

ARUN DISTRICT COURT, F&S/20/DOG

October 2020

**Phase 2 Environmental Risk Assessment**

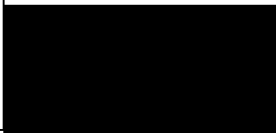
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Foreword

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1.0 EXECUTIVE SUMMARY

Site Address	Former McIntyre Nursery, Highdown Business Park, Littlehampton Road, Ferring, Worthing, BN12 6PG
Site Description	The site comprises an existing two storey metal cylindrical silo currently used for the storage of general household materials and associated hard standing areas. The floor of the silo is concrete with no signs of historical spillages. Anecdotal evidence indicates that the silo has not been used for grain storage in over 20 years. The silo is positioned upon a concrete slab with the areas surrounding the silo having asphalt roadway or gravel hard standing surfaces.
Surrounding Areas	- Northern boundary – Fencing contractor's yard - Eastern boundary – Access roadway - Southern boundary – Self storage units - Western boundary – Modular Office
Proposed Development	The proposed development is understood to comprise the demolition of a silo and the erection of a three storey B1(a) office building, 6no. parking spaces for office workers and erection of boundary fencing.
Geology and Hydrology	Superficial Deposits: Head (Secondary Undifferentiated Aquifer) Bedrock: Newhaven Chalk Formation (Principal Aquifer) There are no surface water features within 250m of the site boundary.
Intrusive Field Results and Field Observations	Made Ground: 0.0m – 0.6mbgl Gravelly Sand (Head Deposits): 0.6m – 4.7mbgl Chalk: 4.7m – 5.0mbgl (maximum depth proved) No grossly contaminative, visual or olfactory evidence of contamination was encountered during the intrusive investigation.
Ground gas	Methane Gas Screening Value is characterised as Very Low (Max CH₄ = 0.0%) Carbon Dioxide Gas Screening Value is characterised as Very Low (Max CO₂ = 4.0%) No special enhancements are likely to be required for the protection of future receptors from ground gas/vapours at this site.
Environmental Laboratory Results	None of the soil samples exceeded the adopted GACs for the proposed commercial land use.
Geotechnical Laboratory Results	Laboratory triaxial testing was not possible due to the granular nature of the samples, however, shear vane and pocket penetrometer data indicates a shear strength ranging between 34 and 206kN/m ² with Atterberg testing revealing a worst case Low volume change potential.
Comments and Foundations	Traditional strip foundations are likely to be appropriate for consideration. The Head Deposits are likely to offer a bearing capacity of 99kN/m ² from a depth of 2.0mbgl. It is recommended that a specialist structural engineer be consulted for the final design of foundations.
Recommendations	Implementation of a Discovery Strategy during construction

2.0 Introduction

In July 2020 Constructive Evaluation (CE) Limited was commissioned by Milwards to carry out a Phase 2 Environmental Risk Assessment at Former McIntyre Nursery, Highdown Business Park, Littlehampton Road, Ferring, Worthing, BN12 6PG referred to as the “site”. This report should be read in conjunction with the previously completed Phase 1 Environmental Risk Assessment¹ undertaken by CE in August 2020 for a more comprehensive understanding of the site.

The aims of this report are as follows;

- To identify whether there is any contamination onsite which is likely to cause significant harm to human health, the environment or other sensitive receptors.
- To identify the geotechnical properties of the ground to determine outline design parameters for foundations.

To achieve these aims, the following will be undertaken;

- Investigate the nature of material that is present on site through field investigations.
- Investigate the nature and extent of any contamination onsite through field investigations.
- Compare onsite soil and groundwater concentrations with generic UK based assessment criteria.

2.1 Site Location

The site is accessed from the south via an unnamed road to the north of Littlehampton Road (A259) at approximate National Grid Reference TQ 09656 03843. To the east of the site lies an open sports field, to the west and north is the Highdown Vineyard and associated buildings, as well as the industrial estate at Hangleton. A site location plan is available in **Figure 1**.

2.2 Site Description

The site comprises an existing two storey metal cylindrical silo currently used for the storage of general household materials and associated hard standing areas. The floor of the silo is concrete with no signs of historical spillages. Anecdotal evidence indicates that the silo has not been used for grain storage in over 20 years.

The silo is positioned upon a concrete slab with the areas surrounding the silo having asphalt roadway or gravel hard standing surfaces. A telephone pole with overhead services is present next to the silo.

A single storey, modular office building is present to the west of the silo with a number of self storage units adjacent to the south of the site. To the north of the silo is a fencing contractor’s yard used for the storage of wood.

A current site plan is available in **Figure 2**. Photographs from the site walkover and investigation are presented in **Appendix A**.

2.3 Proposed Development

The proposed development is understood to comprise the demolition of a silo and the erection of a three storey B1(a) office building, 6no. parking spaces for office workers and erection of boundary fencing. A proposed site development plan is available in **Figure 3**.

3.0 Previous Reports

3.1 Phase 1 Environmental Risk Assessment

In August 2020, a Phase 1 Environmental Risk Assessment¹ was completed by Constructive Evaluation, this should be read in conjunction with this report for a full understanding of the site.

A summary of the report can be found below;

Geology and Hydrology

Superficial Deposits: Head (Secondary Undifferentiated Aquifer).

Bedrock: Newhaven Chalk Formation (Principal Aquifer).

There are no surface water features within 250m of the site boundary.

Site Walkover Observations

A site walkover was undertaken on 3rd August 2020 with the aim of identifying any potential areas of concern that may be present on site prior to the commencement of any works.

During the site walkover no potential areas of concern were observed.

Site History

The silo in its current state does not appear on any of the historical maps, however, it appears to predate any associated planning requests for the site, of which records date back to 1993.

Potential Areas of Concern

- Potential Made Ground associated with previous land uses.
- Potential off site contamination from historical industrial land uses.

Conceptual Site Model

Low risk to future end users

Low to Moderate risk to controlled waters

Low risk from ground gas

Recommendations and Conclusions

A site investigation to further refine the findings of the CSM and investigate the geotechnical properties of soils on site.

¹ 20.1098. Phase 1 Environmental Risk Assessment. August 2020.

4.0 Field Work

The following intrusive works were carried out on the 14th September 2020 supervised by an Engineering Geologist from CE:

- **3no. windowless sampler boreholes to 5.0mbgl maximum**
- **Installation of 1no. monitoring well to 3.0mbgl for groundwater and ground gas monitoring**
- **Associated geotechnical and environmental sampling**

The final exploratory positions are provided in **Figure 4**.

4.1 Soil Sample Collection

All intrusive locations were logged, visual and/or olfactory evidence of contamination noted, and representative soil sample removed in accordance with current protocol for geotechnical and geo-environmental parameters.

5.0 Ground Conditions

5.1 Observed Stratigraphic Units

The following anthropogenic (made ground) strata were encountered during the intrusive works:

Made ground soils were identified in all intrusive locations. These materials frequently varied in composition and comprised the following;

- Grey brown GRAVEL
- Brown sandy GRAVEL
- Grey brown gravelly SAND
- Brown sandy gravelly CLAY
- Black sandy GRAVEL
- Black clayey sandy GRAVEL

Made ground deposits extended to depths of between 0.6mbgl in WS3 and 0.9mbgl in WS1. A concrete slab was observed in WS3 between 0.3m and 0.4mbgl.

Beneath the made ground material, the natural stratigraphic sequence is as follows:

Head Deposits: Soft to firm brown sandy gravelly CLAY was observed in all intrusive locations between depths of 0.6m and 1.8mbgl. This was underlain by soft to firm light brown sandy gravelly CLAY containing frequent Chalk gravels and flint cobbles between depths of 1.5m and 4.7mbgl.

Newhaven Chalk Formation: Structureless CHALK composed of silty, subangular to sub-rounded GRAVEL was observed within WS1 and WS2 from a minimum depth of 4.4mbgl to the base of both intrusive locations at 5.0mbgl.

Reference should be made to the stratigraphic logs contained within **Appendix C** for a more detailed description.

5.2 Groundwater

Groundwater was not encountered during the site works. Any groundwater within the other boreholes may not necessarily have been readily observed due to the short timescale and relatively impermeable Head Deposits. Furthermore, groundwater levels may vary both seasonally and in the long-term.

5.3 Field Evidence of Contamination

No visual or olfactory evidence of any gross contamination was observed during the intrusive investigation.

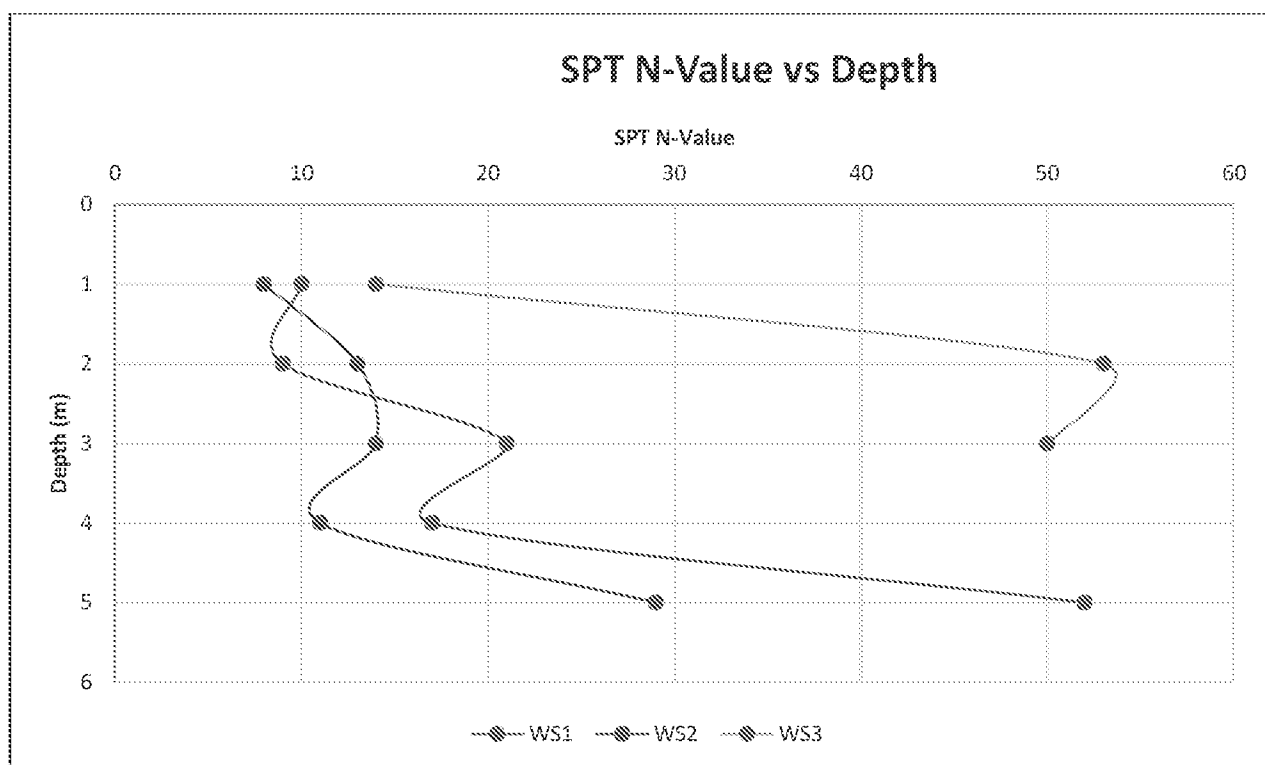
6.0 In-Situ Testing

6.1 Standard Penetration Testing

Standard penetration testing (SPT) was completed where possible throughout the drilling of WS1 to WS3 at 1.0m centres.

This form of testing is completed using a 63.5kg drop hammer weight, over a 750mm drop, measuring the blow counts for six, 75mm increments. The first two values are recorded as seating blows, with the remaining four values, added together to provide an 'N-value'.

The results of the SPT testing are presented in the graph below:



Eleven (11no.) SPT tests were completed within the Head Deposits encountered between 0.6m and 4.7mbgl, returning N values ranging from 8 to 53. The values within WS3 at 2.0m and 3.0mbgl are considered to be a result of large flint cobbles.

Two (2no.) SPT tests were completed within the Newhaven Chalk materials encountered, returning N values ranging from 29 to 52.

7.0 Groundwater and Ground Gas Monitoring

7.1 Groundwater Monitoring Results

A summary of the groundwater monitoring data obtained during the monitoring visits between the 21st and 24th September 2020 is presented in the table below.

Date	Borehole Reference	Depth to Water (mbgl)	Depth to Base (mbgl)
21/09/2020	WS3	Dry	3.0
24/09/2020	WS3	Dry	3.0

7.2 Ground Gas Monitoring Results

A summary of the ground gas monitoring results obtained between the 21st and 25th September 2020 is presented in the table below. Full monitoring results can be viewed in **Appendix D**.

Date	Borehole Reference	O ₂ (%)	CO ₂ (%)	CH ₄ (%)	Atm (mbar)	Flow (l/hr)	CO (ppm)	H ₂ S (ppm)
21/09/2020	WS3	14.4	4.0	0.0	1015	-0.1	0	0
24/09/2020	WS3	16.2	3.5	0.0	997	+0.1	0	0

7.3 Ground Gas Assessment

A ground gas assessment has been undertaken to assess risks associated with carbon dioxide and methane to new buildings and their users. The CIRIA 2007 guidance² calculates a gas screening value to identify the protective measures required.

Taking a conservative viewpoint, the highest readings from the monitoring wells have been selected for the determination of the relevant gas screening values. If readings were <0.01 a value of 0.01 is used in line with CIRIA 2007 guidelines. A summary of gas screening calculations and the associated characterisation of the site are identified in the table below.

Gas	Screening Value	Characterisation Situation
Methane	$((0.01/100) \times 0.1) = 0.00001$	1 (Very Low)
Carbon Dioxide	$((4.0/100) \times 0.1) = 0.004$	1 (Very Low)

No source materials for the generation of ground gas have been identified during the ground investigation and a maximum characterisation value of 1 (Very Low) has been returned from the monitoring visits. It is therefore considered that there is no requirement for additional ground gas monitoring.

² CIRIA. 2007. Assessing Risks Posed by Hazardous Ground Gases to Buildings. C665.

Monitoring results can be viewed in full in **Appendix D**.

8.0 Geotechnical Laboratory Testing

8.1 Natural Moisture Content and Atterberg Limits

Three (3no.) samples of material were submitted for determination of their natural moisture content (NMC) and plasticity index (PI).

Results are summarised in the table below.

Sample Location	Depth (mbgl)	Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Modified Plasticity Index (%)	Volume Change Potential
WS1	1.0-2.0	14	25	14	7	Low
WS2	2.0-3.0	14	26	15	6	Low
WS3	1.0-2.0	13	31	16	9	Low

Geotechnical laboratory results can be found in full in **Appendix E**.

8.2 Unconsolidated Undrained Triaxial Testing

Three (3no.) samples of material were submitted for determination of their undrained shear strength (C_u) by unconsolidated undrained triaxial compression testing. All samples failed upon extrusion due to the presence of gravel, with an estimate of undrained shear strength determined from hand vane tests.

A summary of triaxial test results is presented in the table below.

Sample Location	Depth (mbgl)	Bulk Density (Mg/m^3)	Undrained Shear Strength (kN/m^2)	Strength
WS1	1.0-2.0	N/A	34 – 170	Low to Very High
WS2	2.0-3.0	N/A	55 – 137	Medium to High
WS3	1.0-2.0	N/A	48 - 206	Medium to Very High

For full geotechnical laboratory results, refer to **Appendix E**.

8.3 Sulphate And pH Analysis

Four (4no.) samples were submitted for determination of pH and water-soluble sulphate concentration.

Water soluble sulphate concentrations within the made ground soils were found to range from 37mg/l to 140mg/l, with pH values of 7.9 to 8.1.

Water soluble sulphate concentrations within the natural soils were found to be 12mg/l, with a pH value of 8.3.

For full laboratory test results please see **Appendix F**.

9.0 Geotechnical Discussion

9.1 Soil Engineering Properties

The current proposal is for a three storey commercial office building with associated hard standing parking. The exact proposed loadings are not known; however, they are expected to be low to moderate based on the anticipated low-rise nature of the development.

Made Ground soils were encountered to 0.6mbgl. Due to the variable nature and thickness of Made Ground soils, they are considered unsuitable as founding stratum.

Beneath the Made Ground soils, Head Deposits were encountered from 0.6m to a minimum depth of 4.4mbgl. The Head Deposits were recorded to have a maximum observed thickness of 3.8m.

Standard Penetration Testing (SPT) in the Head Deposits indicated a range in SPT-N Value between N=8 and N=53. It is thought likely that the value of 53 obtained from WS3 is due to the presence of flint and is likely not representative of the material as a whole.

With reference to the works of Stroud and Butler (1975), and adopting an F1 value of 4.5, this value corresponds to a range of estimated undrained shear strength between 36 and 94.5kN/m², indicating a range in strengths from low to high strength.

Laboratory triaxial testing was not possible due to the granular nature of the samples, however, shear vane and pocket penetrometer data indicates a shear strength ranging between 34kN/m² and 206kN/m².

A moderately conservative undrained shear strength of 50kN/m² is considered suitable for this site, assuming foundations are taken to a minimum depth of 2.0mbgl.

Atterberg testing revealing a worst-case "Low" volume change potential.

10.0 FOUNDATION DESIGN

10.1 Shallow Foundations

Any foundations formed within Made Ground soils would be expected to be subject to total and differential settlement beyond tolerable limits. These soils are frequently present in a variable and inconsistent nature and as such are not considered suitable as a founding stratum.

Given the identified ground conditions, it is likely that strip foundations would be appropriate for this low-rise development.

Traditional strip foundations would likely need to extend to a minimum of 2.0mbgl and prove a minimum of 300mm of natural materials.

A moderately conservative safe allowable bearing capacity of 99kN/m² may be achievable from a depth of 2.0mbgl. It is recommended that a structural engineer is consulted for the final design of the foundations.

It should be noted that the NHBC guidance, Chapter 4.2 'Building near Trees' notes that foundations deeper than 2.5m within the zone of influence of trees are outside of the scope of the document and may require specific assessment by the engineer.

The use of void former or compressible material should be considered around the inside faces of foundations and around ground beams which are situated within this material within the zones of tree root influence to mitigate against seasonal volume changes.

If the proposed structure loads are such that a greater bearing capacity is required, it may be necessary to consider a deep foundation solution such as piles. This may require further site investigation and it is advised that a structural engineer be consulted prior to any further works.

10.2 Floor Slab

The floor slab design will depend on the final foundation design and is dependent on the underlying materials, bearing capacity and the presence of any cohesive or Made Ground soils.

The ground gas risk for the site has been characterised as Very Low. As a result, there is no requirement for the enhancement of the membrane above the standard specification. It is recommended that a block and beam floor construction is adopted to accommodate potential heave associated with the Low volume change materials.

10.3 Excavations and Groundwater

It is likely that excavations of less than 1.2mbgl will locally require support to their faces due to the potentially granular nature of the Made Ground soils encountered. Should excavations be taken below this, then adequate support should be provided in order to satisfy statutory safety regulations.

No groundwater was encountered within the upper 5.0mbgl of the soil profile during the ground investigation. It is unlikely that any special requirements for dewatering excavations within the upper 5.0m will be needed.

Groundwater levels may be dependent on seasonal variations and levels may change after periods of heavy rainfall or prolonged drought. Where groundwater is encountered within any excavations during the construction phase it should be dealt with appropriately and removed using good engineering practices.

10.4 Concrete in Aggressive Ground

The results of the laboratory testing have indicated that a design class of DS-1 and subclass of AC-1 will likely be suitable for buried concrete on this site. This is in response to a maximum water-soluble sulphate concentration of 140mg/l and a minimum pH value of 7.9.

11.0 Geo-Environmental Testing

11.1 Soil Analysis

Four (4No.) soil samples obtained from depths ranging between 0.3 and 1.7mbgl were submitted to QTS Environmental, a UKAS and MCERTS accredited laboratory testing facility, for a screen of contamination testing.

Testing included an asbestos screen, heavy metals and hydrocarbons including speciated total petrol hydrocarbons (TPH LQM aromatic/aliphatic split), BTEX, MTBE and speciated polycyclic aromatic hydrocarbons (PAH), as well as a background suite of pH, SOM, total cyanide, and total phenols.

11.2 Screening Criteria

The results of this laboratory testing have been compared to published guidance criteria, widely referred to by consultants and Regulatory Authorities within the industry, and include the following:

- Published Land Quality Management (LQM) Suitable for Use Levels (S4UL) (LQM, 2015);
- As there is no UK GAC for Cyanide, the Dutch Intervention Value (DIV) will be adopted;
- As there is no UK GAC for Lead, the Category 4 Screening Level (C4SL) will be adopted (CL:AIRE, 2014);
- In the case of Asbestos and MTBE, the Detection Limits have been adopted as the GAC.

Due to the proposed use of site, comparisons were made against guidance criteria for the '**Commercial**' land use settings.

11.3 Soil Results

A summary of soil results is presented in the following paragraphs and tables, including further discussion.

Determinand	GAC Commercial	Source	Min	Max	Exceeded
Asbestos	DL	CE	Absent	Absent	-
Total Cyanide	50	DIV	BDL	BDL	-
Total Phenols	760	LQM	BDL	BDL	-
Arsenic	640	LQM	5	12	-
Cadmium	190	LQM	BDL	1	-
Chromium	8600	LQM	10	21	-
Copper	68000	LQM	8	221	-
Lead	6600	C4SL	7	93	-
Mercury	1100	LQM	BDL	2.9	-
Nickel	980	LQM	9	18	-
Selenium	12000	LQM	BDL	BDL	-
Zinc	730000	LQM	25	183	-
Naphthalene	190	LQM	BDL	BDL	-
Acenaphthylene	83000	LQM	BDL	BDL	-
Acenaphthene	84000	LQM	BDL	BDL	-
Fluorene	63000	LQM	BDL	BDL	-
Phenanthrene	22000	LQM	BDL	0.54	-
Anthracene	520000	LQM	BDL	0.12	-

Fluoranthene	23000	LQM	BDL	1.19	-
Pyrene	54000	LQM	BDL	1.02	-
Benzo(a)anthracene	170	LQM	BDL	0.53	-
Chrysene	350	LQM	BDL	0.55	-
Benzo(b)fluoranthene	44	LQM	BDL	0.79	-
Benzo(k)fluoranthene	1200	LQM	BDL	0.30	-
Benzo(a)pyrene	35	LQM	BDL	0.64	-
Indeno(1,2,3-cd)pyrene	500	LQM	BDL	0.42	-
Dibenz(a,h)anthracene	3.5	LQM	BDL	BDL	-
Benzo(ghi)perylene	3900	LQM	BDL	0.37	-
Benzene	27	LQM	BDL	BDL	-
Toluene	56000	LQM	BDL	BDL	-
Ethylbenzene	5700	LQM	BDL	BDL	-
Total Xylenes	5900	LQM	BDL	BDL	-
MTBE	DL	CE	BDL	BDL	-
Aliphatic >C5-C6	3200	LQM	BDL	BDL	-
Aliphatic >C6-C8	7800	LQM	BDL	BDL	-
Aliphatic >C8-C10	2000	LQM	BDL	BDL	-
Aliphatic >C10-C12	9700	LQM	BDL	BDL	-
Aliphatic >C12-C16	59000	LQM	BDL	BDL	-
Aliphatic >C16-C35	1600000	LQM	BDL	BDL	-
Aliphatic >C35-C44	1600000	LQM	BDL	BDL	-
Aromatic >C5-C7	26000	LQM	BDL	BDL	-
Aromatic >C7-C8	56000	LQM	BDL	BDL	-
Aromatic >C8-C10	3500	LQM	BDL	BDL	-
Aromatic >C10-C12	16000	LQM	BDL	BDL	-
Aromatic >C12-C16	36000	LQM	BDL	BDL	-
Aromatic >C16-C21	28000	LQM	BDL	BDL	-
Aromatic >C21-C35	28000	LQM	BDL	BDL	-
Aromatic >C35-C44	28000	LQM	BDL	BDL	-

Full laboratory certificates can be viewed in **Appendix F**.

12.0 Updated Risk Assessment

Following the results of the intrusive investigation and associated laboratory testing, a revised Source – Pathway – Receptor assessment has been undertaken.

12.1 Revised Conceptual Site Model

The Preliminary CSM has been formulated to provide information regarding the possible sources of contamination that may impact the site, the pathway in which the contamination can migrate, any vulnerable receptors, all of which need to be present for there to be a risk.

Source	Pathway	Receptor	Likelihood	Potential Risk
Potential Historical Made Ground	Inhalation, ingestion and dermal contact from exposure to contaminated soils	End Users	Possible	Low: No exceedances identified in laboratory testing.
		Site Workers (during development)	Possible	Low: No exceedances identified in laboratory testing.
	Impacted soils	Services	Probable	Low: No exceedances identified in laboratory testing.
	Volatilisation of hydrocarbons in underlying soils and groundwater to indoor and outdoor air	End users and proposed development	Unlikely	Low: Limited hydrocarbon source material identified; no exceedances identified in laboratory testing.
		Site Workers (during development)	Possible	Low: Temporary external work setting and short exposure time reduces this risk; no exceedances identified in laboratory testing.
	Migration of ground gas through the soil pores of the underlying geology	End users and proposed development	Possible	Low: No source material identified for the generation of ground gas.
		Site workers (during development)	Unlikely	Low: Short exposure time and temporary external work setting reduces this risk.
	Infiltration and migration of contaminants through the underlying geology	Secondary A superficial aquifer and Principal bedrock aquifer underlying the site	Unlikely	Low: No exceedances identified in laboratory testing.

Site Name: Former McIntyre Nursery, Ferring

Historical and contemporary industrial land uses within 250m of the site boundary	Inhalation, ingestion and dermal contact from exposure to contaminated soils	End Users	Possible	Low: The potential for contamination is low due to the very limited previous industrial land uses surrounding the site; no exceedances identified in laboratory testing.
	Volatilisation of hydrocarbons in underlying soils and groundwater to indoor and outdoor air	End users and proposed development	Unlikely	Low: Limited hydrocarbon source material identified; no exceedances identified in laboratory testing.
		Site Workers (during development)	Possible	Low: Temporary external work setting and short exposure time reduces this risk; no exceedances identified in laboratory testing.
	Migration of ground gas through the soil pores of the underlying geology	End users and proposed development	Possible	Low: No source material identified for the generation of ground gas.
		Site workers (during development)	Unlikely	Low: Short exposure time and temporary external work setting reduces this risk.
	Infiltration and migration of contaminants through the underlying geology	Secondary A superficial aquifer and Principal bedrock aquifer underlying the site	Unlikely	Low to Moderate: Due to the low risk of contamination from historical off site activities, no exceedances identified in laboratory testing.
Negligible Risk	Defined as the site should be considered suitable for the present or future use and environmental setting. Contaminants unlikely to be present, which might have unacceptable impact on key targets.			
Low Risk	Infiltration and migration of contaminants through the underlying geology			
Moderate Risk	Migration of contaminants to surface water			
High Risk	Defined as the site is probably or certainly not suitable for the present or future use and environmental setting. Contaminants are probably or certainly present and likely to have unacceptable impact on key targets.			

13.0 Conclusions and Recommendations

13.1 Conclusions

13.1.1 GEOTECHNICAL ASSESSMENT

Traditional strip foundations to a depth of 2.0mbgl are likely to be appropriate for a three storey commercial development. A structural engineer should be consulted for the final foundation design.

A block and beam floor construction is likely to be appropriate to accommodate potential heave within Low volume change potential soils.

13.1.2 ENVIRONMENTAL ASSESSMENT

No exceedances of the adopted criteria were observed within the laboratory test results. As a result, it is unlikely that any large-scale remedial actions will be required during the redevelopment of the site.

13.2 Recommendations

It is recommended that the Discovery Strategy outlined below is followed during the groundworks and construction phases of the project.

If any previously unidentified contamination is observed or suspected during the construction phase, the following procedures should be adhered to. Material excavated should be placed onto an impermeable cover to prevent any potential cross contamination.

Potential Contamination

Potential contamination can be identified by the following;

- Oily odour or sheen
- Solvent odour
- Potentially contaminative anthropogenic materials
- Fragments of asbestos sheeting

This list is not exhaustive and a thorough watching brief should be maintained throughout works.

If any previously unidentified contamination is observed during the watching brief, it is recommended that the site manager decides if the material is potentially contaminated and to inform Constructive Evaluation, who will send a representative to site for sampling and a visual appraisal of the materials. It is recommended that the material is cordoned off until it has been determined as contaminated or otherwise.

14.0 Relevant Guidance

Constructive Evaluation has duly taken account of the recommendations contained within the following guidance documents during the preparation of this report.

Model Procedures for the Management of Land Contamination CLR-11 produced by DEFRA and the Environment Agency³.

Environment Agency Soil Science Report SR3⁴.

Environment Agency and National House Building Council (NHBC), Chartered Institute for Environmental Health (CIEH) joint publication for the Safe Development of Housing on Land Affected by Contamination⁵.

British Standards issued guidance for the Investigation of Potentially Contaminated Sites⁵ and for undertaking Site Investigations⁶ have duly been considered in the undertaking of this assessment.

The National Planning Policy Framework⁷ requires the following:

- The site is made suitable for its intended use, taking into account all ground conditions arising from natural and former activities, pollution arising from previous uses and proposals for mitigation including land remediation.
- After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990.
- Adequate site investigation information, prepared by a competent person, is presented.

³ Environment Agency. 2004. Model Procedures for the Management of Land Contamination. Contaminated Land Report 11.

⁴ Environment Agency. August 2008. Updated technical background to the CLEA model, Science Report – SC050021/SR3.

⁵ Environment Agency. 2008. Guidance for the Safe Development of Housing on Land Affected by Contamination. R&D66.

⁶ British Standards. 2015. Code of Practice for Site Investigations. BS5930.2015.

⁷ Department of Communities and Local Government. March 2012.

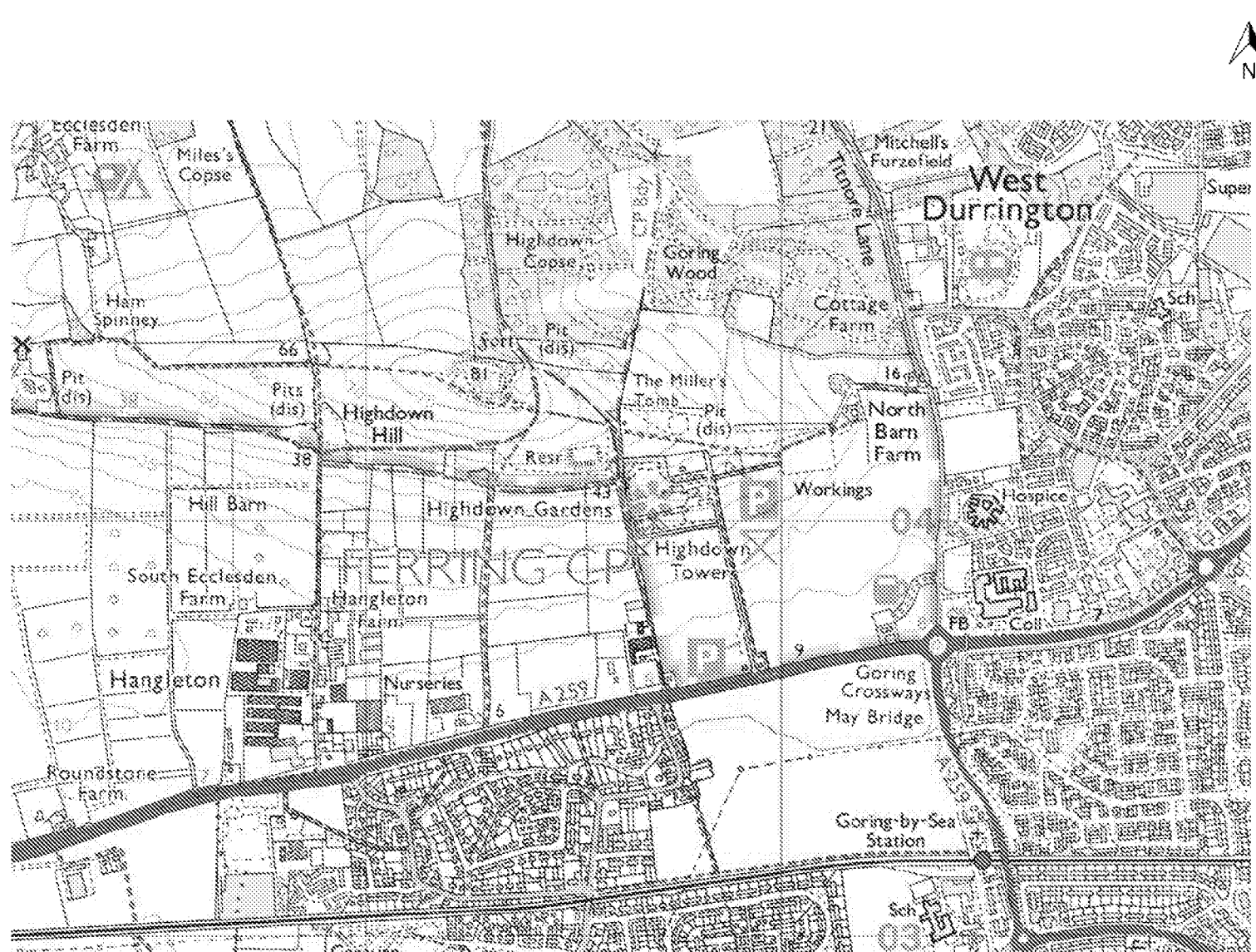
FIGURES

Figure 1 – Site Location Plan

Figure 2 – Current Site Plan

Figure 3 – Proposed Development Plan

Figure 4 – Site Investigation Plan



Notes:

1. Do not scale from this drawing.
2. All dimensions must be checked on site prior to commencement of work.
3. Where applicable this drawing is to be read in conjunction with other consultants drawings.
4. This drawing is the copyright of Constructive Evaluation Ltd.

