

**Industrie Cartarie Tronchetti (ICT) UK Ltd and Crag Hill Estates Ltd  
(CHEL)**

# **Paper Mill Facility, Plot C, Airfields, Northern Gateway**

**Environmental Statement**

**Part 2 – Geology & Ground Conditions Technical Paper 1**

Revision 1 26 July 2021



## Revision Record

Revision Reference	Date of Revision	Nature of Revision	Author	Checked By
Version I	26/07/2021	Draft	A Smith	A Edgar

Report Author	Alex Smith
Report Date	26 <sup>th</sup> July 2021
Project No.	15-168
Document Ref.	15-168-R01
Revision	Version I

## Contents

<b>1.</b>	<b>Introduction .....</b>	<b>5</b>
<b>2.</b>	<b>Documents Consulted .....</b>	<b>6</b>
<b>3.</b>	<b>Consultations .....</b>	<b>8</b>
<b>4.</b>	<b>Methodology and Approach.....</b>	<b>10</b>
	Receptors .....	10
	Environmental Impacts.....	11
	Significance of Effects.....	12
	Impact Prediction Confidence.....	12
<b>5.</b>	<b>Baseline Information.....</b>	<b>13</b>
<b>6.</b>	<b>Alternatives Considered.....</b>	<b>15</b>
<b>7.</b>	<b>Potential Environmental Effects.....</b>	<b>16</b>
	Construction Phase .....	16
	Operational Phase.....	22
<b>8.</b>	<b>Proposed Mitigation.....</b>	<b>24</b>
	Construction Phase .....	24
	Operational Phase.....	25
<b>9.</b>	<b>Potential Residual Effects.....</b>	<b>27</b>
	Potential Residual Effects – Construction Phase.....	27
	Potential Residual Effects – Operational Phase .....	28
<b>10.</b>	<b>Additive Impacts (Cumulative Impacts and their Effects) .....</b>	<b>30</b>
<b>11.</b>	<b>Conclusion.....</b>	<b>35</b>
<b>12.</b>	<b>Reference List.....</b>	<b>37</b>
<b>13.</b>	<b>Appendices.....</b>	<b>38</b>

### Tables and Figures:

Table I.1 - Summary of Consultations and Discussion

Table I.2 Receptors

Table I.3 Environmental Impact

Table I.4 – Confidence Levels

Table I.5 – Significance of Effect – Construction Phase

Table I.6 – Significant of Effect – Operational Phases

Table I.7 – Residual Significance of Effect – Constructions Phase

Table I.8 – Residual Significance of Effect – Operational Phase

Table I.9 – Cumulative Development

### Appendices:

Appendix I.1 – Phase I Geoenvironmental Site Assessment Land at Welsh Road Northern Gateway Deeside

Appendix I.2 – Groundsure Report (Ref GS-8066692).

Appendix I.3 – Ordnance Survey Maps



## I. Introduction

- I.1. An assessment of the likely significant effects on ground conditions from or associated with the Proposed Development as described in the ES Project Description, Section 2 of the ES Part 1 Report. This Technical Chapter has been undertaken by Shepherd Gilmour Infrastructure (SGI).
- I.2. This Technical Chapter of the ES describes the existing soil and geological conditions including ground and surface water resources beneath and near the site and development constraints of the Proposed Development Site (PDS) (the baseline conditions).
- I.3. It goes onto describe the proposed method of assessment of likely significant environmental effects to or from ground conditions during both the construction and operational phase and impacts from and the proposed development will be considered.
- I.4. Where appropriate mitigation measures necessary to reduce or remove likely significant effects are described, together with an assessment of the residual impact.
- I.5. This Paper links closely with the Water Environment Technical Paper 3 and they should be read in conjunction with one another. In relation to ground, this Paper will assess the impact that naturally occurring risk, permanent development and also construction associated with this manufacturing facility will have on the underlying sub-strata and receiving waters. The Water Environment Paper will also assess the impact on the underlying sub-strata and receiving waters but from drainage conveyance.

## 2. Documents Consulted

- 2.1. This Technical Paper will be based upon the published guidance and documents/studies identified in this Section.
- 2.2. Planning Policy Wales (PPW) indicates that principal planning objective when considering development on land affected by contamination is to ensure that any unacceptable risks to human health, buildings and other property, and the natural and historical environment from the contaminated condition of land are identified, so that appropriate action can be considered and then taken to address those risks.
- 2.3. To prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.
- 2.4. The framework planning policies and decisions should also ensure that:
- the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that 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.
- 2.5. The assessment completed by SGI has been guided by the following legislation and good practice with due regard to the Planning Policy Wales and the following documents:
- Part 2A Environmental Protection Act 1990 and the Contaminated Land (Wales) Regulations 2006,
  - The Contaminated Land (Wales) (Amendment) Regulations 2012, Contaminated Land Statutory Guidance for Wales 2012 (Welsh Government, 2012) Defra Circular 01/2006 (Defra 2006).
  - Environment Agency (Environment Agency, Land Contamination: Risk Management (LCRM) (2020)
  - Environment Agency Groundwater Protection: Policy and Practice (GP3) 2008

- BSI 10175 (Code of Practice for Investigation of Potentially Contaminated Land)

- 2.6. Part 2A of the Environmental Protection Act (EPA) 1990, introduced by s57 of the Environment Act 1995, came into force in Wales on 1 July 2001. The main objective of introducing the Part 2A regime is to provide an improved system for the identification and remediation of land where contamination is causing unacceptable risks to human health or the wider environment given the current use and circumstances of the land.
- 2.7. The main documents that set out procedures for the conduct of technical processes or activities which may be relevant or partially relevant to Part 2A includes The Environment Agency / Department of Environment guidance, Land Contamination: Risk Management (LCRM) (2020) and this document recommends a phased or tiered approach to risk assessment.
- 2.8. The Tier 1 assessment that is reported within the SGI Phase 1 Geoenvironmental Site Assessment encompasses a review of the available historical and geo-environmental information. See Appendix I.1 of this Technical Paper. The data collection exercise has been undertaken following the guidelines outlined for 'Preliminary Investigations' in Section 6 of BS10175:2011 Investigation of potentially contaminated sites – Code of Practice.

### 3. Consultations

- 3.1. In the case of this application, SGI has not undertaken a detailed Screening or Scoping Opinion request to the Council. On this basis Spawforths have previously sought to confirm with the Council by letter the information to be provided in the ES in accordance with Part 4 (13) of the ES Regulations, to ensure the scope of the Technical Paper and the methodology for assessing the significant is robust. The Council subsequently confirmed that they accepted this approach and methodology. This Paper seeks to use the same approach and methodology. A copy of the Council letter is attached to the ES Part I Report at Appendix 14.
- 3.2. A desk-based assessment of ground conditions has been undertaken. No intrusive investigation works have been completed and no previous site investigation reports have been provided or reviewed.
- 3.3. The information obtained and considered in the Phase I Geoenvironmental Site Assessment includes historical Ordnance Survey maps, geological maps and memoirs, hydrological and hydrogeological records, environmental databases, coal mining and mineral extraction records.
- 3.4. As part of these searches, information from the following consultees has been assessed.



Theme / Issue	Date	Consultee	Method	Summary of Discussion	Outcome / Output
Air Pollution, Waste, Contaminated Land	22/07/2021	Flintshire County Council	Database search	No pertinent features recorded.	NA
Waste, Hydrogeology, Hydrology	22/07/2021	Natural Resources Wales (NRW)	Database search	<p>The underlying solid geological strata are classified as a Secondary A aquifer. No groundwater abstractions are located within 1km of the proposed development. One pollution incident identified within a 250m radius of the site involving spills of solvents c. 235m north of the site.</p> <p>The River Dee and Estuary are classified as Ramsar, Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC).</p>	The pollution incident does not relate to the proposed development site.
Coal Mining	22/07/2021	Coal Authority	Database search	No pertinent features recorded	NA
Radon	22/07/2021	Public Health England	Database search	Intermediate Probability Area (5-10% affected) – Full protection measures required which are to be agreed with the Local Authority.	NA
COMAH Industrial Sites	22/07/2021	Health and Safety Executive	Database search	None identified within 1km	NA
Scoping of the EIA	09/08/2021	Flintshire County Council	Informal discussion	Accepted that the stated approach was acceptable	EIA completed in accordance with the ES.

**Table 3.1: Summary of Consultations and Discussions**

## 4. Methodology and Approach

- 4.1. The ES assessment has been undertaken in accordance with the requirements of the Regulation and Guidance and assesses both ground conditions and contamination risk to and from the Proposed Development.
- 4.2. The generally accepted method of assessing the risks associated with ground conditions is based on Environment Agency (Environment Agency, Land Contamination: Risk Management (LCRM) (2020) and this requires:
- to establish the environmental setting of the site, particularly with regards to ground conditions including local geology, hydrology and hydrogeology;
  - to identify historic use or current potential sources of contamination and how these may affect the proposed scheme or indeed the wider environment;
  - to develop a Conceptual Site Model [CSM] of the site. This would be carried out in line with requirements of the Environmental Protection Act Part 2A source-pathway-receptor 'pollutant linkage' methodology;
  - to undertake a geotechnical appraisal of the site and identify any site constraints and potential risks;
  - to characterise, where possible, constraints and development considerations, including recommendations for further investigations, assessments and mitigation.
- 4.3. No field surveys have been completed as part of this phase of works. Intrusive site investigation to confirm the findings of the desk based Tier I assessment and to provide geotechnical parameters for the constructions of buildings, highways and infrastructure will be undertaken.

### Receptors

- 4.4. The receptors identified as susceptible to potential impact from the development are controlled waters (surface waters adjacent and on the site) and human health risks both on and adjacent to the site. The identified receptors have been ranked according to the following designation criteria.

Designation	Receptors
International	NA
National	River Dee and the Dee Estuary SSSI, Ramsar, SAC
Regional	River Dee and the Dee Estuary SSSI, Ramsar, SAC

County	River Dee and the Dee Estuary SSSI, Ramsar, SAC
Borough / District	River Dee and the Dee Estuary SSSI, Ramsar, SCA Secondary A Aquifer
Local/Neighbourhood	Shotwick Brook/Northern drain River Dee and the Dee Estuary SSSI, Ramsar, SAC Secondary A Aquifer Third party property Future site users

Table 1.1: Receptors

## Environmental Impacts

- 4.5. Based on the findings of the Phase I Geoenvironmental Site Assessment the potential effects during the construction stage and the operational development have been evaluated.

The assessment includes consideration of any proposed earth works and the potential effects of the development activities on sensitive receptors such as surface groundwater and future site workers.

Magnitude	Environmental Impact
Major	Activities will substantially increase long-term contaminant release over and above the baseline conditions with significantly increased risks to human health and the wider environment. Effects are likely to be important considerations at a regional or district scale. Remedial work may mitigate such effects to some degree but is unlikely to remove all of the effects upon the affected receptors.
Major	Activities are likely to increase long-term contaminant release over and above the baseline conditions with significantly increased risks to human health and the wider environment. Effects are likely to be important considerations at a regional or district scale. Remedial work may mitigate such effects to some degree but is unlikely to remove all of the effects upon the affected receptors.
Moderate	Activities are may result in a moderate contaminant release, or cause degradation of other soil quality parameters, over and above the baseline conditions, with moderate increased risks to human health or controlled waters. Effects could be permanent on a local scale or have wider, temporary impact. Remediation measures are likely to be largely effective although some residual effects may still arise.
Minor	Activities may result in some contaminant release or cause degradation of other soil quality parameters over and above the baseline conditions with significant increased risks to human health or controlled waters. Effects are likely to be both temporary and local in nature and can be successfully addressed by remediation to leave minimal residual risk.
Negligible	Activities may result in small risks to human health or controlled waters.
Neutral	Activities will not result in any changes to baseline conditions.

Table 1.2: Environmental Impacts

## Significance of Effects

- 4.6. The significance of effect is determined using the significance matrix in Section 6 of the Environmental Statement Part I Report. This identifies the receptor level across the top of the matrix and the magnitude of environmental impact down the side and where they meet within the matrix identifies the significance of the effect.

## Impact Prediction Confidence

- 4.7. It is also of value to attribute a level of confidence by which the predicted impact has been assessed. The criteria for these definitions are set out below:

Confidence Level	Description
High	The predicted impact is either certain i.e. a direct impact, or believed to be very likely to occur, based on reliable information or previous experience.
Low	The predicted impact and its levels are best estimates, generally derived from first principles of relevant theory and experience of the assessor. More information may be needed to improve confidence levels.

Table 1.3: Confidence Levels



## 5. Baseline Information

- 5.1. This Section sets out all of the baseline data that has been collected to inform the proposal and the assessment of the environmental impact of ground conditions and contamination. All baseline data used in this assessment can be found in the Appendices.
- 5.2. A review of the pertinent Ordnance Survey (OS) mapping dating from 1870s to 2021 indicates that the site has remained undeveloped agricultural land. Based on the review of OS mapping, there are not considered likely to be any potentially contaminative land uses at the site.
- 5.3. British Geology Survey (BGS) records identify that the site is underlain by Tidal Flat Deposits (Clay, Silt, Sand) that in turn are underlain by Pennine Lower / Middle Coal Measures (Mudstone, Siltstone, Sandstone). The Tidal Flat deposits are classified by NRW as a Secondary Undifferentiated aquifer, while the Pennine Lower / Middle Coal Measures are classified as a Secondary A aquifer. No groundwater source protection zones or groundwater abstractions have been identified within 1km of the site.
- 5.4. The River Dee is located c. 430m south of the site boundary with the site reported to be located in a Flood Risk Zone C1; being an area with significant infrastructure served by flood defences. There are no surface water abstractions within 500m of the site.
- 5.5. Shotwick Brook is located within the western portion of the site orientated NE to SW flowing towards the River Dee.
- 5.6. Northern Drain runs along the Northern Boundary and issues into Shotwick Brook in the NW corner of the site
- 5.7. The site is not located within an area deemed to be at risk from ground instability arising from historic coal mining activities.
- 5.8. The site is located within an area that may be affected by radon with between 5% and 10% of homes affected.
- 5.9. Given the predominantly undeveloped nature of the site there are unlikely to be significant site wide sources of contamination present. However, localised impact within the Made Ground used to infilled ponds / ground cannot be entirely discounted.

- 5.10. The Initial Conceptual Site Model has not identified any potential on-site sources of mobile contamination, as such the site is deemed to pose a very low risk to controlled waters.
- 5.11. The presence of alluvial soils may be a low-level source of ground gas (methane and carbon dioxide) which may pose a risk to human health. Additionally, the site is located within an area that is classified as Intermediate Probability Area (5-10% affected) for radon gas.

## 6. Alternatives Considered

- 6.1. Development proposals have evolved embracing the concept of maximising the re-use of material on-site where possible.
- 6.2. Development proposals have included developing a 'cut and fill' model that allows for 100% of suitable materials to be re-used on site. However, given the magnitude of the development, there is still a requirement for the import of materials.
- 6.3. If unsuitable soils are encountered during enabling works, the option of on-site treatment or off-site disposal will be considered.

## 7. Potential Environmental Effects

- 7.1. The following section looks at the potential environmental effects from the development site in both construction and operational phases.
- 7.2. There are also affects not addressed directly in this Technical Paper (such as those associated with Noise and Vibration) which are partially dictated by ground conditions, such as the formation of foundations and re-engineering of site won materials to form development platforms. The extent to which ground conditions affect the formation choice is primarily dictated by the detailed design of the proposed structures and therefore cannot be quantified at this stage.
- 7.3. The following impacted impacts have been assessed.

### Construction Phase

#### Enabling Works

- 7.4. To facilitate the Proposed Development site enabling and infrastructure works will be required and hence they form part of the Application Proposals. These are summarised below and detailed in later sections:
- Removing the Site topsoil and setting it aside for reuse
  - Carrying out a cut and fill exercise to create plateaus for the future buildings.
- 7.5. During the enabling works process, there will be a requirement to prepare the ground for subsequent development. This will include the excavation of any Made Ground or natural strata to remove any obstructions and to remove any geotechnically unsuitable material such as timber or organic soils. Concrete obstructions (if present) that are excavated will be processed on-site under a WRAP (Waste Recycling Action Plan) Protocol and turned into construction aggregate for subsequent re-use on-site as part of the development. Any remaining chemically and geotechnically suitable material will either be re-used or require off-site disposal. These works are likely to be completed as part of the initial phase of construction only and any potential effects are likely to be short term.



## Receptors

- 7.6. During the initial phase of enabling works and wider construction works there will be a requirement for construction workers to be present on-site and at this time there is likely to be requirement for construction workers to be in direct contact with any contaminated soils, therefore, human health is of high sensitivity. Impacts are likely to be limited to inhalation of dust by residents adjacent to the Site, during earthworks and movement of soils, but likely to be limited to dry and windy periods. Importation of material will increase traffic movements and potentially provide a source of dust during these activities, although these will be restricted to construction traffic routes.
- 7.7. The River Dee located c. 430m south of the site boundary is considered to be of high sensitivity (national importance). Shotwick Brook and the Northern Drain are also considered to be of high sensitivity but of local importance. Excavations and works to watercourses may result in the mobilisation of contaminated soils/groundwater or the creation of preferential pathways.

## Significance of Effect

- 7.8. Desk based research to date, has not identified any significant on-site sources of contamination associated with historical site activities that may pose a risk to human health, groundwater or surface water. Therefore, completion of the engineering works during the construction phase is considered to have **negligible effect**.

## Fuel Storage

- 7.9. During the enabling and construction works it is likely that excavators, crushers and tipper trucks will be required to move and process arisings and subsequently replace arisings with recycled engineering aggregates. The use of plant is likely to require the storage and use of fuel. The storage of fuel is likely to be a requirement of the constructions works and therefore any potential effects are likely to be short term.

## Receptors

- 7.10. The geological strata beneath the proposed development site comprises Tidal Flat deposits overlying Pennine Lower / Middle Coal Measures. NRW classify these strata as Unproductive and Secondary A aquifers respectively. No groundwater abstractions have been identified

within a 1km radius of the proposed development site. The tidal deposits are likely to be low permeability and afford protection to the underlying Coal Measures from any vertical contaminant migration.

- 7.11. The River Dee is high sensitivity as it is classified as a Ramsar site, SSSI and SCA. Shotwick Brook forms the western boundary and is considered to be of high sensitivity.

### Significance of Effect

- 7.12. Based on the nature of activity, the storage of fuel is considered to have a medium magnitude of effect and given the sensitivity of the receptors, spillage of fuel could have a short term high adverse effect on baseline conditions with particular reference to the River Dee as this is on national importance and moderate adverse with reference to Shotwick Brook.

### Storage of Soils

- 7.13. Exposed soils or stockpiles of material awaiting processing or disposal may be exposed to precipitation which could induce run-off into adjacent watercourses. While the soils are not likely to contain contaminants, they could cause physical impact upon sensitive ecological receptors while dust generated could create nuisance to adjacent properties. The storage of soils is likely to be undertaken during the initial phases of construction only and is therefore any effects are likely to be short term and generation of dust limited to periods of windy, dry weather.

### Receptors

- 7.14. During the enabling works there will be a requirement for construction workers to be present on-site, therefore at this time human health is considered to be of high sensitivity.
- 7.15. The River Dee is high sensitivity as it is classified as a Ramsar site, SSSI and SCA. Shotwick Brook and the Northern Drain which forms the Northern and Western boundary are also considered to be of high sensitivity.

Stockpiles that are exposed to precipitation could generate run-off which contain a high suspended solids content. Should run-off therefore be uncontained this could wash into Shotwick Brook and the Northern Drain, affecting water quality. Therefore, this activity is

also likely to have a **short term high adverse effect** on the Shotwick Brook and the Northern Drain.

## Foundation Structures

- 7.16. No site specific geotechnical assessment of the site has been completed but given that high loadings may be required it may be necessary to utilise piled foundations onto the underlying Sandstone bedrock. The formation of piles through any Made Ground and drift strata may result in the creation of preferential pathways. However, based on desk study research no potentially significant on-site sources of contamination are anticipated.

## Receptors

- 7.17. As discussed previously, the geological strata beneath the proposed development site comprises Tidal Flat deposits overlying Pennine Lower / Middle Coal Measures. NRW classify these strata as Unproductive and Secondary A aquifers respectively. No groundwater abstractions have been identified within a 1km radius of the proposed development site. The tidal deposits are likely to be low permeability and afford protection to the underlying Coal Measures from any vertical contaminant migration.
- 7.18. The River Dee is high sensitivity as it is classified as a Ramsar site, SSSI and SCA. Shotwick Brook which forms the western boundary is also considered to be of high sensitivity.



## Significance of Effect

- 7.19. As no significant sources of on-site contamination have been identified, the provision of a piled foundation, if required, is considered to have a low magnitude of effect as it is unlikely to pose a significant risk to controlled waters receptors. Therefore, the provision of foundation structures is likely to have a **negligible effect**.

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level
Enabling Work - civil engineering excavations for foundations and drainage etc	Local	Negligible	Negligible	High
Enabling Work - civil engineering excavations for foundations and drainage etc	Borough/District	Negligible	Negligible	High
Fuel Storage	National (River Dee)	Moderate Negative	Moderate/High Adverse	High
	Local (Shotwick Brook)	Moderate Negative	Minor Adverse	High
Storage of Soils	Local	Negligible	Negligible	High
Storage of Soils	National (River Dee)	Moderate Negative	Moderate/High Adverse	High
	Local (Shotwick Brook)	Moderate Negative	Minor Adverse	High
Installation of Foundation Structures	Local	Negligible	Negligible	High

Table 7.1: Significance of Effect - Construction Phase

## Operational Phase

- 7.20. No significant on-site sources of contamination have been identified based on desk-based research and given that the site will largely comprise hard standings and buildings there are unlikely to be contaminant pathways to the sub-surface with infiltration and subsequent leachate unlikely to be a significant long-term issue.
- 7.21. The Site is located within a radon affected area and due to the presence of alluvial Tidal Flat deposits (and possible organic material associated with Shotwick Brook) there may be a potential ground gas source. Should radon or ground gas be identified these may migrate through the sub-surface and accumulate within foundation structures and buildings. There is likely to be some inherent mitigation in that the building will likely require substantial engineering of ground and floor slabs which will reduce the potential for migration pathways. The duration of effects for the operational phase is long term.
- 7.22. Given the proposed end use of the Site, significant on-site storage of potentially hazardous material is likely to be limited, and where present, contained to areas specifically designed for chemical/product storage. The specification, construction, maintenance and monitoring of pollution prevention equipment at the Site will be a specific requirement of the site's environmental permit issued by NRW under the Environmental Permitting (England and Wales) (Amendment) Regulations 2018. As such, should any spillages occur, these will be to areas of hardstanding and controlled via the site drainage networks and would therefore not impact upon existing ground conditions or controlled waters receptors.
- 7.23. Process effluent from the plant is proposed for discharge to the River Dee but this will be strictly controlled by Environmental Installation Permit conditions issued by NRW. In determining the limits of any discharge consent, NRW will consider factors including the chemical and biological sensitivity of the receiving water and mitigation measures placed on the effluent in terms of treatment and pollution prevention infrastructure to prevent any discharges in the event of an emergency situation.

## Receptors

- 7.24. During the operational phase, human health is considered to be of low to medium sensitivity due to a possible ground gas/radon inhalation pathway. No dermal contact or ingestion pathways are considered likely to be present.
- 7.25. Controlled water receptors within the underlying Secondary A aquifer are considered to be low sensitivity due to the presence of low permeability drift. The adjacent Shotwick Brook is considered to be of a high sensitive receptor.

## Significance of Effect

- 7.26. As no potentially significant sources of contamination have been identified and only a low possibly of ground gas/radon migration identified, the magnitude of effect associated with the operation phase is considered to be low. Therefore, given the sensitivity of the identified receptors, potential effects during operation are considered to be **minor adverse**.
- 7.27. Chemical storage facilities are likely to be within dedicated areas of the site that are constructed within impermeable areas of the site and where necessary banded in accordance with regulations and/or permit conditions. There is considered to be a **negligible effect**.
- 7.28. As discharges from the plant to the River Dee will be made within strict limits imposed by the site's Environmental Installation Permit, there is considered to be a **negligible effect**.

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level
Exposure to sub-surface surface contamination	Local	Negligible	Negligible	High
Ingress of ground gas/radon	Local	Minor Negative	Negligible/Minor Adverse	High
Discharge of process effluent	National	Negligible	Negligible	High
Storage of chemicals	Local	Negligible	Negligible	High

Table 7.2: Significance of Effect - Operation Phase

## 8. Proposed Mitigation

This section outlines the proposed environmental impact mitigation measures in the construction and operational phases to address the limited adverse impacts and their effects previously identified.

### Construction Phase

- 8.1. The following details the mitigation that will be put in place during the construction phase.
- 8.2. The Proposed Development will be constructed in accordance with a Construction Environmental Management Plan (CEMP) which will be prepared and submitted to Flintshire County Council for their approval prior to development commencing. The Framework CEMP is presented in Appendix II of the ES Part I Report.
- 8.3. The CEMP would specify a range of measures to prevent the generation of dust or run-off during the enabling works. Such measures will include the location of and protection of stockpiles, setting of speed limits for construction traffic and the damping down of haul roads and stockpiles during dry weather.
- 8.4. Where soils are exposed at the surface and if contaminated soils are encountered (albeit unlikely) then it may be necessary for site operatives to utilise personal protection equipment should as gloves and overall to prevent dermal contact. It is likely that any enabling and construction works will be of a sufficient duration to necessitate the provision of adequate welfare facilities with washing and a clean eating environment in order to prevent any ingestion of impacted soils.
- 8.5. If asbestos fibres are identified within any Made Ground deposits then additional dust control measures, such as burying impacted soil at depth, may be required to prevent asbestos fibres being generated. These type of control measures as specified within CIRIA 733 Asbestos in soil and made ground: a guide to understanding and managing risks. Additional measures such as boundary dust monitoring may be completed to demonstrate that dust/fibres have not been released or that additional dust suppression is required.
- 8.6. Fuel storage requirements would also be addressed within the CEMP. The storage of fuels is controlled by the Control of Pollution (Oil Storage) (England) Regulations 2001 which

requires all fuel storage facilities over 250litrs to be provided with adequate bunding in order to prevent spillages. Furthermore, it will be necessary to ensure that all fuel storage facilities are located away from adjacent watercourses.

