.

8.2.5 Contamination Found

There was no visual or olfactory evidence of contamination noted within any of the trial pits.

8.3 Groundwater

Groundwater was not encountered within any of the trial pits but SOISL had undertaken a period of groundwater monitoring and during FEML additional investigations the probe holes were dipped again. Table 8.3.1 below summaries the groundwater levels recorded by SOILS and FEML.

Table 8.3.1 Groundwater standing Levels

Date	Depth to Water Table (m bgl)						
	WS1	WS2	WS3	TP1	TP2	TP3	TP4
22/12/2017	3.85	Dry	4.51	-	-	-	-
23/12/2017	3.86	Dry	4.52	-	-	-	-
26/12/2017	3.86	Dry	4.53	-	-	-	-
30/12/2017	3.68	4.89	4.34	-	-	-	-
02/01/2018	3.33	4.54	3.97	-	-	-	-
05/01/2018	3.22	4.35	3.82	-	-	-	-
08/01/2018	3.40	4.30	3.79	-	-	-	-
11/01/2018	3.26	4.33	3.91	-	-	-	-
14/01/2018	3.33	4.40	3.89	-	-	-	-
17/01/2018	3.81	4.41	3.89	-	-	-	-
20/01/2018	3.31	4.38	3.89	-	-	-	-
23/01/2018	3.80	4.35	3.93	-	-	-	-
26/01/2018	3.11	4.23	3.70	-	-	-	-
29/01/2018	3.13	4.22	3.67	-	-	-	-
01/02/2018	3.19	4.28	3.74	-	-	-	-
06/02/2018	3.26	4.34	3.85	-	-	-	-
09/02/2018	3.34	4.44	3.99	-	-	-	-
15/02/2018	3.31	4.52	3.96	-	-	-	-
20/02/2018	3.33	4.39	3.94	-	-	-	-
23/02/2018	3.34	4.43	3.92	-	-	-	-

03/03/2018	3.50	4.63	4.11	-	-	-	-
06/03/2018	3.57	4.69	4.27	-	-	-	-
13/03/2018	3.44	4.59	4.06	-	-	-	-
15/03/2018	3.41	4.76	4.00	-	-	-	-
22/03/2018	3.39	4.50	3.99	-	-	-	-
26/03/2018	3.47	4.57	4.04	-	-	-	-
30/03/2018	3.49	4.62	4.36	-	-	-	-
02/04/2018	3.34	4.55	3.90	-	-	-	-
05/04/2018	2.96	4.01	3.51	-	-	-	-
10/04/2018	2.97	4.17	3.78	-	-	-	-
14/04/2018	3.06	4.15	3.78	-	-	-	-
18/04/2018	3.22	4.19	3.88	-	-	-	-
13/08/2020	4.65	Dry	Damp silt in base	Dry	Dry	Dry	Dry
Depth of hole	5.0m	5.0m	5.0m	1.9m	2.1m	2.1m	2.2m

8.4 Gas Conditions

From the Desk Study information it was not considered there were any viable sources of landfill gases in the vicinity of the site. In addition, from the history maps there is no evidence that the site would have extensive areas of deep made ground across it, which the intrusive investigations confirmed was correct as no made ground was encountered.

Therefore, due to the absence of any identified sources of landfill gases that could impact upon the site it was concluded methane and/or carbon dioxide are unlikely to pose a risk to future site occupiers. However, to support his assumption as the probe holes were already installed a round of gas monitoring was undertaken on the 13th August 2020 the results of which are shown in Table 8.4.1 below and discussed later in this report.

Table 8.4.1 –Ground Gas Results

Borehole	Flow rate (l/hr)	Max CH ₄ (%)	Max CO ₂ (%)	Min O ₂ (%)	Max H ₂ S (ppm)	Max CO (ppm)
13th August 2020 – Atmospheric pressure = 1011mb						
WS1	0.0	0.0	2.6	19.3	0	0
WS2	0.0	0.0	0.1	20.3	0	0
WS6	0.0	0.0	2.5	18.6	0	0

8.5 Geotechnical Test Results

Selected samples of the natural soils were collected from depths 1.0m between 1.5m from the trial pits and forwarded to GSTL for geotechnical testing the results of which are summarised below but are also discussed in detailed in Section 15 and a full copy of the report sheet is presented in Appendix H.

Table 8.5.1 Natural Geotechnical Laboratory Results

Trial Pit	Depth	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.424mm (%)	Grading Description	BRE Sulphate (g/l)
TP1	1.00	11	35	21	14	20	Brown slightly fine to coarse sandy silty/clayey fine to coarse GRAVEL	0.03

TP2	1.00	8.8		Not plastic		21	Brown slightly sandy silty/clayey fine to coarse GRAVEL	0.03
TP3	1.00	5.0		Not plastic		16	Brown slightly sandy clayey/silty fine to coarse GRAVEL	0.04
TP4	1.50	9.7	57	21	36	11	Brown slightly sandy silty/clayey fine to coarse GRAVEL (with cobbles)	0.04

8.6 Soil Solid Chemical Test Results

From the trial pits excavated across the site a total of 8N° soil samples were selected for chemical analysis and these were dispatched to E.Lab and their results are summarised below but a full copy of the report sheet is Appendix G.

Table 8.6.1: Chemical Soils Results Summary

Determinant	Recorded Concentrations		Number of Samples Tested
	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	
Arsenic	6.4	15.2	8
Cadmium	<0.5	1.4	8
Chromium	21	45	8
Copper	10.7	23.1	8
Lead	14.7	109	8
Mercury	<0.5	<0.5	8
Nickel	11.8	45.2	8
Selenium	<1	<1	8
Zinc	56.8	102	8
Water Soluble Sulphate	<0.02	<0.02	8
Elemental Sulphur	<20	<20	8
Free Cyanide	<1	<1	8
Hexavalent Chromium	<0.8	<0.8	8
Total Sulphide	<2	<2	8
Total Cyanide	<1	<1	8
Water Soluble Boron	<0.5	1.5	8
Acid Neutralisation Capacity	<0.1	<0.1	2
Loss On Ignition (450°C)	3.21	5.81	2
pH	6.1	7.6	8
Soil Organic Matter	0.2	0.6	8
Total Organic Carbon	0.49	2	2
Phenol	<1	5	8
3,4-Dimethylphenol	<1	<1	8
2,3-Dimethylphenol	<1	<1	8
2,3,5-trimethylphenol	<1	<1	8
Total Monohydric Phenols	<5	<5	8
Naphthalene	<0.1	<0.1	8
Acenaphthylene	<0.1	<0.1	8
Acenaphthene	<0.1	<0.1	8
Fluorene	<0.1	<0.1	8
Phenanthrene	<0.1	<0.1	8
Anthracene	<0.1	<0.1	8
Fluoranthene	<0.1	0.2	8
Pyrene	<0.1	0.2	8
Benzo(a)anthracene	<0.1	<0.1	8
Chrysene	<0.1	0.1	8
Benzo(b)fluoranthene	<0.1	<0.1	8
Benzo(k)fluoranthene	<0.1	<0.1	8
Benzo(a)pyrene	<0.1	<0.1	8
Indeno(1,2,3-cd)pyrene	<0.1	0.1	8
Dibenzo(a,h)anthracene	<0.1	<0.1	8
Benzo[g,h,i]perylene	<0.1	<0.1	8
Total PAH(16)	0.4	1.2	8
Total PAH with Coronene	<2	<2	2
Benzene	<0.01	<0.01	8
Toluene	<0.01	<0.01	8
Ethylbenzene	<0.01	<0.01	8

Table 8.6.1: Chemical Soils Results Summary

Determinant	Recorded Concentrations		Number of Samples Tested
	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	
Xylenes	<0.01	<0.01	8
MTBE	<0.01	<0.01	8
Total BTEX	<0.01	<0.01	2
>C5-C6 Aliphatic	<0.01	<0.01	8
>C6-C8 Aliphatic	<0.01	<0.01	8
>C8-C10 Aliphatic	<1	<1	8
>C10-C12 Aliphatic	<1	<1	8
>C12-C16 Aliphatic	<1	<1	8
>C16-C21 Aliphatic	<1	<1	8
>C21-C35 Aliphatic	<1	1	8
>C35-C40 Aliphatic	<1	<1	8
>C5-C7 Aromatic	<0.01	<0.01	8
>C7-C8 Aromatic	<0.01	<0.01	8
>C8-C10 Aromatic	<1	<1	8
>C10-C12 Aromatic	<1	<1	8
>C12-C16 Aromatic	<1	<1	8
>C16-C21 Aromatic	<1	<1	8
>C21-C35 Aromatic	<1	4.9	8
>C35-C40 Aromatic	<1	2.9	8
Total (>C5-C40) Ali/Aro	<1	10.4	8
Mineral Oils	<5	<5	2
PCB (total of 7 congeners)	<0.03	<0.03	2

9.0 HUMAN HEALTH RISK ASSESSMENT

9.1 Introduction

Part IIA of the Environmental Protection Act 1990, inserted by Section 57 of the Environment Act, 1995 and the associated Contaminated Land (England) Regulations 2000 (SI 2000/227), was brought into full effect on 1 April 2000. This has created a new regime for the identification and remediation of contaminated land. Contaminated land is defined 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 significant harm is being caused or there is significant possibility of such harm being caused’.

The human health risk assessment process is based upon a tiered system of risk estimation. It aims to identify significant risks that may require further investigation, be considered for remediation or indicate potential legal or financial liability. A tiered approach has been adopted within the UK risk assessment framework providing a series of steps, after each of which decisions are taken on whether or not more sophisticated assessment is required. By doing so a pragmatic approach to the assessment of human health risk is maintained.

9.2 Assessment of Averaging Areas/Zones Following Ground Investigation Works

As discussed in Section 5.6 for the purposes of investigation and assessment a site can be divided into zones based on the historical usages or proposed end use and these zones can be further divided into averaging areas. These averaging areas can be used to assess different soil types revealed or different potential exposure pathways etc. for the purposes of accurately modelling the site conditions. Each averaging area can be considered independently of each other for human health exposure assessment.

Based on professional judgement following the findings of the site investigation, it is considered that the single zone identified previously for the assessment of the land at 1 Northfields Cottages, Fontwell Avenue should be sub-divided into two averaging areas based upon the ground conditions encountered as follows:

- Zone 1 – topsoil – 4No samples;
- Zone 1 – natural soils – 4No sample.

9.3 Tier 1 Risk Assessment

Where analysis results record contaminant concentrations at beneath the laboratory detection limits these are excluded from further assessment as it is considered that the source is absent from the pollutant linkage relationship. This forms the basis for the Tier 1 risk assessment.

Based upon the chemical test data recovered during the works Table 9.3.1, overleaf, details both those determinants, split into their individual averaging areas, with observed contaminant concentrations at or beneath the limits of detection highlighted in yellow and those with recorded values that will require further consideration.

Table 9.3.1: Determinants Analysed, Identifying those above Detection

Determinant	Recorded Concentrations (mg/kg)			
	Zone 1 – Site Area			
	Topsoil 4No samples		Natural Soil 4No samples	
	Min	Max	Min	Max
Arsenic	6.4	7.7	6.9	15.2
Cadmium	<0.5	<0.5	<0.5	1.4
Chromium	21	26.6	26.1	45
Copper	11.9	17.8	10.7	23.1
Lead	35.1	109	14.7	28.9
Mercury	<0.5	<0.5	<0.5	<0.5
Nickel	11.8	14.5	17.3	45.2
Selenium	<1	<1	<1	<1
Zinc	63.7	95	56.8	102
Water Soluble Sulphate (g/l)	<0.02	<0.02	<0.02	<0.02
Elemental Sulphur	<20	<20	<20	<20
Free Cyanide	<1	<1	<1	<1
Hexavalent Chromium	<0.8	<0.8	<0.8	<0.8
Total Sulphide	<2	<2	<2	<2
Total Cyanide	<1	<1	<1	<1
Water Soluble Boron	0.6	1.5	<0.5	0.5
Acid Neutralisation Capacity	-	<0.1	-	<0.1
Loss On Ignition (450°C) (%)	-	5.81	-	3.31
pH	6.1	6.5	6.6	7.6
Soil Organic Matter (%)	0.3	0.5	0.2	0.6
Total Organic Carbon (%)	-	2	-	0.49
Phenol	<1	5	<1	<1
3,4-Dimethylphenol	<1	<1	<1	<1
2,3-Dimethylphenol	<1	<1	<1	<1
2,3,5-trimethylphenol	<1	<1	<1	<1
Total Monohydric Phenols	<5	<5	<5	<5
Naphthalene	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	<0.1	<0.1	<0.1	<0.1
Acenaphthene	<0.1	<0.1	<0.1	<0.1
Fluorene	<0.1	<0.1	<0.1	<0.1
Phenanthrene	<0.1	<0.1	<0.1	<0.1
Anthracene	<0.1	<0.1	<0.1	<0.1
Fluoranthene	<0.1	0.2	<0.1	<0.1
Pyrene	<0.1	0.2	<0.1	<0.1
Benzo(a)anthracene	<0.1	<0.1	<0.1	<0.1
Chrysene	<0.1	0.1	<0.1	<0.1
Benzo(b)fluoranthene	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	<0.1	0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	<0.1	<0.1	<0.1	<0.1
Benzo[g,h,i]perylene	<0.1	<0.1	<0.1	<0.1
Total PAH(16)	<0.4	1.2	<0.4	<0.4
Total PAH with Coronene	-	<2	-	<2
Benzene	<0.01	<0.01	<0.01	<0.01
Toluene	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	<0.01	<0.01	<0.01	<0.01
Xylenes	<0.01	<0.01	<0.01	<0.01
MTBE	<0.01	<0.01	<0.01	<0.01
Total BTEX	-	<0.01	-	<0.01
>C5-C6 Aliphatic	<0.01	<0.01	<0.01	<0.01
>C6-C8 Aliphatic	<0.01	<0.01	<0.01	<0.01
>C8-C10 Aliphatic	<1	<1	<1	<1
>C10-C12 Aliphatic	<1	<1	<1	<1
>C12-C16 Aliphatic	<1	<1	<1	<1
>C16-C21 Aliphatic	<1	<1	<1	<1

<i>Determinant</i>	Recorded Concentrations (mg/kg)			
	Zone 1 – Site Area			
	<i>Topsoil</i> <i>4No samples</i>		<i>Natural Soil</i> <i>4No samples</i>	
	<i>Min</i>	<i>Max</i>	<i>Min</i>	<i>Max</i>
>C21-C35 Aliphatic	<1	1	<1	<1
>C35-C40 Aliphatic	<1	<1	<1	<1
>C5-C7 Aromatic	<0.01	<0.01	<0.01	<0.01
>C7-C8 Aromatic	<0.01	<0.01	<0.01	<0.01
>C8-C10 Aromatic	<1	<1	<1	<1
>C10-C12 Aromatic	<1	<1	<1	<1
>C12-C16 Aromatic	<1	<1	<1	<1
>C16-C21 Aromatic	<1	<1	<1	<1
>C21-C35 Aromatic	<1	4.9	<1	<1
>C35-C40 Aromatic	<1	2.9	<1	<1
Total (>C5-C40) Ali/Aro	<1	10.4	<1	<1
Mineral Oils	-	<5	-	<5
PCB (total of 7 congeners)	-	<0.03	-	<0.03

In addition to those identified in the Table 6.3.1, the following determinants have also not been assessed further with regard to human health. The justification for this is detailed below.

- Total PAH
- Total TPH (>C5-C40) Aromatic/Aliphatic
- Soil Organic Matter
- Total Carbon Content
- pH
- Loss on Ignition (LOI)

Total PAH values have not been considered as, in accordance with current best practice, the individual PAH species have been assessed in accordance with their differing toxicological properties.

Total TPH values are discounted as the assessment approach is to compare the individual aliphatic or aromatic carbon ranges against their respective target values, which have been determined based upon their differing toxicology properties and availability.

Soil Organic Matter and pH have been recorded in order to provide information to complete quantitative human health risk assessment should it be needed and do not pose any identified human health-based risks under normal circumstances.

Total Carbon Content and Loss on Ignition are used for the determination of the waste classification for the disposal and do not pose a risk to human health.

9.4 Tier 2 Risk Assessment

The Tier 2 risk assessment utilises published and authoritative generic assessment criteria to determine the likelihood of harm being caused to human health. Therefore, as previously discussed in Section 5.1 the proposed development will comprises residential properties with private gardens therefore it is considered appropriate to use the “**residential with the consumption of homegrown vegetables**” end use threshold values. Where applicable the values used are based upon a soil organic matter (SOM) value of 1% (lowest available value) based upon the recorded SOM results within the topsoil (0.3 to 0.5%) and natural soils (0.2-0.6%).

Table 9.4.1 compares the determinants revealed with concentrations above their respective limit of detection against their adopted published assessment criteria (Residential with plant uptake), the source of which has been detailed. Any failures identified are highlighted in blue.

Table 9.4.1 Tier 2 Assessment for Determinants with concentrations above Limit of |Detection

Determinant	Recorded Concentrations (mg/kg)				Assessment Criterial (mg/kg)	
	Zone 1 – Site Area					
	Topsoil		Natural Soils			
	Min	Max	Min	Max	Threshold	Source
Arsenic	6.4	7.7	6.9	15.2	37	LQM
Cadmium	-	-	<0.5	1.4	11	LQM
Chromium	21	26.6	26.1	45	910	LQM
Copper	11.9	17.8	10.7	23.1	2400	LQM
Lead	35.1	109	14.7	28.9	200	DEFRA
Nickel	11.8	14.5	17.3	45.2	180	LQM
Zinc	63.7	95	56.8	102	3700	LQM
Water Soluble Boron	0.6	1.5	<0.5	0.5	290	LQM
Phenol	<1	5	-	-	120	LQM
Fluoranthene	<0.1	0.2	-	-	280	LQM
Pyrene	<0.1	0.2	-	-	620	LQM
Chrysene	<0.1	0.1	-	-	15	LQM
Indeno(1,2,3-cd)pyrene	<0.1	0.1	-	-	27	LQM
>C21-C35 Aromatic	<1	4.9	-	-	1100	LQM
>C35-C40 Aromatic	<1	2.9	-	-	1100	LQM

Key:

- = determinant recorded value below detection level for that averaging area and therefore passed Tier 1 assessment and not considered further

LQM = LQM/CIEH S4UL (S4UL) published 2015

DEFRA = Category 4 Screening Levels (C4SL) published 2014

9.5 Presentation of Results of Tier 2 Risk Assessment across the Study Area

As can be seen from Table 9.4.1 none of the determinants were present at concentrations that exceeded their respective target levels. Therefore, no further evaluation of the results is necessary as they have passed the Tier 2 assessment.

9.6 Summary of Human Health Risk Assessment and Outline Remedial Proposals

Based upon the above assessment of the available chemical test results it has been shown that using the LQM/CIEH S4UL and DEFRA C4SL target values none of the determinants were present at concentrations that are considered sufficient to pose a risk to human health.

Therefore, no remedial works will be necessary to make the site suitable for the current proposed residential development with private gardens.

10.0 CONTROLLED WATERS RISK ASSESSMENT

10.1 Receptors

As identified earlier in this report the controlled water receptors and their risk levels were:

- Surface water, - although there were no surface water features/courses identified within the immediate vicinity of the site it is within c.730m of the Lidsey Rife, which was given a Moderate overall rating in 2016.

Based upon the above and with reference to the “*Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66: 2008*”, as the site relatively close (<1km) of a moderate quality watercourse surface waters are considered to have a Moderate (M2) sensitivity.

- Groundwater – although the deep chalk is classified as a Principal aquifer and is a SPZ1c it is protected by the overlaying London Clay therefore the most accessible groundwater is within the drift and shallow Lambeth Group strata. These are both designated as Secondary A aquifers from which the nearest abstraction is 900m from the site where the water is used of irrigation.

Therefore, in accordance with the “*Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66: 2008*”, as there are no identified uses for the water within the secondary A aquifer in the vicinity of the site groundwater is considered to have a Low (L1) sensitivity.

Therefore, based upon the above the most sensitive receptor is surface water due the proximity of the Moderate rated Lidsey Rife.

10.2 Qualitative Assessment of Controlled Waters

The Lidsey Rife has been identified as the most sensitive controlled water receptor and there are two methods by which contamination leaving the site could impact upon the quality of the water within it. One is via downward migration into the groundwater and then lateral movement in the flow direction.

The other route is via surface water runoff created by any rainwater falling on the site that does not soak into the ground entering the stream, probably via a drainage/ditch network system. In this scenario the water would have very limited contact with any contamination as it will not actually filter through the ground.

When the above mechanisms for transporting any contamination to the Lidsey Rife are considered in conjunction with the actual site investigation results, which only revealed natural soils with no elevated levels of contamination (max PAH = 1.2mg/kg & TPH = 10.4mg/kg) the site is deemed to not pose a significant risk to controlled waters

11.0 GAS RISK ASSESSMENT

11.1 Natural Radon

From the risk assessment obtained from Public Health England (PHE) and BGS the site is not in a radon affected area, with <1% of homes being recorded with concentrations above the Action Level.

Therefore, no radon protection measures are necessary in the construction of new properties or extensions.

11.2 Landfill Gases

250m is the generally accepted zone of influence used by Local Planning Authorities when considering the possibility on-site migration of landfill gases from landfills and other areas of deep made ground.

However, although a small area of fill has been identified 19m east of the site due to the cohesive nature of the natural shallow soils, the size of the landfill and the age of the fill it is not considered to be a viable source of landfill gas that could migrate onto the site. No other landfills have been identified within 250m of the site therefore the on-site migration of landfill gases is not considered to represent a risk at the future development.

As discussed earlier in this report although gas monitoring was not deemed to be necessary as part of any future site investigations because probe holes with standpipes were already installed within the site a round of gas monitoring was undertaken to support the above assessment.

The maximum gas concentrations recorded values were:

- No methane was revealed within any of the boreholes; and
- a carbon dioxide concentration of 2.6% (WS1); with
- no flow rates (0 l/hr) were recorded within any of the boreholes

Using these maximum recorded values for the assessment of the gassing regime in the soils beneath the site in accordance with the CIRIA publication C665 "Assessing risks posed by hazardous ground gases to buildings" the maximum gas screening values (GSV) can be calculated as follows:

$$\text{Methane GSV} = 0.0 \times 0.0 = 0.0 \text{ l/hr}$$

$$\text{Carbon Dioxide GSV} = 2.6 \times 0.0 = 0.0 \text{ l/hr}$$

Based upon the above calculated GSV levels using Table 8.5 of CIRIA publication C665 as the GSV were both <0.07 litres/hour this equates to a very low risk Characteristic Situation (CS) 1 classification. Therefore, no gas protection measures are considered to be necessary.

Also when the maximum carbon dioxide (2.6%<5%) volume is compared against Table 14.1 of the NHBC "Guidance on Methane and Carbon Dioxide" Report Edition No.04 based upon their traffic light characterisation system the site would be considered to be GREEN, which confirms that no gas protection measures are required.

11.3 Conclusion

Therefore, as the site has been shown not to have any recorded elevated carbon dioxide or methane gas concentrations and the site is not within an area of elevated radon gas levels no gas protection measures are required within the new properties

12.0 RISK ASSESSMENT OF OTHER ENVIRONMENTAL RECEPTORS

12.1 General

The other environmental receptors identified earlier in this report were buildings, services and future planting. This chapter discusses both receptors and assesses the risk to them based upon the results of the chemical analysis and the proposed development.

12.2 Building Materials Risk Estimation for the Study Area

Recorded soil pH values from the chemical analysis of the samples indicated that the soils (topsoil and natural soils) ranged from marginally acidic to marginally alkaline with values ranging from 6.1 to 7.6. The associated water-soluble sulphate concentrations were all below the limit of detection <0.02g/l.

When these results are compared against the BRE Special Digest 1 (2005) assessment levels, the maximum sulphate result indicates a DS1 design mix concrete should be suitable for buried structures. Also, as the shallowest groundwater level revealed during the SOILS winter monitoring was 2.96m bgl, which is deeper than the anticipated foundation depth static water can be assumed giving an ACEC class AC-1s

12.3 Phytotoxic Risk Estimation for the Study Area

Where considering phytotoxic risks, the contaminants selected are those listed within Annex 3 of 'Guidance for the Safe Development of Housing on Land Affected by Contamination. R&D66: 2008 Volume 2' as being 'phytotoxic'. Where available, assessment values have been chosen based on the criteria within, (in priority order), SGV Documents, ICRCL 59/83 phytotoxic threshold levels, Dutch RIVM Serious Risk Concentrations (SRC) for ecological receptors (amended for a UK soil of 10% clay and 2% soil organic matter) and US EPA Soil Screening Levels for plants.

Table 12.3.1 to compares the results for potentially phytotoxic contaminant concentrations against the phytotoxic assessment criteria with any exceedances highlighted in blue.

Table 12.3.1: Elevated Concentrations of Phytotoxic Contaminants within the Soils

Phytotoxic Metals	Ass't Criteria	Laboratory Detection Limit or recorded concentrations(mg/kg)	
		Min (mg/kg)	Max (mg/kg)
Selenium	10	<1	<1
Boron	3	<0.5	1.5
Copper	130	10.3	23.1
Nickel	60	11.8	45.2
Zinc	300	56.8	102
Cadmium	8	<0.5	1.4
Chromium	154	21	45
Mercury	28	<0.5	<0.5

Based on the available chemical test results presented within Table 12.3.1 it has been shown that none of the phototoxic metals are at concentrations that are considered likely to be detrimental to plant growth.

12.4 Services Risk Estimation for the Study Area

Contaminants in the ground can pose a risk to potable water supply by permeating water supply pipes. Therefore, to fulfil their statutory obligation, UK water supply companies require robust evidence from developers to demonstrate either that the ground in which new plastic supply pipes will be laid is free from specific contaminants, or that the proposed remedial strategy will mitigate any existing risk. If these requirements cannot be demonstrated to the satisfaction of the relevant water company, it becomes necessary to specify an alternative pipe material on the whole development or specific zones.

In 2010, UK Water Industry Research (UKWIR) published *Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites* (Report Ref. No. 10/WM/03/21). This report reviewed previously published industry guidelines and threshold concentrations adopted by individual water supply companies. The focus of the UKWIR research project was to develop clear and concise procedures, which provide consistency in the pipe selection decision process. It was intended to provide guidance that can be used to ensure compliance with current regulations and to prevent water supply pipe failing prematurely due to the presence of contamination.

Report 10/WM/03/21 concluded that in most circumstances only organic contaminants pose a potential risk to plastic pipe materials and Table 3.1 of the report provides threshold concentrations for PE and PVC pipes for the organic contaminants of concern.

The potential risks to water supply pipes have therefore been assessed against the threshold concentrations for PE and PVC pipe specified in Table 3.1 of Report 10/WM/03/21, which have been adopted as the GAC's for this project. Table 12.4.1 summarises the results

Table 12.4.1: Assessment of Results against WRAS Criteria

Determinant	WRAS criteria		Recorded Concentrations	
	PE pipe	PVC pipe	Minimum	Maximum
VOC	0.5	0.125	Not tested	Not tested
BTEX + MTBE	0.1	0.03	All <0.01 & Total BTEX <0.01	All <0.01 & Total BTEX <0.01
SVOCs	2	1.4	Not Tested	Not tested
Phenols	2	0.4	<1	5
Cresols and chlorinated phenols	2	0.04	Not tested	Not tested
Mineral Oils C11-C20	10	Suitable	<1	<1
Mineral Oils C21-C40	500	Suitable	<1	10.4

Notes:

VOC and SVOC values given are the sum of the results for individual determinants that were shown to be present at concentrations in excess of the limit of detection for the analysis

Mineral Oils C11-C20 is a combination of TPH aliphatic and aromatic ranges C10 to C21

Mineral Oils C21-C40 is a combination of TPH aliphatic and aromatic ranges C21 to C35

Table 12.4.1 indicates that, based on the available chemical test results, the maximum recorded phenol concentration has the potential to pose a risk to buried PVC water supply pipework.

However, from a review of the results it can be seen that the single elevated phenol was within the topsoil (0.0-0.15m bgl) in TP1 and therefore is unlikely to be in contact with the pipework and it may be possible to obtain a relaxation of the assessment.

Regardless of the above it will be necessary to liaise with the statutory water suppliers to obtain their confirmation as to their requirements for the specification for buried portable water supply pipework to be used on the site.

13.0 REFINED CONCEPTUAL SITE MODEL

13.1 General

Chapter 5 presented the preliminary conceptual site model that utilises desk-based information to present a qualitative assessment of potential source-pathway-receptor relationships across the site. Following completion of the ground investigation works and Tier 2 risk assessment for human health and other environmental receptors a refined conceptual site model has been developed as detailed below.

13.2 Sources

The site investigation works and associated chemical testing have revealed the following:

- None of the soils across the site were shown to have concentrations of contamination that would pose a risk to human health based upon a residential development with private gardens;
- The soils are not considered to pose a potential risk to future plant growth;
- The site is not considered to pose a risk to controlled waters
- There is a risk that phenol within the topsoil may be present at concentrations that make it unsuitable for water supply pipes to be PVC based upon the WRAS Trigger Values although PE pipework should be suitable;
- The water soluble sulphate concentration within the soils would only require a DS1 design mix for buried concrete and foundations.

13.3 Pathway and Receptor

The potential pathways for the proposed development were identified earlier in Section 5.3 but are also summarised again below.

The human receptors will include both children and adults living in the new properties, the residents in neighbouring properties or the site operatives and general public during the construction phase via the following exposure pathways

- Outdoor/indoor ingestion of soil.
- Outdoor/indoor exposure to soil through skin contact.
- Consumption of vegetables and soil attached
- Outdoor/indoor inhalation of fugitive dust.
- Outdoor/indoor inhalation of vapours.

The deep chalk is classified as a Principal aquifer and is in a SPZ1c but this is protected by the overlaying London Clay therefore the most accessible groundwater is within the drift and shallow Lambeth Group strata. These are both designated as Secondary A aquifers from which the nearest abstraction is 900m from the site where the water is used of irrigation.

There are no surface water features/courses identified within the immediate vicinity of the site with the Lidsey Rife, which was given a Moderate overall rating in 2016 being the nearest at c.730m to the south. The site is not within an area at risk of flooding.

Based upon the recorded water-soluble sulphate concentration a DS1 concrete design mix for buried structures and footings is considered suitable.

Underground services associated with the proposed development may potentially be impacted by phenols within the topsoil.

The proposed development will include areas of soft landscaped gardens and communal areas which will present viable floral receptor.

13.4 Risk Evaluation

Subsequent to the assessment of the results of the site investigation the site-specific qualitative risk evaluation, as presented in Section 5.5, has been reviewed and updated as discussed below and summarised in Table 13.4.1. The risk estimation has been undertaken as per 'Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66: 2008'.

The following evaluation of risk is based upon a residential development consisting of properties with private gardens with the recorded values being assessed against the "residential with the consumption of homegrown vegetables" for the viable pollutant linkages identified earlier.

13.4.1 Risk to Human Health: Soils/Gases

The topsoil and natural have been shown to be acceptable for their proposed use and therefore are considered to pose a **Low Risk** to human health.

No radon protection measures are necessary within the construction of new dwellings. Based upon the Desk Study landfill gases were not deemed to represent a risk to future site occupiers, which was confirmed by a round of gas monitoring. Therefore, gases (landfill and radon) are considered to pose a **Low Risk** to future property occupiers and workmen.

13.4.2 Risk to Building Materials and Services

The results of the sulphate and pH testing indicate that the geo-chemistry of the soils will not create an aggressive environment for buried concrete structures. Therefore, the site is considered to pose a **Low Risk** to concrete foundations/footings and a standard DS1 concrete design mix will be adequate for buried structures.

With regard to buried services the recorded concentration, when considered against the WRAS guidelines, indicate that PVC pipework may be at risk due to an elevated phenol concentration recorded in one of the topsoil samples. Therefore, although it may be possible to get agreement from the Water Authority that this is acceptable until these discussions are held buried mains and pipework are deemed to be at a **Moderate Risk** of damage.

13.4.3 Risk to Surface and Groundwater

The deep principal aquifer within the chalk site is protected by the overlying London Clay. The superficial deposits and shallow bedrock are both designated as secondary A aquifers. However, as no contamination was revealed within the soils, the maximum recorded PAH and TPH concentrations being 1.2mg/kg and 10.4mg/kg respectively, when considered in

conjunction with the absence of any identified usages groundwater is deemed to be a **Low Risk** from the site.

When considering the risk posed to the Lidsey Rife c.730 to the south the absence of contamination across the site again has resulted in the risk to surface water being deemed to be **Low Risk** from the site.

13.4.4 Risk to flora and fauna

Based upon the absence of any elevated phytotoxic metals within the soils and the previous use of the area for horse grazing it is considered the site poses a **Very Low Risk** to any future planting.

Table 13.4.1 below presents the summary risk evaluation associated with each source-pathway-receptor linkage related to the proposed development of the site.

Table 13.4.1: Summary of Risk Evaluation

APC Nº	Source	Identified contamination	Pathway (s)	Receptor	Classification of Consequence	Classification of Probability	Classification of Risk
1	On site Possible presence of made ground of unknown source or impacted natural soils due historical human activity on the site	No sources of contamination were identified within the soils across the site that pose a risk to human health, controlled waters, buried concrete or plant growth. A single phenol concentration within the topsoil could create an aggressive environment for PVC water mains	Oral ingestion	Future Occupiers/Workmen	Medium	Unlikely	Low Risk
			Vapour and dust inhalation	Future Occupiers/Workmen	Medium	Unlikely	Low Risk
			Dermal contact	Future Occupiers/Workmen	Medium	Unlikely	Low Risk
			Landfill gases/vapours	Future Occupiers	Medium	Unlikely	Low Risk
			Downward migration	Groundwater	Medium	Unlikely	Low Risk
			Via groundwater/runoff	Surface Water	Medium	Unlikely	Low Risk
			Direct contact	Buildings	Medium	Unlikely	Low Risk
			Direct contact	Underground Services	Medium	Likely	Moderate Risk
			Uptake via root systems	On-site flora	Mild	Unlikely	Very Low Risk

14.0 RISK MANAGEMENT AND REMEDIAL STRATEGY

14.1 Summary of Findings

Based upon the finding of the investigations and the revised risk assessment it has been shown that the site in its current form and post development does not pose a risk to human health, controlled waters, buildings or flora and fauna.

However, due to a single phenol concentration of 5mg/kg within the topsoil in TP1 the soils have to be considered to have the potential to create an aggressive environment that could be detrimental to the water quality in buried PVC pipes. Therefore, as discussed, below it is recommended that the Local Water Authority are consulted to confirm their required specification for buried water supply pipework.

14.2 Proposed Remedial Measures

To address the localised elevated phenol within the topsoil that could create a risk to the drinking water quality if PVC pipework is used for the mains. The Local Water Authority should be consulted and their required specification of pipework or construction method (e.g. clean service trenches) be used.

Table 14.2.1 below details the revised risk evaluation for the identified issues following the completion of the proposed remedial works.

Table 14.2.1 Revised Risk Evaluation Post Remedial Works

AP C N ^o	Source	Pathway(s)	Receptor	Current Risk Rating	Proposed Remedial Works	Revised Risk Rating
1	<i>Localised elevated phenol within the topsoil</i>	Direct contact	Buried services	Moderate	Liaise with the Local Water Authority to determine their requirements for buried water mains	Very Low

If during the works any unexpected contamination is revealed then work in the area should stop immediately and it be made safe after which specialist advice should be sought from an environmental consultant.

15.0 GEOTECHNICAL CONDITIONS AND ENGINEERING RECOMEMNDATIONS

15.1 Laboratory Geotechnical Testing Results

From the investigations undertaken on the parcel of land at 1 Northfields Cottages in Eastergate the natural soils were shown to be topsoil over HEAD deposits, which varied from silty gravelly SAND to gravelly CLAY in the log descriptions, resting on CHALK, which was revealed in the SOILS probe holes.

Bulk soil samples were collected by FEML from the trial pits from depths between 1.0m to 1.5m bgl in the HEAD deposits, which is likely to the founding depth. The CHALK was not encountered in the trial pits and therefore no samples of it were collected.

The samples were forwarded to the laboratory of GSTL for a range of geotechnical tests including Particle Size Distribution (PSD) and Atterberg the results of which are contained in Appendix H but are also discussed below.

The PSD testing confirmed the soils were predominantly a sandy gravel but it did contain a varying quantity of clay and silt.

The results for the Atterberg testing are shown in Table 15.1.1 below.

Table 15.1.1 Bedrock Geotechnical Laboratory Results

BH	Depth	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.424mm (%)	Laboratory Remarks	Modified Plasticity Index
TP1	1.00	11	35	21	14	20	CL Low/ Interim Plasticity	2.8
TP2	1.00	8.8		Not plastic		21		
TP3	1.00	5.0		Not plastic		16		
TP4	1.50	9.7	57	21	36	11	CH High Plasticity	3.96

The table above details the actual plasticity indices for the soils however, in accordance with the NHBC guidance for foundation design, it also shows the Modified Plasticity Index which is calculated using the formula below

$$\text{Modified Plasticity Index (I'p)} = \frac{\text{Plasticity Index (Ip)} \times \% \text{ less than } 425\mu\text{m}}{100\%}$$

Based upon the Modified Plasticity Index results although the deeper soil (1.5m in TP4) was shown to have a 36% plasticity index due to the clay content only be present at 11% the soils are not classed as having a potential volume change (i.e. <10%) that needs to be considered when determining a founding depth.

15.2 Engineering Considerations

15.2.1 Subsurface Concrete

As discussed in Section 12.2 the recorded soil pH values from the chemical analysis of the samples indicated that the soils (topsoil and natural soils) ranged from marginally acidic to marginally alkaline with values ranging from 6.1 to 7.6. The associated water-soluble sulphate concentrations were all below the limit of detection <0.02g/l.

The geotechnical laboratory test results using the BRE BR 279 sulphate testing method identified similar pH values ranging between 7.06 and 7.28 with the aqueous extract sulphate concentrations also being low at between 0.03g/l to 0.04g/l

When both these sets of results are compared against the BRE Special Digest 1 (2005) assessment levels, the maximum sulphate result indicates a DS1 design mix concrete should be suitable for buried structures.

15.2.2 Floor Slabs

Although the shallow natural soils across the site were shown to have a variable clay content they were shown to have a potential volume change of <10% therefore they are considered to be non-plastic and not likely to cause heave. Therefore ground bearing slabs could be used although the formation level will require inspection to ensure the ground conditions are as expected, especially as the SOILS window sample probe holes considered the soils to be a "*gravelly CLAY*".

15.2.4 Deep Excavations

The exploratory holes were stable during the investigation although they were not left open for a long period of time. However, as the soils varied in the amount of clay within them and these variations in cohesiveness could result localised overbreak within excavations. Therefore, man entry into any excavation should be avoided where possible but if ultimately necessary then the sides should be adequately shored and supported or battered back to a safe angle in accordance with a site-specific developed Health & Safety Plan.

15.2.5 Groundwater

From the winter groundwater monitoring the shallowest groundwater was recorded at 2.96m bgl. Therefore, if deep excavations are necessary then it may be encountered dewatering may be required.

15.2.6 Road Construction

In-situ CBR testing has not been undertaken as part of this investigation however, the soils have a variable clay content based upon the log descriptions. Therefore, a qualitative assessment a likely CBR value of 2% should be assumed.

Cohesive soils are prone to rapid loss of consistence and structure during periods of wet weather and the anticipated CBR values will be significantly reduced to <1%. In such circumstances a geotextile starter layer would be beneficial and would minimise the loss of granular sub-base into the formation

15.3 Preliminary Foundation Recommendations

The anticipated proposed development will comprise of traditional brick and block two storey properties. Based upon the assumed height and construction line loads of between 50-70kN/m would be typical.

The underlying natural soils were generally a medium dense silty gravelly SAND tending to a medium dense sandy clayey GRAVEL with depth although it did contain varying amounts of clay however it should provide an allowable net bearing capacity of 100kN/m². Based upon this it is considered that traditional spread foundations will be suitable for the proposed development. As the soils are non-plastic although the minimum NHBC founding depth is 0.45m as the logs identified topsoil and soft strata to 0.6m it is considered a suitable foundation depth should be 0.7m.

Also due to the varying clay content in the soils it is recommended that the base of the excavation is inspected with any soft/unsuitable spots being removed and replaced with suitable compacted granular fill or lean mix concrete. Also due to the variability in the density of the founding stratum it would be prudent to nominally reinforce the foundations.