KEY

Drawing Title:

Site Location Plan

Project Reference:

20.1098

Site Name:

Former McIntyre Nursery

Revision: 0

Drawn by: ME

Scale: Not to Scale



Figure 1:



Notes:

1. Do not scale from this drawing.
2. All dimensions must be checked on site prior to commencement of work.
3. Where applicable this drawing is to be read in conjunction with other consultants drawings.
4. This drawing is the copyright of Constructive Evaluation Ltd.

KEY

Drawing Title:

Current Site Plan

Project Reference:

20.1098

Site Name:

Former McIntyre
Nursery

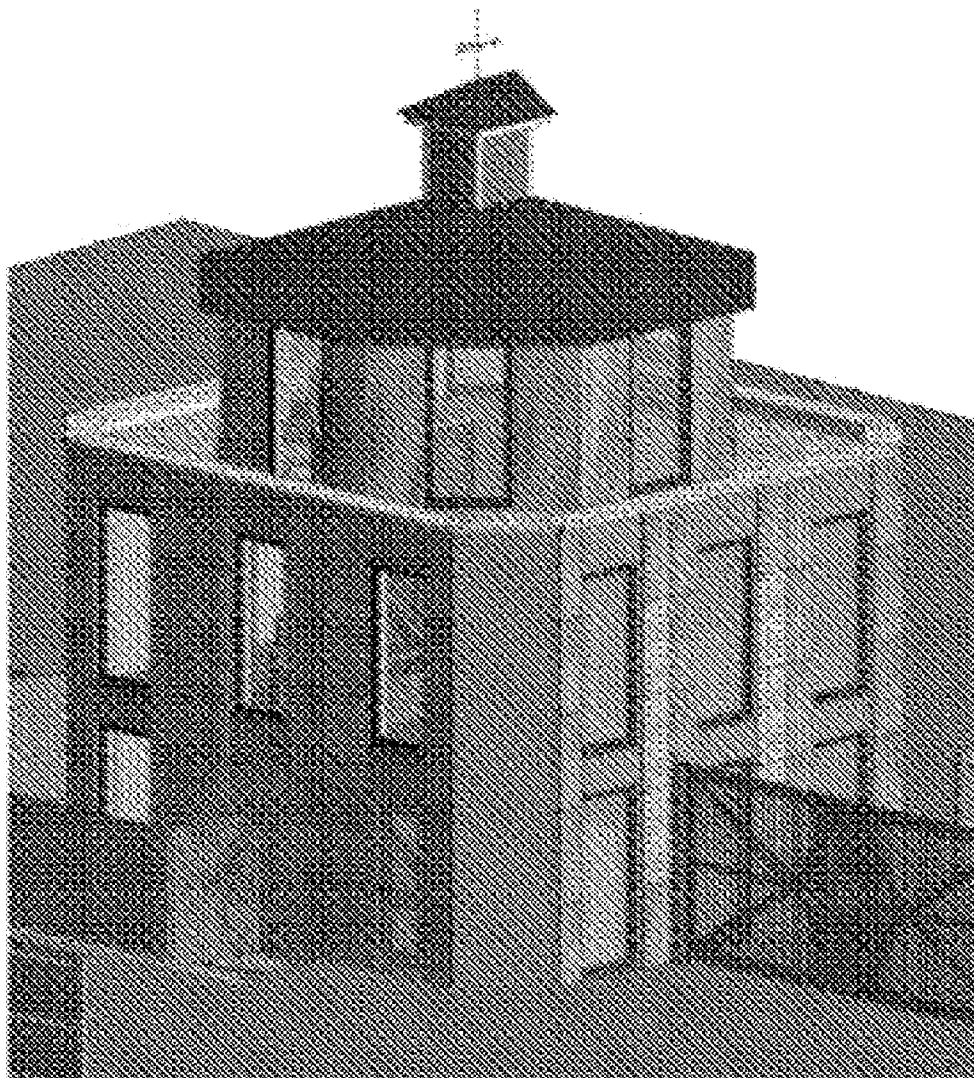
Revision: 0

Drawn by: ME

Scale: Not to Scale



Figure 2:



Notes:

1. Do not scale from this drawing.
2. All dimensions must be checked on site prior to commencement of work.
3. Where applicable this drawing is to be read in conjunction with other consultants drawings.
4. This drawing is the copyright of Constructive Evaluation Ltd.

KEY

Drawing Title:

Proposed Site Plan

Project Reference:

20.1098

Site Name:

Former McIntyre
Nursery

Revision: 0

Drawn by: ME

Scale: Not to Scale



Figure 3:



- Notes:
1. Do not scale from this drawing.
 2. All dimensions must be checked on site prior to commencement of work.
 3. Where applicable this drawing is to be read in conjunction with other consultants drawings.
 4. This drawing is the copyright of Constructive Evaluation Ltd.

KEY



Drawing Title:

Site Investigation Plan

Project Reference:

20.1098

Site Name:

Former McIntyre
Nursery

Revision: 0

Drawn by: ME

Scale: Not to Scale

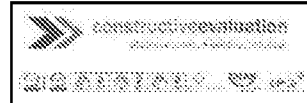


Figure 4:

APPENDICES

Appendix A – Site Investigation Plan

Appendix B – Stratigraphic Logs

Appendix C – Stratigraphic Logs

Appendix D – Monitoring Results

Appendix E – Geotechnical Laboratory Results

Appendix F – Environmental Laboratory Results

Appendix G – Report Terms and Conditions

APPENDIX A

Site Investigation ~~PDA/PL/22~~

Investigation Photographs

Project Ref: 20.1098

Site Name: Former McIntyre Nursery

1.



2.



- 1) Silo viewed from access road (SE)
- 2) Silo viewed from fencing contractors (N)
- 3) Access road
- 4) Concrete slab as silo base

3.



4.



Investigation Photographs

Project Ref: 20.1098

Site Name: Former McIntyre Nursery

5.



6.



7.



8.



- 5) Telephone pole on site
- 6) Storage units bordering site (S)
- 7) Modular office unit bordering silo (W)
- 8) Internal view of silo

Investigation Photographs

Project Ref: 20.1098

Site Name: Former McIntyre Nursery

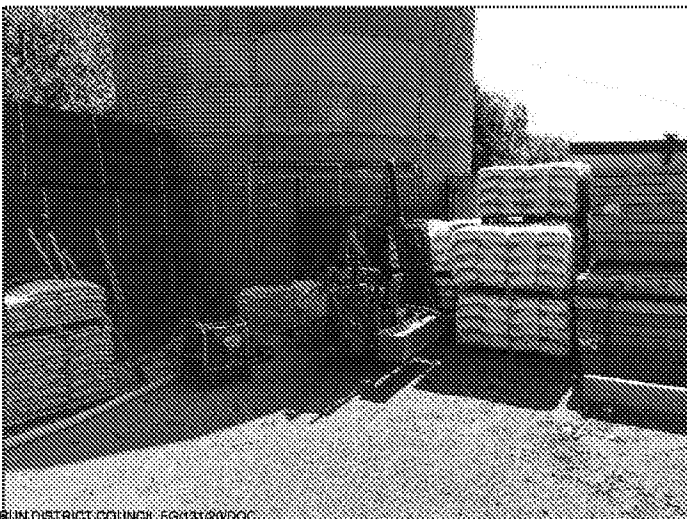
9.



10.



11.



12.



- 9) Windowless Sampler at WS1
- 10) Windowless Sampler at WS2
- 11) Windowless Sampler at WS3
- 12) Monitoring Well installed at WS3

Appendix B

Environmental Database Information

Former McIntyre Nursery, LITTLEHAMPTON ROAD, FERRING, BN12 6PH

Order Details

Date: 30/07/2020
Your ref: 20_1098
Our Ref: GS-6928709
Client: Constructive Evaluation Ltd

Site Details

Location: 509657 103844
Area: 0.02 ha
Authority: [Arun District Council](#)



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Summary of findings

p. 2

Aerial image

p. 8

OS MasterMap site plan

p.13

groundsure.com/insightuserguide

Contact us with any questions at:

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
<u>14</u>	<u>1.1</u>	<u>Historical industrial land uses</u>	0	2	5	24	-
<u>16</u>	<u>1.2</u>	<u>Historical tanks</u>	0	0	0	6	-
<u>16</u>	<u>1.3</u>	<u>Historical energy features</u>	0	0	1	0	-
17	1.4	Historical petrol stations	0	0	0	0	-
17	1.5	Historical garages	0	0	0	0	-
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
<u>18</u>	<u>2.1</u>	<u>Historical industrial land uses</u>	0	2	7	34	-
<u>20</u>	<u>2.2</u>	<u>Historical tanks</u>	0	0	0	6	-
<u>21</u>	<u>2.3</u>	<u>Historical energy features</u>	0	0	4	0	-
21	2.4	Historical petrol stations	0	0	0	0	-
21	2.5	Historical garages	0	0	0	0	-
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	0	0	0	-
23	3.5	Historical waste sites	0	0	0	0	-
23	3.6	Licensed waste sites	0	0	0	0	-
<u>23</u>	<u>3.7</u>	<u>Waste exemptions</u>	0	1	1	1	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
<u>25</u>	<u>4.1</u>	<u>Recent industrial land uses</u>	0	1	5	-	-
26	4.2	Current or recent petrol stations	0	0	0	0	-
26	4.3	Electricity cables	0	0	0	0	-
26	4.4	Gas pipelines	0	0	0	0	-
26	4.5	Sites determined as Contaminated Land	0	0	0	0	-



27	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
27	4.7	Regulated explosive sites	0	0	0	0	-
27	4.8	Hazardous substance storage/usage	0	0	0	0	-
27	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
27	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
28	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
28	4.12	Radioactive Substance Authorisations	0	0	0	0	-
28	4.13	<u>Licensed Discharges to controlled waters</u>	0	0	3	3	-
29	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
29	4.15	Pollutant release to public sewer	0	0	0	0	-
29	4.16	List 1 Dangerous Substances	0	0	0	0	-
30	4.17	List 2 Dangerous Substances	0	0	0	0	-
30	4.18	<u>Pollution Incidents (EA/NRW)</u>	0	0	1	0	-
30	4.19	Pollution inventory substances	0	0	0	0	-
30	4.20	Pollution inventory waste transfers	0	0	0	0	-
31	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
32	5.1	<u>Superficial aquifer</u>	Identified (within 500m)				
34	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
36	5.3	<u>Groundwater vulnerability</u>	Identified (within 50m)				
37	5.4	<u>Groundwater vulnerability- soluble rock risk</u>	Identified (within 0m)				
37	5.5	Groundwater vulnerability- local information	None (within 0m)				
38	5.6	<u>Groundwater abstractions</u>	0	0	0	0	4
39	5.7	Surface water abstractions	0	0	0	0	0
40	5.8	<u>Potable abstractions</u>	0	0	0	0	1
40	5.9	Source Protection Zones	0	0	0	0	-
40	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
41	6.1	Water Network (OS MasterMap)	0	0	0	-	-

41	6.2	Surface water features	0	0	0	-	-
42	6.3	<u>WFD Surface water body catchments</u>	1	-	-	-	-
42	6.4	<u>WFD Surface water bodies</u>	0	0	0	-	-
43	6.5	<u>WFD Groundwater bodies</u>	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
44	7.1	Risk of Flooding from Rivers and Sea (RoFRaS)	None (within 50m)				
44	7.2	Historical Flood Events	0	0	0	-	-
44	7.3	Flood Defences	0	0	0	-	-
44	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
45	7.5	Flood Storage Areas	0	0	0	-	-
46	7.6	Flood Zone 2	None (within 50m)				
46	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
47	8.1	Surface water flooding	Negligible (within 50m)				
Page	Section	Groundwater flooding					
48	9.1	<u>Groundwater flooding</u>	Moderate (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
49	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
50	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
50	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
50	10.4	Special Protection Areas (SPA)	0	0	0	0	0
50	10.5	National Nature Reserves (NNR)	0	0	0	0	0
51	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
51	10.7	<u>Designated Ancient Woodland</u>	0	0	0	0	17
52	10.8	Biosphere Reserves	0	0	0	0	0
52	10.9	Forest Parks	0	0	0	0	0
52	10.10	Marine Conservation Zones	0	0	0	0	0
52	10.11	Green Belt	0	0	0	0	0
53	10.12	Proposed Ramsar sites	0	0	0	0	0

53	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
53	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
53	10.15	Nitrate Sensitive Areas	0	0	0	0	0
54	10.16	<u>Nitrate Vulnerable Zones</u>	0	0	0	0	1
55	10.17	<u>SSSI Impact Risk Zones</u>	1	-	-	-	-
56	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
57	11.1	World Heritage Sites	0	0	0	-	-
58	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
58	11.3	<u>National Parks</u>	0	1	0	-	-
58	11.4	Listed Buildings	0	0	0	-	-
59	11.5	<u>Conservation Areas</u>	0	1	0	-	-
59	11.6	Scheduled Ancient Monuments	0	0	0	-	-
59	11.7	<u>Registered Parks and Gardens</u>	0	0	1	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
60	12.1	<u>Agricultural Land Classification</u>	Grade 1 (within 250m)				
61	12.2	Open Access Land	0	0	0	-	-
61	12.3	Tree Felling Licences	0	0	0	-	-
61	12.4	Environmental Stewardship Schemes	0	0	0	-	-
62	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
63	13.1	<u>Priority Habitat Inventory</u>	0	1	13	-	-
64	13.2	<u>Habitat Networks</u>	2	1	2	-	-
65	13.3	Open Mosaic Habitat	0	0	0	-	-
65	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
66	14.1	<u>10k Availability</u>	Identified (within 500m)				
67	14.2	<u>Artificial and made ground (10k)</u>	0	0	0	1	-
68	14.3	<u>Superficial geology (10k)</u>	1	0	1	5	-

69	14.4	Landslip (10k)	0	0	0	0	-
70	14.5	<u>Bedrock geology (10k)</u>	1	0	2	6	-
71	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
72	15.1	<u>50k Availability</u>	Identified (within 500m)				
73	15.2	Artificial and made ground (50k)	0	0	0	0	-
73	15.3	Artificial ground permeability (50k)	0	0	-	-	-
74	15.4	<u>Superficial geology (50k)</u>	1	0	1	5	-
75	15.5	<u>Superficial permeability (50k)</u>	Identified (within 50m)				
75	15.6	Landslip (50k)	0	0	0	0	-
75	15.7	Landslip permeability (50k)	None (within 50m)				
76	15.8	<u>Bedrock geology (50k)</u>	1	0	2	5	-
77	15.9	<u>Bedrock permeability (50k)</u>	Identified (within 50m)				
77	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
78	16.1	<u>BGS Boreholes</u>	0	0	1	-	-
Page	Section	Natural ground subsidence					
79	17.1	<u>Shrink swell clays</u>	Very low (within 50m)				
80	17.2	<u>Running sands</u>	Very low (within 50m)				
81	17.3	<u>Compressible deposits</u>	Negligible (within 50m)				
82	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
83	17.5	<u>Landslides</u>	Very low (within 50m)				
84	17.6	<u>Ground dissolution of soluble rocks</u>	Low (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
86	18.1	Natural cavities	0	0	0	0	-
87	18.2	<u>BritPits</u>	0	0	0	5	-
88	18.3	<u>Surface ground workings</u>	0	0	7	-	-
88	18.4	Underground workings	0	0	0	0	0
88	18.5	Historical Mineral Planning Areas	0	0	0	0	-

89	18.6	<u>Non-coal mining</u>	1	0	0	2	0
89	18.7	Mining cavities	0	0	0	0	0
89	18.8	IPB mining areas	None (within 0m)				
90	18.9	Coal mining	None (within 0m)				
90	18.10	Brine areas	None (within 0m)				
90	18.11	Gypsum areas	None (within 0m)				
90	18.12	Tin mining	None (within 0m)				
90	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
91	19.1	<u>Radon</u>	Between 5% and 10% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
92	20.1	<u>BGS Estimated Background Soil Chemistry</u>	1	0	-	-	-
92	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
92	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
93	21.1	Underground railways (London)	0	0	0	-	-
93	21.2	Underground railways (Non-London)	0	0	0	-	-
93	21.3	Railway tunnels	0	0	0	-	-
93	21.4	Historical railway and tunnel features	0	0	0	-	-
93	21.5	Royal Mail tunnels	0	0	0	-	-
94	21.6	Historical railways	0	0	0	-	-
94	21.7	Railways	0	0	0	-	-
94	21.8	Crossrail 1	0	0	0	0	-
94	21.9	Crossrail 2	0	0	0	0	-
94	21.10	HS2	0	0	0	0	-

Recent aerial photograph



Capture Date: 28/06/2018

Site Area: 0.02ha

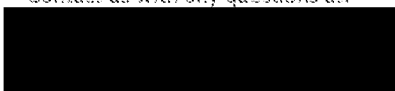


Recent site history - 2015 aerial photograph



Capture Date: 07/06/2015

Site Area: 0.02ha



Recent site history - 2012 aerial photograph



Capture Date: 13/09/2012

Site Area: 0.02ha

Recent site history - 2010 aerial photograph



Capture Date: 24/04/2010

Site Area: 0.02ha



Recent site history - 1999 aerial photograph

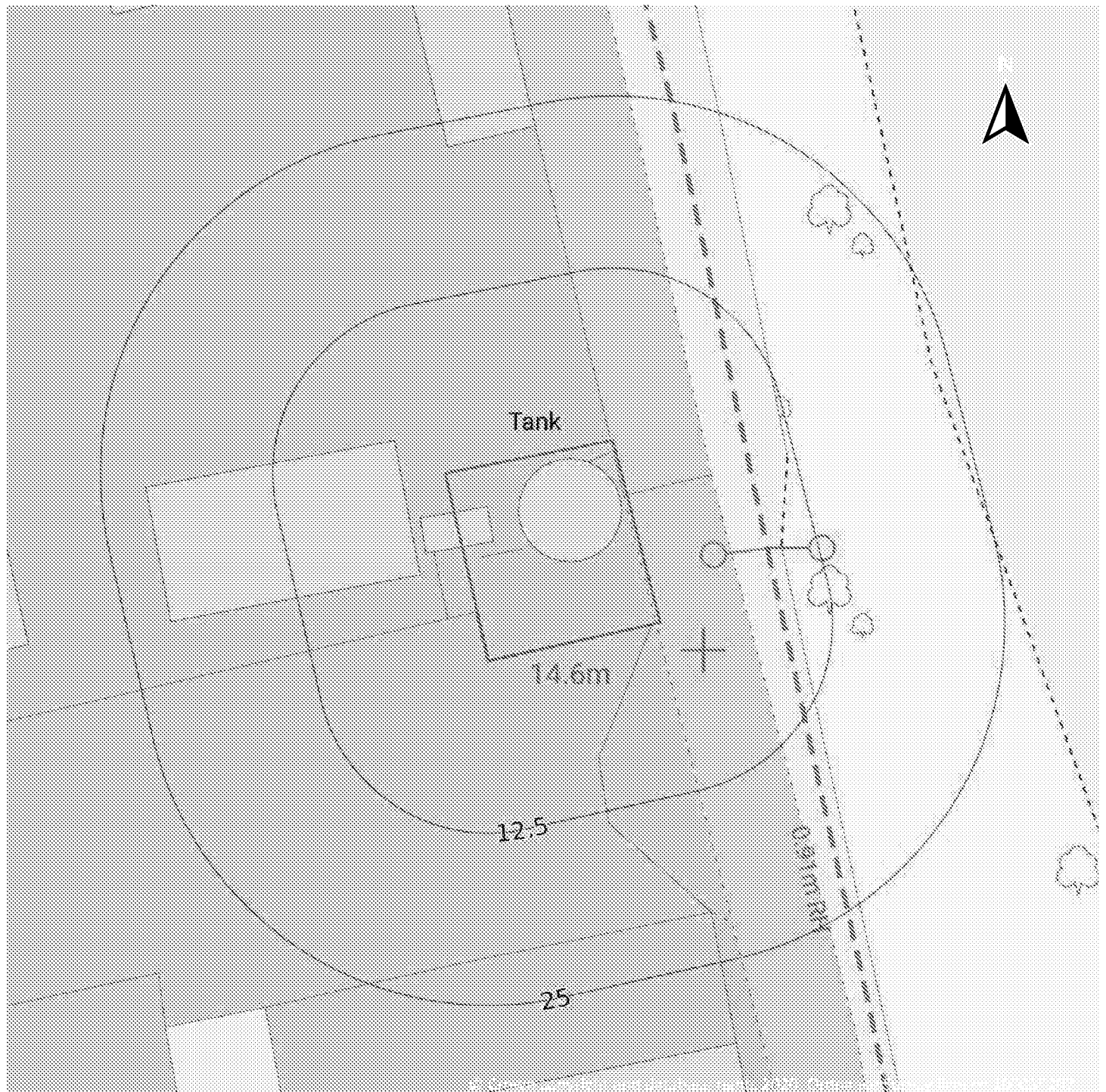


Capture Date: 29/08/1999

Site Area: 0.02ha



OS MasterMap site plan



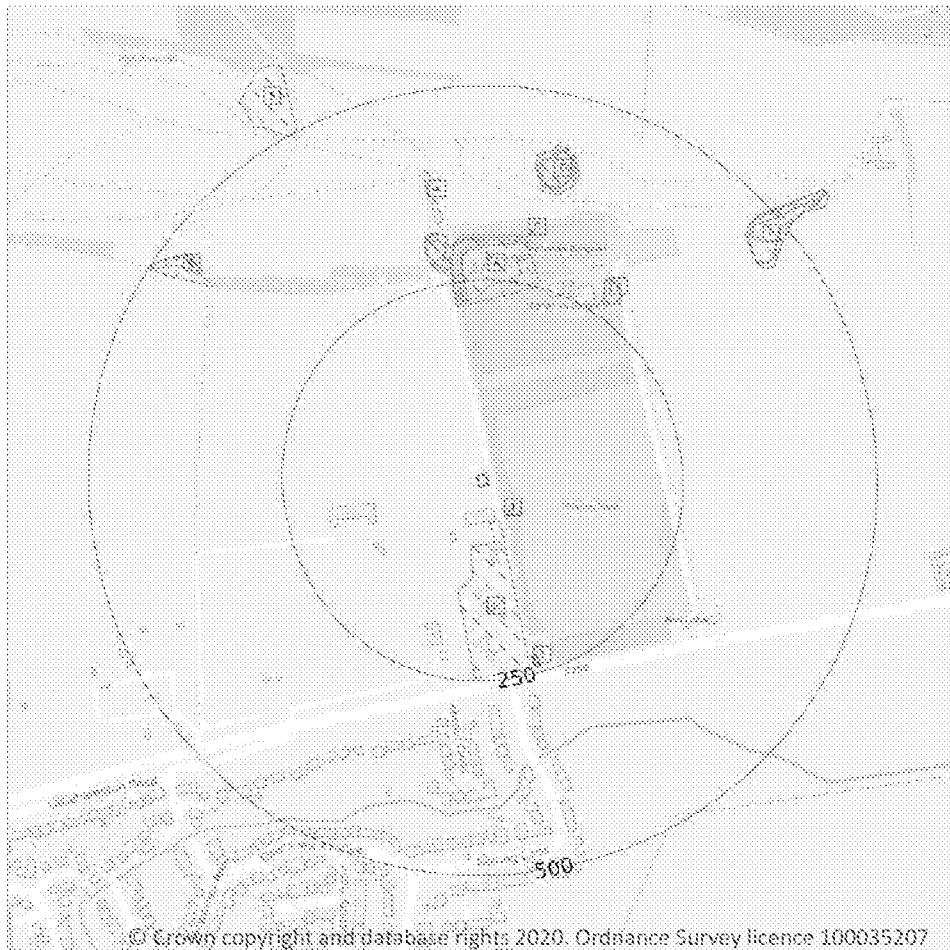
Site Area: 0.02ha



Contact us with any questions at:

Date: 30 July 2020

1 Past land use



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

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1.1 Historical industrial land uses

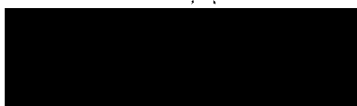
Records within 500m

31

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

Features are displayed on the Past land use map on [page 14](#)

ID	Location	Land use	Dates present	Group ID
1	40m SE	Pumping Station	1943	2151647



ID	Location	Land use	Dates present	Group ID
2	48m S	Nurseries and Garden Centre	1974	2160700
A	217m N	Unspecified Quarry	1957	2247734
A	218m N	Unspecified Quarry	1910 - 1943	2284338
A	220m N	Old Chalk Pits	1896	2142405
A	223m N	Unspecified Ground Workings	1974	2284332
A	224m N	Unspecified Ground Workings	1876	2266977
A	264m N	Unspecified Pit	1957 - 1974	2180032
A	267m N	Unspecified Pit	1876	2258766
B	267m NE	Unspecified Heap	1933	2251887
B	267m NE	Unspecified Heap	1896	2264486
B	268m NE	Unspecified Ground Workings	1938	2132471
B	268m NE	Unspecified Pit	1957	2123502
A	278m N	Unspecified Pit	1910 - 1943	2187659
4	329m N	Unspecified Ground Workings	1957	2132469
D	371m N	Unspecified Pit	1876	2233492
D	375m N	Unspecified Disused Pit	1974	2152019
D	377m N	Unspecified Pit	1957	2204941
D	379m N	Old Chalk Pit	1896	2165412
D	379m N	Unspecified Pit	1910 - 1943	2176055
E	417m NW	Unspecified Quarry	1957	2227365
E	440m NW	Old Chalk Pit	1896	2165411
E	440m NW	Unspecified Quarry	1910 - 1943	2217778
F	442m NE	Unspecified Pit	1909	2123503
F	442m NE	Old Chalk Pit	1896	2271928
F	442m NE	Unspecified Quarry	1938	2276461
F	444m NE	Unspecified Quarry	1969 - 1971	2185851
F	444m NE	Old Chalk Pit	1962	2197571
F	444m NE	Unspecified Quarry	1933	2284874



ID	Location	Land use	Dates present	Group ID
F	468m NE	Unspecified Disused Pit	1978 - 1991	2273146
S	499m NW	Unspecified Disused Pit	1974	2152018

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	6
----------------------------	----------

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 ungrouped 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
C	315m N	Unspecified Tank	1942	410852
C	317m N	Unspecified Tank	1994	407066
C	318m N	Unspecified Tank	1971	401910
E	468m NW	Unspecified Tank	1971	398415
E	468m NW	Unspecified Tank	1994	410030
E	477m NW	Unspecified Tank	1942	359159

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	1
----------------------------	----------

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 ungrouped 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
3	227m S	Electricity Substation	1969 - 1994	280192

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 ungrouped 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	0
----------------------------	----------

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 ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

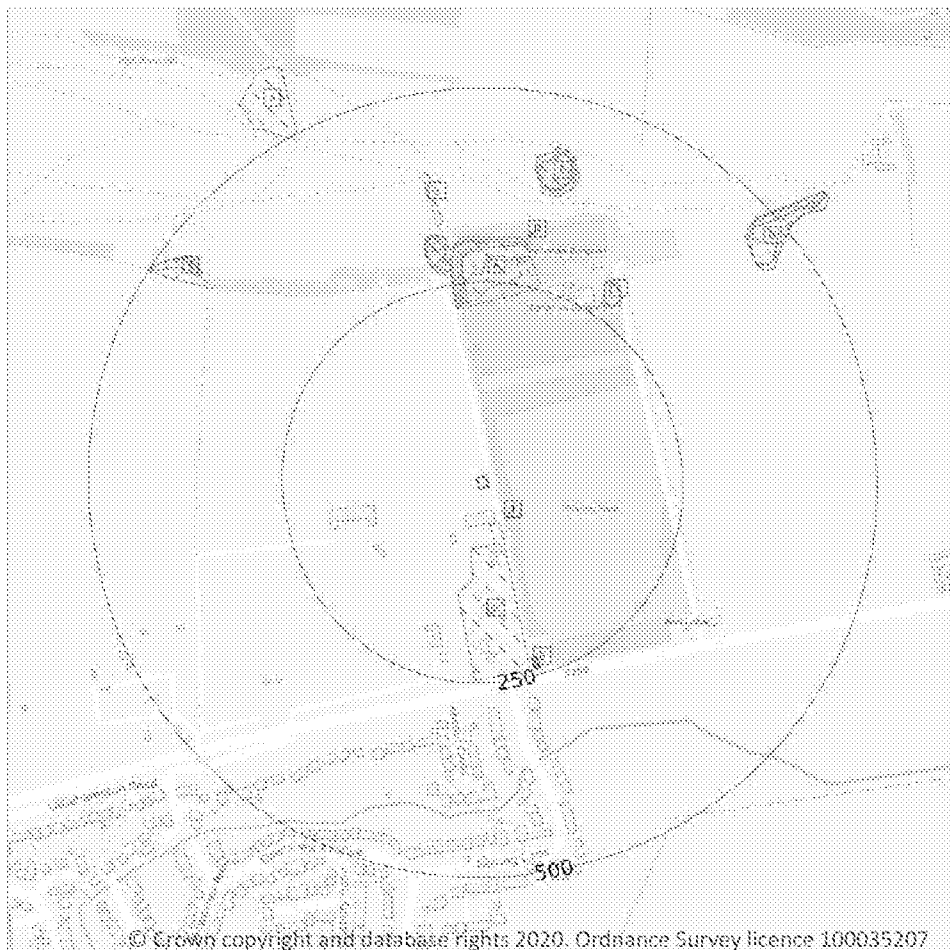
Records within 500m	0
----------------------------	----------

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

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2.1 Historical industrial land uses

Records within 500m

43

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
1	40m SE	Pumping Station	1943	2151647
2	48m S	Nurseries and Garden Centre	1974	2160700
A	217m N	Unspecified Quarry	1957	2247734

ID	Location	Land Use	Date	Group ID
A	218m N	Unspecified Quarry	1943	2284338
A	218m N	Unspecified Quarry	1932	2284338
A	218m N	Unspecified Quarry	1910	2284338
A	220m N	Old Chalk Pits	1896	2142405
A	223m N	Unspecified Ground Workings	1974	2284332
A	224m N	Unspecified Ground Workings	1876	2266977
A	264m N	Unspecified Pit	1974	2180032
A	267m N	Unspecified Pit	1876	2258766
C	267m NE	Unspecified Heap	1933	2251887
C	267m NE	Unspecified Heap	1933	2251887
C	267m NE	Unspecified Heap	1896	2264486
C	268m NE	Unspecified Ground Workings	1938	2132471
C	268m NE	Unspecified Pit	1957	2123502
A	278m N	Unspecified Pit	1943	2187659
A	278m N	Unspecified Pit	1932	2187659
A	278m N	Unspecified Pit	1910	2187659
A	297m N	Unspecified Pit	1957	2180032
B	329m N	Unspecified Ground Workings	1957	2132469
E	371m N	Unspecified Pit	1876	2233492
E	375m N	Unspecified Disused Pit	1974	2152019
E	377m N	Unspecified Pit	1957	2204941
E	379m N	Old Chalk Pit	1896	2165412
E	379m N	Unspecified Pit	1943	2176055
E	379m N	Unspecified Pit	1932	2176055
E	379m N	Unspecified Pit	1910	2176055
F	417m NW	Unspecified Quarry	1957	2227365
F	440m NW	Unspecified Quarry	1943	2217778
F	440m NW	Unspecified Quarry	1932	2217778



ID	Location	Land Use	Date	Group ID
F	440m NW	Unspecified Quarry	1910	2217778
F	440m NW	Old Chalk Pit	1896	2165411
G	442m NE	Unspecified Quarry	1938	2276461
G	442m NE	Old Chalk Pit	1896	2271928
G	442m NE	Unspecified Pit	1909	2123503
G	444m NE	Unspecified Quarry	1971	2185851
G	444m NE	Unspecified Quarry	1969	2185851
G	444m NE	Old Chalk Pit	1962	2197571
G	444m NE	Unspecified Quarry	1933	2284874
G	468m NE	Unspecified Disused Pit	1991	2273146
G	468m NE	Unspecified Disused Pit	1978	2273146
A	499m NW	Unspecified Disused Pit	1974	2152018

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

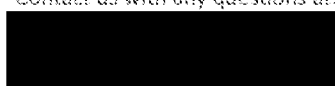
Records within 500m	6
----------------------------	----------

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
D	315m N	Unspecified Tank	1942	410852
D	317m N	Unspecified Tank	1994	407066
D	318m N	Unspecified Tank	1971	401910
F	468m NW	Unspecified Tank	1971	398415
F	468m NW	Unspecified Tank	1994	410030
F	477m NW	Unspecified Tank	1942	359159

This data is sourced from Ordnance Survey / Groundsure.



2.3 Historical energy features

Records within 500m	4
----------------------------	----------

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
B	227m S	Electricity Substation	1989	280192
B	227m S	Electricity Substation	1994	280192
B	227m S	Electricity Substation	1999	280192
B	228m S	Electricity Substation	1971	280192

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

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

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

This data is sourced from Ordnance Survey / Groundsure.