- 8.7. The CEMP would also specify the circumstances in which it would be necessary to employ the use of an on-site wheel cleaner or off-site road sweeper to remove debris.
- 8.8. The likely hardcover commercial development will provide sufficient mitigation against direct dermal contact or ingestion of impacted soils without the need for additional mitigation. Within the landscaped areas a cover system to prevent exposure that is designed in accordance with the requirements of BRE 465 Cover systems for land regeneration - thickness of cover systems for contaminated land would be implemented as necessary.
- 8.9. The desk study report has identified that ground gas and radon may be present and that this may pose a risk to the proposed development. If a risk is identified through further investigations, additional mitigation measures will be defined to prevent to prevent gas migration as specified within BS8485 (2015)+A1(2019) Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.

## Operational Phase

- 8.10. Given the scale and nature of the site, it is likely that it will fall under the Environmental Permitting (England and Wales) Regulations 2018 which applies an integrated environmental approach to the regulation of certain industrial activities. This means that emissions to air, water (including discharges to sewer) and land, plus a range of other environmental effects, must be considered together. It also means that regulators must set permit conditions so as to achieve a high level of protection for the environment as a whole.
- 8.11. These conditions are based on the use of the Best Available Techniques (BAT), which balances the costs to the operator against the benefits to the environment. IPPC aims to prevent emissions and waste production and where that is not practicable, reduce them to acceptable levels.
- 8.12. For the proposed development, reduction in emissions to water and the sub-surface is likely to be through the specification of impermeable surfaces and bunding to all process, chemical

and waste storage areas and where applicable treatment of process effluents prior to discharge.

- 8.13. IPPC also takes the integrated approach beyond the initial task of permitting through to the restoration of sites when industrial activities cease.
- 8.14. All of these conditions will need to be agreed with NRW prior to the Site being made operational.

## 9. Potential Residual Effects

The following tables show the residual significant of the environmental effect from geology and ground conditions post mitigation in both the construction and operational phases.

### Potential Residual Effects – Construction Phase

- 9.1. The overall impact of the proposal in terms of geology and ground conditions issues during the construction phase is highlighted in the table below:

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
Enabling Work Ground Improvement	Local	Negligible	Negligible	High	NA	Negligible
Enabling Work Ground Improvement	Borough/District	Negligible	Negligible	High	NA	Negligible
Fuel Storage	National	Moderate Negative	Moderate/High Adverse (River Dee)	High	CEMP should identify appropriate fuel storage location and all facilities should meet the Oil Storage Regulations.	Negligible
	Local (Shotwick Brook)	Moderate Negative	Minor Adverse	High		Negligible
Storage of Soils	Local	Negligible	Negligible	High	CEMP should design suitable stockpile management plans	Negligible
Storage of Soils	National (River Dee)	Moderate Negative	Moderate/High Adverse	High	CEMP should design suitable stockpile management plans	Negligible

Storage of Soils	Local (Shotwick Brook)	Moderate Negative	Minor Adverse	High	CEMP should design suitable stockpile management plans	Negligible
Installation of Foundation Structures	Local	Negligible	Negligible	High	NA	Negligible

Table 9.1: Residual Significance of Effect - Construction Phase

9.2. The The overall residual effects of the construction phase are assessed as negligible.

## Potential Residual Effects – Operational Phase

9.3. The overall impact of the proposal in terms of geology and ground condition issues during the operational phase is highlighted in the table below:

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
Exposure to sub-surface surface contamination	Local	Negligible	Negligible	High	NA	Negligible
Ingress of ground gas/radon	Local	Minor Negative	Negligible/Minor Adverse	High	Ingress of ground gas and radon can be controlled through the installation of gas mitigation measures.	Negligible
Discharge of process effluent	National	Negligible	Negligible	High	Environmental Permit conditions will be set and on-site effluent treatment completed accordingly.	Negligible



Storage of chemicals	Local	Negligible	Negligible	High	Operational areas will be set upon hard standing and where necessary chemical storage areas will be bunded in accordance with permit conditions and/or regulation.	Negligible
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Table 9.2: Residual Significance of Effect - Operation Phase

- 9.4. The residual effects from the operational phases are generally negligible with respect to geology and ground conditions.

## 10. Additive Impacts (Cumulative Impacts and their Effects)

10.1. For the purposes of this ES we define the additive cumulative effects as:

***‘Those that result from additive impacts (cumulative) caused by other existing and/or approved projects together with the project itself***

10.2. The developments that are likely to have a cumulative impact when considered with the proposed development have been agreed with the Local Authority during the preparation of this ES (a full list is included within Section 9 of this ES Part I Report).

10.3. The following table includes the agreed list of cumulative developments that have been assessed in respect of geology and ground conditions. These are shown geographically on the plan included at Appendix I.3 of the ES Part I Report.

10.4. There is limited potential for the proposed development to give rise to likely significant cumulative effects in combination with other committed developments. This is because, following the implementation of the mitigation measures set out below there will no residual effects attributable to the proposed development on ground conditions such that a ‘contribution’ to cumulative effects cannot occur.

No.	Cumulative Development	Details	Status	Justification for Inclusion in Cumulative Assessment
I	<p>Airfields (former RAF Sealand) Site (Northern Gateway)</p> <p>LPA ref: 049320 and last varied S73 application LPA ref: 061125.</p> <p>Applicant: Crag Hill Estates Ltd.</p>	<p>Outline application for the redevelopment of a strategic brownfield site for an employment led mixed use development with new accesses and associated infrastructure including flood defences and landscaping.</p> <p>The Net Cumulative Development associated with the Airfields site after deducting the floor space (124,344m<sup>2</sup>) taken up by the Proposed ICT Paper Mill Facility (B2, B8, ancillary B1a) and operational Amazon development (ref: 060222) is as follows:</p>	<p>LPA ref: 049320 Planning permission granted by Flintshire County Council in January 2013.</p> <p>The last varied S73 application was granted on the 26 April 2021 (ref: 061125) to remove conditions 26, 28, 30, 34 and 44 and vary condition 13.</p> <p>Development expected to come forward over the next 0-5 years.</p>	<p>There is a limited potential for the proposed development to give rise to likely significant cumulative effects in combination with other cumulative developments.</p> <p>This is because following the implementation of the mitigation measures set out in Section 9 there will be no residual effects attributable to the proposed development on geological ground conditions such that a 'contribution' to cumulative effects cannot occur.</p>

		<p>Development comprises:</p> <p>Residential (C3): 689 units</p> <p>Retail (A1): 4,646m<sup>2</sup></p> <p>Office (B1a): 6,533m<sup>2</sup></p> <p>B2 /B8 Employment: 60,044m<sup>2</sup></p> <p>Car Dealership (Sui generis): 7,779m<sup>2</sup></p> <p><b>Net total floorspace:</b> <b>689 units /</b> <b>79,002m<sup>2</sup></b></p>		
--	--	---	--	--

2	<p>Former Corus Garden City Site (Northern Gateway)</p> <p>Applicant: PGNGL</p> <p>Outline (LPA ref: 054758) / S73 application (LPA ref: 059635)</p>	<p>Employment-led mixed-use development, incorporating Logistics and Technology Park (B1, B2, B8) with residential (C3), local retail centre (A1), hotel (C1), training and skills centre (C2, D1), new parkland; conversion of buildings, demolition of barns; and associated infrastructure comprising construction of accesses, roads, footpaths / cycle paths, earthworks and flood mitigation / drainage works at Northern Gateway, Land off Welsh Road, Deeside.</p> <p>Development comprises:</p> <p>Residential (C3): 770 units  Retail (A1): 2500m<sup>2</sup>  Office (B1a): 3300m<sup>2</sup>  Light industrial uses (B1b, B1c): 7400m<sup>2</sup>  Hotel Uses (C1): 3000m<sup>2</sup>  Training and skills centre (C2, D1): 4000m<sup>2</sup>  Logistics Park (B2, B8, ancillary B1a): 120000m<sup>2</sup>  <b>Total floorspace: 770 units / 140,200m<sup>2</sup></b></p>	<p>Outline planning permission granted by Flintshire County Council in May 2014.</p> <p>The last permission to be granted under a S73 application was approved in June 2020 (ref: 059635) was for removal of conditions 6, 8, 11 and 32 and variation of conditions 7, 31, 36 and 44.</p> <p>Development expected to come forward over the next 0-10 years.</p>	<p>There is a limited potential for the proposed development to give rise to likely significant cumulative effects in combination with other cumulative developments.</p> <p>This is because following the implementation of the mitigation measures set out in Section 9 there will be no residual effects attributable to the proposed development on geological ground conditions such that a 'contribution' to cumulative effects cannot occur.</p>
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		<p>This residential development is likely to come forward over the next 10 years</p> <p>Retail (A1): 2500m<sup>2</sup></p> <p>Office (B1a): 3300m<sup>2</sup></p> <p>Light industrial uses (B1b, B1c): 7400m<sup>2</sup></p> <p>Hotel Uses (C1): 3000m<sup>2</sup></p> <p>Training and skills centre (C2, D1): 4000m<sup>2</sup></p> <p>Logistics Park (B2, B8, ancillary B1a): 197m<sup>2</sup></p> <p>This remaining commercial development is likely to come forward over the next 10 years</p> <p><b>TOTAL: 770 Units and 20,397m<sup>2</sup></b></p>		
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Table 10.1: Cumulative Development

## 11. Conclusion

- 11.1. This Technical Chapter has assessed the environmental impact of geology and ground conditions which included the synergetic impacts with flood risk and drainage on controlled waters. In reaching these conclusions evidence has been renewed which has given certainty with respect to anticipated ground conditions at the site and effects on identified receptors.
- 11.2. The proposed development site has been assessed through the completion of a Phase I Geoenvironmental Site Assessment, though no intrusive site investigation has been completed to date. The Phase I report has been completed in accordance with Environment Agency Land Contamination: Risk Management (LCRM) (2020) which is the UK's accepted approach to assessing land contamination.
- 11.3. The Phase I report has identified that the site is located within a sensitive location with respect to surface water due to the presence of the nationally important River Dee (SSSI, Ramsar, SAC) c. 430m south of the site and Shotwick Brook located at the western boundary. The underlying drift strata are an unclassified aquifer due to their likely low permeability while the underlying solid strata are classified as a Secondary A aquifer.
- 11.4. Historical map research has identified that the site has not been subject to any significant development with agricultural uses shown since the first map edition. In the absence of any development there is not considered likely to be any potentially significant on-site source of contamination with limited potential for the presence of anthropogenic material.
- 11.5. The site is recorded as being in area that is potentially affected by radon and due to the presence of alluvial tidal flat deposits and possible organic clays associated with the Shotwick Brook channel, potential sources of ground gas may also be present.
- 11.6. The interaction between the underlying strata and identified receptors has been considered in two phases: construction; and operational. The construction phases are likely to requirement major earthworks to facilitate ground improvement. Additionally, the development is likely to require the installation of a deep piled foundations. As there are not considered to be any potentially significant sources of contamination, these phases of works will have a negligible effect on site operatives and controlled waters.

- 11.7. An outcome of the proposed enabling works will be the requirement to store fuel for plant and to store soil arisings from excavations. The storage of fuels and soil arisings may pose a risk to surface water through spillages or rain induced surface run-off. This activity is likely to have a short term high adverse effect on Shotwick Brook and the Northern Drain. These risks can be mitigated through carefully planning in the CEMP and locating fuel storage and stockpiles away from watercourses in bunded, secure facilities.
- 11.8. At the operational phase ground conditions are likely to have a negligible effect upon site operatives as the scheme will be surfaced with hardstanding, thus preventing any direct exposure. Conversely, the presence of hardstand will prevent infiltration of any site derived contamination. The specification for hardstanding and bunding of chemical/waste storage facilities as well as their inspection and maintenance will be a requirement the site's environmental permit that will be issued by NRW.
- 11.9. The natural strata beneath the site have been identified as a potential source of radon and ground gas which could result a minor adverse impact to site operatives if they migrate and accumulate within the proposed building. The risks are mitigated to large extent by the requirement to treat shallow soils as part of the enabling works and to engineer the building structures to a high standard to site the proposed plant and machinery. Should a ground gas risk still be present then these can be mitigated through the installation of additional protection measures (membranes and sub-floor ventilation) in accordance with the current British Standards.
- 11.10. This assessment has concluded that any negative impacts are likely to minor and transient being restricted to the construction phase. This assessment goes on to conclude that there will be an overall negligible affect once the development reaches its operational phase.



## 12. Reference List

- Planning Policy Wales, Edition 10, December 2018
- Part 2A Environmental Protection Act 1990 and the Contaminated Land (Wales) Regulations 2006
- The Contaminated Land (Wales) (Amendment) Regulations 2012, Contaminated Land
- Statutory Guidance for Wales 2012 (Welsh Government, 2012) Defra Circular 01/2006 (Defra 2006)
- Environment Agency (Environment Agency, Land Contamination: Risk Management (LCRM) (2020)
- Environment Agency Groundwater Protection: Policy and Practice (GP3) 2008
- The Environmental Permitting (England and Wales) (Amendment) Regulations 2018
- BSI 10175 (Code of Practice for Investigation of Potentially Contaminated Land) 2011
- Groundsure Search, Site at Northern Gateway, Farm Road, Garden City, CH5 2HJ Ref GS-8066692 published by Groundsure 2021
- Historical Ordnance Survey mapping dated 1871 to 2019 published by Landmark Information Group 2016
- Radon: Guidance on protective measures for new buildings, BRE Document BR 211, 2007
- Coal Authority Interactive Mapping Service
- CIRIA 733 Asbestos in soil and made ground: a guide to understanding and managing risks. 2015
- Control of. Pollution (Oil Storage). (England) Regulations 2001
- BRE 465 Cover systems for land regeneration - thickness of cover systems for contaminated land, 2004
- BS8485 (2015)+A1(2019) Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- Phase I Geoenvironmental Site Assessment, Land at Welsh Road, Northern Gateway. SGI July 2021

## 13. Appendices

## **Appendix I.1 – Phase I Geoenvironmental Site Assessment Land at Welsh Road, Northern Gateway, Deeside**



# PHASE I GEOENVIRONMENTAL SITE ASSESSMENT

Land at Welsh Road  
Northern Gateway  
Deeside

Prepared for:

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CI405/EAJ/jt/20210112 Rev A  
September 2021

## QUALITY ASSURANCE

<b>PROJECT NUMBER</b>	C1405		
<b>VERSION</b>	Version 1	Version 2	
<b>REMARKS</b>	Final	Final	
<b>DATE</b>	26 <sup>th</sup> July 2021	20 <sup>th</sup> September 2021	
<b>PREPARED BY</b>	A Smith	A Smith	
<b>QUALIFICATIONS</b>	BSc (Hons), FGS, MIEnvSc, CEnv	BSc (Hons), FGS, MIEnvSc, CEnv	
<b>CHECKED BY</b>	A Edgar	A Edgar	
<b>QUALIFICATIONS</b>	BSc, MSc, PIEMA, MIEnvSc, CEnv	BSc, MSc, PIEMA, MIEnvSc, CEnv	
<b>AUTHORISED BY</b>	A Edgar	A Edgar	
<b>QUALIFICATIONS</b>	BSc, MSc, PIEMA, MIEnvSc, CEnv	BSc, MSc, PIEMA, MIEnvSc, CEnv	

## EXECUTIVE SUMMARY

<b>Site Address</b>	Welsh Road, Garden City, Northern Gateway, Deeside CH5 2HJ	
<b>Grid Reference</b>	E332337 N369897	
<b>Site Area</b>	23.74 Ha	
<b>Current Site Use</b>	The site is located to the west of Welsh Road off a track named Farm Road and currently comprises an undeveloped parcel of agricultural land.	
<b>Proposed Development</b>	It is understood that the site will be developed for commercial use with associated access road, car parking soft landscaping and adopted utility infrastructure.	
<b>Environmental Setting</b>	<b>Drift Geology</b>	Tidal Flat Deposits – <i>Clay, Silt, Sand.</i>
	<b>Bedrock Geology</b>	Pennie Lower /Middle Coal Measures – <i>Mudstone, Siltstone, Sandstone.</i>
	<b>Hydrogeology</b>	Superficial Deposits – <i>Secondary Undifferentiated Aquifer; and</i> Bedrock Geology – <i>Secondary A Aquifer.</i>
	<b>Hydrology</b>	Shotwick Brook forms the western boundary of the site.
	<b>Flood Risk</b>	The site lies within a Flood Risk Zone C1; being an area with significant infrastructure served by flood defenses.
	<b>Ecology</b>	Semi-mature and mature trees are recorded sporadically around the periphery of the site. A Phase 1 Habitat Survey may be required due to the potential for protected species.
	<b>Subsidence Hazards</b>	A moderate compressible ground risk is recorded in the data searches, likely associated with the underlying Tidal Flat deposits.
<b>Site History</b>	A review of the pertinent Ordnance Survey mapping dating from 1870s indicates the site has remained undeveloped agricultural land.	
<b>Utility Locations</b>	Service infrastructure is likely present serving Hawarden Bridge Station located to the southwest of the site or Welsh Road to the east.	
<b>Landfill Sites and Ground Gases</b>	There are no landfill sites (active or historic) located within a 500m radius of the site.	
<b>Invasive Plant Species</b>	To be confirmed upon further inspection.	
<b>Radon</b>	Intermediate Probability Area (5-10% of households affected) – Basic Radon protection measures are required.	
<b>Coal Mining / Land Stability</b>	The site is not located within an area deemed to be at risk from ground instability arising from historic coal mining activities.	
<b>Brine Pumping / Subsidence</b>	The site is not located within an area deemed to be at risk from ground instability due to historic brine pumping activities and/or salt extraction.	
<b>Hazardous Installations</b>	No hazardous installations that could potentially prejudice the proposed construction of a commercial development have been identified within influencing distance of the subject site.	

## GEOTECHNICAL ASSESSMENT

The following potential geotechnical constraints have been identified at the site:

- The site has remained undeveloped agricultural land, and as such, the presence of significant Made Ground is not anticipated;
- Furthermore, in the absence of any structures on the site historically, no relict foundations or buried sub-structures (which may require deep excavations) are considered likely;
- Shotwick Brook forms the western boundary of the site, orientated NE to SW flowing towards the River Dee.;
- The site is recorded to benefit from flood defenses. Further flood risk assessment may be required in order to agree floor levels;
- The groundwater regime is likely to be heavily controlled by tidal influence;
- The site is not underlain by any recorded historic mine workings;
- A potential for compressible ground and running sands are recorded at the site most likely associated with the underlying Tidal Flat deposits;
- Due to the likely tidal influence on the groundwater regime, the underlying shallow superficial geology is unlikely to be suitable for soak-away drainage systems.

## CONTAMINATED LAND RISK ASSESSMENT

<b>Human Health</b>	<p>Given the undeveloped nature of the site, there are unlikely to be any significant sources of contamination present that would pose a significant risk to human health or prejudice the future commercial development at the site.</p> <p>However, local low-level impact associated with any Made Ground deposits cannot be entirely discounted.</p>
<b>Controlled Waters</b>	<p>The Initial Conceptual Site Model has not identified any potentially significant on-site sources of mobile contamination or a viable receptor, as such the site is deemed to pose no unacceptable level of risk to controlled waters.</p>
<b>Ground Gas</b>	<p>The presence of alluvial soils (Tidal Flat Deposits) may represent a low-level source of ground gas which may pose a risk to human health.</p>

## RECOMMENDATIONS

A detailed Phase II intrusive Geo-Environmental Ground Investigation should be undertaken in order to confirm the findings of the initial conceptual site model and value engineer a development solution.

## TABLE OF CONTENTS

EXECUTIVE SUMMARY .....	3
<b>1. INTRODUCTION .....</b>	<b>7</b>
1.1. Background .....	7
1.2. Proposed Development.....	7
1.3. Objectives .....	8
1.4. Sources of Information .....	9
1.5. Confidentiality .....	9
1.6. Limitations .....	9
1.7. Previous Reports .....	9
<b>2. SITE SETTING .....</b>	<b>10</b>
2.1. Site Details .....	10
2.2. Current Site Use .....	10
2.3. Surrounding Area.....	11
<b>3. SITE HISTORY.....</b>	<b>12</b>
3.1. On-Site Historical Development.....	12
3.2. Off-Site Historical Development .....	13
3.3. Planning History .....	13
<b>4. ENVIRONMENTAL SETTING.....</b>	<b>14</b>
4.1. Geology and Hydrogeology .....	14
4.2. Natural Landform and Geomorphology .....	15
4.3. Geotechnical Data .....	15
4.4. Brine Workings.....	15
4.5. Coal Mining .....	15
4.6. Hydrology .....	16
4.7. Radon Risk Potential .....	16
4.8. Industrial Land Uses.....	16
4.9. Hazardous Substance Consents .....	17
4.10. Soil chemistry .....	17
4.11. Sensitive Land Uses .....	18
4.12. Site Sensitivity Assessment.....	18
4.13. Preliminary Geotechnical Assessment .....	20
4.14. Unexploded Ordnance.....	21
<b>5. CONSULTATIONS .....</b>	<b>22</b>
5.1. Landfill Sites and Waste Treatment Sites.....	22
5.2. Regulatory Database .....	22
<b>6. INITIAL CONCEPTUAL SITE MODEL.....</b>	<b>23</b>
6.1. On-Site Sources of Contamination .....	23
6.2. Off-Site Sources of Contamination .....	23
<b>7. CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>27</b>
7.1. Site Summary.....	27
7.2. Contamination Issues .....	27
7.3. Geotechnical Issues .....	27



<b>APPENDIX I LIMITATIONS.....</b>	<b>28</b>
<b>APPENDIX II GLOSSARY .....</b>	<b>30</b>
<b>APPENDIX III DRAWINGS .....</b>	<b>33</b>
<b>APPENDIX IV .....</b>	<b>35</b>
<b>HISTORICAL MAPS .....</b>	<b>35</b>

## **DRAWING LIST**

Drawing No. 15-168-001	Site Location Plan
------------------------	--------------------

## 1. INTRODUCTION

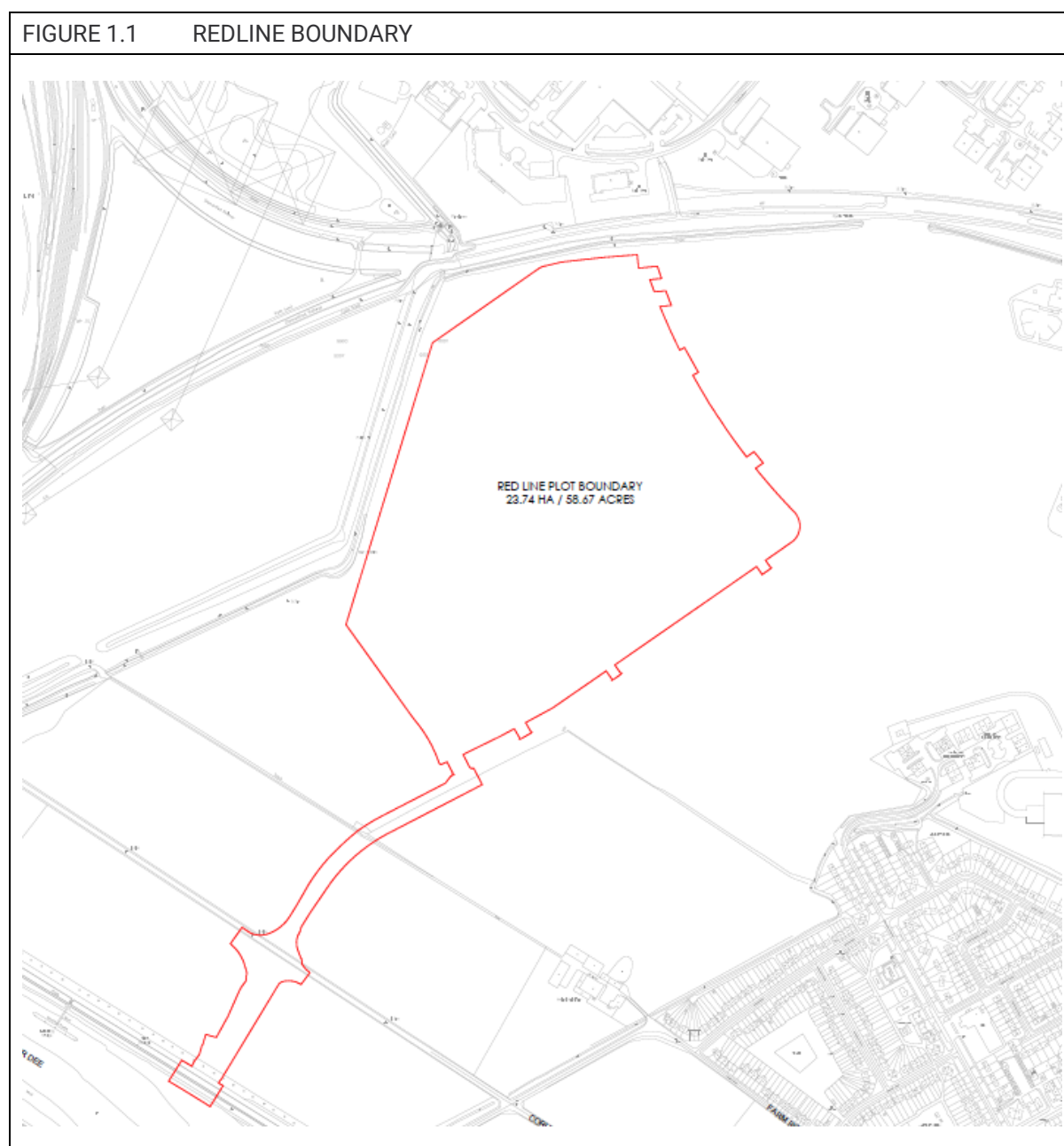
## 1.1. BACKGROUND

Shepherd Gilmour Infrastructure Ltd (SGi) has been commissioned by Industrie Cartarie Tronchetti (the Client) to undertake a Phase I Geoenvironmental Site Assessment for a parcel of land at Welsh Road Garden City, Deeside; herein referred to as the site.