15.3.1 Building Near Trees

Although localised areas of the shallow soils have been shown to have a high plasticity when this is considered in conjunction with its grading the soils have been shown not to have a significant volume change potential. Therefore, no deepening of foundations is anticipated due to the influence of trees.

16.0 INFILTRATION TESTING

16.1 In-situ Testing Results

In-situ infiltration testing was undertaken in trial pits TP1, TP3 and TP4 the results sheets for which are contained in Appendix I but are also summarised in Table 16.1.1 below

Table 16.1.1: Infiltration Testing Results

Ref	Description	Depth to water (m)		Level drop (m)	Time (minutes)	Infiltration Rate (m/s)	Comments
		start	end				
TP1	1.7m long x 0.7m wide x 1.9m deep	1.100	1.900	0.800	30	2.15×10^{-4}	
		1.350	1.900	0.550	20	2.03×10^{-4}	
		1.400	1.900	0.500	20	2.17×10^{-4}	
TP2	1.8m long x 0.7m wide x 2.1m deep	1.700	2.100	0.400	5	7.43×10^{-4}	With 2" pump water level steady at 1.700m
		1.700	2.100	0.400	5	7.96×10^{-4}	With 2" pump water level steady at 1.700m
		1.700	2.100	0.400	5	8.22×10^{-4}	With 2" pump water level steady at 1.700m
TP3	2.0m long x 0.7m wide x 2.2m deep	1.770	2.200	0.430	2	1.78×10^{-3}	With 2" pump water level steady at 1.770m
		1.770	2.200	0.430	3	1.94×10^{-3}	With 2" pump water level steady at 1.770m
		1.770	2.200	0.430	3	1.33×10^{-3}	With 2" pump water level steady at 1.770m

16.2 Conclusion

The results from the in-situ infiltration testing undertaken have shown that the soils readily permit the passage of water.

Therefore, soakaways are a viable drainage option for the discharge of surface water.

17.0 WASTE DISPOSAL CLASSIFICATION ASSESSMENT

17.1 Introduction

For the construction of the new properties it is likely it will be necessary to remove surplus material from site. Therefore, an assessment of the waste categorisation has been undertaken to comply with the various legislation and guidance related to waste. All material removed from site must be adequately described by reference to the appropriate codes in the List of Waste regulations.

Following the implementation of the Landfill Regulations 2002 which introduced the use of waste acceptance criteria testing for hazardous waste classification on the 16th July 2005 when hazardous waste is intended for disposal at a suitably licensed landfill site it is necessary for the producer (i.e. the developer or their consultant on their behalf) to identify among other general information the following:

- the European Waste Catalogue (EWC) code for the waste;
- the relevant hazard code (H1 to H14)
- the landfill class where the waste may be accepted.

The EWC codes for all wastes are listed in “Consolidated European Waste Catalogue” of the “Environment Agency Hazardous Waste: Interpretation of the definition and classification of hazardous waste”.

17.2 European Waste Catalogue (EWC) Code

Based on the chemical analysis results for the soils on the site it is anticipated that most suitable EWC codes will be:

17 05 04

Table 17.2.1: EWC Codes and Description – Construction and Demolition Waste

Number	Description
17	Construction and Demolition Waste (including Excavated Soils from Contaminated Sites)
05	Soil (including excavated from contaminated sites), stones and dredging
04	Soil and stones other than those mentioned in 17 05 03

17.3 Hazard Codes

In addition to the category code if hazardous soils require removal to landfill they will also have to be coded in terms of their relative hazard properties, as detailed in Table 17.3.1 below.

Table 17.3.1: Hazard Codes

Hazard code	Description
HP1	Explosive
HP2	Oxidising
HP3A	Highly Flammable
HP3B	Flammable
HP4	Irritant
HP5	Harmful
HP6	Toxic
HP7	Carcinogenic
HP8	Corrosive
HP9	Infectious

HP10	Teratogenic
HP11	Mutagenic
HP12	Substances which release toxic gases when in contact with air or acid
HP13	Substances capable of yielding another substance after disposal
HP14	Ecotoxic

17.4 Waste Soil Classifications

As discussed above prior to disposal it is necessary to classify soils within one of the following categories:

- Inert Waste
- Non-hazardous Waste
- Hazardous Waste

Within the Environment Agency document “Environmental Permitting Regulations: Inert Waste Guidance” based upon the landfill Directive inert waste is defined as:

“....waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater.”

Hazardous waste is defined by Article 1 of “Commission Decision 2000/532/EC” as amended by 2001/118/EC, 2001/119/EC and 2001/573/EC of the “Hazardous Waste Directive” and is based upon the total concentrations of the individual determinants when compared against the associated EWC limit values.

Non-hazardous waste is the classification for all other material that is not shown to be inert or hazardous. However, within this classification there is a sub group that is described as “inactive non hazardous waste” and if the soils are classified in this group although they attract a higher disposal rate they are not subject to the higher rate of landfill tax which is discussed later in this section.

17.5 Actual Soil Classifications

Topsoil should be viewed as a resource rather than a waste and as it is chemically suitable for residential garden use, it should be stripped and reused on this site and any surplus reused on other developments. However, the receiving developments may require further testing to determine the topsoil parameters in accordance with BS3883 : 2015 as the current testing was for human health risk assessments.

For the determination of whether the soils revealed on the site are hazardous the chemical analysis results obtained have been assessed using the HazWasteOnline computer program. Table 17.5.1 overleaf summaries this assessment with additional comments and considerations used to determine the most likely waste classification.

Table 17.5.1 – Summary of Soil Waste Classification

Exploratory Hole		Soil Type	Initial Classification	Comments	Likely Classification
Ref	Depth				
TP1	0.15	Topsoil	Non-hazardous	Based upon the results of the WAC testing for TP2 topsoil the soils can be considered to be inert	Inert EWC 17 05 04
TP1	0.50	Natural soils	Non-hazardous	Based upon the results of the WAC testing for TP3 natural soils this material can be considered to be inert	Inert EWC 17 05 04
TP2	0.15	Topsoil	Non-hazardous	Based upon the WAC results this topsoil is inert	Inert EWC 17 05 04
TP2	0.8	Natural soils	Non-hazardous	Based upon the results of the WAC testing for TP3 natural soils this material can be considered to be inert	Inert EWC 17 05 04
TP3	0.15	Topsoil	Non-hazardous	Based upon the results of the WAC testing for TP2 topsoil the soils can be considered to be inert	Inert EWC 17 05 04
TP3	0.75	Natural soils	Non-hazardous	The WAC result for this sample has confirmed the soils are inert	Inert EWC 17 05 04
TP4	0.15	Topsoil	Non-hazardous	Based upon the results of the WAC testing for TP2 topsoil the soils can be considered to be inert	Inert EWC 17 05 04
TP4	1.00	Natural soils	Non-hazardous	Based upon the results of the WAC testing for TP3 natural soils this material can be considered to be inert	Inert EWC 17 05 04

As can be seen from the table if any soils are to be removed from site to a landfill based upon the solid results supported by the Waste Acceptance Criteria (WAC) results they would most likely be classified as inert waste.

However, as mentioned above the topsoil is chemically suitable for use on other developments as are the underlying natural soils if a suitable development nearby requires fill material. The movement and reuse of this material could be undertaken in accordance with an approved Material Management Plan under the Definition of Waste Code of Practice (DoWCoP).

Regardless of the destination of any material removed from site appropriate documentation should be retained, and be available for inspection, that demonstrates the nature of the material disposed of including chemical analysis where appropriate.

18.0 CONCLUDING DISCUSSION

18.1 Summary

From the investigations undertaken on the proposed development site at 1 Northfields Cottages, Fontwell Avenue the following conclusions can be drawn based upon the proposed residential development consisting of properties with private gardens.

- The British Geological Survey (BGS) maps show the site is underlain by Head superficial deposits with the shallow bedrock being the Lambeth Group with Chalk at depth. The FEML trial pits, which extended to a maximum depth of 2.2m, revealed topsoil over silty gravelly SAND tending to a sandy clayey GRAVEL with depth. However, the SOILS window sample probe holes revealed soils with a higher clay content and the geotechnical testing revealed a variable composition of the soils. The probe holes sunk by SOILS in 2017 also revealed Chalk was present below the superficial deposits at shallow depths ranging from 1.35 to 2.5m bgl;
- The superficial deposits and shallow bedrock are designated as a Secondary (A) aquifer. However, the deeper Chalk is a Principal Aquifer and within SPZ1c although this is protected by the London Clay. Therefore, the groundwater receptor is deemed to be the Secondary (A) aquifer in the superficial deposits and shallow bedrock, which is considered to be a Low risk (L1) from any contamination on the site;
- The nearest surface water feature is Lidsey Rife c.730m to the south, which was graded as being Moderate overall in 2016. Therefore, as it could be connected via drainage ditches to the site it is considered to have a Moderate (M2) sensitivity to contamination present on the site, if present.
- The British Geological Survey (BGS), National Geoscience Information Service have designated the area as not requiring radon protective measures within the construction of new dwellings.
- The site is within an area that is considered to have a low risk of UXO's;
- The site history has revealed that the site has never been developed and has been in agricultural use the earliest available maps (1876).
- A former gravel pit was identified to the east of the site on the opposite site of Fontwell Avenue that was used as an inert landfill was between 1979 and 1981. Although this is a potential source of landfill gases due to the age of the fill (c.40 years) and because the area has been developed with a property it is considered any fill present will no longer have the capacity to generate significant quantities of methane or carbon dioxide. To support this assessment as there were boreholes present on the site a round of gas monitoring was undertaken, which confirmed the site is a Characteristic Situation (CS) 1. Therefore, no gas protection measures will be required within any of the new properties across the site;
- The chemical testing did not reveal any contamination that is considered likely to pose a risk to human health.
 - No shallow groundwater was encountered but based upon a qualitative assessment when considering the site's setting and absence of any contamination it is not considered to pose a significant risk to controlled waters.
- Based upon the sulphate concentrations and absence of shallow groundwater a DS1-AC-1s concrete design mix should be suitable for buried concrete when compared against the BRE Special Digest 1 (2005) assessment criteria.

- The chemical results indicate that an elevated phenol within the topsoil when compared against the WRAS thresholds could be detrimental to PVC pipework if used for water supply mains.
- No elevated phytotoxic metal concentrations were revealed within the soils that are considered likely to be detrimental to current or future plant growth.
- To address the potential risk to PVC pipework the following remedial measures are proposed:
 1. The local Water Authority should be forwarded the soil results for their review and confirmation as the specification for buried pipework for water mains to be used across the site.
- Although the underlying soils have been described as having varying clay, sand and gravel content the geotechnical testing undertaken on the FEML samples confirmed the soils were predominantly a sandy GRAVEL and although locally it had a higher plasticity index when this was considered in conjunction with the soils grading all strata tested was confirmed to be non-shrinkable. Therefore, the ground should be suitable for traditional strip foundations with a maximum bearing capacity of 100KN/m² and, based upon the soil strata revealed during the site investigation, a foundation depth of 0.7m is recommended. Also due to the variable amounts of granular and cohesive materials within the soils it is recommended that mesh reinforcement should be included within the footings if differing strata is revealed at the founding depth.
- Infiltration testing has the soils are suitable for soakaways for the discharge of surface water with rates ranging from 1.33x10⁻³ to 8.22x10⁻⁴m/s
- Any surplus soils on the site should be suitable for reuse on other local developments under the DoWCoP scheme, however if any material is disposed of at licensed landfill it is likely it will be classified as inert waste.

18.2 Conclusion

Based upon the above it has been shown that the site is suitable for the proposed residential development as the soils do not pose a risk to human health, controlled waters, buried concrete or plant growth. Although, due to a localised phenol result within the topsoil it will be necessary to liaise with the local Water Authority with regard the pipework to be used for buried water mains.

18.3 Recommendations

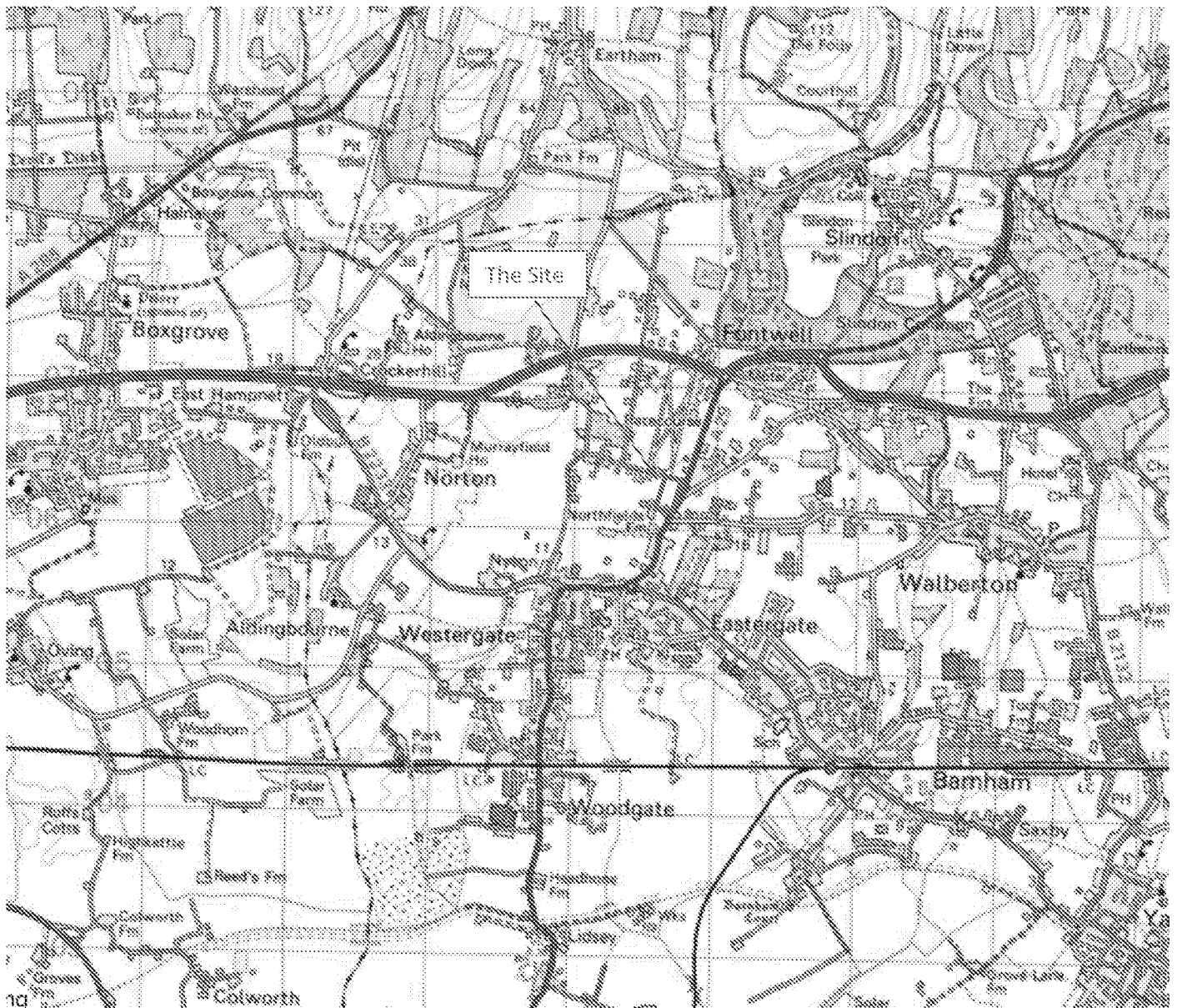
In line with the concluding remarks above the following recommendations are made:

- This report should be forwarded to Council's Environmental Health Department for their assessment and to confirm that they are in agreement with the conclusions and recommendations.
- Liaison with the statutory water supplier should be undertaken to determine the specification for underground water supply pipework across the site.
- If soakaways are the preferred drainage solution it is recommended that this report is forwarded to the Council's Drainage Department for their review to support any future design proposals

APPENDICES

A	DRAWINGS
B	GROUNDSURE ENVIRO INSIGHT DATA REPORT
C	HISTORICAL MAPS
D	SOILS LIMITED LETTER REPORT
E	SITE PHOTOGRAPHS
F	TRIAL PIT LOGS
G	CHEMICAL TEST RESULTS
H	GEOTECHNICAL TEST RESULTS
I	INFILTRATION RESULTS
J	GAS MONITORING

APPENDIX A DRAWINGS



PROJECT I Northfield Cottage, Eastergate	CLIENT Hampshire Homes Group Ltd	Date : 11 th August 2020 Scale : Not To Scale	 THE FORGE Sustainable Design The Forge Lower Vagg Chilthorne Damer Yeovil Somerset BA21 3PY Tel : 01935 840 346
DRAWING TITLE Site Location Plan		DRAWING No. FON206.D/sk01	



NOTES:

Do Not Scale.

Report all discrepancies, errors and omissions.

Verify all dimensions on site before commencing any work on site or preparing shop drawings.

All materials, components and workmanship are to comply with the relevant British Standards, Codes of Practice, and appropriate manufacturers recommendations that from time to time shall apply.

For all specialist work, see relevant drawings.

This drawing and design are copyright of Clague LLP
Registration number OC335948.

Rev	Date	Description
-----	------	-------------

- Bin Collection Point
- Root Protection Zones
- 5m Water main easement
- Parking space
- Visitors Parking space
- Site Boundary

Project Title

Proposed Residential Development
Fontwell Avenue
West Sussex

Drawing Description

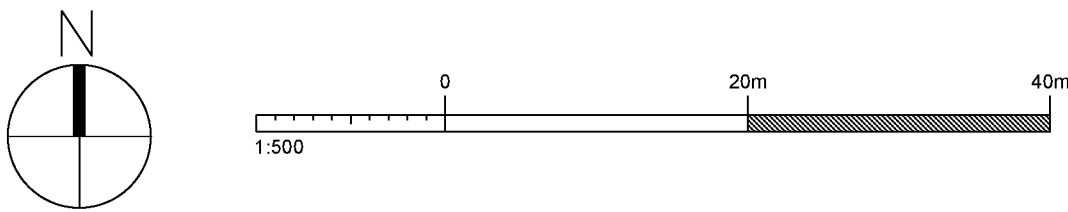
Site Block Plan
Garden Dimensions

Scale	Drawn by
1:500 @ A1	AS
Date	Checked by
July 2020	CSS

CLAGUE ARCHITECTS

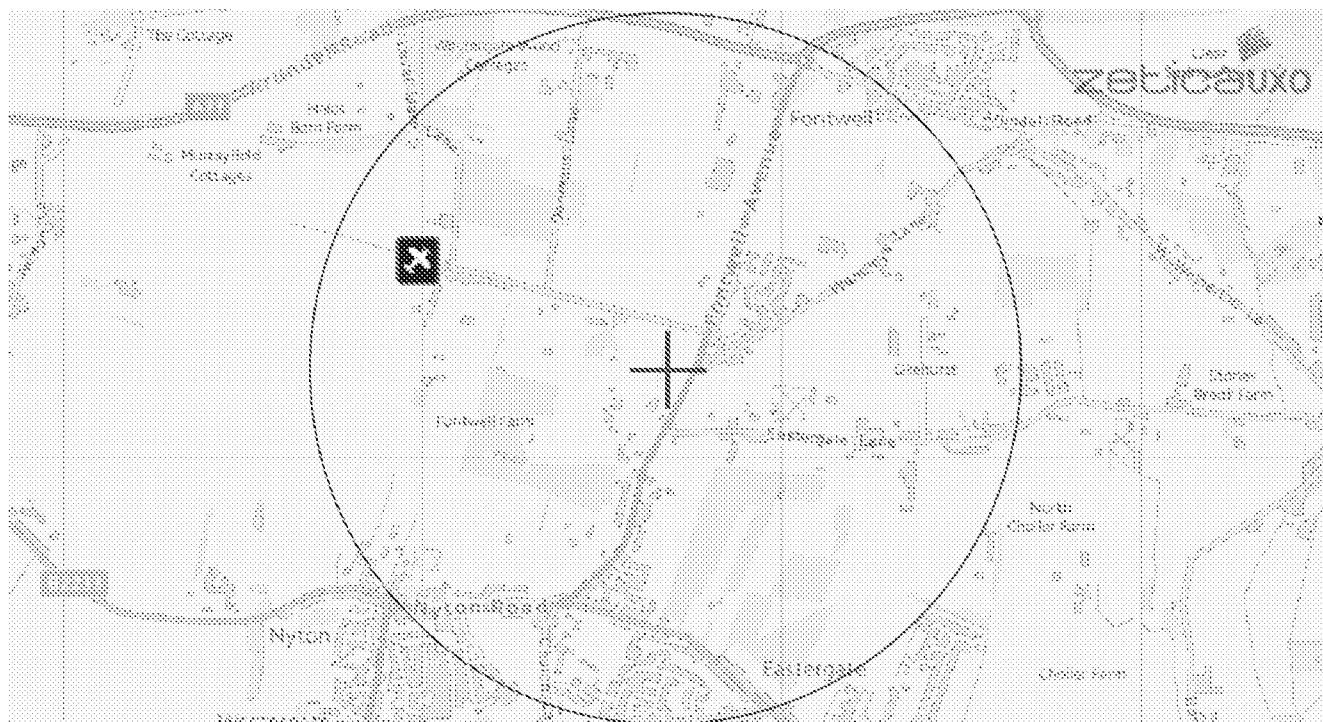
62 Burgate, Canterbury Kent CT1 2BH	01227 762060
1 Kinsbourne Court, Lufon Road, Harpenden, Hertfordshire AL5 3BL	01562 795102
8, Disney Street London SE1 1JF	0203 597 8112
CANTERBURY	LONDON
	HARPENDEN

Drawing Number	Revision
29662A_100	V



zeticauxo

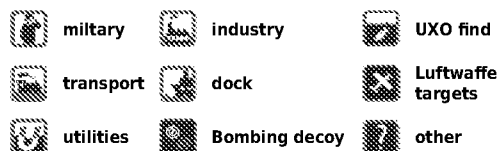
Map Centre: 494688,106246



 High: Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.

 Moderate: Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.

 Low: Areas indicated as having 15 bombs per 1000acre or less.



The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

What do I do if my site is in a moderate or high risk area?

Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

Similarly, if your site is near to a designated Luftwaffe target or bombing decoy then additional detailed research is recommended.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirms that there is a low potential for UXO to be present on your site then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

If I have any questions, who do I contact?

tel: +44 (0) 1993 886682

email: **uxo@zetica.com**

web: www.zeticauxo.com

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website: (<https://zeticauxo.com/downloads-and-resources/risk-maps/>)

Zetica cannot guarantee the accuracy or completeness of the information or data used and cannot accept any liability for any use of the maps. These maps can be used as part of a technical report or similar publication, subject to acknowledgment. The copyright remains with Zetica Ltd.

It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.



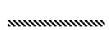
KEY



2017 Soils Ltd Probe Hole



2020 FEML Trial Pit



Proposed development area

PROJECT Northfields Cottage, Eastergate	CLIENT Hampshire Homes Group Ltd	Date : 13 th August 2020 Scale : Not To Scale	 FORGE Construction & Design The Forge Lower Vagg Chilthorne Damer Yeovil Somerset BA21 3PY Tel : 01935 840 346
DRAWING TITLE Exploratory Hole Location Plan		DRAWING No. FON206.D/sk02	

APPENDIX B GROUNDSURE ENVIRO INSIGHT DATA REPORT

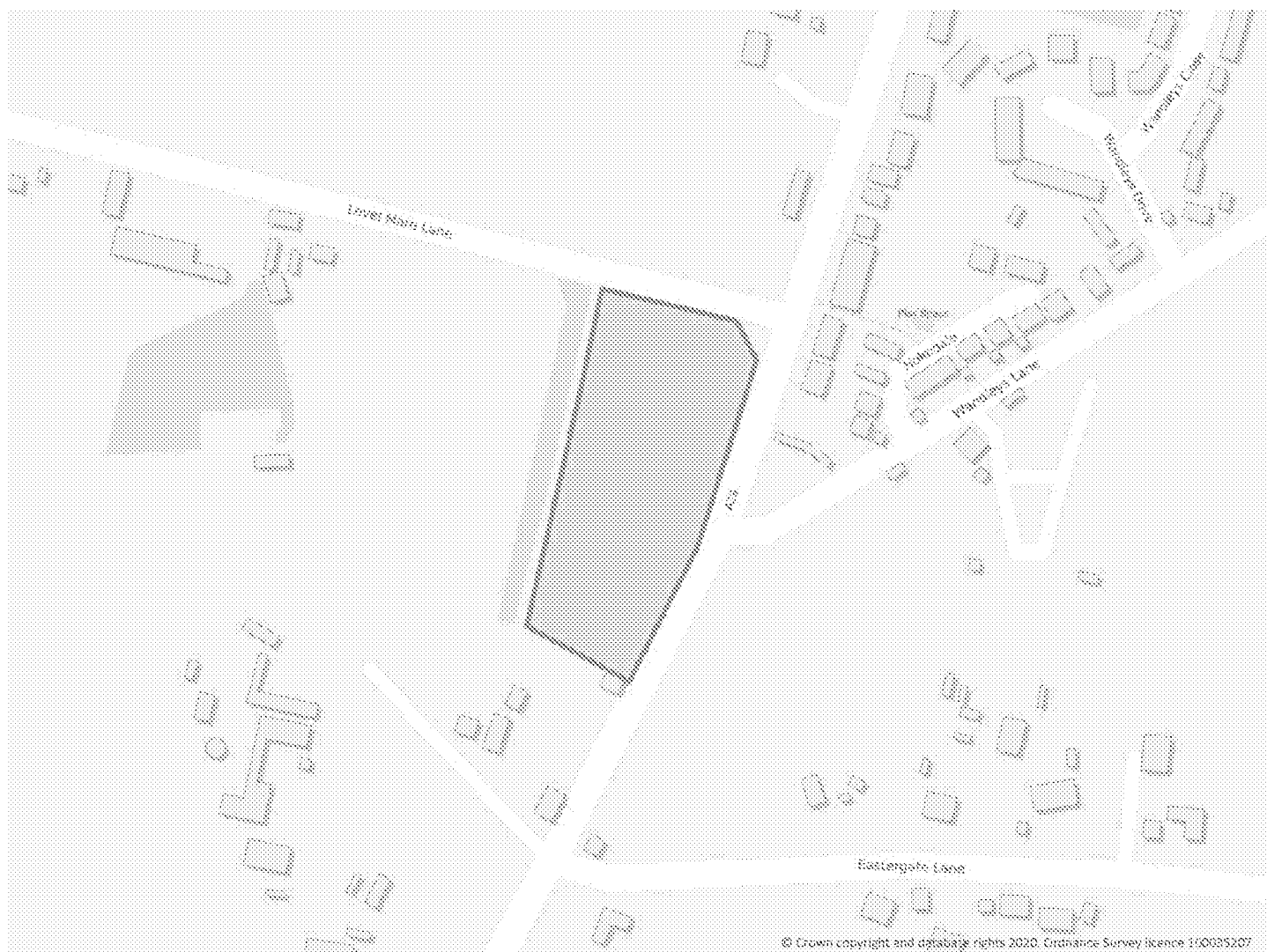
1 NORTHFIELDS COTTAGES, FONTWELL AVENUE, EASTERGATE, PO20 3RX

Order Details

Date: 10/08/2020
Your ref: FON206D
Our Ref: GS-6955268
Client: Forge Environmental Management Ltd

Site Details

Location: 494719 106271
Area: 1.34 ha
Authority: [Arun District Council](#)



Summary of findings

p. 2

Aerial image

p. 8

OS MasterMap site plan

p.13

groundsure.com/insightuserguide

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	0	4	10	13	-
16	1.2	Historical tanks	0	0	5	0	-
16	1.3	Historical energy features	1	0	1	0	-
17	1.4	Historical petrol stations	0	0	0	0	-
17	1.5	Historical garages	0	0	0	1	-
17	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
18	2.1	Historical industrial land uses	0	4	11	14	-
20	2.2	Historical tanks	0	0	8	0	-
20	2.3	Historical energy features	2	0	2	0	-
21	2.4	Historical petrol stations	0	0	0	0	-
21	2.5	Historical garages	0	0	0	2	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
22	3.1	Active or recent landfill	0	0	0	0	-
22	3.2	Historical landfill (BGS records)	0	0	0	0	-
23	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
23	3.4	Historical landfill (EA/NRW records)	0	1	0	1	-
23	3.5	Historical waste sites	0	2	2	5	-
25	3.6	Licensed waste sites	0	0	3	0	-
26	3.7	Waste exemptions	0	0	0	12	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
28	4.1	Recent industrial land uses	0	1	7	-	-
29	4.2	Current or recent petrol stations	0	0	0	0	-
29	4.3	Electricity cables	0	0	0	0	-
29	4.4	Gas pipelines	0	0	0	0	-
30	4.5	Sites determined as Contaminated Land	0	0	0	0	-

30	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
30	4.7	Regulated explosive sites	0	0	0	0	-
30	4.8	Hazardous substance storage/usage	0	0	0	0	-
30	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
31	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
31	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
31	4.12	Radioactive Substance Authorisations	0	0	0	0	-
31	4.13	<u>Licensed Discharges to controlled waters</u>	0	0	3	0	-
32	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
32	4.15	Pollutant release to public sewer	0	0	0	0	-
32	4.16	List 1 Dangerous Substances	0	0	0	0	-
32	4.17	List 2 Dangerous Substances	0	0	0	0	-
33	4.18	<u>Pollution Incidents (EA/NRW)</u>	0	0	1	1	-
33	4.19	Pollution inventory substances	0	0	0	0	-
33	4.20	Pollution inventory waste transfers	0	0	0	0	-
34	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
35	5.1	<u>Superficial aquifer</u>	Identified (within 500m)				
37	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
39	5.3	<u>Groundwater vulnerability</u>	Identified (within 50m)				
40	5.4	<u>Groundwater vulnerability- soluble rock risk</u>	Identified (within 0m)				
41	5.5	Groundwater vulnerability- local information	None (within 0m)				
42	5.6	<u>Groundwater abstractions</u>	0	0	2	1	5
44	5.7	<u>Surface water abstractions</u>	0	0	0	0	2
45	5.8	<u>Potable abstractions</u>	0	0	2	0	2
46	5.9	<u>Source Protection Zones</u>	0	0	1	0	-
47	5.10	<u>Source Protection Zones (confined aquifer)</u>	1	0	1	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
48	6.1	Water Network (OS MasterMap)	0	0	0	-	-

48	6.2	Surface water features	0	0	0	-	-
49	6.3	<u>WFD Surface water body catchments</u>	1	-	-	-	-
49	6.4	<u>WFD Surface water bodies</u>	0	0	0	-	-
50	6.5	<u>WFD Groundwater bodies</u>	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
51	7.1	Risk of Flooding from Rivers and Sea (RoFRaS)	None (within 50m)				
51	7.2	Historical Flood Events	0	0	0	-	-
51	7.3	Flood Defences	0	0	0	-	-
51	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
52	7.5	Flood Storage Areas	0	0	0	-	-
53	7.6	Flood Zone 2	None (within 50m)				
53	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
54	8.1	<u>Surface water flooding</u>	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding					
56	9.1	<u>Groundwater flooding</u>	High (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
57	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
58	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
58	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
58	10.4	Special Protection Areas (SPA)	0	0	0	0	0
58	10.5	National Nature Reserves (NNR)	0	0	0	0	0
59	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
59	10.7	<u>Designated Ancient Woodland</u>	0	0	0	0	18
60	10.8	Biosphere Reserves	0	0	0	0	0
60	10.9	Forest Parks	0	0	0	0	0
60	10.10	Marine Conservation Zones	0	0	0	0	0
60	10.11	Green Belt	0	0	0	0	0
61	10.12	Proposed Ramsar sites	0	0	0	0	0

61	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
61	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
61	10.15	Nitrate Sensitive Areas	0	0	0	0	0
62	10.16	<u>Nitrate Vulnerable Zones</u>	2	0	1	0	4
63	10.17	<u>SSSI Impact Risk Zones</u>	1	-	-	-	-
64	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
65	11.1	World Heritage Sites	0	0	0	-	-
65	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
65	11.3	National Parks	0	0	0	-	-
65	11.4	Listed Buildings	0	0	0	-	-
66	11.5	Conservation Areas	0	0	0	-	-
66	11.6	Scheduled Ancient Monuments	0	0	0	-	-
66	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
67	12.1	<u>Agricultural Land Classification</u>	Grade 1 (within 250m)				
68	12.2	Open Access Land	0	0	0	-	-
68	12.3	Tree Felling Licences	0	0	0	-	-
68	12.4	Environmental Stewardship Schemes	0	0	0	-	-
69	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
70	13.1	<u>Priority Habitat Inventory</u>	0	1	7	-	-
71	13.2	<u>Habitat Networks</u>	3	2	1	-	-
71	13.3	Open Mosaic Habitat	0	0	0	-	-
72	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
73	14.1	<u>10k Availability</u>	Identified (within 500m)				
74	14.2	<u>Artificial and made ground (10k)</u>	0	0	1	1	-
75	14.3	<u>Superficial geology (10k)</u>	2	1	4	5	-

76	14.4	Landslip (10k)	0	0	0	0	-
77	14.5	<u>Bedrock geology (10k)</u>	2	0	2	0	-
78	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
79	15.1	<u>50k Availability</u>	Identified (within 500m)				
80	15.2	Artificial and made ground (50k)	0	0	0	0	-
80	15.3	Artificial ground permeability (50k)	0	0	-	-	-
81	15.4	<u>Superficial geology (50k)</u>	2	0	3	3	-
82	15.5	<u>Superficial permeability (50k)</u>	Identified (within 50m)				
82	15.6	Landslip (50k)	0	0	0	0	-
82	15.7	Landslip permeability (50k)	None (within 50m)				
83	15.8	<u>Bedrock geology (50k)</u>	2	0	0	0	-
84	15.9	<u>Bedrock permeability (50k)</u>	Identified (within 50m)				
84	15.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
85	16.1	<u>BGS Boreholes</u>	0	0	2	-	-
Page	Section	Natural ground subsidence					
86	17.1	<u>Shrink swell clays</u>	Moderate (within 50m)				
87	17.2	<u>Running sands</u>	Very low (within 50m)				
88	17.3	<u>Compressible deposits</u>	Negligible (within 50m)				
89	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
90	17.5	<u>Landslides</u>	Very low (within 50m)				
91	17.6	<u>Ground dissolution of soluble rocks</u>	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
92	18.1	Natural cavities	0	0	0	0	-
93	18.2	<u>BritPits</u>	0	0	1	2	-
93	18.3	<u>Surface ground workings</u>	0	3	4	-	-
94	18.4	Underground workings	0	0	0	0	0
94	18.5	Historical Mineral Planning Areas	0	0	0	0	-

94	18.6	<u>Non-coal mining</u>	1	0	1	0	0
95	18.7	Mining cavities	0	0	0	0	0
95	18.8	IPB mining areas	None (within 0m)				
95	18.9	Coal mining	None (within 0m)				
95	18.10	Brine areas	None (within 0m)				
96	18.11	Gypsum areas	None (within 0m)				
96	18.12	Tin mining	None (within 0m)				
96	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
97	19.1	<u>Radon</u>	Less than 1% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
98	20.1	<u>BGS Estimated Background Soil Chemistry</u>	3	1	-	-	-
98	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
98	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
99	21.1	Underground railways (London)	0	0	0	-	-
99	21.2	Underground railways (Non-London)	0	0	0	-	-
99	21.3	Railway tunnels	0	0	0	-	-
99	21.4	Historical railway and tunnel features	0	0	0	-	-
99	21.5	Royal Mail tunnels	0	0	0	-	-
100	21.6	Historical railways	0	0	0	-	-
100	21.7	Railways	0	0	0	-	-
100	21.8	Crossrail 1	0	0	0	0	-
100	21.9	Crossrail 2	0	0	0	0	-
100	21.10	HS2	0	0	0	0	-

Recent aerial photograph



Capture Date: 28/06/2018

Site Area: 1.34ha

Recent site history - 2015 aerial photograph



Capture Date: 30/06/2015

Site Area: 1.34ha

Recent site history - 2013 aerial photograph



Capture Date: 03/05/2013

Site Area: 1.34ha

Recent site history - 2012 aerial photograph



Capture Date: 13/09/2012

Site Area: 1.34ha

Recent site history - 1999 aerial photograph



Capture Date: 06/09/1999

Site Area: 1.34ha

OS MasterMap site plan



Site Area: 1.34ha

1 Past land use



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical garages

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1.1 Historical industrial land uses

Records within 500m

27

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
A	39m E	Unspecified Pit	1940	1905123

ID	Location	Land use	Dates present	Group ID
A	40m E	Gravel Pit	1910	1872031
A	41m E	Unspecified Pit	1969	1902686
A	46m E	Unspecified Works	1977	1860824
A	59m E	Unspecified Pit	1876	1932854
B	105m N	Pumping Station	1910 - 1940	1906170
B	107m N	Pumping Station	1977	1895371
B	111m N	Pumping Station	1896	1962390
B	116m N	Unspecified Tank	1969	1859300
B	121m N	Unspecified Tank	1940	1859298
2	121m NE	Gravel Pits	1910	1863676
3	130m E	Nursery	1977	1868107
C	160m S	Old Gravel Pit	1896	1874195
C	160m S	Unspecified Pit	1910	1881724
D	332m W	Unspecified Pit	1969	1961768
E	334m SE	Unspecified Disused Pits	1977	1944900
E	334m SE	Unspecified Disused Pits	1990	1961855
D	334m NW	Unspecified Ground Workings	1940	1853480
D	335m NW	Unspecified Pit	1910	1899017
D	340m NW	Unspecified Pit	1969	1962951
S	341m SE	Sand Pit	1910	1873638
D	342m NW	Unspecified Pit	1910	1965719
D	345m NW	Unspecified Pit	1940	1930055
E	351m SE	Unspecified Pit	1961	1881723
E	352m SE	Old Gravel Pits	1940	1863811
7	409m E	Unspecified Pit	1940 - 1961	1936703
8	497m S	Nursery	1969	1991048

This data is sourced from Ordnance Survey / Groundsure.



1.2 Historical tanks

Records within 500m	5
----------------------------	----------

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	122m N	Unspecified Tank	1939 - 1973	323296
B	156m N	Unspecified Tank	1939 - 1973	321794
A	160m W	Unspecified Tank	1973 - 1994	327174
B	167m N	Tanks	1939	311436
B	168m N	Tanks	1939	311435

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	2
----------------------------	----------

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
1	On site	Electricity Substation	1973 - 1994	199226
A	115m E	Electricity Substation	1973 - 1994	211549

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**1**

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
6	386m SW	Car Breakers Yard	1979 - 1984	63613

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



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical garages

2.1 Historical industrial land uses

Records within 500m

29

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 18](#)

ID	Location	Land Use	Date	Group ID
B	39m E	Unspecified Pit	1940	1905123
B	40m E	Gravel Pit	1910	1872031
B	41m E	Unspecified Pit	1969	1902686

ID	Location	Land Use	Date	Group ID
B	46m E	Unspecified Works	1977	1860824
B	59m E	Unspecified Pit	1876	1932854
C	105m N	Pumping Station	1940	1906170
C	107m N	Pumping Station	1910	1906170
C	107m N	Pumping Station	1977	1895371
C	111m N	Pumping Station	1896	1962390
C	116m N	Unspecified Tank	1969	1859300
C	121m N	Unspecified Tank	1940	1859298
1	121m NE	Gravel Pits	1910	1863676
2	130m E	Nursery	1977	1868107
D	160m S	Old Gravel Pit	1896	1874195
D	160m S	Unspecified Pit	1910	1881724
F	332m W	Unspecified Pit	1969	1961768
G	334m SE	Unspecified Disused Pits	1990	1961855
G	334m SE	Unspecified Disused Pits	1977	1944900
F	334m NW	Unspecified Ground Workings	1940	1853480
F	335m NW	Unspecified Pit	1910	1899017
F	340m NW	Unspecified Pit	1969	1952951
3	341m SE	Sand Pit	1910	1873638
F	342m NW	Unspecified Pit	1910	1965719
F	345m NW	Unspecified Pit	1940	1930055
G	351m SE	Unspecified Pit	1961	1881723
G	352m SE	Old Gravel Pits	1940	1863811
I	409m E	Unspecified Pit	1940	1936703
I	410m E	Unspecified Pit	1961	1936703
4	497m S	Nursery	1969	1951048

This data is sourced from Ordnance Survey / Groundsure.