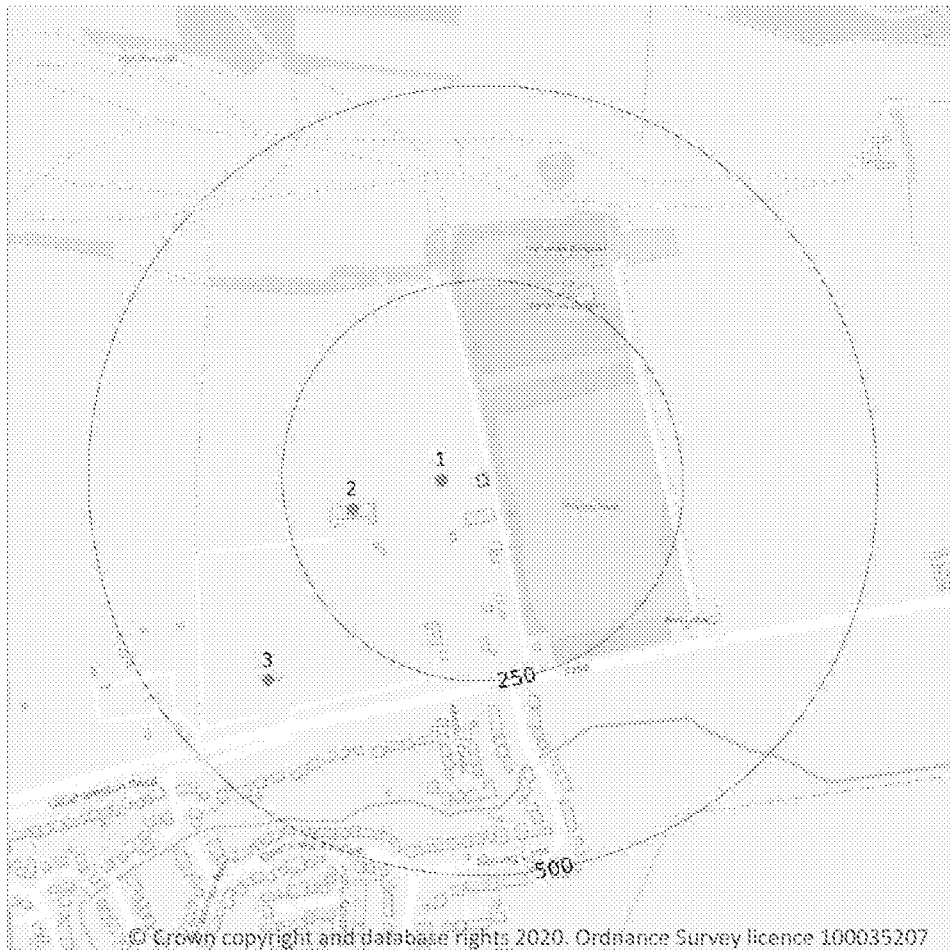
2.5 Historical garages

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

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'.

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Waste exemptions

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3.1 Active or recent landfill

Records within 500m

0

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

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

3.2 Historical landfill (BGS records)

Records within 500m

0

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

This data is sourced from the British Geological Survey.



3.3 Historical landfill (LA/mapping records)

Records within 500m**0**

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

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

3.4 Historical landfill (EA/NRW records)

Records within 500m**0**

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

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

3.5 Historical waste sites

Records within 500m**0**

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

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

3.6 Licensed waste sites

Records within 500m**0**

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

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

3.7 Waste exemptions

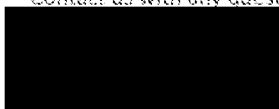
Records within 500m**3**

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.

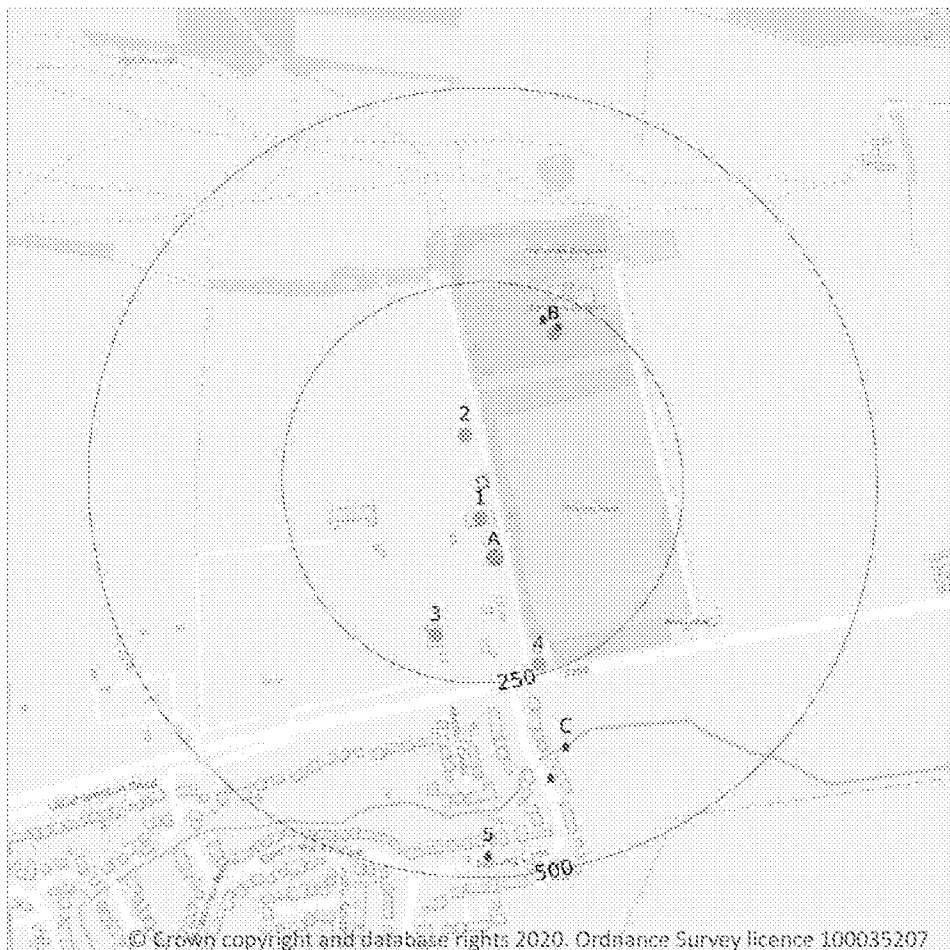
Features are displayed on the Waste and landfill map on **page 22**

ID	Location	Site	Reference	Category	Sub-Category	Description
1	46m W	LITTLEHAMPTON ROAD, FERRING, WORTHING, BN12 6PG	WEX224491	Storing waste exemption	Not on a farm	Storage of waste in a secure place
2	167m W	EASTLANDS, LITTLEHAMPTON ROAD, FERRING, WORTHING, BN12 6PB	WEX084800	Using waste exemption	Not on a farm	Use of waste in construction
3	369m SW	LITTLEHAMPTON ROAD, FERRING, WORTHING, BN12 6PG	WEX166752	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

6

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 25**

ID	Location	Company	Address	Activity	Category
1	38m S	P H S Waste Management	Littlehampton Road, Ferring, Worthing, West Sussex, BN12 6PG	Waste Storage, Processing and Disposal	Infrastructure and Facilities
2	58m N	Bell Davis Fencing Supplies Ltd	Littlehampton Road, Ferring, Worthing, West Sussex, BN12 6PG	Fences, Gates and Rollings	Industrial Products



Contact us with any questions at:

Date: 30 July 2020

ID	Location	Company	Address	Activity	Category
A	93m S	P J Autos	Highdown House, Littlehampton Road, Ferring, Worthing, West Sussex, BN12 6PG	Vehicle Repair, Testing and Servicing	Repair and Servicing
3	196m S	Highdown Vineyard	Littlehampton Road, Ferring, Worthing, West Sussex, BN12 6PG	Alcoholic Drinks	Foodstuffs
6	203m NE	Pump	West Sussex, BN12	Water Pumping Stations	Industrial Features
4	237m S	Electricity Sub Station	West Sussex, BN12	Electrical Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

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

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

6

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 25](#)

ID	Location	Address	Details	
B	213m NE	MANSION HOUSE HIGHDOWN TOWERS, THE MANSION HOUSE, LITTLEHAMPTON ROAD, GORING-BY-SEA, WEST SUSSEX, BN12 6PF	Effluent Type: SEWAGE & TRADE COMBINED - UNSPECIFIED Permit Number: P12277 Permit Version: 1 Receiving Water: GROUNDWATER VIA SOAKAWAY	Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 24/03/2005 Effective Date: 24/03/2005 Revocation Date: 20/12/2012
B	213m NE	MANSION HOUSE HIGHDOWN TOWERS, THE MANSION HOUSE, LITTLEHAMPTON ROAD, GORING-BY-SEA, WEST SUSSEX, BN12 6PF	Effluent Type: SEWAGE & TRADE COMBINED - UNSPECIFIED Permit Number: P12277 Permit Version: 2 Receiving Water: GROUNDWATER VIA SOAKAWAY	Status: VARIED UNDER EPR 2010 Issue date: 21/12/2012 Effective Date: 21/12/2012 Revocation Date: -
B	215m N	THE MANSION HSE, HIGHDOWN TOWERS, LITTLEHAMPTON RD, WORTHING, SUSSEX	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P09656 Permit Version: 1 Receiving Water: INTO LAND	Status: REVOKED (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 23/05/2001 Effective Date: 23/05/2001 Revocation Date: 24/03/2005



ID	Location	Address	Details	
C	348m S	A259 SURFACE WATER, LITTLEHAMPTON ROAD	Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: S01071 Permit Version: 1 Receiving Water: CONTROLLED SEA	Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995 Issue date: 26/02/1964 Effective Date: 26/02/1964 Revocation Date: 31/03/1997
C	382m S	MOLEHURST, FERRING LANE, FERRING, MOLEHURST FERRING LANE FERRING	Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: S02629 Permit Version: 1 Receiving Water: FRESHWATER RIVER	Status: PRE NRA LEGISLATION WHERE ISSUE DATE 01-SEP-89 (HISTORIC ONLY) Issue date: 12/02/1969 Effective Date: 12/02/1969 Revocation Date: 01/07/1991
S	471m S	BUNGALOW NORTH OF 'TORRINGTON', FERRING LANE, FERRING, WORTHING, WEST SUSSEX	Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: S02724 Permit Version: 1 Receiving Water: FRESHWATER RIVER	Status: PRE NRA LEGISLATION WHERE ISSUE DATE 01-SEP-89 (HISTORIC ONLY) Issue date: 12/02/1965 Effective Date: 12/02/1965 Revocation Date: 01/07/1991

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

4.14 Pollutant release to surface waters (Red List)

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

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

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

4.15 Pollutant release to public sewer

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

Discharges of Special Category Effluents to the public sewer.

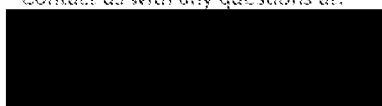
This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

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

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

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



4.17 List 2 Dangerous Substances

Records within 500m

0

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

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

4.18 Pollution Incidents (EA/NRW)

Records within 500m

1

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 25**

ID	Location	Details	
A	91m S	Incident Date: 29/09/2003 Incident Identification: 193124 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Smoke	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.

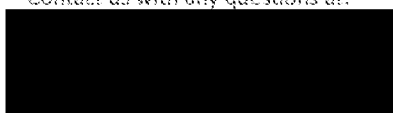
4.20 Pollution inventory waste transfers

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



5.1 Superficial aquifer

Records within 500m

7

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on page 32

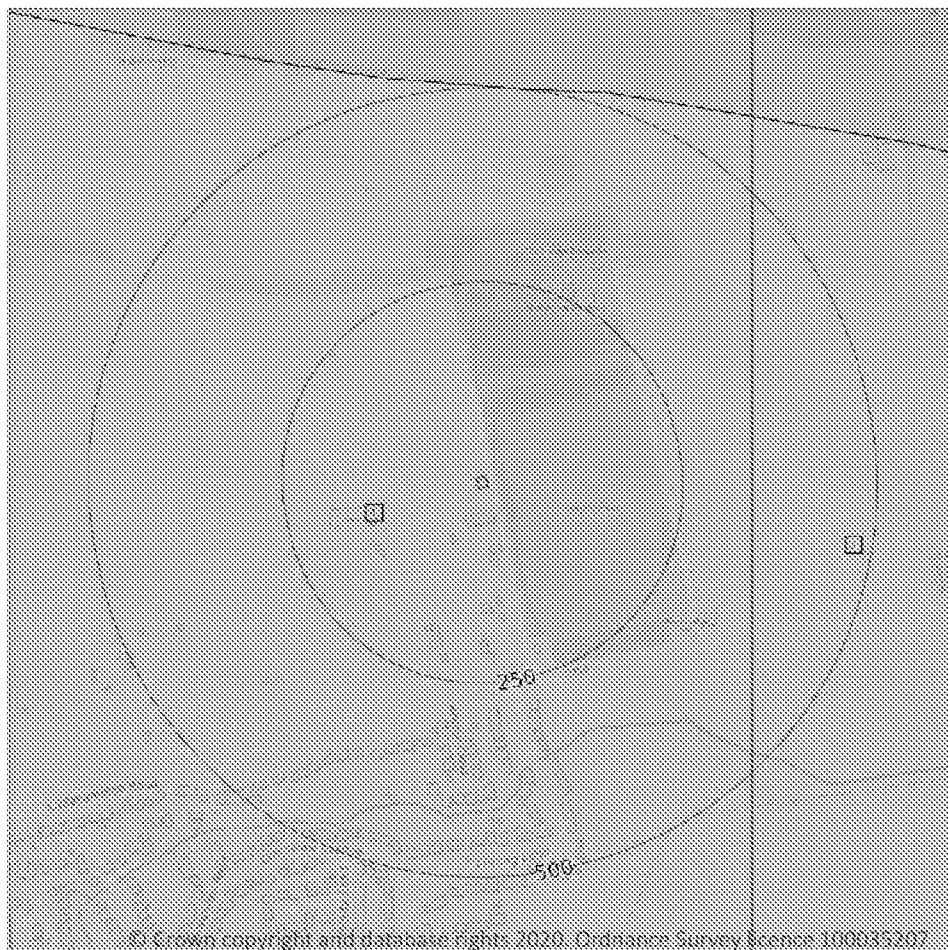
ID	Location	Designation	Description
1	On site	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
2	69m S	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

ID	Location	Designation	Description
3	306m E	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
4	340m E	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
5	340m E	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
6	472m SE	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
7	490m SE	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-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

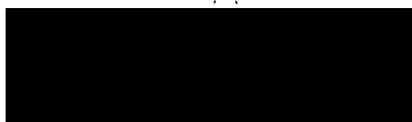
Records within 500m

2

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on [page 34](#)

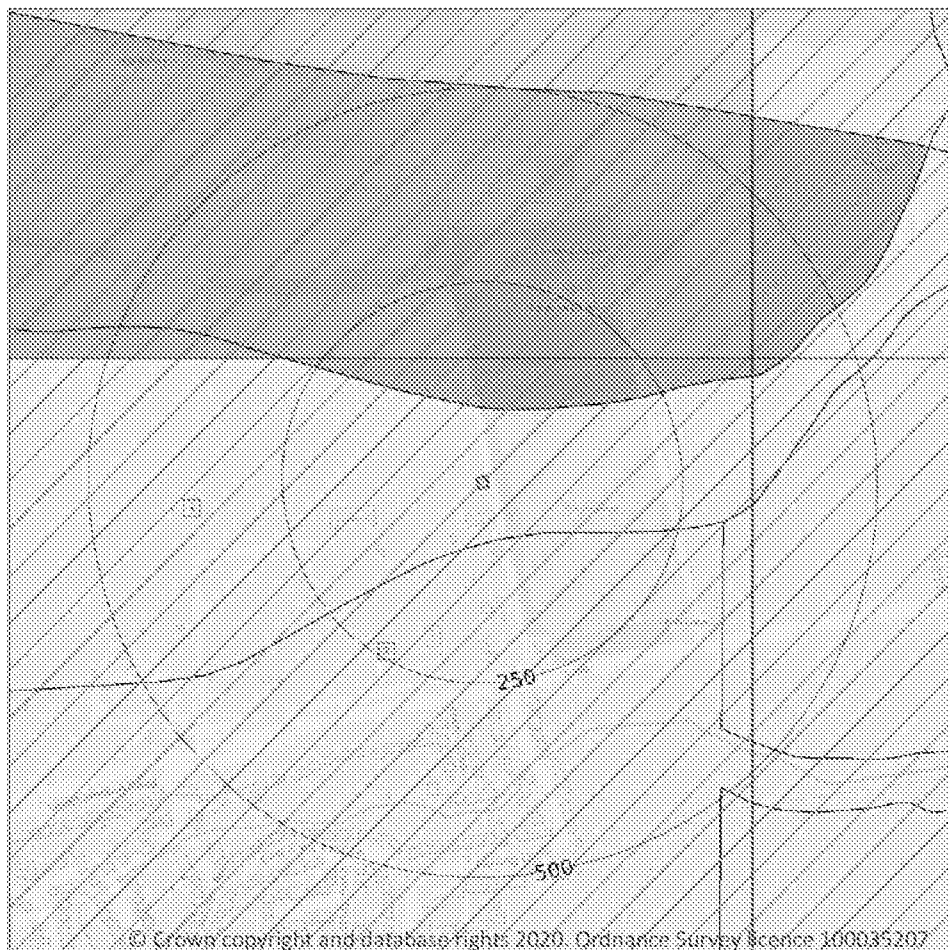
ID	Location	Designation	Description
1	On site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
2	340m E	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers



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



Groundwater vulnerability



- 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

1

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

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

Features are displayed on the Groundwater vulnerability map on **page 36**

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: <3m Patchiness value: >90% Recharge potential: No Data	Vulnerability: Medium Aquifer type: Principal Flow mechanism: Well connected fractures

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
2	Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.	25.0%

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

5.5 Groundwater vulnerability- local information

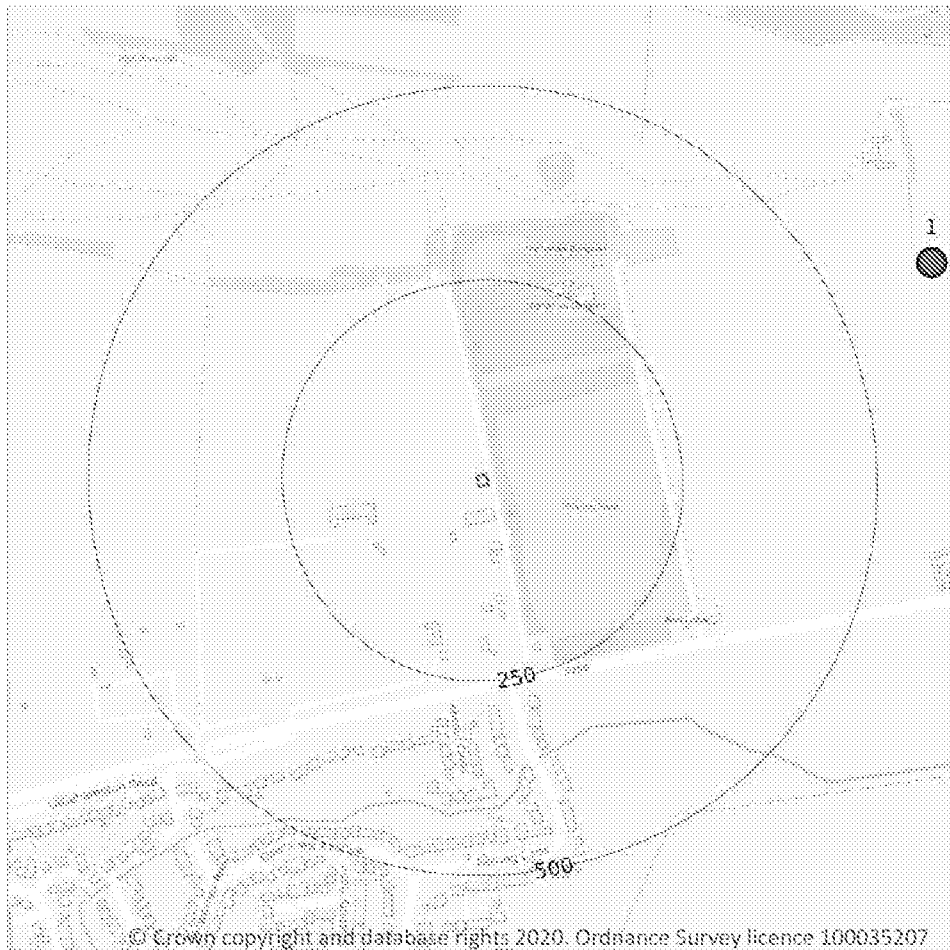
Records on site	0
------------------------	----------

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

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



Abstractions and Source Protection Zones



- 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

4

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 38](#)

ID	Location	Details	
1	634m NE	Status: Historical Licence No: 10/41/310110 Details: Spray Irrigation - Direct Direct Source: Southern Region Groundwater Point: NORTHBROOK FARM GORING Data Type: Point Name: S.Saibstein Limited Easting: 510230 Northing: 104120	Annual Volume (m³): 10000 Max Daily Volume (m³): 614 Original Application No: - Original Start Date: - Expiry Date: - Issue No: 102 Version Start Date: 01/04/2010 Version End Date: -
-	792m W	Status: Historical Licence No: 10/41/310103 Details: General Farming & Domestic Direct Source: Southern Region Groundwater Point: REYNARDS NURSERY Data Type: Point Name: Fox Esq Easting: 508900 Northing: 103570	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 01/01/1971 Version End Date: -
-	1099m W	Status: Active Licence No: 10/41/310112 Details: Spray Irrigation - Direct Direct Source: Southern Region Groundwater Point: ROUNDSTONE FARM FERRING Data Type: Point Name: Langmead Easting: 508580 Northing: 104120	Annual Volume (m³): 77,270 Max Daily Volume (m³): 1,820 Original Application No: - Original Start Date: 03/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 08/06/2009 Version End Date: -
-	1141m E	Status: Active Licence No: SO/041/0024/012 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Southern Region Groundwater Point: BOREHOLE AT ROMANY ROAD WORTHING Data Type: Point Name: David Lloyd Leisure Limited Easting: 510754 Northing: 104162	Annual Volume (m³): 25,550 Max Daily Volume (m³): 70 Original Application No: - Original Start Date: 15/08/2017 Expiry Date: 31/03/2028 Issue No: 1 Version Start Date: 15/08/2017 Version End Date: -

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

5.7 Surface water abstractions

Records within 2000m	0
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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.



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

5.8 Potable abstractions

Records within 2000m	1
-----------------------------	----------

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 38**

ID	Location	Details	
-	1141m E	Status: Active Licence No: SO/041/0024/012 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Southern Region Groundwater Point: BOREHOLE AT ROMANY ROAD WORTHING Data Type: Point Name: David Lloyd Leisure Limited Easting: 510754 Northing: 104162	Annual Volume (m³): 25,550 Max Daily Volume (m³): 70 Original Application No: - Original Start Date: 15/08/2017 Expiry Date: 31/03/2028 Issue No: 1 Version Start Date: 15/08/2017 Version End Date: -

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

5.9 Source Protection Zones

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

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

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

5.10 Source Protection Zones (confined aquifer)

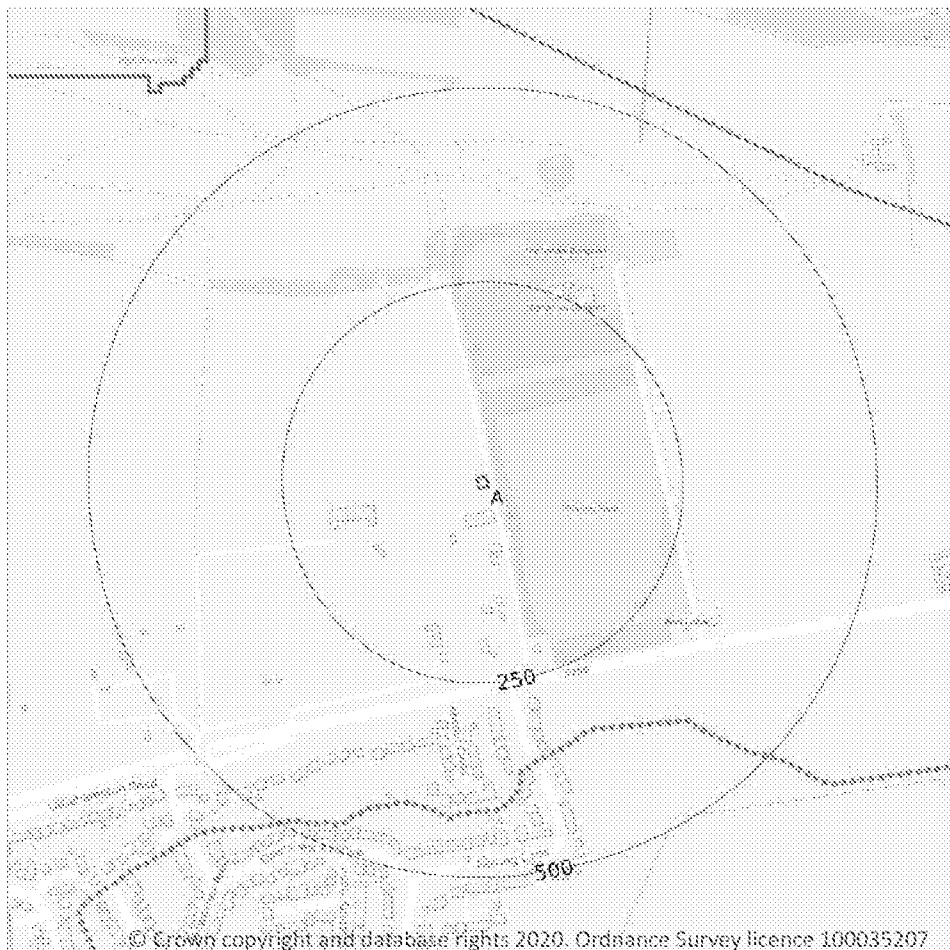
Records within 500m	0
----------------------------	----------

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

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



6 Hydrology



- Site Outline
- Search buffers in metres (m)
- Water Network (OS MasterMap)
- Surface water features (wider than 5m)
- Surface water features (narrower than 5m)
- WFD River, canal and surface water transfer water bodies
- WFD Lake water bodies
- WFD Transitional and coastal water bodies
- WFD Surface water body catchments boundaries
- WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m

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 41**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	On site	River WB catchment	Ferring Rife	GB107041073300	Lower Arun	Arun and Western Streams

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

6.4 WFD Surface water bodies

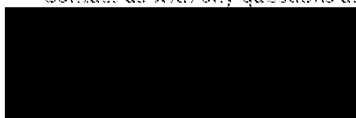
Records identified	1
---------------------------	----------

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 41**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
2	339m SE	River	Ferring Rife	GB107041073300	Good	Good	Good	2016

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



6.5 WFD Groundwater bodies

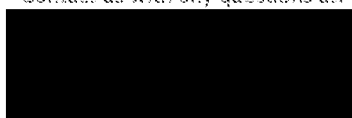
Records on site	1
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Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 41**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
A	On site	Littlehampton Anticline East	GB40701G503400	Good	Good	Good	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

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

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

7.7 Flood Zone 3

Records within 50m
0

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

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



8 Surface water flooding

8.1 Surface water flooding

Highest risk on site

Negligible

Highest risk within 50m

Negligible

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.

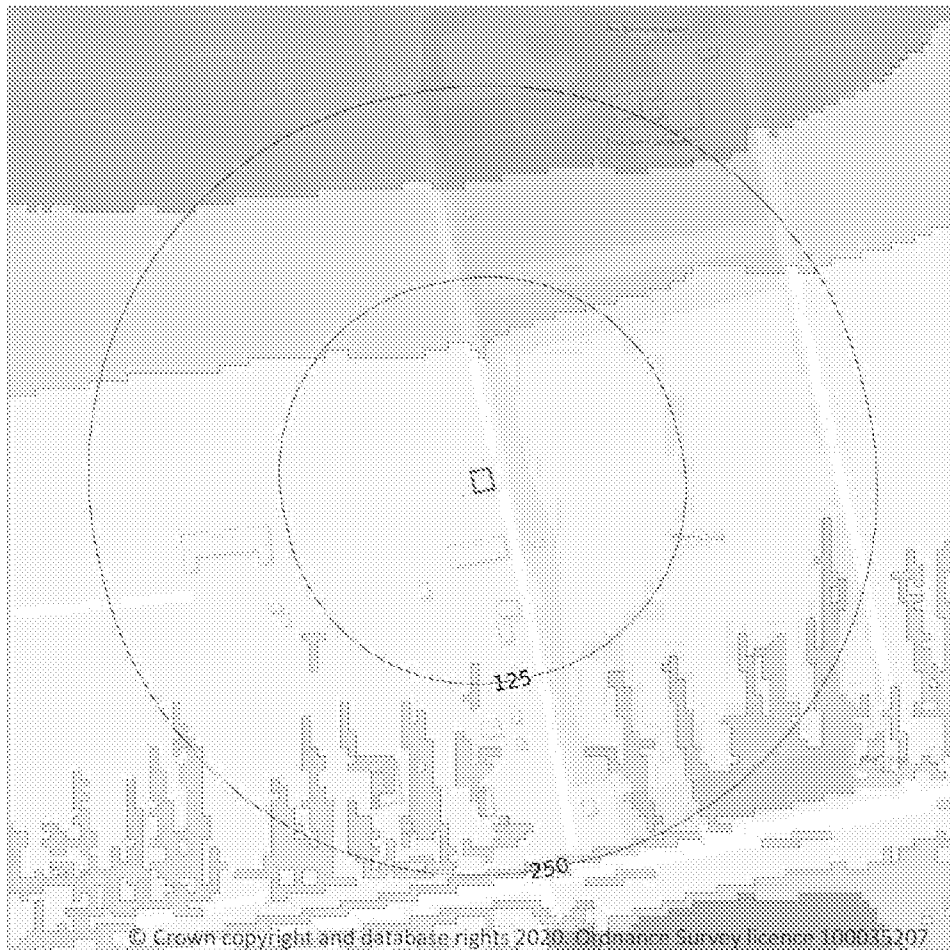
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the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

Return period	Maximum modelled depth
1 in 1000 year	Negligible
1 in 250 year	Negligible
1 in 100 year	Negligible
1 in 30 year	Negligible

This data is sourced from Ambiental Risk Analytics.



9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site

Moderate

Highest risk within 50m

Moderate

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 48](#)

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

17

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 49**

ID	Location	Name	Woodland Type
1	576m N	Unknown	Ancient & Semi-Natural Woodland
A	664m NE	white house coppice, millers croft	Ancient & Semi-Natural Woodland
2	670m N	farmer land coppice	Ancient & Semi-Natural Woodland
A	826m NE	the white house coppice	Ancient & Semi-Natural Woodland
3	857m NE	the white house coppice	Ancient & Semi-Natural Woodland
A	881m NE	the white house coppice	Ancient & Semi-Natural Woodland
4	1080m N	Unknown	Ancient & Semi-Natural Woodland
5	1085m NE	Unknown	Ancient & Semi-Natural Woodland
6	1244m N	Unknown	Ancient & Semi-Natural Woodland
7	1247m N	Unknown	Ancient & Semi-Natural Woodland
-	1350m E	Unknown	Ancient & Semi-Natural Woodland
-	1419m N	Unknown	Ancient & Semi-Natural Woodland
10	1430m NE	Unknown	Ancient & Semi-Natural Woodland
-	1538m N	Unknown	Ancient & Semi-Natural Woodland
-	1629m N	Unknown	Ancient & Semi-Natural Woodland
-	1645m N	Unknown	Ancient & Semi-Natural Woodland

ID	Location	Name	Woodland Type
-	1939m N	clapham common	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
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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.

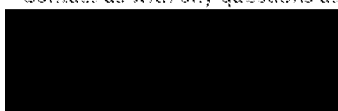
This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

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**1**

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
1169m W	Sussex Chalk	Groundwater	GS6	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

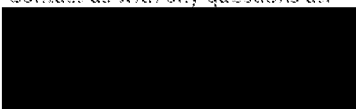
1

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 55](#)

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

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



- Site Outline
- Search buffers in metres (m)
- Listed buildings
- Conservation areas
- Conservation areas - no data
- National Parks
- Areas of Outstanding Natural Beauty
- Registered parks and gardens
- Scheduled Monuments
- World Heritage Sites

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

1

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.

Features are displayed on the Visual and cultural designations map on [page 57](#)

ID	Location	Name	Data Source
1	10m E	South Downs	Natural England

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	1
----------------------------	----------

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.

Features are displayed on the Visual and cultural designations map on **page 57**

ID	Location	Name	District	Date of designation
2	11m E	The Local Authority for this area have not supplied conservation area data		-

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

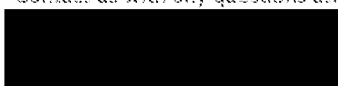
Records within 250m	1
----------------------------	----------

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.