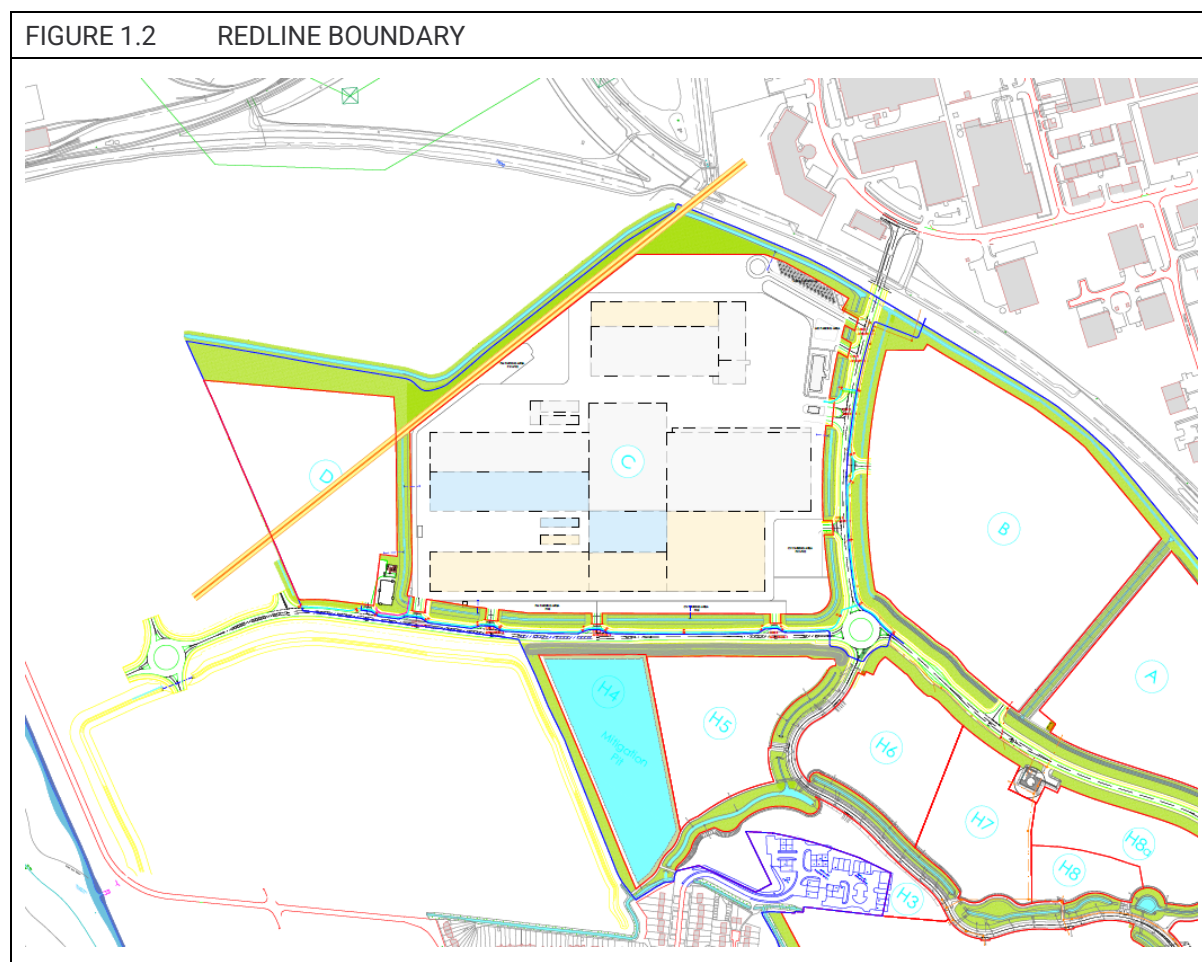
## 1.2. PROPOSED DEVELOPMENT

It is understood that the site will be developed for commercial use with associated access road, car parking soft landscaping and adopted utility infrastructure.

The redline boundary for the site is presented in Figure 1.1 below.



The proposed plot development layout is presented in Figure 1.2 below.



### 1.3. OBJECTIVES

The objectives of the geoenvironmental investigation are as follows:

- Review historical plans, geology, hydrogeology, site sensitivity, floodplain issues, mining records and any local authority information available in order to complete a desk study in line with Environment Agency (EA) document *Land Contamination: Risk Management*
- Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the future use of the site and in relation to off-site receptors.
- Assess the desk-study information and, where possible, provide preliminary recommendations in relation to foundations, pavement construction and floor slabs;
- Prepare a preliminary contaminated land risk assessment and remediation requirements;
- Provide recommendations regarding future works required.

## 1.4. SOURCES OF INFORMATION

Background information was sought from the following sources:

- Groundsure Search (Ref: GS-8066692);
- Historical mapping dated 1869 to 2021. A selection of historical maps are reproduced in Appendix V;
- On-line planning records held by Flintshire County Council;
- Consultations with representatives of Flintshire County Council;
- Magic Map Groundwater Vulnerability Map;
- Radon: Guidance on protective measures for new buildings (BRE Document BR 211, 2007);
- British Geological Survey Map;
- <https://zeticauxo.com/downloads-and-resources/risk-maps/>; and,
- <https://flood-map-for-planning.service.gov.uk>.

## 1.5. CONFIDENTIALITY

SGi has prepared this report solely for the use of the client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from SGi; a charge may be levied against such approval.

## 1.6. LIMITATIONS

The limitations of this report are presented in Appendix I.

## 1.7. PREVIOUS REPORTS

The following geoenvironmental reports have been completed at the site:

- JPG (Leeds) Limited. Geoenvironmental Desk Study Report. The Airfield, Deeside. Report Ref. MT/DS/4671.v1, dated July 2014 for Praxis Real Estate Management Ltd.
- JPG (Leeds) Limited. Geoenvironmental Ground Investigation. The Airfields, Deeside. Report Ref. MHP/GI/4671.v1, dated December 2018 for Praxis Real Estate Management Ltd.

The Phase I Geoenvironmental Desk Study is superseded by this report but relevant findings of the Geoenvironmental Ground Investigation are summarised in Section 3.4

## 2. SITE SETTING

### 2.1. SITE DETAILS

TABLE 2.1 SITE DETAILS

<b>Site Address</b>	Welsh Road, Garden City, Northern Gateway, Deeside CH5 2HJ
<b>Grid Reference</b>	E332337 N369897
<b>Site Area</b>	23.74 Ha

All acronyms used within this report are defined in the Glossary presented in Appendix II.

A site location plan is presented in Appendix III as Drawing 15-168-001.

### 2.2. CURRENT SITE USE

SGi has undertaken a review of the site using Google Earth imagery and street view to provide a description of the key features as summarised in Table 2.2.

TABLE 2.2 SITE DESCRIPTION

<b>Occupancy / Use</b>	The site is located to the west of Welsh Road (off a track named Farm Road) and currently comprises an undeveloped parcel of agricultural land.  Shotwick Brook forms the western boundary of the site.	
<b>Structures</b>	There are no above ground structures within the subject site.	
<b>Access</b>	The site can be accessed from the east via Welsh Road.	
<b>Slope</b>	The site is relatively flat with little topographical variance.	
<b>Retaining Structures</b>	None identified.	
<b>Surface Cover (%)</b>	Buildings:	Nil
	Hardstand:	Nil
	Soft Cover:	100%
<b>Vegetation / Ecology</b>	The site is flat open agricultural land with sporadic semi mature trees around the site boundary. A habitat survey may be required to support the planning application.	
<b>Hazardous Material Storage</b>	No above-ground storage tanks (AST) or underground storage tanks (UST) can be determined from aerial photography but are not considered likely to be present.	
<b>Asbestos-Containing Material (ACM)</b>	In the absence of any historic structures the presence of ACM is not anticipated.	
<b>Polychlorinated Biphenyls (PCBs)</b>	There is no equipment identified which may contain PCBs within the site boundary.	
<b>Waste Storage</b>	Potentially hazardous waste streams are unlikely to be generated at the site.	
<b>Drainage</b>	A formal drainage survey has not been completed under the scope of this report.	
	However, drainage infrastructure is likely present in Welsh Road to the east or serving Hawarden Bridge Station to the southwest.	

## 2.3. SURROUNDING AREA

The surrounding area land uses are summarised in Table 2.3.

TABLE 2.3 SURROUNDING LAND

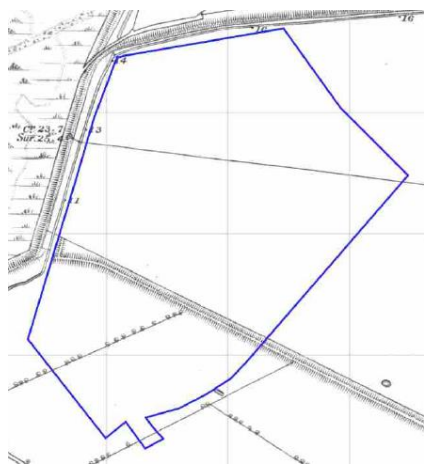
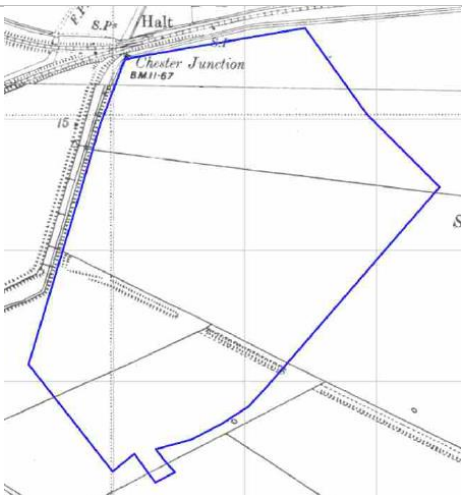
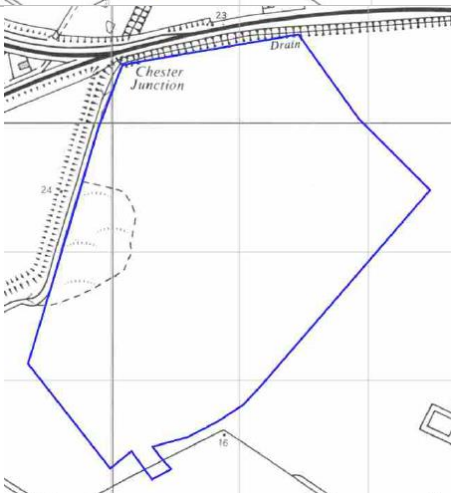
DIRECTION	LAND USE
North	Deeside Industrial Estate
East	Development Land (under construction)
South	Track & Agricultural Field
West	Shotwick Brook & Agricultural Field

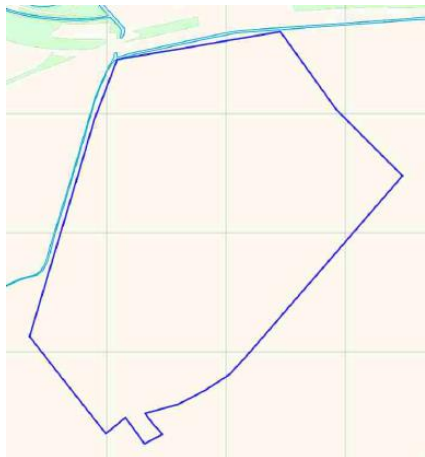
### 3. SITE HISTORY

#### 3.1. ON-SITE HISTORICAL DEVELOPMENT

A review of historical mapping pertinent to the site is summarised in Table 3.1 below.

TABLE 3.1 SITE HISTORICAL DEVELOPMENT

MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1869 1:2,500	<p>The site comprises of an undeveloped parcel of land.</p> <p>A track is present within the southern sector and field boundaries are present within the northern and southern field.</p>	
1938 1:2,500	<p>No significant changes are recorded.</p>	
1970 1:2,500	<p>A marsh is noted within the western portion of the site and the field boundaries are no longer recorded.</p> <p>No other significant changes recorded.</p>	

MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
<b>2021</b> 1:2,500	<p>The marsh is no longer recorded after c. 2001.</p> <p>No significant changes recorded, and the site remains in this configuration.</p>	

### 3.2. OFF-SITE HISTORICAL DEVELOPMENT

A review of potentially contaminative uses identified on historical Ordnance Survey maps within a 250 m radius of the site is summarised in Table 3.2.

TABLE 3.2 SURROUNDING POTENTIALLY CONTAMINATIVE LAND USES

SURROUNDING FEATURE	DISTANCE	DATES	DIRECTION
<b>Great Central Railway</b> ... Then Disused	<20m	Pre 1900 to Pre 2001 Pre 2001 to Present	North
<b>Deeside Industrial Estate</b>	50-250m	Pre 1989 to Present	North

### 3.3. PLANNING HISTORY

SGI has undertaken a search of on-line planning records held by Flintshire County Council which has not identified any pertinent environmental information in relation to the proposed development site.



## 4. ENVIRONMENTAL SETTING

### 4.1. GEOLOGY AND HYDROGEOLOGY

The British Geological Survey (BGS) map for the site (1:50,000, Solid and Drift Edition, Sheet 110) and online records indicate that the site is underlain by the geological sequence presented in Table 4.1.

TABLE 4.1 SUMMARY OF UNDERLYING GEOLOGY

GEOLOGICAL UNIT	CLASSIFICATION	DESCRIPTION	AQUIFER CLASSIFICATION
<b>Drift</b>	Tidal Flat Deposits	Clay, Silt, Sand	Secondary Undifferentiated Aquifer
<b>Solid</b>	Pennine Lower Measures Formation	Coal Mudstone, Siltstone & Sandstone	Secondary A Aquifer
<b>Solid (Northeast)</b>	Pennine Middle Measures Formation	Coal Mudstone, Siltstone & Sandstone	Secondary A Aquifer

SGi has reviewed BGS records and a borehole located c. 10m southwest of the site boundary identified 15.24m of SAND overlying 1.07m of SAND and GRAVEL. The granular soils were in turn underlain by boulder CLAY (with interbedded sand bands) to a depth of 46.89m bgl.

A red SANDSTONE was recorded at 46.89m bgl.

There are no geological faults within 500m of the subject site.

The Phase II Geoenvironmental Site Investigation completed by JPG identified the following with respect to the ground conditions at the site:

#### Made Ground

Reworked topsoil was encountered at all exploratory hole locations across the site. The thickness of topsoil was typically less than 0.20 m. The topsoil generally comprised dark brown silty sand with abundant rootlets. Anthropogenic inclusions were generally absent from the topsoil.

#### Natural Strata - Granular

Natural Tidal Flat Deposits were found to underlie the reworked topsoil at all exploratory locations. The underlying natural deposits consisted of granular light greyish brown medium dense to dense sand, with frequent, disseminated shell fragments. The granular strata were encountered to a maximum depth of 15m bgl; the base of the unit was not proven.

#### Natural Strata – Cohesive

Clay was encountered during the investigation at eight exploratory hole locations. Generally, the cohesive natural strata were identified as lenses and thick laminations. The cohesive material comprised soft to firm, dark greyish brown, sandy clay. Clay horizons were noted within trial pits at depths of between 0.15m and 2.00m bgl and within boreholes at depths of between 7.50m and 9.00 m bgl.

The underlying bedrock was not encountered during the 2018 ground investigation due to a maximum drilled depth of 15.0m bgl, with all exploratory holes terminating within dense sand.

The investigation did not include any chemical or geotechnical analysis of soil and groundwater samples

The Environmental Agency (EA) indicates the study site is not located within a Groundwater Source Protection Zone or Drinking Water Safeguard Zone.

There are no groundwater abstraction boreholes located within 2000 m of the site.

Based on the local topography and location of surface watercourses it is considered likely that shallow groundwater, if present, will flow in a southerly direction, gradient towards River Dee.

## 4.2. NATURAL LANDFORM AND GEOMORPHOLOGY

Based on the initial geological assessment, a review of available topographic data and pertinent mapping, SGi has undertaken a preliminary geomorphological assessment of the landform and its possible mechanism of formation.

The subject site is predominantly underlain by Tidal Flat Deposits – they are deposited on extensive nearly horizontal marshy land in the intertidal zone that is alternately covered and uncovered by the rise and fall of the tide. They consist of unconsolidated sediment, mainly mud and/or sand. They may form the top surface of a deltaic deposit. Normally a consolidated soft silty clay, with layers of sand, gravel and peat. Characteristically low relief.

The site is relatively flat and historically is likely to have formed part of the Deeside estuary and historic boreholes in the area record significant depths of ‘sea sand’ adjacent to the site.

## 4.3. GEOTECHNICAL DATA

Geotechnical data presented within a commercially available environmental database is summarised in Table 4.2.

TABLE 4.2 SUMMARY OF GEOTECHNICAL DATA

HAZARD	DESIGNATION
Shrink-Swell Clay	Very Low Risk
Landslides	Very Low Risk
Ground Dissolution	Very Low Risk
Compressible Ground	Moderate Risk This is likely associated with the alluvial deposits.
Collapsible Deposits	Very Low Risk
Running Sand	Moderate Risk
Natural Cavities	None recorded within 500m
Mining Cavities	None recorded within 1000m

## 4.4. BRINE WORKINGS

The site is not situated in an area affected by brine pumping / extraction or rock salt mining.

## 4.5. COAL MINING

The site is not located within a Coal Authority ‘Development High Risk’ Area. Therefore, the risk from coal mining is very low and no further assessment is not required.

## 4.6. HYDROLOGY

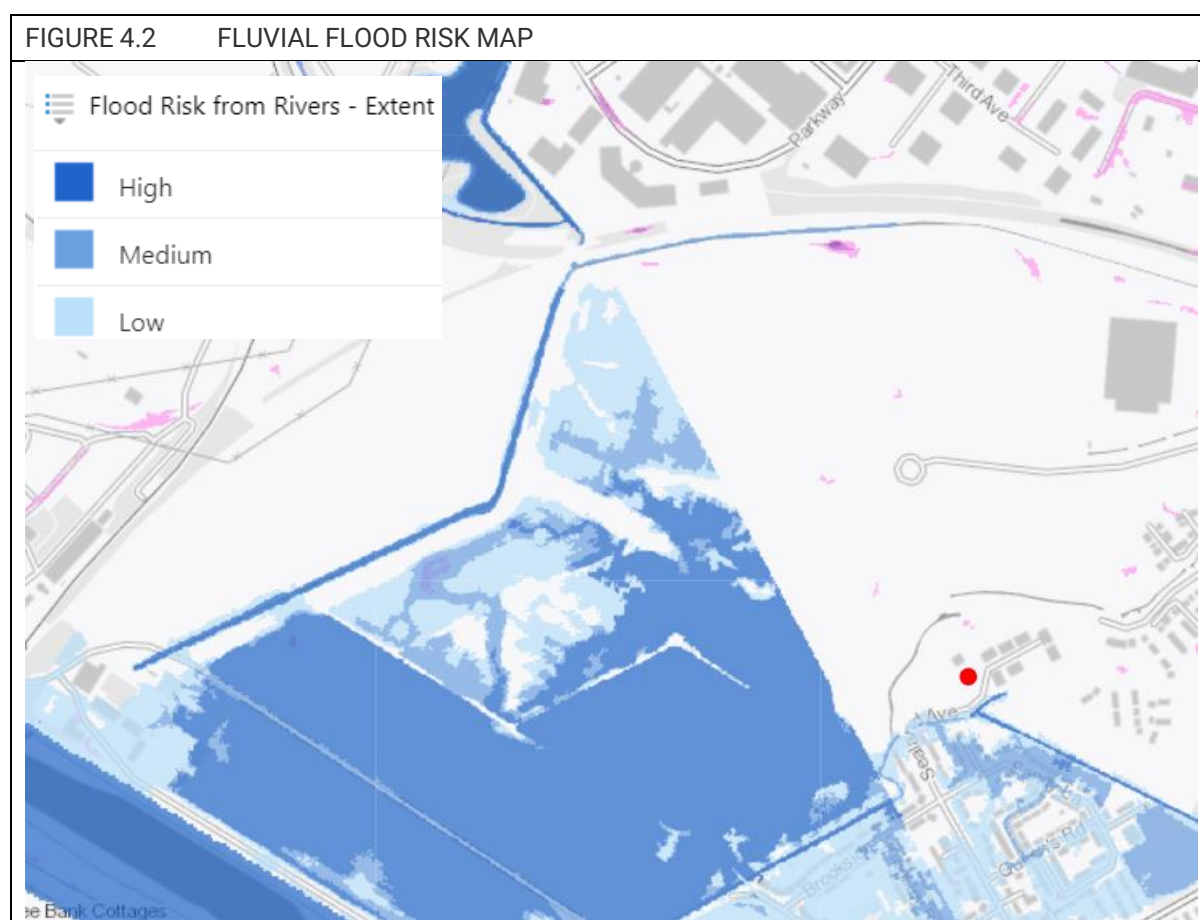
Shotwick Brook forms the western boundary of the site, orientated NE to SW flowing towards the River Dee. The River Dee is located c. 430m south of the site boundary.

The southern portion of the site is noted to be in an area at medium to high risk of river flooding, whilst the northwest portion of the site is at low to medium risk. However, the site is located within a currently defined Flood Risk Zone C1; which is an area with significant infrastructure served by flood defences.

Further assessment and a Flood Consequence Report may be required.

In addition, the Envirocheck Report states there is a potential for groundwater flooding to occur at the surface of the site.

The Fluvial Flood Risk Map is presented in Figure 4.2 overleaf.



Source : <https://check-your-flood-risk.naturalresources.wales/>

## 4.7. RADON RISK POTENTIAL

The Groundsure Report indicates the site is situated in an Intermediate Probability Radon area, where between 5-10% of homes are estimated to be above the Action Level.

The BGS reports that radon protective measures are necessary in the construction of new structures.

## 4.8. INDUSTRIAL LAND USES

There current industrial land uses recorded within a 100m radius of the site are detailed below:

- Electricity Sub Station (81m North);
- Electricity Sub Station (134m Northeast);
- Tank (173m Northeast);
- Telecoms Mast (191m West);
- Mondi Packaging (207m North);
- Ardagh Metal Beverage UK Ltd (236m North);
- Tank (237m North); and
- Pylon (245m Northwest)

There are no petrol filling stations recorded within a 500m radius of the site.

There are no gas pipelines recorded within a 500m radius of the site.

There are no sites recorded on the Contaminated Land Register designated under Part 2a of the Environmental Protection Act 1990 within 500m of the site.

#### 4.9. HAZARDOUS SUBSTANCE CONSENTS

The Groundsure Report confirms the presence of a lower tier Control of Major Accident Hazard (COMAH) Site located c. 455m west of the site, operated by Tata Steel UK Ltd.

The Groundsure Report confirms the absence of the following Hazardous Installations within 250 m of the site:

- Explosive Sites;
- Notification of Installation Handling Hazardous Substances (NIHHS);
- Planning Hazardous Substance Consents; and
- Planning Hazardous Substance Enforcements.

#### 4.10. SOIL CHEMISTRY

The UK Soil Observatory Map Viewer datasets detail the topsoil concentrations of five potentially harmful elements (PHEs): Arsenic (As), Cadmium (Cd), Chromium (Cr), Nickel (Ni) and Lead (Pb). Elevated concentrations of these PHEs can exist because of natural geological conditions or possible anthropogenic sources.

The following estimated soil chemistry levels (detailed in Table 4.3 overleaf) are attributed to the site:

TABLE 4.3 ESTIMATED SOIL CHEMISTRY

POTENTIALLY HARMFUL ELEMENT	ESTIMATED GEOMETRIC MEAN CONCENTRATION RANGE WITHIN THE SITE BOUNDARY (mg/kg)
Arsenic	<15
Cadmium	<1.8
Chromium	20 – 60
Lead	<100
Nickel	<15

A comparison of these estimated concentration with relevant Tier I values would indicate that these heavy metal compounds would not pose a development constraint.

However, actual concentrations will need to be confirmed through ground investigation.

#### 4.11. SENSITIVE LAND USES

Shotwick Brook has considered a sensitive land uses.

No other environmentally sensitive land uses have been identified within close proximity to the site.

#### 4.12. SITE SENSITIVITY ASSESSMENT

The site is assessed to be located within a **Low to Moderate** sensitivity setting as discussed in Table 4.4 below.