2.2 Historical tanks

Records within 500m	8
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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 18**

ID	Location	Land Use	Date	Group ID
C	122m N	Unspecified Tank	1973	323296
C	123m N	Unspecified Tank	1939	323296
C	156m N	Unspecified Tank	1973	321794
C	157m N	Unspecified Tank	1939	321794
E	160m W	Unspecified Tank	1973	327174
E	162m W	Unspecified Tank	1994	327174
C	167m N	Tanks	1939	311436
C	168m N	Tanks	1939	311435

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	4
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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 18**

ID	Location	Land Use	Date	Group ID
A	On site	Electricity Substation	1973	199226
A	On site	Electricity Substation	1994	199226
B	115m E	Electricity Substation	1994	211549
B	116m E	Electricity Substation	1973	211549

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m	0
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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	2
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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 18**

ID	Location	Land Use	Date	Group ID
H	386m SW	Car Breakers Yard	1979	63613
H	386m SW	Car Breakers Yard	1984	63613

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Historical landfill (EA/NRW)
- Historical waste sites
- Licensed waste sites
- Waste exemptions

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
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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	2
---------------------	---

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.

Features are displayed on the Waste and landfill map on **page 22**

ID	Location	Details		
1	19m E	Site Address: Wandley's Lane, Eastergate, Sussex Licence Holder Address: -	Waste Licence: Yes Site Reference: WD27/100, WD13/5/28 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: - Licence issue: 14/03/1979 Licence Surrender: 13/03/1981	Operator: - Licence Holder: Eastergate Parish Council First Recorded 14/03/1979 Last Recorded: 13/03/1981
2	330m SE	Site Address: Eastergate Lane, Eastergate, Sussex Licence Holder Address: -	Waste Licence: Yes Site Reference: 27-153, WD27/099 Waste Type: Inert, Commercial, Household Environmental Permitting Regulations (Waste) Reference: - Licence issue: 01/01/1976 Licence Surrender: -	Operator: - Licence Holder: - First Recorded 31/12/1949 Last Recorded: 31/12/1963

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

3.5 Historical waste sites

Records within 500m	9
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Waste site records derived from Local Authority planning records and high detail historical mapping.

Features are displayed on the Waste and landfill map on **page 22**

ID	Location	Address	Further Details	Date
A	36m E	Site Address: N/A	Type of Site: Ground Workings and Refuse Heap Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1912
A	36m E	Site Address: N/A	Type of Site: Ground Workings and Refuse Heap Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1912
B	124m NE	Site Address: N/A	Type of Site: Ground Workings and Refuse Heap Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1912
B	124m NE	Site Address: N/A	Type of Site: Ground Workings and Refuse Heap Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1912
E	334m NW	Site Address: N/A	Type of Site: Ground Workings and Refuse Heap Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1912
E	334m NW	Site Address: N/A	Type of Site: Ground Workings and Refuse Heap Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1912
F	386m SW	Site Address: N/A	Type of Site: Car Breakers Yard Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1979
F	386m SW	Site Address: N/A	Type of Site: Car Breakers Yard Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1984
F	387m SW	Site Address: N/A	Type of Site: Scrap Yard Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1994



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

3.6 Licensed waste sites

Records within 500m	3
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Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

Features are displayed on the Waste and landfill map on **page 22**

ID	Location	Details		
C	185m SE	Site Name: Sussex Recovery Site Address: Sussex Recovery, Fontwell Avenue, Eastergate, West Sussex, PO20 6RU Correspondence Address: Sussex Recovery, Fontwell Avenue, Eastergate, West Sussex, PO20 6RU	Type of Site: Metal Recycling Site (Vehicle Dismantler) Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: PAR001 EPR reference: - Operator: Parker David Michael Waste Management licence No: 19748 Annual Tonnage: 4000	Issue Date: 31/03/1994 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued
C	185m SE	Site Name: S R C Recycling Ltd Site Address: Sussex Recovery, Fontwell Avenue, Eastergate, West Sussex, PO20 6RU Correspondence Address: Fontwell Avenue, Eastergate, Chichester, West Sussex, PO20 3RU	Type of Site: Metal Recycling Site (Vehicle Dismantler) Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SRC001 EPR reference: - Operator: S R C Recycling Ltd Waste Management licence No: 19748 Annual Tonnage: 4000	Issue Date: 31/03/1994 Effective Date: 16/10/2006 Modified: 01/01/2006 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Transferred
C	185m SE	Site Name: S R C Recycling Ltd Site Address: Sussex Recovery, Fontwell Avenue, Eastergate, West Sussex, PO20 6RU Correspondence Address: -	Type of Site: Metal Recycling Site (Vehicle Dismantler) Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SRC001 EPR reference: EA/EPR/CP209855/V004 Operator: S R C Recycling Ltd Waste Management licence No: 19748 Annual Tonnage: 24999	Issue Date: 31/03/1994 Effective Date: 16/10/2006 Modified: 16/03/2009 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified

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

3.7 Waste exemptions

Records within 500m	12
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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.

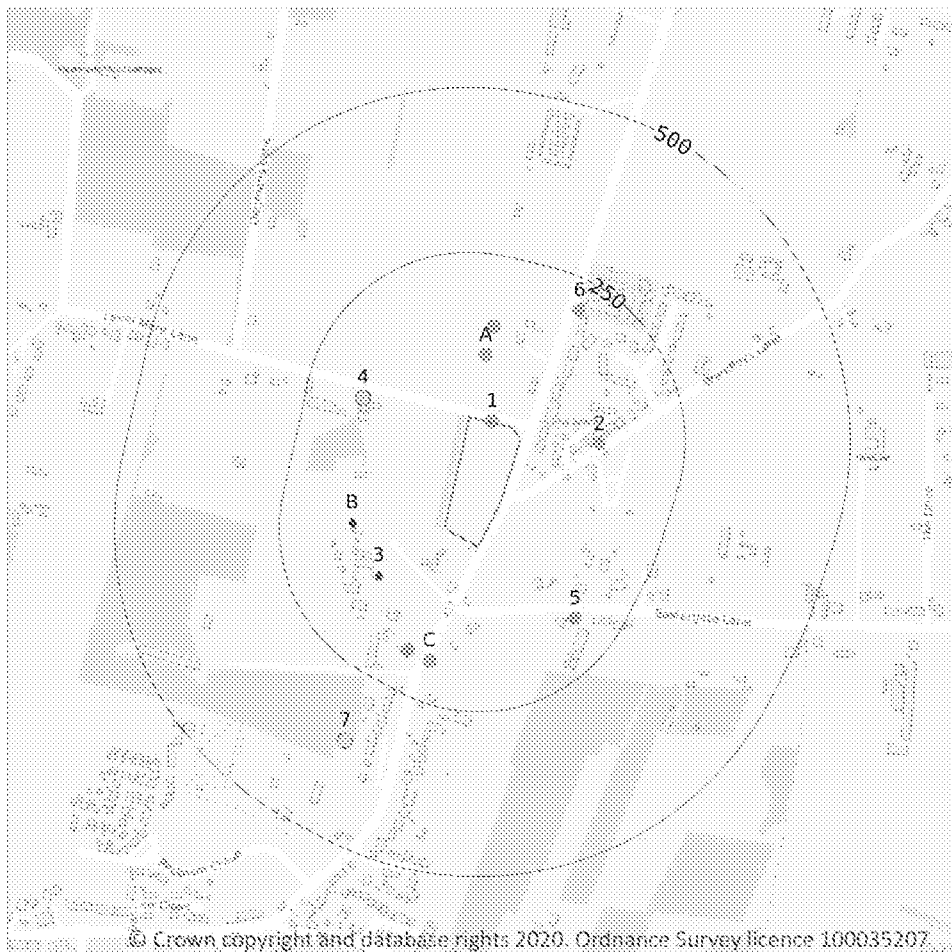
Features are displayed on the Waste and landfill map on **page 22**

ID	Location	Site	Reference	Category	Sub-Category	Description
D	281m SE	SWALLOWFIELD, EASTERGATE LANE, EASTERGATE, CHICHESTER, PO20 3SJ	WEX033840	Disposing of waste exemption	On a farm	Burning waste in the open
D	281m SE	SWALLOWFIELD, EASTERGATE LANE, EASTERGATE, CHICHESTER, PO20 3SJ	WEX033840	Treating waste exemption	On a farm	Treatment of waste in a biobed or biofilter
D	281m SE	SWALLOWFIELD, EASTERGATE LANE, EASTERGATE, CHICHESTER, PO20 3SJ	WEX033840	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
D	281m SE	SWALLOWFIELD, EASTERGATE LANE, EASTERGATE, CHICHESTER, PO20 3SJ	WEX033840	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
D	284m SE	Swallowfield Eastergate Lane CHICHESTER West Sussex PO20 3SJ	EPR/AH0872W F/A001	Disposing of waste exemption	Agricultural Waste Only	Burning waste in the open
D	284m SE	Swallowfield Eastergate Lane CHICHESTER West Sussex PO20 3SJ	EPR/AH0872W F/A001	Treating waste exemption	Agricultural Waste Only	Treatment of waste in a biobed or biofilter
D	284m SE	Swallowfield Eastergate Lane CHICHESTER West Sussex PO20 3SJ	EPR/AH0872W F/A001	Treating waste exemption	Agricultural Waste Only	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
D	284m SE	Swallowfield Eastergate Lane CHICHESTER West Sussex PO20 3SJ	EPR/AH0872W F/A001	Using waste exemption	Agricultural Waste Only	Spreading waste on agricultural land to confer benefit
3	390m SW	NEW YARD, RUTLAND WAY, CHICHESTER, PO20 3RU	WEX081785	Using waste exemption	Not on a farm	Use of waste in construction

ID	Location	Site	Reference	Category	Sub-Category	Description
4	459m NE	Wanley House Wandleys Lane CHICHESTER West Sussex PO20 3SE	EPR/RE5082W C/A001	Using waste exemption	Non-Agricultural Waste Only	Use of waste in construction
5	496m SW	FONTWELL AVENUE, EASTERGATE, CHICHESTER, PO20 3RU	WEX123772	Using waste exemption	On a farm	Use of waste in construction
6	498m E	EASTMERE STABLES, EASTERGATE LANE, EASTERGATE, CHICHESTER, PO20 3SJ	WEX036999	Using waste exemption	Not on a farm	Use of waste in construction

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

4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- ◆ Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

8

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	3m N	Electricity Sub Station	West Sussex, PO20	Electrical Features	Infrastructure and Facilities
A	98m N	Solar Panels	West Sussex, PO20	Energy Production	Industrial Features
2	120m E	Electricity Sub Station	West Sussex, PO20	Electrical Features	Infrastructure and Facilities

ID	Location	Company	Address	Activity	Category
A	143m N	Pumping Station	West Sussex, PO20	Water Pumping Stations	Industrial Features
5	183m SE	Parkers Food Service Ltd	Hill View, Eastergate Lane, Eastergate, Chichester, West Sussex, PO20 3SJ	Catering and Non Specific Food Products	Foodstuffs
C	188m SW	Electricity Sub Station	West Sussex, PO20	Electrical Features	Infrastructure and Facilities
C	189m SW	S P R Centre	Greenfields Farm, Fontwell Avenue, Eastergate, Chichester, West Sussex, PO20 3RU	Animal Feeds, Pet Foods, Hay and Straw	Foodstuffs
6	204m NE	Electricity Sub Station	West Sussex, PO20	Electrical Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	0
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Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	0
----------------------------	----------

High voltage underground electricity transmission cables.

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

0

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.

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

3

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.
 Features are displayed on the Current industrial land use map on **page 28**

ID	Location	Address	Details	
3	122m SW	HERBARY, NORTHFIELD FARM, FONTWELL AVENUE, EASTERGATE, WEST SUSSEX, PO20 6RX	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P05260 Permit Version: 1 Receiving Water: INTO LAND	Status: Lapsed UNDER SCHEDULE 23 ENVIRONMENT ACT 1995 Issue date: 14/04/1994 Effective Date: 14/04/1994 Revocation Date: 31/03/1997
B	140m W	NORTHFIELDS FARM & CONVERTED FARM, NORTHFIELDS FARM & CONVERTED FAR, BUILDING, EASTERGATE, CHICHESTER, WEST SUSSEX, PO20 6RX	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P05082 Permit Version: 1 Receiving Water: INTO LAND	Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: 20/10/1993 Effective Date: 20/10/1993 Revocation Date: 11/08/1994

ID	Location	Address	Details	
B	140m W	NORTHFIELDS FARM & CONVERTED FARM, NORTHFIELDS FARM & CONVERTED FAR, BUILDING, EASTERGATE, CHICHESTER, WEST SUSSEX, PO20 6RX	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P05082 Permit Version: 2 Receiving Water: INTO LAND	Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995 Issue date: 11/08/1994 Effective Date: 11/08/1994 Revocation Date: 31/03/1997

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

2

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

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

ID	Location	Details	
4	163m W	Incident Date: 13/06/2003 Incident Identification: 165479 Pollutant: Agricultural Materials and Wastes Pollutant Description: Solid Manure	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
7	353m SW	Incident Date: 22/04/2002 Incident Identification: 73572 Pollutant: Other Pollutant Pollutant Description: Noise	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)

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

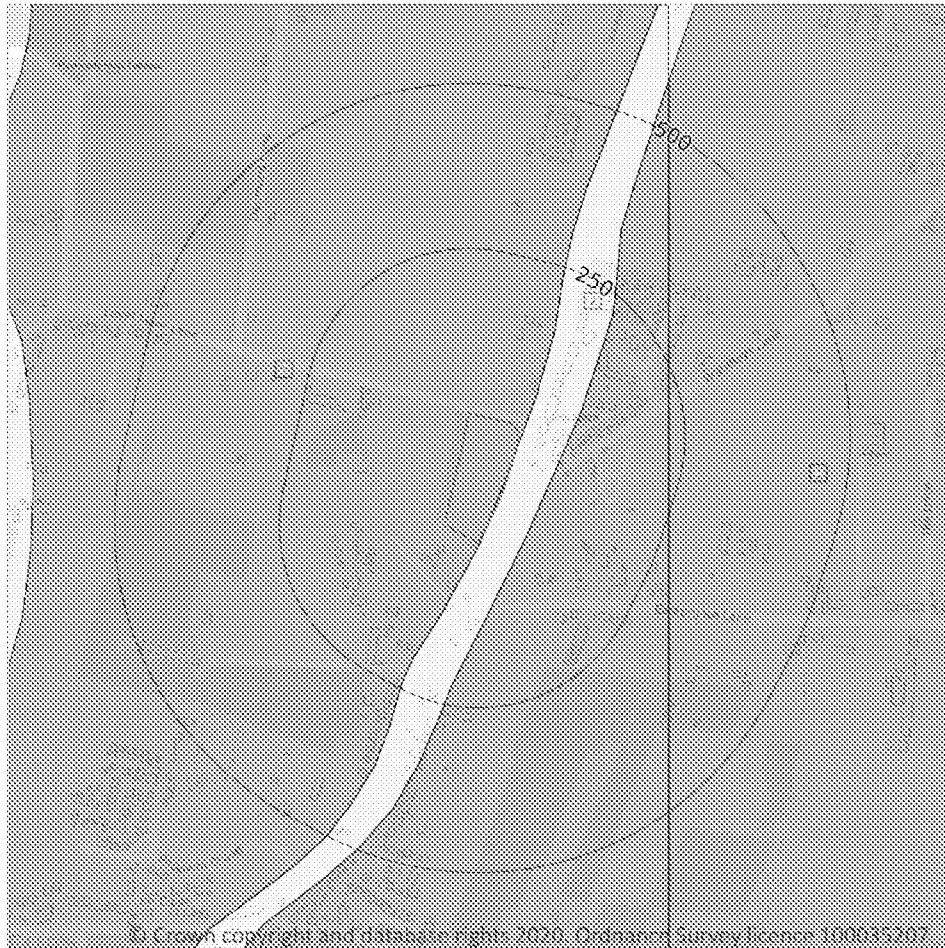
4.21 Pollution inventory radioactive waste

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



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive
 - Unknown

5.1 Superficial aquifer

Records within 500m

3

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on page 35

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	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

ID	Location	Designation	Description
3	225m E	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

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

Bedrock aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive

5.2 Bedrock aquifer

Records within 500m

4

Aquifer status of groundwater held within bedrock geology.

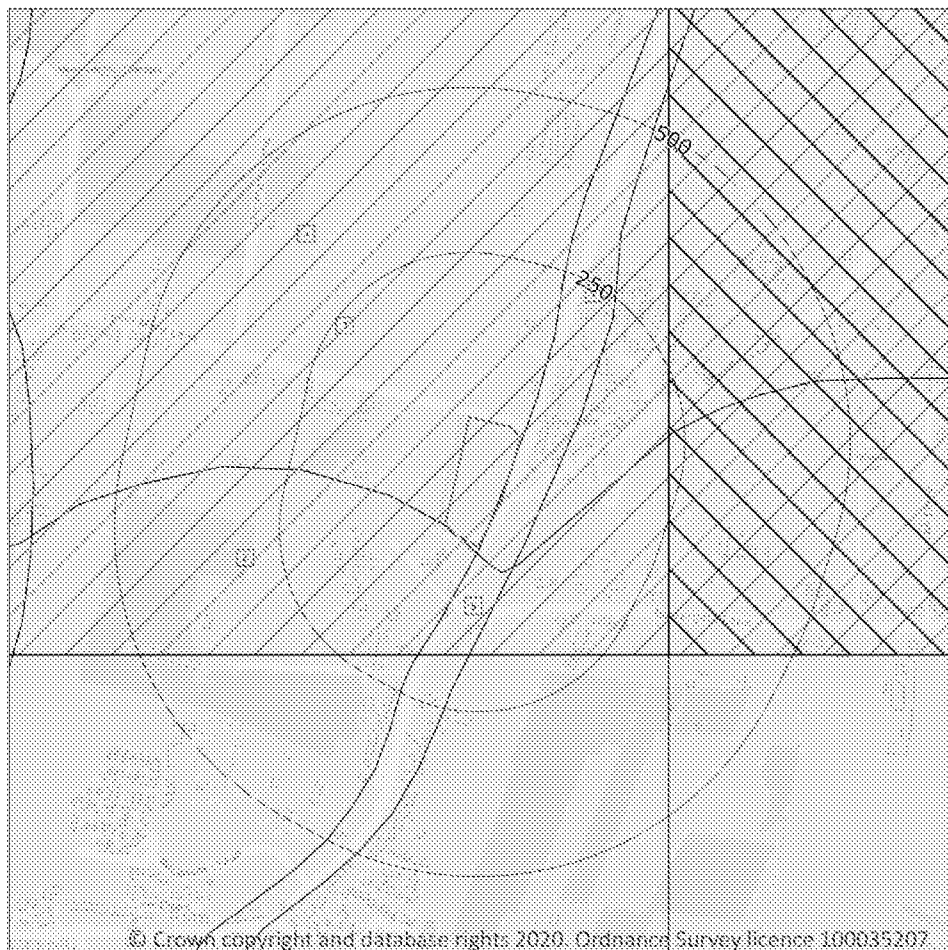
Features are displayed on the Bedrock aquifer map on [page 37](#)

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	On site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

ID	Location	Designation	Description
3	225m E	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
4	225m E	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

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

Groundwater vulnerability



Site Outline

Search buffers in metres (m)

Superficial vulnerability

- Principal superficial aquifer, high vulnerability
- Secondary superficial aquifer, high vulnerability
- Principal superficial aquifer, medium vulnerability
- Secondary superficial aquifer, medium vulnerability
- Principal superficial aquifer, low vulnerability
- Secondary superficial aquifer, low vulnerability

Bedrock vulnerability

- Principal bedrock aquifer, high vulnerability
- Secondary bedrock aquifer, high vulnerability
- Principal bedrock aquifer, medium vulnerability
- Secondary bedrock aquifer, medium vulnerability
- Principal bedrock aquifer, low vulnerability
- Secondary bedrock aquifer, low vulnerability

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m

4

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 39**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Mixed
2	On site	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Unproductive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Mixed
4	On site	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Mixed
5	10m S	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Unproductive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Unproductive Aquifer type: Unproductive 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

1

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

ID	Maximum soluble risk category	Percentage of grid square covered by maximum risk
3	Very significant soluble rocks are likely to be present with a moderate possibility of localised natural subsidence or dissolution-related degradation of bedrock, especially in adverse conditions such as concentrated surface or subsurface water flow.	1.0%

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

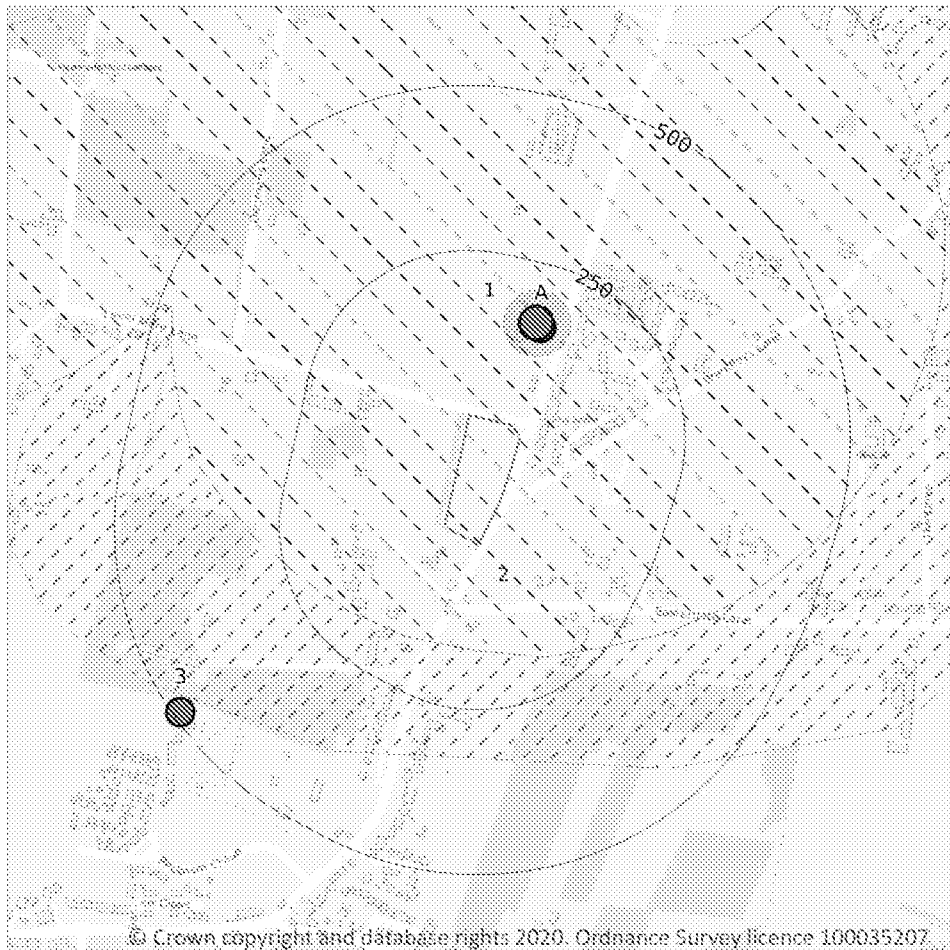
5.5 Groundwater vulnerability- local information

Records on site	0
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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



- Site Outline
- Search buffers in metres (m)
- Source Protection Zone 1
Inner catchment
- Source Protection Zone 2
Outer catchment
- Source Protection Zone 3
Total catchment
- Source Protection Zone 4
Zone of Special Interest
- Source Protection Zone 1c
Inner catchment - confined aquifer
- Source Protection Zone 2c
Outer catchment - confined aquifer
- Source Protection Zone 3c
Total catchment - confined aquifer
- Drinking water abstraction licences
- Drinking water abstraction licences
Polygon features
- Drinking water abstraction licences
Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m

8

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 42](#)

ID	Location	Details	
A	154m N	Status: Active Licence No: 10/41/542108 Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: POINT A EASTERGATE PUMPING STATION Data Type: Point Name: Portsmouth Water Ltd Easting: 494807 Northing: 106492	Annual Volume (m³): 10,357,800 Max Daily Volume (m³): 41,000 Original Application No: - Original Start Date: 31/03/1974 Expiry Date: - Issue No: 103 Version Start Date: 01/04/2016 Version End Date: -
A	160m N	Status: Historical Licence No: 10/41/542108 Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: POINT A EASTERGATE PUMPING STATION Data Type: Point Name: Portsmouth Water Ltd Easting: 494800 Northing: 106500	Annual Volume (m³): 12,857,800 Max Daily Volume (m³): 41000 Original Application No: - Original Start Date: 31/03/1974 Expiry Date: - Issue No: 102 Version Start Date: 10/06/2009 Version End Date: -
B	488m SW	Status: Historical Licence No: 10/41/542108 Details: Spray Irrigation - Direct Direct Source: Southern Region Groundwater Point: POINT A AT EASTERGATE Data Type: Point Name: Robinson Easting: 494260 Northing: 105910	Annual Volume (m³): 10183 Max Daily Volume (m³): 327.3 Original Application No: - Original Start Date: 19/03/1979 Expiry Date: - Issue No: 100 Version Start Date: 31/03/2016 Version End Date: -
-	888m NW	Status: Active Licence No: 10/41/542108 Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: POINT B WESTERGATE PUMPING STATION Data Type: Point Name: Portsmouth Water Ltd Easting: 493956 Northing: 106250	Annual Volume (m³): 10,357,800 Max Daily Volume (m³): 41,000 Original Application No: - Original Start Date: 31/03/1974 Expiry Date: - Issue No: 103 Version Start Date: 01/04/2016 Version End Date: -
-	900m E	Status: Active Licence No: 10/41/542211 Details: Spray Irrigation - Direct Direct Source: Southern Region Groundwater Point: POINT A AT STONEYFIELDS NURSERIES, EASTERGATE LANE, WALBERTON Data Type: Point Name: Fuente Easting: 495590 Northing: 105920	Annual Volume (m³): 9,092 Max Daily Volume (m³): 102.20 Original Application No: - Original Start Date: 03/01/1978 Expiry Date: - Issue No: 101 Version Start Date: 31/03/2016 Version End Date: -

ID	Location	Details	
-	963m NW	Status: Historical Licence No: 10/41/542108 Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: POINT B WESTERGATE PUMPING STATION Data Type: Point Name: Portsmouth Water Ltd Easting: 493900 Northing: 106900	Annual Volume (m ³): 12,857,800 Max Daily Volume (m ³): 41000 Original Application No: - Original Start Date: 31/03/1974 Expiry Date: - Issue No: 102 Version Start Date: 10/06/2009 Version End Date: -
-	1748m W	Status: Historical Licence No: 10/41/541306 Details: General Farming & Domestic Direct Source: Southern Region Groundwater Point: A WELL AT NORTON GRANGE FARM, ALDINGBOURNE Data Type: Point Name: Rushbridger Easting: 492980 Northing: 106690	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 29/03/1966 Version End Date: -
-	1772m W	Status: Active Licence No: 10/41/541312 Details: Spray Irrigation - Direct Direct Source: Southern Region Groundwater Point: AT NORTON GRANGE FARM, ALDINGBOURNE Data Type: Point Name: Rushbridge & Co Easting: 492960 Northing: 106710	Annual Volume (m ³): 40,914 Max Daily Volume (m ³): 196.30 Original Application No: - Original Start Date: 30/06/1975 Expiry Date: - Issue No: 100 Version Start Date: 16/04/2019 Version End Date: -

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

5.7 Surface water abstractions

Records within 2000m	2
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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.

Features are displayed on the Abstractions and Source Protection Zones map on **page 42**

ID	Location	Details	
-	1872m S	Status: Historical Licence No: 10/41/542102 Details: Spray Irrigation - Direct Direct Source: Southern Region Surface Waters Point: BETWEEN POINTS A&B AT LIDSEY,BERSTED Data Type: Line Name: Ashmarden Ltd Easting: 494380 Northing: 104320	Annual Volume (m ³): 19639 Max Daily Volume (m ³): 909.2 Original Application No: - Original Start Date: 20/05/1966 Expiry Date: 31/03/2016 Issue No: 101 Version Start Date: 10/06/2009 Version End Date: -
-	1884m S	Status: Active Licence No: 10/41/542102/R01 Details: Spray Irrigation - Direct Direct Source: Southern Region Surface Waters Point: BETWEEN POINTS A&B AT LIDSEY,BERSTED Data Type: Line Name: Ashmarden Limited Easting: 494358 Northing: 104312	Annual Volume (m ³): 24,548 Max Daily Volume (m ³): 909 Original Application No: - Original Start Date: 01/04/2016 Expiry Date: 31/03/2028 Issue No: 2 Version Start Date: 13/12/2018 Version End Date: -

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

5.8 Potable abstractions

Records within 2000m	4
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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 42**

ID	Location	Details	
A	154m N	Status: Active Licence No: 10/41/542103 Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: POINT A EASTERGATE PUMPING STATION Data Type: Point Name: Portsmouth Water Ltd Easting: 494807 Northing: 106492	Annual Volume (m ³): 10,357,800 Max Daily Volume (m ³): 41,000 Original Application No: - Original Start Date: 31/03/1974 Expiry Date: - Issue No: 103 Version Start Date: 01/04/2016 Version End Date: -

ID	Location	Details	
A	160m N	Status: Historical Licence No: 10/41/542108 Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: POINT A EASTERGATE PUMPING STATION Data Type: Point Name: Portsmouth Water Ltd Easting: 494800 Northing: 106500	Annual Volume (m ³): 12,857,800 Max Daily Volume (m ³): 41000 Original Application No: - Original Start Date: 31/03/1974 Expiry Date: - Issue No: 102 Version Start Date: 10/06/2009 Version End Date: -
-	888m NW	Status: Active Licence No: 10/41/542108 Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: POINT B WESTERGATE PUMPING STATION Data Type: Point Name: Portsmouth Water Ltd Easting: 493956 Northing: 106850	Annual Volume (m ³): 10,357,800 Max Daily Volume (m ³): 41,000 Original Application No: - Original Start Date: 31/03/1974 Expiry Date: - Issue No: 103 Version Start Date: 01/04/2016 Version End Date: -
-	963m NW	Status: Historical Licence No: 10/41/542108 Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: POINT B WESTERGATE PUMPING STATION Data Type: Point Name: Portsmouth Water Ltd Easting: 493900 Northing: 106900	Annual Volume (m ³): 12,857,800 Max Daily Volume (m ³): 41000 Original Application No: - Original Start Date: 31/03/1974 Expiry Date: - Issue No: 102 Version Start Date: 10/06/2009 Version End Date: -

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

5.9 Source Protection Zones

Records within 500m	1
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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 42**

ID	Location	Type	Description
A	109m N	1	Inner catchment

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

5.10 Source Protection Zones (confined aquifer)

Records within 500m**2**

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.

Features are displayed on the Abstractions and Source Protection Zones map on **page 42**

ID	Location	Type	Description
1	On site	1c	Inner catchment within confined aquifer
2	158m S	2c	Outer catchment within confined aquifer

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

0

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

This data is sourced from the Ordnance Survey

6.2 Surface water features

Records within 250m

0

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.

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 48**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
2	On site	River WB catchment	Lidsey Rife	GB107041012010	Western Streams	Arun and Western Streams

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

6.4 WFD Surface water bodies

Records identified	1
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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.

Features are displayed on the Hydrology map on **page 48**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	732m SW	River	Lidsey Rife	GB107041012010	Moderate	Good	Moderate	2016

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

6.5 WFD Groundwater bodies

Records on site	1
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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 48](#)

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
1	On site	Sussex Lambeth Group	GB40701G505100	Poor	Good	Poor	2015

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
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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.

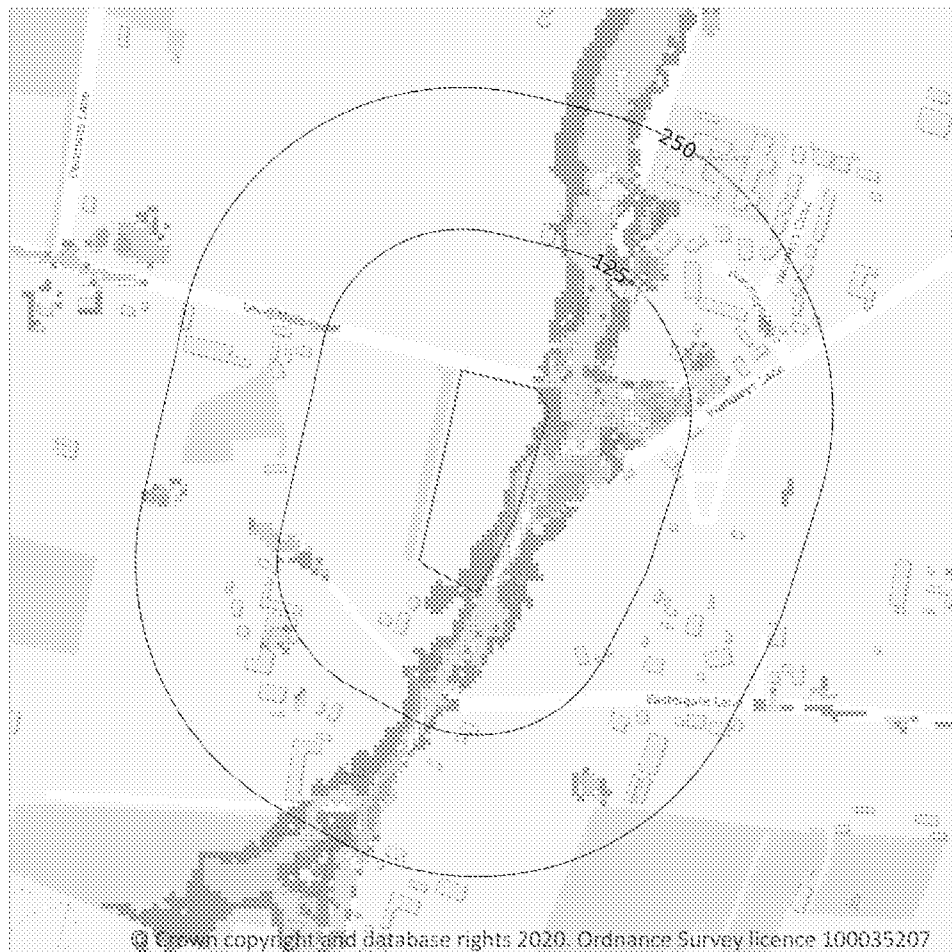
7.7 Flood Zone 3

Records within 50m	0
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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



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 250 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 54](#)

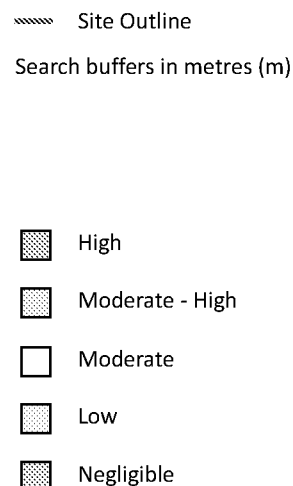
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

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	Negligible
1 in 30 year	Negligible

This data is sourced from Ambienta! Risk Analytics.

9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site

High

Highest risk within 50m

High

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 56](#)

This data is sourced from Ambient Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- ▨ Designated Ancient Woodland

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

0

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.

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

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m**0**

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.

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**0**

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.

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

18

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.

Features are displayed on the Environmental designations map on **page 57**

ID	Location	Name	Woodland Type
1	830m E	wanley's copse	Ancient & Semi-Natural Woodland
2	882m N	Unknown	Ancient & Semi-Natural Woodland
3	993m N	slindon wood	Ancient & Semi-Natural Woodland
4	1081m N	slindon wood	Ancient Replanted Woodland
5	1403m NE	slindon wood & common	Ancient & Semi-Natural Woodland
-	1587m E	potwell copse	Ancient & Semi-Natural Woodland
A	1618m NE	butcher's copse	Ancient & Semi-Natural Woodland
-	1676m NW	Unknown	Ancient & Semi-Natural Woodland
-	1682m N	slindon wood	Ancient & Semi-Natural Woodland
-	1721m NW	Unknown	Ancient & Semi-Natural Woodland
-	1725m N	slindon wood	Ancient Replanted Woodland
-	1760m E	potwell copse	Ancient & Semi-Natural Woodland
-	1762m NE	Unknown	Ancient & Semi-Natural Woodland
-	1767m NE	butcher's copse	Ancient Replanted Woodland
-	1811m SE	Unknown	Ancient & Semi-Natural Woodland
-	1828m SE	Unknown	Ancient & Semi-Natural Woodland

ID	Location	Name	Woodland Type
-	1873m NE	butcher's copse	Ancient & Semi-Natural Woodland
-	1960m E	Unknown	Ancient & Semi-Natural Woodland

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

0

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

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	7
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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
On site	Aldingbourne Rife NVZ	Surface Water	S517	Existing
On site	Sussex Chalk	Groundwater	G56	Changed
180m S	Aldingbourne Rife NVZ	Surface Water	S517	Existing
568m NW	Aldingbourne Rife NVZ	Surface Water	S517	Existing
569m NW	Sussex Chalk	Groundwater	G56	Changed
605m SW	Aldingbourne Rife NVZ	Surface Water	S517	Existing
756m W	Sussex Chalk	Groundwater	G56	Changed

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

SSSI Impact Zones and Units



- 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

1

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 63](#)

ID	Location	Type of developments requiring consultation
1	On site	Infrastructure - Airports, helipads and other aviation proposals. Air pollution - 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.

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	0
----------------------	---

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.

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 English Heritage, 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 English Heritage, 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 English Heritage, Cadw and Historic Environment Scotland.

11.7 Registered Parks and Gardens

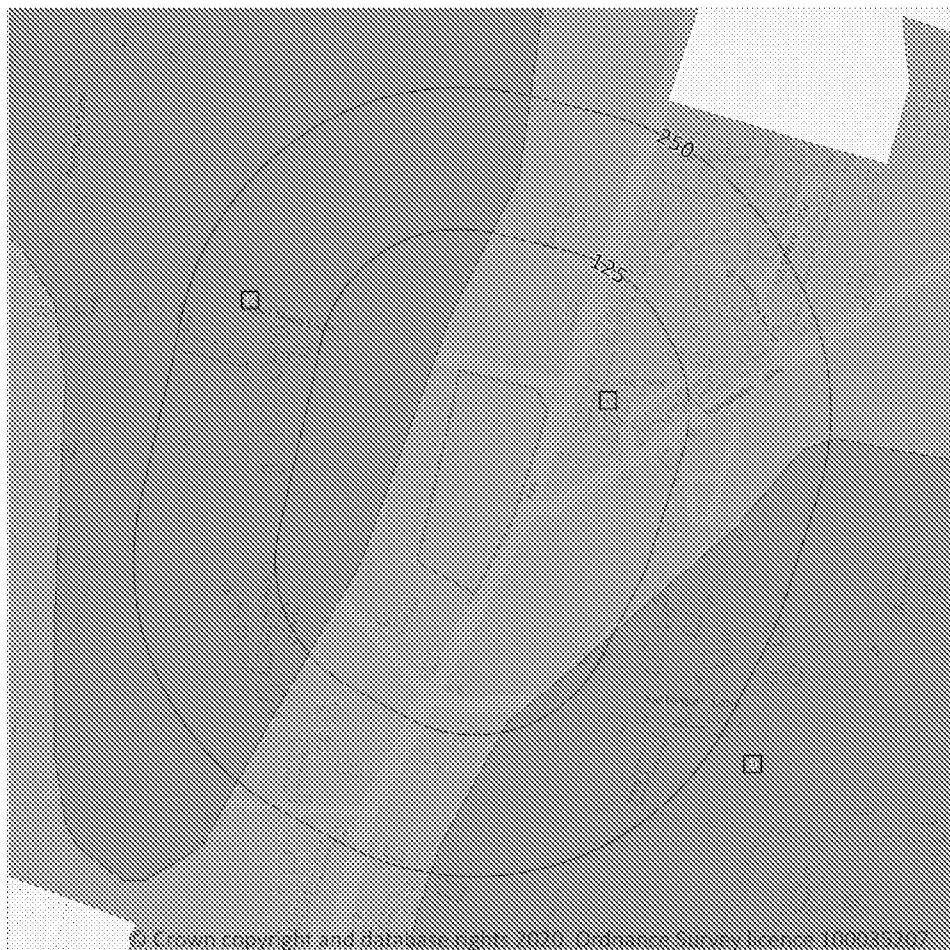
Records within 250m

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 English Heritage, 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

3

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 67**

ID	Location	Classification	Description
1	On site	Grade 2	Very good quality agricultural land. Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.
2	24m W	Grade 1	Excellent quality agricultural land. Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.
3	107m SE	Grade 1	Excellent quality agricultural land. Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

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.