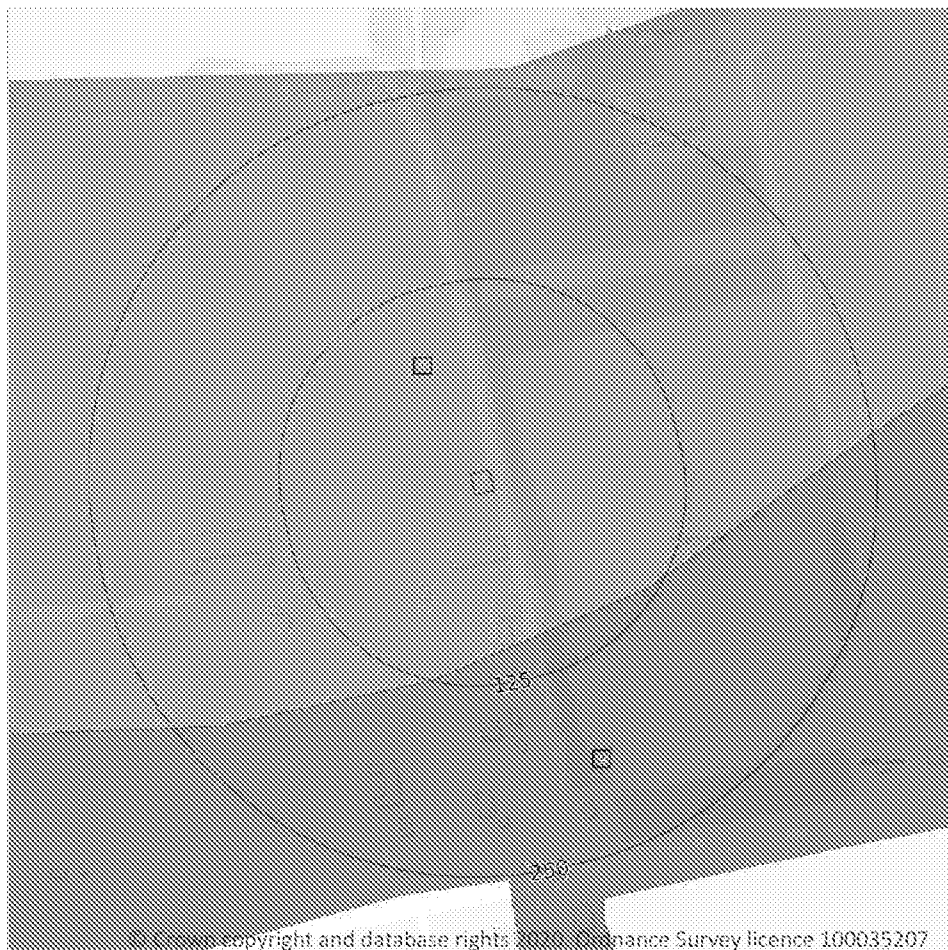
Features are displayed on the Visual and cultural designations map on **page 57**

ID	Location	Name	Grade
3	110m N	Highdown	II*

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

2

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 60**

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	98m 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

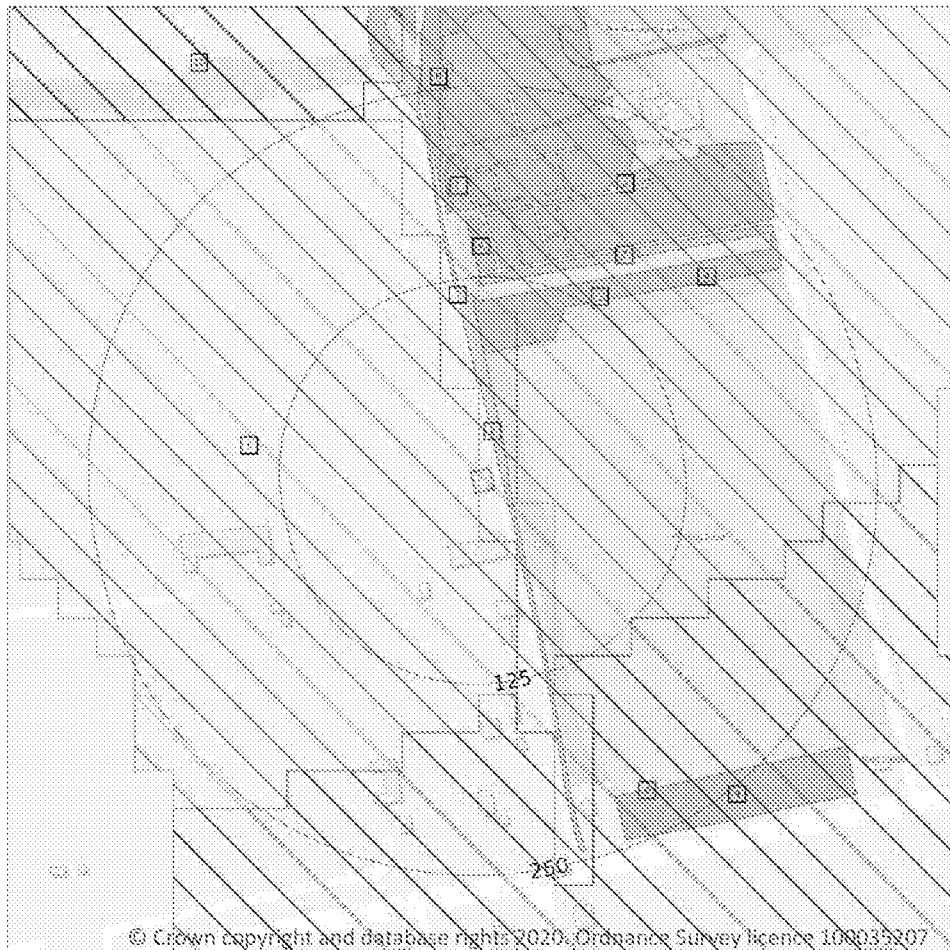
0

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

14

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 63](#)

ID	Location	Main Habitat	Other habitats
3	6m E	Good quality semi-improved grassland	Main habitat: GQSIG (INV > 50%)
5	75m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
7	120m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	128m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)



ID	Location	Main Habitat	Other habitats
A	131m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	135m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	142m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
8	149m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	156m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
B	169m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
C	169m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
C	172m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
B	211m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
9	216m S	Traditional orchard	Main habitat: TORCH (INV > 50%)

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	5
----------------------------	----------

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 63**

ID	Location	Type	Habitat
1	On site	Network Enhancement Zone 1	Not specified
2	On site	Restorable Habitat	Not specified
4	15m E	Network Enhancement Zone 1	Not specified
6	116m S	Network Enhancement Zone 2	Not specified
10	240m N	Primary Habitat	Lowland calcareous grassland

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

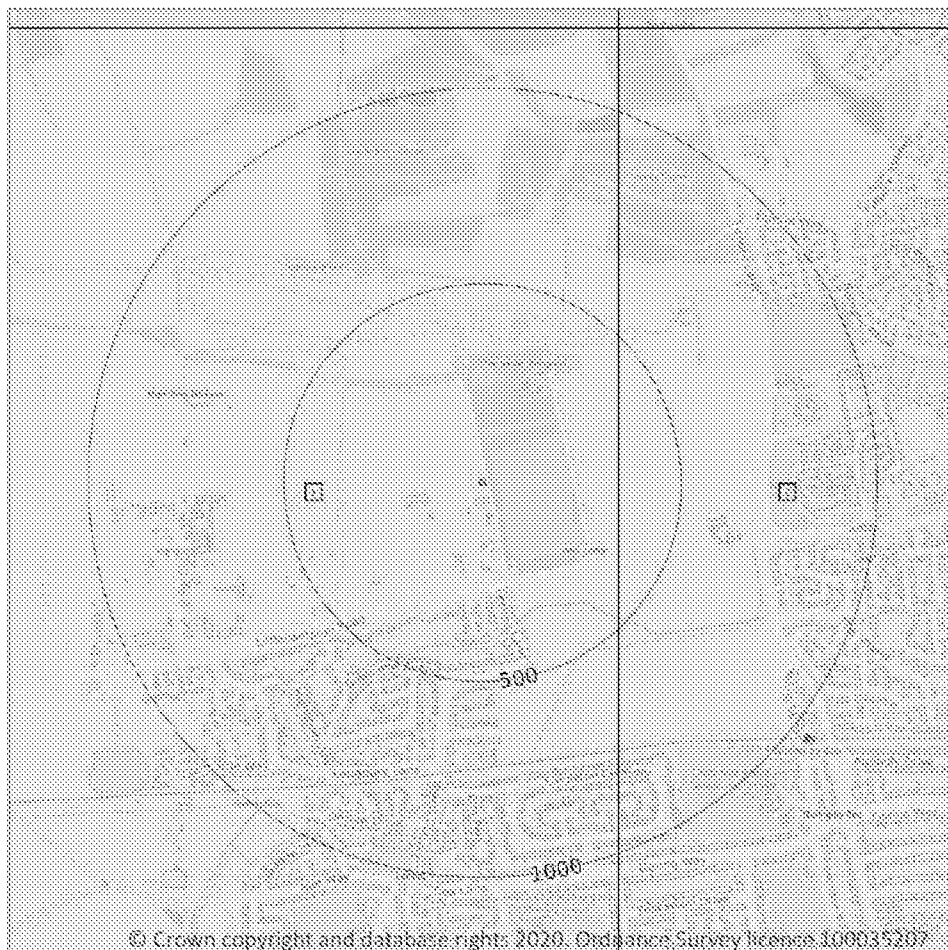
Records within 250m
0

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

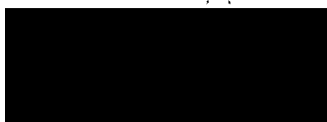
2

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 66](#)

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	TQ00SE
2	340m E	Full	Full	Full	No coverage	TQ10SW

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

1

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on [page 67](#)

ID	Location	LEX Code	Description	Rock description
1	452m NE	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

7

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 68](#)

ID	Location	LEX Code	Description	Rock description
1	On site	HEAD-DMTN	Head - Diamicton	Diamicton
2	75m S	BRK-Z	Brickearth - Silt	Silt
3	313m S	ALV-XSZC	Alluvium - Sand, Silt And Clay	Sand, Silt And Clay

ID	Location	LEX Code	Description	Rock description
4	340m E	HEAD-DMTN	Head - Diamicton	Diamicton
5	340m E	BRK-XSZC	Brickearth - Sand, Silt And Clay	Sand, Silt And Clay
6	396m S	BRK-Z	Brickearth - Silt	Silt
7	474m SE	ALV-CZ	Alluvium - Silty Clay	Clay, Silty

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

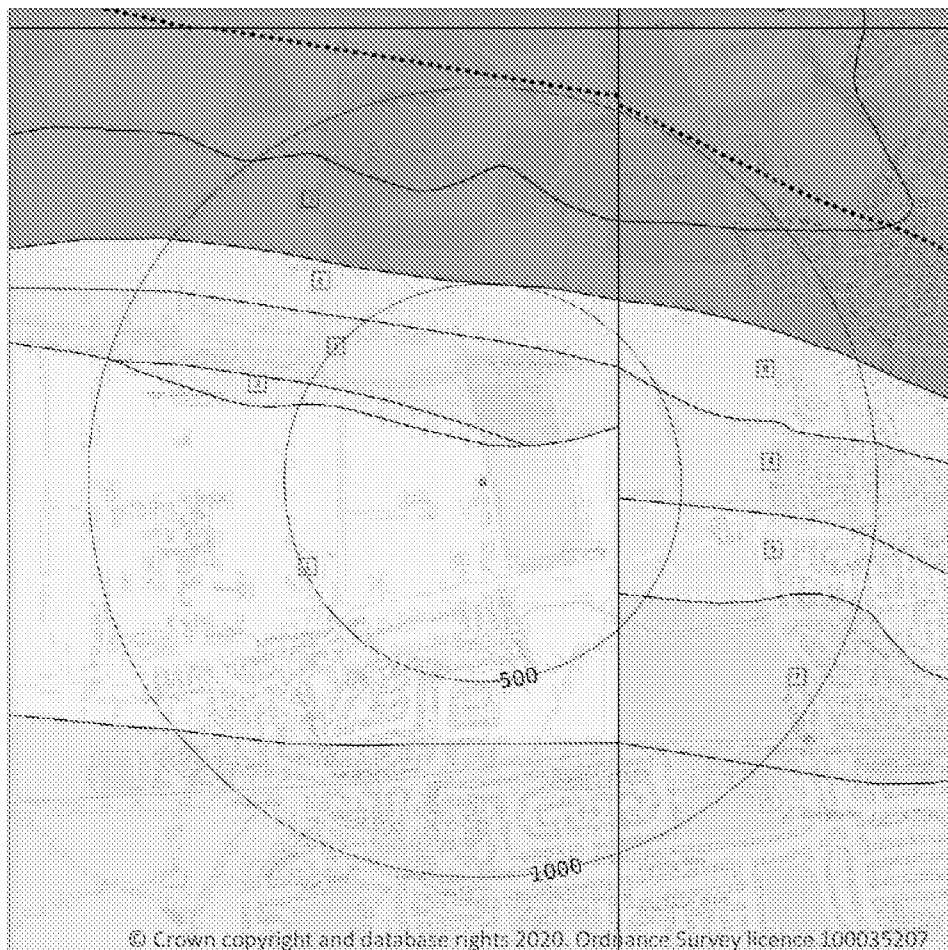
Records within 500m	0
----------------------------	----------

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

9

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 70**

ID	Location	LEX Code	Description	Rock age
1	On site	LPCK-CHLK	Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation And Portsdown Chalk Formation (undifferentiated) - Chalk	Campanian Age - Turonian Age
2	88m N	SECK-CHLK	Seaford Chalk Formation - Chalk	Santonian Age - Coniacian Age



ID	Location	LEX Code	Description	Rock age
3	117m N	NCK-CHLK	Newhaven Chalk Formation - Chalk	Campanian Age - Santonian Age
4	340m E	NCK-CHLK	Newhaven Chalk Formation - Chalk	Campanian Age - Santonian Age
5	341m E	SECK-CHLK	Seaford Chalk Formation - Chalk	Santonian Age - Coniacian Age
6	354m N	TACH-CHLK	Tarrant Chalk Member - Chalk	Campanian Age
7	439m SE	LECH-CHLK	Lewes Nodular Chalk Formation - Chalk	Coniacian Age - Turonian Age
8	447m NE	TACH-CHLK	Tarrant Chalk Member - Chalk	Campanian Age
9	499m N	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

2

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 72](#)

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	EW317_332_chichester_and_bognor_v4
2	303m E	Full	Full	Full	Full	EW318_333_brighton_and_worthing_v4

This data is sourced from the British Geological Survey.



Contact us with any questions at:



Date: 30 July 2020

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)

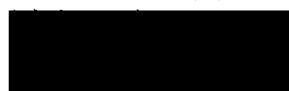
Records within 500m

7

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 74](#)

ID	Location	LEX Code	Description	Rock description
1	On site	HEAD-XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL
2	69m S	RTDU-XSZC	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY
3	303m E	HEAD-XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL



ID	Location	LEX Code	Description	Rock description
4	304m SE	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
5	306m E	RTDU-XSZC	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY
6	390m S	RTDU-XSZC	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY
7	432m SE	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	1
---------------------------	----------

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Mixed	High	Very 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)

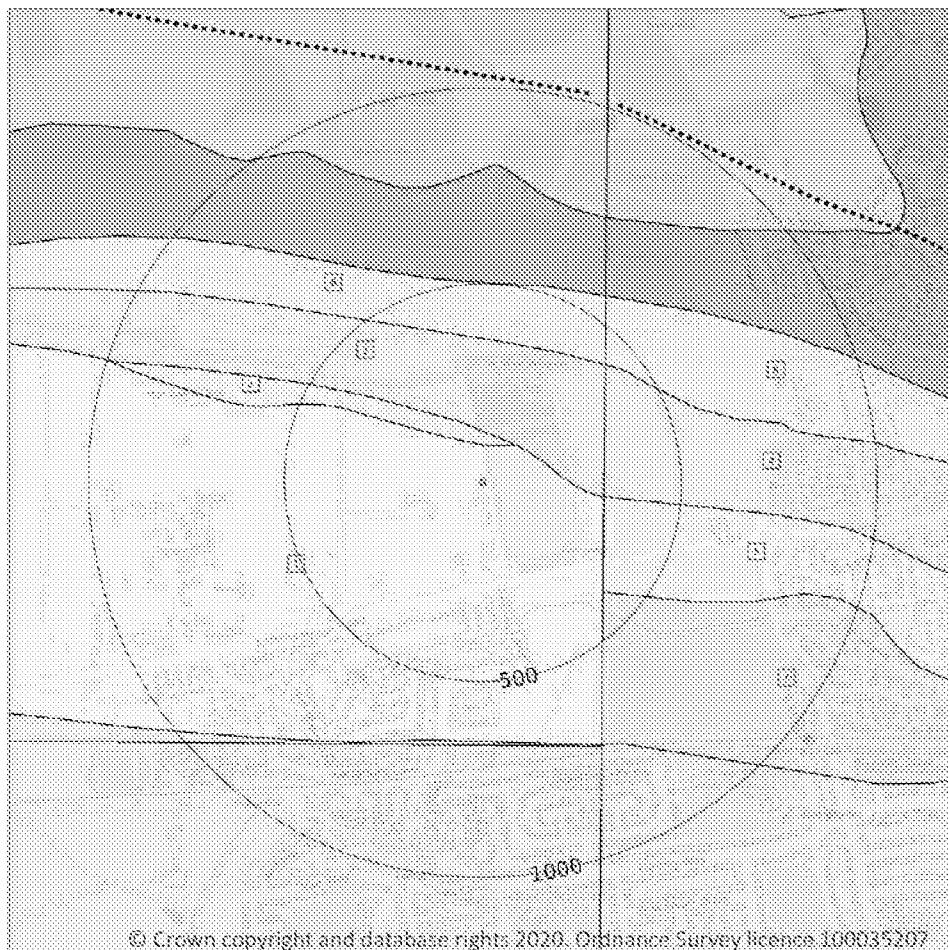
Records within 50m	0
---------------------------	----------

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

8

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 76](#)

ID	Location	LEX Code	Description	Rock age
1	On site	LPCK-CHLK	LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK FORMATION AND PORTSDOWN CHALK FORMATION (UNDIFFERENTIATED) - CHALK	TURONIAN
2	88m N	SECK-CHLK	SEAFORD CHALK FORMATION - CHALK	CONIACIAN



Contact us with any questions at:



Date: 30 July 2020

ID	Location	LEX Code	Description	Rock age
3	112m N	NCK-CHLK	NEWHAVEN CHALK FORMATION - CHALK	SANTONIAN
4	303m E	NCK-CHLK	NEWHAVEN CHALK FORMATION - CHALK	SANTONIAN
5	304m E	SECK-CHLK	SEAFORD CHALK FORMATION - CHALK	CONIACIAN
6	354m N	TACH-CHLK	TARRANT CHALK MEMBER - CHALK	CAMPANIAN
7	407m SE	LECH-CHLK	LEWES NODULAR CHALK FORMATION - CHALK	TURONIAN
8	425m NE	TACH-CHLK	TARRANT CHALK MEMBER - CHALK	CAMPANIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	1
---------------------------	----------

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Fracture	Very High	Very High

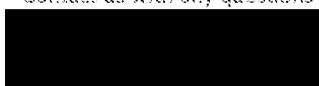
This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

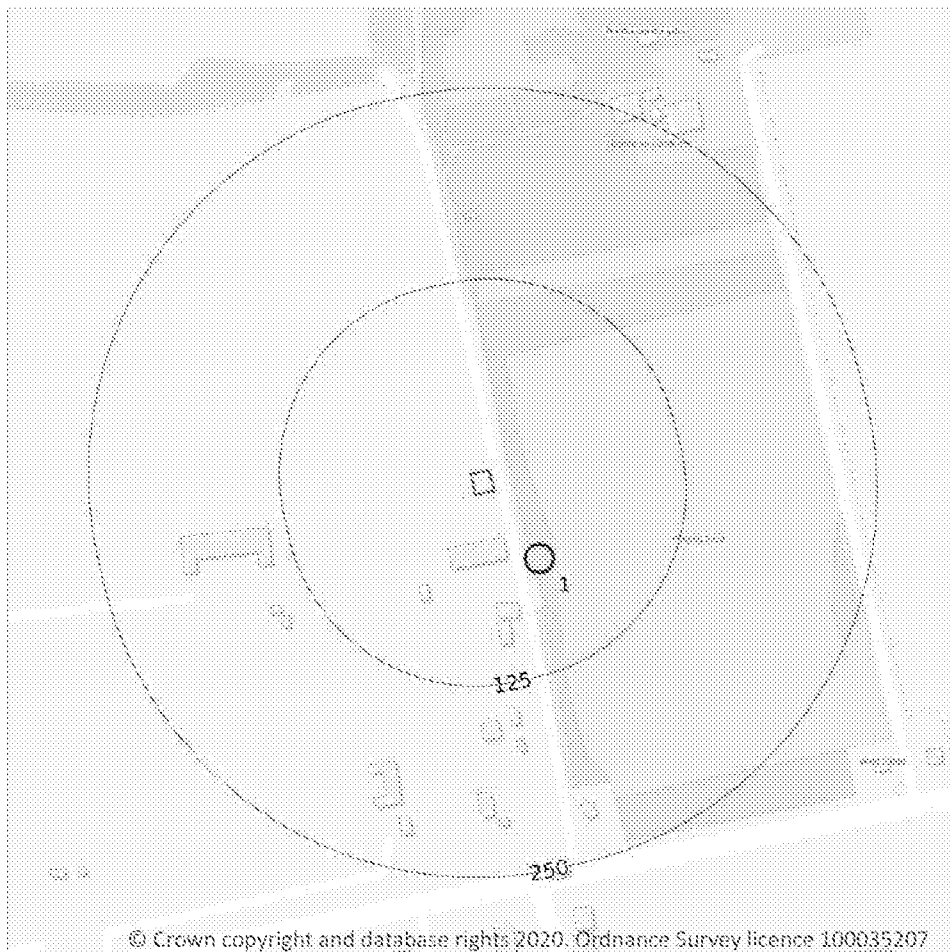
Records within 500m	0
----------------------------	----------

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

1

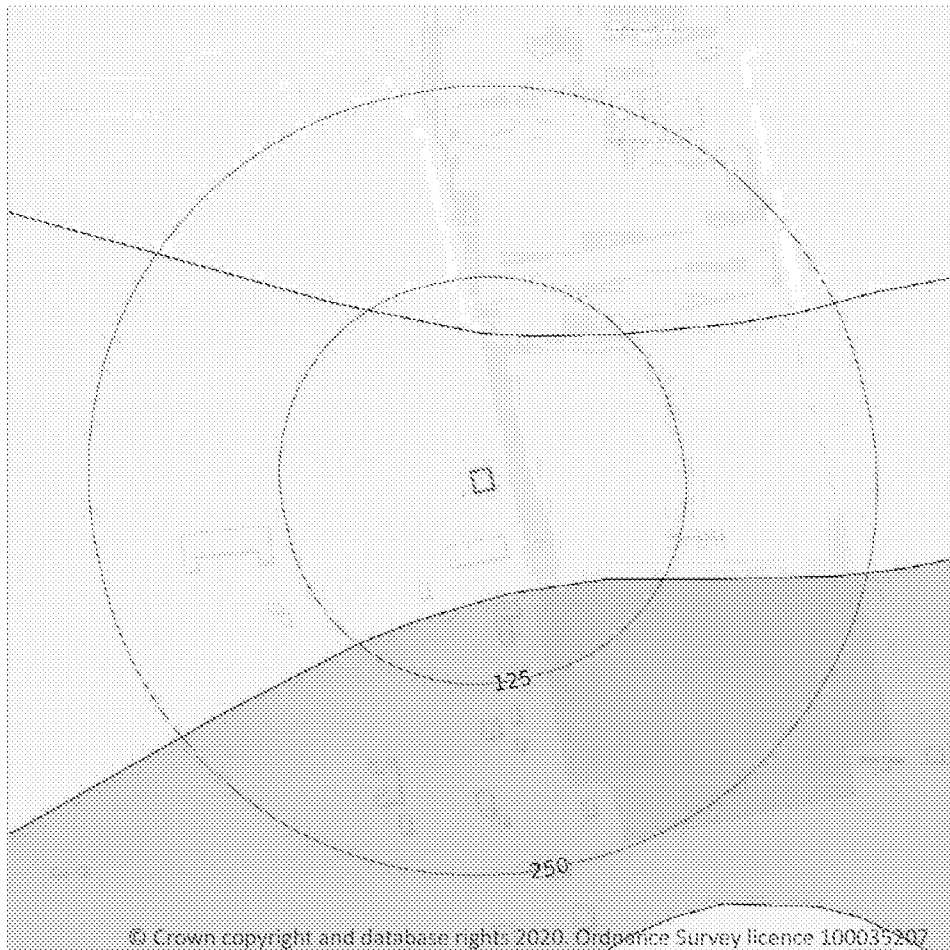
The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

Features are displayed on the Boreholes map on **page 78**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	53m SE	509690 103790	HIGHDOWN TOWER GORING BY SEA	10.05	N	569362

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

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17.1 Shrink swell clays

Records within 50m

1

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

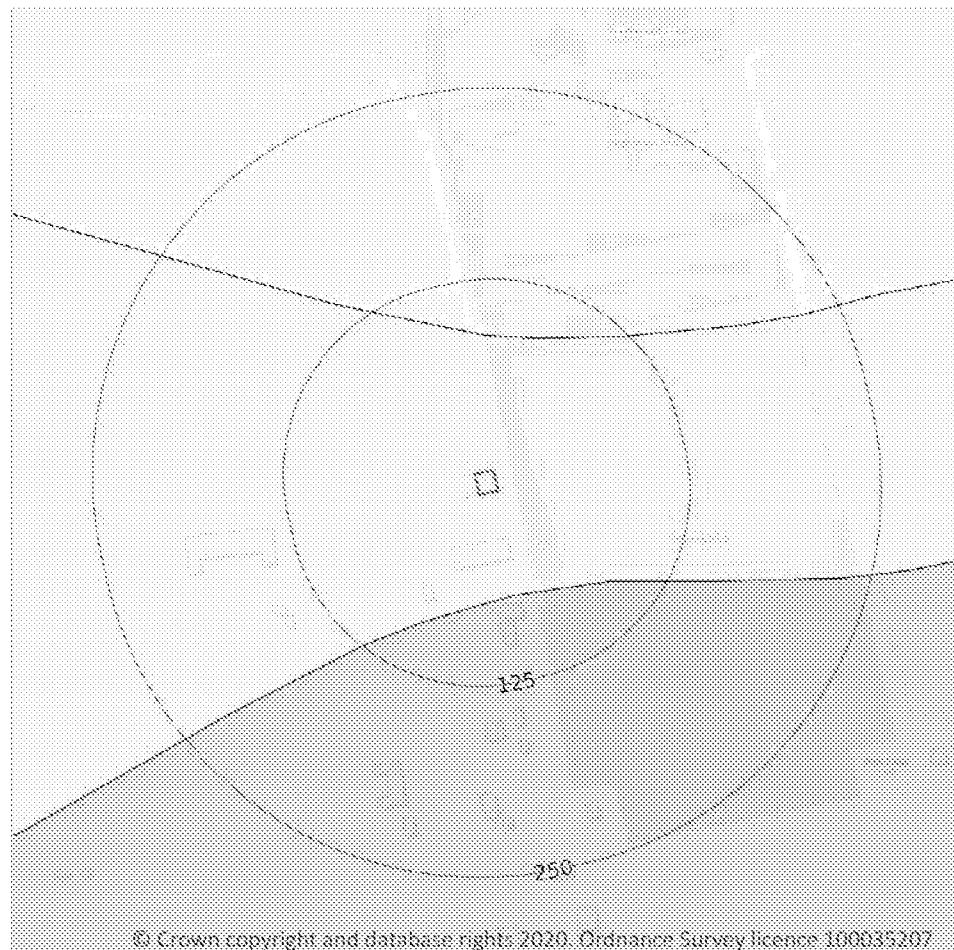
Features are displayed on the Natural ground subsidence - Shrink swell clays map on [page 79](#)

Location	Hazard rating	Details
On site	Very low	Ground conditions predominantly low plasticity.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



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

17.2 Running sands

Records within 50m

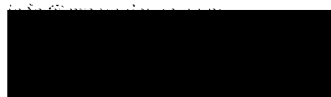
1

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

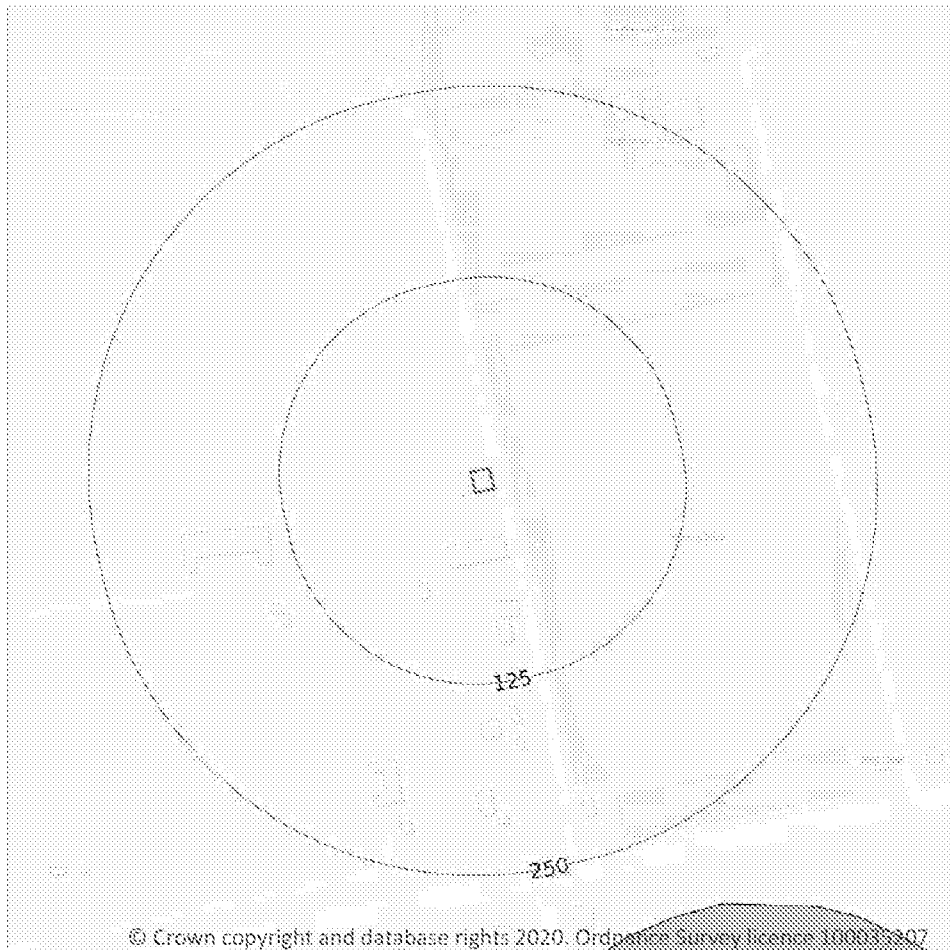
Features are displayed on the Natural ground subsidence - Running sands map on [page 80](#)

Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



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

17.3 Compressible deposits

Records within 50m

1

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

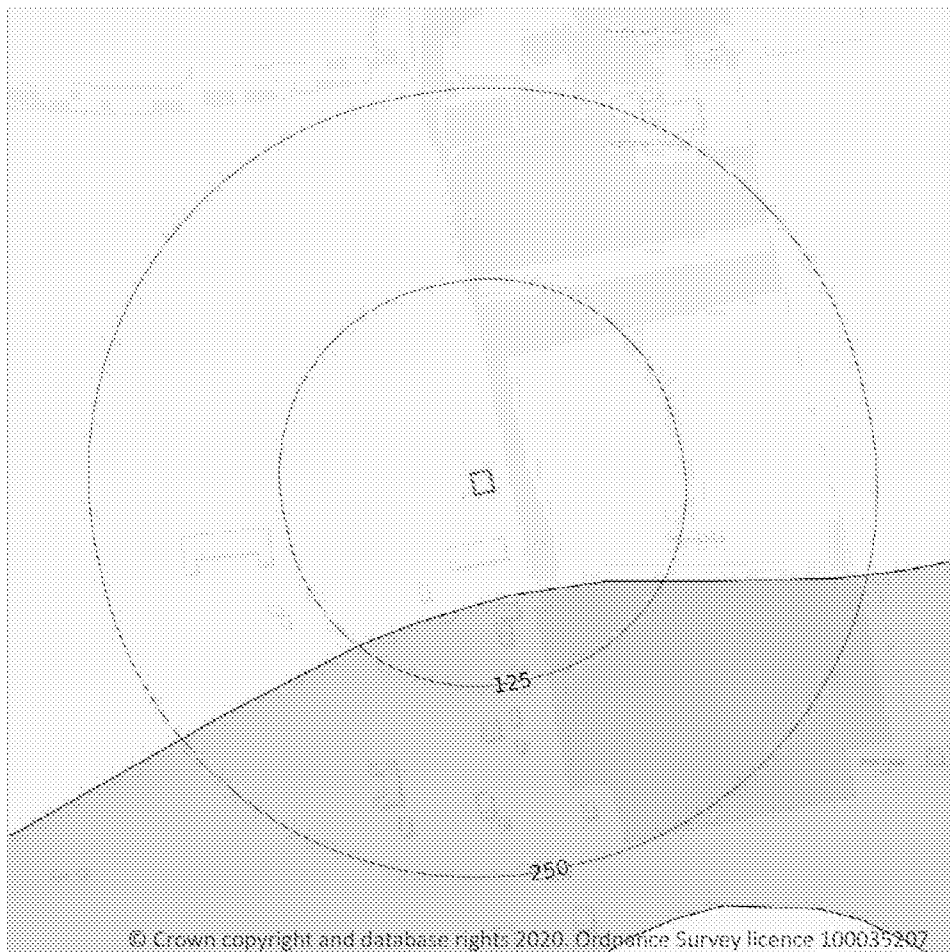
Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 81**

Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Collapsible deposits



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

17.4 Collapsible deposits

Records within 50m

1

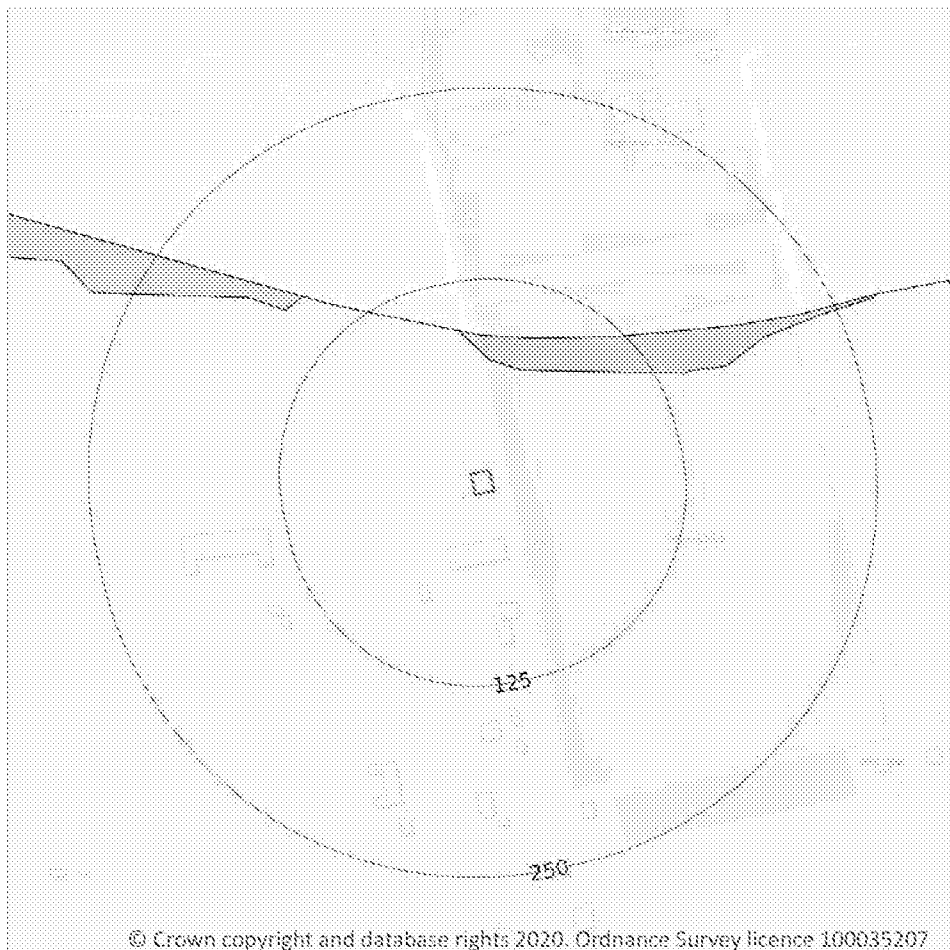
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 82](#)

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



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

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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 83](#)

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.