TABLE 4.4 SITE SENSITIVITY ASSESSMENT

SENSITIVITY PROFILE	DISCUSSION	RATING
<b>Sensitive Land Uses Within Close Proximity (e.g. Residential, School, Nursery, Local Nature Reserves)</b>	None identified.	<b>Low</b>
<b>Groundwater Source Protection Zone or Drinking Water Safeguard Zone</b>	The site is not located within a Groundwater Source Protection Zone or Drinking Water Safeguard Area.	<b>Low</b>
<b>Distance to the Closest Groundwater Abstraction Point</b>	No potable groundwater abstraction boreholes recorded within a 2000m radius of the site.	<b>Low</b>
<b>Aquifer Classification in Superficial Drift Deposits</b>	The Secondary Undifferentiated Aquifer within the Tidal Flat Deposits is not considered a critical receptor in this instance.	<b>Low</b>
<b>Aquifer Classification in Bedrock</b>	<p>The Secondary A Aquifer in the bedrock is not considered a critical receptor for any soluble phase contaminants present at the site.</p> <p>Furthermore, the overall sensitivity is reduced given the absence of any potable supply boreholes in the locality.</p>	<b>Low</b>
<b>Is the Site Underlain by Low-Permeability Drift to Depths in Excess of 10 m?</b>	<p>BGS borehole records for the area indicate the presence of a predominantly granular soil matrix to a depth of &gt;10m bgl.</p> <p>The exact drift conditions for the site cannot be known without further intrusive site investigation.</p>	<b>Moderate</b>
<b>Is the Site Located Within 50 m of a Surface Watercourse?</b>	Shotwick Brook is located immediately west of the site boundary.	<b>High</b>
<b>OVERALL SITE ENVIRONMENTAL SENSITIVITY</b>		<b>Low to Moderate</b>

## 4.13. PRELIMINARY GEOTECHNICAL ASSESSMENT

SGi has completed an assessment of potential geotechnical constraints based on the available desk-study information within the context of the proposed commercial development.

This assessment is summarised in Table 4.7 below.

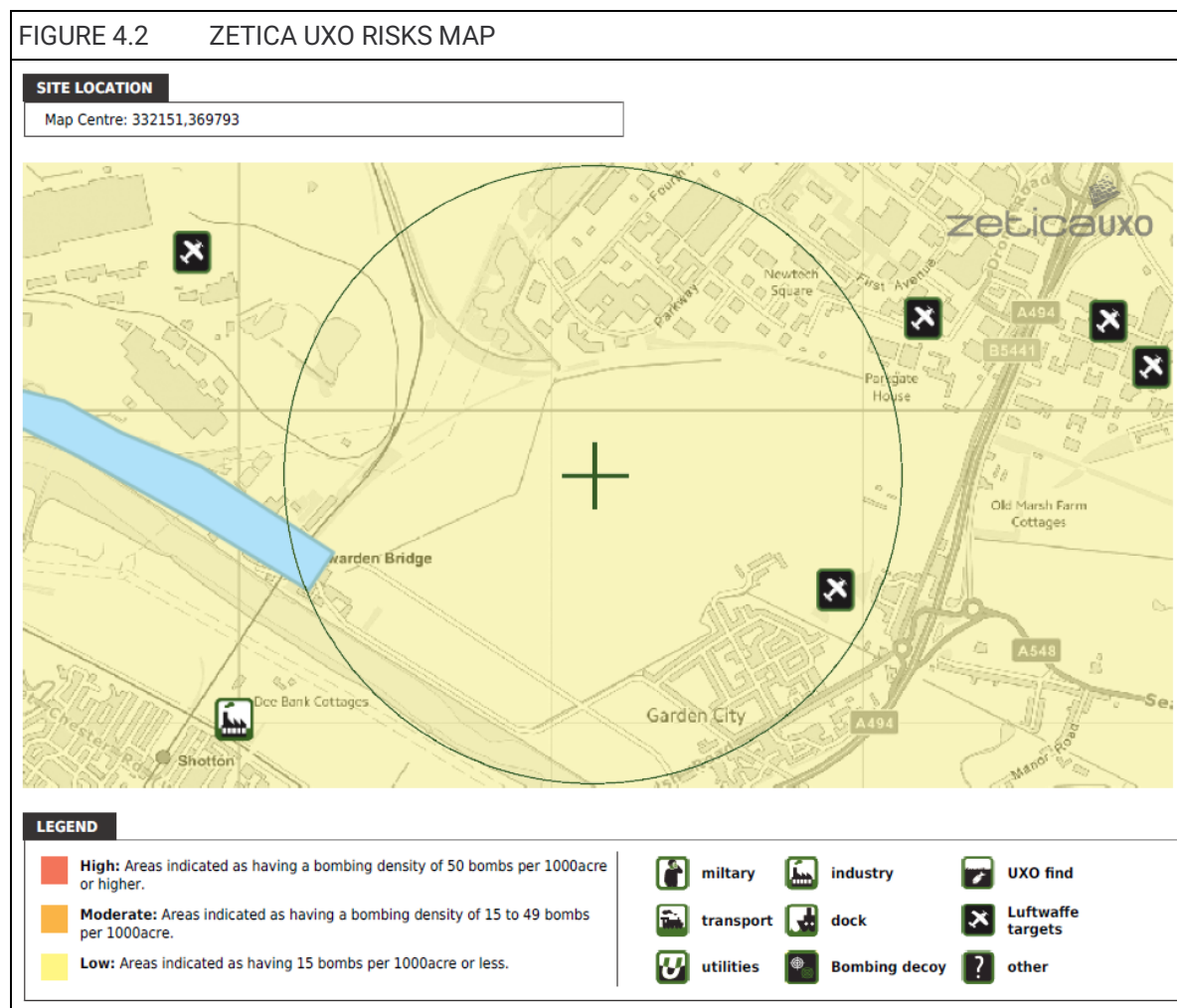
TABLE 4.7 SUMMARY OF POTENTIAL GEOTECHNICAL CONSTRAINTS

POTENTIAL ABNORMAL CONSTRAINT	LOCATION ON SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Remediation of Contaminated Soils	Site	TBC	No significant sources of contamination have been identified. The investigation is required to determine the presence of any local Made Ground and any levels of contamination, prior to developing remediation strategies, if necessary.
Steep Slope to Adjacent Site	N/A	N/A	None identified.
Obstructions	N/A	N/A	No significant obstructions are anticipated.
Uneven Topography	Site	<10	The wider site is relatively flat. However, an element of cut/fill earthworks may be required to create a level developable platform.
Trench Collapse	Site	100	Potential given the presence of natural granular soils.
Infilled Field Boundary	North / South	<5	None identified.
Mature Trees	Periphery	TBC	Arboriculture survey required to determine areas of potential tree influence.
Volume Change Potential Clay	All	100	Heave precautions may be required within any areas of shallow cohesive soils. The full extent of precautions will only be determined after site investigation.
Running Sands	N/A	N/A	Data searches indicate Very Low Risk.
Ground Dissolution	N/A	N/A	Data searches indicate Very Low Risk.
Shallow Bedrock	N/A	N/A	The presence of shallow bedrock is not anticipated.
Concrete Design	TBC	-	To be confirmed during Ground Investigation.
Low-Permeability Ground	TBC	-	Soakaways likely to be effective in areas where permeable granular deposits are present.
Services/Sensitive Structures	N/A	N/A	No services / sensitive structures are anticipated.
Abnormal Foundation Solutions	N/A	N/A	Depending on structural loads, piled foundations may be required.

## 4.14. UNEXPLODED ORDNANCE

The regional unexploded bomb risk map from Zetica indicates that the site is in an area of Deeside at low risk from possible Unexploded Ordnance (UXO) resulting from the Second World War.

The Zetica UXO Risks Map (2014) is presented in Figure 4.2 (below).



Source: <https://zeticauxo.com/downloads-and-resources/risk-maps/>

Based on the information available, no further action is deemed necessary.



## 5. CONSULTATIONS

### 5.1. LANDFILL SITES AND WASTE TREATMENT SITES

There are no landfill sites (current or historic) recorded within 250 m of the site boundary.

### 5.2. REGULATORY DATABASE

The information summarised in Table 5.1 has been obtained from a commercially available environmental database.

The summary table only includes records from within 250 m of the subject site and not otherwise detailed in the report.

TABLE 5.1 SUMMARY OF ENVIRONMENTAL DATA

RECORD	ENTRIES WITHIN 250 m	DETAILS
Contaminated Land Register Entries and Notices	0	None identified.
Authorised Industrial Processes (IPC/IPPC/LAPPC)	0	None identified.
Fuel Stations Entries	0	None identified.
Licensed Radioactive Substances	0	None identified.
Enforcements, Prohibitions or Prosecutions	0	None identified.
Discharge Consents	0	No active sites were recorded.
Pollution Incidents	1	The pollution incident involved the release of solvents on 24 <sup>th</sup> March 2016 c. 235m north of the site.  However, the incident is not considered to have a residual impact at the site.
Consents Issued Under the Planning (Hazardous Substances) Act 1990	0	None identified.
Control of Major Accident Hazard (COMAH) Sites	1	Tata Steel UK Ltd (455m west of the site)

## 6. INITIAL CONCEPTUAL SITE MODEL

In accordance with Environment Agency, LC:RM (2019) and BSI 10175 (Code of Practice for Investigation of Potentially Contaminated Land), SGi Ltd has developed an initial CSM to identify potential contamination sources, migration pathways and receptors within the study area.

This is summarised in Table 6.1.

### 6.1. ON-SITE SOURCES OF CONTAMINATION

The following potential on-site sources of contamination have been identified:

- Any existing Made Ground deposits underlying the site may be a potential source of heavy metals, asbestos, PAH and TPH compounds.

### 6.2. OFF-SITE SOURCES OF CONTAMINATION

There are no potentially significant off-site sources of contamination located in close proximity to the site, other than a historic railway (now cycle path).

TABLE 6.1 INITIAL CONCEPTUAL SITE MODEL

CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY (Likelihood)	CURRENT RISK
<b>Human Health</b>				
<b>Heavy metals, petroleum hydrocarbons and PAH (Made Ground)</b>	<b>Dermal contact. Dermal contact and ingestion.</b>	<b>Future site users</b>	<b>Low</b>	<b>Low</b>
<p><i>Assessment</i> No significant sources of heavy metals have been identified at the site; however, the presence of local heavy metals, non-volatile PAH and TPH compounds associated with infilled field boundaries or Made Ground deposits cannot be discounted, as such, there is considered to be a very low risk to human health.</p> <p>If impacted soils are present, localised remediation may be required, however, any low-level impact will likely be capped by hardstand or a cover system in soft landscaped areas thereby removing the exposure pathway be removed.</p>				
<b>ACM in Made Ground</b>	<b>Inhalation of dust.</b>	<b>Future site users. Buildings. Off-site land users.</b>	<b>Very Low</b>	<b>Very Low</b>
<p><i>Assessment</i> No site wide asbestos containing material is anticipated given the undeveloped nature of the site.</p> <p>However, the presence of local areas of Made Ground and ACM cannot be entirely discounted.</p> <p>If encountered, ACM poses a risk through fibre and dust inhalation and if present may pose a risk to construction workers during any future earthworks / demolition and to adjacent third-party property should dust be generated during those works. These risks can be mitigated through the development of a detailed enabling works strategy following guidance and protocol specified within the Control of Asbestos Regulations (2012) and industry best practice as detailed in CIRIA733 (Asbestos in Soil and Made Ground: A guide to understanding risk).</p>				

CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY (Likelihood)	CURRENT RISK
<b>Methane, carbon dioxide (Alluvial or Made Ground)</b>	<b>Inhalation of gas. Migration through permeable strata and preferential pathways. Explosion in confined spaces.</b>	<b>Future site users. Buildings. Off-site land users.</b>	<b>Very Low</b>	<b>Low</b>
<p><i>Assessment</i> The presence of alluvial soils (Tidal Flat Deposits) may represent a low-level source of ground gas which may pose a risk to human health.</p> <p>Should a ground gas risk be identified, the risk to construction workers can be mitigated through appropriate management of confined space entry, whereas the risk to future end users can be mitigated through the adoption of suitable control measures within the building construction using guidance presented within CIRIA 665 (<i>Assessing Risk Posed by Hazardous Ground Gases to Buildings</i>) and BS8485 (<i>Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings</i> (2015 and A1:2019)).</p>				
<b>Controlled Waters</b>				
<b>Mobile contaminants such as metals, PAHs, hydrocarbons, volatile compounds (Local Made Ground)</b>	<b>Surface runoff.</b>	<b>Surface Water</b>	<b>Very Low</b>	<b>Low</b>
<p><i>Assessment</i> The presence of significant soluble phase contaminants within the soils is not anticipated. Shotwick Brook which forms the western boundary is a potential receptor, however, in the absence of any likely contaminants the risk to controlled waters is considered to be low.</p>				
<b>Buildings and Infrastructure</b>				
<b>Sulphate (potential ash within Made Ground)</b>	<b>Sulphate attack on concrete.</b>	<b>Building structure.</b>	<b>Low</b>	<b>Low</b>
<p><i>Assessment</i> The presence of low pH and high sulphate within any Made Ground deposits may result in corrosion of buried concrete within the proposed development. Assessment must be undertaken to confirm the levels of pH and sulphate within Made Ground deposits and thus determine the concrete classification.</p>				

CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY (Likelihood)	CURRENT RISK
<b>Ecology</b>				
N/A	Lateral migration	Vegetation and Fauna	Low	Low
<i>Assessment</i> With respect to contaminated land, in the likely absence of any potential contaminants sources, no risk to ecology or aquatic ecosystems has been identified. However, semi-mature and mature trees at the site could support species of protected wildlife such as bats and birds which may be affected by groundworks. A Phase 1 Habitat Survey may be required.				

## 7. CONCLUSIONS AND RECOMMENDATIONS

### 7.1. SITE SUMMARY

<b>Current Site Use</b>	The subject site is currently undeveloped agricultural land.
<b>Historical Site Use</b>	Historical mapping suggests that the site has remained predominantly undeveloped agricultural land throughout its mapped history.
<b>Site Sensitivity</b>	Shotwick Brook is located at the western boundary of the site.  No other sensitive land uses are recorded.

### 7.2. CONTAMINATION ISSUES

<b>Human Health</b>	Given the undeveloped nature of the site, there are unlikely to be any significant sources of contamination present that would pose a significant risk to human health or prejudice the future commercial development at the site.  However, local low-level impact associated with any Made Ground deposits cannot be entirely discounted.
<b>Controlled Waters</b>	The Initial Conceptual Site Model has not identified any potentially significant on-site sources of mobile contamination, as such the site is deemed to pose no unacceptable level of risk to controlled waters.
<b>Ground Gas</b>	The presence of alluvial soils (Tidal Flat Deposits) may represent a low-level source of ground gas which may pose a risk to human health.
<b>Potable Water Supply</b>	Based on existing information, it is considered that the site may be suitable for PE water supply pipework.  A UKWIR Risk Assessment would be required to confirm this.

### 7.3. GEOTECHNICAL ISSUES

<b>Geological</b>	A moderate risk of running sand and compressible ground is recorded at the site, likely associated with the Tidal Flat Deposits.
<b>Civil and Structural</b>	No significant civil and structural restraints are anticipated.
<b>Abnormal Foundations</b>	Depending on the likely loadings, the most feasible foundation option is likely to be driven piles set into (or onto) competent strata.

## END OF REPORT

# APPENDIX I

# LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between SGi and the Client as indicated in Section 1.3.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover, reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
9. SGi cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by SGi is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by SGi in this connection without their explicit written agreement there to by SGi.
10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.



# APPENDIX II

# GLOSSARY

## TERMS

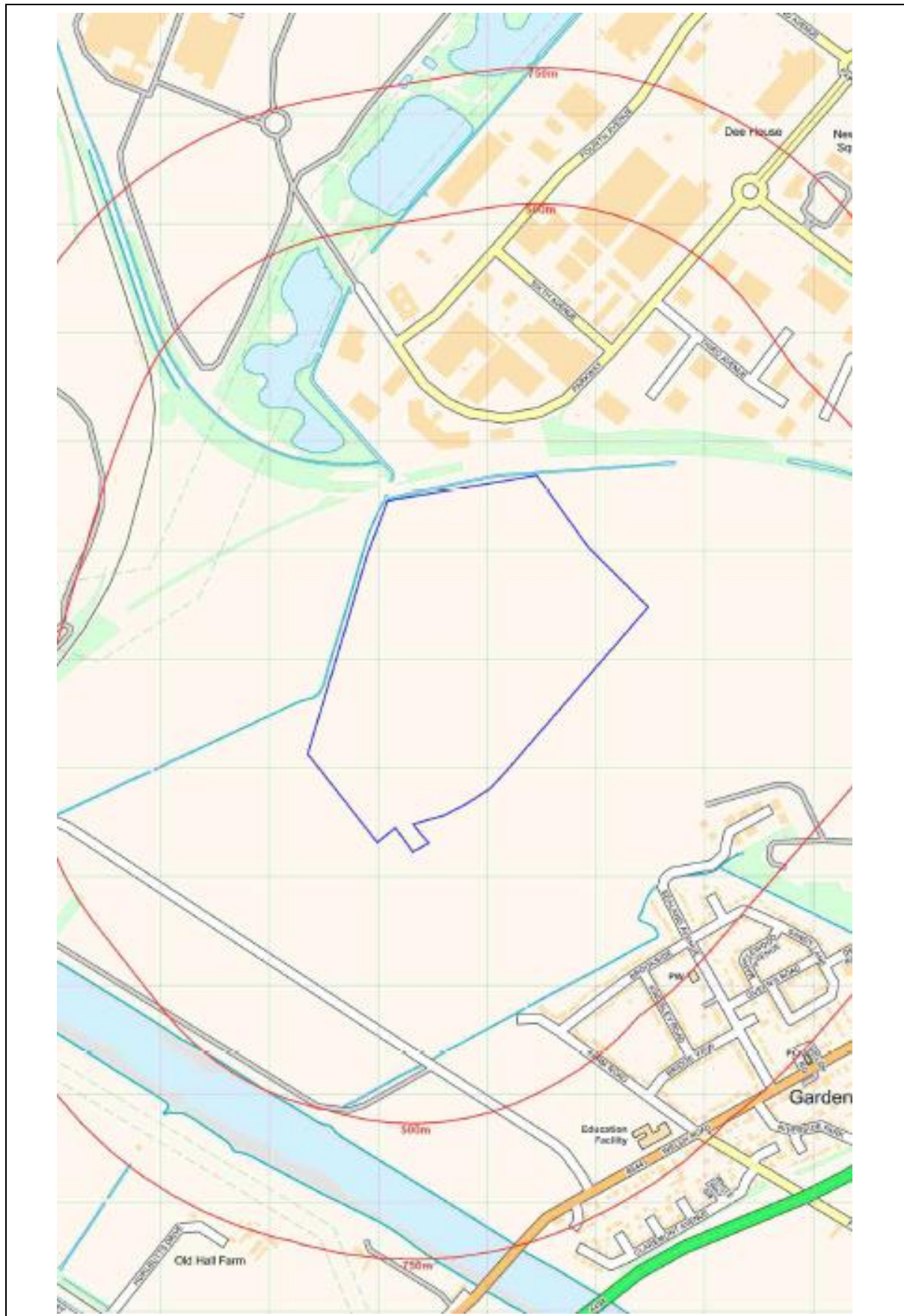
<b>ACM</b>	Asbestos-containing material	<b>MMP</b>	Materials management plan
<b>ADS</b>	Acoustic design statement	<b>ND</b>	Not detected
<b>AST</b>	Above-ground storage tank	<b>NDP</b>	Nuclear density probe
<b>BGS</b>	British Geological Survey	<b>NMP</b>	Noise management plan
<b>BSI</b>	British Standards Institute	<b>NPSE</b>	Noise policy statement for England
<b>BTEX</b>	Benzene, toluene, ethylbenzene, xylenes	<b>NR</b>	Not recorded
<b>CA</b>	Coal Authority	<b>PAH</b>	Polycyclic aromatic hydrocarbon
<b>CBR</b>	California bearing ratio	<b>PCB</b>	Polychlorinated biphenyl
<b>CIEH</b>	Chartered Institute of Environmental Health	<b>PI</b>	Plasticity index
<b>CIRIA</b>	Construction Industry Research Association	<b>PID</b>	Photo ionisation detector
<b>CLEA</b>	Contaminated land exposure assessment	<b>POS</b>	Public open space
<b>CML</b>	Council of Mortgage Lenders	<b>PPE</b>	Personnel protective equipment
<b>CoC</b>	Contaminants of concern	<b>ProPG</b>	Professional practice guidance
<b>CSM</b>	Conceptual site model	<b>QA</b>	Quality assurance
<b>DNAPL</b>	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	<b>SGV</b>	Soil guideline value
<b>DWS</b>	Drinking water standard	<b>SPH</b>	Separate-phase hydrocarbon
<b>EA</b>	Environment Agency	<b>SPT</b>	Standard penetration test
<b>EQS</b>	Environmental quality standard	<b>SVOC</b>	Semi-volatile organic compound
<b>FFL</b>	Finished floor level	<b>TPH</b>	Total and speciated petroleum hydrocarbon
<b>GAC</b>	General assessment criteria	<b>TPH CWG</b>	Total Petroleum Hydrocarbon (Criteria Working Group)
<b>GL</b>	Ground level	<b>UKWIR</b>	United Kingdom Water Infrastructure Risk
<b>GSV</b>	Gas screening value	<b>UST</b>	Underground storage tank
<b>HCV</b>	Health criteria value	<b>VCC</b>	Vibro-concrete column
<b>ICSM</b>	Initial conceptual site model	<b>VOC</b>	Volatile organic compound
<b>LEL</b>	Lower explosive limit	<b>VRSC</b>	Vibro-replacement stone columns
<b>LMRL</b>	Lower method reporting limit	<b>VSC</b>	Vibro-stone columns
<b>LNAPL</b>	Light non-aqueous phase liquid (petrol, diesel, kerosene)	<b>WHO</b>	World Health Organisation
<b>MCV</b>	Moisture condition value	<b>WRAP</b>	Waste and Resources Action Programme
<b>MIBK</b>	Methyl isobutyl ketone	<b>WTE</b>	Water table elevation

<b>m</b>	Metres	<b>ppm</b>	Parts per million
<b>km</b>	Kilometres	<b>mg/m<sup>3</sup></b>	Milligram per metre cubed
<b>% v/v</b>	Percent volume in air	<b>m bgl bgl</b>	Metres below ground level
<b>mb</b>	Millibars (atmospheric pressure)	<b>m bcl</b>	Metre below cover level
<b>l/hr</b>	Litres per hour	<b>mAOD</b>	Metres above ordnance datum (sea level)
<b>µg/l</b>	Micrograms per litre (parts per billion)	<b>kN/m<sup>2</sup></b>	Kilonewtons per metre squared
<b>ppb</b>	Parts per billion	<b>µm</b>	Micrometre
<b>mg/kg</b>	Milligrams per kilogram (parts per million)		

# APPENDIX III

# DRAWINGS

## DRAWING 15-168-001 – SITE LOCATION PLAN



# **APPENDIX IV**

## **HISTORICAL MAPS**



#### Site Details:

FARM ROAD, GARDEN CITY,  
CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** County Series

**Map date:** 1869

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1869  
Revised 1869  
Edition N/A  
Copyright N/A  
Levelled N/A

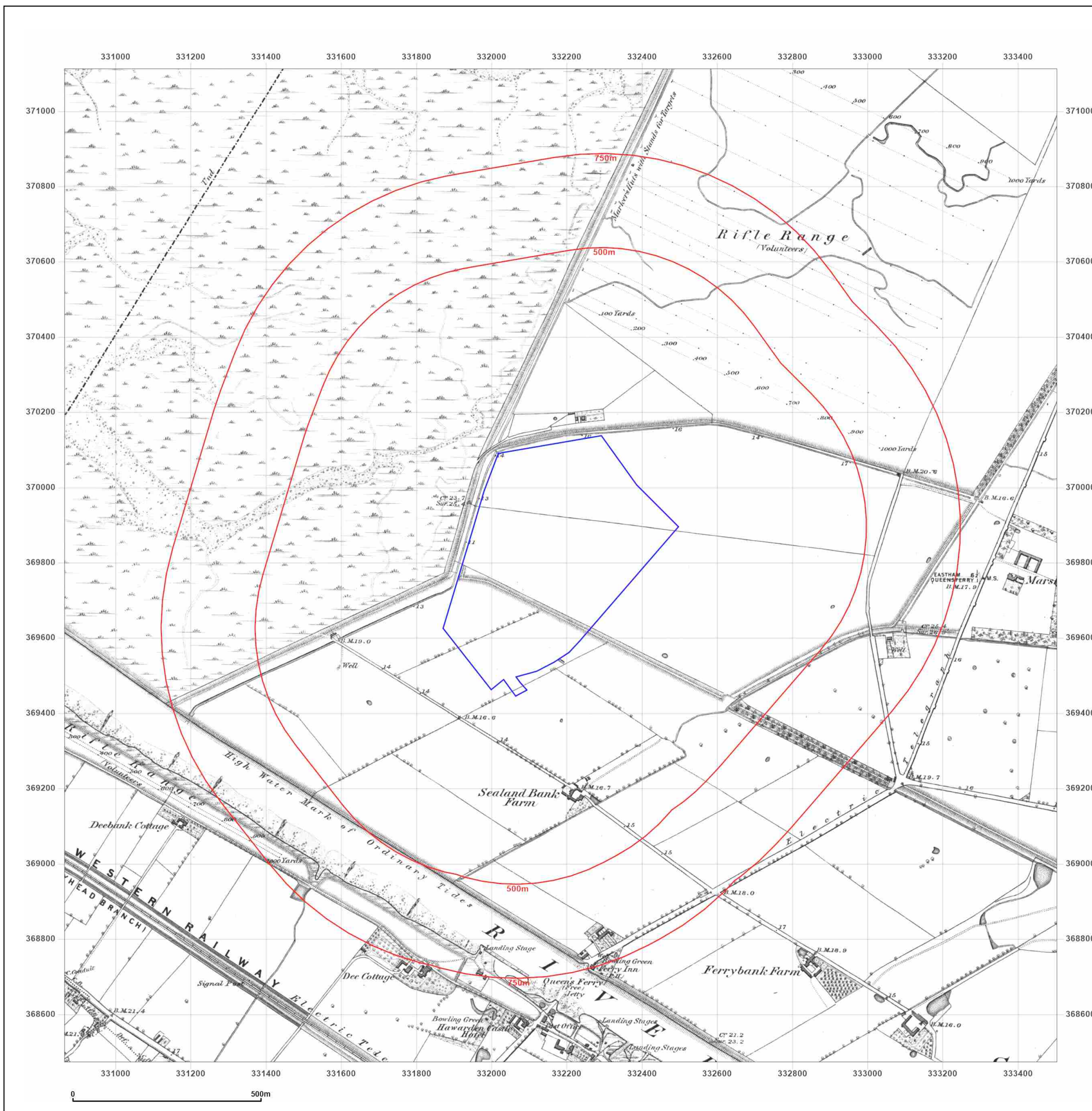


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Production date: 22 July 2021