This data is sourced from Natural England.



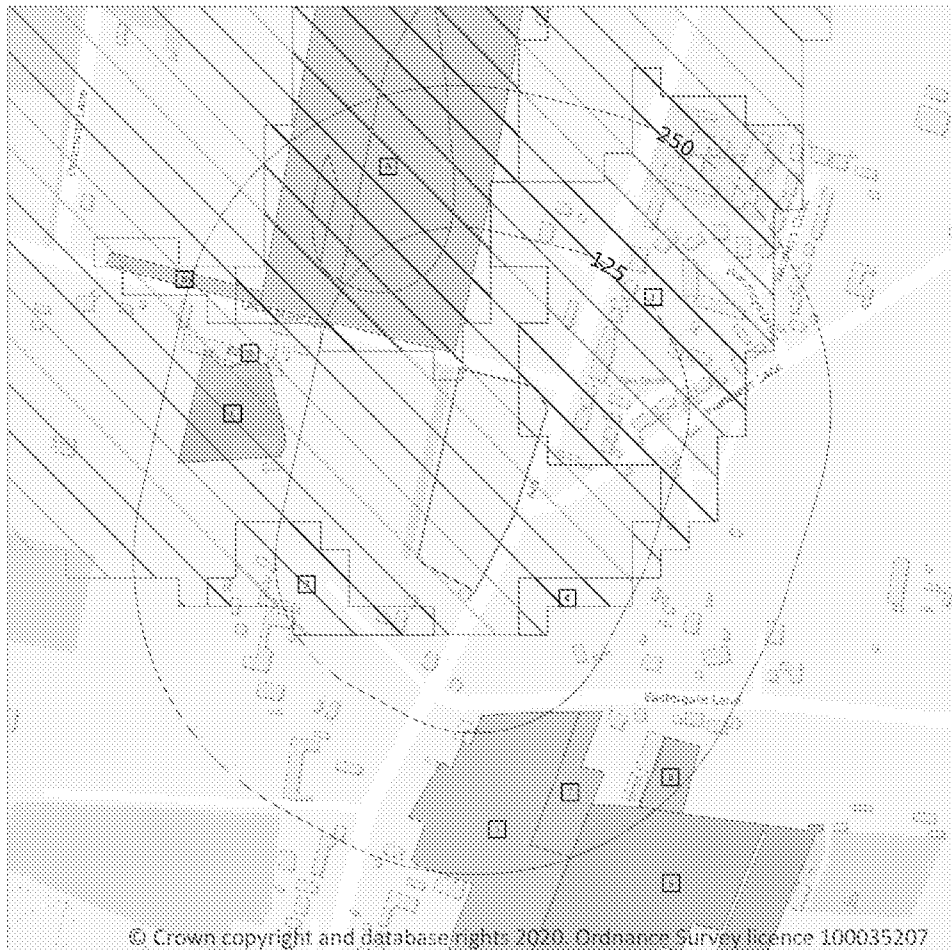
12.5 Countryside Stewardship Schemes

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



- Site Outline
- Search buffers in metres (m)
- Priority Habitat Inventory
- Open Mosaic Habitat
- Limestone Pavement Orders
- Habitat Networks
- Primary Habitat
- Restorable Habitat
- Associated Habitats
- Habitat Restoration-Creation
- Network Enhancement Zone 1
- Network Enhancement Zone 2

13.1 Priority Habitat Inventory

Records within 250m

8

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on [page 70](#)

ID	Location	Main Habitat	Other habitats
A	15m N	Lowland meadows	Main habitat: LMEAD (INV > 50%)
A	86m NW	Lowland meadows	Main habitat: LMEAD (INV > 50%)
5	110m S	Traditional orchard	Main habitat: TORCH (INV > 50%)
6	135m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

ID	Location	Main Habitat	Other habitats
7	141m SE	Traditional orchard	Main habitat: TORCH (INV > 50%)
8	185m W	Traditional orchard	Main habitat: TORCH (INV > 50%)
8	211m SE	No main habitat but additional habitats present	Additional: TORCH (INV > 50%)
9	215m SE	Traditional orchard	Main habitat: TORCH (INV > 50%); DWOOD (INV > 50%)

This data is sourced from Natural England

13.2 Habitat Networks

Records within 250m	6
----------------------------	----------

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.

Features are displayed on the Habitat designations map on **page 70**

ID	Location	Type	Habitat
1	On site	Network Enhancement Zone 2	Not specified
2	On site	Network Enhancement Zone 1	Not specified
A	On site	Primary Habitat	Lowland meadows
3	29m SW	Network Enhancement Zone 2	Not specified
4	29m SE	Network Enhancement Zone 2	Not specified
B	202m W	Associated Habitats	Other associated habitats

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.

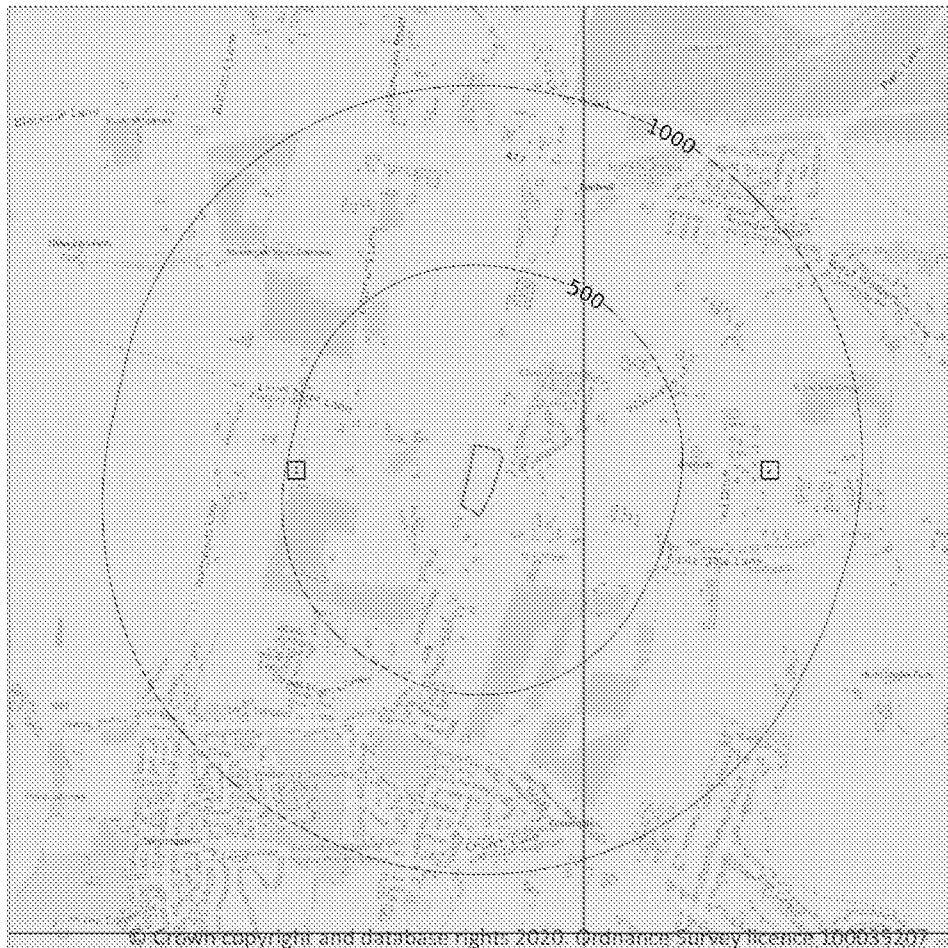
13.4 Limestone Pavement Orders

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



- Site Outline
- Search buffers in metres (m)
- ☒ Full coverage
 - ☒ Partial coverage
 - ☐ No coverage

14.1 10k Availability

Records within 500m

2

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 73](#)

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	No coverage	SU90NW
2	225m E	Full	Full	Full	Full	SU90NE

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Artificial and made ground



- 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

2

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 74](#)

ID	Location	LEX Code	Description	Rock description
1	169m S	WGR-VOID	Worked Ground (Undivided)	Void
2	337m SE	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

12

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 75](#)

ID	Location	LEX Code	Description	Rock description
1	On site	HEAD-XVSZC	Head - Gravel, Sand, Silt And Clay	Gravel, Sand, Silt And Clay
2	On site	HEAD-XCZSV	Head - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel

ID	Location	LEX Code	Description	Rock description
3	46m SE	HEAD-XVSZC	Head - Gravel, Sand, Silt And Clay	Gravel, Sand, Silt And Clay
4	200m S	RTDU-Z	River Terrace Deposits (undifferentiated) - Silt (unlithified Deposits Coding Scheme)	Silt
5	213m NE	RTDU-Z	River Terrace Deposits (undifferentiated) - Silt (unlithified Deposits Coding Scheme)	Silt
6	225m E	HEAD-XVSZC	Head - Gravel, Sand, Silt And Clay	Gravel, Sand, Silt And Clay
7	228m E	RTDU-Z	River Terrace Deposits (undifferentiated) - Silt (unlithified Deposits Coding Scheme)	Silt
8	292m NE	HEAD-XVSZC	Head - Gravel, Sand, Silt And Clay	Gravel, Sand, Silt And Clay
9	337m SE	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
10	342m SW	RTDU-XSZC	River Terrace Deposits (undifferentiated) - Sand, Silt And Clay	Sand, Silt And Clay
11	407m NW	RTDU-XSZC	River Terrace Deposits (undifferentiated) - Sand, Silt And Clay	Sand, Silt And Clay
12	444m N	RSB2-V	Raised Storm Beach Deposits, 2 - Gravel	Gravel

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

4

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 77](#)

ID	Location	LEX Code	Description	Rock age
1	On site	LC-CLSISA	London Clay Formation - Clay, Silt And Sand	Eocene Epoch
2	On site	LMBE-CLAY	Lambeth Group - Clay	Paleocene Epoch
3	225m E	LC-CLSISA	London Clay Formation - Clay, Silt And Sand	Eocene Epoch
4	226m E	LMBE-CLAY	Lambeth Group - Clay	Paleocene Epoch

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m

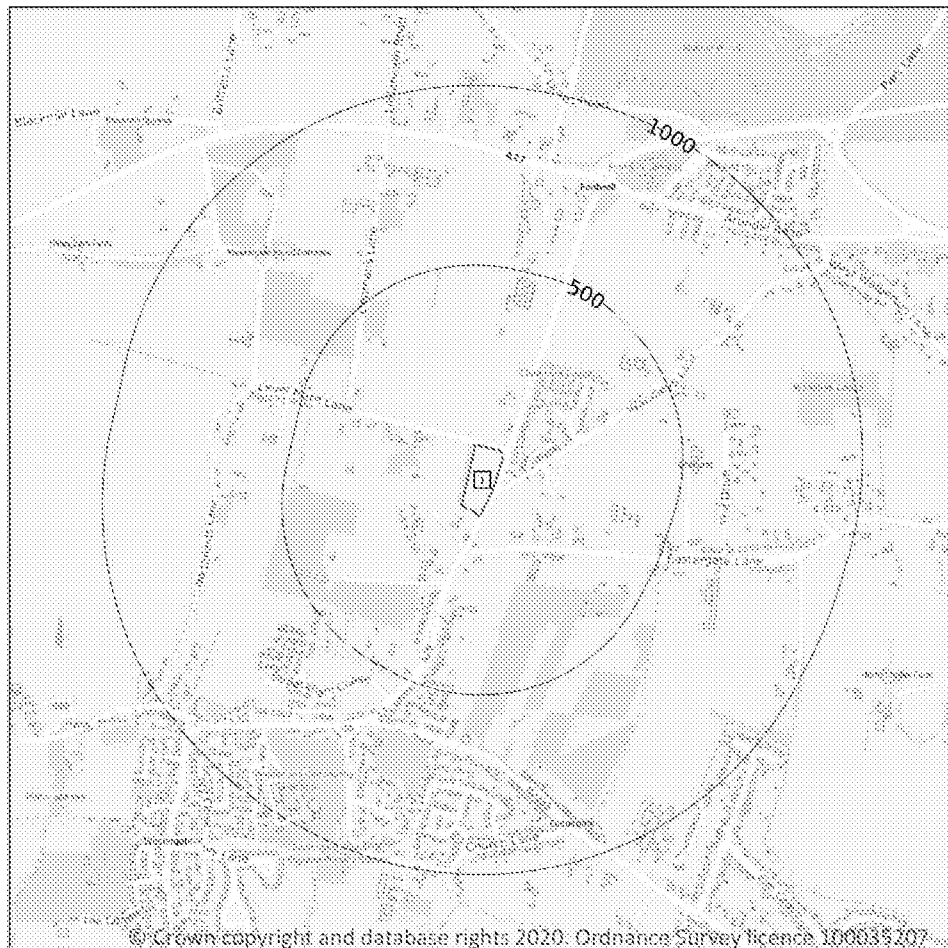
0

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.

This data is sourced from the British Geological Survey.



15 Geology 1:50,000 scale - Availability



- 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 79](#)

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	EW317_332_chichester_and_bognor_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

8

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 81](#)

ID	Location	LEX Code	Description	Rock description
1	On site	HEAD-XVSZC	HEAD	GRAVEL, SAND, SILT AND CLAY
2	On site	HEAD-XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL

ID	Location	LEX Code	Description	Rock description
3	59m SE	HEAD-XVSZC	HEAD	GRAVEL, SAND, SILT AND CLAY
4	203m SE	RTDU-XSZC	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY
5	224m NE	RTDU-XSZC	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY
6	328m SW	RTDU-XSZC	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY
7	397m NW	RTDU-XSZC	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY
8	447m N	R5B2-V	RAISED STORM BEACH DEPOSITS, 2	GRAVEL

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	2
---------------------------	----------

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	Very Low
On site	Intergranular	Very 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

2

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 83](#)

ID	Location	LEX Code	Description	Rock age
1	On site	LC-XCZS	LONDON CLAY FORMATION - CLAY, SILT AND SAND	YPRESIAN
2	On site	LMBE-XCZS	LAMBETH GROUP - CLAY, SILT AND SAND	THANETIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	2
---------------------------	----------

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	Mixed	Moderate	Very Low
On site	Mixed	Moderate	Very Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m	0
----------------------------	----------

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.

This data is sourced from the British Geological Survey.

16 Boreholes



- Site Outline
- Search buffers in metres (m)
- Confidential
 - 0 - 10m
 - 10 - 30m
 - 30m+
 - Unknown

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16.1 BGS Boreholes

Records within 250m

2

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 85**

ID	Location	Grid reference	Name	Length	Confidential	Web link
A	160m N	494800 106500	BOGNOR WATERWORKS EASTERGATE SUSSEX	-	Y	N/A
A	160m N	494800 106500	BOGNOR WATERWORKS EASTERGATE SUSSEX	-	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

2

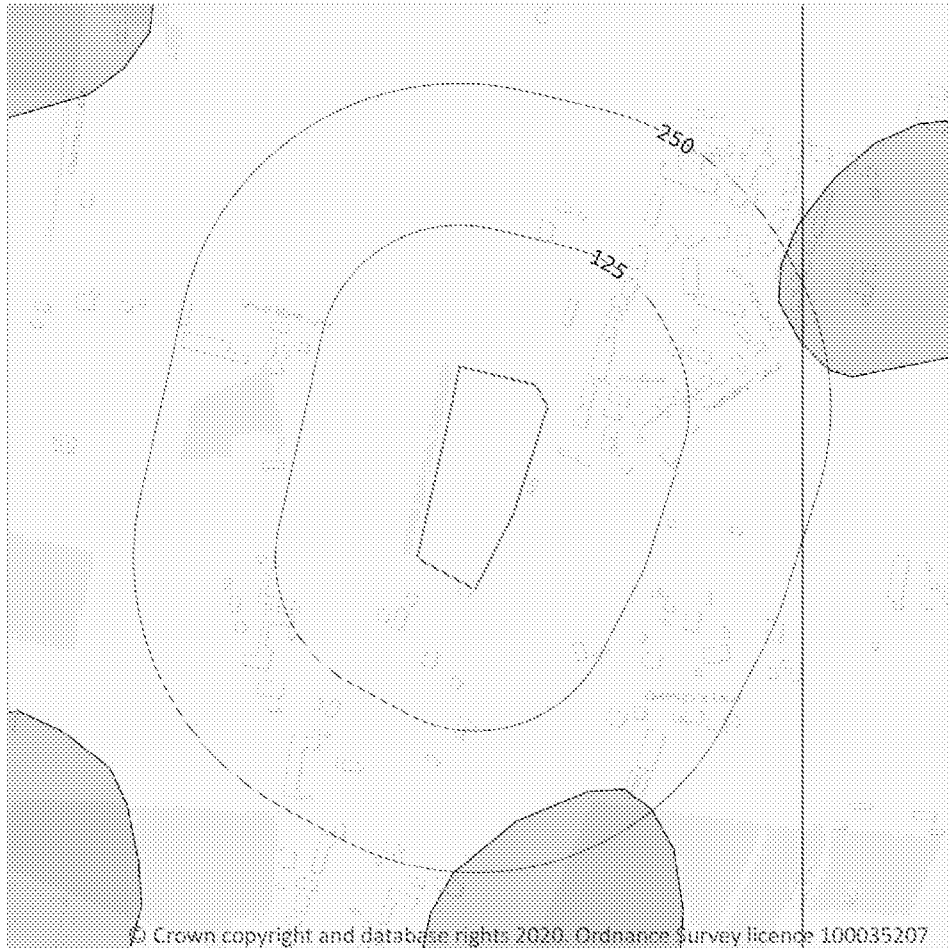
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on [page 86](#)

Location	Hazard rating	Details
On site	Very low	Ground conditions predominantly low plasticity.
On site	Moderate	Ground conditions predominantly high 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 87](#)

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



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- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.3 Compressible deposits

Records within 50m

1

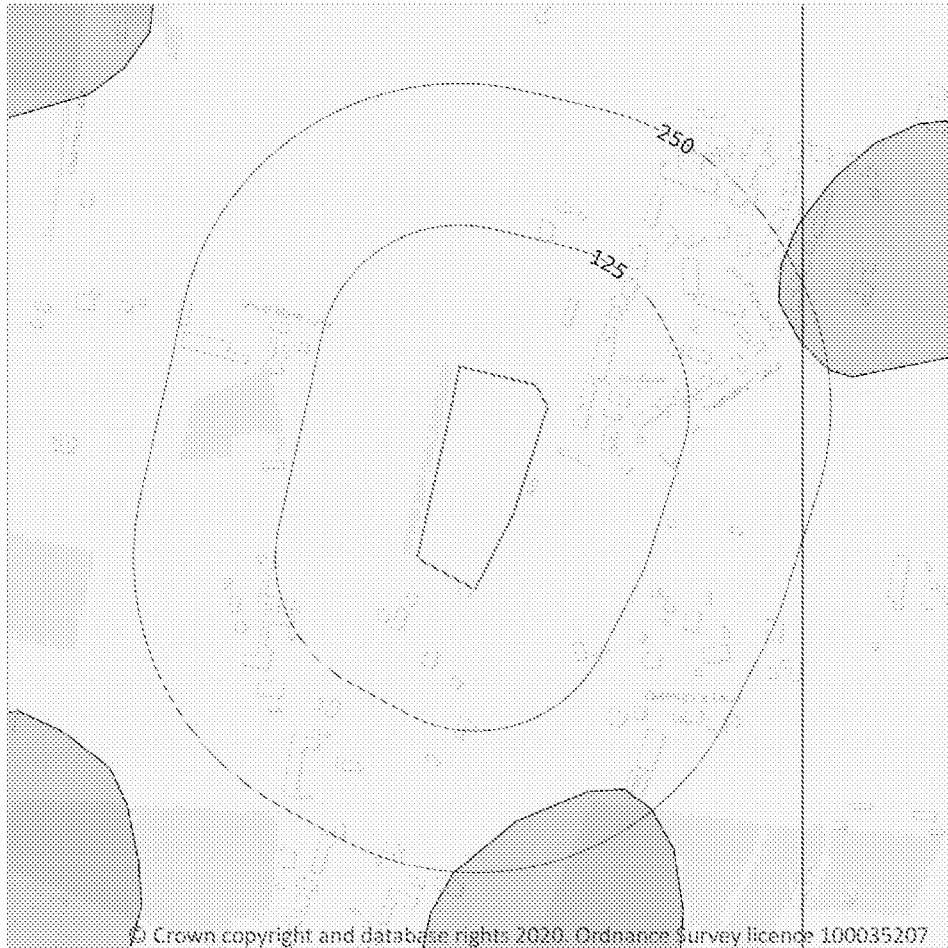
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on [page 88](#)

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

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17.4 Collapsible deposits

Records within 50m

1

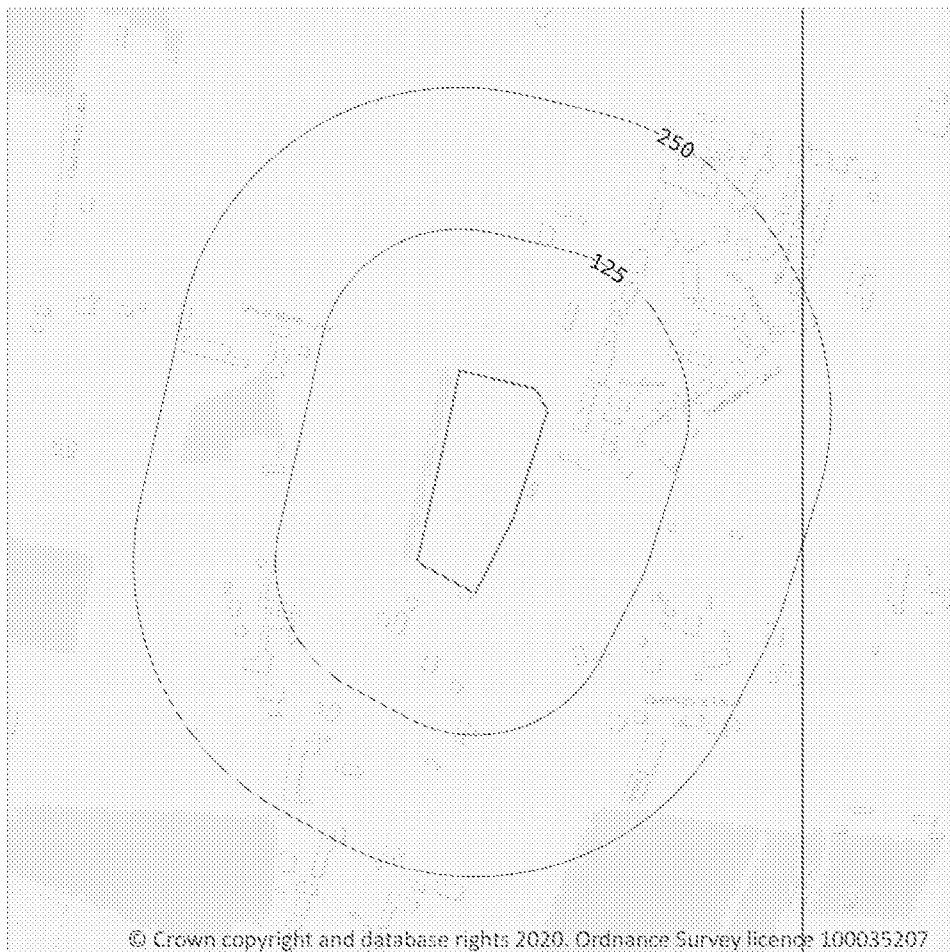
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 89](#)

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 90](#)

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



- 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.

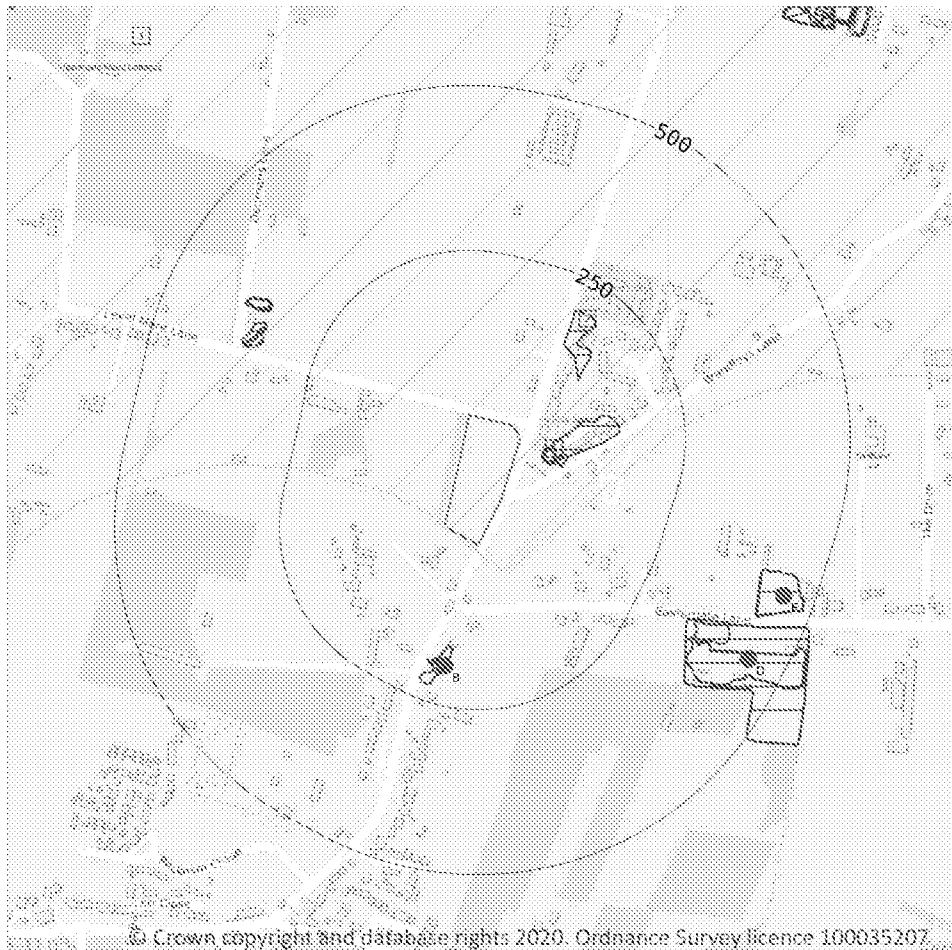
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on [page 91](#)

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 Peter Brett Associates (PBA).

18.2 BritPits

Records within 500m

3

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.

Features are displayed on the Mining, ground workings and natural cavities map on **page 92**

ID	Location	Details	Description
B	190m S	Name: Northfields Farm Gravel Pit Address: Nyton, Aldingbourne, CHICHESTER, West Sussex Commodity: Sand & Gravel Status: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
D	443m SE	Name: Northfields Farm Gravel Pit Address: Nyton, Aldingbourne, CHICHESTER, West Sussex Commodity: Sand & Gravel Status: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
E	452m E	Name: Northfields Farm Gravel Pit Address: Nyton, Aldingbourne, CHICHESTER, West Sussex Commodity: Sand & Gravel Status: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m

7

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 92**

ID	Location	Land Use	Year of mapping	Mapping scale
A	39m E	Unspecified Pit	1940	1:10560
A	40m E	Gravel Pit	1910	1:10560
A	41m E	Unspecified Pit	1969	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
A	59m E	Unspecified Pit	1876	1:10560
2	121m NE	Gravel Pits	1910	1:10560
B	160m S	Unspecified Pit	1910	1:10560
B	160m S	Old Gravel Pit	1896	1:10560

This 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 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	2
-----------------------------	----------

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).

Features are displayed on the Mining, ground workings and natural cavities map on **page 92**

ID	Location	Name	Commodity	Class	Likelihood
1	On site	Not available	Chalk	A	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered

ID	Location	Name	Commodity	Class	Likelihood
3	225m E	Not available	Chalk	A	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered

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 Peter Brett Associates (PBA).

18.8 JPB mining areas

Records on site	0
------------------------	----------

Areas which could be affected by former coal 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.

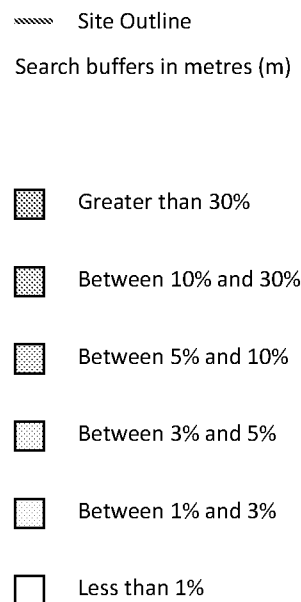
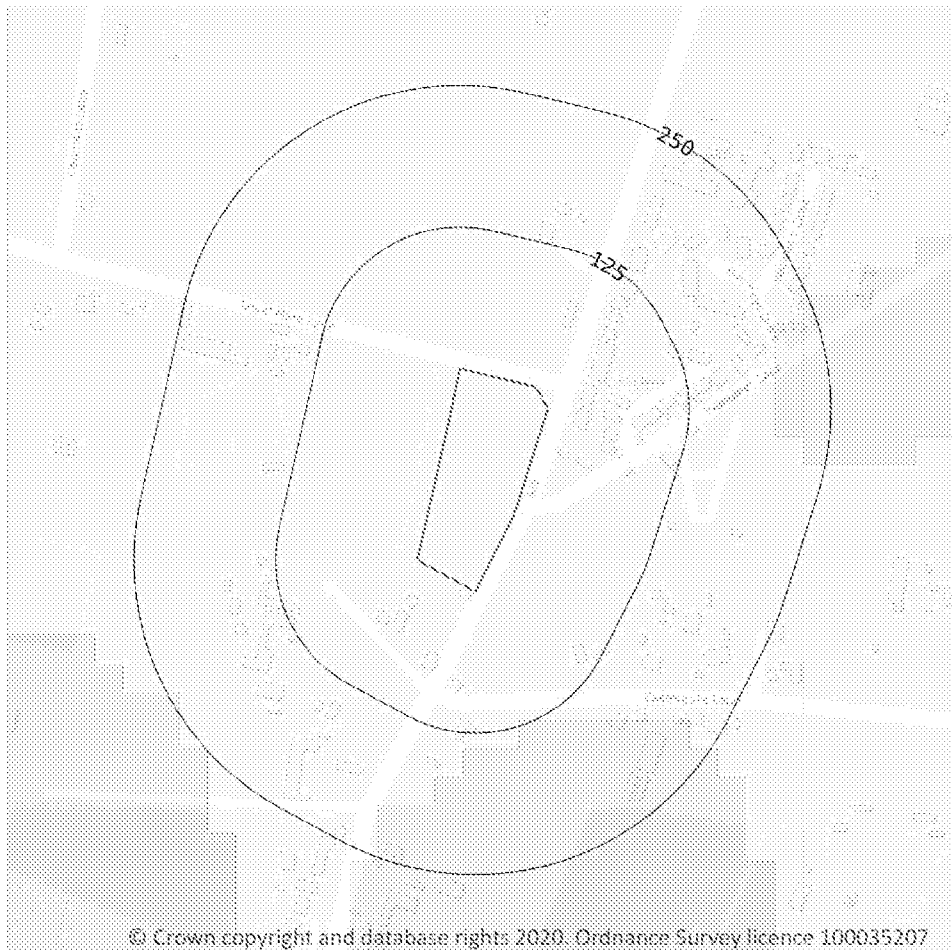
18.13 Clay mining

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



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 97](#)

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

4

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 km². 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 km²; 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	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
10m S	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 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 km²).

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 km².

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

0

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.

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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APPENDIX C HISTORICAL MAPS

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1 NORTHFIELDS COTTAGES,
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EASTERGATE, PO20 3RX

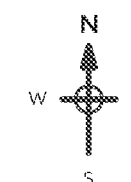
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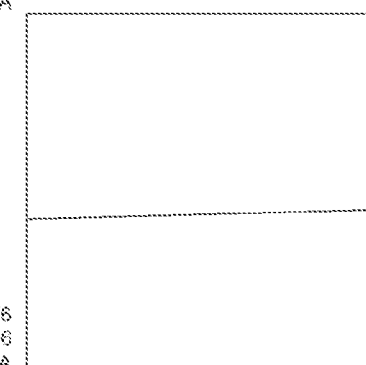
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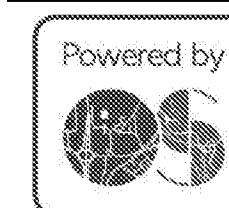
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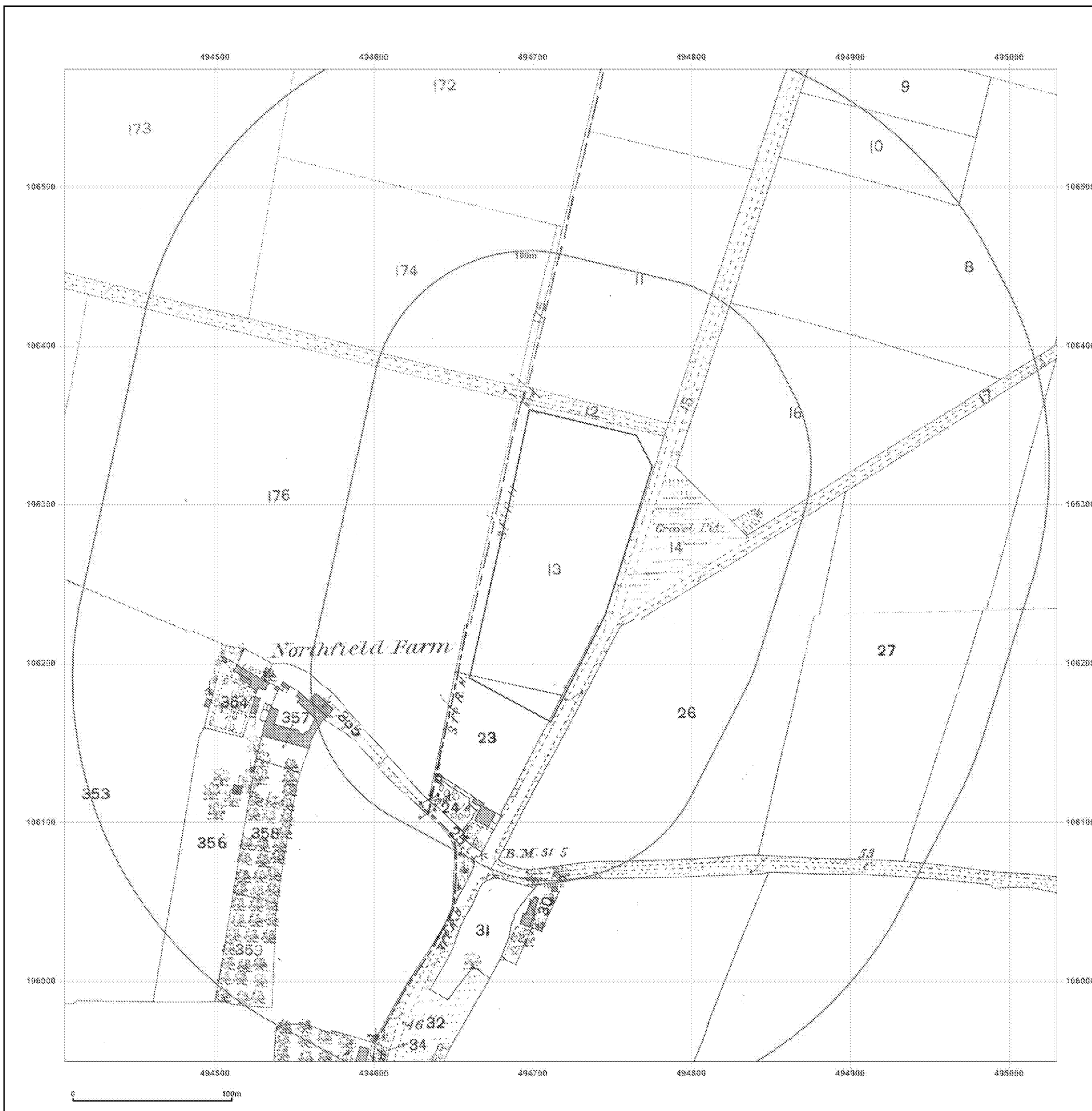


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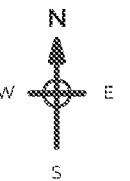
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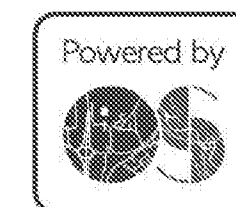
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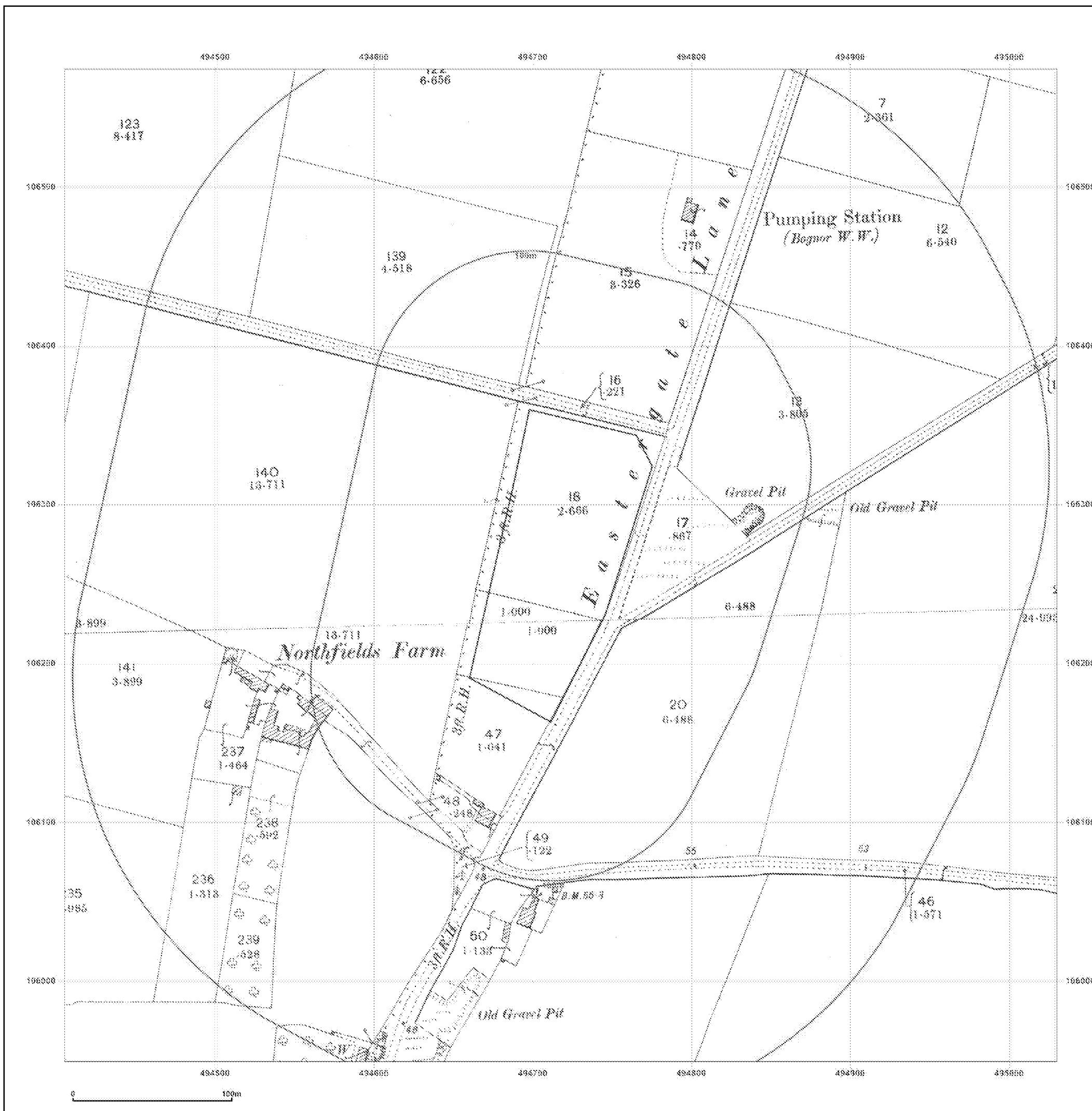