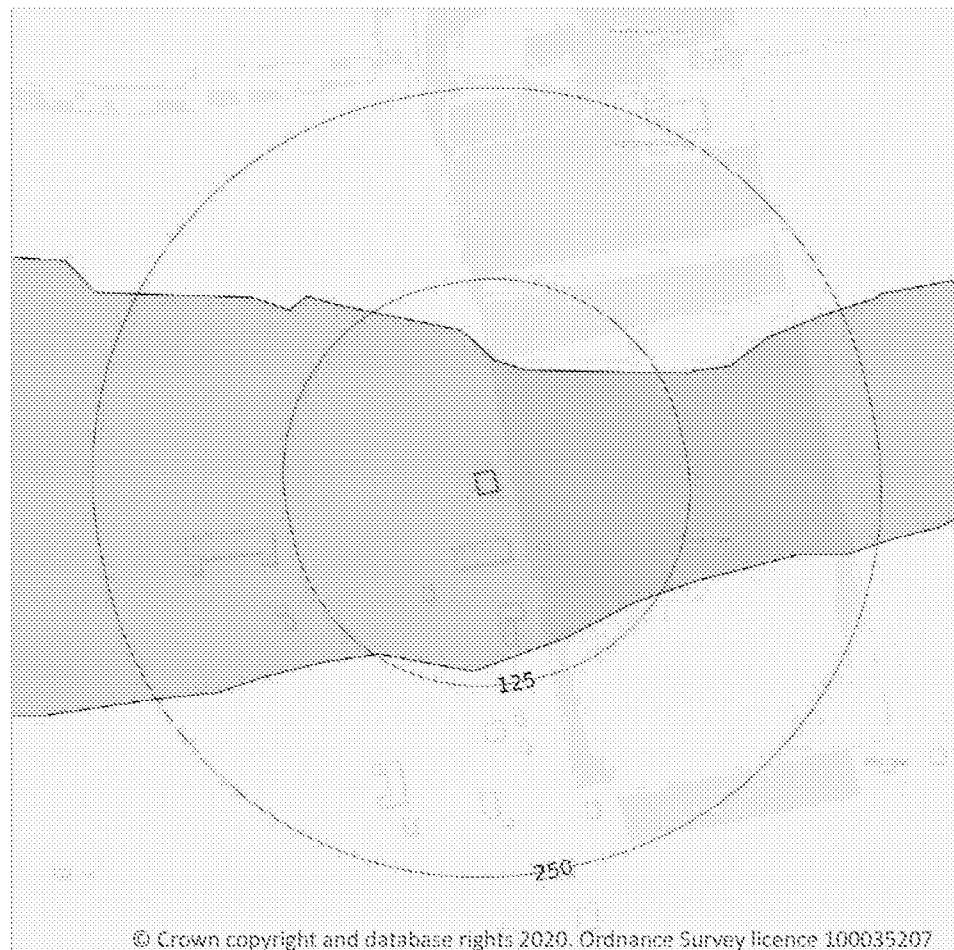
This data is sourced from the British Geological Survey.



Contact us with any questions at:

Date: 30 July 2020

Natural ground subsidence - Ground dissolution of soluble rocks



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

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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 84](#)

Location	Hazard rating	Details
On site	Low	Soluble rocks are present within the ground. Some dissolution features may be present. Potential for difficult ground conditions are at a level where they may be considered, localised subsidence need not be considered except in exceptional circumstances.



This data is sourced from the British Geological Survey.



18 Mining, ground workings and natural cavities



- Site Outline
- Search buffers in metres (m)
- Natural cavities (Area)
- Natural cavities (Point)
- BritPits
- Surface ground workings
- Underground workings
- Historical Mineral Planning Areas
- Mining Cavities
- Non Coal Mining
 - Sporadic underground mining of restricted extent possible
 - Localised small scale underground mining possible
 - Small scale mining possible
 - Underground mining known or likely within or in close proximity
 - Underground mining known within or in very close proximity

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

5

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 86**

ID	Location	Details	Description
A	289m N	Name: Highdown Tower Chalk Pit Address: Angmering, LITTLEHAMPTON, West Sussex Commodity: Chalk 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
A	294m N	Name: Highdown Tower Chalk Pit Address: Angmering, LITTLEHAMPTON, West Sussex Commodity: Chalk 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	402m N	Name: Highdown Tower Chalk Pit Address: Angmering, LITTLEHAMPTON, West Sussex Commodity: Chalk 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	464m NW	Name: Highdown Hill Chalk Pit Address: Angmering, LITTLEHAMPTON, West Sussex Commodity: Chalk 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
F	489m NE	Name: Goring Wood Chalk Pit Address: Durrington, WORTHING, West Sussex Commodity: Chalk 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 86**

ID	Location	Land Use	Year of mapping	Mapping scale
A	217m N	Unspecified Quarry	1957	1:10560
A	218m N	Unspecified Quarry	1943	1:10560
A	218m N	Unspecified Quarry	1932	1:10560
A	218m N	Unspecified Quarry	1910	1:10560
A	220m N	Old Chalk Pits	1896	1:10560
A	223m N	Unspecified Ground Workings	1974	1:10000
A	224m N	Unspecified Ground Workings	1876	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

3

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 86**

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
4	340m 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
5	490m SE	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).

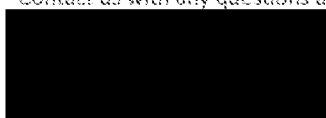
18.8 JPB mining areas

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

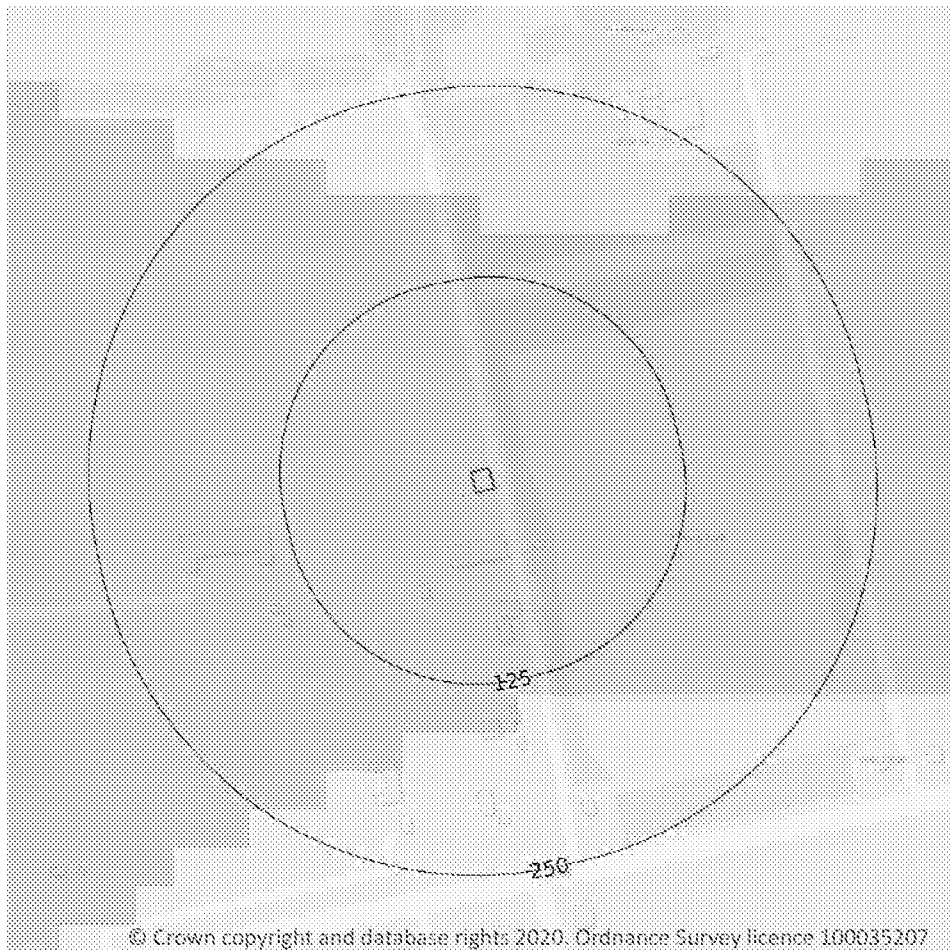
Records on site**0**

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 91](#)

Location	Estimated properties affected	Radon Protection Measures required
On site	Between 5% and 10%	Basic

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

1

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

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.

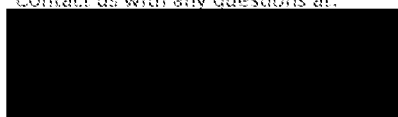
20.3 BGS Measured Urban Soil Chemistry

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
---------------------	---

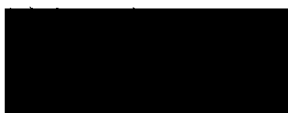
Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

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.

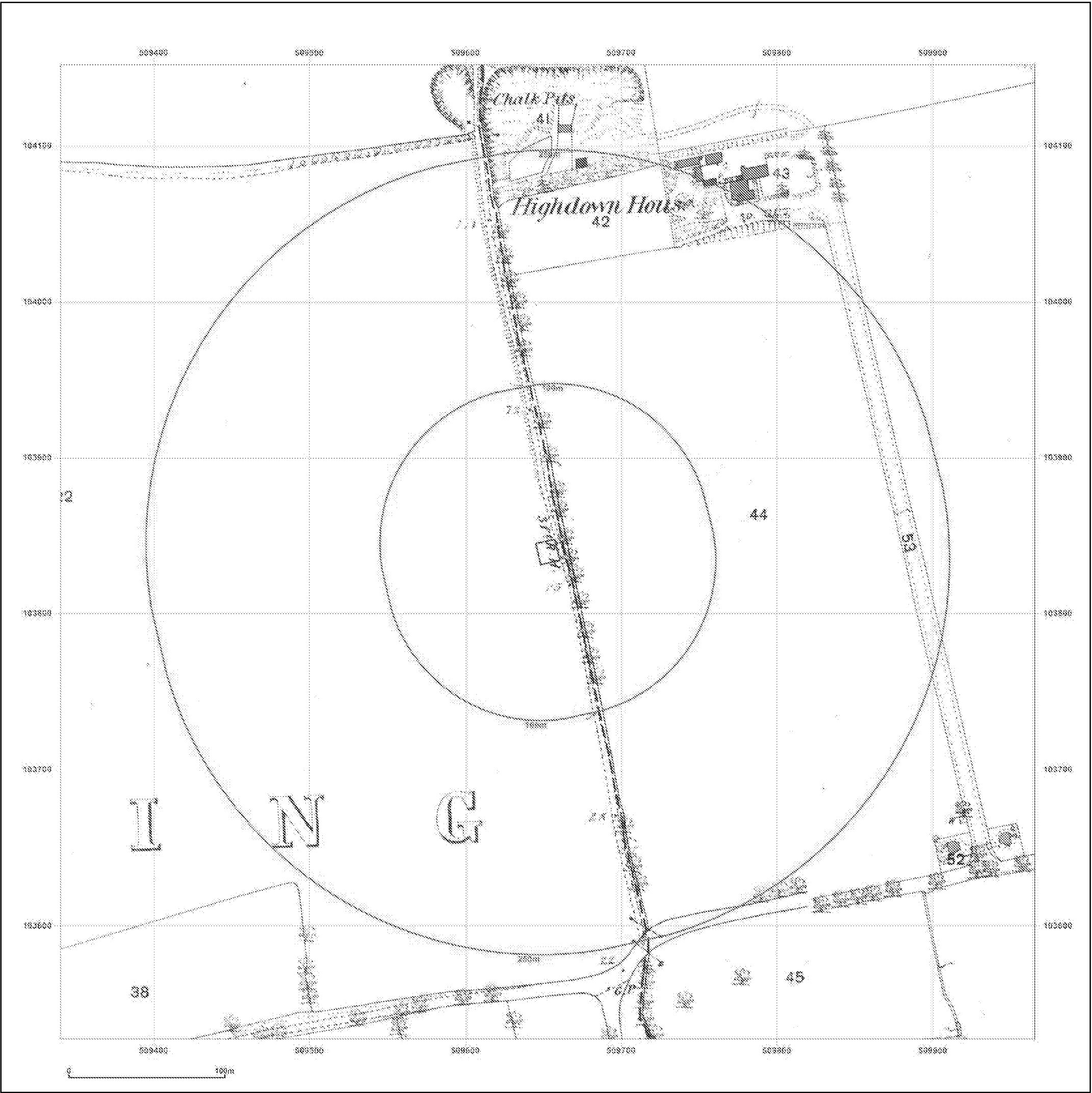


Data providers

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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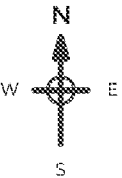
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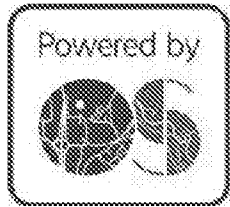
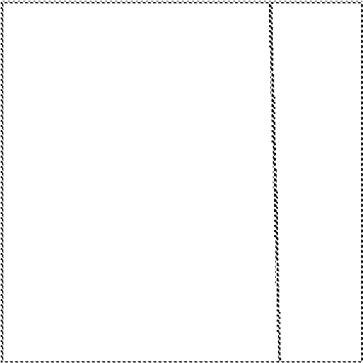
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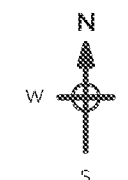
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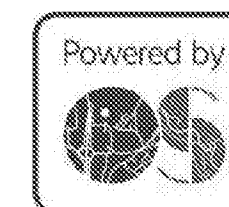
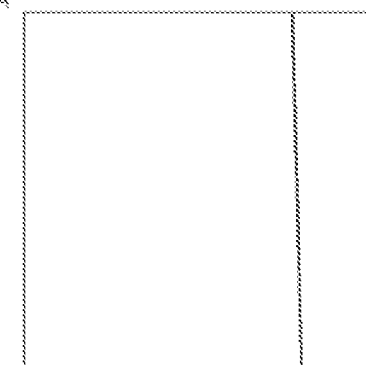
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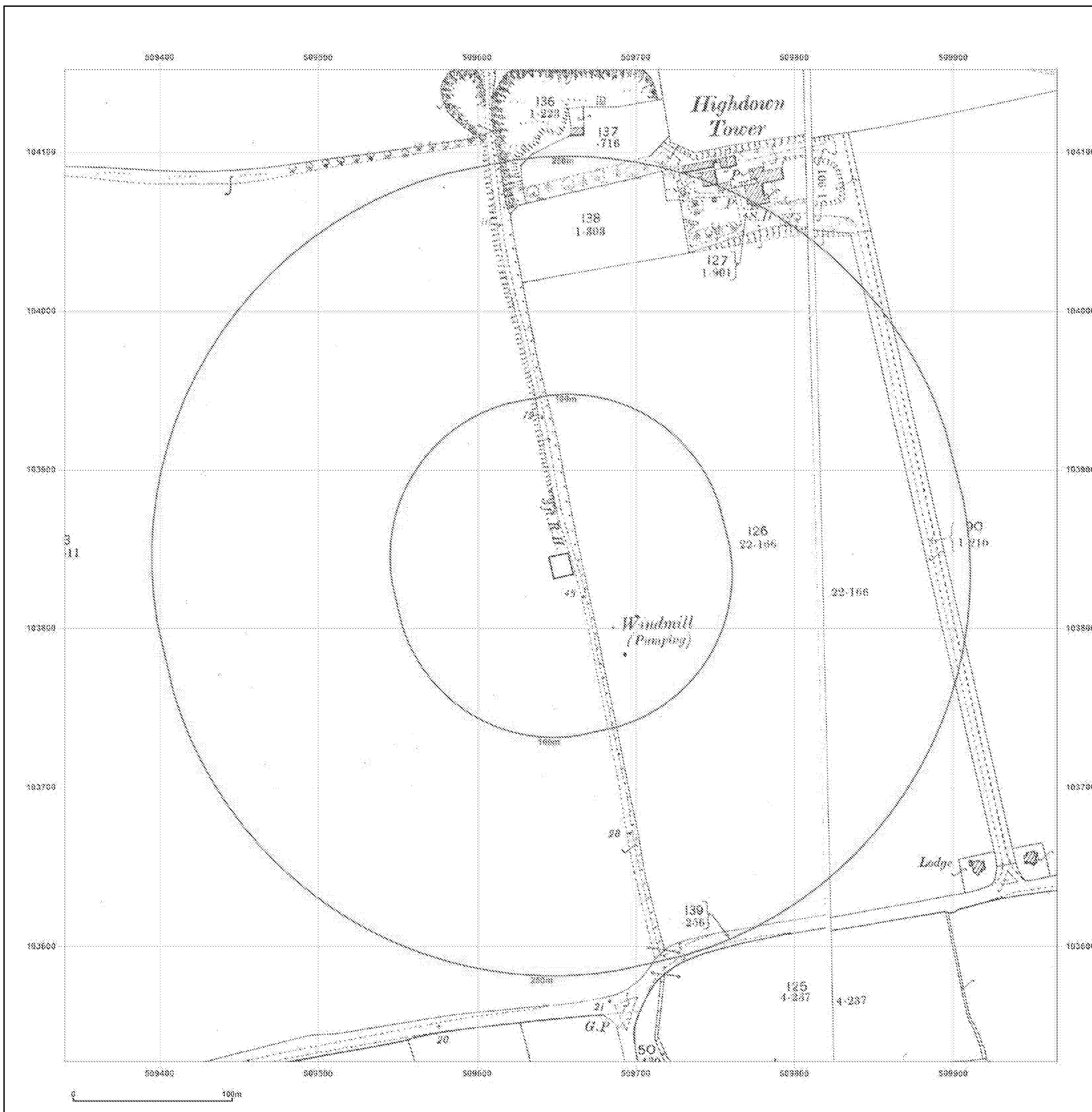


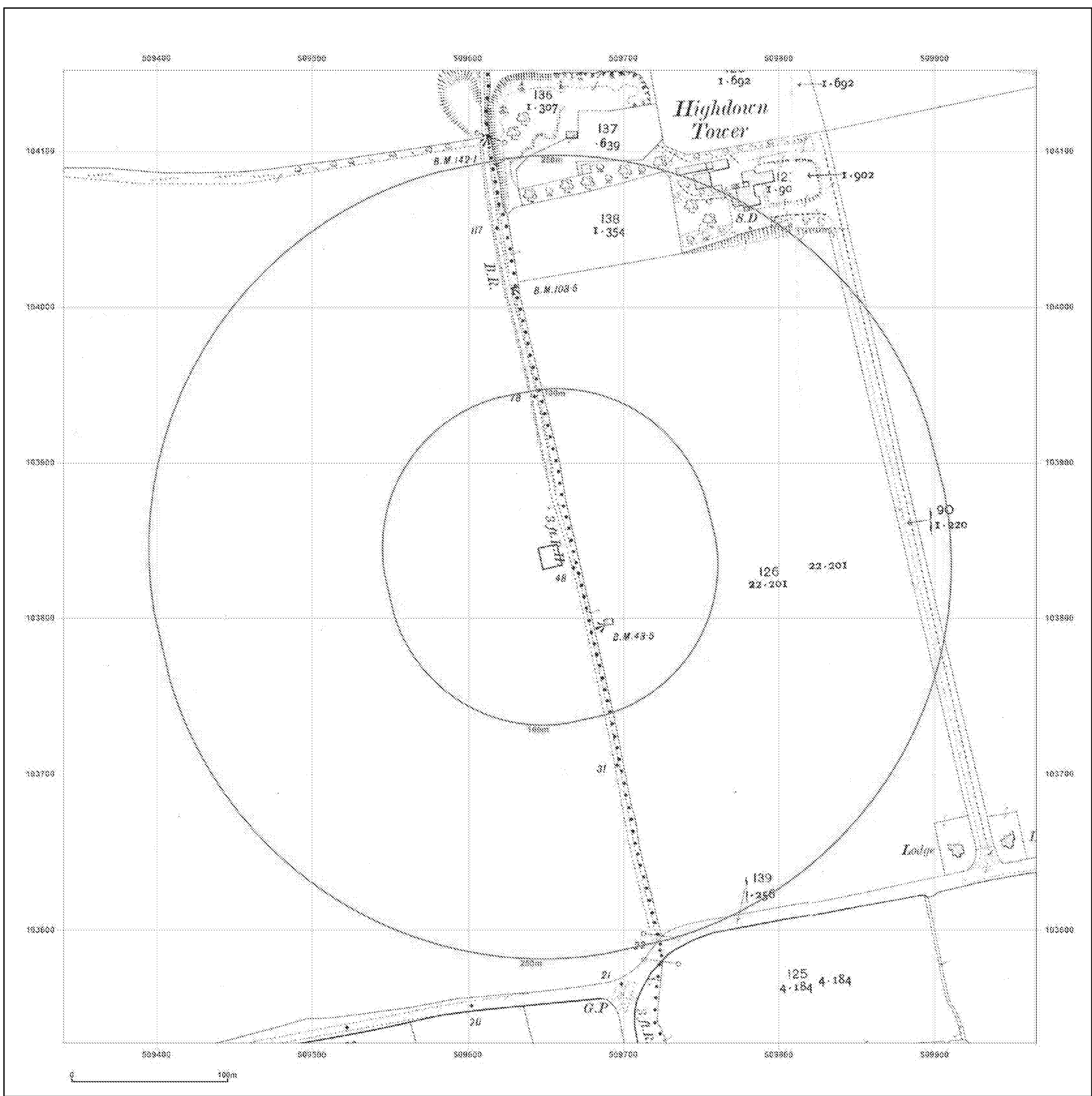
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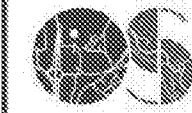
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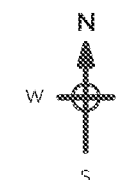
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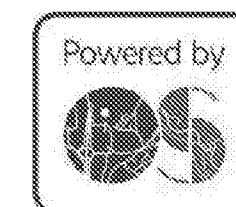
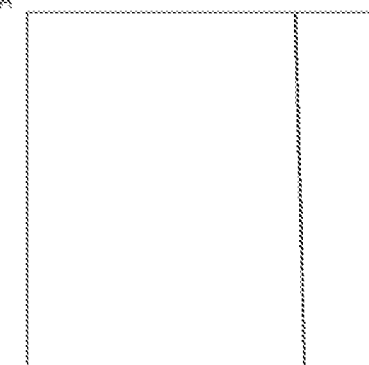
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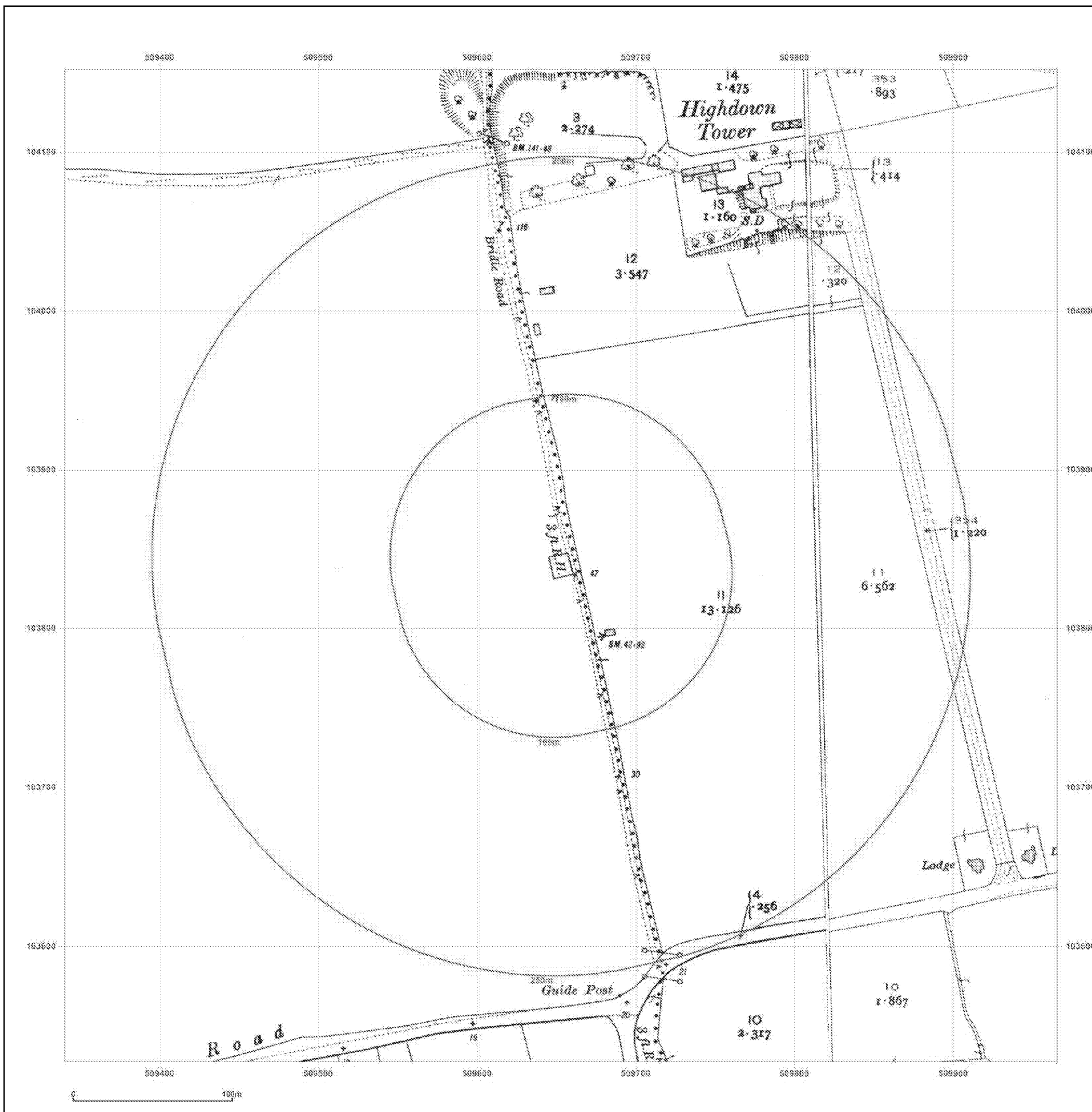


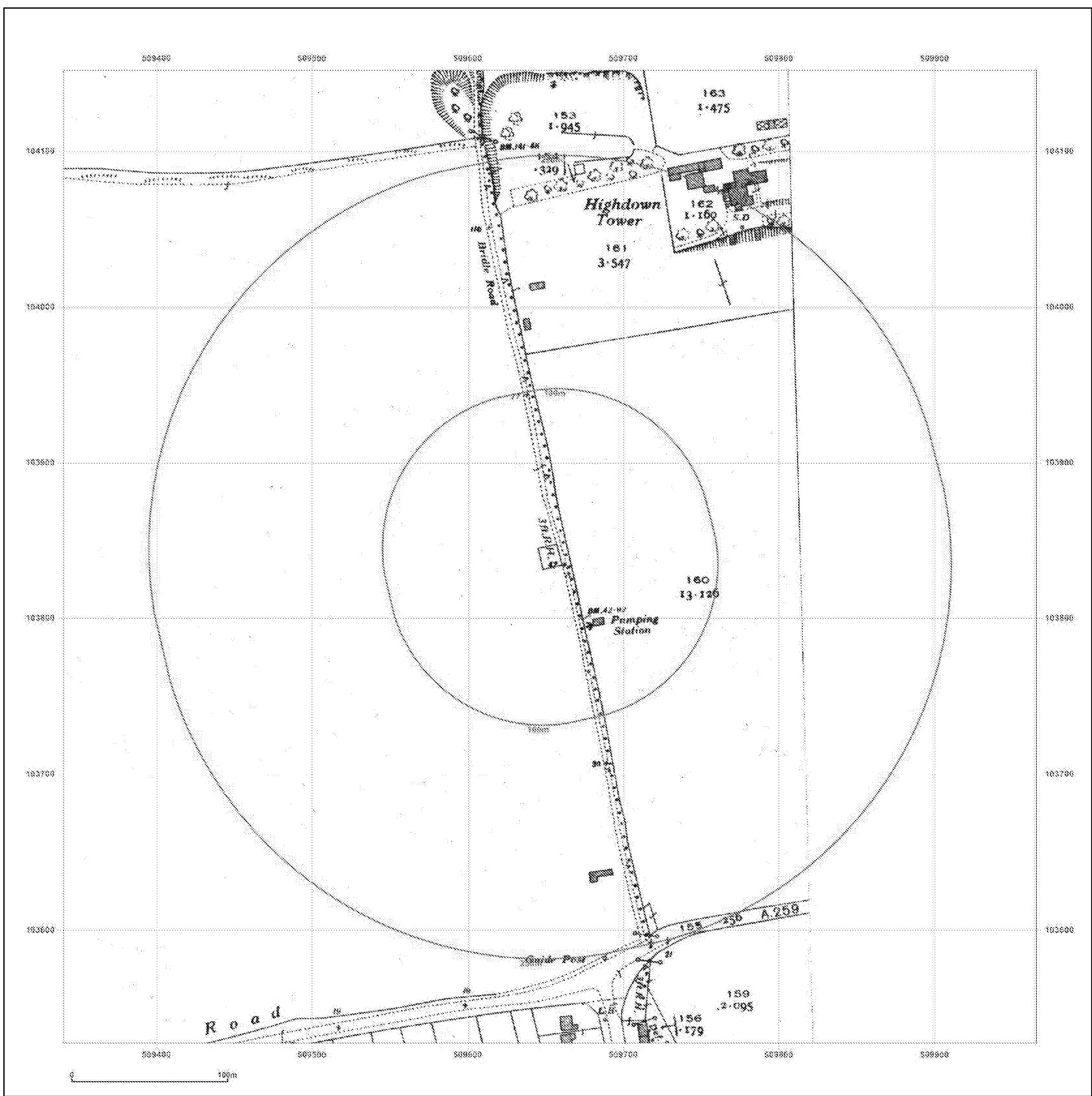
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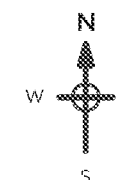
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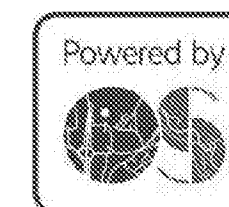
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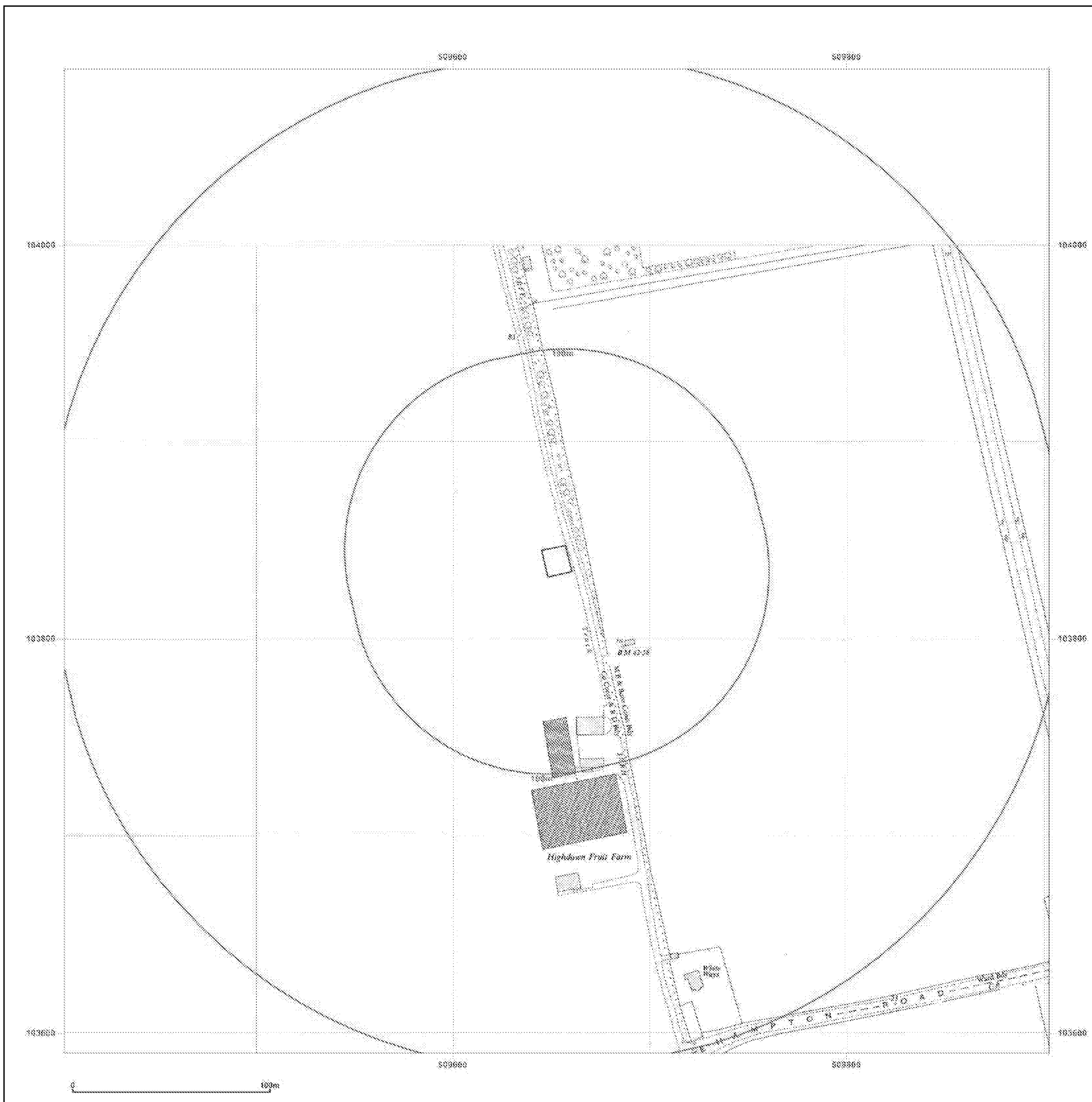