Map legend available at:  
[www.groundsure.com/sites/default/files/groundsure\\_legend.pdf](http://www.groundsure.com/sites/default/files/groundsure_legend.pdf)





#### Site Details:

FARM ROAD, GARDEN CITY,  
CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** County Series

**Map date:** 1897-1898

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1872  
Revised 1897  
Edition N/A  
Copyright N/A  
Levelled N/A

Surveyed 1869  
Revised 1898  
Edition N/A  
Copyright N/A  
Levelled N/A

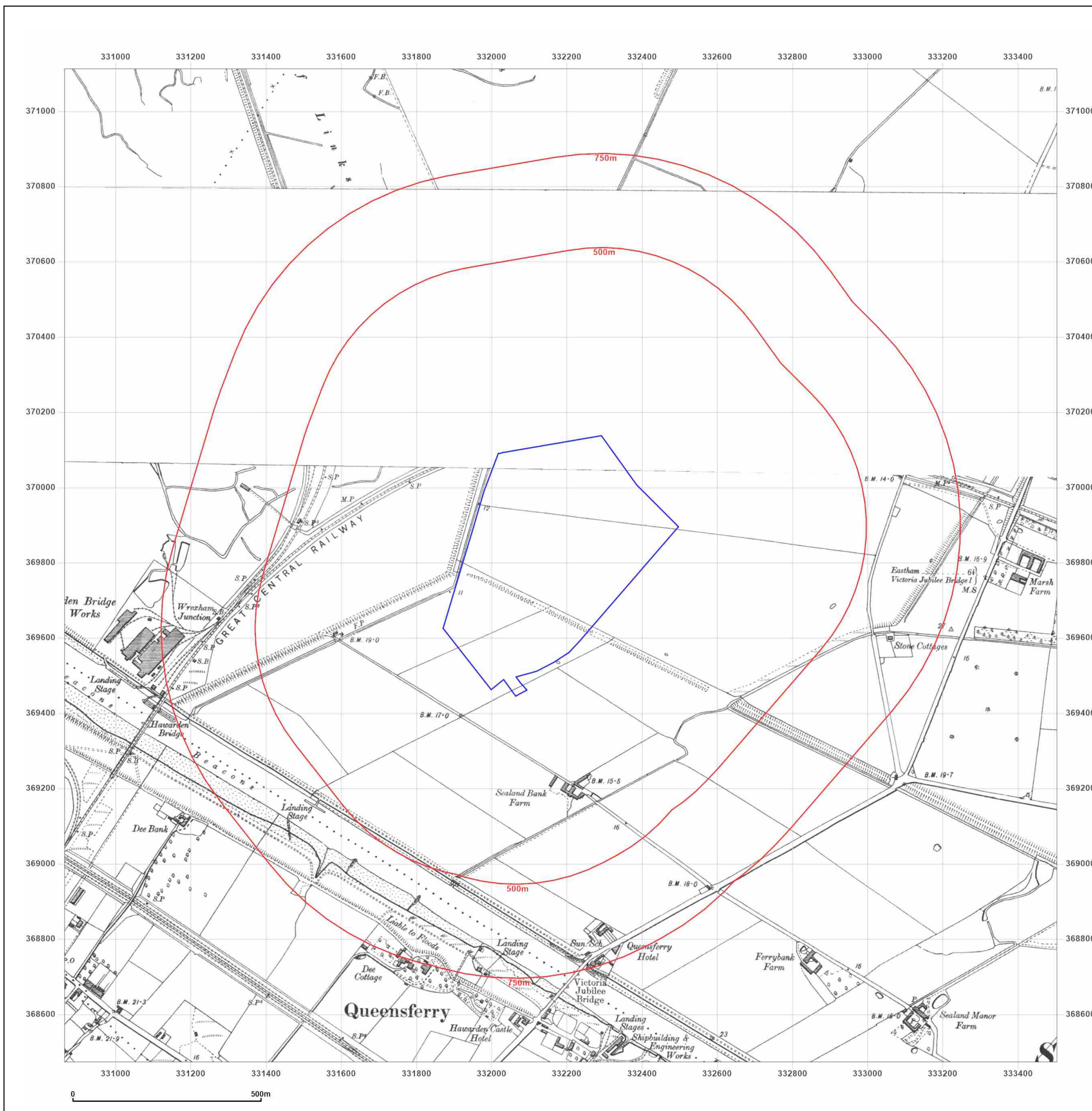


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#### Site Details:

FARM ROAD, GARDEN CITY,  
CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** County Series

**Map date:** 1898

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1869  
Revised 1898  
Edition N/A  
Copyright N/A  
Levelled N/A

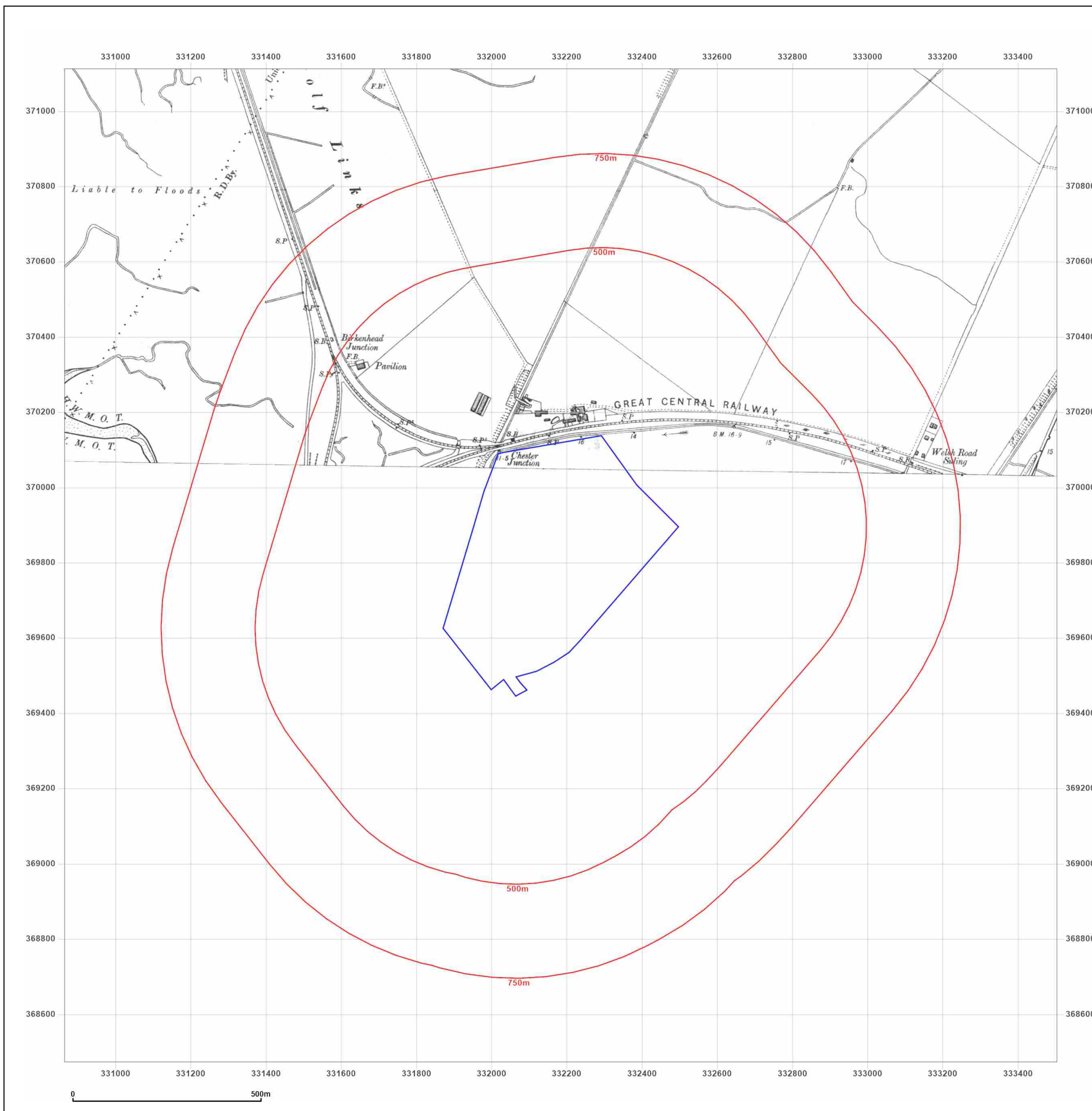


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#### Site Details:

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CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** County Series

**Map date:** 1898

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1872  
Revised 1898  
Edition N/A  
Copyright N/A  
Levelled N/A

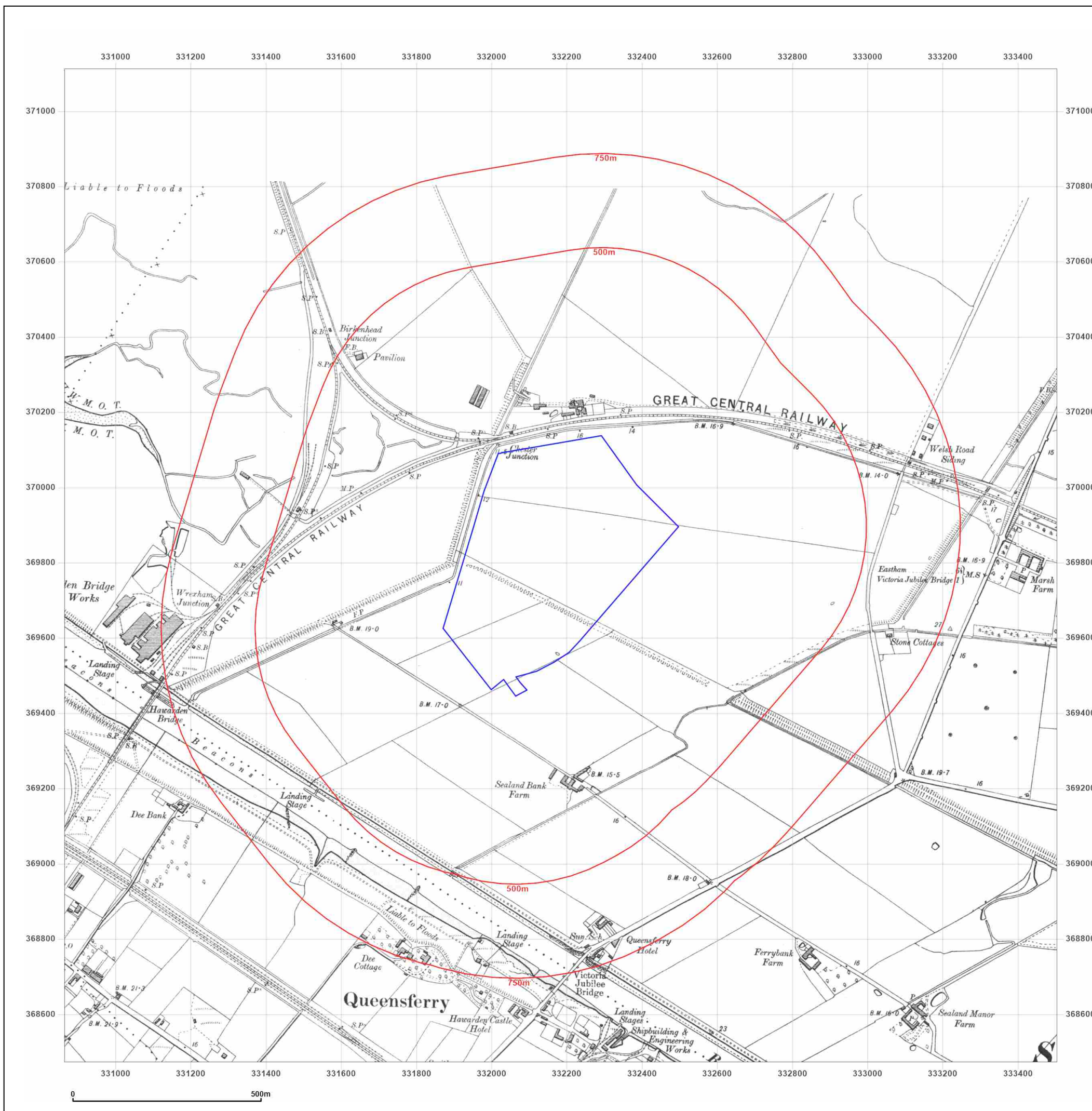


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#### Site Details:

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CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** County Series

**Map date:** 1909-1913

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1869  
Revised 1913  
Edition 1913  
Copyright N/A  
Levelled N/A

Surveyed 1869  
Revised 1909  
Edition N/A  
Copyright N/A  
Levelled N/A

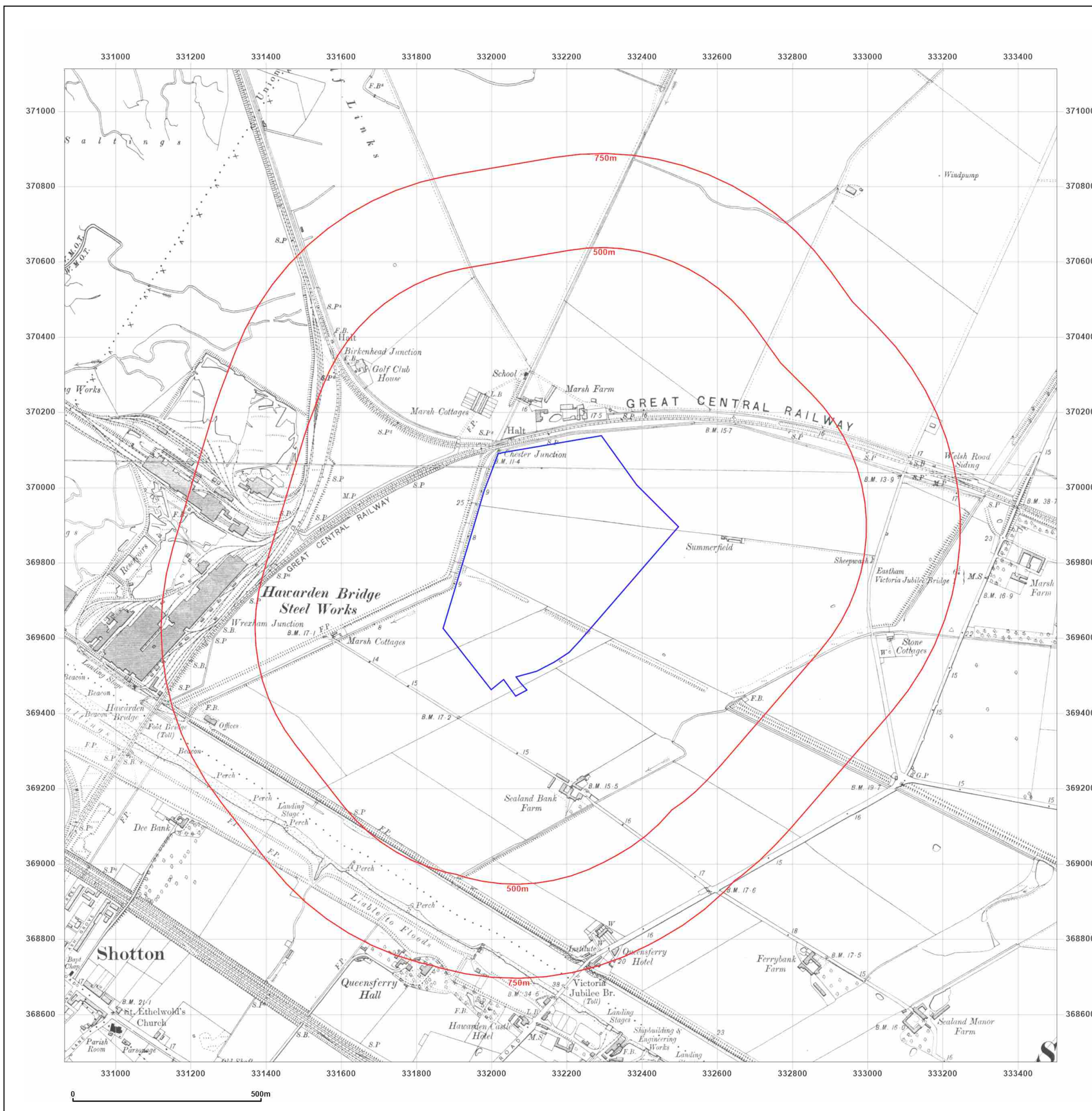


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#### Site Details:

FARM ROAD, GARDEN CITY,  
CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** County Series

**Map date:** 1913-1914

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1872  
Revised 1913  
Edition N/A  
Copyright N/A  
Levelled N/A

Surveyed 1872  
Revised 1914  
Edition N/A  
Copyright N/A  
Levelled N/A

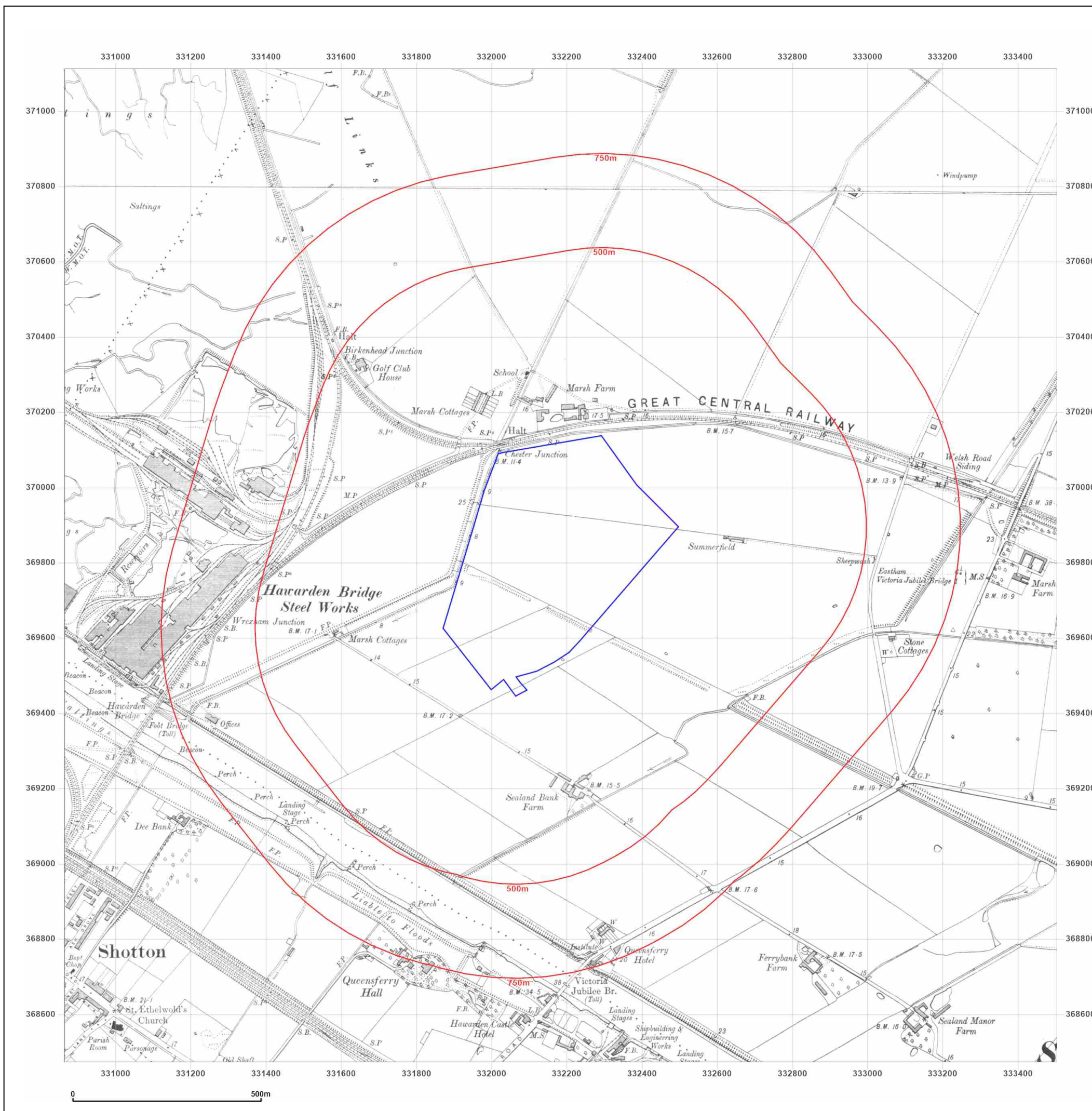


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#### Site Details:

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CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** County Series

**Map date:** 1938

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1869  
Revised 1938  
Edition N/A  
Copyright N/A  
Levelled N/A

Surveyed 1869  
Revised 1938  
Edition 1938  
Copyright N/A  
Levelled N/A

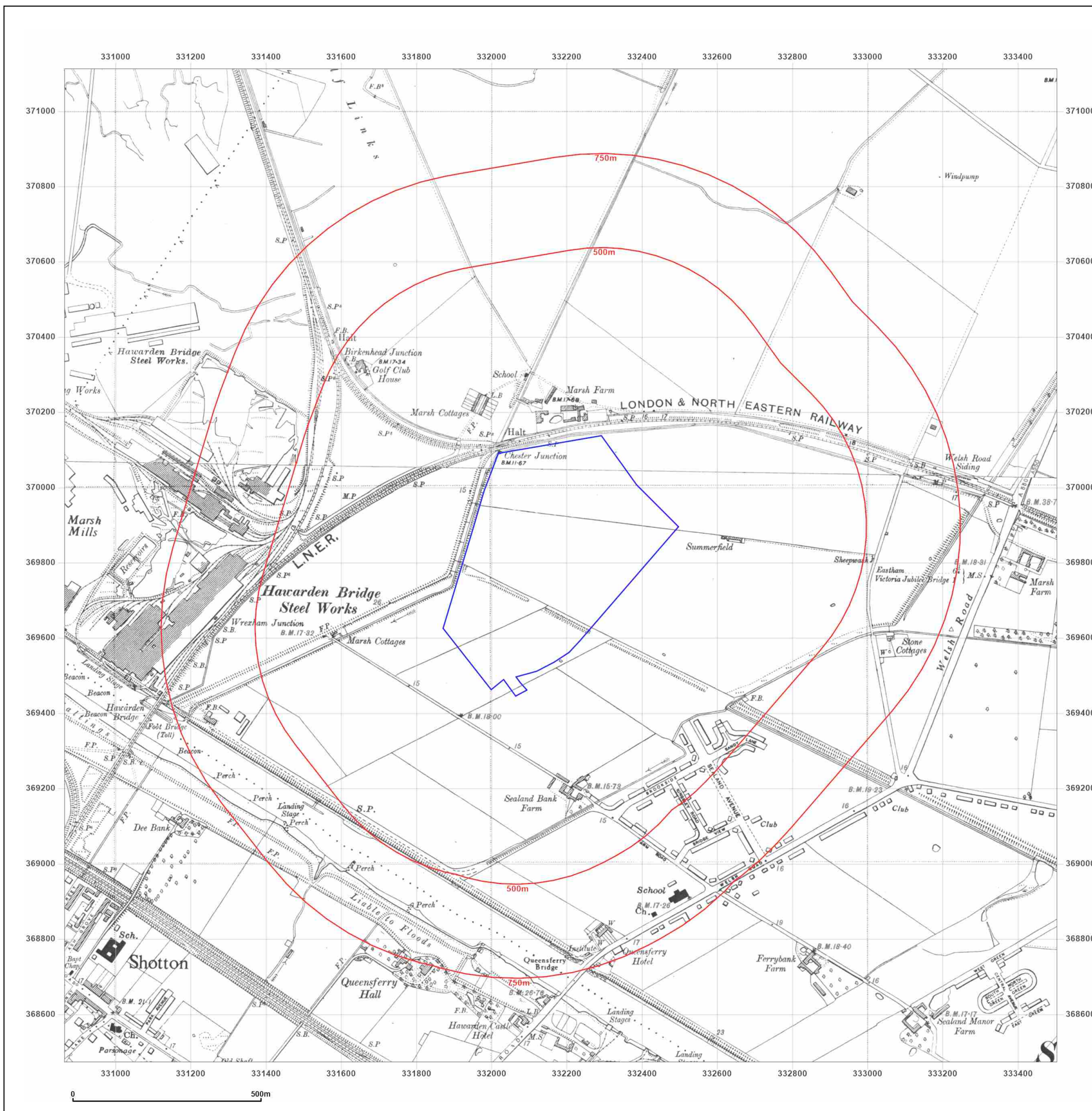


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#### Site Details:

FARM ROAD, GARDEN CITY,  
CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** County Series

**Map date:** 1948

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1869  
Revised 1948  
Edition N/A  
Copyright N/A  
Levelled N/A



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#### Site Details:

FARM ROAD, GARDEN CITY,  
CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** Provisional

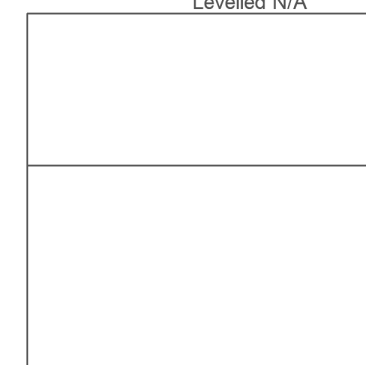
**Map date:** 1954

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed N/A  
Revised 1953  
Edition 1954  
Copyright N/A  
Levelled N/A