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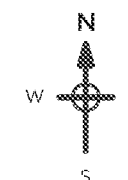
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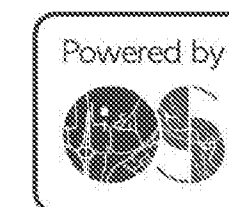
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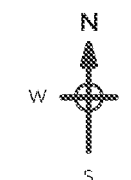
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Map Name: National Grid

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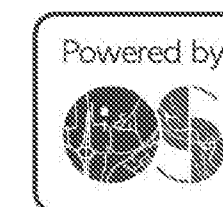
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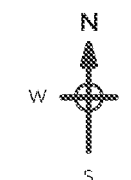
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Map Name: National Grid

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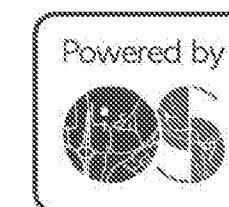


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Revised 1991
Edition N/A
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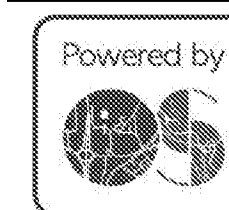
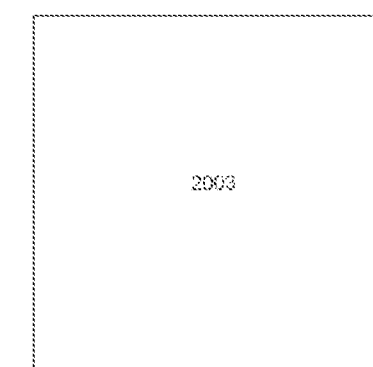
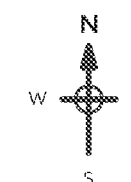
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Grid Ref: 494717, 106262

Map Name: LandLine

Map date: 2003

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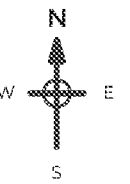
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Grid Ref: 494717, 106262

Map Name: County Series

Map date: 1876

Scale: 1:10,560

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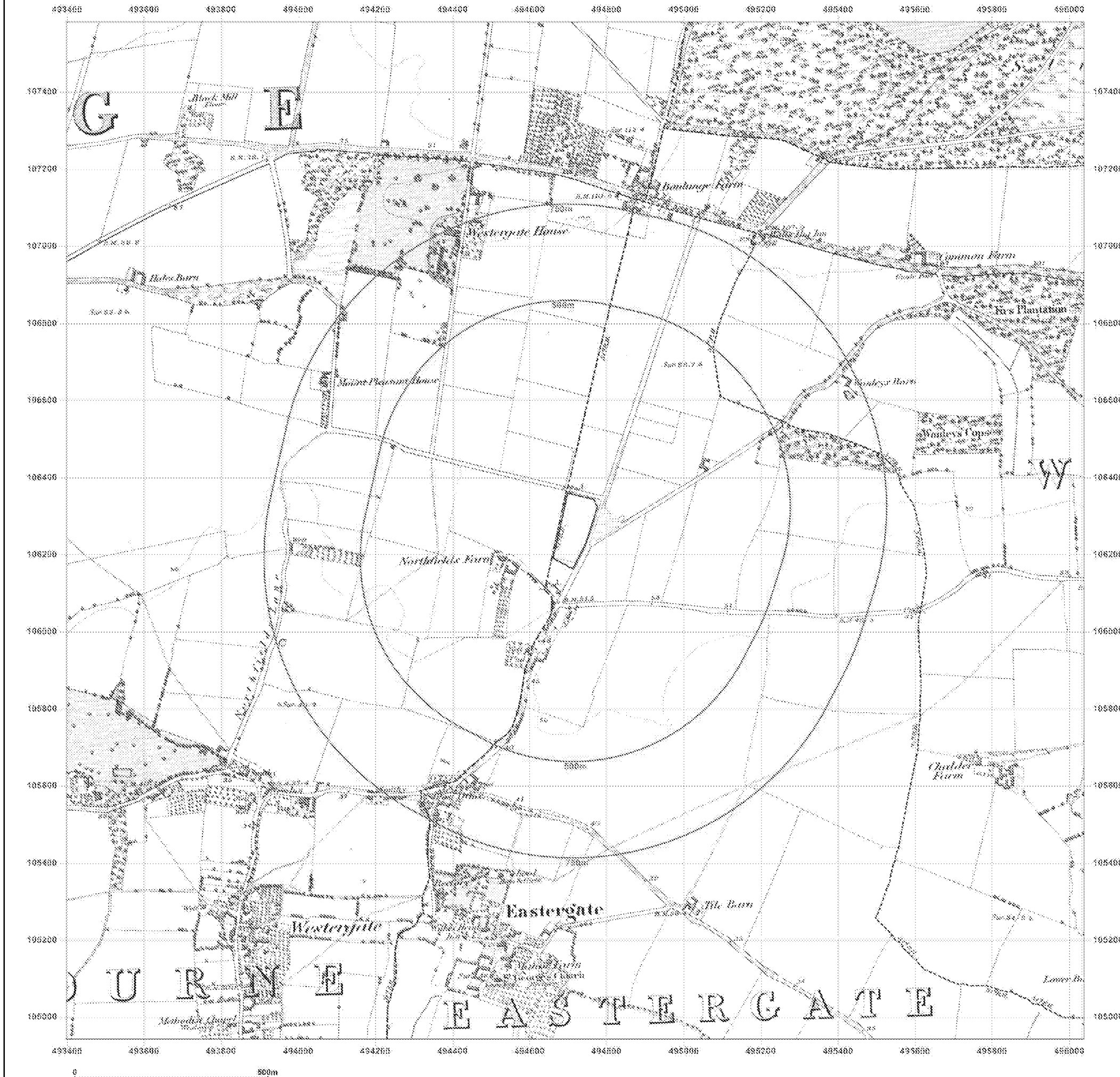


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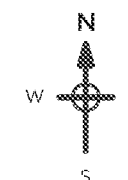
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Map Name: County Series

Map date: 1896

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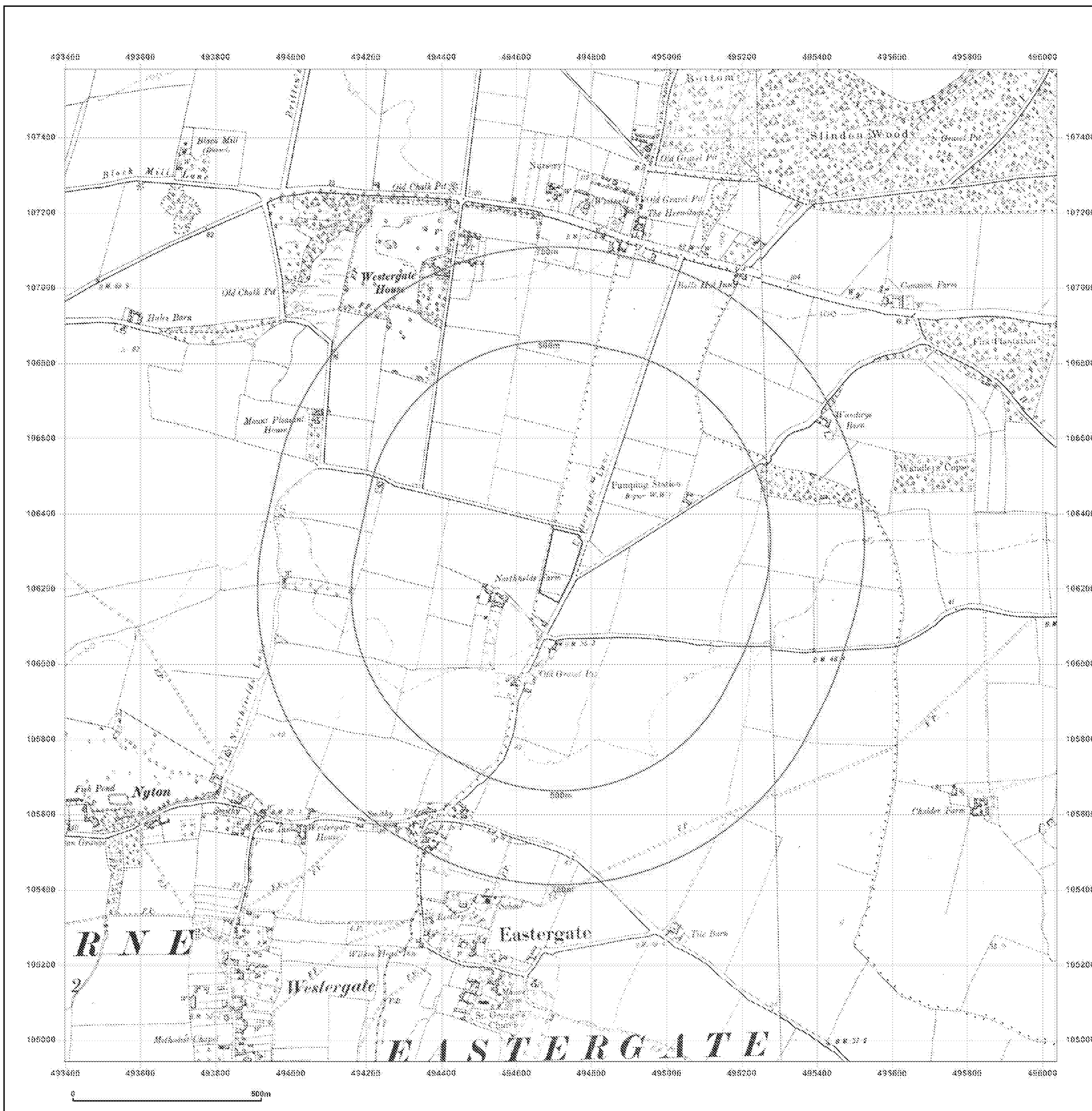


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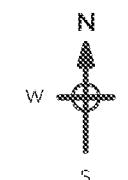
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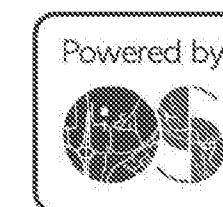
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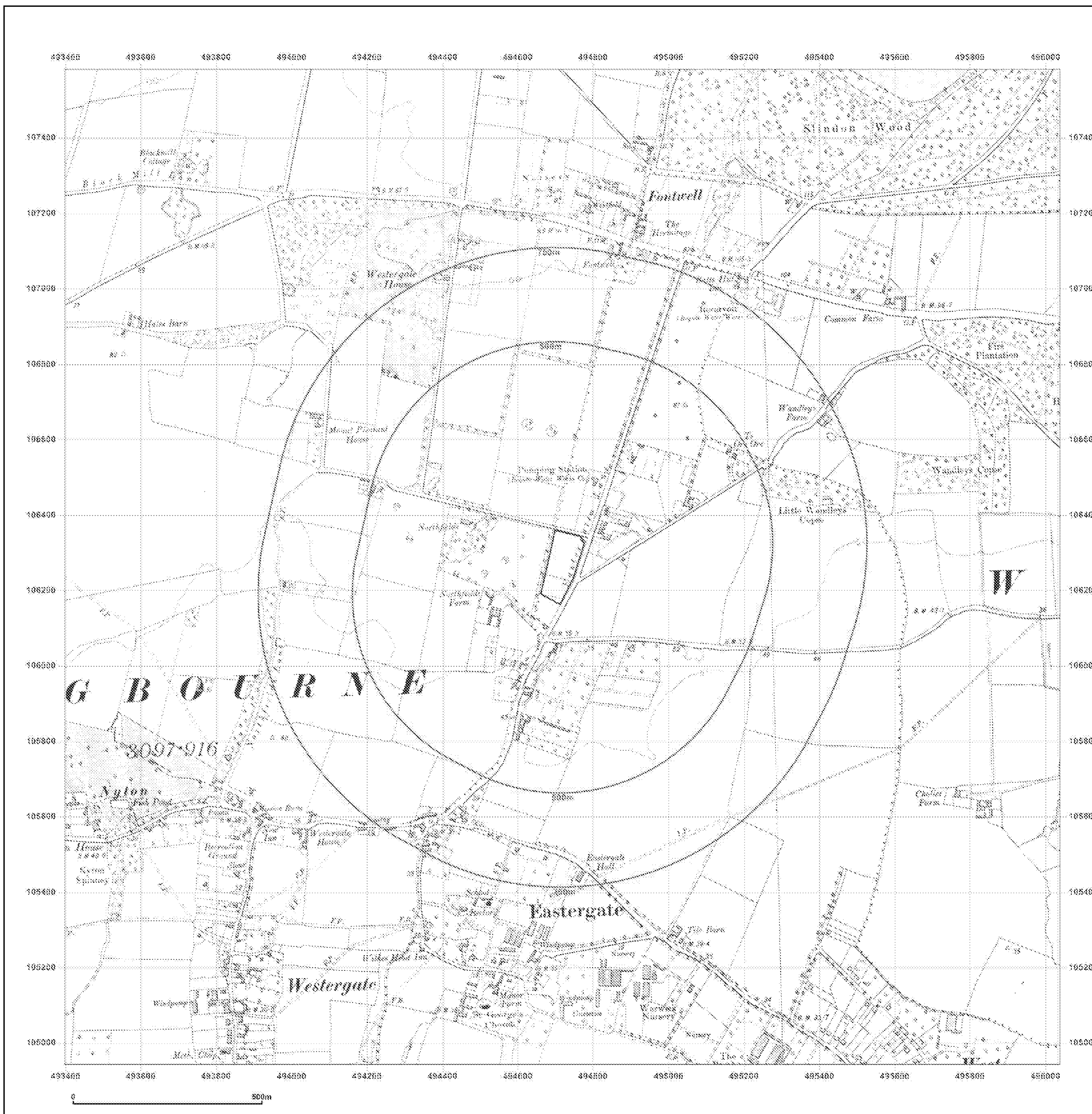


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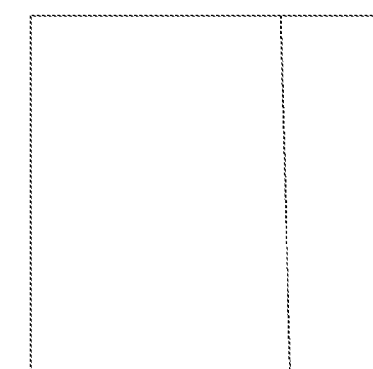
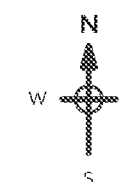
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Surveyed 1874
Revised 1910
Edition N/A
Copyright N/A
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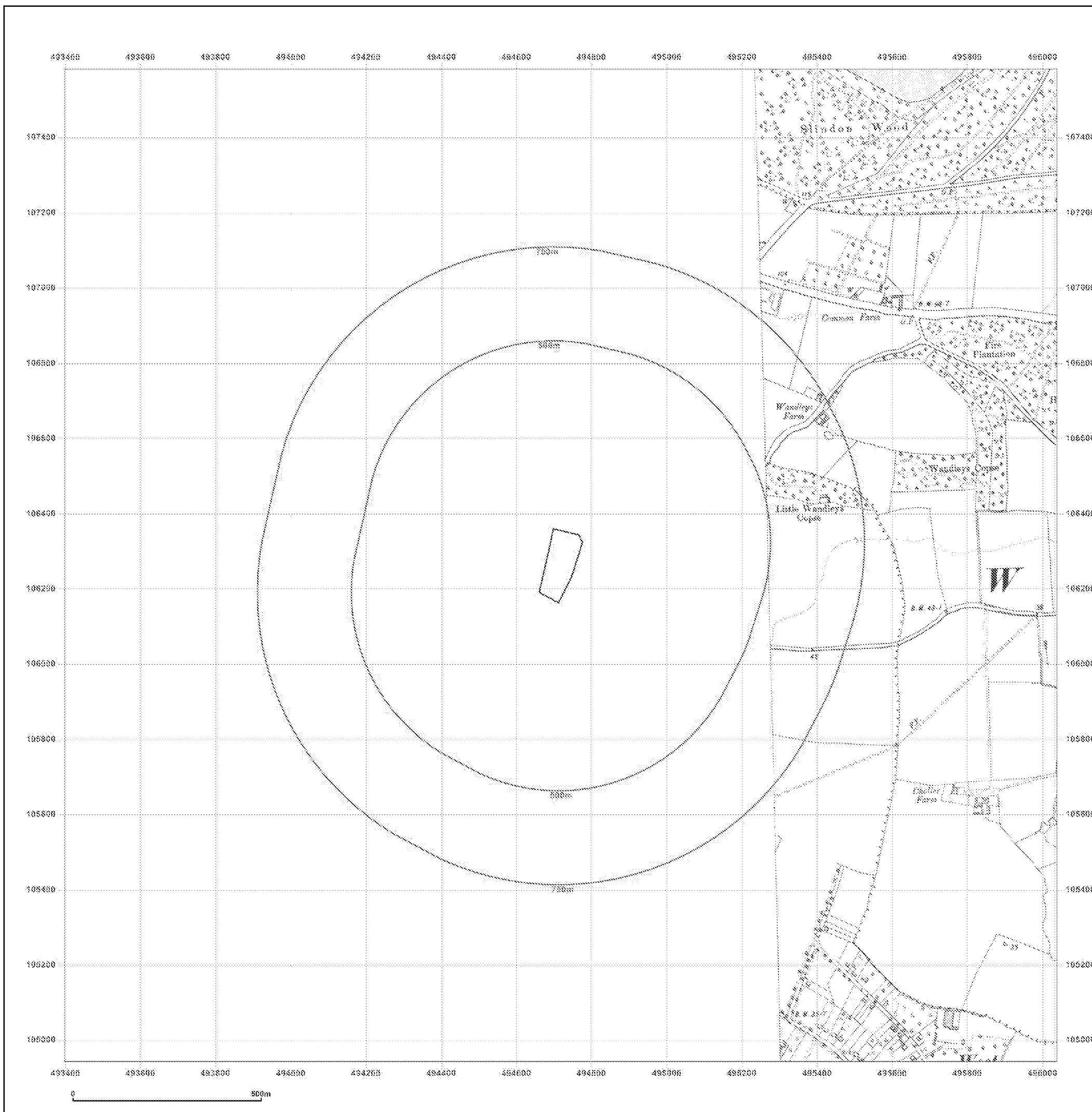


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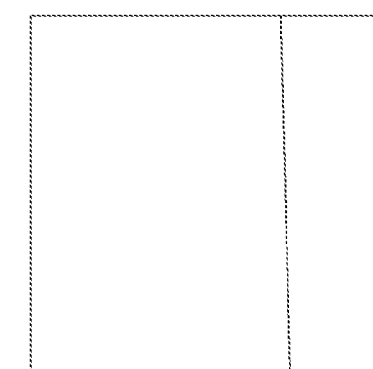
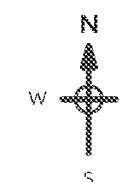
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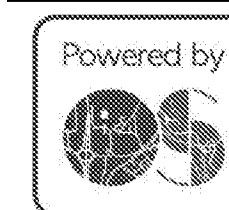
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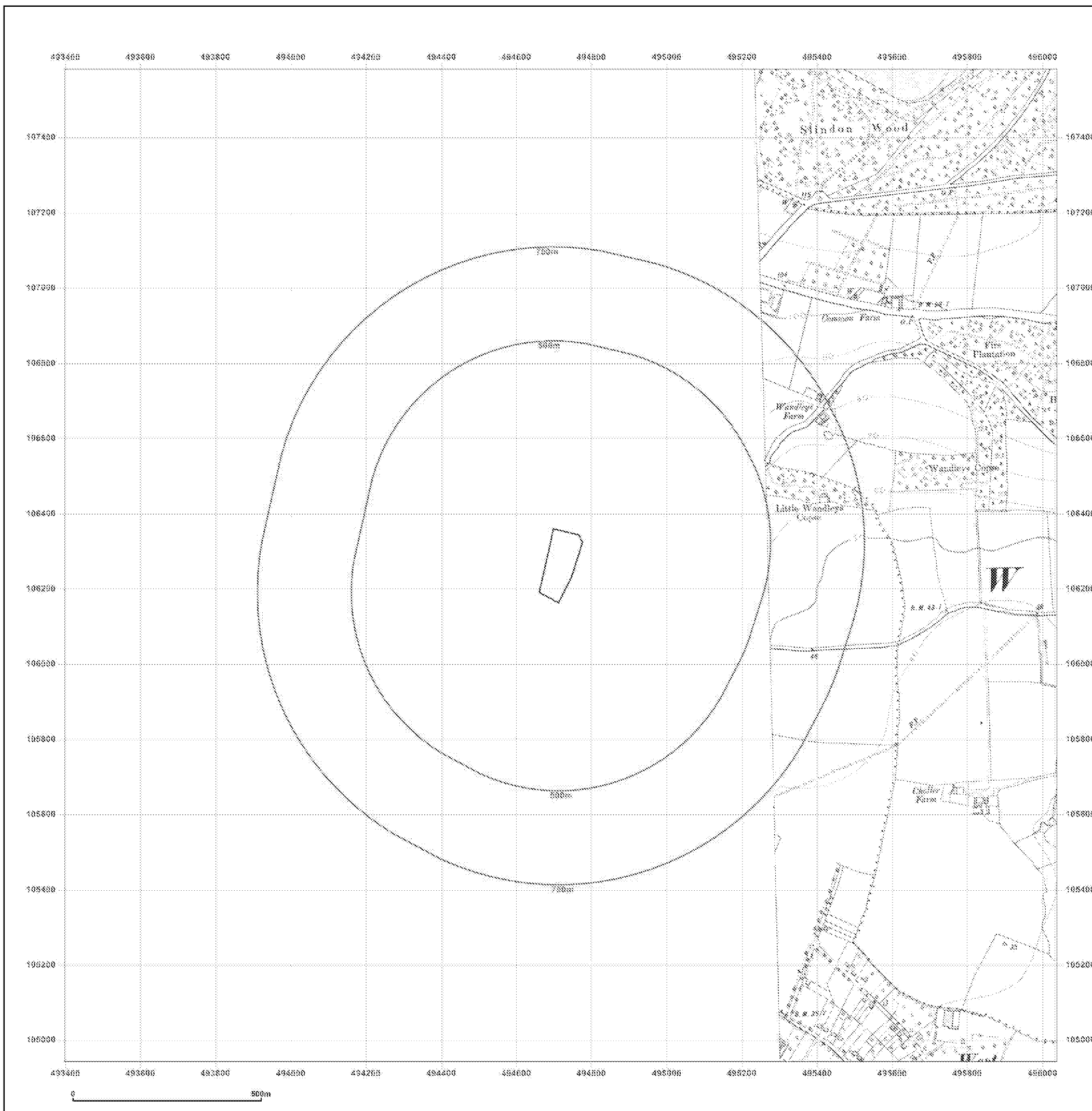


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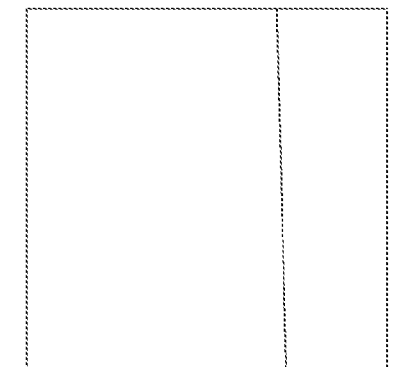
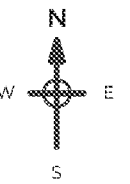
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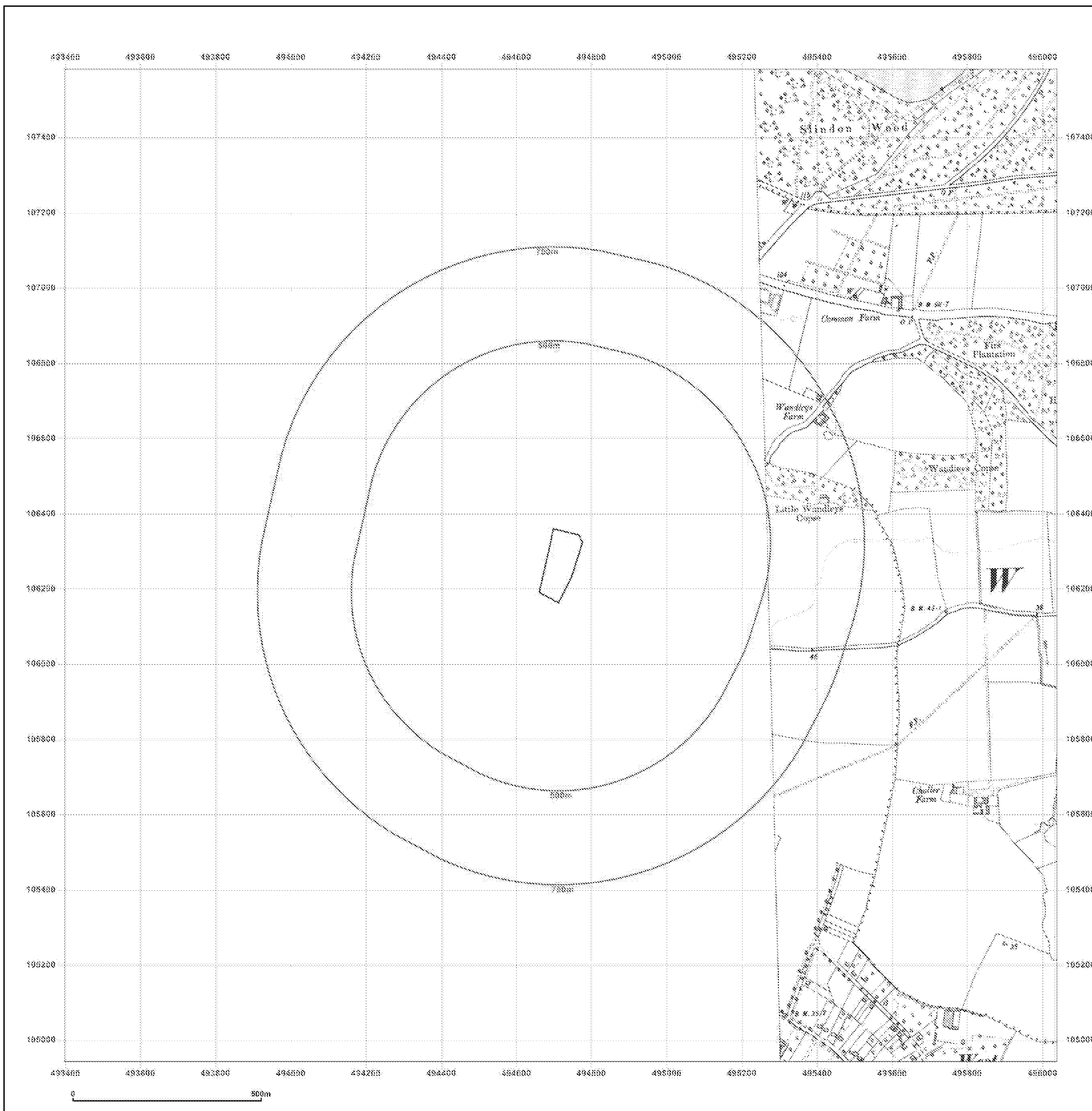


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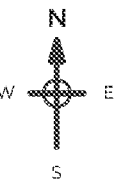
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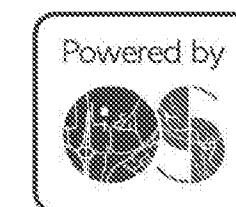
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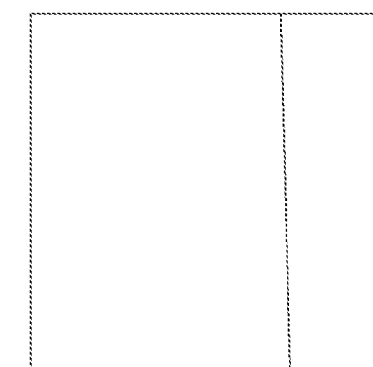
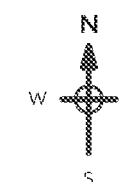
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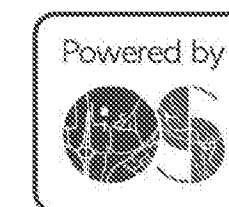
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Revised 1950
Edition N/A
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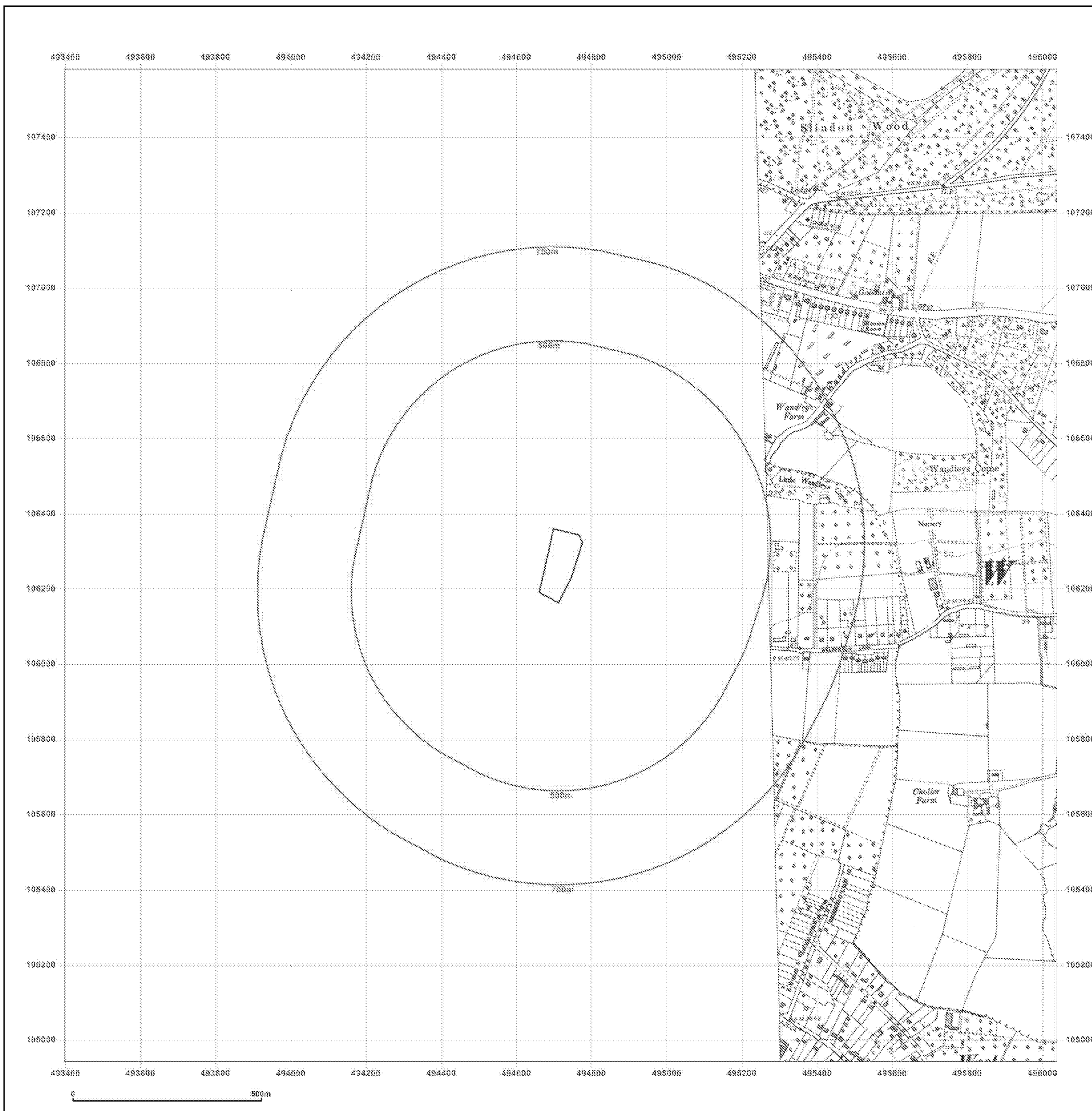


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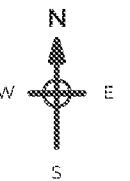
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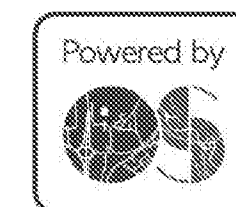


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Revised 1961
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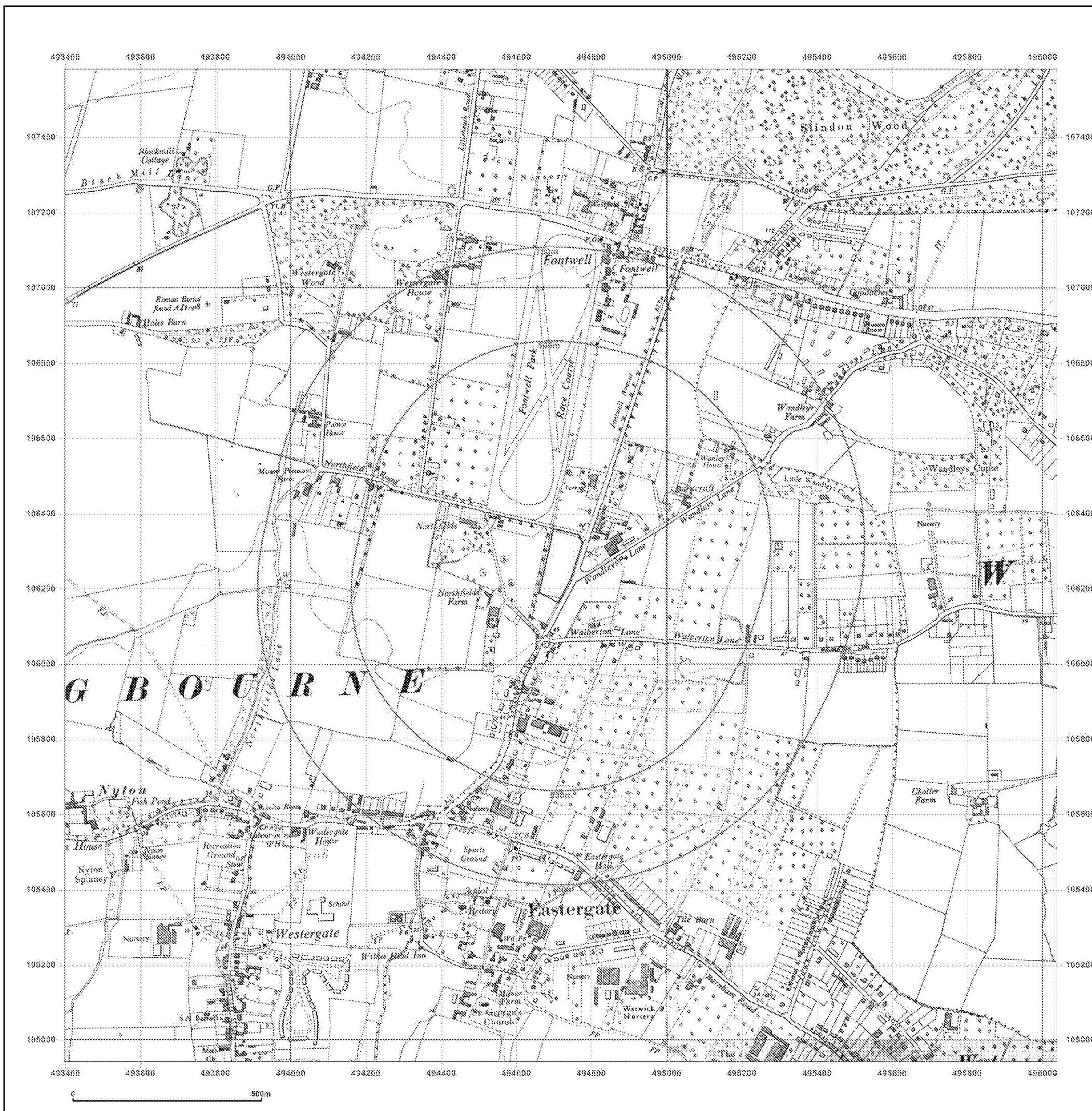


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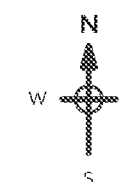
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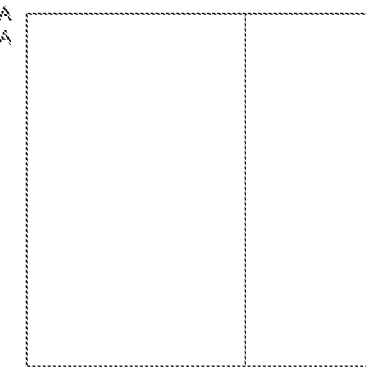
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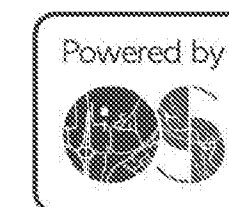
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Revised 1966
Edition N/A
Copyright N/A
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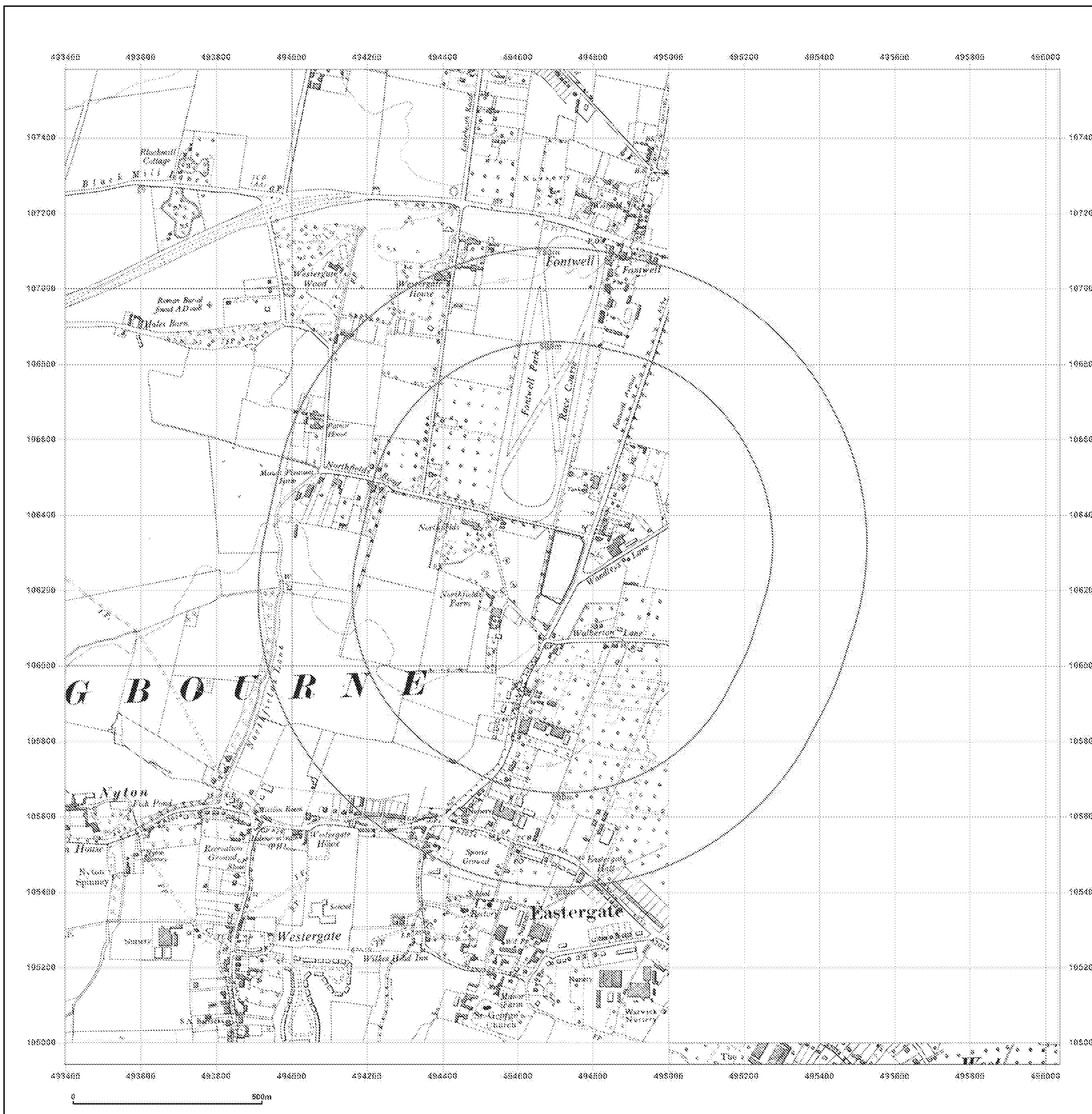