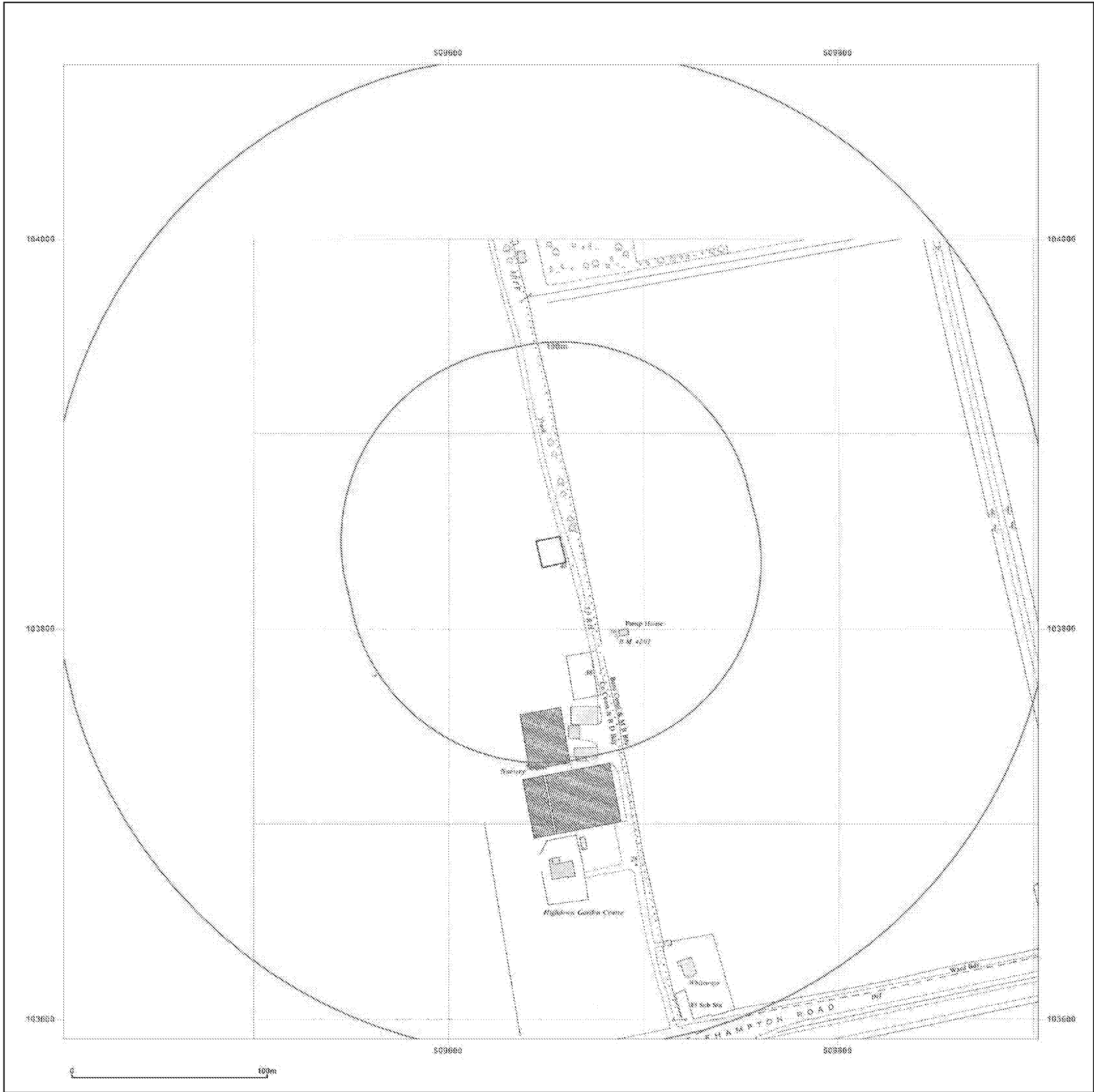
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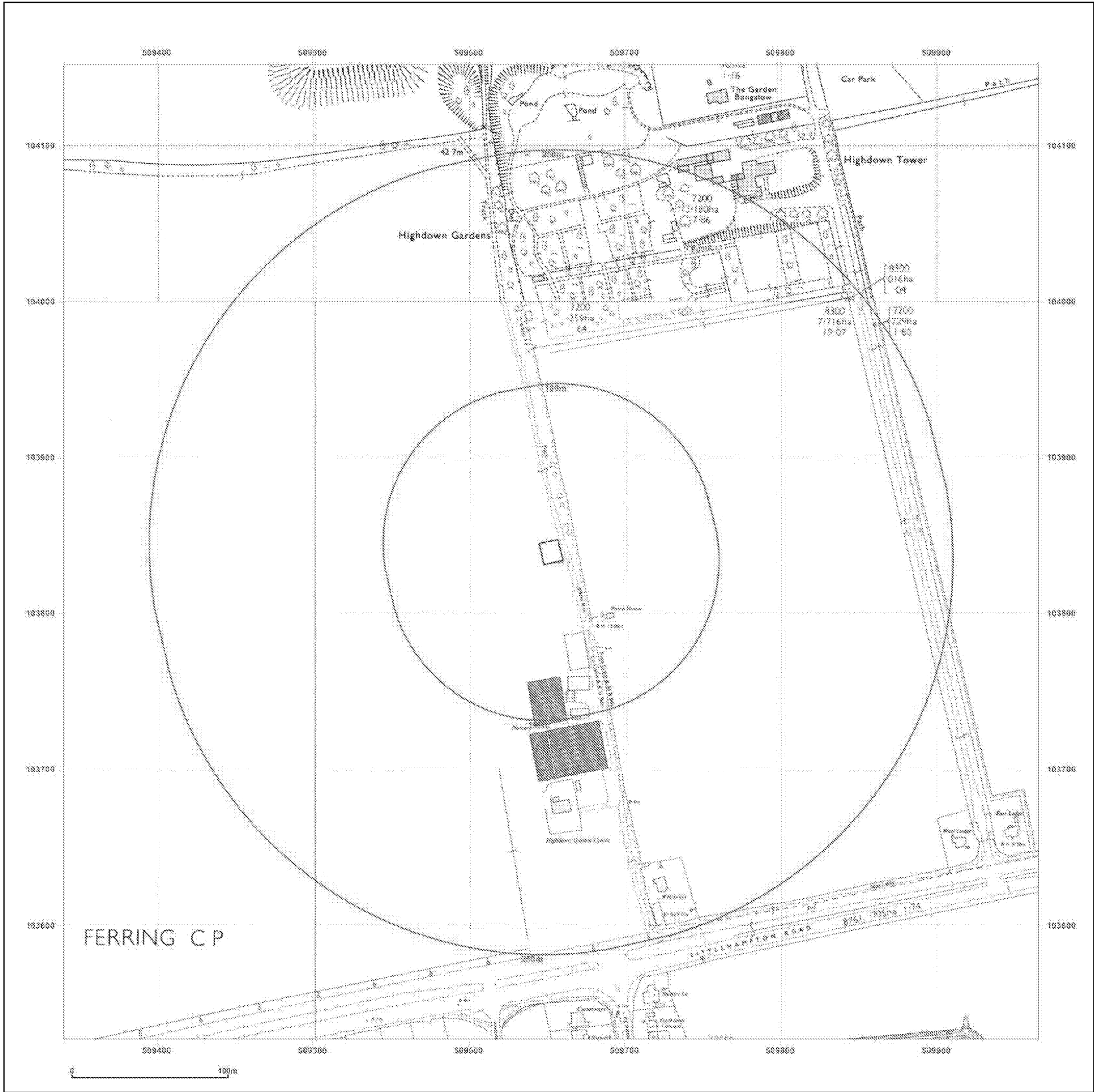
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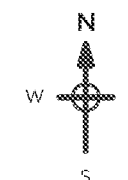
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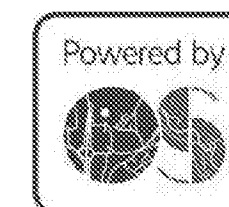
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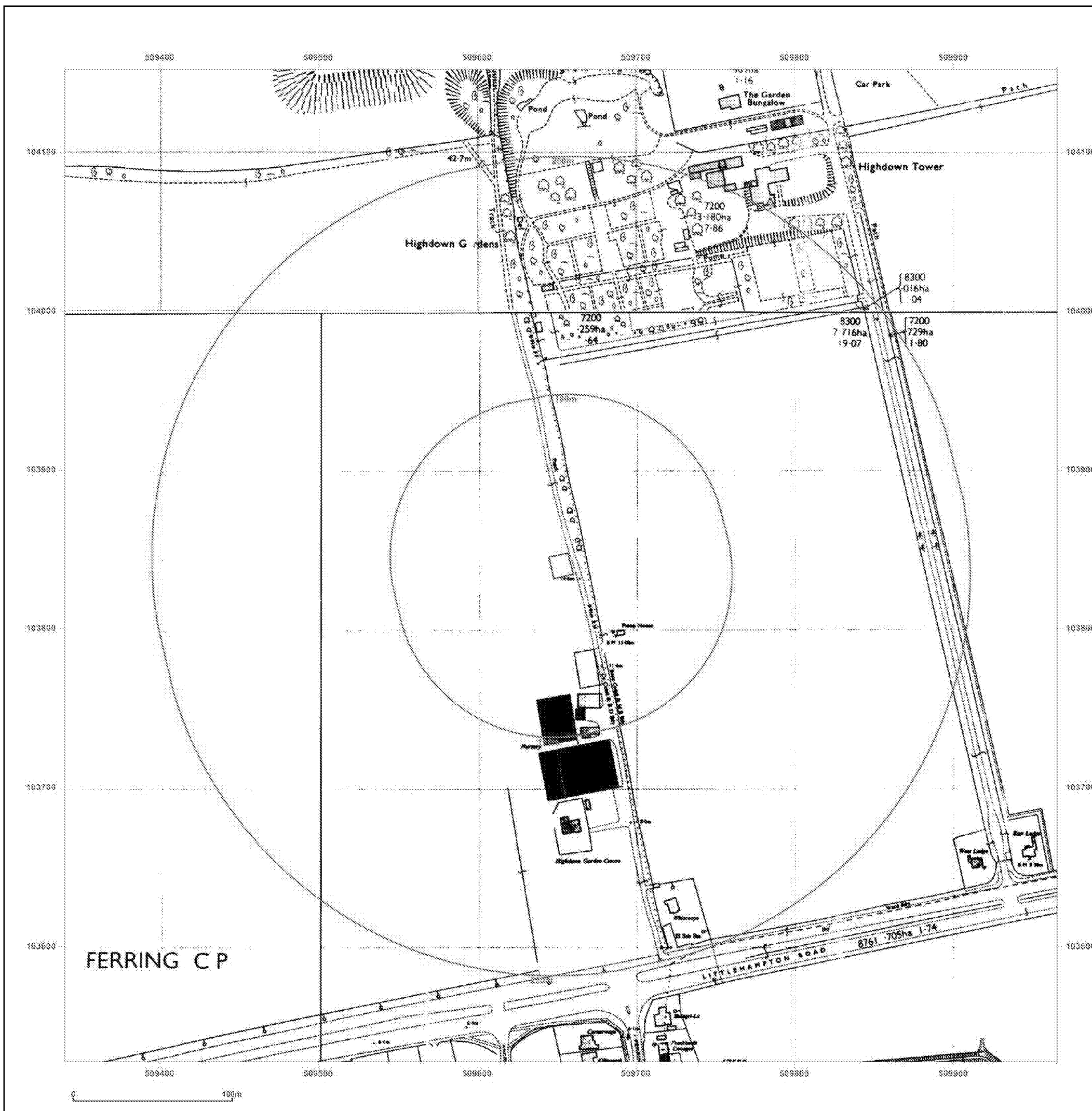


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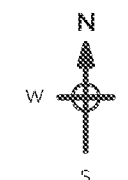
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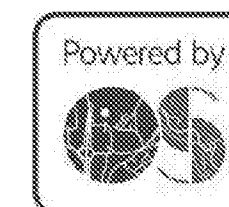
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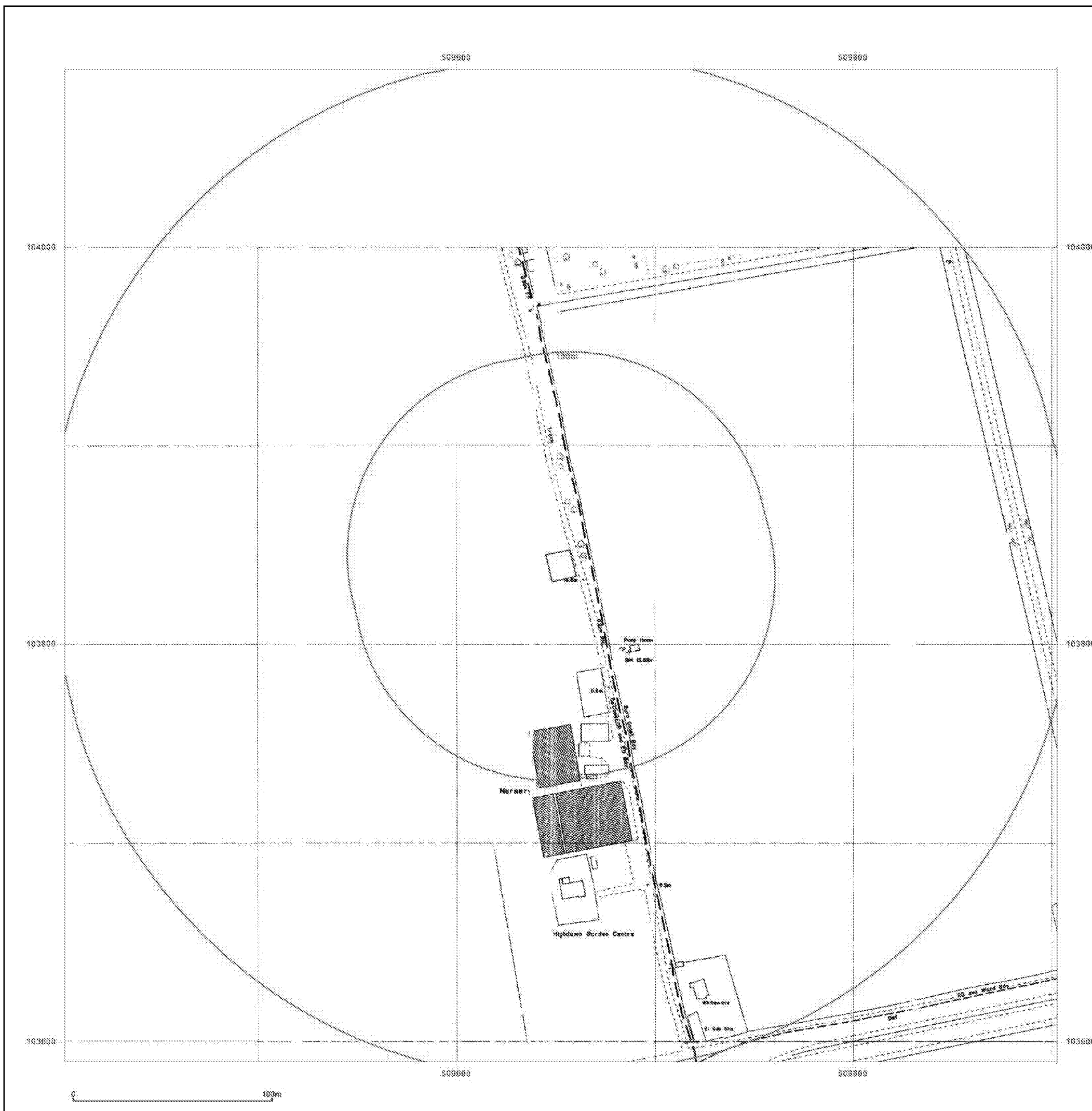


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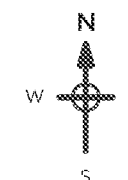
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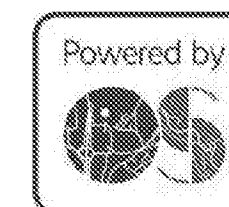
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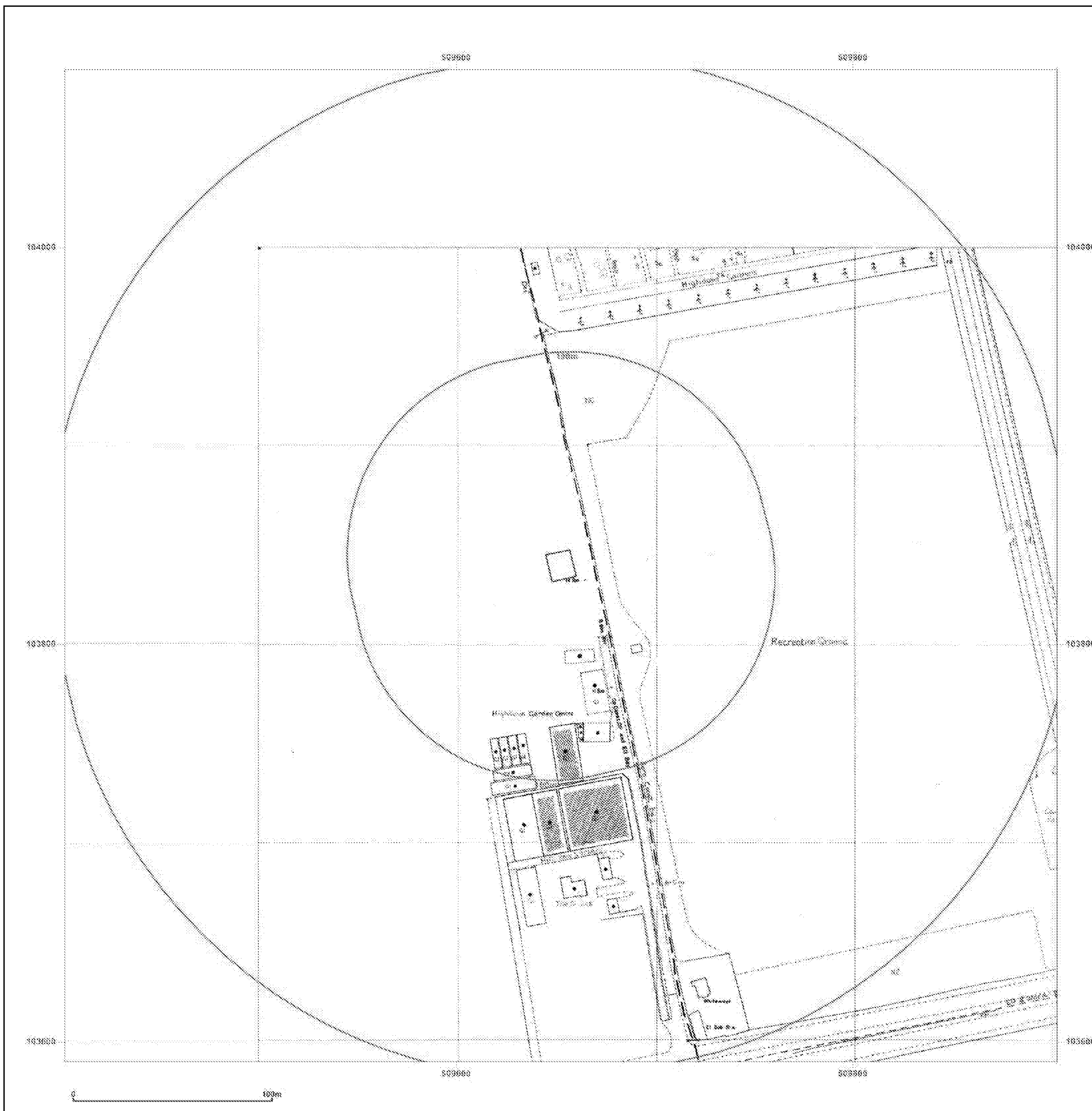


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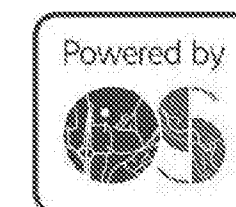
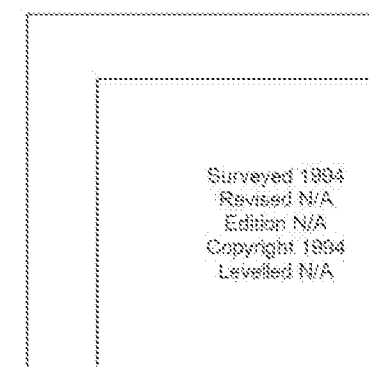
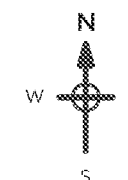
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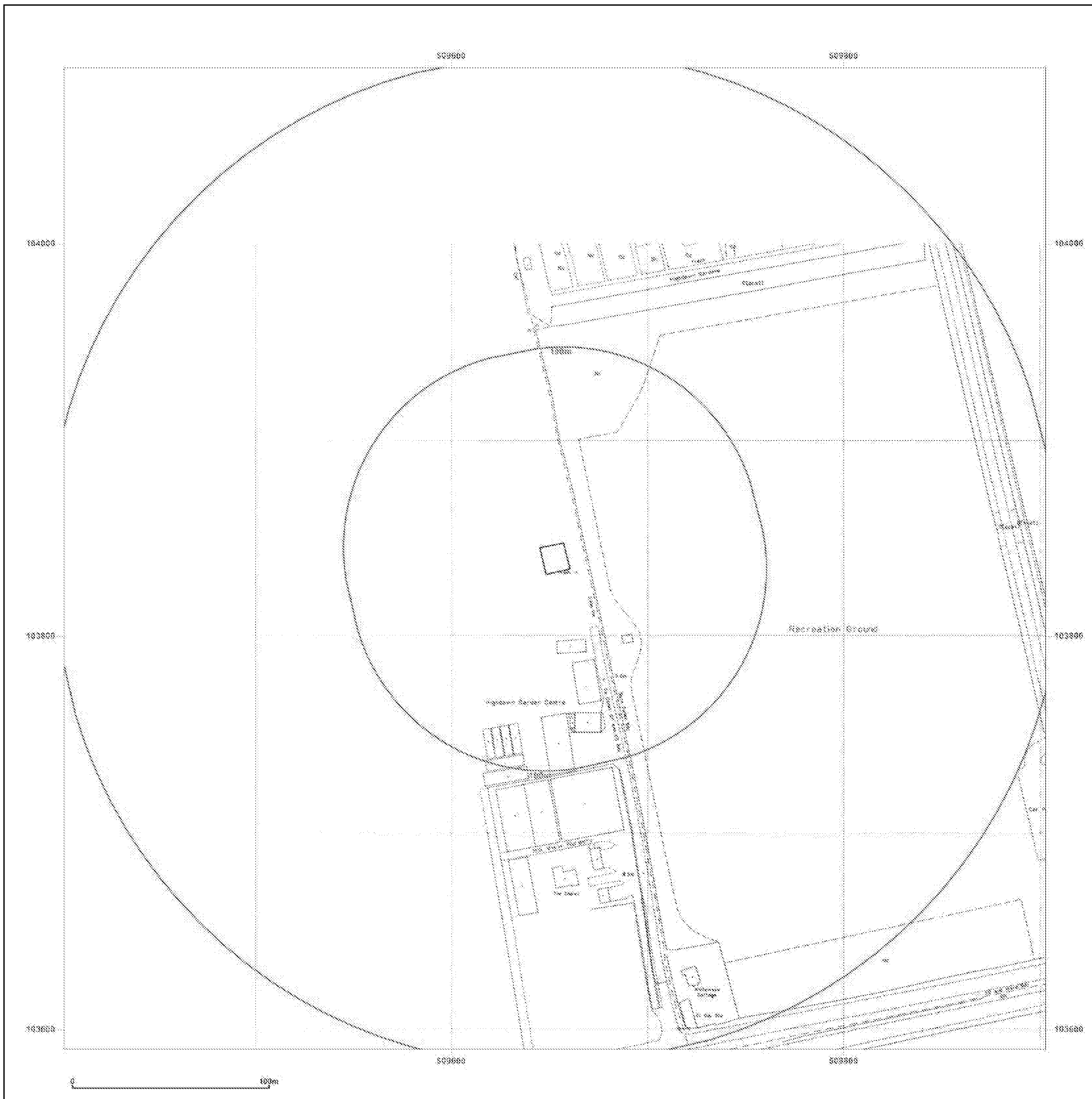


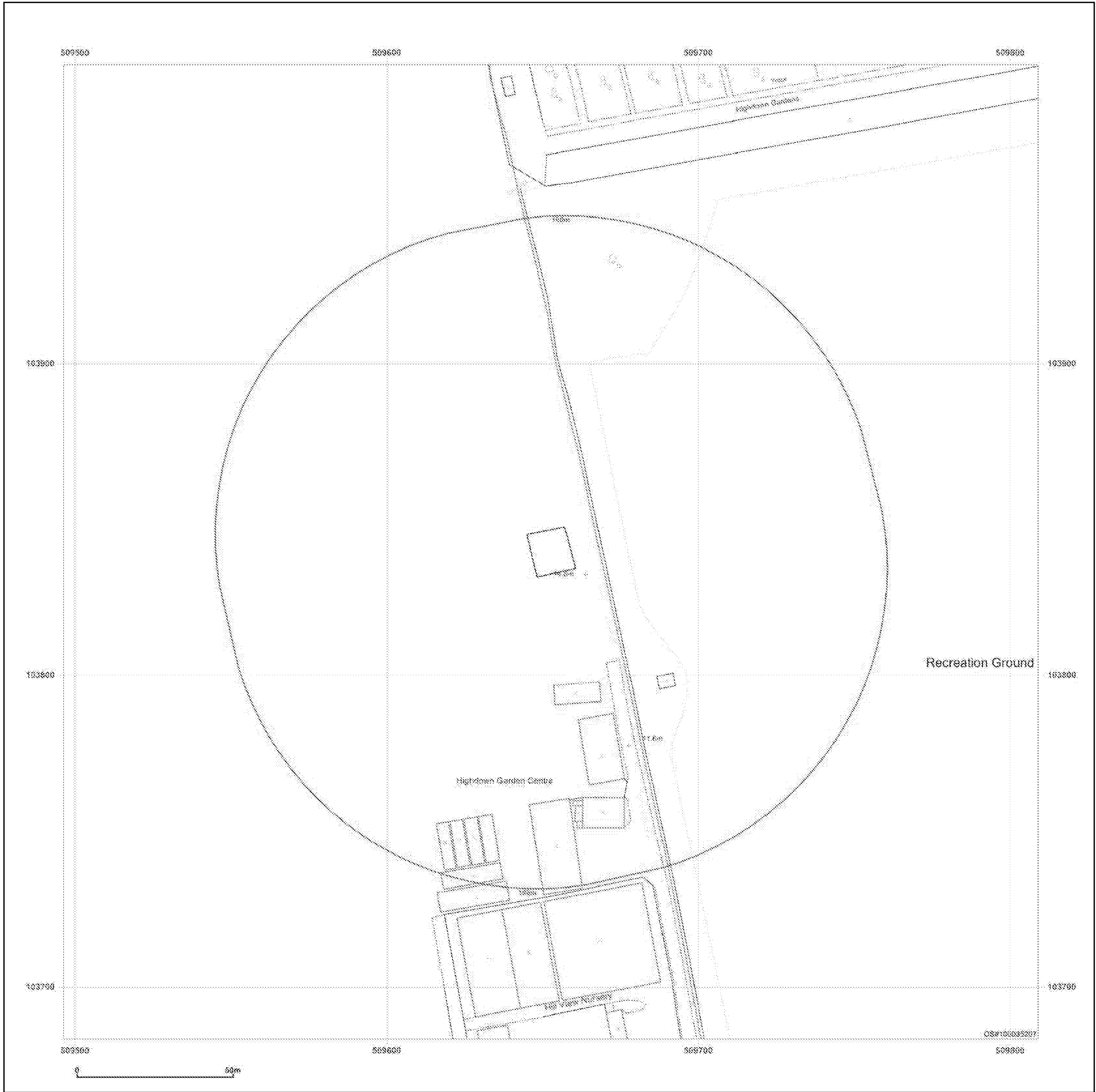
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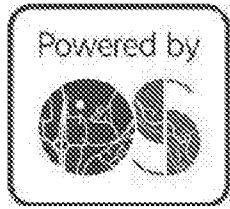
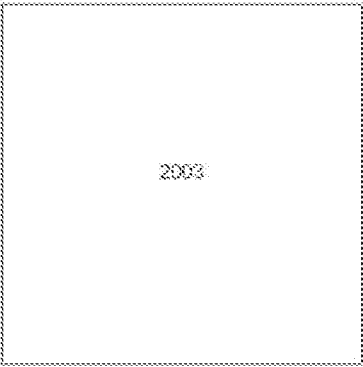
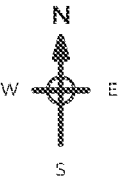
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Grid Ref: 509653, 103840

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



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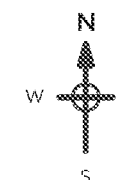
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Map Name: County Series

Map date: 1875-1876

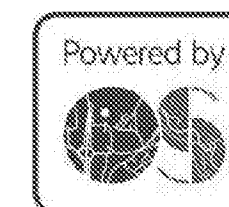
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Revised 1876
Edition N/A
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Surveyed 1875
Revised 1875
Edition N/A
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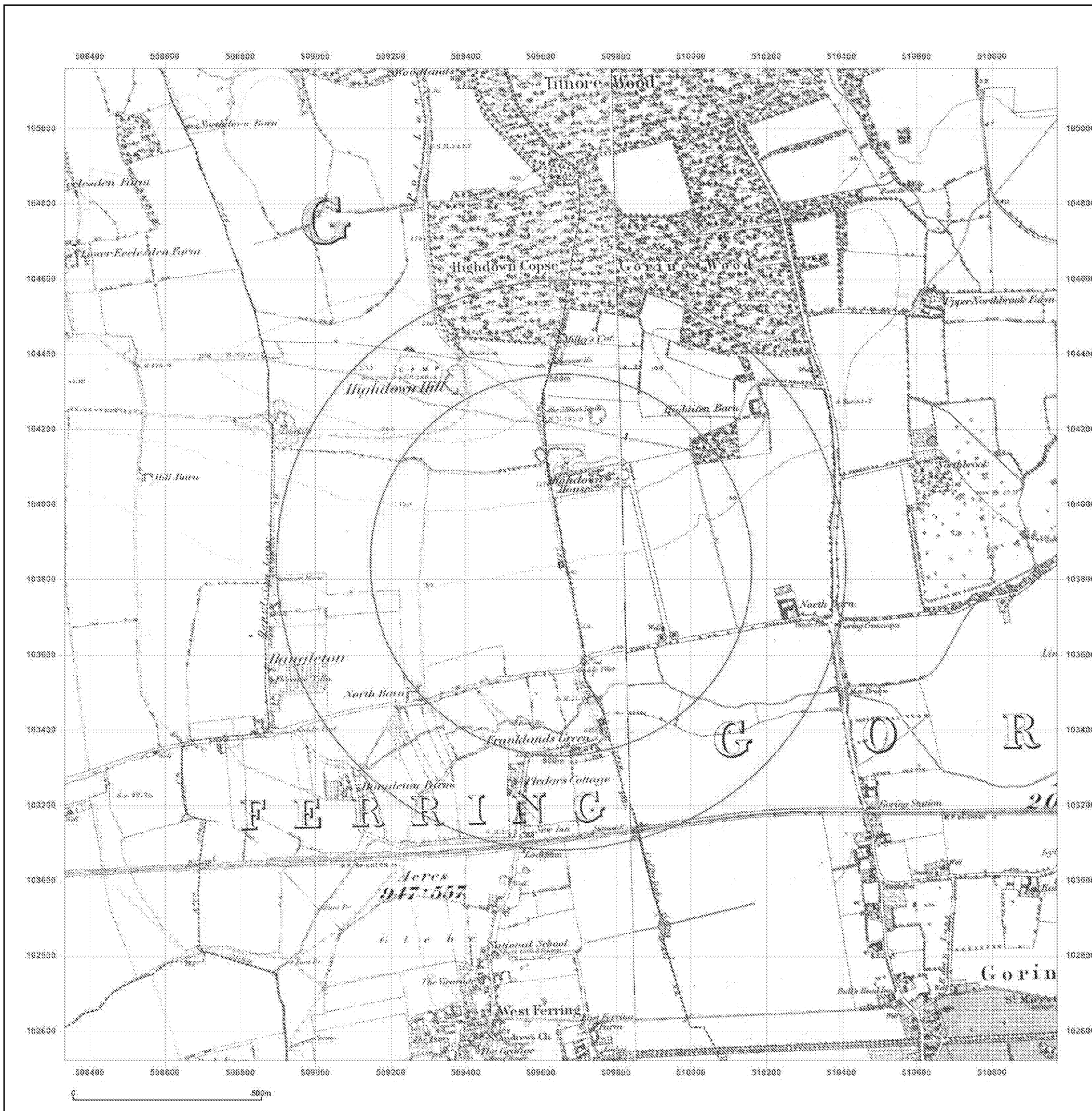