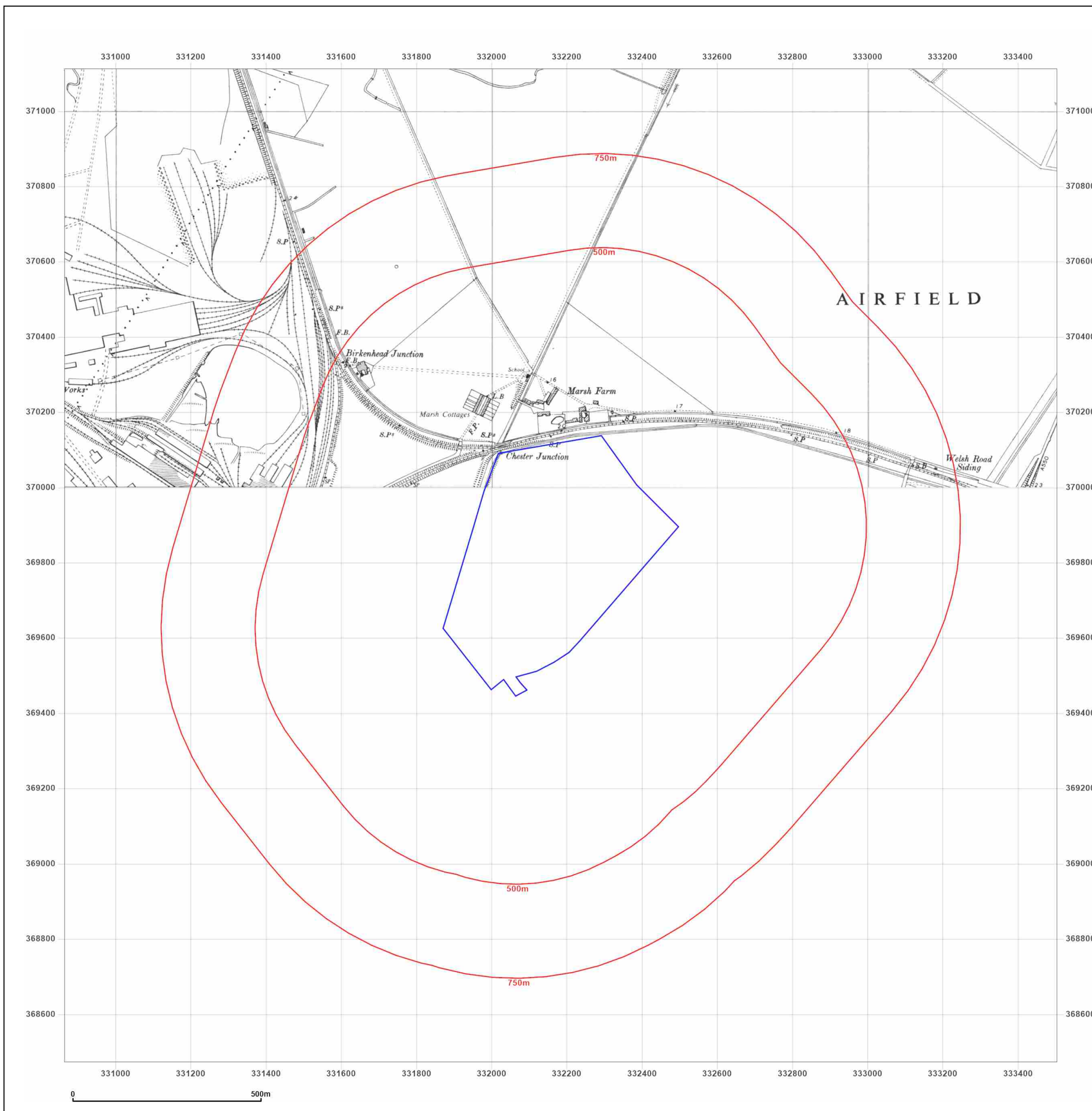


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#### Site Details:

FARM ROAD, GARDEN CITY,  
CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** Provisional

**Map date:** 1960-1963

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1872  
Revised 1960  
Edition N/A  
Copyright N/A  
Levelled N/A

Surveyed N/A  
Revised 1962  
Edition N/A  
Copyright 1963  
Levelled N/A

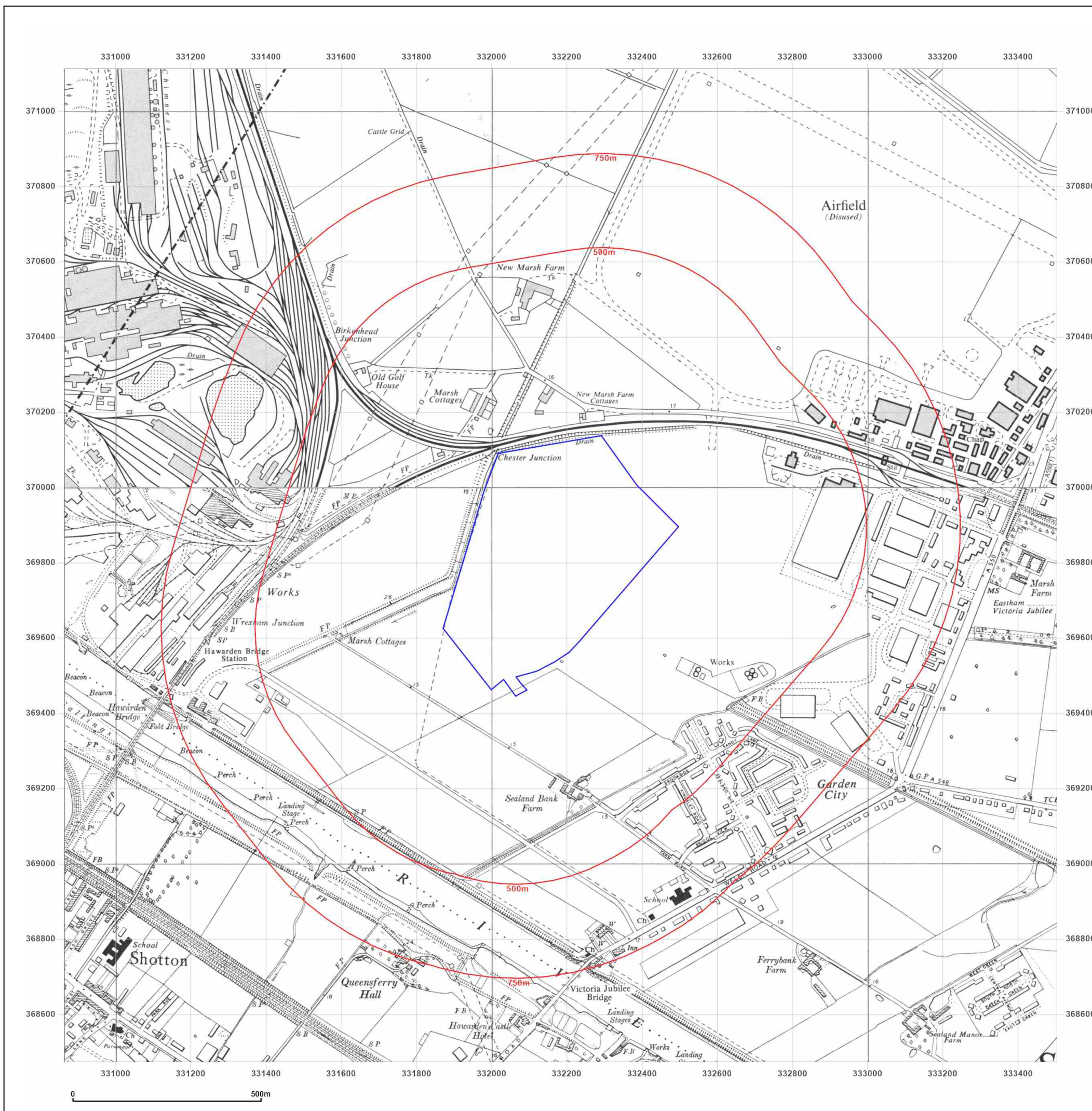


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#### Site Details:

FARM ROAD, GARDEN CITY,  
CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** Provisional

**Map date:** 1963

**Scale:** 1:10,560

**Printed at:** 1:10,560



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

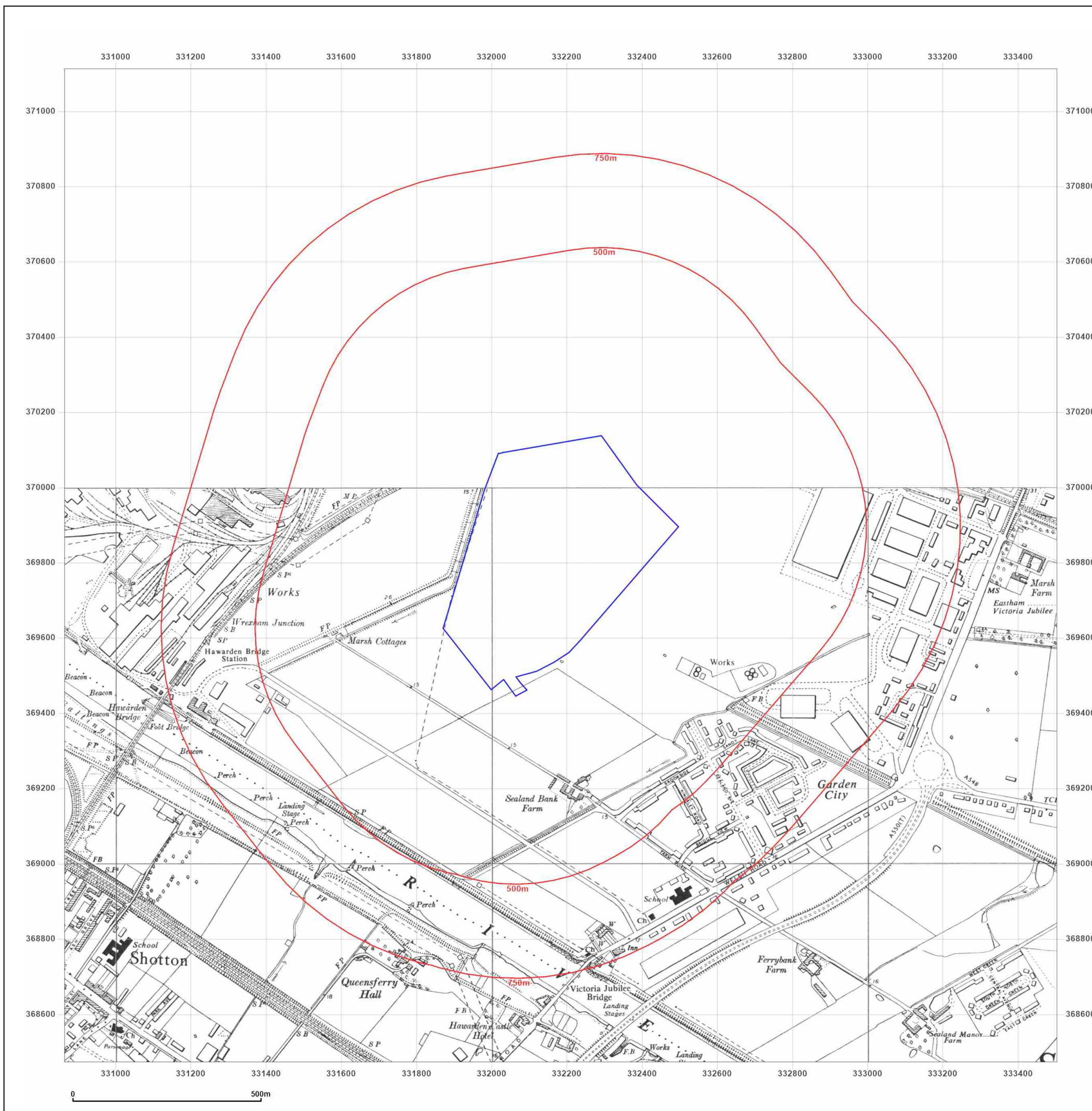


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#### Site Details:

FARM ROAD, GARDEN CITY,  
CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** Provisional

**Map date:** 1969-1970

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1965  
Revised 1970  
Edition N/A  
Copyright 1970  
Levelled N/A

Surveyed 1965  
Revised 1968  
Edition N/A  
Copyright 1969  
Levelled N/A

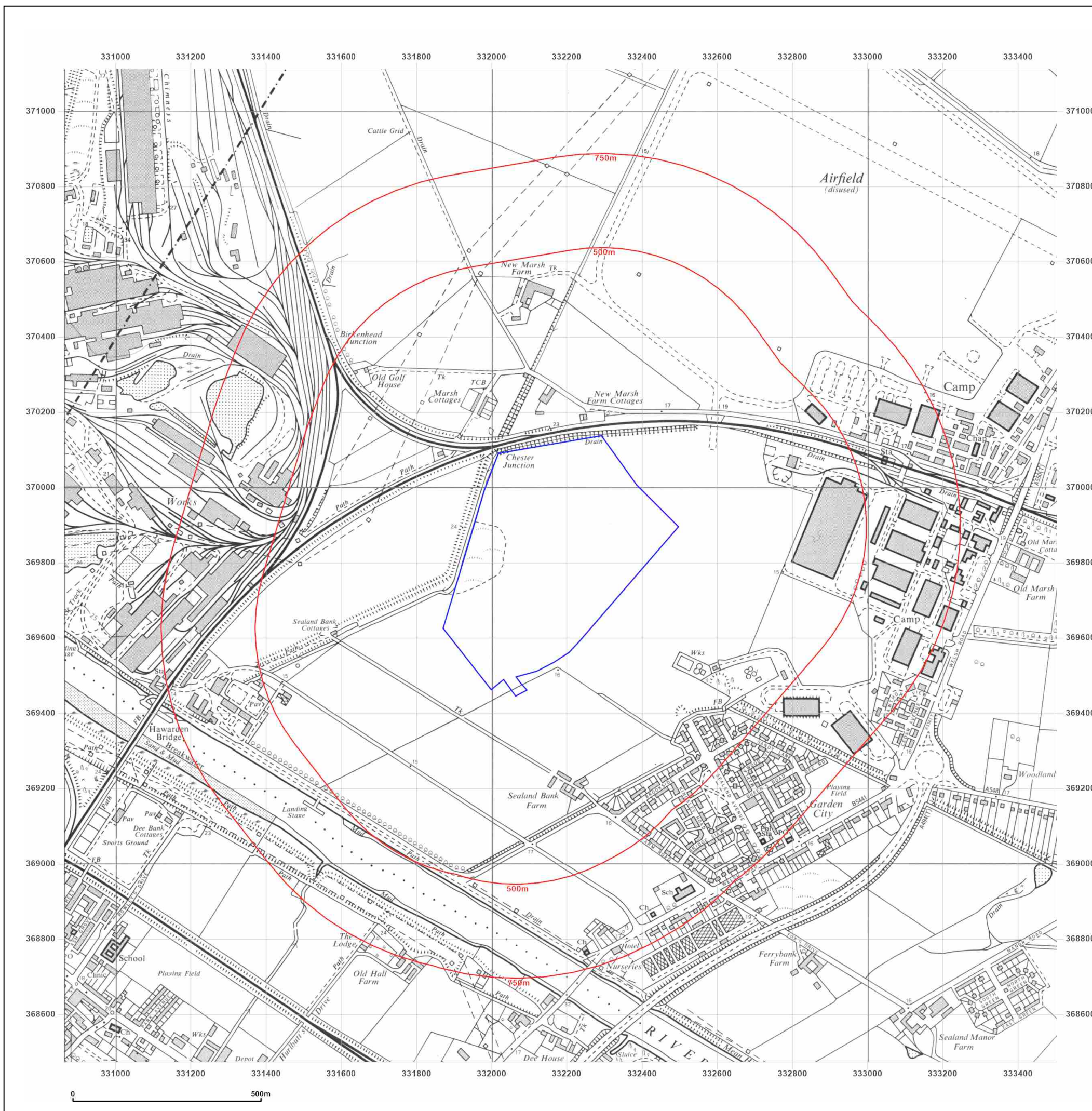


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#### Site Details:

FARM ROAD, GARDEN CITY,  
CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** National Grid

**Map date:** 1978-1981

**Scale:** 1:10,000

**Printed at:** 1:10,000



Surveyed 1981  
Revised 1981  
Edition N/A  
Copyright N/A  
Levelled N/A

Surveyed 1969  
Revised 1978  
Edition N/A  
Copyright 1978  
Levelled 1965

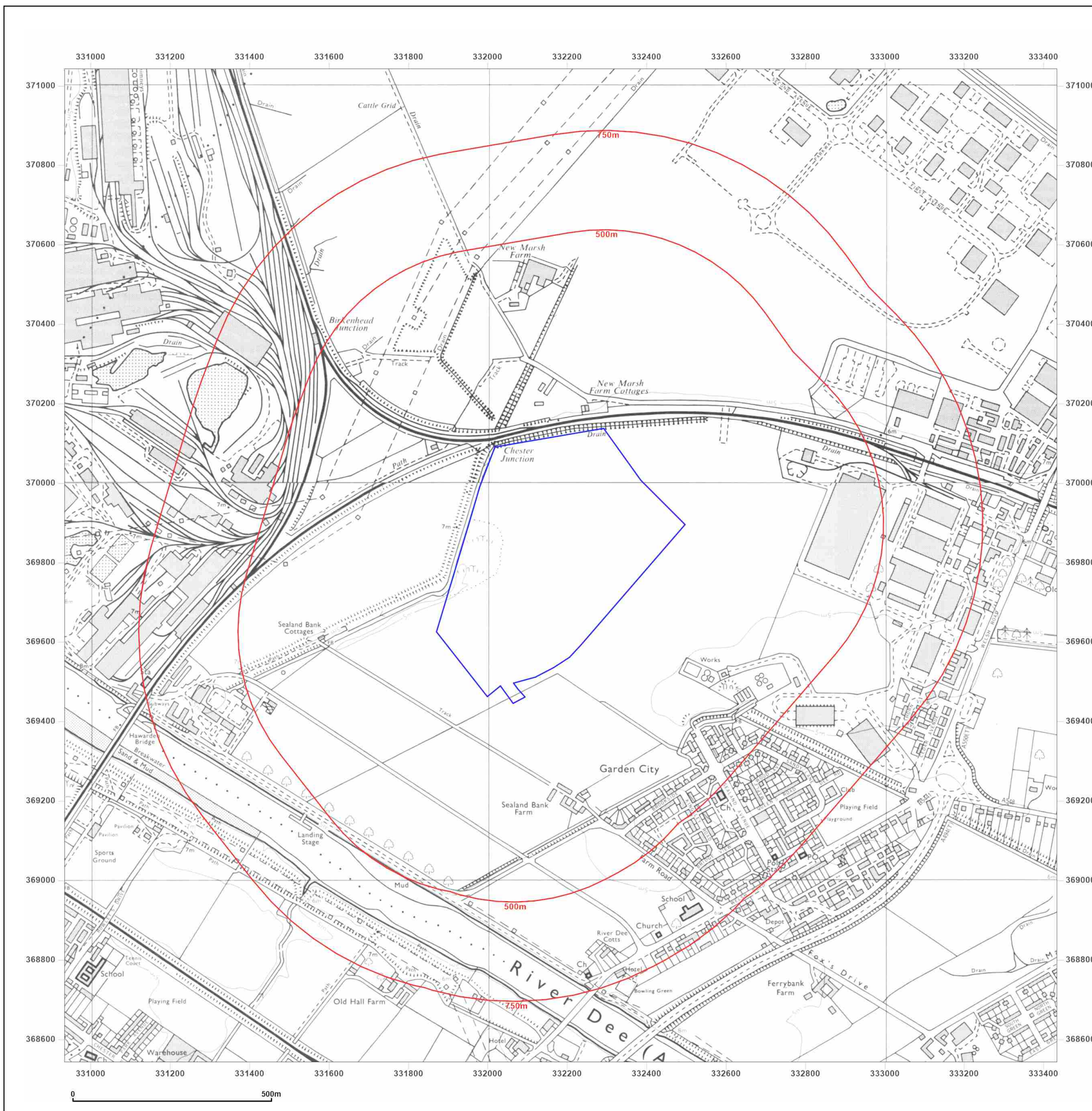


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#### Site Details:

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CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** National Grid

**Map date:** 1989-1992

**Scale:** 1:10,000

**Printed at:** 1:10,000



Surveyed 1981  
Revised 1992  
Edition N/A  
Copyright N/A  
Levelled N/A

Surveyed 1988  
Revised 1989  
Edition N/A  
Copyright N/A  
Levelled N/A



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#### Site Details:

FARM ROAD, GARDEN CITY,  
CH5 2HJ

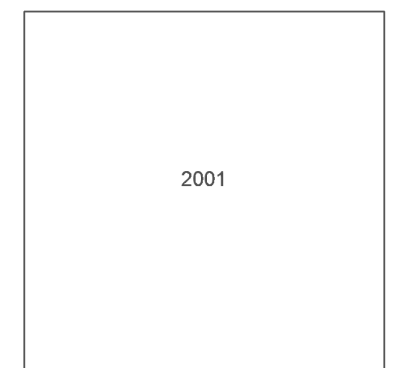
**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** National Grid

**Map date:** 2001

**Scale:** 1:10,000

**Printed at:** 1:10,000

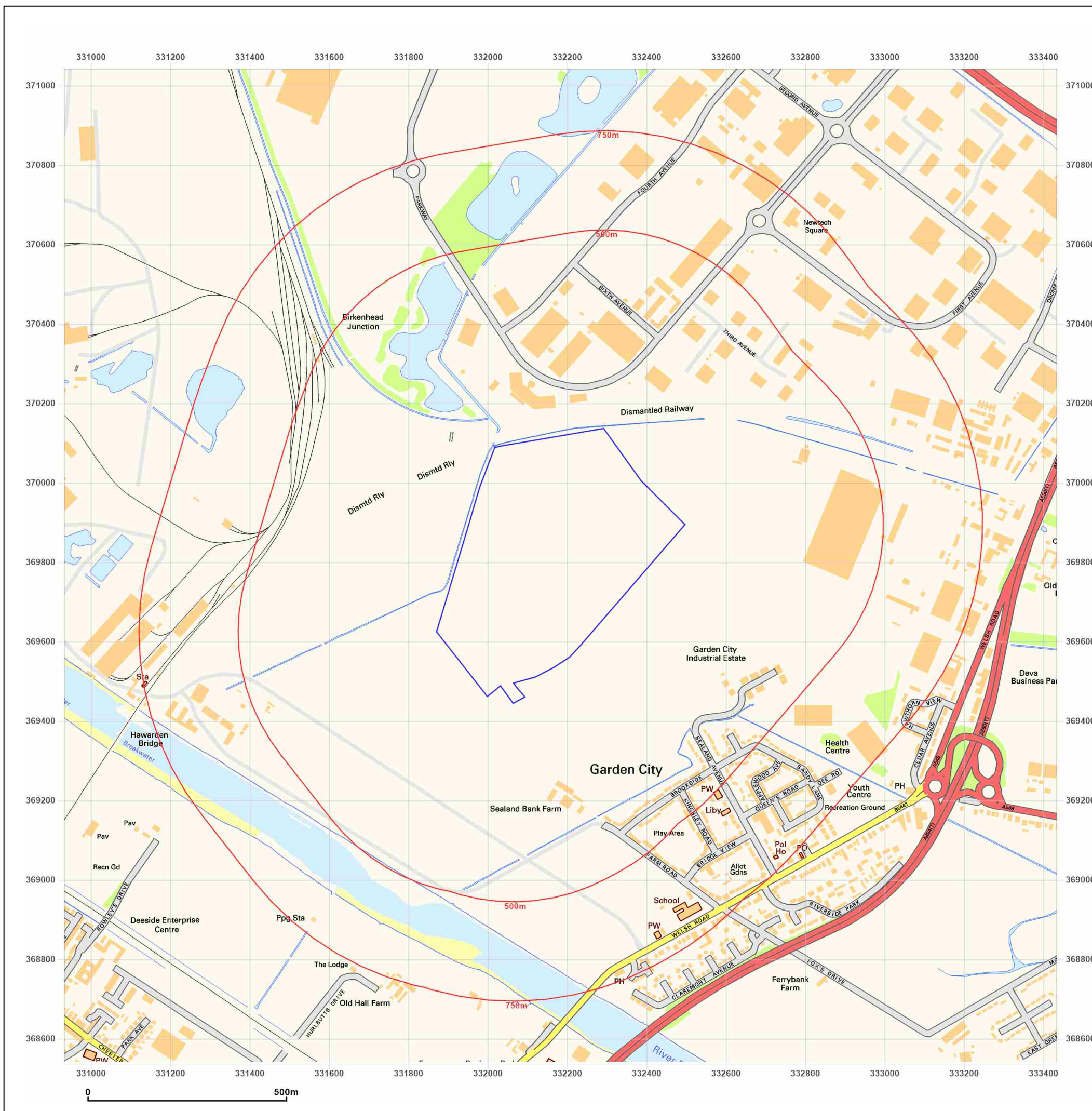


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#### Site Details:

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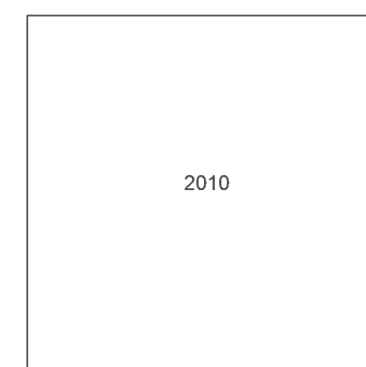
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**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** National Grid