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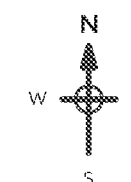
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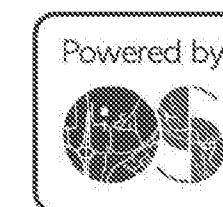
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Edition N/A
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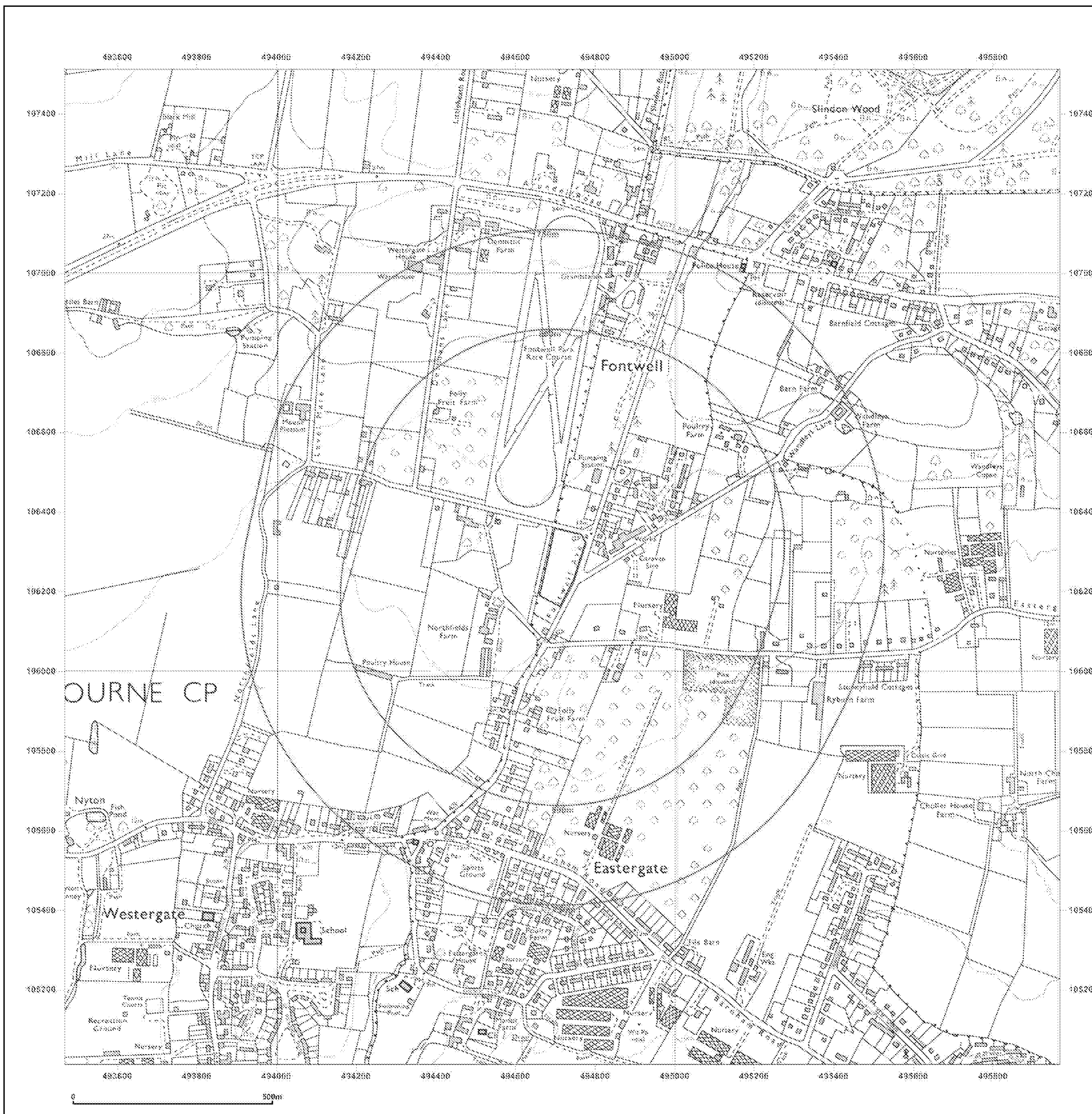


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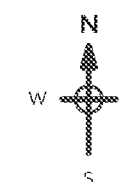
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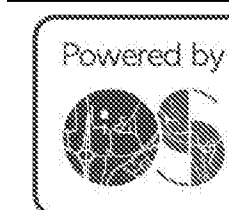
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Revised 1990
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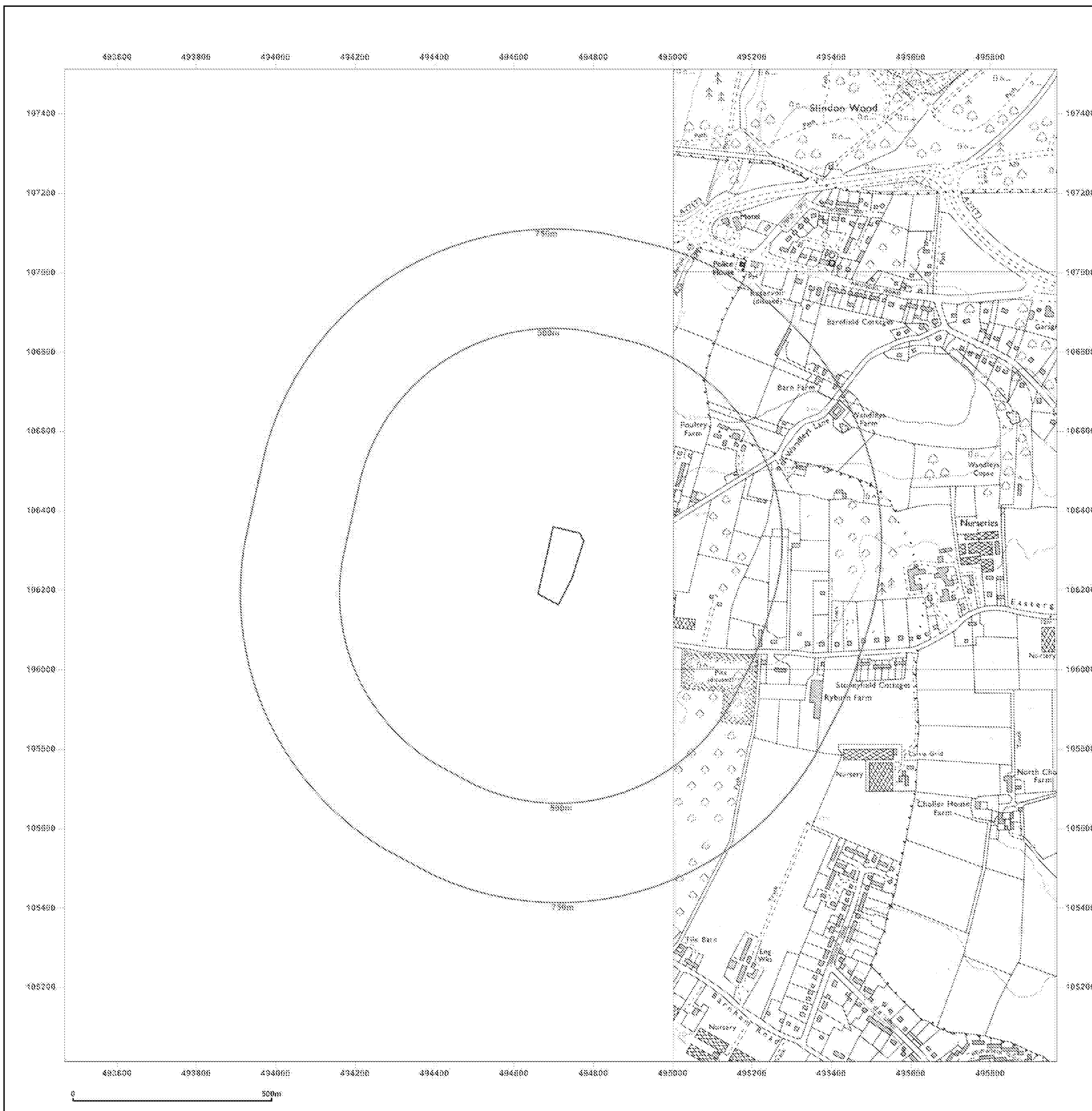


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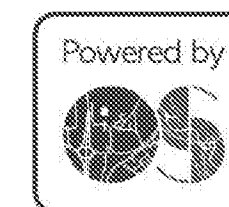
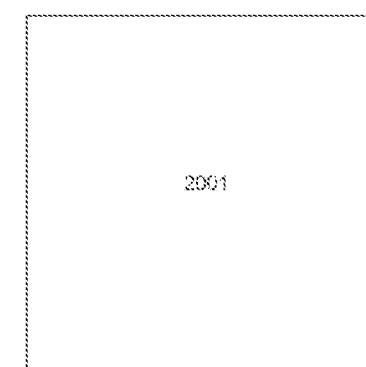
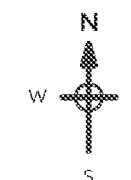
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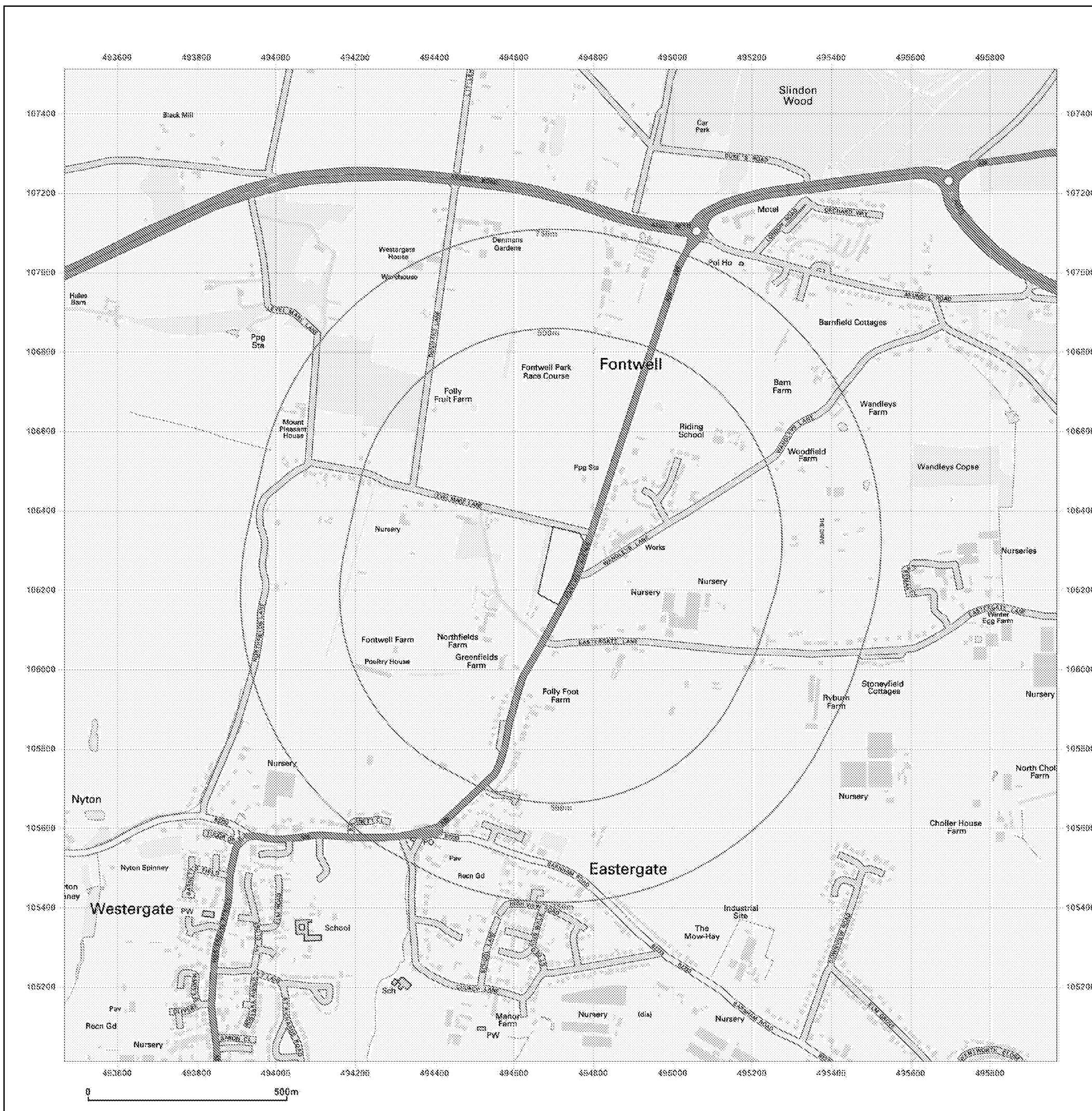


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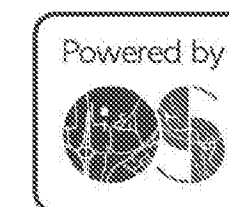
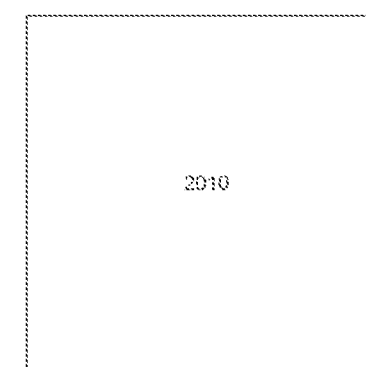
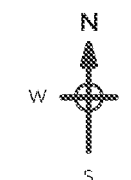
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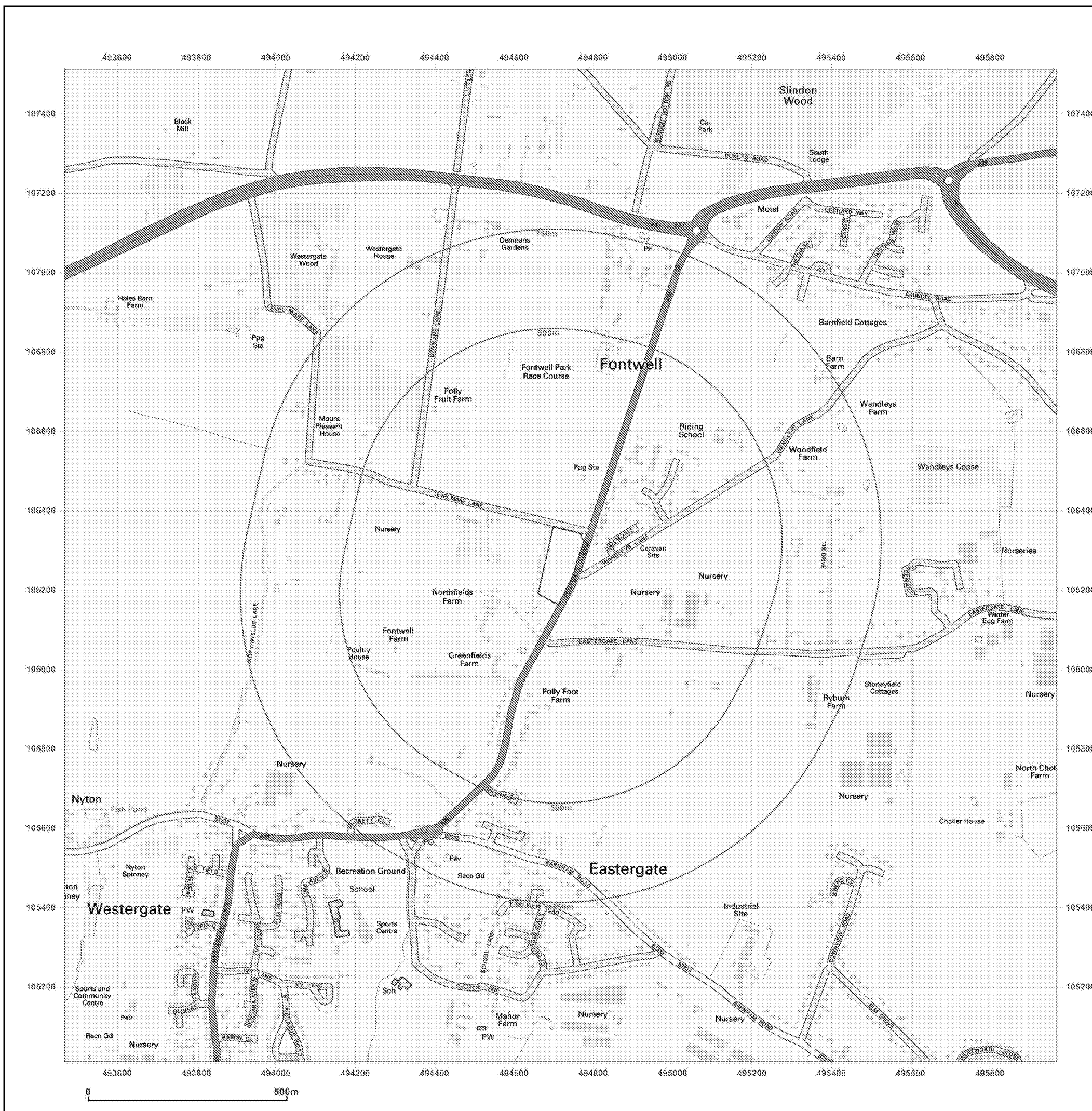


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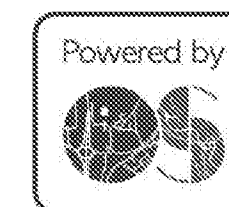
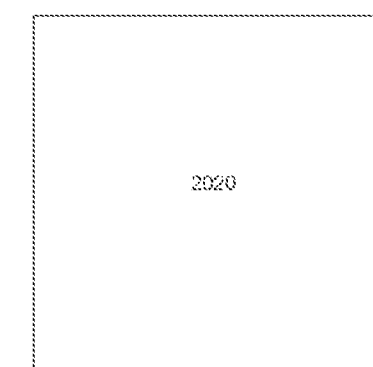
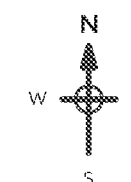
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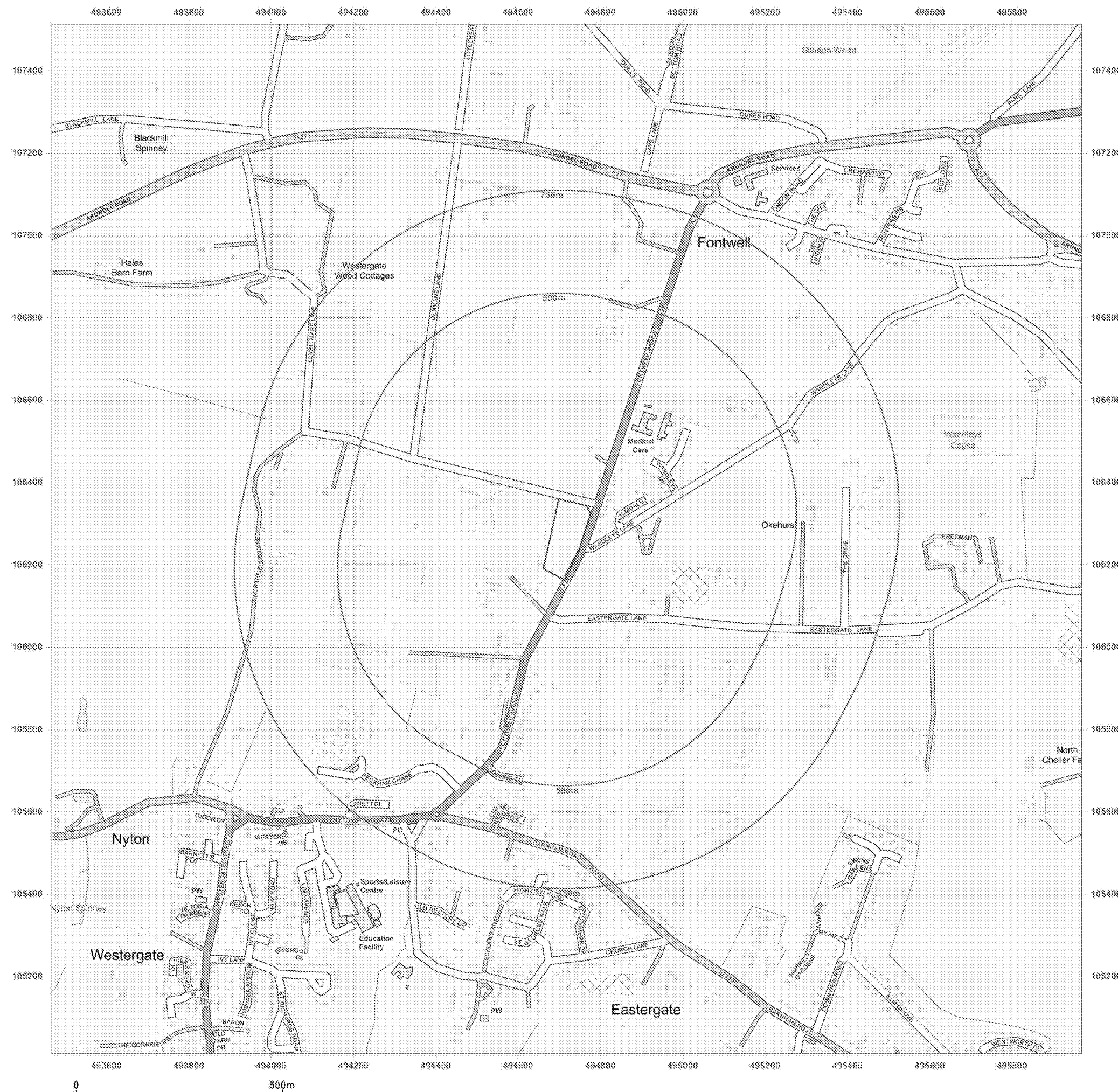


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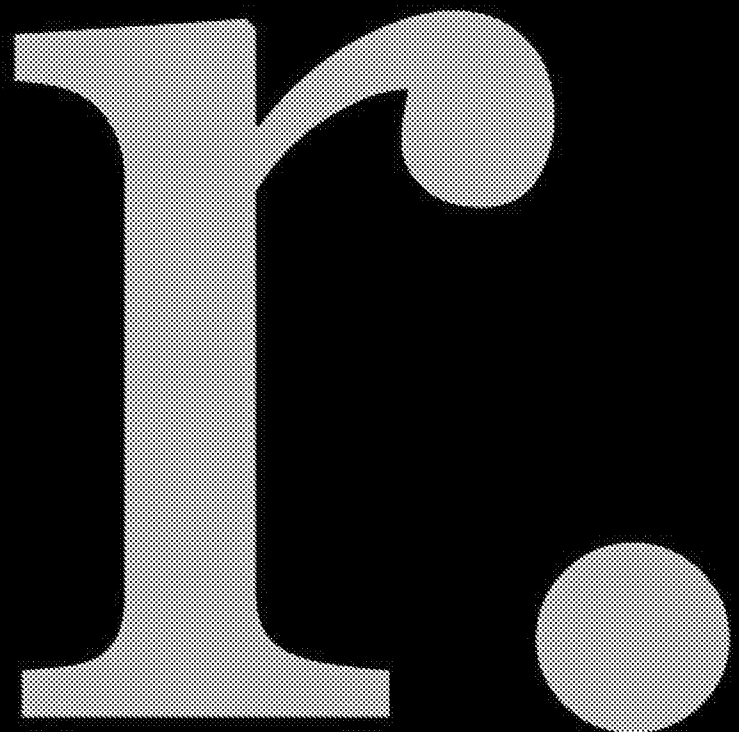


APPENDIX D SOILS LIMITED LETTER REPORT

reside.

Land west of Fontwell Avenue, Eastergate

Letter Report 16695/LR June 2018



BVL Developments Ltd.

F.A.O. Ben Lutyens
[REDACTED]

Our ref.: 16695/LR
June 2018

Thomas Telford House
Sun Valley Business Park
Winnall Close
Winchester SO23 0LS
[REDACTED]

Dear Ben

RE: 1 Northfields Cottages, Fontwell Avenue, Eastergate, Chichester, West Sussex PO20 3RX

We are writing regarding the scheme of winter groundwater monitoring undertaken at the above-named site.

Brief

Soils Limited quotation reference Q19523, dated 15th December 2017, set the scope of the investigation. A scheme of winter groundwater monitoring was undertaken following intrusive works to install three groundwater monitoring wells via the drilling of windowless sampler boreholes. Groundwater monitoring visits were undertaken by the client under instruction by Soils Limited.

General

The site was located at 1 Northfields Cottages, Fontwell Avenue, Eastergate, Chichester, West Sussex PO20 3RX and had an O.S Land Ranger Grid Reference of SU 947 062.

The site comprised open pasture land with an equestrian sand school and tarmac car park in the south quarter of the site. The site was relatively flat with a gentle slope down to the south. Mature trees and vegetation occupied the east, north and west site boundaries. The site was surrounded by residential and pasture land to the north, residential to the east, residential to the south and pasture land to the west.

A site location plan has been included as Figure 2.

Anticipated Geology

1:50,000 BGS geology maps showed the site to be situated on bedrock of the Lambeth Group over undifferentiated Lewes Nodular, Seaford and Newhaven Chalk Formation, with superficial deposits of Head overlying.

Head deposit are drifts produced by solifluxion, the downslope movement of debris outwash during the periglacial period, and characteristically comprise poorly sorted sands gravels and chalk of local derivation

The Lambeth Group, formerly known as the Woolwich and Reading Beds, occurs in the London and Hampshire Basins, where it directly overlies the Chalk or Thanet Sand Formation, and is succeeded by the Harwich and London Clay Formations. Although generally less than 50

metres thick, it's lithological variability and position beneath much of London has concerned tunnelling engineers since the early 19th century.

Lewes Nodular Chalk Formation is composed of hard to very hard nodular chalks and hardgrounds (which resist scratching by finger-nail) with interbedded soft to medium hard chalks (some grainy) and marls; some griotte chalks. The softer chalks become more abundant towards the top. Nodular chalks are typically lumpy and iron-stained (usually marking sponges). Brash is rough and flaggy or rubbly, and tends to be dirty. First regular seams of nodular flint, some large, commence near the base and continue throughout.

Seaford Chalk Formation can be described as firm white chalk with conspicuous semi-continuous nodular and tabular flint seams. Hardgrounds and thin marls are known from the lowest beds. Some flint nodules are large to very large.

The Newhaven Chalk Formation is a soft white friable microporous limestone composed of coccolith biomicrites with a varying proportion of larger shell fragments. At various levels clay sized material occurs as marl seams and partings. Close to the surface the upper few metres are invariably discoloured brown, due to leaching from the overlying strata. The interface with any overlying stratum is invariably extremely irregular as a result of localised weathering and general solution. Weathering by frost action may extend to a depth of several metres.

Occasional erosional features, such as pipes, swallow holes and solution cavities, usually infilled with drift deposits, are found in the chalk. The features sometimes manifest themselves at the surface as shallow circular depressions. Solution features may be reactivated by the concentrated ingress of water from leaking drains or soakaways. Reactivation may lead to surface collapse.

Site Works

On 24th November 2018, three windowless sampler boreholes were all drilled to a depth of 5.00m below ground level (bgl) at locations selected by Soils Limited.

All three windowless sampler boreholes were installed with groundwater monitoring wells comprising 33mm slotted standpipes surrounded by a response zone formed by siliceous 10mm gravel and sealed above with 1m 33mm plain standpipe with bentonite surround. The installations were completed with a cap and metal stopcock cover set in concrete.

A trial hole location plan has been included as Figure 3.

Groundwater monitoring visits were undertaken by the client within the period of 22nd December 2017 and 18th April 2018.

Ground Conditions

The ground conditions encountered during the site investigation have been summarised in Table 1.

Topsoil (TS)
Head (HEAD)

Lambeth Group (LMBE, not encountered)
Undifferentiated Lewes Nodular, Seaford and Newhaven Chalk Formation (WHCK)

Table 1 Ground Conditions

Strata	Epoch	Depth Encountered (m bgl)		Typical Thickness (m)	Typical Description
		Top	Bottom		
TS	Anthropocene	0.00	0.30 – 0.60	0.50	Turf over dark brown slightly gravelly silty CLAY with frequent roots and rootlets.
HEAD	Quaternary	0.30 – 0.60	1.35 – 2.50	1.40	Dark becoming light brown gravelly CLAY. Gravel is fine to coarse subangular to angular clasts of flint.
LMBE	Paleocene	Not encountered			
WHCK	L. Cretaceous	1.35 – 2.50	2.50 ¹	Not proven ²	Off white and brownish white weathered structureless CHALK recovered as fine gravel sized intact blocks of chalk within a sandy SILT calcareous matrix, with frequent fine to coarse gravel sized clasts of subrounded to angular flint.

Note: ¹ Final depth of trial hole. ² Base of strata not encountered. 0.00 refers to ground level

The ground conditions encountered in trial holes have been described below in descending order. The engineering logs are presented in Appendix A.

Topsoil

Soils described as Topsoil were encountered in all three trial holes from ground level to depths ranging between 0.30m and 0.60m bgl.

The Topsoil typically comprised turf over dark brown slightly gravelly silty CLAY with frequent roots and rootlets. Gravel was fine to medium subangular clasts of flint.

Head

Soils described as Head were encountered in all three trial holes underlying the Topsoil and persisted to depths ranging between 1.35m and 2.50m bgl.

The Head typically comprised dark becoming light brown gravelly CLAY. Gravel was fine to coarse subangular to angular clasts of flint. The gravel content was observed to increase with depth.

Undifferentiated Lewes Nodular, Seaford and Newhaven Chalk Formation

Soils described as White Chalk Subgroup were encountered in all three trial holes underlying deposits of Head and persisted to the full investigatory depth of 5.00m bgl.

The White Chalk Subgroup comprised off white and brownish white weathered structureless CHALK recovered as fine gravel sized intact fragments of chalk within a sandy SILT calcareous matrix, with frequent fine to coarse gravel sized clasts of subrounded to angular flint.

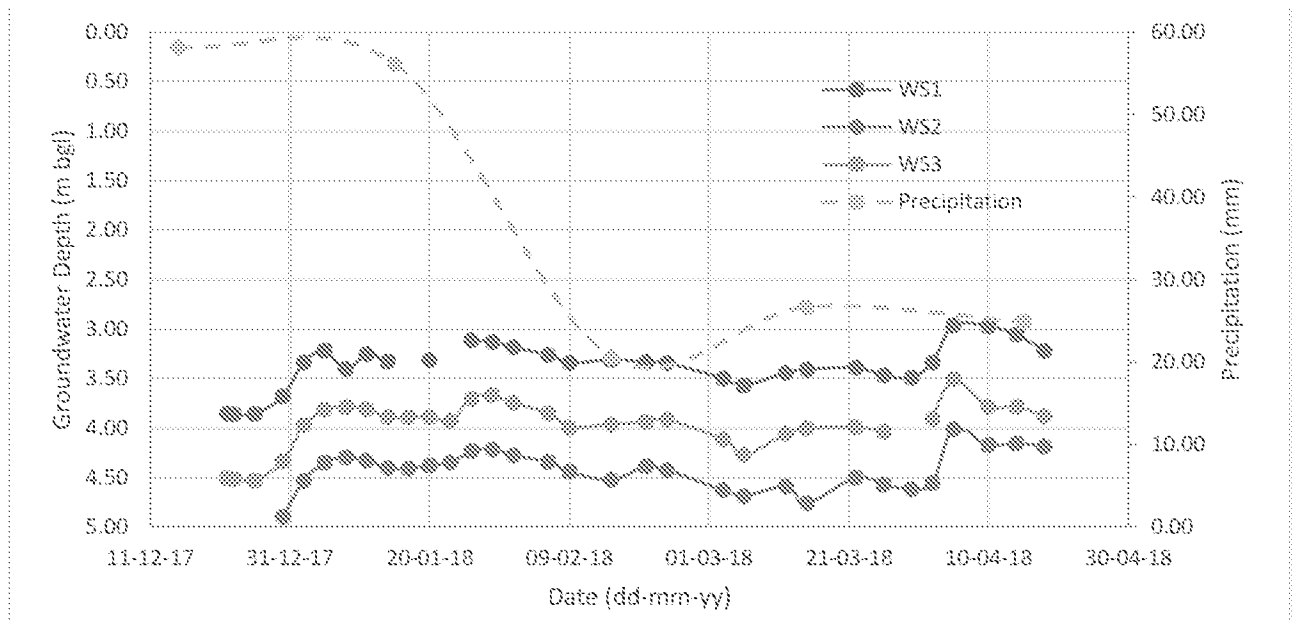
Winter Groundwater Monitoring

Groundwater was not encountered in any of the exploratory trial holes during construction of the groundwater monitoring wells. Changes in groundwater level occur for a number of reasons including seasonal effects and variations in drainage. The drilling was conducted in December (2017), when

groundwater levels should be rising from their annual minimum (lowest) elevation, which typically occurs around September.

Further groundwater monitoring was conducted within the standpipes installed on site following completion of site works and the results have been graphed in Figure 1. The groundwater monitoring period included the winter seasons from December (2017) to April (2018). Raw data provided by the client have been presented in Appendix B.

Figure 1 Winter Groundwater Monitoring Graph



Note: Precipitation data obtained from Shoreham weather station. www.wunderground.com. Two anomalous readings from WS1 and one from WS3 have been omitted in production of the graph.

Over the monitoring period, which included the winter months where groundwater levels are typically at their highest, groundwater was recorded at shallowest depths of 2.96m, 4.01m and 3.51m bgl in the area of WS1, WS2 and WS3 respectively. The difference in groundwater levels across the site may be accounted for by change in ground elevation. The topography was noted to slope down to the south.

The following attachments make up the remainder of this letter report.

Figure 2 – Site Location Plan

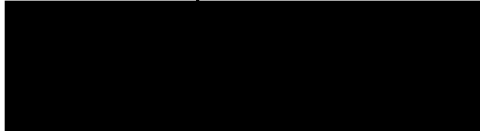
Figure 3 – Trial Hole Location Plan

Appendix A – Engineering Borehole Logs

Appendix B – Raw Groundwater Monitoring Data

Should you have any queries, please do not hesitate to contact the undersigned.

Yours sincerely



Tim Rudkin BSc. (Hons.), MSc., FGS.

Graduate Geo-Environmental Engineer



For and on behalf of Soils Limited.



Figure 2 - Site Location Plan

Project
1 Northfields Cottages

Date
June 2018

Client
BVL Developments Ltd.

Job Number
16695



Figure 3 – Trial Hole Location Plan

Project
I Northfields Cottages

Date
June 2018

Client
BVL Developments Ltd.

Job Number
16695

Appendix A – Engineering Borehole Logs

**Soils Limited**

Newton House, Cross Road, Tadworth KT20 5SR

Borehole Log

Borehole No.

WS1

Sheet 1 of 1

Project Name: 1 Northfields Cottages

Project No.: 16695

Co-ords:

Hole Type

WS

Location: Fontwell Avenue, Eastergate, Chichester, West Sussex PO20 3RX

Level:

Scale

1:50

Client: BVL Developments Ltd.

Dates: 21-12-2017

Logged By

AP

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (mAOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	D		0.30			Turf over dark brown slightly gravelly silty CLAY with frequent roots and rootlets. Gravel is fine to medium subangular clasts of flint.	
								TOPSOIL	
		0.80	D					Light brown gravelly CLAY. Gravel was fine to coarse subangular clasts of flint. HEAD	
								Percentage gravel increasing with depth	1
		1.50	D		1.35			Light yellow and light brown weathered structureless CHALK recovered as fine to medium gravel sized fragments of intact chalk within a sandy SILT calcareous matrix. WHITE CHALK SUBGROUP	2
		2.50	D					Off white weathered structureless CHALK recovered as fine to medium gravel sized fragments of intact chalk within a clayey SILT comminuted calcareous matrix. WHITE CHALK SUBGROUP	3
		3.50	D		4.10			End of Borehole at 5.00m	4
		4.50	D		5.00				5
									6
									7
									8
									9
									10

General Remarks:

Roots to 1.20m bgl. No groundwater encountered.

Groundwater Remarks:

Borehole Type

CP: Cable Percussive
WS: Windowless Sampler
RC: Rotary Cored

Sample Types

D: Disturbed
B: Bulk
J: Jar
W: Water
U: Undisturbed

In-Situ Testing

SPT: Split spoon - Standard Penetration Test
CPT: Cone - Standard Penetration Test

**Soils Limited**

Newton House, Cross Road, Tadworth KT20 5SR

Borehole Log

Borehole No.

WS2

Sheet 1 of 1

Project Name: 1 Northfields Cottages

Project No.: 16695

Co-ords:

Hole Type

WS

Location: Fontwell Avenue, Eastergate, Chichester, West Sussex PO20 3RX

Level:

Scale

1:50

Client: BVL Developments Ltd.

Dates: 21-12-2017

Logged By

AP

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	D		0.50			Turf over dark brown slightly gravelly silty CLAY with frequent roots and rootlets. Gravel is fine to medium subangular clasts of flint. TOPSOIL	
		0.80	D		0.90			Soft light brown gravelly CLAY. Gravel is fine to medium sub-angular clasts of flint. HEAD Percentage gravel increasing with depth	
		1.50	D		2.50			Dark brown very gravelly CLAY. Gravel is fine to coarse angular clasts of flint. HEAD	1
		2.50	D		3.50			Light brown and off white weathered structureless CHALK recovered as fine gravel sized fragments of intact chalk within a sandy SILT calcareous matrix. WHITE CHALK SUBGROUP	2
		3.50	D		4.50				3
		4.50	D		5.00				4
									5
									6
									7
									8
									9
									10
End of Borehole at 5.00m									

General Remarks:

Roots to 0.50m bgl. No groundwater encountered.

Groundwater Remarks:**Borehole Type**CP: Cable Percussive
WS: Windowless Sampler
RC: Rotary Cored**Sample Types**D: Disturbed
B: Bulk
J: Jar
W: Water
U: Undisturbed**In-Situ Testing**SPT: Split spoon - Standard Penetration Test
CPT: Cone - Standard Penetration Test

**Soils Limited**

Newton House, Cross Road, Tadworth KT20 5SR

Borehole Log

Borehole No.

WS3

Sheet 1 of 1

Project Name: 1 Northfields Cottages

Project No.: 16695

Co-ords:

Hole Type

WS

Location: Fontwell Avenue, Eastergate, Chichester, West Sussex PO20 3RX

Level:

Scale

1:50

Client: BVL Developments Ltd.

Dates: 21-12-2017

Logged By

AP

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (mAOD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.20	D		0.60			Turf over dark brown slightly gravelly silty CLAY with frequent roots and rootlets. Gravel is fine to medium subangular clasts of flint. TOPSOIL		
		0.80	D					Light brown becoming light brown very gravelly CLAY. Gravel is fine to coarse angular clasts of flint. HEAD Percentage gravel increasing with depth	1	
		1.50	D		1.90			light brown and off white weathered structureless CHALK recovered as fine gravel sized fragments of intact chalk within a sandy SILT calcareous matrix. WHITE CHALK SUBGROUP	2	
		2.50	D						3	
		3.50	D						4	
		4.50	D						5	
					5.00		End of Borehole at 5.00m		5	
									6	
									7	
									8	
									9	
									10	

General Remarks:

Roots to 0.60m bgl. No groundwater encountered.