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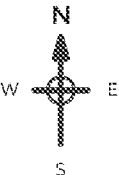
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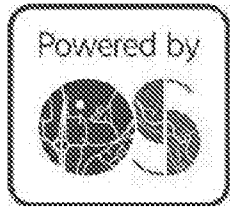
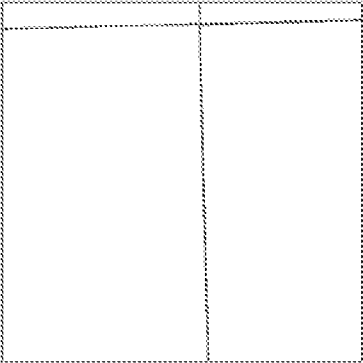


Surveyed 1878
Revised 1899
Edition N/A
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Surveyed 1875
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
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Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1896
Edition N/A
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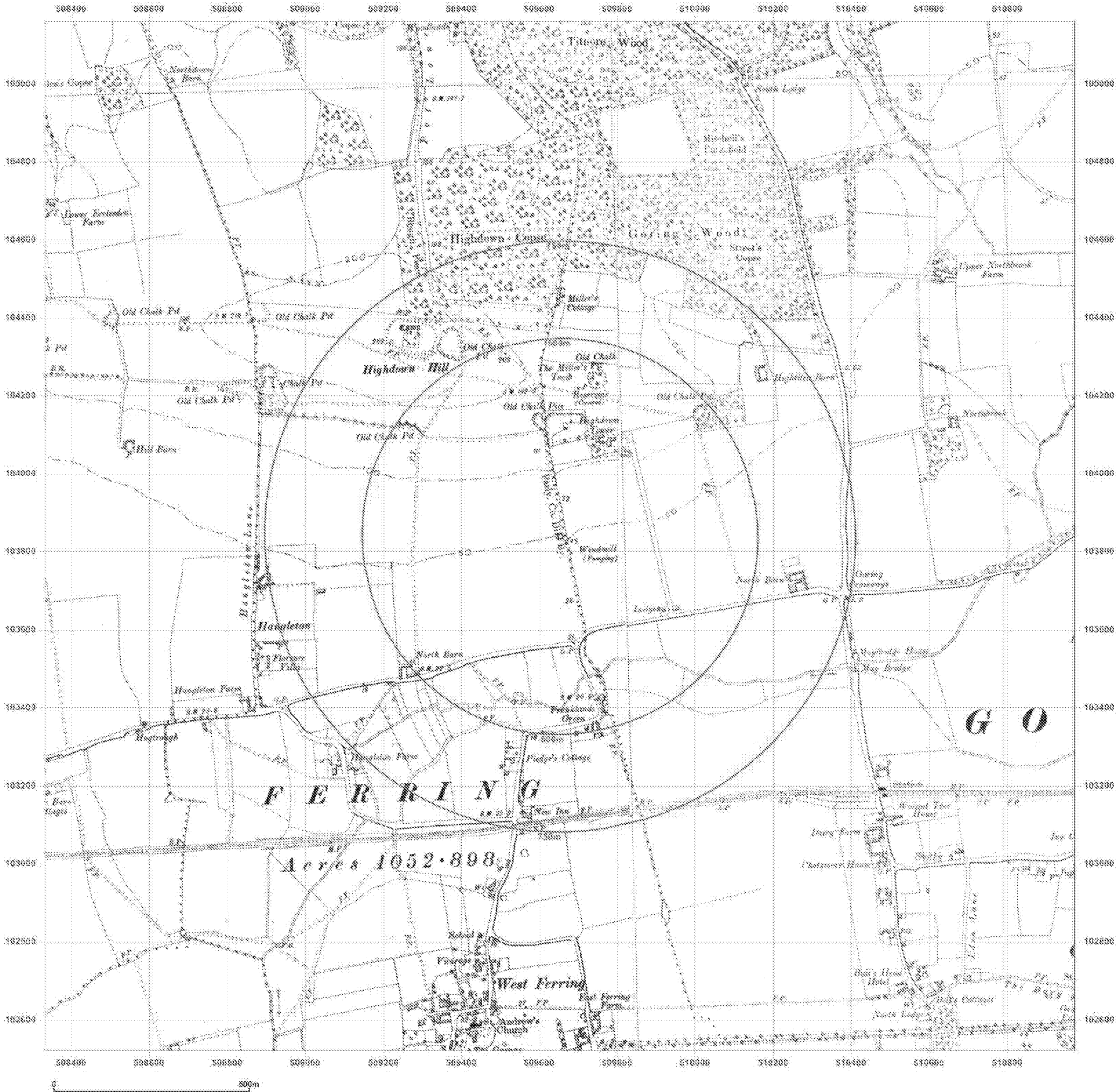


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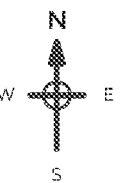
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Map Name: County Series

Map date: 1909-1910

Scale: 1:10,560

Printed at: 1:10,560

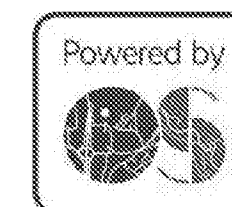
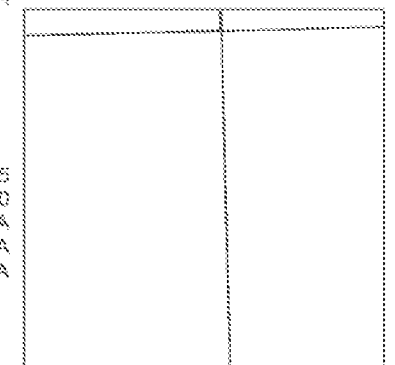


Surveyed 1875
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1873
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1910
Edition N/A
Copyright N/A
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Surveyed 1675
Revised 1909
Edition N/A
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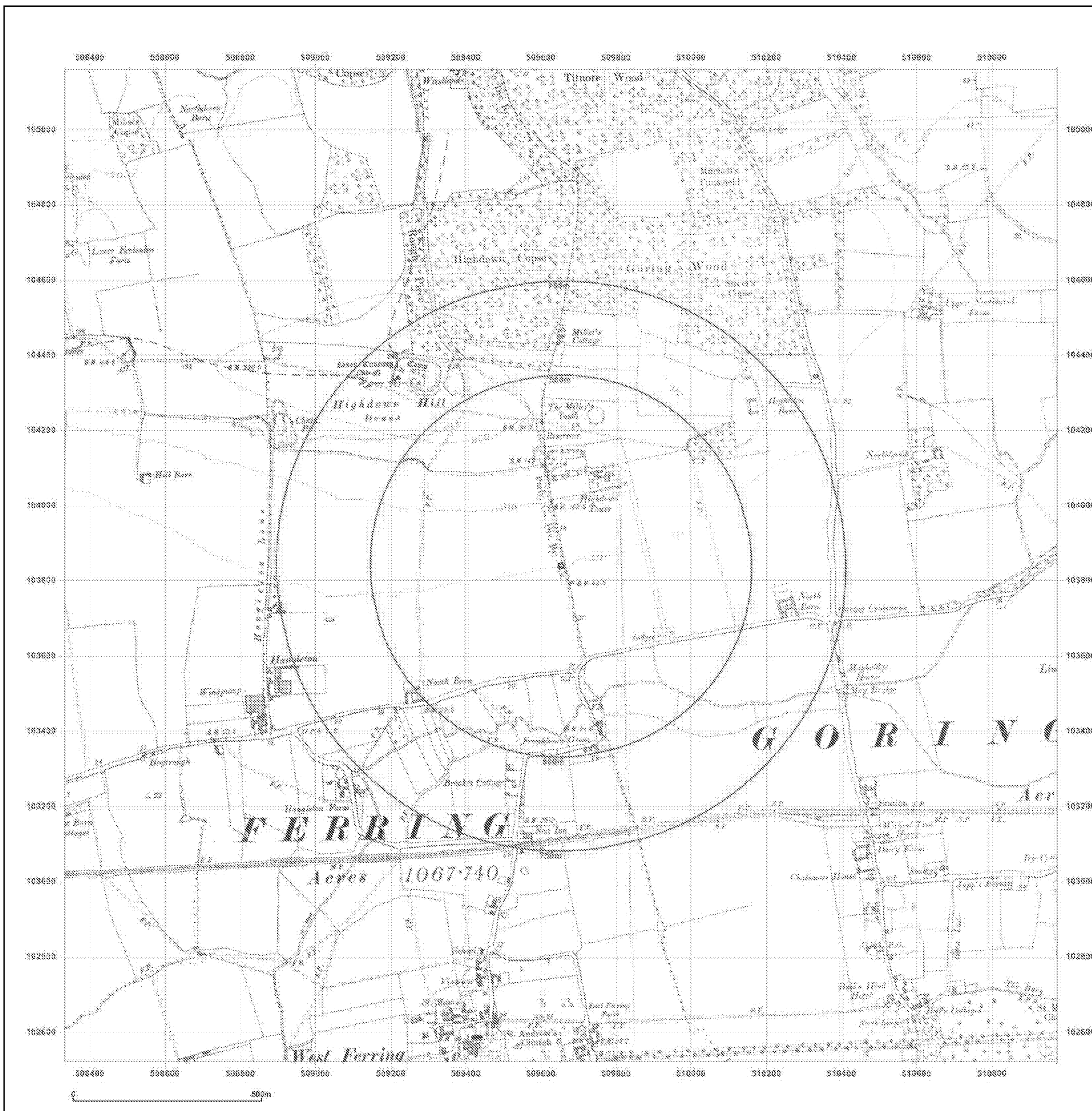


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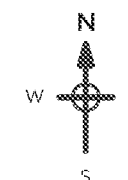
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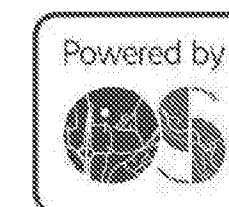
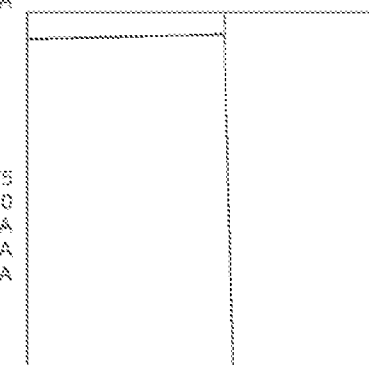
Scale: 1:10,560

Printed at: 1:10,560



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Edition N/A
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Levelled N/A

Surveyed 1875
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A

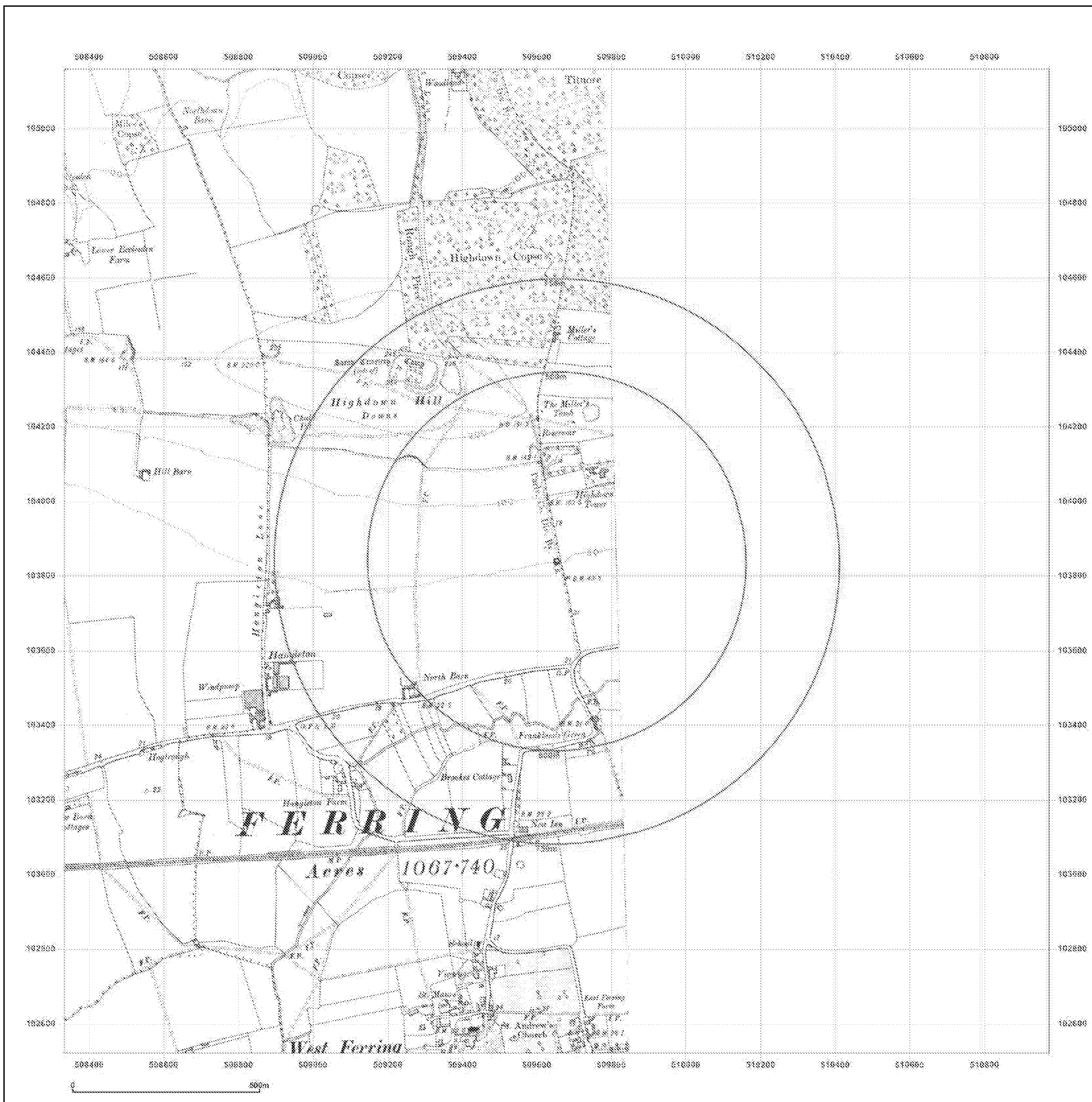


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FERRING, BN12 6PH

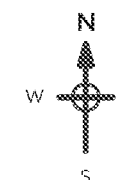
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Map Name: County Series

Map date: 1932-1933

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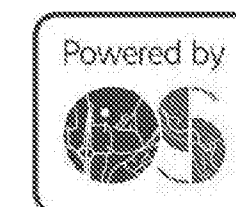
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Surveyed 1873
Revised 1933
Edition N/A
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Surveyed 1875
Revised 1932
Edition N/A
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Surveyed 1875
Revised 1933
Edition N/A
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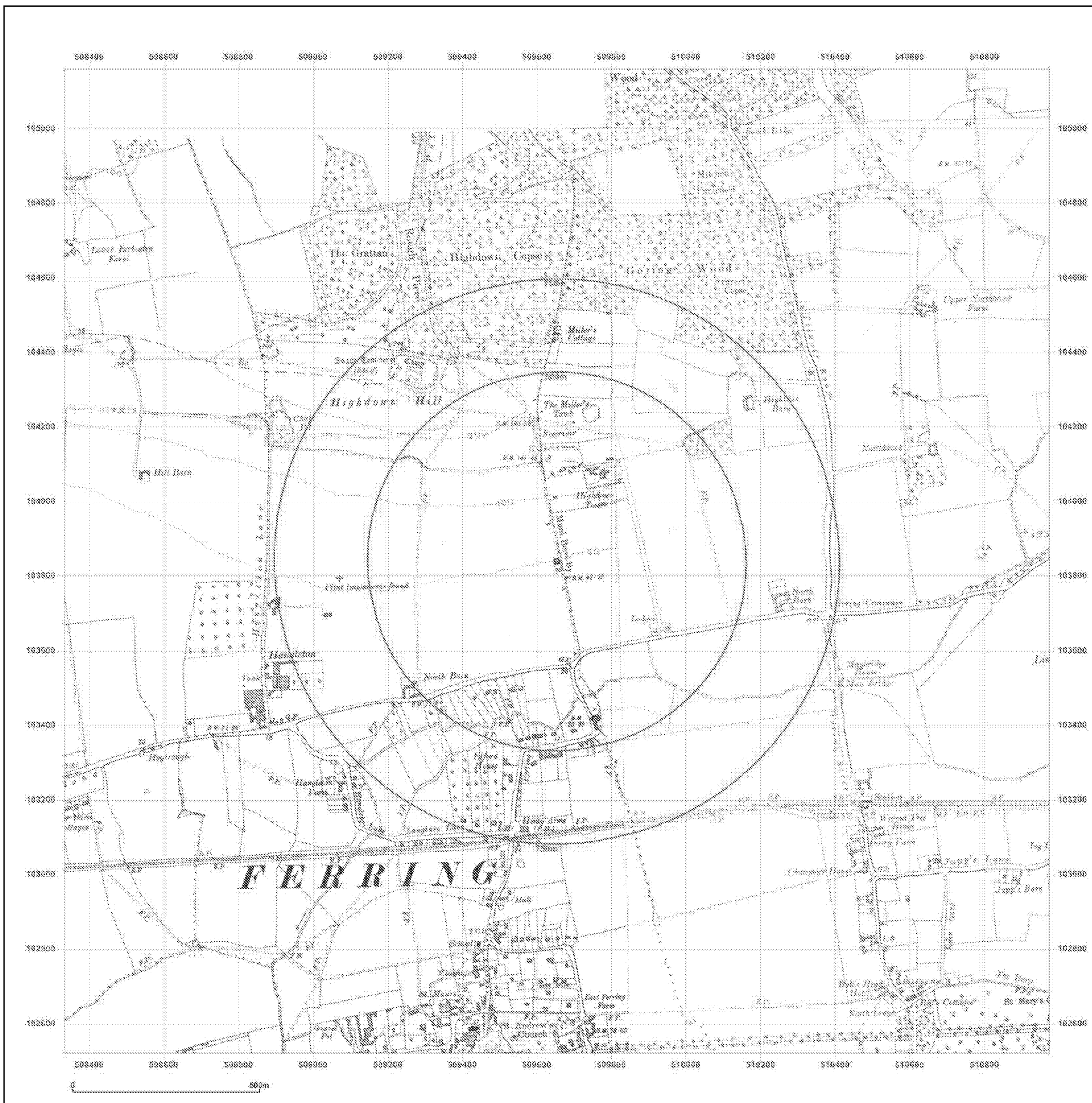


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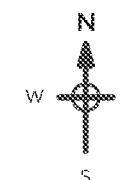
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Map Name: County Series

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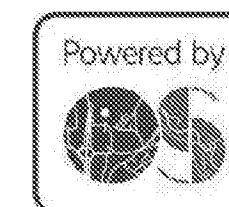


Surveyed 1875
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Edition N/A
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Surveyed 1875
Revised 1938
Edition N/A
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Surveyed 1875
Revised 1943
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Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1938
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Copyright N/A
Levelled N/A

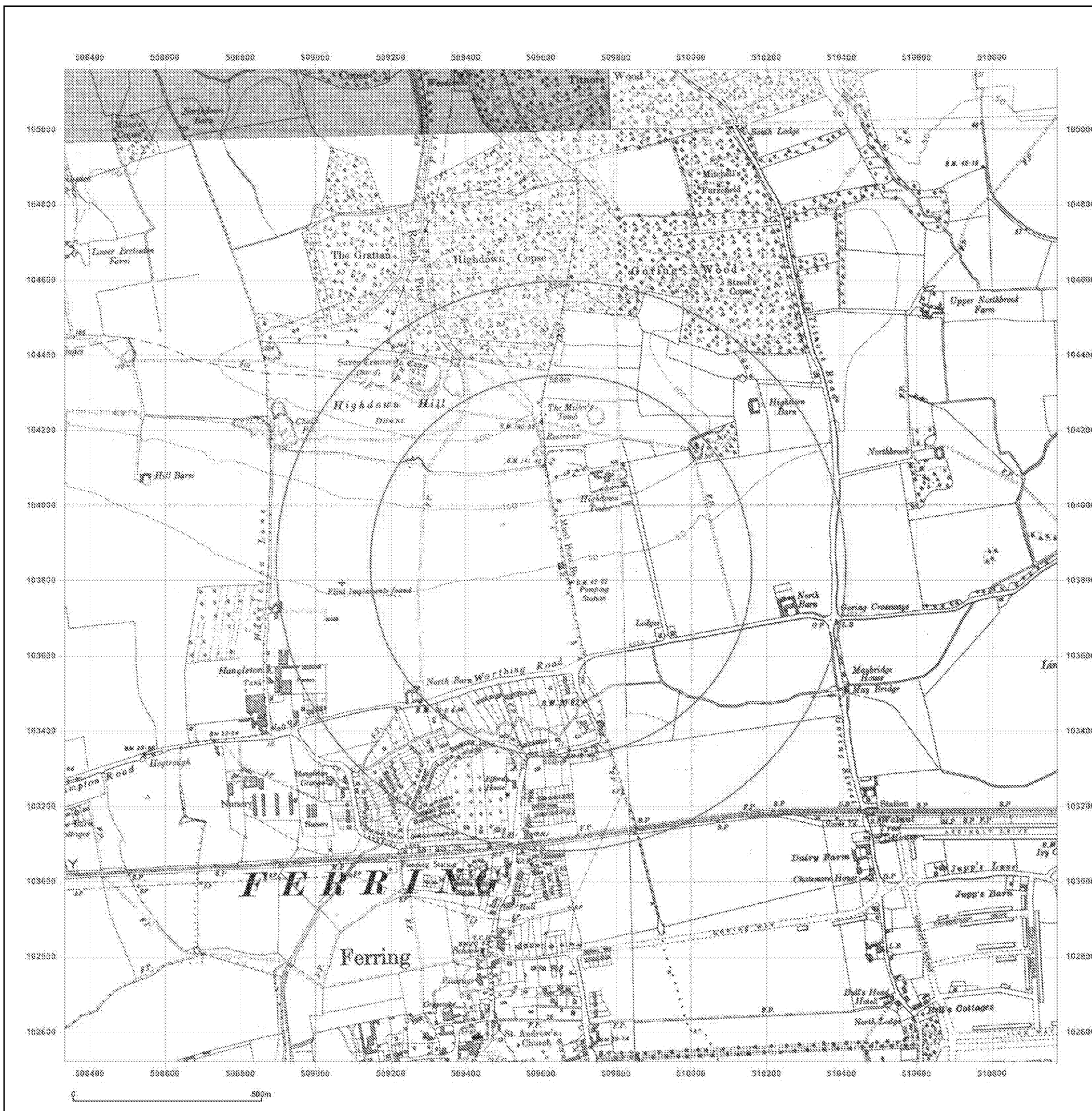


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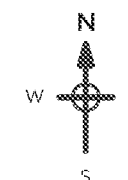
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Map Name: Provisional

Map date: 1957-1962

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Printed at: 1:10,560

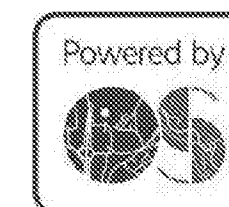


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Edition N/A
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Revised 1957
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1957
Revised 1957
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1962
Revised 1962
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Copyright N/A
Levelled N/A

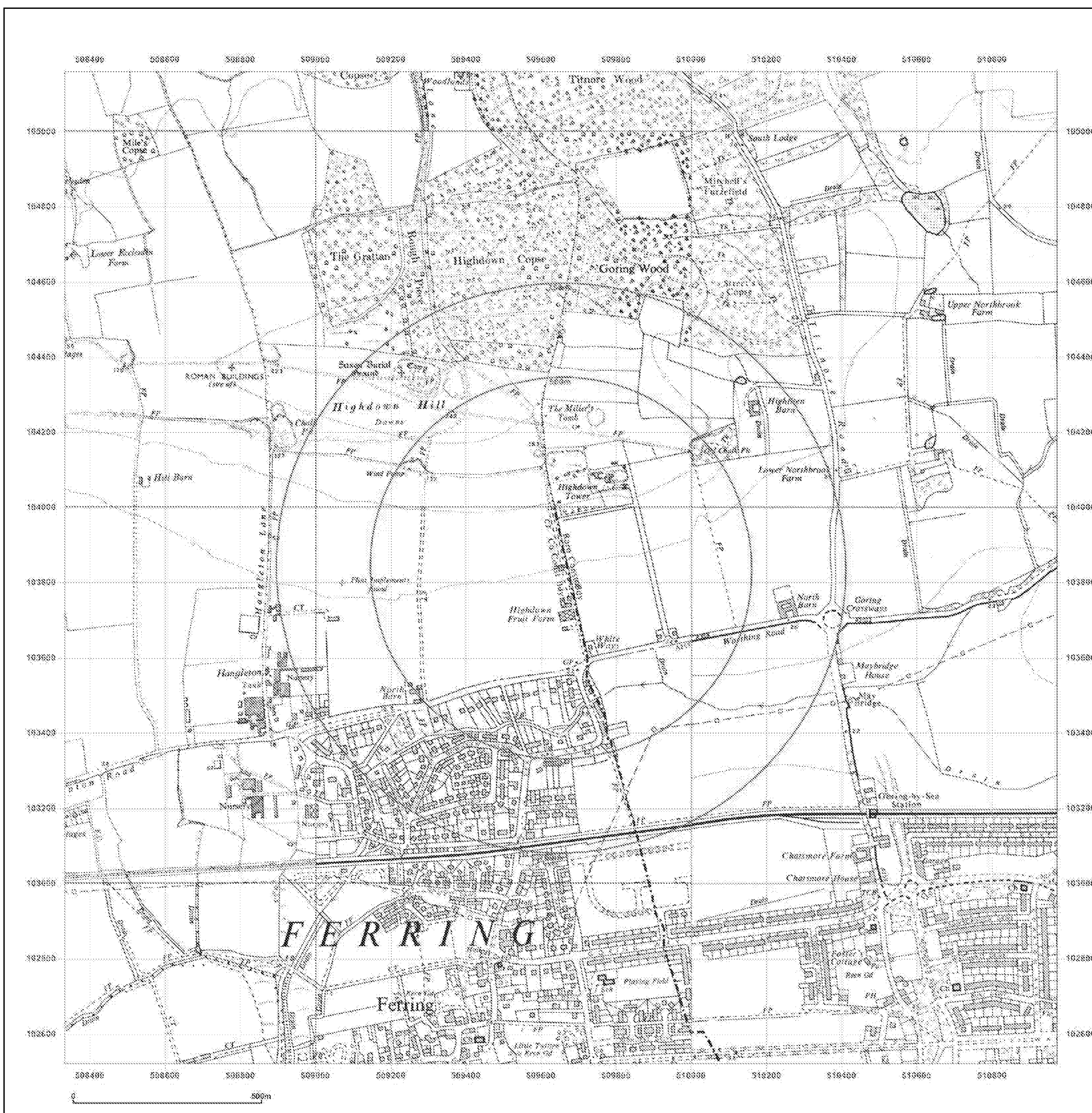


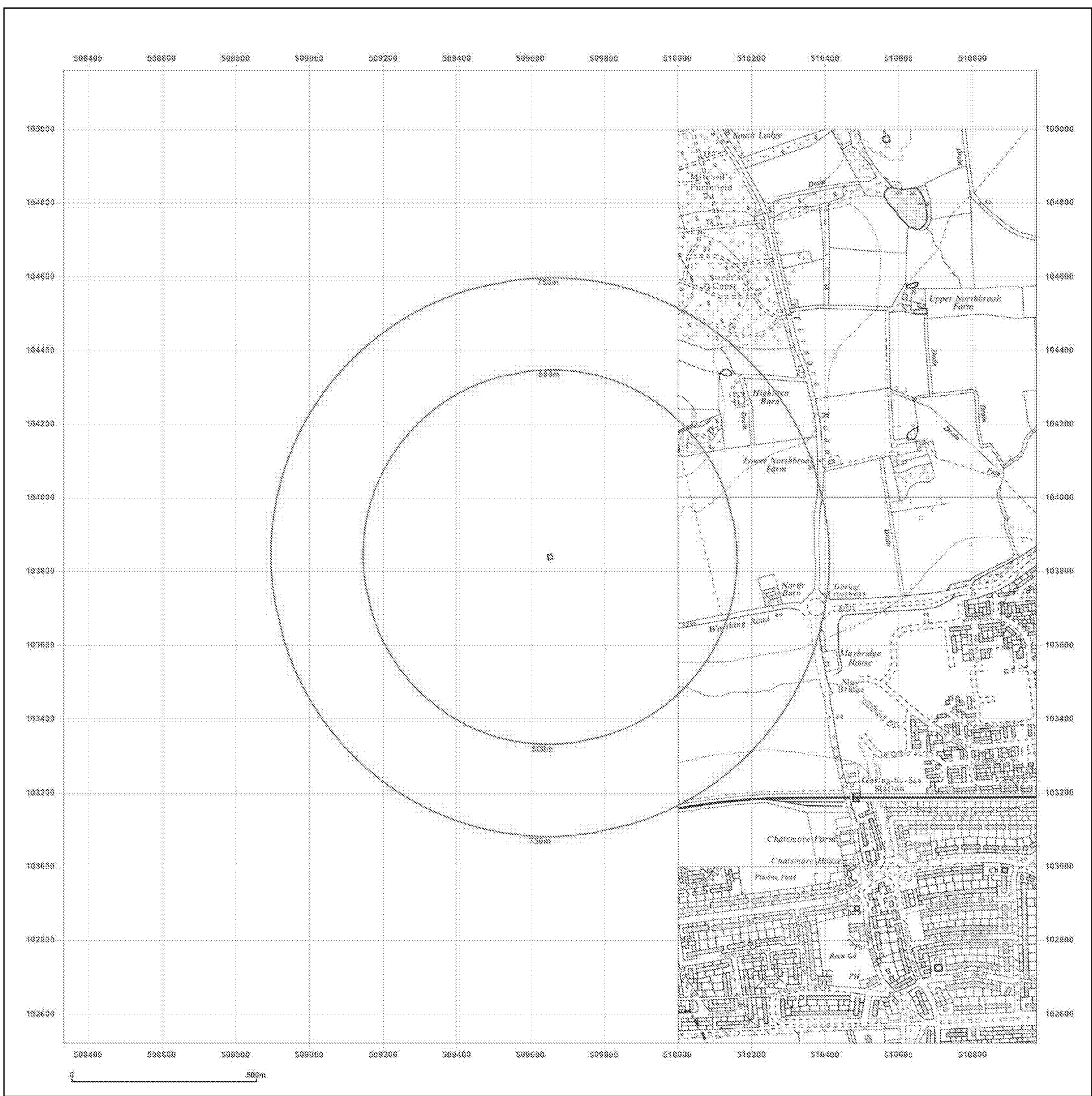
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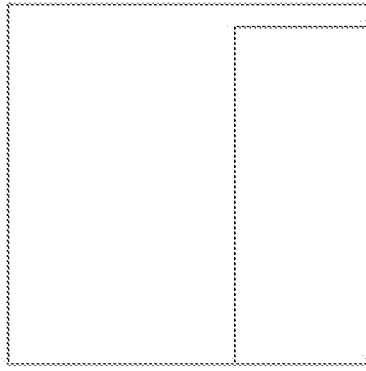
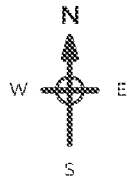


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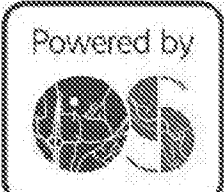
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Grid Ref: 509653, 103840

Map Name: Provisional
Map date: 1969
Scale: 1:10,560
Printed at: 1:10,560



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Client Ref: 20_1098
Report Ref: GS-6928708
Grid Ref: 509653, 103840