**Map date:** 2010

**Scale:** 1:10,000

**Printed at:** 1:10,000

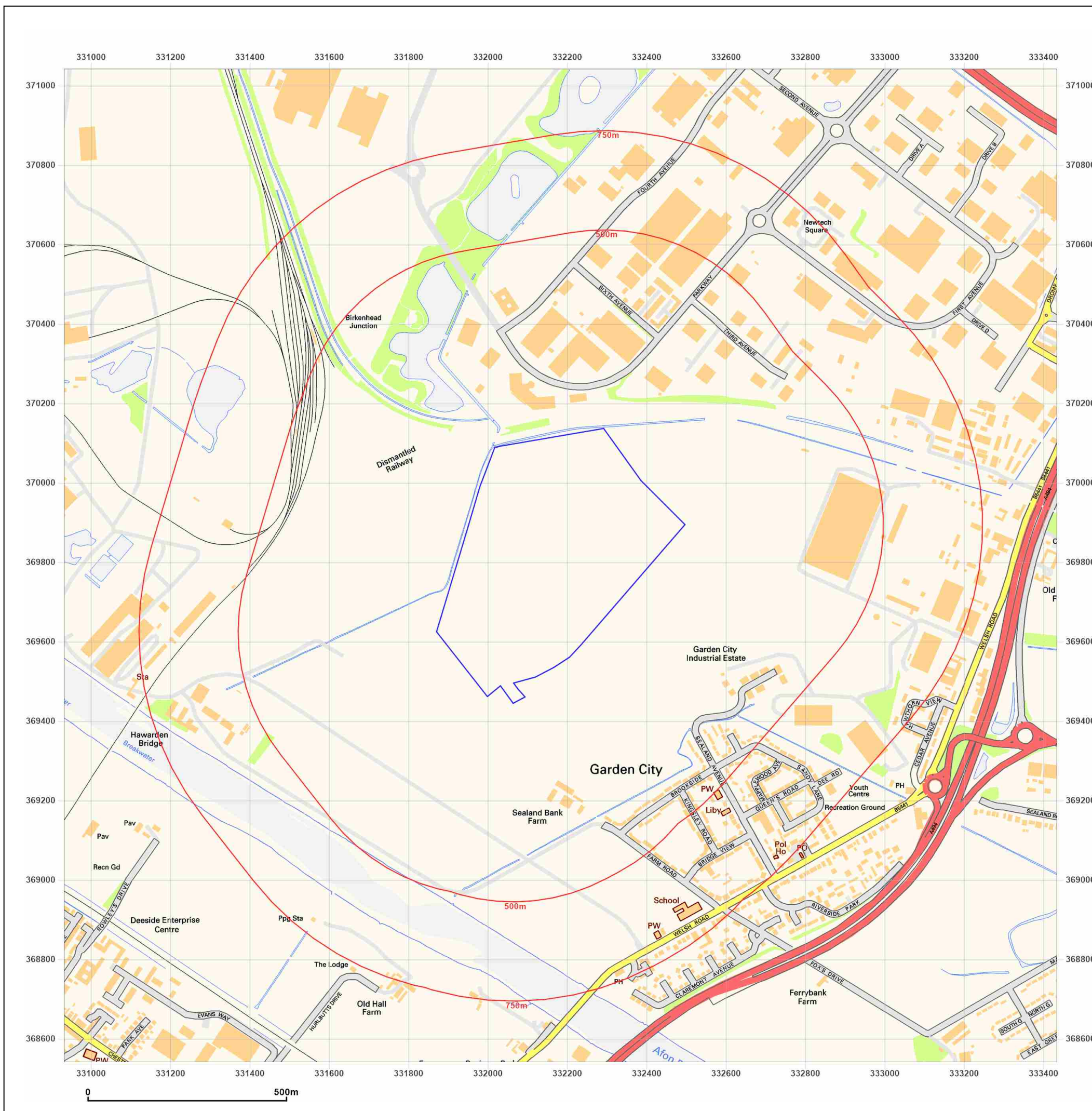


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**Site Details:**

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CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** National Grid

**Map date:** 2021

**Scale:** 1:10,000

**Printed at:** 1:10,000



2021

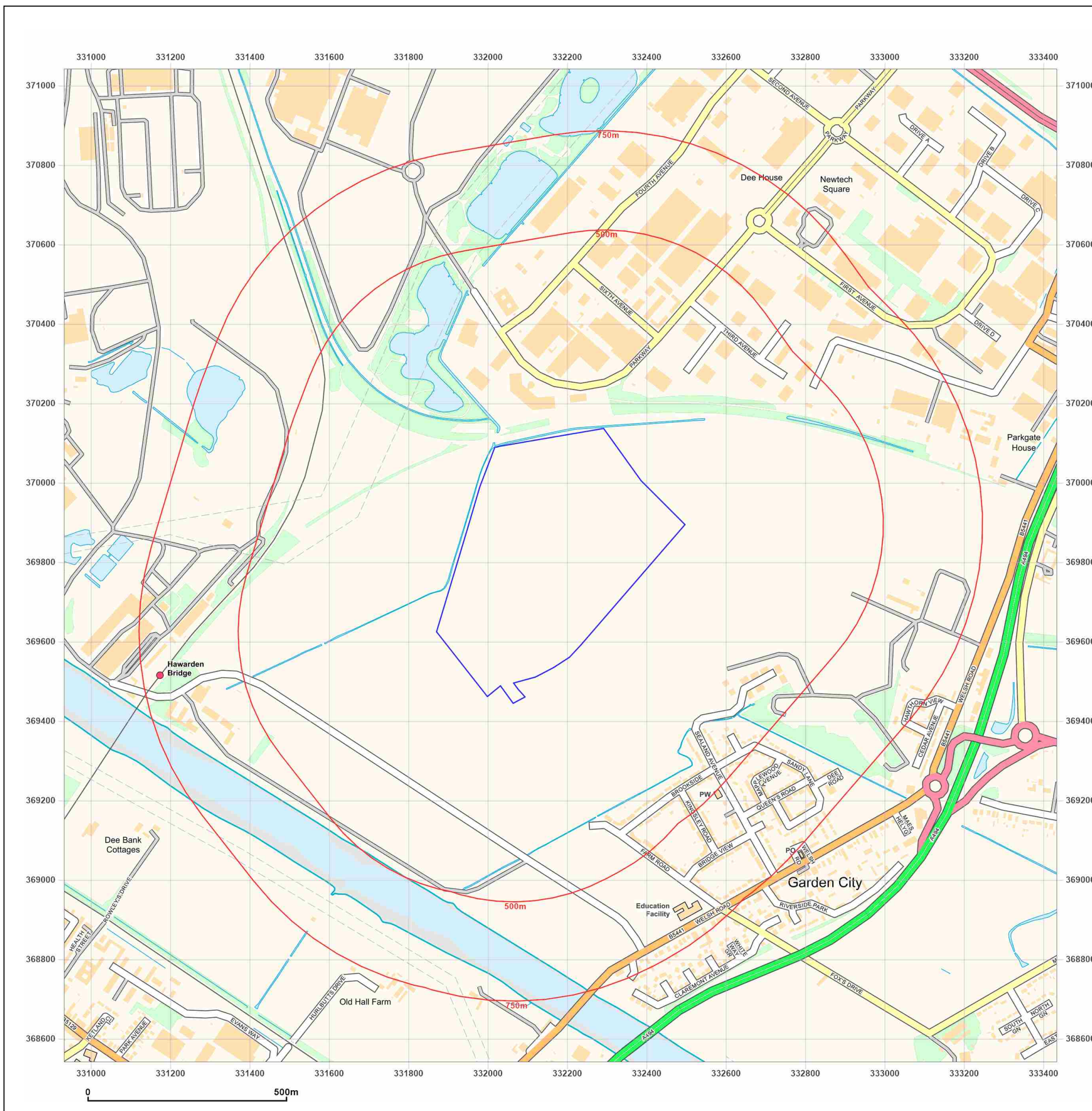


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## **Appendix I.2 – Groundsure Report (Ref: GS-8066692)**



FARM ROAD, GARDEN CITY, CH5 2HJ

**Order Details**

**Date:** 22/07/2021  
**Your ref:** 15-161-NG-A  
**Our Ref:** GS-8066692  
**Client:** E3P

**Site Details**

**Location:** 332337 369897  
**Area:** 25.37 ha  
**Authority:** [Sir y Fflint - Flintshire County Council](#)

**Summary of findings**

p. 2

**Aerial image**

p. 8

**OS MasterMap site plan**

N/A: &gt;10ha

[groundsure.com/insightuserguide](https://groundsure.com/insightuserguide)

Contact us with any questions at:

[info@groundsure.com](mailto:info@groundsure.com)

08444 159 000

## Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
<b><u>13</u></b>	<b><u>1.1</u></b>	<b><u>Historical industrial land uses</u></b>	3	10	9	48	-
<b><u>16</u></b>	<b><u>1.2</u></b>	<b><u>Historical tanks</u></b>	0	0	5	7	-
<b><u>17</u></b>	<b><u>1.3</u></b>	<b><u>Historical energy features</u></b>	0	0	3	24	-
18	1.4	Historical petrol stations	0	0	0	0	-
19	1.5	Historical garages	0	0	0	0	-
19	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
<b><u>20</u></b>	<b><u>2.1</u></b>	<b><u>Historical industrial land uses</u></b>	5	10	11	53	-
<b><u>23</u></b>	<b><u>2.2</u></b>	<b><u>Historical tanks</u></b>	0	0	12	13	-
<b><u>25</u></b>	<b><u>2.3</u></b>	<b><u>Historical energy features</u></b>	0	0	11	45	-
27	2.4	Historical petrol stations	0	0	0	0	-
27	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
28	3.1	Active or recent landfill	0	0	0	0	-
28	3.2	Historical landfill (BGS records)	0	0	0	0	-
29	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
29	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
29	3.5	Historical waste sites	0	0	0	0	-
<b><u>29</u></b>	<b><u>3.6</u></b>	<b><u>Licensed waste sites</u></b>	0	0	11	7	-
<b><u>34</u></b>	<b><u>3.7</u></b>	<b><u>Waste exemptions</u></b>	0	0	0	15	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
<b><u>36</u></b>	<b><u>4.1</u></b>	<b><u>Recent industrial land uses</u></b>	0	0	8	-	-
37	4.2	Current or recent petrol stations	0	0	0	0	-
37	4.3	Electricity cables	0	0	0	0	-
37	4.4	Gas pipelines	0	0	0	0	-
38	4.5	Sites determined as Contaminated Land	0	0	0	0	-



<b>38</b>	<b>4.6</b>	<b><u>Control of Major Accident Hazards (COMAH)</u></b>	0	0	0	1	-
38	4.7	Regulated explosive sites	0	0	0	0	-
38	4.8	Hazardous substance storage/usage	0	0	0	0	-
39	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
39	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
<b>39</b>	<b>4.11</b>	<b><u>Licensed pollutant release (Part A(2)/B)</u></b>	0	0	2	1	-
40	4.12	Radioactive Substance Authorisations	0	0	0	0	-
<b>40</b>	<b>4.13</b>	<b><u>Licensed Discharges to controlled waters</u></b>	0	0	1	3	-
41	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
41	4.15	Pollutant release to public sewer	0	0	0	0	-
41	4.16	List 1 Dangerous Substances	0	0	0	0	-
41	4.17	List 2 Dangerous Substances	0	0	0	0	-
<b>41</b>	<b>4.18</b>	<b><u>Pollution Incidents (EA/NRW)</u></b>	0	0	5	6	-
43	4.19	Pollution inventory substances	0	0	0	0	-
43	4.20	Pollution inventory waste transfers	0	0	0	0	-
43	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
<b>44</b>	<b>5.1</b>	<b><u>Superficial aquifer</u></b>	Identified (within 500m)				
<b>46</b>	<b>5.2</b>	<b><u>Bedrock aquifer</u></b>	Identified (within 500m)				
<b>48</b>	<b>5.3</b>	<b><u>Groundwater vulnerability</u></b>	Identified (within 50m)				
49	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
50	5.5	Groundwater vulnerability- local information	None (within 0m)				
<b>51</b>	<b>5.6</b>	<b><u>Groundwater abstractions</u></b>	0	0	0	0	8
<b>53</b>	<b>5.7</b>	<b><u>Surface water abstractions</u></b>	0	0	0	0	4
54	5.8	Potable abstractions	0	0	0	0	0
55	5.9	Source Protection Zones	0	0	0	0	-
55	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
<b>56</b>	<b>6.1</b>	<b><u>Water Network (OS MasterMap)</u></b>	0	5	5	-	-



57	6.2	<u>Surface water features</u>	1	1	0	-	-
58	6.3	<u>WFD Surface water body catchments</u>	2	-	-	-	-
58	6.4	<u>WFD Surface water bodies</u>	0	0	0	-	-
58	6.5	<u>WFD Groundwater bodies</u>	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
60	7.1	<u>Risk of Flooding from Rivers and Sea (RoFRaS)</u>	High (within 50m)				
61	7.2	<u>Historical Flood Events</u>	0	1	0	-	-
61	7.3	<u>Flood Defences</u>	0	0	1	-	-
61	7.4	<u>Areas Benefiting from Flood Defences</u>	1	2	0	-	-
62	7.5	Flood Storage Areas	0	0	0	-	-
63	7.6	<u>Flood Zone 2</u>	Identified (within 50m)				
64	7.7	<u>Flood Zone 3</u>	Identified (within 50m)				
Page	Section	Surface water flooding					
65	8.1	<u>Surface water flooding</u>	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding					
67	9.1	<u>Groundwater flooding</u>	High (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
68	10.1	<u>Sites of Special Scientific Interest (SSSI)</u>	0	0	0	1	1
69	10.2	<u>Conserved wetland sites (Ramsar sites)</u>	0	0	0	0	1
70	10.3	<u>Special Areas of Conservation (SAC)</u>	0	0	0	1	1
71	10.4	<u>Special Protection Areas (SPA)</u>	0	0	0	0	2
72	10.5	National Nature Reserves (NNR)	0	0	0	0	0
72	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
72	10.7	<u>Designated Ancient Woodland</u>	0	0	0	0	1
73	10.8	Biosphere Reserves	0	0	0	0	0
73	10.9	Forest Parks	0	0	0	0	0
73	10.10	Marine Conservation Zones	0	0	0	0	0
73	10.11	<u>Green Belt</u>	0	0	0	0	1
74	10.12	Proposed Ramsar sites	0	0	0	0	0



74	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
74	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
74	10.15	Nitrate Sensitive Areas	0	0	0	0	0
<b>75</b>	<b>10.16</b>	<b><u>Nitrate Vulnerable Zones</u></b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>5</b>
<b>76</b>	<b>10.17</b>	<b><u>SSSI Impact Risk Zones</u></b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
77	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
78	11.1	World Heritage Sites	0	0	0	-	-
78	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
78	11.3	National Parks	0	0	0	-	-
78	11.4	Listed Buildings	0	0	0	-	-
79	11.5	Conservation Areas	0	0	0	-	-
79	11.6	Scheduled Ancient Monuments	0	0	0	-	-
79	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
<b>80</b>	<b>12.1</b>	<b><u>Agricultural Land Classification</u></b>	<b>Grade 2 (within 250m)</b>				
81	12.2	Open Access Land	0	0	0	-	-
81	12.3	Tree Felling Licences	0	0	0	-	-
81	12.4	Environmental Stewardship Schemes	0	0	0	-	-
81	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
82	13.1	Priority Habitat Inventory	0	0	0	-	-
82	13.2	Habitat Networks	0	0	0	-	-
82	13.3	Open Mosaic Habitat	0	0	0	-	-
82	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
<b>83</b>	<b>14.1</b>	<b><u>10k Availability</u></b>	<b>Identified (within 500m)</b>				
84	14.2	Artificial and made ground (10k)	0	0	0	0	-
85	14.3	Superficial geology (10k)	0	0	0	0	-

85	14.4	Landslip (10k)	0	0	0	0	-
86	14.5	Bedrock geology (10k)	0	0	0	0	-
86	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
<b>87</b>	<b>15.1</b>	<b><u>50k Availability</u></b>	Identified (within 500m)				
<b>88</b>	<b>15.2</b>	<b><u>Artificial and made ground (50k)</u></b>	1	0	1	0	-
<b>89</b>	<b>15.3</b>	<b><u>Artificial ground permeability (50k)</u></b>	1	1	-	-	-
<b>90</b>	<b>15.4</b>	<b><u>Superficial geology (50k)</u></b>	1	0	0	0	-
<b>91</b>	<b>15.5</b>	<b><u>Superficial permeability (50k)</u></b>	Identified (within 50m)				
91	15.6	Landslip (50k)	0	0	0	0	-
91	15.7	Landslip permeability (50k)	None (within 50m)				
<b>92</b>	<b>15.8</b>	<b><u>Bedrock geology (50k)</u></b>	2	0	2	2	-
<b>93</b>	<b>15.9</b>	<b><u>Bedrock permeability (50k)</u></b>	Identified (within 50m)				
<b>93</b>	<b>15.10</b>	<b><u>Bedrock faults and other linear features (50k)</u></b>	0	0	2	1	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
<b>95</b>	<b>16.1</b>	<b><u>BGS Boreholes</u></b>	0	1	6	-	-
Page	Section	Natural ground subsidence					
<b>97</b>	<b>17.1</b>	<b><u>Shrink swell clays</u></b>	Very low (within 50m)				
<b>98</b>	<b>17.2</b>	<b><u>Running sands</u></b>	Moderate (within 50m)				
<b>100</b>	<b>17.3</b>	<b><u>Compressible deposits</u></b>	Moderate (within 50m)				
<b>102</b>	<b>17.4</b>	<b><u>Collapsible deposits</u></b>	Negligible (within 50m)				
<b>103</b>	<b>17.5</b>	<b><u>Landslides</u></b>	Very low (within 50m)				
<b>104</b>	<b>17.6</b>	<b><u>Ground dissolution of soluble rocks</u></b>	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
106	18.1	Natural cavities	0	0	0	0	-
107	18.2	BritPits	0	0	0	0	-
<b>107</b>	<b>18.3</b>	<b><u>Surface ground workings</u></b>	5	4	2	-	-
<b>108</b>	<b>18.4</b>	<b><u>Underground workings</u></b>	0	0	0	0	2
108	18.5	Historical Mineral Planning Areas	0	0	0	0	-



<b><u>108</u></b>	<b><u>18.6</u></b>	<b><u>Non-coal mining</u></b>	2	0	0	1	2
109	18.7	Mining cavities	0	0	0	0	0
<b><u>109</u></b>	<b><u>18.8</u></b>	<b><u>JPB mining areas</u></b>	Identified (within 0m)				
110	18.9	Coal mining	None (within 0m)				
110	18.10	Brine areas	None (within 0m)				
110	18.11	Gypsum areas	None (within 0m)				
110	18.12	Tin mining	None (within 0m)				
110	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
<b><u>111</u></b>	<b><u>19.1</u></b>	<b><u>Radon</u></b>	Between 5% and 10% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
<b><u>113</u></b>	<b><u>20.1</u></b>	<b><u>BGS Estimated Background Soil Chemistry</u></b>	11	1	-	-	-
113	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
114	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
115	21.1	Underground railways (London)	0	0	0	-	-
115	21.2	Underground railways (Non-London)	0	0	0	-	-
116	21.3	Railway tunnels	0	0	0	-	-
<b><u>116</u></b>	<b><u>21.4</u></b>	<b><u>Historical railway and tunnel features</u></b>	0	17	6	-	-
117	21.5	Royal Mail tunnels	0	0	0	-	-
<b><u>117</u></b>	<b><u>21.6</u></b>	<b><u>Historical railways</u></b>	0	3	0	-	-
118	21.7	Railways	0	0	0	-	-
118	21.8	Crossrail 1	0	0	0	0	-
118	21.9	Crossrail 2	0	0	0	0	-
118	21.10	HS2	0	0	0	0	-





## Recent aerial photograph



Capture Date: 10/04/2020

Site Area: 25.37ha





## Recent site history - 2017 aerial photograph



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Capture Date: 07/05/2017

Site Area: 25.37ha



Contact us with any questions at:

[info@groundsure.com](mailto:info@groundsure.com)

08444 159 000

Date: 22 July 2021

## Recent site history - 2009 aerial photograph



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Capture Date: 20/04/2009

Site Area: 25.37ha





## Recent site history - 2001 aerial photograph



Capture Date: 01/05/2001

Site Area: 25.37ha





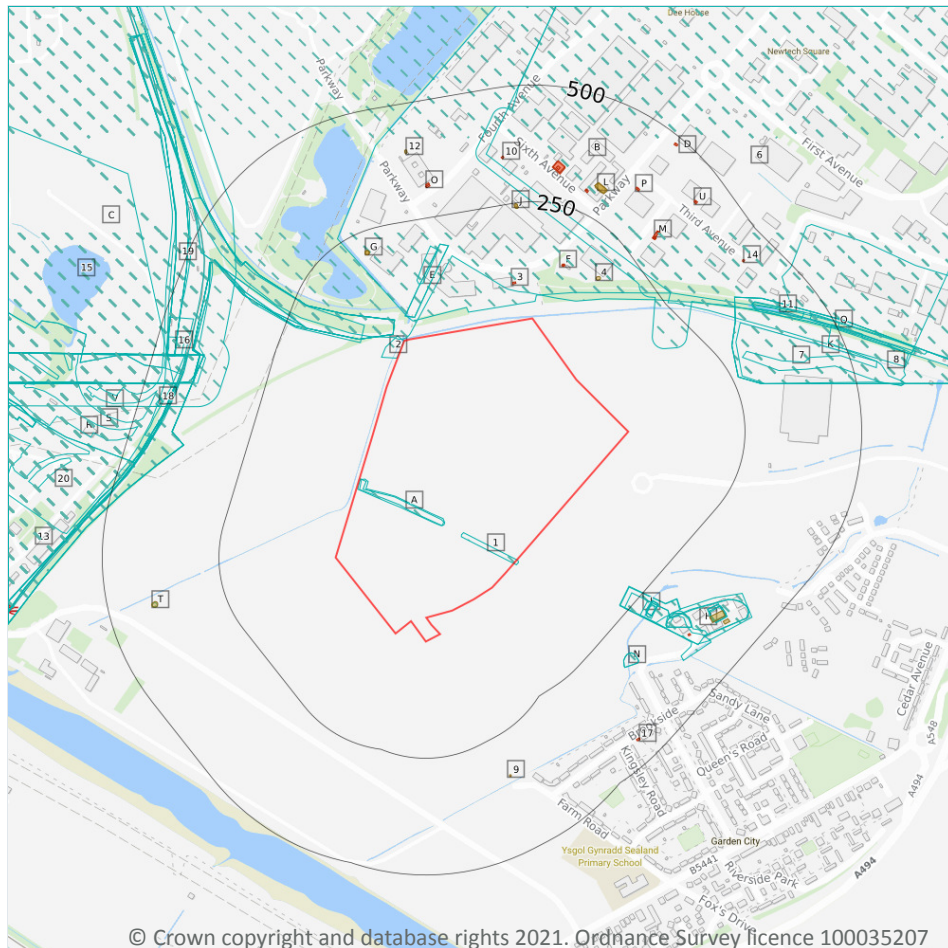
## Recent site history - 2000 aerial photograph



Capture Date: 04/09/2000

Site Area: 25.37ha

## 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

70

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 13**

ID	Location	Land use	Dates present	Group ID
1	On site	Unspecified Heap	1938	863355





ID	Location	Land use	Dates present	Group ID
A	On site	Unspecified Heap	1914	803609
A	On site	Unspecified Ground Workings	1938	931858
2	0m W	Cuttings	1913	795403
B	4m N	Airfield	1948	808717
C	28m NW	Railway Sidings	1969	844346
C	28m NW	Railway Sidings	1969	867410
C	28m NW	Unspecified Commercial/Industrial	1969	885292
C	28m NW	Railway Sidings	1960	917387
C	28m NW	Unspecified Commercial/Industrial	1960	948887
D	35m N	Unspecified Commercial/Industrial	1992	975771
E	45m N	Cuttings	1960 - 1969	865502
E	45m N	Cuttings	1981	929309
C	87m W	Railway Sidings	1948 - 1992	930634
E	113m N	Unspecified Heap	1914	803608
5	173m NE	Disused Airfield	1960 - 1969	925517
C	210m W	Railway Sidings	1981	791244
C	210m W	Unspecified Commercial/Industrial	1981	791250
H	218m SE	Unspecified Works	1969 - 1976	900101
I	220m SE	Unspecified Works	1989	917057
6	222m NE	Volunteer Rifle Range	1869	836702
H	232m SE	Unspecified Works	1960	897387
K	263m NE	Railway Sidings	1960	844432
K	263m NE	Railway Sidings	1960	844433
K	263m NE	Railway Sidings	1969	962961
H	269m SE	Sewage Works	1948	811816
7	272m NE	Unspecified Works	1981	830084
I	276m SE	Unspecified Tanks	1969	923265
I	277m SE	Unspecified Tanks	1989	918763



ID	Location	Land use	Dates present	Group ID
I	277m SE	Unspecified Tanks	1976	924778
I	280m SE	Unspecified Tanks	1948	898148
I	280m SE	Unspecified Tanks	1960	958658
8	292m NE	Railway Sidings	1981	915178
N	311m SE	Unspecified Pit	1969 - 1976	899324
N	311m SE	Unspecified Pit	1989	969635
H	324m SE	Unspecified Ground Workings	1969	799533
H	328m SE	Unspecified Heap	1976	858719
H	328m SE	Unspecified Heap	1989	926782
C	340m W	Slag Works	1938 - 1948	870652
11	377m NE	Unspecified Pit	1938	885454
H	377m SE	Unspecified Tanks	1969 - 1976	848570
Q	377m NE	Unspecified Pit	1948	914242
H	378m SE	Unspecified Tanks	1989	915323
Q	379m NE	Unspecified Pit	1914	962856
R	382m W	Steel Works	1938	949168
S	382m W	Railway Sidings	1948	844707
S	382m W	Railway Sidings	1938	844708
S	382m W	Railway Sidings	1948	844709
S	382m W	Railway Sidings	1913	844710
H	384m SE	Unspecified Tanks	1948	943137
H	385m SE	Unspecified Tanks	1960	900176
T	395m W	Unspecified Tank	1989	824022
13	426m W	Railway Sidings	1898	847422
V	428m W	Slag Works	1914	897166
V	428m W	Railway Sidings	1914	980495
R	430m W	Steel Works	1948	902674
R	431m W	Steel Works	1909	953405