Groundwater Remarks:

Borehole Type

CP: Cable Percussive
WS: Windowless Sampler
RC: Rotary Cored

Sample Types

D: Disturbed
B: Bulk
J: Jar
W: Water
U: Undisturbed

In-Situ Testing

SPT: Split spoon - Standard Penetration Test
CPT: Cone - Standard Penetration Test

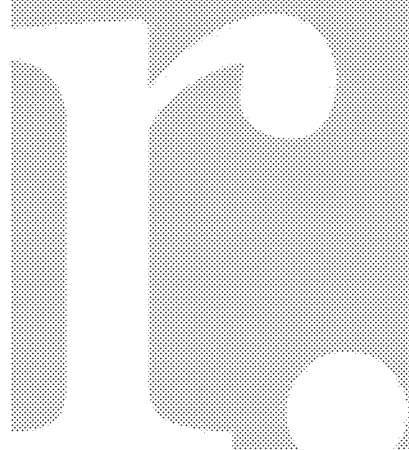
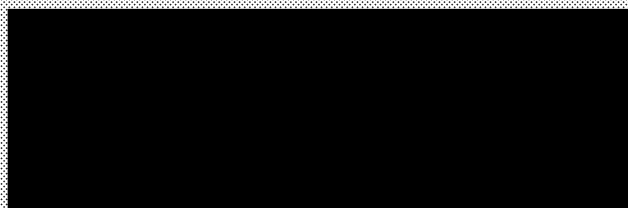
Appendix B – Raw Groundwater Monitoring Data

Date of reading	Depth to Water (m bgl)		
	WS1	WS2	WS3
22-12-17	3.85	DRY	4.51
23-12-17	3.86	DRY	4.52
26-12-17	3.86	DRY	4.53
30-12-17	3.68	4.89	4.34
02-01-18	3.33	4.54	3.97
05-01-18	3.22	4.35	3.82
08-01-18	3.40	4.30	3.79
11-01-18	3.26	4.33	3.81
14-01-18	3.33	4.40	3.89
17-01-18	3.81	4.41	3.89
20-01-18	3.31	4.38	3.89
23-01-18	3.80	4.35	3.93
26-01-18	3.11	4.23	3.70
29-01-18	3.13	4.22	3.67
01-02-18	3.19	4.28	3.74
06-02-18	3.26	4.34	3.85
09-02-18	3.34	4.44	3.99
15-02-18	3.31	4.52	3.96
20-02-18	3.33	4.39	3.94
23-02-18	3.34	4.43	3.92
03-03-18	3.50	4.63	4.11
06-03-18	3.57	4.69	4.27
12-03-18	3.44	4.59	4.06
15-03-18	3.41	4.76	4.00
22-03-18	3.39	4.50	3.99
26-03-18	3.47	4.57	4.04
30-03-18	3.49	4.62	4.36
02-04-18	3.34	4.55	3.90
05-04-18	2.96	4.01	3.51
10-04-18	2.97	4.17	3.78
14-04-18	3.06	4.15	3.78
18-04-18	3.22	4.19	3.88
Depth of well (m bgl)	5.00	5.00	5.00

Report presented by

soils
LIMITED

Reside Developments Ltd
The Dutch House
132-134 High Street
Dorking RH4 1BG



APPENDIX E SITE PHOTOGRAPHS



PLATE 1 – Looking north along the eastern boundary



PLATE 2 – Looking west along the southern boundary



PLATE 3 – Gate off Fontwell Avenue on eastern boundary in southern most paddock



PLATE 4 – looking south across the site from the northern boundary



PLATE 5 – Sewer manhole in the north-eastern corner of the site



PLATE 6 – looking west along the northern boundary

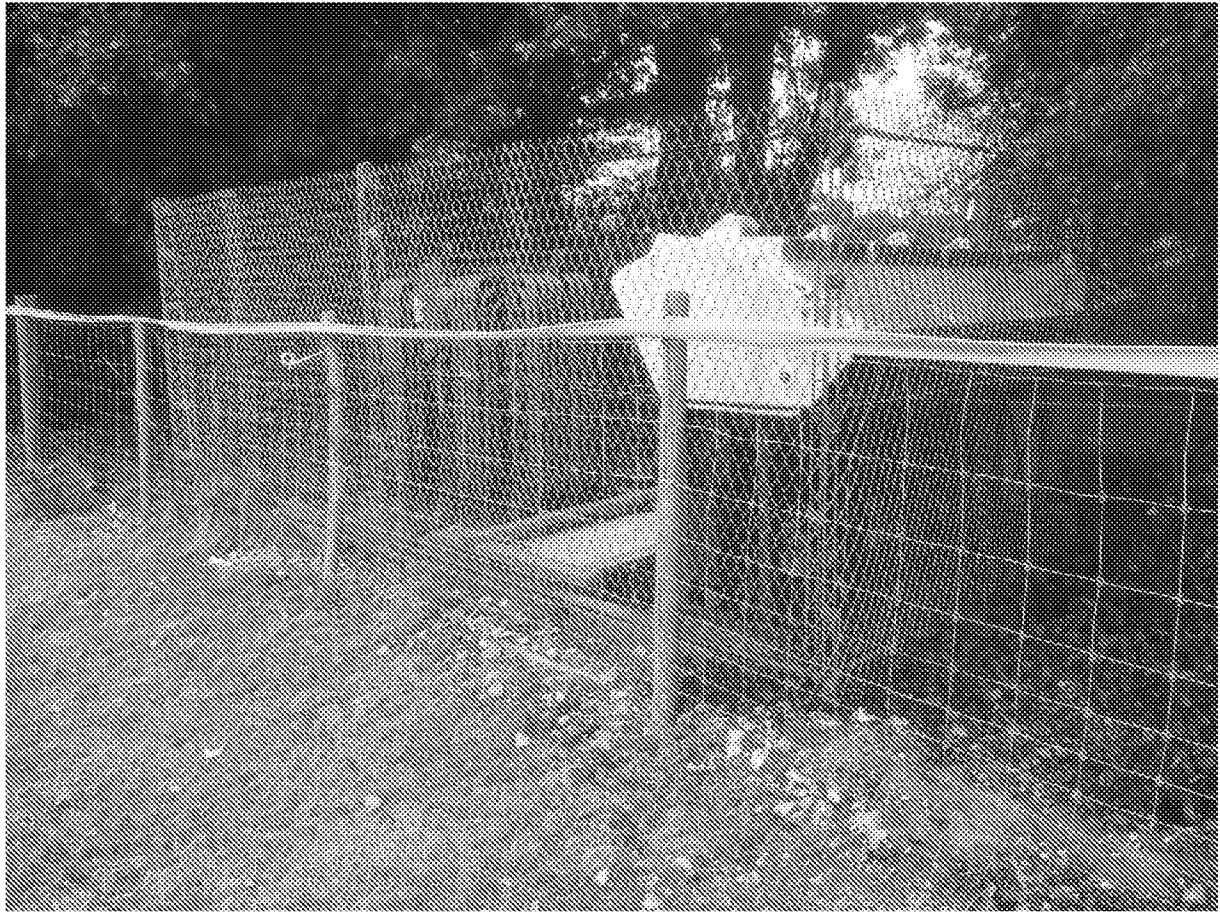


PLATE 7 – Electricity sub-station on the northern boundary



PLATE 8 – Access trackway along the western boundary, which is accessed via a gate off Level Mare lane



PLATE 9 – Trial Pit 1



PLATE 10 – Arisings from TP1



PLATE 11 – Trial pit TP2



PLATE 12 – Trial pit TP2 arisings



PLATE 13 – Trial pit TP3



PLATE 14 – Trial pit TP3 arisings



PLATE 15 – Trial pit TP4



PLATE 16 – Trial pit TP4 arisings

APPENDIX F TRIAL PIT LOGS

Issue No	A	Dug by	Brian	Logged by	RB	Approved by	RB
 Forge Environmental Management Ltd The Forge, Lower Vagg, Chilthorne Damer, Yeovil, Somerset. BA21 3PY						Trial Pit No. TP1	
Project 1 Northfields Cottages, Fontwell Avenue, Eastergate							
Job No	FON206.D	Date	13/08/2020	Ground Level	c.18m AOD	Co-Ordinates	Depth 1.90m
Client Hampshire Homes Group Ltd						Method/Plant JCB 3ex	Sheet 1 of 1

STRATA					SAMPLES & TESTS			Field Records
Water	Level (mOD)	Legend	Depth (thickness)	Strat Description	Depth	Type No	Test Result	
			(0.20) 0.20	Light brown gravelly clay. Gravel medium sub angular flint TOPSOIL	0.15	T & AJ		
			(0.40) 0.60	Light brown medium dense silty gravelly SAND. Gravel fine to coarse with occasional cobbles of sub-angular flint. NATURAL SOILS				
			(1.30) 1.90	Dark brown medium dense sandy clayey GRAVEL. Gravel medium to coarse with occasional cobbles sub-angular flint NATURAL SOILS	1.0 1.5	T & AJ Bulk		
				BASE OF TRIAL PIT				

GENERAL REMARKS - Disturbed samples collected at 0.15m and 1.0m in plastic tubs and amber jars and a bulk sample 1.5m - No groundwater was encountered - Trial pit was used for infiltration testing.
--

Issue No	A	Dug by	Brian	Logged by	RB	Approved by	RB
 Forge Environmental Management Ltd The Forge, Lower Vagg, Chilthorne Damer, Yeovil, Somerset. BA21 3PY						Trial Pit No. TP2	
Project 1 Northfields Cottages, Fontwell Avenue, Eastergate							
Job No	FON206.D	Date	13/08/2020	Ground Level	c.17m AOD	Co-Ordinates	Depth 2.10m
Client Hampshire Homes Group Ltd						Method/Plant	Sheet 1 of 1
						JCB 3ex	

STRATA					SAMPLES & TESTS			Field Records
Water	Level (mOD)	Legend	Depth (thickness)	Strat Description	Depth	Type No	Test Result	
			(0.20) 0.20	Light brown gravelly clay. Gravel medium sub angular flint TOPSOIL	0.15	T & AJ		
			(0.70) 0.90	Light brown medium dense silty gravelly SAND. Gravel fine to coarse with occasional cobbles of sub-angular flint. NATURAL SOILS	0.80	T & AJ		
			(1.20) 2.10	Dark brown medium dense sandy clayey GRAVEL. Gravel medium to coarse with occasional cobbles sub-angular flint NATURAL SOILS	1.00	bulk		
				BASE OF TRIAL PIT				

GENERAL REMARKS 1 Disturbed samples collected at 0.15m and 0.8m in plastic tubs and amber jars and a bulk sample 1.0m 2 No groundwater was encountered

Issue No	A	Dug by	Brian	Logged by	RB	Approved by	RB
 Forge Environmental Management Ltd The Forge, Lower Vagg, Chilthorne Damer, Yeovil, Somerset. BA21 3PY						Trial Pit No. TP3	
Project 1 Northfields Cottages, Fontwell Avenue, Eastergate							
Job No	FON206.D		Date	13/08/2020	Ground Level	Co-Ordinates	
					c.16m AOD		
Client						Method/Plant	Sheet
Hampshire Homes Group Ltd						JCB 3ex	1 of 1

STRATA					SAMPLES & TESTS			Field Records
Water	Level (mOD)	Legend	Depth (thickness)	Strat Description	Depth	Type No	Test Result	
			(0.20)	Light brown gravelly clay. Gravel medium sub angular flint	0.15	T & AJ		
			(1.90)	Light brown medium dense silty gravelly SAND. Gravel fine to coarse with occasional cobbles of sub-angular flint.	0.75	T & AJ		
			2.10	NATURAL SOILS	1.00	bulk		
				BASE OF TRIAL PIT				

GENERAL REMARKS 1 Disturbed samples collected at 0.15m and 0.75m in plastic tubs and amber jars and a bulk sample 1.0m 2 No groundwater was encountered 3 Trial pit used for infiltration testing

Issue No	A	Dug by	Brian	Logged by	RB	Approved by	RB
 Forge Environmental Management Ltd The Forge, Lower Vagg, Chilthorne Damer, Yeovil, Somerset. BA21 3PY						Trial Pit No. TP4	
Project 1 Northfields Cottages, Fontwell Avenue, Eastergate							
Job No	FON206.D	Date	13/08/2020	Ground Level	c.16m AOD	Co-Ordinates	Depth
Client Hampshire Homes Group Ltd						Method/Plant	Sheet
						JCB 3ex	1 of 1

STRATA					SAMPLES & TESTS			Field Records
Water	Level (mOD)	Legend	Depth (thickness)	Strat Description	Depth	Type No	Test Result	
			(0.20) 0.20	Light brown gravelly clay. Gravel medium sub angular flint TOPSOIL	0.15	T & AJ		
			(0.90) 1.10	Light brown medium dense silty gravelly SAND. Gravel fine to coarse with occasional cobbles of sub-angular flint. NATURAL SOILS	0.75	T & AJ		
			(1.10) 2.20	Dark brown medium dense sandy clayey GRAVEL. Gravel medium to coarse with occasional cobbles sub-angular flint NATURAL SOILS	1.00	bulk		
				BASE OF TRIAL PIT				

GENERAL REMARKS 1 Disturbed samples collected at 0.15m and 0.50m in plastic tubs and amber jars and a bulk sample 1.0m 2 No groundwater was encountered 3 Trial pit used for infiltration testing

APPENDIX G CHEMICAL TEST RESULTS



2683



MCERTS
THE ENVIRONMENTAL AGENCY
PMD/00000000000000000000

Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 20-29391

Issue: 1

Date of Issue: 24/08/2020

Contact: Richard Blaney

Customer Details: Forge Environmental Management Ltd
The Forge
Lower Vagg
Yeovil
SomersetBA21 3PY

Quotation No: Q19-01649

Order No: FON206.D/250

Customer Reference: FON206

Date Received: 17/08/2020

Date Approved: 24/08/2020

Details: 1 Northfield Cottages, Fontwell Avenue, Eastergate

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.: 20-29391, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
211430	TP1 0.15	13/08/2020	17/08/2020	Silty loam	
211431	TP1 0.50	13/08/2020	17/08/2020	Silty loam	
211432	TP2 0.15	13/08/2020	17/08/2020	Silty loam	
211433	TP2 0.80	13/08/2020	17/08/2020	Silty loam	
211434	TP3 0.15	13/08/2020	17/08/2020	Silty loam	
211435	TP3 0.75	13/08/2020	17/08/2020	Silty loam	
211436	TP4 0.15	13/08/2020	17/08/2020	Silty loam	
211437	TP4 1.00	13/08/2020	17/08/2020	Silty loam	

Results Summary

Report No.: 20-29391, issue number 1

ELAB Reference	211430	211431	211432	211433	211434	211435	211436	211437
Customer Reference								
Sample ID								
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP1	TP1	TP2	TP2	TP3	TP3	TP4	TP4
Sample Depth (m)	0.15	0.50	0.15	0.80	0.15	0.75	0.15	1.00
Sampling Date	13/08/2020	13/08/2020	13/08/2020	13/08/2020	13/08/2020	13/08/2020	13/08/2020	13/08/2020
Determinand	Codes	Units	LOD					
Soil sample preparation parameters								
Material removed	N	%	0.1	< 0.1	36.5	38.9	47.8	14.4
Description of Inert material removed	N		0	None	Stones	Stones	Stones	Stones
Metals								
Arsenic	M	mg/kg	1	6.6	13.0	6.5	8.4	7.7
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	0.5	< 0.5
Chromium	M	mg/kg	5	21.0	37.4	23.7	33.4	26.6
Copper	M	mg/kg	5	17.8	20.0	14.8	14.3	13.4
Lead	M	mg/kg	5	46.0	19.0	43.5	20.0	109
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	13.2	29.2	12.3	25.3	14.5
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	5	95.0	75.0	79.9	85.1	69.5
Anions								
Water Soluble Sulphate	M	g/l	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Inorganics								
Elemental Sulphur	M	mg/kg	20	< 20	< 20	< 20	< 20	< 20
Free Cyanide	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Boron	N	mg/kg	0.5	1.5	0.5	0.7	< 0.5	0.8
Miscellaneous								
Acid Neutralisation Capacity	N	mol/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Loss On Ignition (450°C)	M	%	0.01	n/t	n/t	5.81	n/t	3.21
pH	M	pH units	0.1	6.5	6.6	6.1	6.7	6.4
Soil Organic Matter	U	%	0.1	0.4	0.3	0.5	0.6	0.3
Total Organic Carbon	N	%	0.01	n/t	n/t	2.0	n/t	0.49
Phenols								
Phenol	M	mg/kg	1	5	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	6	< 5	< 5	< 5	< 5
Polyaromatic hydrocarbons								
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	0.2	< 0.1	< 0.1	0.1	< 0.1
Pyrene	M	mg/kg	0.1	0.2	< 0.1	< 0.1	0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	1.2	< 0.4	< 0.4	0.4	< 0.4
Total PAH (including Coronene GC-FID)	N	mg/kg	2	n/t	n/t	< 2	n/t	n/t

Results Summary

Report No.: 20-29391, issue number 1

ELAB Reference:				211430	211431	211432	211433	211434	211435	211436	211437
Customer Reference:											
Sample ID:											
Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location:				TP1	TP1	TP2	TP2	TP3	TP3	TP4	TP4
Sample Depth (m):				0.15	0.50	0.15	0.80	0.15	0.75	0.15	1.00
Sampling Date:				13/08/2020	13/08/2020	13/08/2020	13/08/2020	13/08/2020	13/08/2020	13/08/2020	13/08/2020
Determinand	Codes	Units	LOD								
BTEX											
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
MTBE	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Total BTEX	N	mg/kg	0.01	n/t	n/t	< 0.01	n/t	n/t	< 0.01	n/t	n/t
TPH CWG											
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 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	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	< 1.0	2.1	< 1.0	1.6	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 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	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	M	mg/kg	1	2.4	< 1.0	4.9	< 1.0	3.7	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	M	mg/kg	1	1.4	< 1.0	2.9	< 1.0	2.1	< 1.0	< 1.0	< 1.0
Total aromatic hydrocarbons (>C5 - C40)	N	mg/kg	1	4.0	< 1.0	8.3	< 1.0	6.1	< 1.0	< 1.0	< 1.0
Total petroleum hydrocarbons (>C5 - C40)	N	mg/kg	1	5.0	< 1.0	10.4	< 1.0	7.8	< 1.0	< 1.0	< 1.0
Total Petroleum Hydrocarbons											
Mineral Oil	M	mg/kg	5	n/t	n/t	^ 15	n/t	n/t	^ < 5	n/t	n/t
PCB (ICES 7 congeners)											
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	< 0.03	n/t	n/t	< 0.03	n/t	n/t



Results Summary

2683

Report No.: 20-29391, issue number 1

WAC Analysis

Elab Ref:	211435				Landfill Waste Acceptance Criteria Limits*		
Sample Date:	13/08/2020				Inert Waste Landfill	Stable Non-reactive Hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:	TP3						
Depth (m)	0.75						
Site:	1 Northfield Cottages, Fontwell Avenue, Eastergate						
Determinand		Code	Units				
Total Organic Carbon		N	%	0.49	3	5	6
Loss on Ignition		M	%	3.2	--	--	10
Total BTEX		M	mg/kg	< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg	< 0.03	1	--	--
TPH Total WAC		M	mg/kg	< 5	500	--	--
Total (of 17) PAHs		N	mg/kg	< 2	100	--	--
pH		M		7.6	--	>6	--
Acid Neutralisation Capacity		N	mol/kg	< 0.1	--	To evaluate	To evaluate

Eluate Analysis

		10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	N	< 0.005	< 0.05	0.5	2	25
Barium	N	< 0.005	< 0.05	20	100	300
Cadmium	N	< 0.001	< 0.01	0.04	1	5
Chromium	N	< 0.005	< 0.05	0.5	10	70
Copper	N	0.008	0.08	2	50	100
Mercury	N	< 0.005	< 0.01	0.01	0.2	2
Molybdenum	N	< 0.005	< 0.05	0.5	10	30
Nickel	N	< 0.001	< 0.05	0.4	10	40
Lead	N	< 0.001	< 0.05	0.5	10	50
Antimony	N	< 0.005	< 0.05	0.06	0.7	5
Selenium	N	< 0.005	< 0.05	0.1	0.5	7
Zinc	N	< 0.005	< 0.05	4	50	200
Chloride	N	< 5	< 50	800	15000	25000
Fluoride	N	< 5	< 10	10	150	500
Sulphate	N	3	26.40	1000	20000	50000
Total Dissolved Solids	N	71	713.00	4000	60000	100000
Phenol Index	N	< 0.01	< 0.10	1	-	-
Dissolved Organic Carbon	N	9.410	94.00	500	800	1000

Leach Test Information

pH	N	7.4				
Conductivity (uS/cm)	N	106				
Dry mass of test portion (g)		100.000				
Dry Matter (%)		93				
Moisture (%)		8				
Eluent Volume (ml)		948				

Results are expressed on a dry weight basis, after correction for moisture content where applicable

* Stated limits are for guidance only, and not for conformity assessment.



Results Summary

2683

Report No.: 20-29391, issue number 1

WAC Analysis

Elab Ref:	211432				Landfill Waste Acceptance Criteria Limits*		
Sample Date:	13/08/2020				Inert Waste Landfill	Stable Non-reactive Hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:	TP2						
Depth (m)	0.15						
Site:	1 Northfield Cottages, Fontwell Avenue, Eastergate						
Determinand		Code	Units				
Total Organic Carbon		N	%	2.00	3	5	6
Loss on Ignition		M	%	5.8	--	--	10
Total BTEX		M	mg/kg	< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg	< 0.03	1	--	--
TPH Total WAC		M	mg/kg	15	500	--	--
Total (of 17) PAHs		N	mg/kg	< 2	100	--	--
pH		M		6.1	--	>6	--
Acid Neutralisation Capacity		N	mol/kg	< 0.1	--	To evaluate	To evaluate

Eluate Analysis

			10:1	10:1	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
			mg/l	mg/kg			
Arsenic		N	< 0.005	< 0.05	0.5	2	25
Barium		N	< 0.005	< 0.05	20	100	300
Cadmium		N	< 0.001	< 0.01	0.04	1	5
Chromium		N	< 0.005	< 0.05	0.5	10	70
Copper		N	0.020	0.20	2	50	100
Mercury		N	< 0.005	< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005	< 0.05	0.5	10	30
Nickel		N	0.002	< 0.05	0.4	10	40
Lead		N	0.002	< 0.05	0.5	10	50
Antimony		N	< 0.005	< 0.05	0.06	0.7	5
Selenium		N	< 0.005	< 0.05	0.1	0.5	7
Zinc		N	0.007	0.07	4	50	200
Chloride		N	< 5	< 50	800	15000	25000
Fluoride		N	< 5	< 10	10	150	500
Sulphate		N	3	31.40	1000	20000	50000
Total Dissolved Solids		N	30	304.00	4000	60000	100000
Phenol Index		N	< 0.01	< 0.10	1	-	-
Dissolved Organic Carbon		N	16.500	165.00	500	800	1000

Leach Test Information

pH		N	6.2				
Conductivity (uS/cm)		N	< 50				
Dry mass of test portion (g)			100.000				
Dry Matter (%)			95				
Moisture (%)			5				
Eluent Volume (ml)			942				

Results are expressed on a dry weight basis, after correction for moisture content where applicable

* Stated limits are for guidance only, and not for conformity assessment.



Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY

Results Summary

Report No.: 20-29391, 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	Gravimetric Analysis Total	Gravimetric Analysis by ACM Type	Free Fibre Analysis	Total Asbestos
211430	0.15	TP1	Brown Soil, Stones, Plant	No asbestos detected	n/t	n/t	n/t	n/t
211432	0.15	TP2	Brown Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t
211434	0.15	TP3	Brown Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t
211436	0.15	TP4	Brown Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 20-29391, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Free cyanide	N	As submitted sample	19/08/2020	107	Colorimetry
Sulphide	N	As submitted sample	19/08/2020	109	Colorimetry
Hexavalent chromium	N	As submitted sample	19/08/2020	110	Colorimetry
Phenols in solids	M	As submitted sample	19/08/2020	121	HPLC
Elemental Sulphur	M	Air dried sample	19/08/2020	122	HPLC
PAH (GC-FID)	M	As submitted sample	19/08/2020	133	GC-FID
Water soluble anions	M	Air dried sample	19/08/2020	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	20/08/2020	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	20/08/2020	181	GC-MS
Water soluble boron	N	Air dried sample	19/08/2020	202	Colorimetry
Total cyanide	M	As submitted sample	19/08/2020	204	Colorimetry
TPH CWG soil by gc-gc	M	As submitted sample	18/08/2020	271	
Aqua regia extractable metals	M	Air dried sample	19/08/2020	300	ICPMS
Soil organic matter	U	Air dried sample	24/08/2020	BS1377:P3	Titrimetry
Asbestos identification	U	Air dried sample	24/08/2020	PMAN	Microscopy
Leachate					
Arsenic	N		21/08/2020	301	ICPMS
Cadmium	N		21/08/2020	301	ICPMS
Chromium	N		21/08/2020	301	ICPMS
Lead	N		21/08/2020	301	ICPMS
Nickel	N		21/08/2020	301	ICPMS
Copper	N		21/08/2020	301	ICPMS
Zinc	N		21/08/2020	301	ICPMS
Mercury	N		21/08/2020	301	ICPMS
Selenium	N		21/08/2020	301	ICPMS
Antimony	N		21/08/2020	301	ICPMS
Barium	N		21/08/2020	301	ICPMS
Molybdenum	N		21/08/2020	301	ICPMS
pH Value	N		21/08/2020	113	Electrometric
Electrical Conductivity	N		21/08/2020	136	Probe
Dissolved Organic Carbon	N		21/08/2020	102	TOC analyser
Chloride	N		21/08/2020	131	Ion Chromatography
Fluoride	N		21/08/2020	131	Ion Chromatography
Sulphate	N		21/08/2020	131	Ion Chromatography
Total Dissolved Solids	N		21/08/2020	144	Gravimetric
Phenol index	N		21/08/2020	121	HPLC
WAC Solids analysis					
pH Value	M	Air dried sample	24/08/2020	113	Electrometric
Total Organic Carbon	N	Air dried sample	24/08/2020	210	IR
Loss on Ignition	M	Air dried sample	20/08/2020	129	Gravimetric
Acid Neutralization Capacity to pH 7	N	Air dried sample	24/08/2020	NEN 737	Electrometric
Total BTEX	M	As submitted sample	20/08/2020	181	GCMS
Mineral Oil	M	As submitted sample	19/08/2020	117	GCFID
Total PCBs (7 congeners)	M	Air dried sample	19/08/2020	120	GCMS
Total PAH (17)	N	As submitted sample	20/08/2020	133	GCFID

Tests marked N are not UKAS accredited



2683

Report Information

Report No.: 20-29391, 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"

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 H GEOTECHNICAL TEST RESULTS



Contract Number: 49820

Client Ref:

Report Date: **15-09-2020**

Client PO: **FON206.D/251**

Client **Forge Enviromental Managment LTD**
The Forge
Lower Vagg
Chilthorne Domer
Yeovil
Somerset
BA21 3PY

Contract Title: **1 Northfields Cottages, Fontwell Ave, Eastergate**
For the attention of: **Richard Blaney**

Date Received: **19-08-2020**

Date Completed: **15-09-2020**

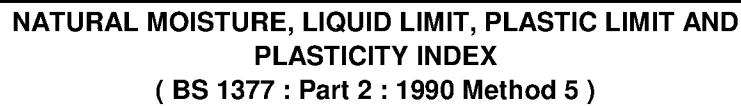
Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	4
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	4
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	4
BRE Reduced Suite includes pH, water & acid soluble sulphate and total sulphur BRE - BR279 - @ Non Accredited Test	4
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation
* - denotes test included in laboratory scope of accreditation
- denotes test carried out by approved contractor
@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Emma Sharp (Office Manager) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)
Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)

[illegible]

Operators	Checked	15/09/2020	Wayne Honey (Administrative/Quality Assistant)
Daniel Bassett	Approved	15/09/2020	Paul Evans (Quality/Technical Manager)





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **49820**

Borehole/Pit No. **TP1**

Site Name **1 Northfields Cottages, Fontwell Ave, Eastergate**

Sample No.

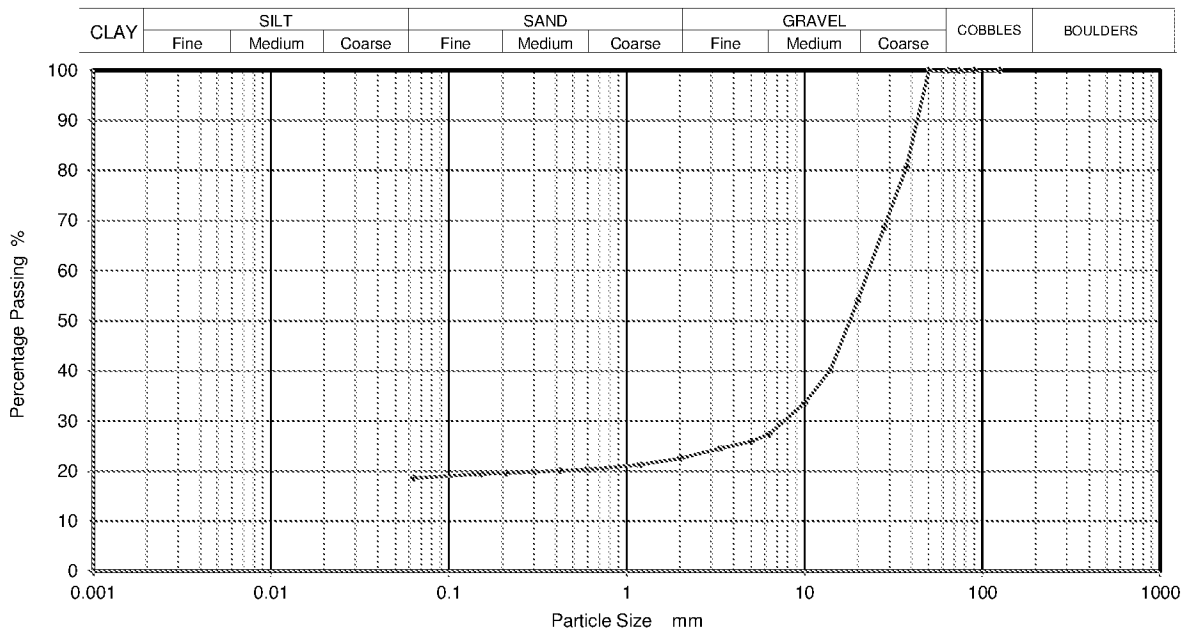
Soil Description **Brown slightly fine to coarse sandy silty/clayey fine to coarse GRAVEL**

Depth Top **1.00**

Depth Base

Date Tested **10/09/2020**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	81		
28	69		
20	54		
14	40		
10	34		
6.3	27		
5	26		
3.35	24		
2	23		
1.18	21		
0.6	20		
0.425	20		
0.3	20		
0.212	20		
0.15	19		
0.063	19		

Sample Proportions	% dry mass
Cobbles	0
Gravel	77
Sand	4
Silt and Clay	19

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	14/09/2020	Wayne Honey
RO/MH	Approved	15/09/2020	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **49820**

Borehole/Pit No. **TP2**

Site Name **1 Northfields Cottages, Fontwell Ave, Eastergate**

Sample No.

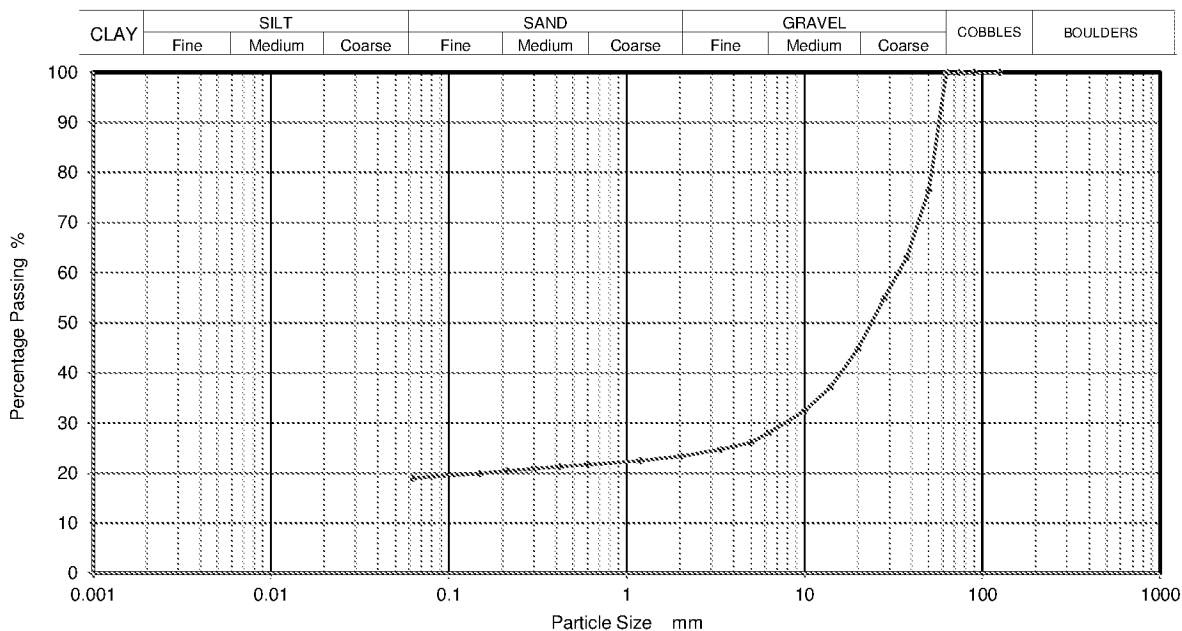
Soil Description **Brown slightly sandy silty/clayey fine to coarse GRAVEL**

Depth Top **1.00**

Depth Base

Date Tested **11/09/2020**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	77		
37.5	63		
28	55		
20	45		
14	37		
10	32		
6.3	28		
5	26		
3.35	25		
2	23		
1.18	22		
0.6	22		
0.425	21		
0.3	21		
0.212	20		
0.15	20		
0.063	19		

Sample Proportions	% dry mass
Cobbles	0
Gravel	77
Sand	4
Silt and Clay	19

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	14/09/2020	Wayne Honey
RO/MH	Approved	15/09/2020	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **49820**

Borehole/Pit No. **TP3**

Site Name **1 Northfields Cottages, Fontwell Ave, Eastergate**

Sample No.

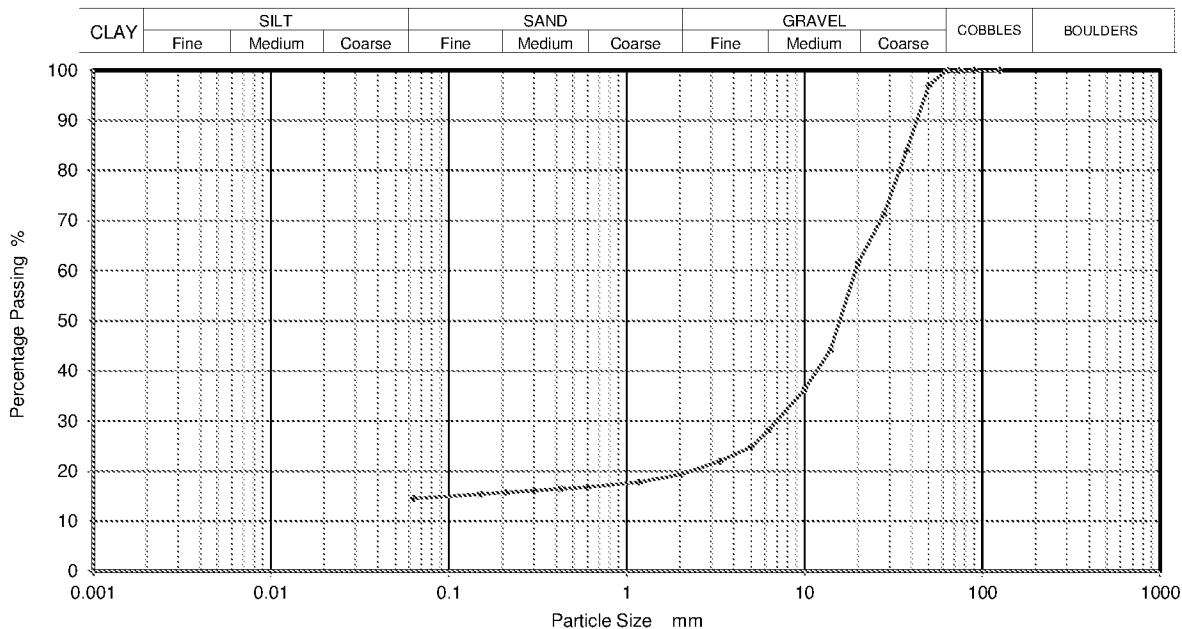
Soil Description **Brown slightly sandy clayey/silty fine to coarse GRAVEL**

Depth Top **1.00**

Depth Base

Date Tested **11/09/2020**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	97		
37.5	84		
28	71		
20	61		
14	44		
10	36		
6.3	28		
5	25		
3.35	22		
2	19		
1.18	18		
0.6	17		
0.425	16		
0.3	16		
0.212	16		
0.15	15		
0.063	15		

Sample Proportions	% dry mass
Cobbles	0
Gravel	81
Sand	4
Silt and Clay	15

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	14/09/2020	Wayne Honey
RO/MH	Approved	15/09/2020	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **49820**

Borehole/Pit No. **TP4**

Site Name **1 Northfields Cottages, Fontwell Ave, Eastergate**

Sample No.