Map Name: National Grid
Map date: 1978
Scale: 1:10,000
Printed at: 1:10,000

Surveyed 1977
Revised 1978
Edition N/A
Copyright N/A
Levelled N/A

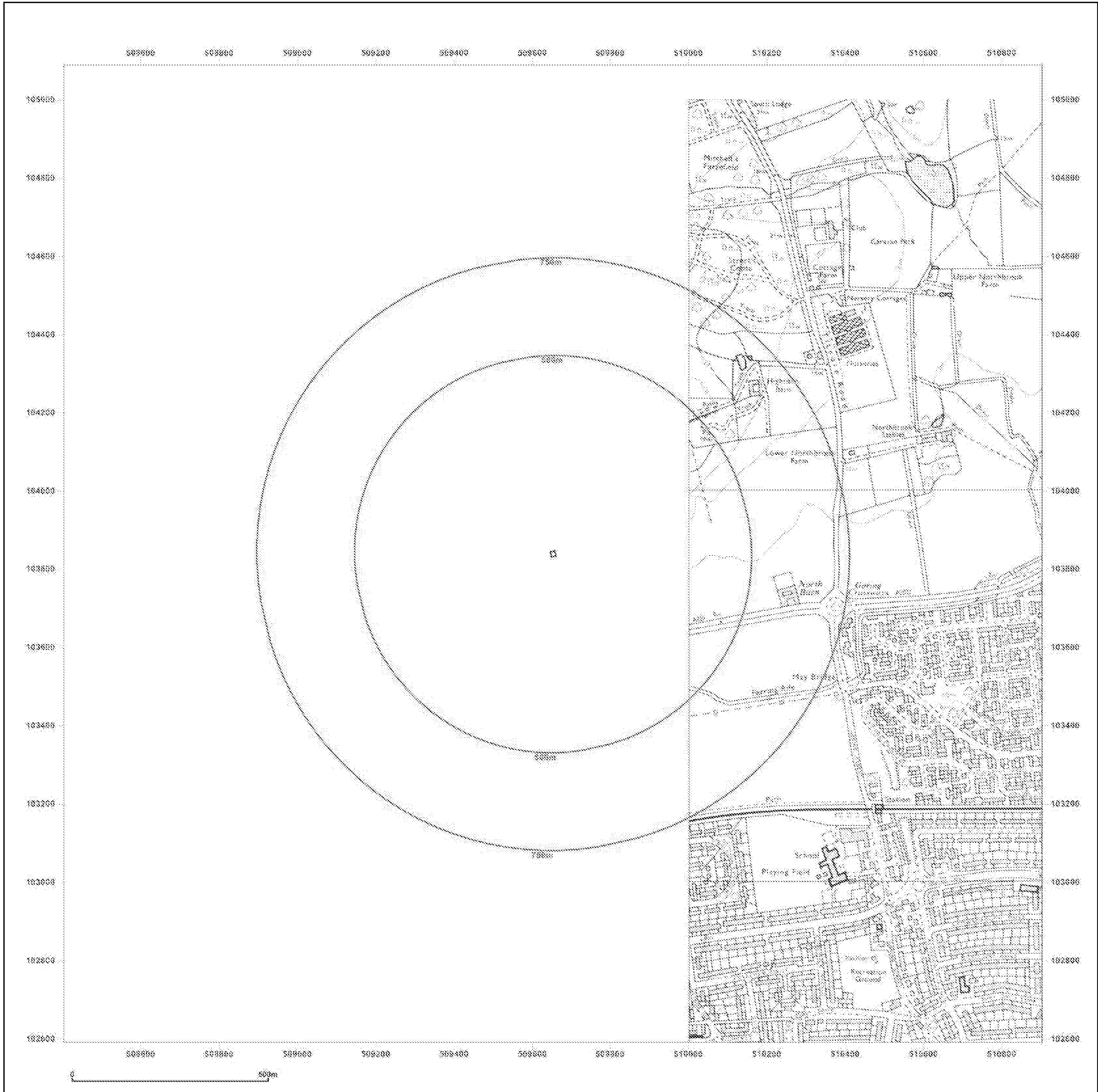
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Site Details:

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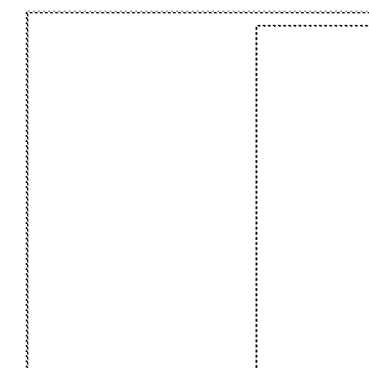
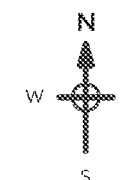
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Map Name: National Grid

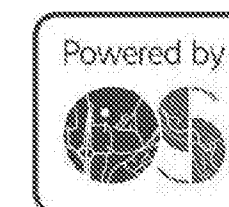
Map date: 1991

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Printed at: 1:10,000



Surveyed 1990
Revised 1991
Edition N/A
Copyright N/A
Levelled N/A

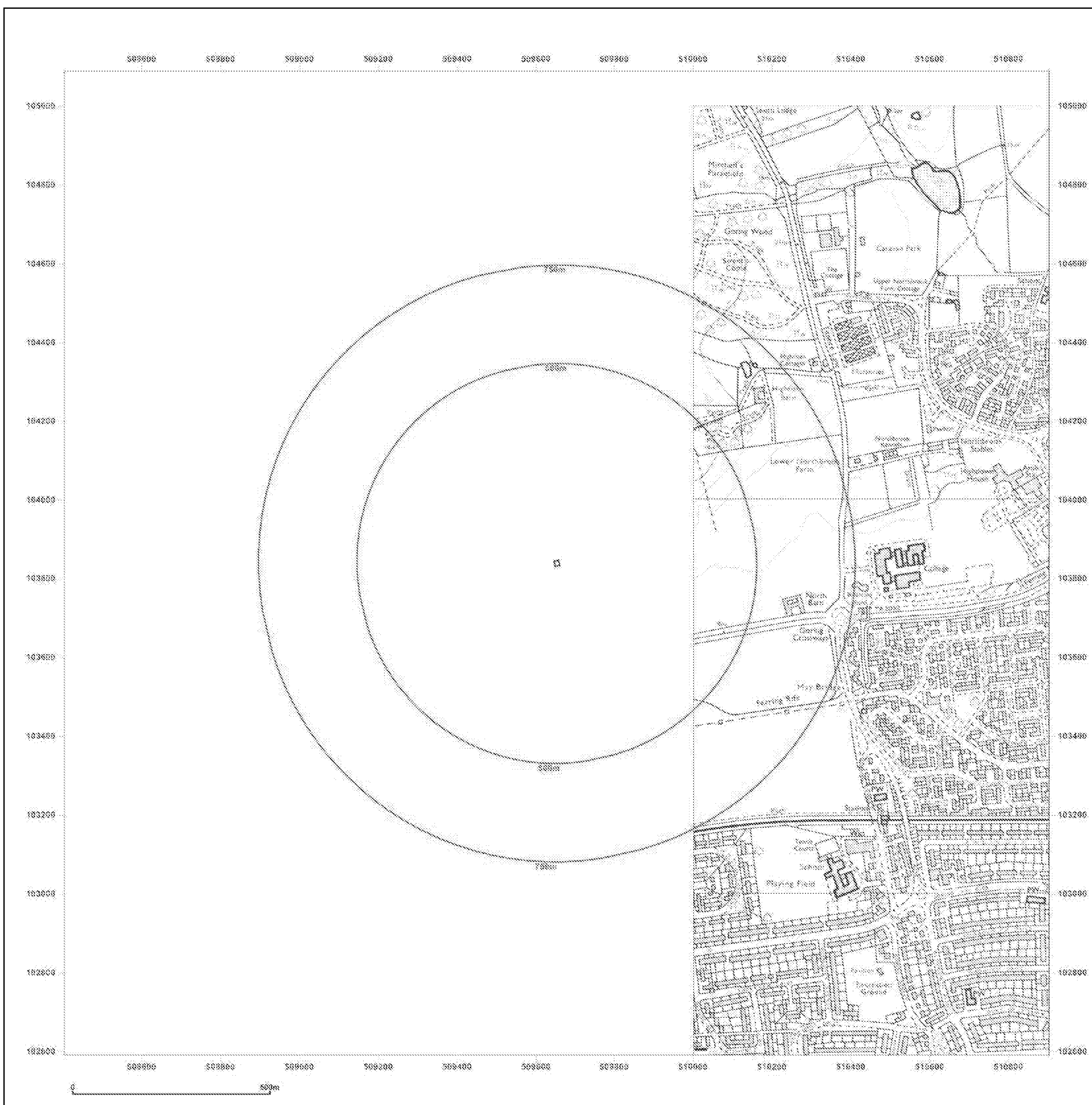


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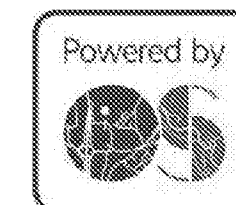
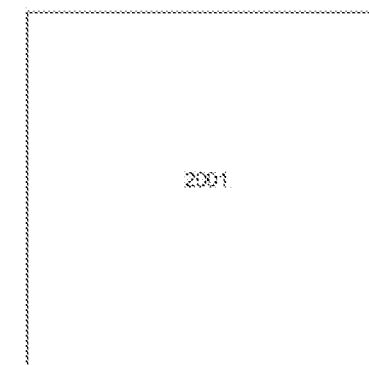
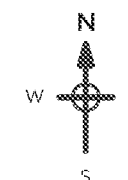
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Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000



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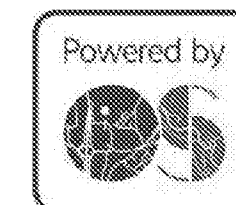
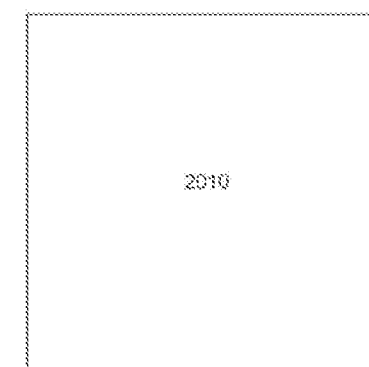
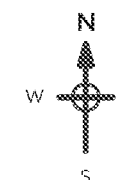
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Report Ref: GS-6928708
Grid Ref: 509653, 103840

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



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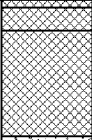
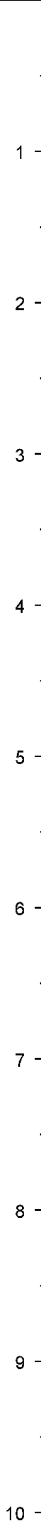
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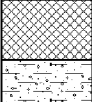
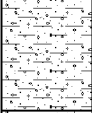
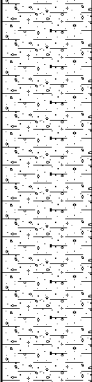
Appendix C

Stratigraphic Logs

 constructiveevaluation site investigation • building pathology					Borehole Log			Borehole No. WS1 Sheet 1 of 1	
Project Name: Former McIntyre Nursery					Project No. 20.1098		Co-ords: 509657E - 103838N		Hole Type WS
Location: Highdown Business Park, Ferring, Worthing					Level: 15.00		Scale 1:50		Logged By ME
Client: Milwards					Dates: 14/09/2020				

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.05 0.20	14.95 14.80		Grey brown fine to medium, subangular to subrounded flint GRAVEL. (MADE GROUND) Brown sandy GRAVEL. Sand is fine to medium. Gravels are fine to coarse, subangular to rounded flint, concrete and red brick fragments. (MADE GROUND) Brown sandy gravelly CLAY. Sand is fine to medium. Gravels are fine to coarse, subangular to subrounded flint, concrete and red brick fragments. (MADE GROUND) Firm brown sandy gravelly CLAY. Sand is fine to medium. Gravels are fine to medium, subangular to rounded flint. ...band of flints between 1.5m and 1.7mbgl. (HEAD) Soft to firm light brown sandy gravelly CLAY. Sand is fine to medium. Gravels are fine, subangular to rounded chalk and cobbles of subangular to subrounded flint. (HEAD)	
		1.00 1.00	C SPT	N=10 (1,0/2,2,3,3)	0.90	14.10			
		1.70 2.00	ES SPT	N=9 (2,4/2,3,2,2)	1.70	13.30			
		2.50	D						
		3.00 3.20	SPT D	N=21 (4,4/5,6,5,5)					
		4.00	SPT	N=17 (3,4/3,3,6,5)					
		4.70			10.30				
		5.00	SPT	N=52 (13,13/13,13,13,13)	5.00	10.00			

Remarks No groundwater encountered.		
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 constructiveevaluation site investigation • building pathology				Borehole Log				Borehole No. WS2 Sheet 1 of 1		
Project Name: Former McIntyre Nursery				Project No. 20.1098		Co-ords: 509660E - 103842N		Hole Type WS		
Location: Highdown Business Park, Ferring, Worthing						Level: 15.00		Scale 1:50		
Client: Milwards						Dates: 14/09/2020		Logged By ME		
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.50	ES		0.40	14.60		Grey brown gravelly SAND. Sand is fine to medium. Gravels are fine to coarse, subangular to rounded, flint and concrete fragments. (MADE GROUND)	1	
		1.00 1.00	D SPT	N=8 (2,1/2,2,2,2)	0.80	14.20				Brown sandy gravelly CLAY. Sand is medium to coarse. Gravels are fine to medium, subangular to subrounded flint, concrete and red brick fragments. (MADE GROUND)
										Soft brown sandy gravelly CLAY. Sand is fine to coarse. Gravels are fine to medium, subangular to subrounded flint. (HEAD)
		2.00 2.00	C SPT	N=13 (2,3/4,3,3,3)	1.80	13.20		Firm light brown sandy gravelly CLAY. Sand is fine to medium. Gravels are fine to medium, subangular to subrounded chalk and cobbles of subangular to subrounded flint. (HEAD)		
		3.00	SPT	N=14 (1,1/3,3,3,5)						
		4.00	SPT	N=11 (2,2/3,2,3,3)						
		4.50	D		4.40	10.60		Structureless CHALK composed of silty, subangular to subrounded GRAVEL. Clasts are weak, low density and white. (NEWHAVEN CHALK FORMATION)	5	
		5.00	SPT	N=29 (7,6/5,7,8,9)	5.00	10.00				End of Borehole at 5.000m
Remarks No groundwater encountered.										



Borehole Log

Borehole No.

WS3

Sheet 1 of 1

Project Name: Former McIntyre Nursery

Project No.
20.1098

Co-ords: 509653E - 103846N

Hole Type
WS

Location: Highdown Business Park, Ferring, Worthing

Level: 15.00

Scale
1:50

Client: Milwards

Dates:

Logged By
ME

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30			0.30	14.70		Black sandy GRAVEL. Sand is fine to coarse. Gravels are medium to coarse, subangular to subrounded flints. (MADE GROUND)	1
		0.40			0.40	14.60			
		0.60			0.60	14.40			
		0.90	ES					CONCRETE	2
		1.00	C						
		1.00	SPT	N=14 (1,2/3,3,4,4)					
		1.50			1.50	13.50		Firm dark brown sandy gravelly CLAY. Sand is fine to coarse. Gravels are fine to coarse, subangular to subrounded flint. (HEAD)	3
		2.00	SPT	N=53 (14,11/12,13,14,14)					
		2.50	D						
		3.00	SPT	N=50 (13,13/13,10,13,14)	3.00	12.00		End of Borehole at 3.000m	4
									5
									6
									7
									8
									9
									10

Remarks

No groundwater encountered.
Window sampler refused at 3.0mbgl, likely on large flints.
Monitoring well installed to 3.0mbgl.



Appendix D

Monitoring Results

Project No:	20.1098	Project Name:	Former McIntyre Nursery
-------------	---------	---------------	-------------------------

Date:	21/09/2020	Personnel:	ME
Weather:	Clear	Ground Conditions:	Hardstanding
Temp (°C):	20°C	Humidity (%):	73%
Atmospheric Pressure:	1015 mb	Monitoring Round:	1

Well Information

Well No.	WS3			
Borehole Diameter (mm):	50			
Time Monitored	10:37			
Groundwater level (mbgl)	DRY			
Depth of installation (mbgl)	3.000			

Gas Monitoring

ATM P (mb)	1015			
Downhole Pressure (mb)	+1.00			
Flow Rate (l/hr)	-0.1			
Methane (%)	Peak	0.0		
	Steady	0.0		
LEL (%)	Peak	0		
	Steady	0		
Carbon Dioxide (%)	Peak	4.0		
	Steady	3.9		
Oxygen (%)	Min	14.4		
	Steady	14.4		
VOC's (ppm)	0.0			
H ₂ S (ppm)	0000			
H ₂	LOW			
CO (ppm)	0000			
Notes				

Project No:	20.1098	Project Name:	Former McIntyre Nursery
-------------	---------	---------------	-------------------------

Date:	24/09/2020	Personnel:	ME
Weather:	Clear	Ground Conditions:	Hardstanding
Temp (°C):	13°C	Humidity (%):	72%
Atmospheric Pressure:	997 mb	Monitoring Round:	2

Well Information

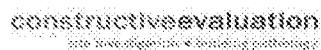
Well No.	WS3			
Borehole Diameter (mm):	50			
Time Monitored	08.45			
Groundwater level (mbgl)	DRY			
Depth of installation (mbgl)	3.000			

Gas Monitoring

ATM P (mb)	997			
Downhole Pressure (mb)	+0.22			
Flow Rate (l/hr)	+0.1			
Methane (%)	Peak	0.0		
	Steady	0.0		
LEL (%)	Peak	0		
	Steady	0		
Carbon Dioxide (%)	Peak	3.5		
	Steady	3.5		
Oxygen (%)	Min	16.2		
	Steady	16.2		
VOC's (ppm)	0.0			
H ₂ S (ppm)	0000			
H ₂	LOW			
CO (ppm)	0000			
Notes				

Appendix E

Geotechnical Laboratory Results



SUMMARY OF RESULTS

Client	Milwards
--------	----------

The Plasticity Chart is a graph with Liquid Limit (%) on the x-axis (0% to 120%) and Plasticity Index (%) on the y-axis (0% to 70%). It is divided into regions for soil classification: CL, CI, CH, CV, CE, ML, MH, MV, ME, and MI. A legend indicates three data series: WS1 (2.50m), WS2 (2.00-3.00m), and WS3 (1.00-2.00m). The chart shows that WS1 and WS2 are in the ML region, while WS3 is in the CL region.

22/09/2020



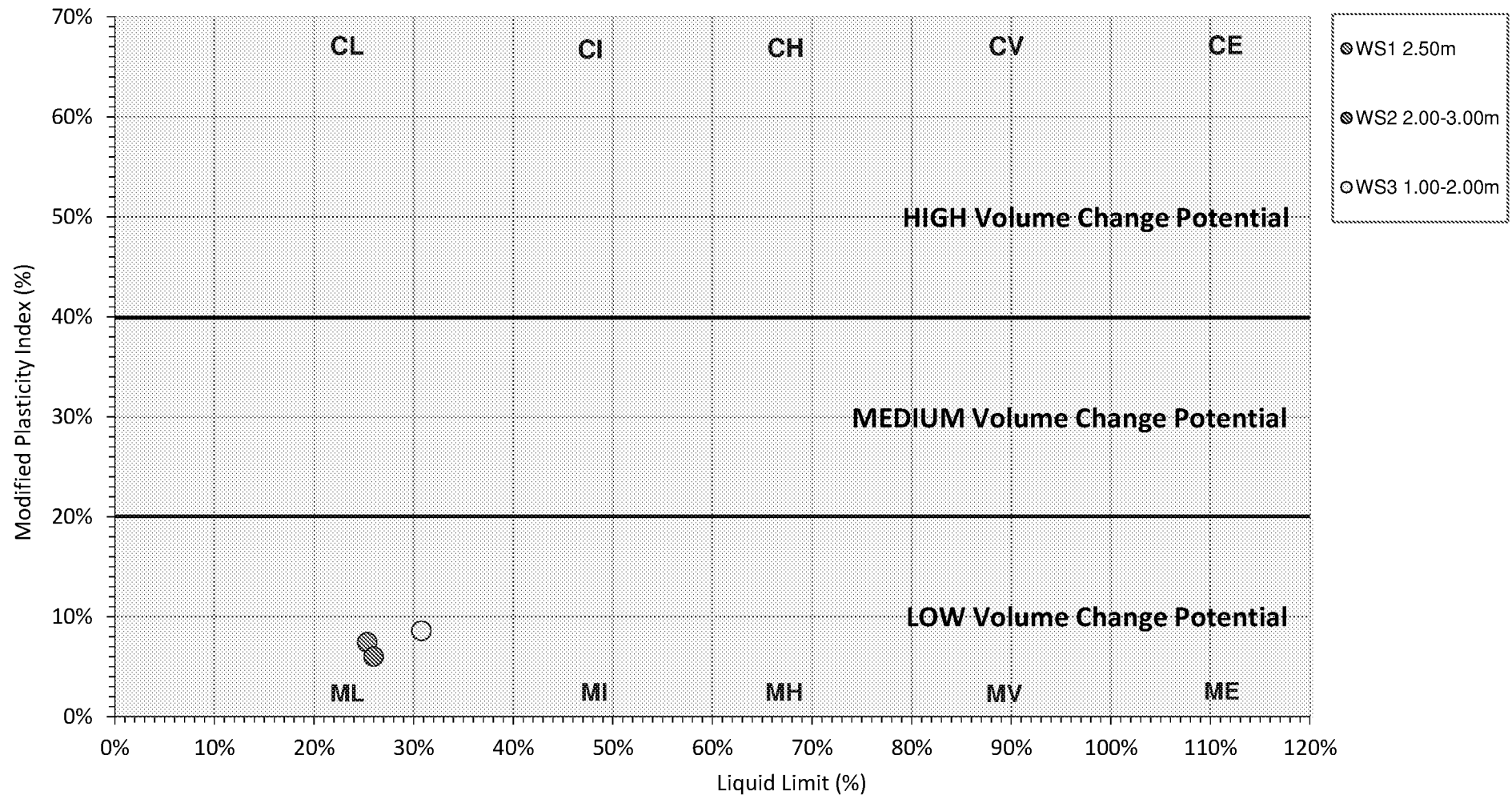
constructiveevaluation

site investigation • building pathology

NHBC Volume Change Potential:

20.1098 Former McIntyre Nursery, Ferring

$y = 0.73x - 20$





constructiveevaluation

soil investigation • building construction

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

SUMMARY OF RESULTS

Project No		20.1098							
Project Name		Former McIntyre Nursery, Ferring							
Client		Milwards							

Hole ID	Depth (m)	Sample Description	Cell Test Pressure (kN/m²)	Bulk Density (Mg/m³)	BS 1377 Moisture Content (W%)	Undrained Shear Strength (kN/m²)	Strain at Failure	Strength Term	Failure Mode
WS1	1.00-2.00m	Firm to stiff locally soft dark brown locally off-white and cream very sandy gravelly CLAY. Gravel is fine to coarse, subangular to subrounded flint, concrete and red brick fragments.	N/A	N/A	21%	34-170		Shear Strength given as an unreliable approximation derived from hand shear vane and pocket penetrometer testing. Values should be used as a GUIDE ONLY.	No triax as sample split during extrusion
WS2	2.00-3.00m	Firm to stiff light brown locally white very gravelly sandy CLAY. Gravel is fine to coarse, subangular to subrounded chalk and cobbles of subangular to subrounded flint	N/A	N/A	14%	55-137		Shear Strength given as an unreliable approximation derived from hand shear vane and pocket penetrometer testing. Values should be used as a GUIDE ONLY.	No triax as sample split during extrusion
WS3	1.00-2.00m	Firm to stiff locally very stiff dark brown locally off-white and cream very gravelly sandy CLAY. Gravel is fine to coarse, subangular to subrounded flint	N/A	M/A	13%	48-206		Shear Strength given as an unreliable approximation derived from hand shear vane and pocket penetrometer testing. Values should be used as a GUIDE ONLY.	No triax as sample split during extrusion

0

20

40

60

80

100

120

140

0

0.5

1

1.5

2

2.5

3

CU (kN/m²)

WS1

WS2

WS3

Constructive Evaluation Ltd Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ	E:	Test Procedure(s):	BS1377: Part 2: Clause 3.2: 1990: Determination of moisture content by the oven drying method
		Checked and Approved:	BS1377: Part 7: Clause 8: 1990: Determination of undrained shear strength in triaxial compression without measurement of pore pressure (definitive method)
			B.R. (LabMngr)
			22/09/2020

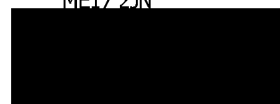
Appendix F

Environmental Laboratory Results



Michael Emery
Constructive Evaluation Ltd
Unit 15 & 16
Ford Lane Business
Ford Lane
Ford
Arundel
BN18 0UZ

DETS Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN



DETS Report No: 20-10776

Site Reference: Former McIntyre Nursery, Ferring

Project / Job Ref: 20.1098

Order No: 20.1098

Sample Receipt Date: 17/09/2020

Sample Scheduled Date: 17/09/2020

Report Issue Number: 1

Reporting Date: 28/09/2020

Authorised by:



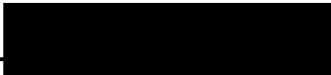
Kevin Old
General Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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.



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Soil Analysis Certificate						
DETS Report No: 20-10776	Date Sampled	14/09/20	14/09/20	14/09/20	14/09/20	
Constructive Evaluation Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Former McIntyre Nursery, Ferring	TP / BH No	WS1	WS1	WS2	WS3	
Project / Job Ref: 20.1098	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: 20.1098	Depth (m)	0.30	1.70	0.50	0.50	
Reporting Date: 28/09/2020	DETS Sample No	499517	499518	499519	499520	

Determinand	Unit	RL	Accreditation				
Asbestos Screen ^(S)	N/a	N/a	ISO 17025	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	7.9	8.3	8.1	7.9
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	37	12	120	140
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.04	0.01	0.12	0.14
Organic Matter	%	< 0.1	MCERTS	3.1	0.2	4.1	4.3
Arsenic (As)	mg/kg	< 2	MCERTS	12	5	8	8
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	1	0.5	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	21	10	13	15
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	57	8	21	221
Lead (Pb)	mg/kg	< 3	MCERTS	93	7	52	30
Mercury (Hg)	mg/kg	< 1	MCERTS	1.8	2.9	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	18	9	10	9
Selenium (Se)	mg/kg	< 2	MCERTS	< 3	< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	183	25	94	112
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2
TPH - Aliphatic >C35 - C40	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10
TPH - Aromatic >C35 - C40	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)



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Soil Analysis Certificate - Speciated PAHs

DETS Report No: 20-10776	Date Sampled	14/09/20	14/09/20	14/09/20	14/09/20
Constructive Evaluation Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Former McIntyre Nursery, Ferring	TP / BH No	WS1	WS1	WS2	WS3
Project / Job Ref: 20.1098	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 20.1098	Depth (m)	0.30	1.70	0.50	0.50
Reporting Date: 28/09/2020	DETS Sample No	499517	499518	499519	499520

Determinand	Unit	RL	Accreditation				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	0.49	< 0.1	0.37	0.54
Anthracene	mg/kg	< 0.1	MCERTS	0.12	< 0.1	< 0.1	0.12
Fluoranthene	mg/kg	< 0.1	MCERTS	1.09	< 0.1	0.56	1.19
Pyrene	mg/kg	< 0.1	MCERTS	1	< 0.1	0.48	1.02
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.52	< 0.1	0.25	0.53
Chrysene	mg/kg	< 0.1	MCERTS	0.55	< 0.1	0.27	0.53
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.79	< 0.1	0.40	0.68
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.30	< 0.1	0.15	0.23
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.64	< 0.1	0.32	0.48
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.42	< 0.1	0.20	0.32
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.37	< 0.1	0.20	0.28
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	6.3	< 1.6	3.2	5.9



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Soil Analysis Certificate - TPH LQM Banded

DETS Report No: 20-10776	Date Sampled	14/09/20	14/09/20	14/09/20	14/09/20
Constructive Evaluation Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Former McIntyre Nursery, Ferring	TP / BH No	WS1	WS1	WS2	WS3
Project / Job Ref: 20.1098	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 20.1098	Depth (m)	0.30	1.70	0.50	0.50
Reporting Date: 28/09/2020	DETS Sample No	499517	499518	499519	499520

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	
Aliphatic >C16 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	
Aliphatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic (C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30	< 30	
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	
Aromatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	
Aromatic (>C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30	< 30	
Total >C5 - C44	mg/kg	< 60	NONE	< 60	< 60	< 60	< 60	



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Soil Analysis Certificate - BTEX / MTBE

DETS Report No: 20-10776	Date Sampled	14/09/20	14/09/20	14/09/20	14/09/20
Constructive Evaluation Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Former McIntyre Nursery, Ferring	TP / BH No	WS1	WS1	WS2	WS3
Project / Job Ref: 20.1098	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 20.1098	Depth (m)	0.30	1.70	0.50	0.50
Reporting Date: 28/09/2020	DETS Sample No	499517	499518	499519	499520

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5



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Kent ME17 2JN



Soil Analysis Certificate - Sample Descriptions

DETS Report No: 20-10776	
Constructive Evaluation Ltd	
Site Reference: Former McIntyre Nursery, Ferring	
Project / Job Ref: 20.1098	
Order No: 20.1098	
Reporting Date: 28/09/2020	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
499517	WS1	None Supplied	0.30	16.2	Brown sandy clay with stones
499518	WS1	None Supplied	1.70	11.7	Light brown sandy clay with stones and chalk
499519	WS2	None Supplied	0.50	19.5	Brown sandy clay with stones and concrete
499520	WS3	None Supplied	0.50	11.7	Brown loamy sand with stones and chalk

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}



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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 20-10776

Constructive Evaluation Ltd

Site Reference: Former McIntyre Nursery, Ferring

Project / Job Ref: 20.1098

Order No: 20.1098

Reporting Date: 28/09/2020

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphénylcarbazine followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried

AR As Received

Appendix G

Report Terms and Conditions

Trading Terms

Unless specifically stated within the tender/quotation or unless identified within the introduction to this report it is confirmed that this report has been compiled wholly in accord with Constructive Evaluation Limited's terms of engagement. This report is provided for sole use by the Client and is confidential to them. No responsibility whatsoever for the contents of the report will be accepted to anyone other than the Client.

Copyright

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Context

This report is written in the context of an agreed scope of work between Constructive Evaluation Limited and the Client and should not be used in a different context. In light of additional information becoming available, improved practices and changes in legislation amendment or re-interpretation of the report in whole or part may be necessary after its original submission.

Professional Interpretation

The recommendations made and opinions expressed in the report are based on the conditions revealed by the site works together with an assessment of the data from the insitu and laboratory testing or in respect of the desktop reports. No responsibility can be accepted for conditions that have not been revealed by the research, site works and testing.

The Client is advised that the conditions observed on site by Constructive Evaluation Limited at the time of any site survey may be subject to change. Certain indicators of the presence of hazardous substances may have been latent at the time of the most recent site reconnaissance and they may subsequently have become evident. It is not possible to assess areas which are inaccessible or where access is not granted and CE accept no liability for risks subsequently identified therein.

The conceptual model, Risk assessment and sampling regime has been formulated in accordance with current UK guidance at time of production based upon the relevant information gained from Phase 1 and Phase 2 investigations. While the model and assessment offer opinions and interpretations of these guidelines, the comments made are for guidance only and no liability can be accepted for their accuracy. It is possible that aspects of desktop study may need to be altered to conform to the requirements of the statutory regulatory bodies.

Intrusive Field Operations

The data collected through direct operations in the production of this report has been so obtained, unless directly otherwise stated, in accordance with current UK guidance, law or accepted industry practice, including but not limited to: BS.5930: 1990 Code of Practice for Site Investigations (Amendment 2: 2010), BS 10175:2011+A1:2013 Investigations into Potentially Contaminated Sites, and BS.8576:2013 Guidance on Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds. Exact exploratory locations will depend upon access conditions, site use and plant capability, CE do not accept liability for issues arising from material identified between or outside of the area of exploratory locations.

Laboratory Testing

Unless stated otherwise within the text, all geotechnical and material laboratory tests have been performed in accordance with the relevant British Standard Documents. Laboratory testing for contaminated land assessment is completed under the UKAS / MCERTS accreditation schemes, unless identified as otherwise in the report.

Human Health Risk Assessment Criteria

The Environment Agency has recently undertaken revision of the Soil Guideline Values (SGVs) which are partially complete. Where standards are available using the "new" approach, these have been utilised for correlative purposes. Where standards have not yet been revised, guidance following the "old" approach has been utilised. Please note that upon release of the remaining guidelines, the standards contained within this report may be subject to change. In addition, the second edition of the LQM CIEH guidance has now been released and will be utilised in favour of previously published guideline values.

Third Parties

The findings and opinions conveyed in this report are based on information obtained from a variety of sources, including that from previous Site investigations and chemical testing laboratories. Constructive Evaluation Limited has assumed that such information is correct. Constructive Evaluation Limited cannot and does not guarantee the authenticity or reliability of the information it has relied upon and can accept no responsibility for inaccuracies with the data supplied by other parties.

The accuracy of the historical map extracts supplied cannot be guaranteed and it should be noted that different conditions may have existed between mapping sheet editions. Therefore, there can be no certainty that all areas of contamination have been identified during the Phase 1 investigation.

Definitions

Reference to the word "contamination" in this report does not relate to the statutory definition of contaminated land under 1990 Environmental Protection Act unless otherwise stated. The definition used in this report is: "Land that contains substances that, when present in sufficient quantities or concentrations, are likely to cause harm, directly or indirectly, to man, to the environment, or on occasion to other targets" (NATO CCMS, 1985).

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