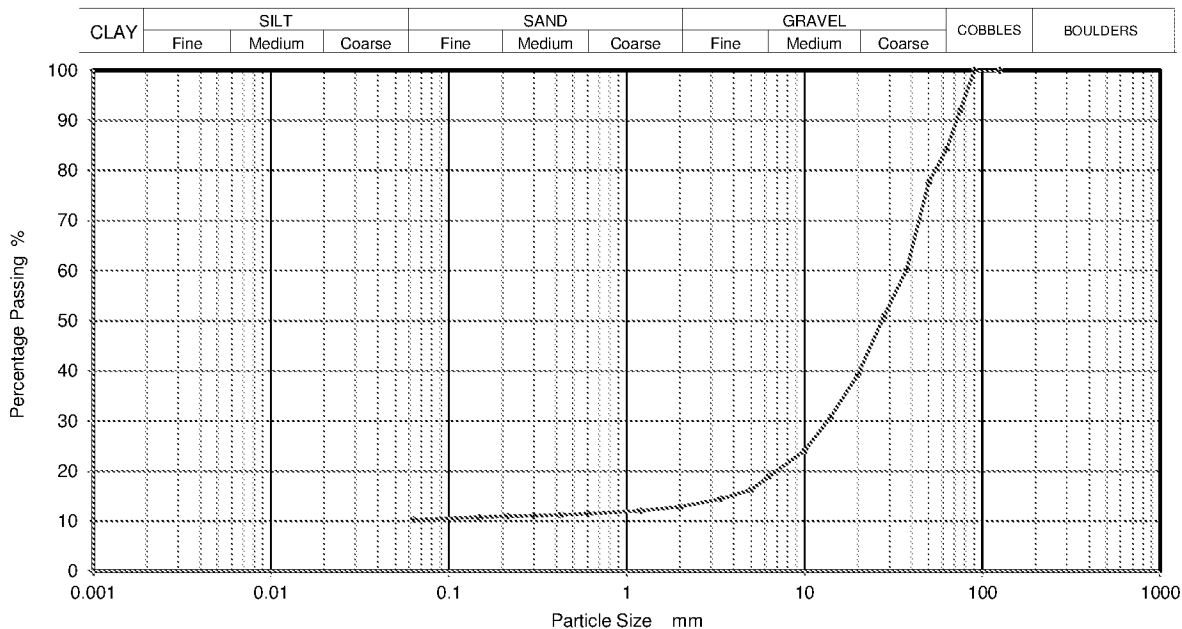
Soil Description **Brown slightly sandy silty/clayey fine to coarse GRAVEL (with cobbles)**

Depth Top **1.50**

Depth Base

Date Tested **11/09/2020**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	92		
63	84		
50	78		
37.5	60		
28	51		
20	39		
14	31		
10	24		
6.3	19		
5	16		
3.35	14		
2	13		
1.18	12		
0.6	11		
0.425	11		
0.3	11		
0.212	11		
0.15	11		
0.063	10		

Sample Proportions	% dry mass
Cobbles	16
Gravel	71
Sand	3
Silt and Clay	10

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	14/09/2020	Wayne Honey
RO/MH	Approved	15/09/2020	Paul Evans



Test Operator	Checked and Authorised by		Paul Evans
Darren Bourne	Date	14/09/2020	

APPENDIX I INFILTRATION TEST RESULTS



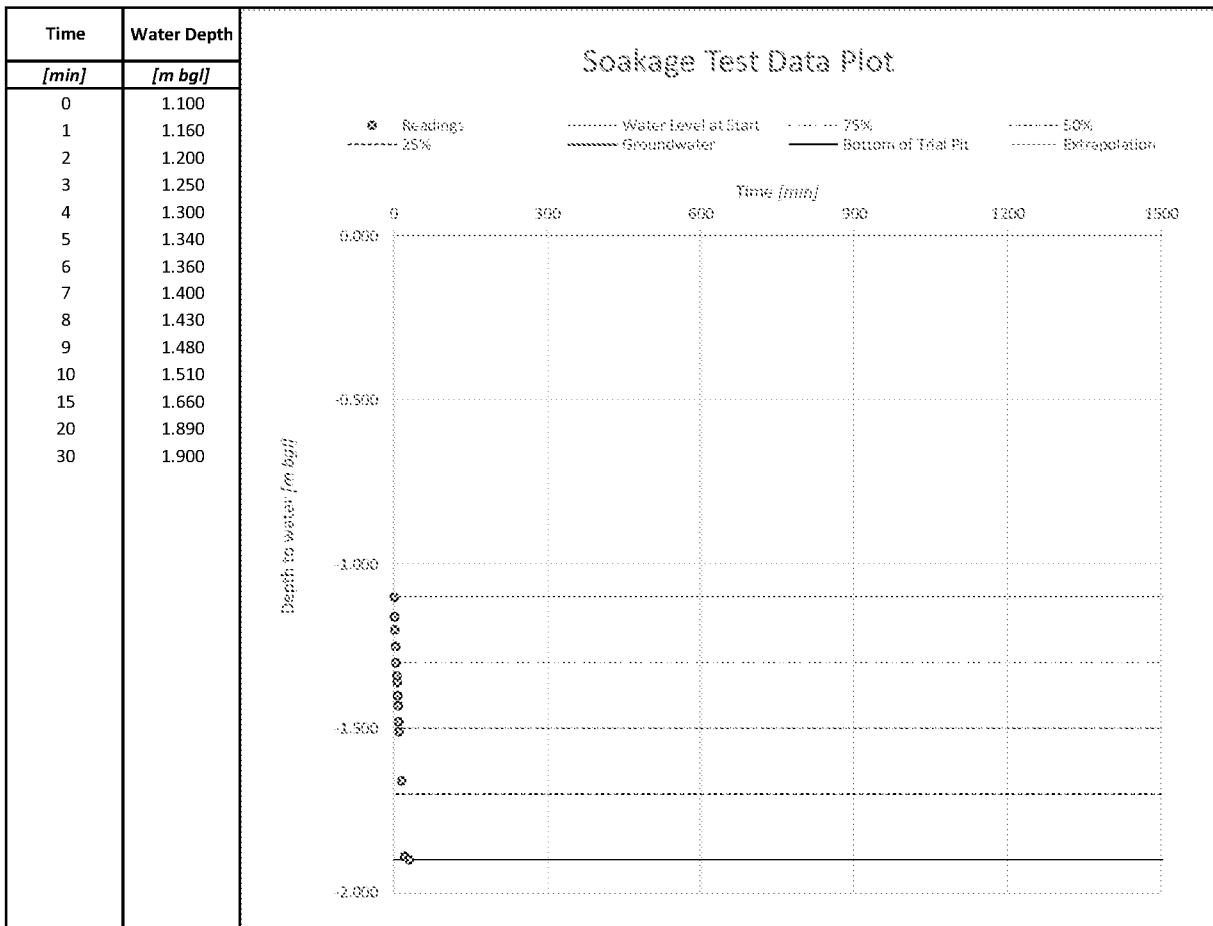
SOIL INFILTRATION RATE

Client: Hampshire Homes
Project Title: 1 Northfields Cottages, Fontwell Avenue, Eastergate
Project No: FON206.D

Borehole No: TP1
Test No: 1
Date: 13th August 2020
Logged by: RB

Length [m]: 1.70
Depth [m]: 1.90
Width [m]: 0.70
Groundwater [m bgl]:

Ground	Conditions	from - to [m bgl]		Description
		0.00	0.20	light brown gravelly sandy clay topsoil
		0.20	0.60	brown medium dense silty gravelly SAND
		0.60	1.90	dark brown medium dense sandy clayey GRAVEL traces of chalk and occasional coarse flints



Soil Infiltration Rate [m/s]:

$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.48**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **3.11**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **7.1.E+02**

Soil Infiltration Rate [m/s]: 2.15E-04

Remarks:



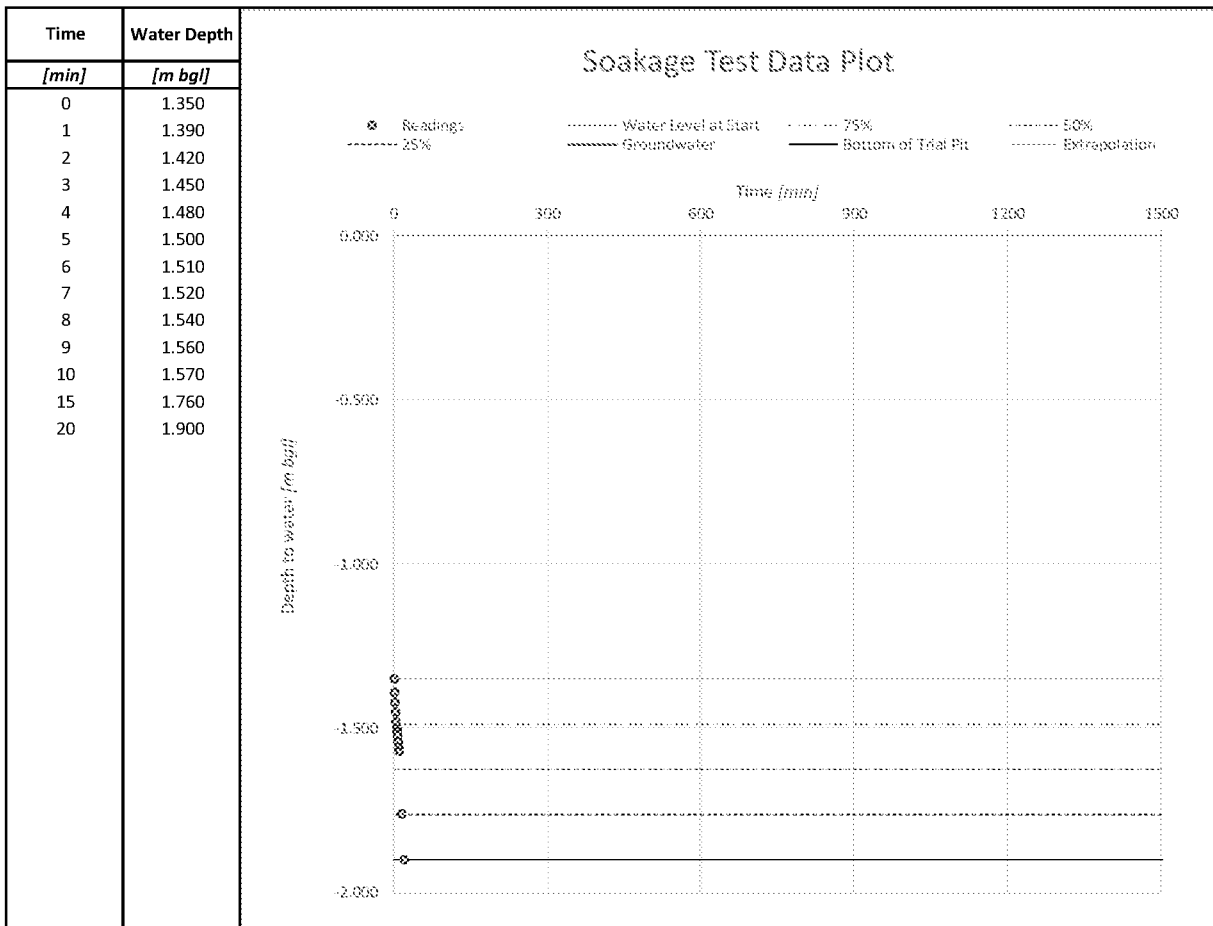
SOIL INFILTRATION RATE

Client: Hampshire Homes
Project Title: 1 Northfields Cottages, Fontwell Avenue, Eastergate
Project No: FON206.D

Borehole No: TP1
Test No: 2
Date: 13th August 2020
Logged by: RB

Length [m]: 1.70
Depth [m]: 1.90
Width [m]: 0.70
Groundwater [m bgl]:

Ground	Conditions	from - to [m bgl]		Description
		0.00	0.20	light brown gravelly sandy clay topsoil
		0.20	0.60	brown medium dense silty gravelly SAND
		0.60	1.90	dark brown medium dense sandy clayey GRAVEL traces of chalk and occasional coarse flints



Soil Infiltration Rate [m/s]:

$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.33**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **2.51**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **6.4.E+02**

Soil Infiltration Rate [m/s]: 2.03E-04

Remarks:



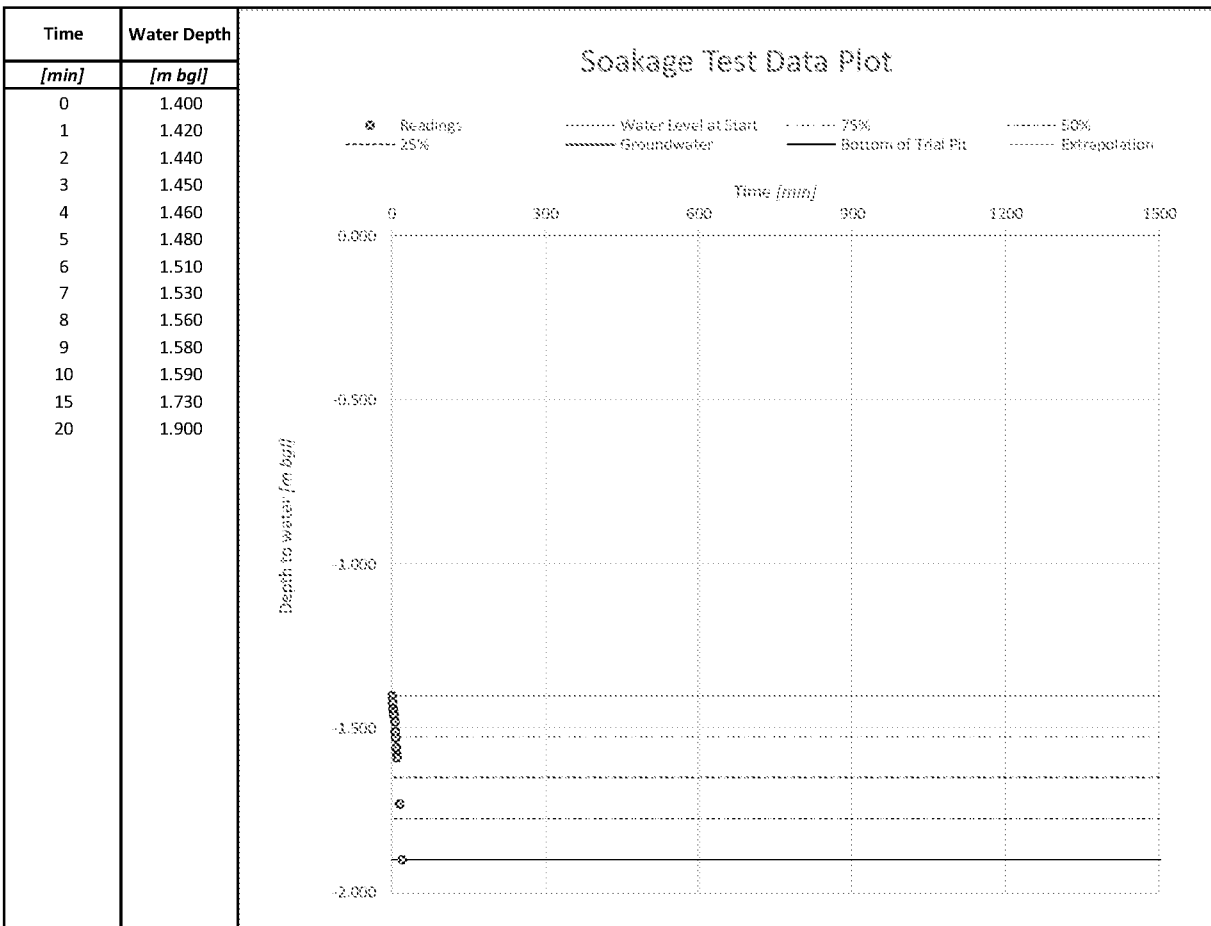
SOIL INFILTRATION RATE

Client: Hampshire Homes
Project Title: 1 Northfields Cottages, Fontwell Avenue, Eastergate
Project No: FON206.D

Borehole No: TP1
Test No: 3
Date: 13th August 2020
Logged by: RB

Length [m]: 1.70
Depth [m]: 1.90
Width [m]: 0.70
Groundwater [m bgl]:

Ground	Conditions	from - to [m bgl]		Description
		0.00	0.20	light brown gravelly sandy clay topsoil
		0.20	0.60	brown medium dense silty gravelly SAND
		0.60	1.90	dark brown medium dense sandy clayey GRAVEL traces of chalk and occasional coarse flints



Soil Infiltration Rate [m/s]:

$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.30**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **2.39**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **5.7.E+02**

Soil Infiltration Rate [m/s]: 2.17E-04

Remarks:



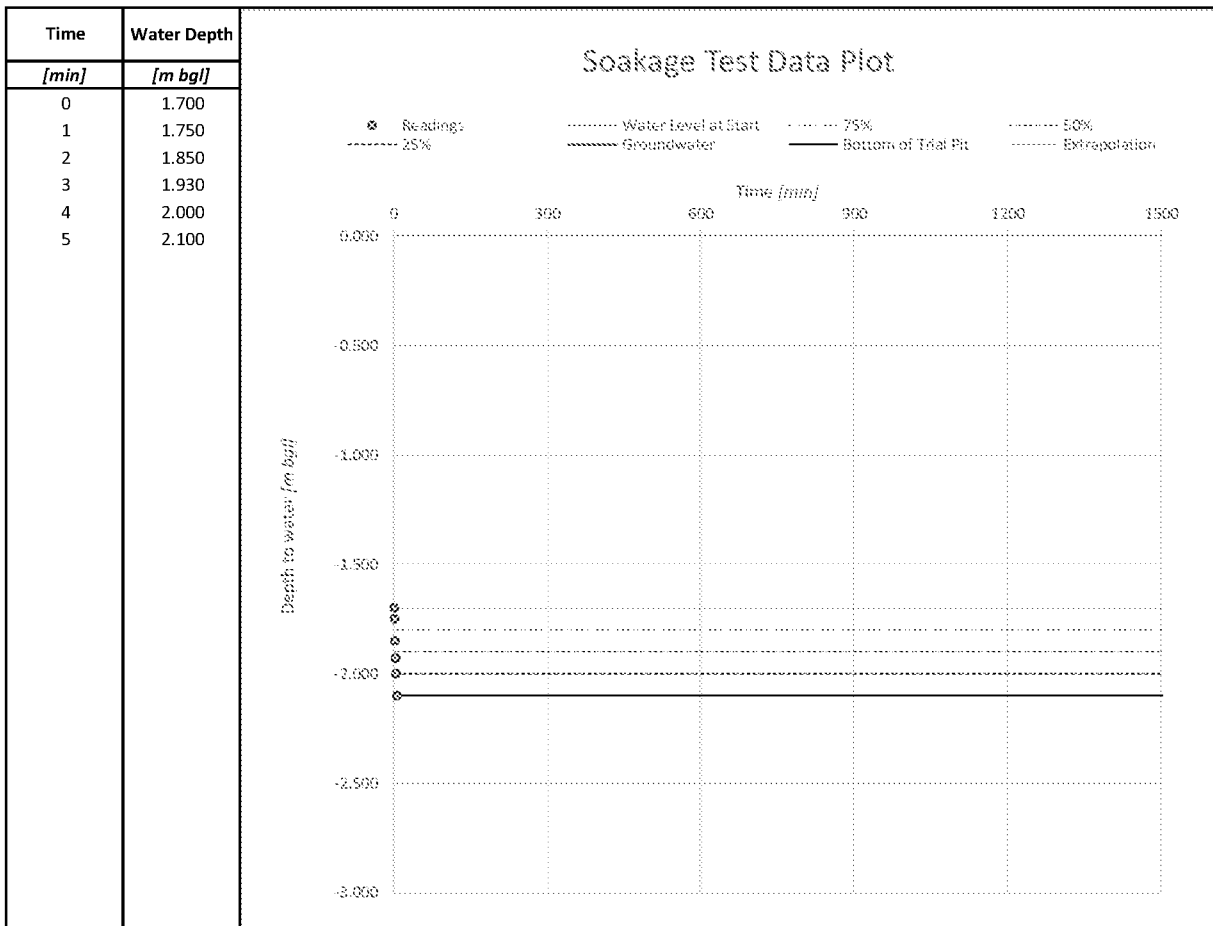
SOIL INFILTRATION RATE

Client: Hampshire Homes
Project Title: 1 Northfields Cottages, Fontwell Avenue, Eastergate
Project No: FON206.D

Borehole No: TP3
Test No: 1
Date: 13th August 2020
Logged by: RB

Length [m]: 1.80
Depth [m]: 2.10
Width [m]: 0.70
Groundwater [m bgl]:

Ground	Conditions	from - to [m bgl]		Description
		0.00	0.20	light brown gravelly sandy clay topsoil
		0.20	2.10	medium dense light brown/dark yellow silty gravelly SAND with occasional cobbles



Soil Infiltration Rate [m/s]:

$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.25**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **2.26**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **1.5.E+02**

Soil Infiltration Rate [m/s]: 7.43E-04

Remarks:

- Using a 2" pump from a 8,000 litre bowser the maximum water level remained at 1.7m



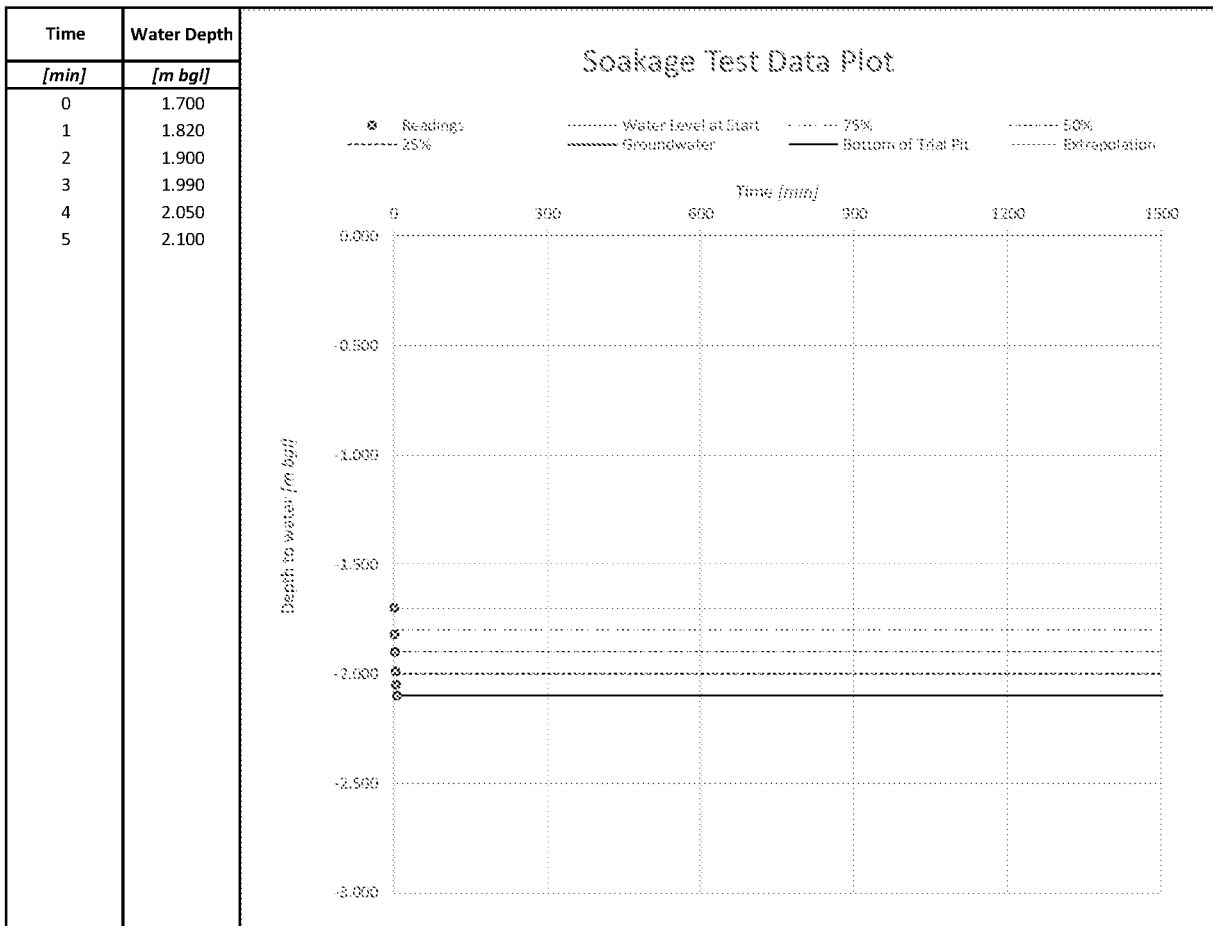
SOIL INFILTRATION RATE

Client: Hampshire Homes
Project Title: 1 Northfields Cottages, Fontwell Avenue, Eastergate
Project No: FON206.D

Borehole No: TP3
Test No: 2
Date: 13th August 2020
Logged by: RB

Length [m]: 1.80
Depth [m]: 2.10
Width [m]: 0.70
Groundwater [m bgl]:

Ground	Conditions	from - to [m bgl]		Description
		0.00	0.20	light brown gravelly sandy clay topsoil
		0.20	2.10	medium dense light brown/dark yellow silty gravelly SAND with occasional cobbles



Soil Infiltration Rate [m/s]:
$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.25**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **2.26**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **1.4.E+02**

Soil Infiltration Rate [m/s]: 7.96E-04

Remarks:

- Using a 2" pump from a 8,000 litre bowser the maximum water level remained at 1.7m



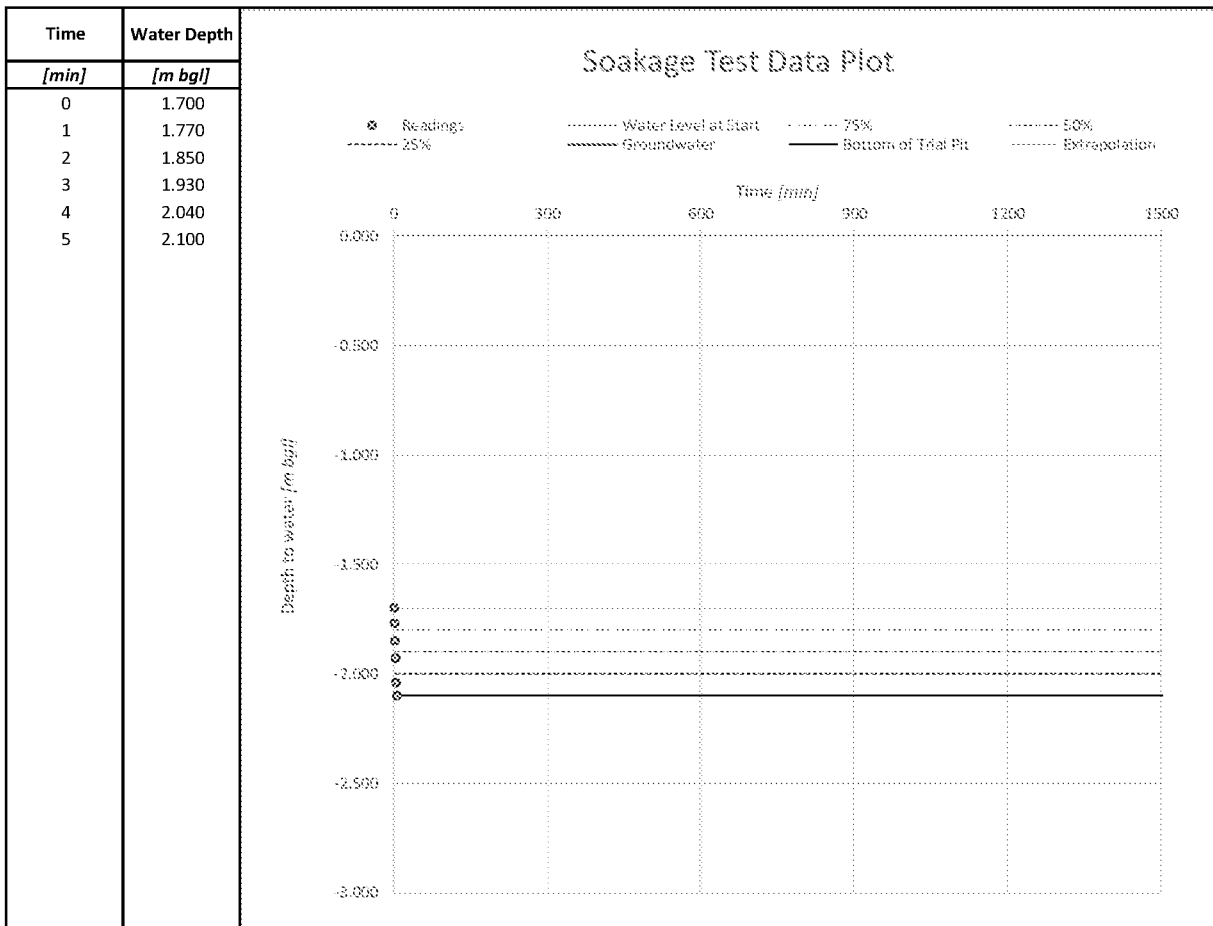
SOIL INFILTRATION RATE

Client: Hampshire Homes
Project Title: 1 Northfields Cottages, Fontwell Avenue, Eastergate
Project No: FON206.D

Borehole No: TP3
Test No: 3
Date: 13th August 2020
Logged by: RB

Length [m]: 1.80
Depth [m]: 2.10
Width [m]: 0.70
Groundwater [m bgl]:

Ground	Conditions	from - to [m bgl]		Description
		0.00	0.20	light brown gravelly sandy clay topsoil
		0.20	2.10	medium dense light brown/dark yellow silty gravelly SAND with occasional cobbles



Soil Infiltration Rate [m/s]:
$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.25**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **2.26**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **1.4.E+02**

Soil Infiltration Rate [m/s]: 8.22E-04

Remarks:

1. Using a 2" pump from a 8,000 litre bowser the maximum water level remained at 1.7m



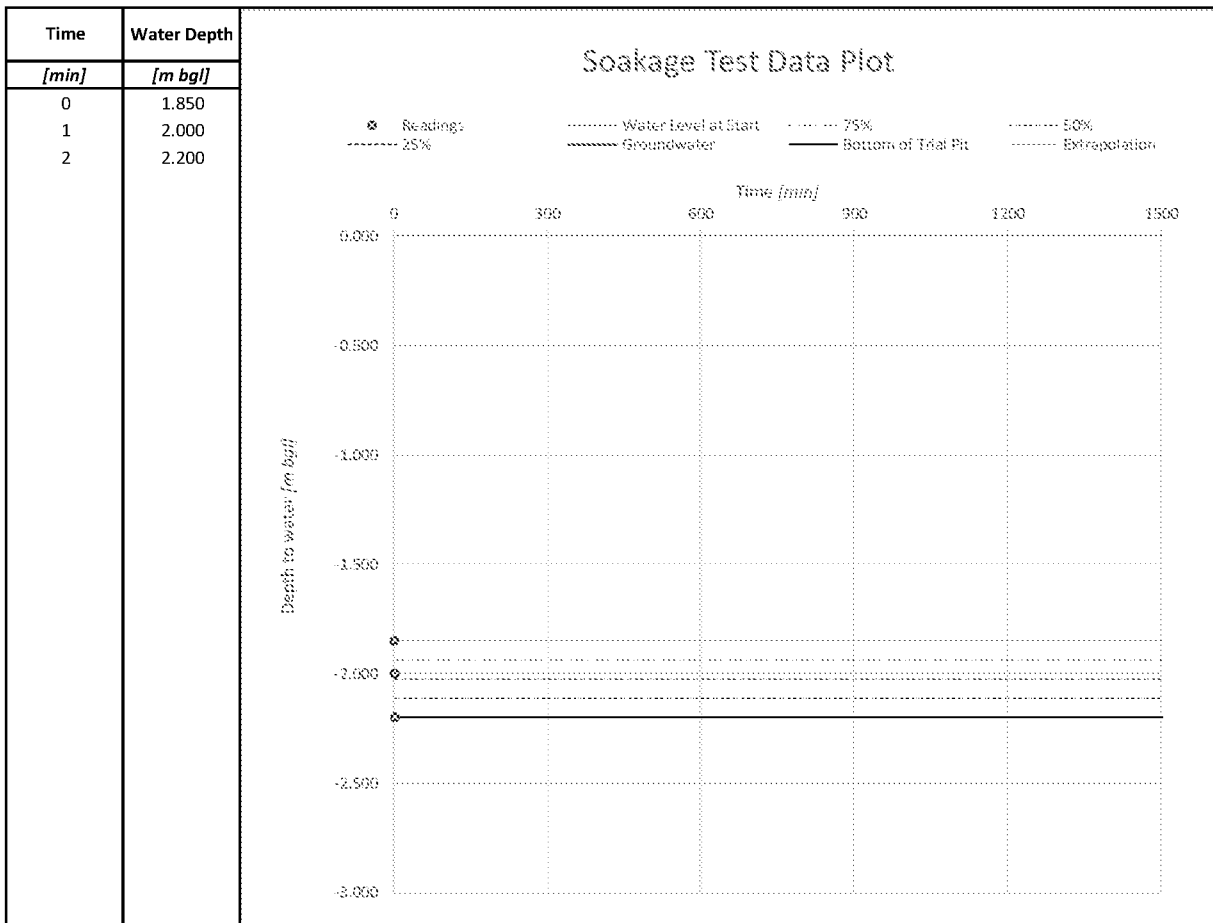
SOIL INFILTRATION RATE

Client: Hampshire Homes
Project Title: 1 Northfields Cottages, Fontwell Avenue, Eastergate
Project No: FON206.D

Borehole No: TP4
Test No: 1
Date: 13th August 2020
Logged by: RB

Length [m]: 2.00
Depth [m]: 2.20
Width [m]: 0.70
Groundwater [m bgl]:

Ground	Conditions	from - to [m bgl]		Description
		0.00	0.20	light brown gravelly sandy clay topsoil
		0.20	2.20	light brown medium dense silty very gravelly SAND with occasional cobbles



Soil Infiltration Rate [m/s]:

$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.24**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **2.34**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **5.9.E+01**

Soil Infiltration Rate [m/s]: 1.78E-03

Remarks:

- Using a 2" pump from a 8,000 litre bowser the maximum water level achieved was 1.77m



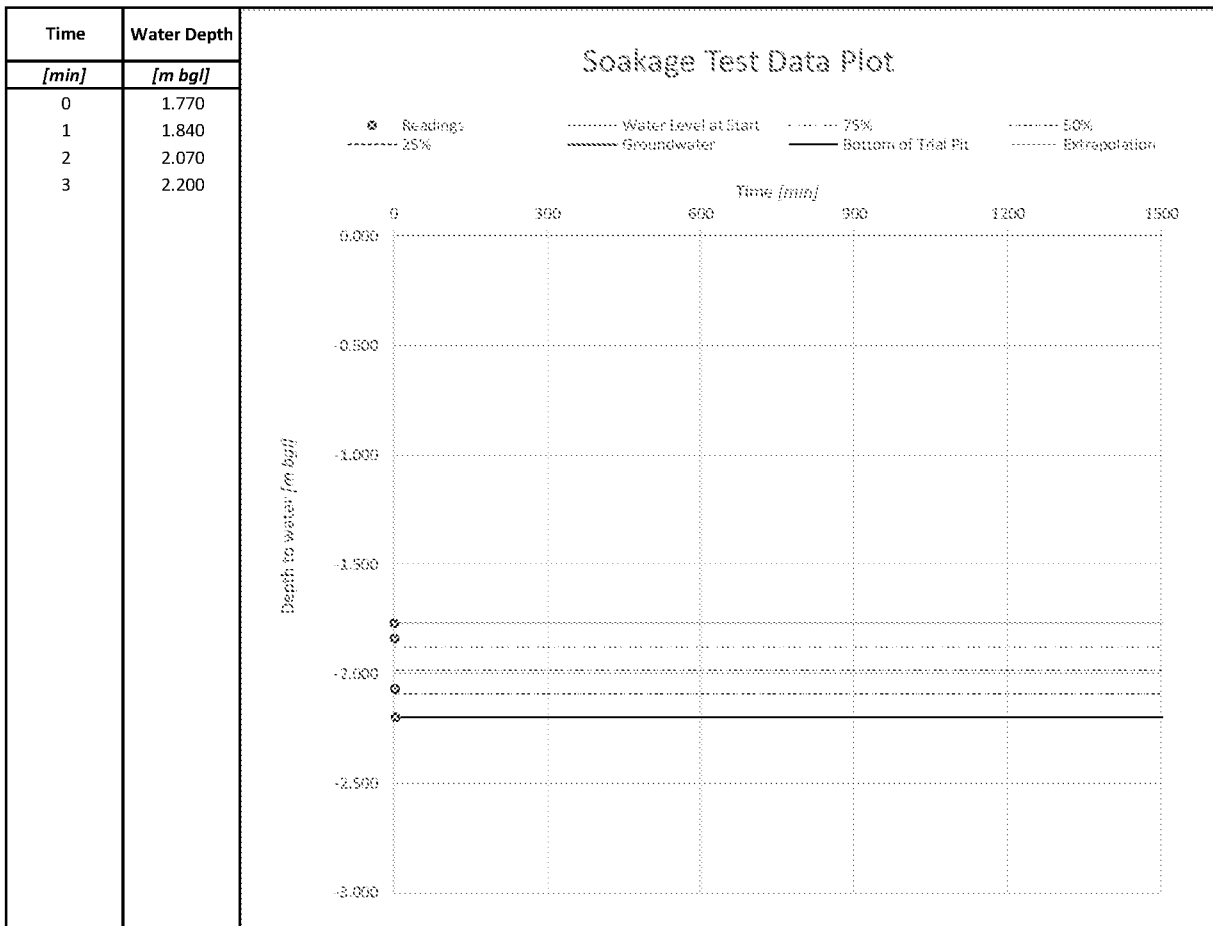
SOIL INFILTRATION RATE

Client: Hampshire Homes
Project Title: 1 Northfields Cottages, Fontwell Avenue, Eastergate
Project No: FON206.D

Borehole No: TP4
Test No: 2
Date: 13th August 2020
Logged by: RB

Length [m]: 2.00
Depth [m]: 2.20
Width [m]: 0.70
Groundwater [m bgl]:

Ground	Conditions	from - to [m bgl]		Description
		0.00	0.20	light brown gravelly sandy clay topsoil
		0.20	2.20	light brown medium dense silty very gravelly SAND with occasional cobbles



Soil Infiltration Rate [m/s]:
$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.30**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **2.56**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **6.1.E+01**

Soil Infiltration Rate [m/s]: 1.94E-03

Remarks:

- Using a 2" pump from a 8,000 litre bowser the maximum water level achieved was 1.77m



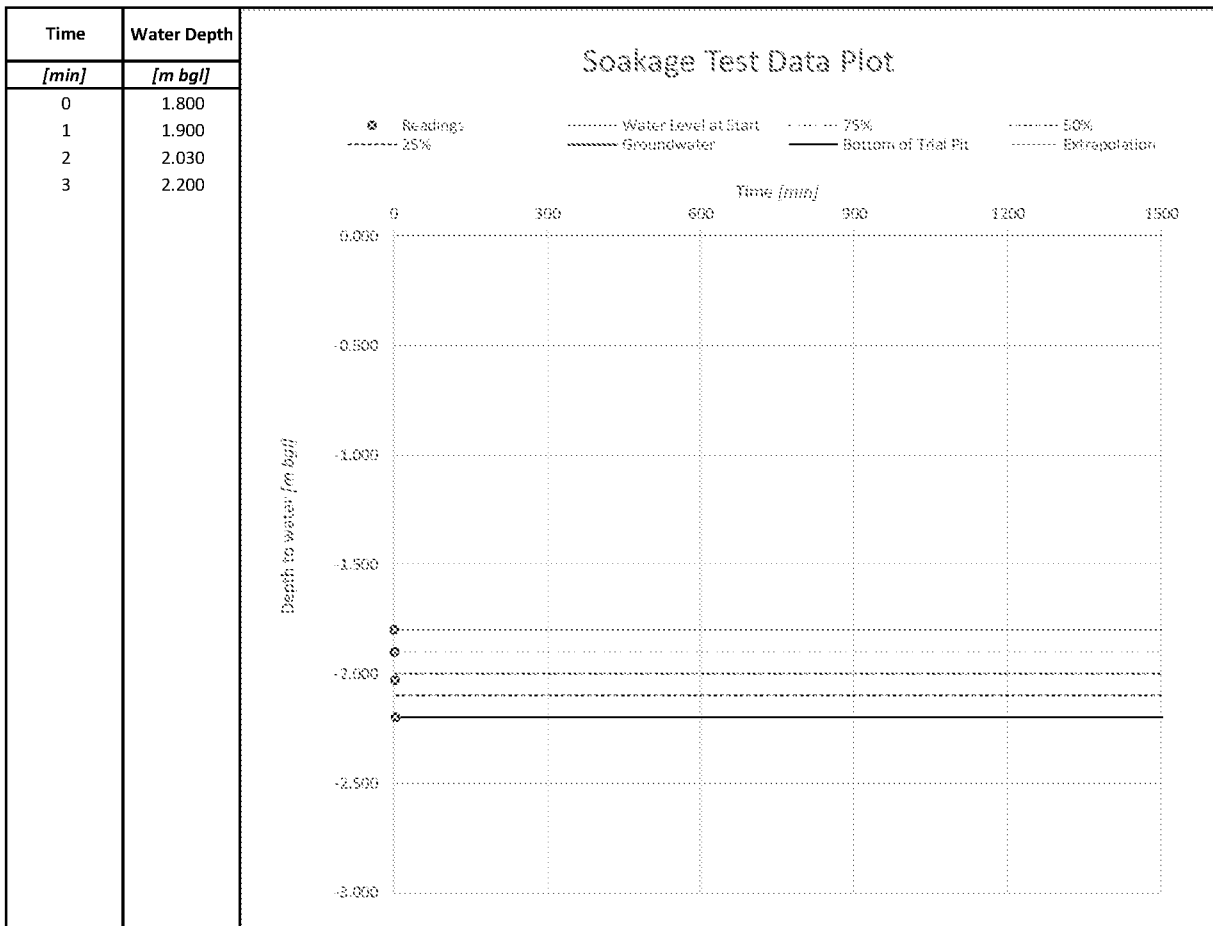
SOIL INFILTRATION RATE

Client: Hampshire Homes
Project Title: 1 Northfields Cottages, Fontwell Avenue, Eastergate
Project No: FON206.D

Borehole No: TP4
Test No: 3
Date: 13th August 2020
Logged by: RB

Length [m]: 2.00
Depth [m]: 2.20
Width [m]: 0.70
Groundwater [m bgl]:

Ground	Conditions	from - to [m bgl]		Description
		0.00	0.20	light brown gravelly sandy clay topsoil
		0.20	2.20	light brown medium dense silty very gravelly SAND with occasional cobbles



Soil Infiltration Rate [m/s]:

$$f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

with:

V_{p75-25} as Effective Storage Volume of water between 75% and 25% effective storage depth [m³] **0.28**

a_{s50} as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area [m²] **2.48**

t_{p75-25} as Time for the water level to fall from 75% to 25% effective storage depth [s] **8.5.E+01**

Soil Infiltration Rate [m/s]: 1.33E-03

Remarks:

- Using a 2" pump from a 8,000 litre bowser the maximum water level achieved was 1.77m

APPENDIX J Gas Monitoring

FORGE ENVIRONMENTAL MANAGEMENT

The Forge, Lower Vagg, Chilthorne Domer, Yeovil, Somerset. BA21 3PY



GROUNDWATER / GAS MONITORING RECORD SHEET

Client	Hampshire Homes Group Ltd	Job No.	FON206.D	Instrument Used	GA2000 Landfill gas analyser
Project	1 Northfields Cottages, Fontwell Avenue, Eastergate	Date	13th August 2020		
Weather	hot (max 26C) but overcast & heavy rain late pm				

[illegible]