ID	Location	Land use	Dates present	Group ID
R	434m W	Railway Sidings	1898 - 1909	951644
R	436m W	Railway Sidings	1960	888068
R	436m W	Unspecified Commercial/Industrial	1976	924419
R	436m W	Unspecified Commercial/Industrial	1989	927299
R	436m W	Unspecified Works	1969	934539
R	436m W	Unspecified Works	1960	948555
R	436m W	Railway Sidings	1969 - 1989	948883
15	439m W	Unspecified Works	1992	844540
16	441m W	Railway Sidings	1898	952690
18	452m W	Railway Building	1898	819488
19	454m W	Railway Sidings	1938	952156
Q	458m NE	Unspecified Pit	1938	907987
20	469m W	Steel Works	1914	976068

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.2 Historical tanks

### Records within 500m

**12**

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 13**

ID	Location	Land use	Dates present	Group ID
4	160m NE	Unspecified Tank	1988 - 1995	122564
G	200m NW	Unspecified Tank	1992	123352
G	200m NW	Unspecified Tank	1989	135063
J	238m N	Unspecified Tank	1992 - 1995	145611
J	241m N	Unspecified Tank	1988 - 1991	137841





ID	Location	Land use	Dates present	Group ID
L	307m NE	Tanks	1965 - 1986	146535
L	307m NE	Tanks	1984	145838
9	336m SE	Unspecified Tank	1911	111785
H	392m SE	Tanks	1963	104604
T	394m W	Unspecified Tank	1962 - 1992	135146
12	394m N	Unspecified Tank	1991 - 1995	123627
H	420m SE	Tanks	1963	104603

*This data is sourced from Ordnance Survey / Groundsure.*

### 1.3 Historical energy features

#### Records within 500m

**27**

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 13**

ID	Location	Land use	Dates present	Group ID
3	80m N	Electricity Substation	1986 - 1995	82470
F	129m NE	Electricity Substation	1988 - 1991	80815
F	130m NE	Electricity Substation	1992 - 1995	77213
L	294m NE	Electricity Substation	1992 - 1995	74994
L	296m NE	Electricity Substation	1991	60768
M	309m NE	Electricity Substations	1988	72744
M	309m NE	Electricity Substations	1991	83094
M	311m NE	Electricity Substations	1994	72558
M	311m NE	Electricity Substations	1995	75720
M	311m NE	Electricity Substations	1992	79503
O	314m N	Electricity Substation	1992 - 1995	71541



ID	Location	Land use	Dates present	Group ID
B	315m N	Electricity Substation	1986 - 1992	68684
B	318m N	Electricity Substation	1984	79318
O	318m N	Electricity Substation	1991	60769
B	323m N	Electricity Substation	1994 - 1995	70571
M	324m NE	Electricity Substations	1995	68468
M	324m NE	Electricity Substations	1994	71655
M	324m NE	Electricity Substations	1992	83769
10	348m N	Electricity Substation	1994 - 1995	74326
P	355m NE	Electricity Substation	1992 - 1995	79640
P	356m NE	Electricity Substation	1988 - 1991	83693
H	382m SE	Electricity Substation	1992	60059
U	427m NE	Electricity Substation	1992 - 1995	77852
U	427m NE	Electricity Substation	1988 - 1991	72136
14	431m NE	Electricity Substation	1994 - 1995	68431
17	449m SE	Electricity Substation	1979 - 1992	81420
D	480m NE	Electricity Substation	1988 - 1995	78016

*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

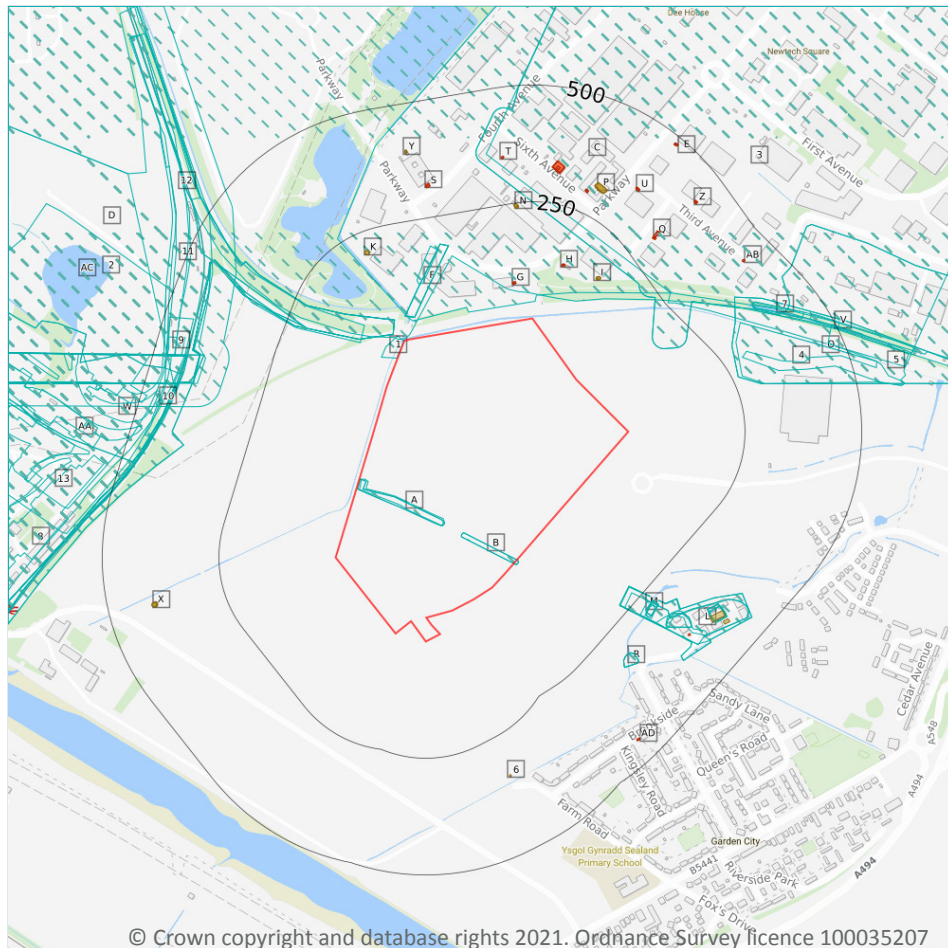
Records within 500m

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

### 2.1 Historical industrial land uses

Records within 500m

79

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 20**

ID	Location	Land Use	Date	Group ID
A	On site	Unspecified Heap	1914	803609
A	On site	Unspecified Ground Workings	1938	931858
A	On site	Unspecified Ground Workings	1938	931858



ID	Location	Land Use	Date	Group ID
<b>B</b>	<b>On site</b>	<b>Unspecified Heap</b>	<b>1938</b>	<b>863355</b>
<b>B</b>	<b>On site</b>	<b>Unspecified Heap</b>	<b>1938</b>	<b>863355</b>
1	0m W	Cuttings	1913	795403
C	4m N	Airfield	1948	808717
D	28m NW	Railway Sidings	1960	917387
D	28m NW	Unspecified Commercial/Industrial	1960	948887
D	28m NW	Unspecified Commercial/Industrial	1969	885292
D	28m NW	Railway Sidings	1969	844346
E	35m N	Unspecified Commercial/Industrial	1992	975771
F	45m N	Cuttings	1981	929309
F	45m N	Cuttings	1960	865502
F	45m N	Cuttings	1969	865502
2	87m W	Railway Sidings	1992	930634
F	113m N	Unspecified Heap	1914	803608
J	173m NE	Disused Airfield	1960	925517
J	173m NE	Disused Airfield	1969	925517
D	210m W	Railway Sidings	1981	791244
D	210m W	Unspecified Commercial/Industrial	1981	791250
L	218m SE	Unspecified Works	1969	900101
L	218m SE	Unspecified Works	1976	900101
M	220m SE	Unspecified Works	1989	917057
3	222m NE	Volunteer Rifle Range	1869	836702
L	232m SE	Unspecified Works	1960	897387
O	263m NE	Railway Sidings	1960	844432
O	263m NE	Railway Sidings	1969	962961
L	269m SE	Sewage Works	1948	811816
4	272m NE	Unspecified Works	1981	830084
M	276m SE	Unspecified Tanks	1969	923265



ID	Location	Land Use	Date	Group ID
M	277m SE	Unspecified Tanks	1989	918763
M	277m SE	Unspecified Tanks	1976	924778
M	280m SE	Unspecified Tanks	1948	898148
M	280m SE	Unspecified Tanks	1960	958658
5	292m NE	Railway Sidings	1981	915178
R	311m SE	Unspecified Pit	1969	899324
R	311m SE	Unspecified Pit	1989	969635
R	311m SE	Unspecified Pit	1976	899324
L	324m SE	Unspecified Ground Workings	1969	799533
L	328m SE	Unspecified Heap	1989	926782
L	328m SE	Unspecified Heap	1976	858719
D	340m W	Slag Works	1948	870652
7	377m NE	Unspecified Pit	1938	885454
L	377m SE	Unspecified Tanks	1969	848570
L	377m SE	Unspecified Tanks	1976	848570
V	377m NE	Unspecified Pit	1948	914242
L	378m SE	Unspecified Tanks	1989	915323
V	379m NE	Unspecified Pit	1914	962856
W	382m W	Railway Sidings	1938	844708
W	382m W	Steel Works	1938	949168
L	384m SE	Unspecified Tanks	1948	943137
L	385m SE	Unspecified Tanks	1960	900176
D	390m W	Railway Sidings	1948	930634
X	395m W	Unspecified Tank	1989	824022
8	426m W	Railway Sidings	1898	847422
AA	428m W	Railway Sidings	1914	980495
AA	428m W	Slag Works	1914	897166
W	430m W	Steel Works	1948	902674



ID	Location	Land Use	Date	Group ID
W	430m W	Railway Sidings	1948	844707
W	431m W	Steel Works	1909	953405
W	434m W	Railway Sidings	1898	951644
W	436m W	Unspecified Works	1969	934539
W	436m W	Railway Sidings	1969	948883
W	436m W	Unspecified Commercial/Industrial	1989	927299
W	436m W	Railway Sidings	1989	948883
W	436m W	Unspecified Commercial/Industrial	1976	924419
W	436m W	Railway Sidings	1976	948883
W	436m W	Railway Sidings	1960	888068
W	436m W	Unspecified Works	1960	948555
AC	439m W	Unspecified Works	1992	844540
9	441m W	Railway Sidings	1898	952690
10	452m W	Railway Building	1898	819488
W	453m W	Railway Sidings	1909	951644
11	454m W	Railway Sidings	1938	952156
12	455m W	Railway Sidings	1913	844710
V	458m NE	Unspecified Pit	1938	907987
13	469m W	Steel Works	1914	976068
AC	477m W	Slag Works	1938	870652

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.2 Historical tanks

### Records within 500m

25

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 20**



ID	Location	Land Use	Date	Group ID
I	160m NE	Unspecified Tank	1988	122564
I	160m NE	Unspecified Tank	1991	122564
I	162m NE	Unspecified Tank	1994	122564
I	162m NE	Unspecified Tank	1995	122564
I	162m NE	Unspecified Tank	1992	122564
K	200m NW	Unspecified Tank	1992	123352
K	200m NW	Unspecified Tank	1989	135063
N	238m N	Unspecified Tank	1994	145611
N	238m N	Unspecified Tank	1995	145611
N	238m N	Unspecified Tank	1992	145611
N	241m N	Unspecified Tank	1988	137841
N	241m N	Unspecified Tank	1991	137841
P	307m NE	Tanks	1965	146535
P	307m NE	Tanks	1986	146535
P	307m NE	Tanks	1984	145838
6	336m SE	Unspecified Tank	1911	111785
L	392m SE	Tanks	1963	104604
X	394m W	Unspecified Tank	1962	135146
Y	394m N	Unspecified Tank	1994	123627
Y	394m N	Unspecified Tank	1995	123627
Y	394m N	Unspecified Tank	1992	123627
X	394m W	Unspecified Tank	1992	135146
X	397m W	Unspecified Tank	1985	135146
Y	397m N	Unspecified Tank	1991	123627
L	420m SE	Tanks	1963	104603

*This data is sourced from Ordnance Survey / Groundsure.*





## 2.3 Historical energy features

### Records within 500m

56

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 20**

ID	Location	Land Use	Date	Group ID
G	80m N	Electricity Substation	1986	82470
G	80m N	Electricity Substation	1988	82470
G	80m N	Electricity Substation	1991	82470
G	80m N	Electricity Substation	1994	82470
G	80m N	Electricity Substation	1995	82470
G	80m N	Electricity Substation	1992	82470
H	129m NE	Electricity Substation	1988	80815
H	129m NE	Electricity Substation	1991	80815
H	130m NE	Electricity Substation	1994	77213
H	130m NE	Electricity Substation	1995	77213
H	130m NE	Electricity Substation	1992	77213
P	294m NE	Electricity Substation	1994	74994
P	294m NE	Electricity Substation	1995	74994
P	294m NE	Electricity Substation	1992	74994
P	296m NE	Electricity Substation	1991	60768
Q	309m NE	Electricity Substations	1988	72744
Q	309m NE	Electricity Substations	1991	83094
Q	311m NE	Electricity Substations	1994	72558
Q	311m NE	Electricity Substations	1995	75720
Q	311m NE	Electricity Substations	1992	79503
S	314m N	Electricity Substation	1994	71541
S	314m N	Electricity Substation	1995	71541
S	314m N	Electricity Substation	1992	71541



ID	Location	Land Use	Date	Group ID
C	315m N	Electricity Substation	1992	68684
C	317m N	Electricity Substation	1986	68684
C	317m N	Electricity Substation	1988	68684
C	317m N	Electricity Substation	1991	68684
C	318m N	Electricity Substation	1984	79318
S	318m N	Electricity Substation	1991	60769
C	323m N	Electricity Substation	1994	70571
C	323m N	Electricity Substation	1995	70571
Q	324m NE	Electricity Substations	1994	71655
Q	324m NE	Electricity Substations	1995	68468
Q	324m NE	Electricity Substations	1992	83769
T	348m N	Electricity Substation	1994	74326
T	348m N	Electricity Substation	1995	74326
U	355m NE	Electricity Substation	1994	79640
U	355m NE	Electricity Substation	1995	79640
U	355m NE	Electricity Substation	1992	79640
U	356m NE	Electricity Substation	1988	83693
U	356m NE	Electricity Substation	1991	83693
L	382m SE	Electricity Substation	1992	60059
Z	427m NE	Electricity Substation	1994	77852
Z	427m NE	Electricity Substation	1995	77852
Z	427m NE	Electricity Substation	1992	77852
Z	427m NE	Electricity Substation	1988	72136
Z	427m NE	Electricity Substation	1991	72136
AB	431m NE	Electricity Substation	1994	68431
AB	431m NE	Electricity Substation	1995	68431
AD	449m SE	Electricity Substation	1992	81420
AD	450m SE	Electricity Substation	1979	81420



ID	Location	Land Use	Date	Group ID
E	480m NE	Electricity Substation	1988	78016
E	480m NE	Electricity Substation	1991	78016
E	482m NE	Electricity Substation	1994	78016
E	482m NE	Electricity Substation	1995	78016
E	482m NE	Electricity Substation	1992	78016

*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**

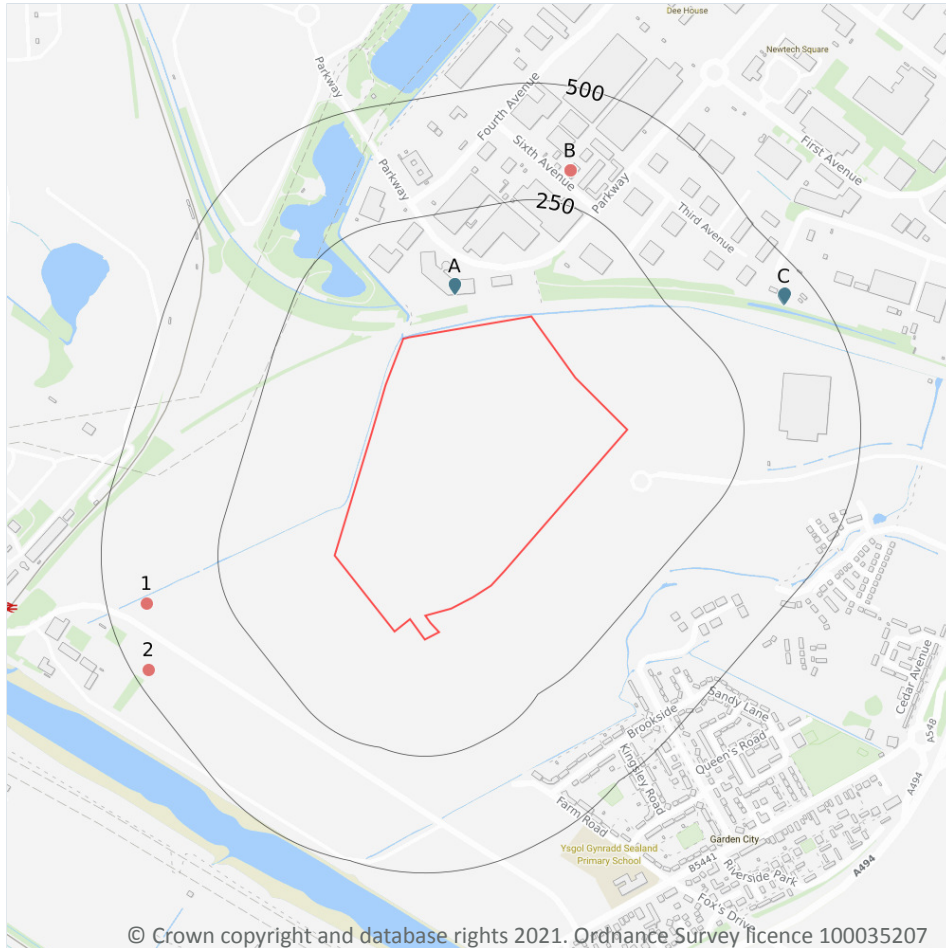
**0**

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)
- Licensed waste sites
- Waste exemptions

### 3.1 Active or recent landfill

Records within 500m

0

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

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

### 3.2 Historical landfill (BGS records)

Records within 500m

0

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

*This data is sourced from the British Geological Survey.*





### 3.3 Historical landfill (LA/mapping records)

Records within 500m

0

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

18

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

Features are displayed on the Waste and landfill map on **page 28**

ID	Location	Details		
A	90m N	Site Name: Paperback Collection & Recycling Ltd Site Address: Unit 1, 1a & 2, Parkway, Zone 2, Deeside Ind Est Zone 2, Deeside, Flintshire, CH5 2NS Correspondence Address: -	Type of Site: 75kte HCI Waste TS + treatment Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: PAP018 EPR reference: EA/EPR/JB3932RM/A001 Operator: Paperback Collection & Recycling Ltd Waste Management licence No: 104542 Annual Tonnage: 74999	Issue Date: 17/10/2012 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued



ID	Location	Details		
A	90m N	Site Name: - Site Address: Paperback Collection & Recycling Ltd, Deeside Industrial Park, Deeside, Flintshire, CH5 2NS Correspondence Address: -	Type of Site: - Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: JB3932RM EPR reference: - Operator: Paperback Collection & Recycling Limited Waste Management licence No: 0 Annual Tonnage: 74999	Issue Date: 17/10/2012 Effective Date: 17/10/2012 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Effective
A	90m N	Site Name: Paperback Collection & Recycling Ltd Site Address: Unit 1, 1a & 2, Parkway, Zone 2, Deeside Ind Est Zone 2, Deeside, Flintshire, CH5 2NS Correspondence Address: -	Type of Site: 75kte HCI Waste TS + treatment Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: PAP018 EPR reference: JB3932RM/A001 Operator: Paperback Collection & Recycling Ltd Waste Management licence No: 104542 Annual Tonnage: 0	Issue Date: 17/10/2012 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued
A	90m N	Site Name: - Site Address: Paperback Collection & Recycling Ltd, Deeside Industrial Park, Deeside, Clwyd, CH5 2NS Correspondence Address: -	Type of Site: Household, Commercial & Industrial Waste T Stn Size: - Environmental Permitting Regulations (Waste) Licence Number: JB3932RM EPR reference: - Operator: Paperback Collection & Recycling Limited Waste Management licence No: 104542 Annual Tonnage: 74999	Issue Date: 17/11/2017 Effective Date: 17/11/2017 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Effective
A	90m N	Site Name: - Site Address: Paperback Collection & Recycling Ltd, Deeside Industrial Park, Deeside, Clwyd, CH5 2NS Correspondence Address: -	Type of Site: Physical Treatment Facility Size: - Environmental Permitting Regulations (Waste) Licence Number: JB3932RM EPR reference: - Operator: Paperback Collection & Recycling Limited Waste Management licence No: 104542 Annual Tonnage: 74999	Issue Date: 17/11/2017 Effective Date: 17/11/2017 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Effective



ID	Location	Details		
A	90m N	Site Name: - Site Address: Paperback Collection & Recycling Ltd, Deeside Industrial Park, Deeside, Clwyd, CH5 2NS Correspondence Address: -	Type of Site: Household, Commercial & Industrial Waste T Stn Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: JB3932RM EPR reference: - Operator: - Waste Management licence No: 104542 Annual Tonnage: 74999	Issue Date: 17/10/2012 Effective Date: 17/10/2012 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Effective
A	90m N	Site Name: - Site Address: Paperback Collection & Recycling Ltd, Deeside Industrial Park, Clwyd, Deeside, Flintshire, CH5 2NS Correspondence Address: -	Type of Site: - Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: JB3932RM EPR reference: - Operator: Paperback Collection & Recycling Limited Waste Management licence No: 104542 Annual Tonnage: 74999	Issue Date: 17/11/2017 Effective Date: 17/11/2017 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Effective
A	90m N	Site Name: - Site Address: Paperback Collection & Recycling Ltd, Deeside Industrial Park, Clwyd, Deeside, Flintshire, CH5 2NS Correspondence Address: -	Type of Site: - Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: JB3932RM EPR reference: - Operator: Paperback Collection & Recycling Limited Waste Management licence No: 104542 Annual Tonnage: 74999	Issue Date: 17/11/2017 Effective Date: 17/11/2017 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Effective
A	90m N	Site Name: - Site Address: Paperback Collection & Recycling Ltd, Deeside Industrial Park, Deeside, Clwyd, CH5 2NS Correspondence Address: -	Type of Site: Household, Commercial & Industrial Waste T Stn Size: - Environmental Permitting Regulations (Waste) Licence Number: JB3932RM EPR reference: - Operator: Paperback Collection & Recycling Limited Waste Management licence No: 104542 Annual Tonnage: 74999	Issue Date: 17/11/2017 Effective Date: 17/11/2017 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Effective



ID	Location	Details		
A	90m N	Site Name: - Site Address: Paperback Collection & Recycling Ltd, Deeside Industrial Park, Deeside, Clwyd, CH5 2NS Correspondence Address: -	Type of Site: Physical Treatment Facility Size: - Environmental Permitting Regulations (Waste) Licence Number: JB3932RM EPR reference: - Operator: Paperback Collection & Recycling Limited Waste Management licence No: 104542 Annual Tonnage: 74999	Issue Date: 17/11/2017 Effective Date: 17/11/2017 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Effective
A	91m N	Site Name: Paperback Collection & Recycling Ltd Site Address: Unit 1, 1a & 2 Parkway, Deeside Industrial Park, Deeside, Clwyd, CH5 2NS Correspondence Address: -	Type of Site: Household, Commercial & Industrial Waste T Stn Size: >= 25000 tonnes 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: PAP018 EPR reference: JB3932RM/V002 Operator: Paperback Collection & Recycling Limited Waste Management licence No: 104542 Annual Tonnage: 74999	Issue Date: 17/10/2012 Effective Date: - Modified: 17/09/2015 Surrendered Date: 0 Expiry Date: 0 Cancelled Date: 0 Status: Modified
C	439m NE	Site Name: - Site Address: C T Skip Hire, C T Skip Hire, Drome Road, Deeside Industrial Park, Deeside, Flintshire, CH5 2LR Correspondence Address: -	Type of Site: - Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: DB3332RH EPR reference: - Operator: Carl Thompson Waste Management licence No: 0 Annual Tonnage: 74999	Issue Date: 17/01/2012 Effective Date: 17/01/2012 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Effective
C	439m NE	Site Name: C T Skip Hire Site Address: C T Skip Hire, Drome Road, Deeside Industrial Park, Deeside, Clwyd, CH5 2LR Correspondence Address: -	Type of Site: 75kte HCI Waste TS + treatment Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: CAR283 EPR reference: EA/EPR/DB3332RH/A001 Operator: Thompson Carl Waste Management licence No: 103589 Annual Tonnage: 74999	Issue Date: 17/01/2012 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued



ID	Location	Details		
C	439m NE	Site Name: - Site Address: C T Skip Hire, C T Skip Hire, Drome Road, Deeside Industrial Park, Deeside, Clwyd, CH5 2LR Correspondence Address: -	Type of Site: 75kte HCI Waste TS + treatment Size: - Environmental Permitting Regulations (Waste) Licence Number: DB3332RH EPR reference: - Operator: Carl Thompson Waste Management licence No: 103589 Annual Tonnage: 74999	Issue Date: 17/01/2012 Effective Date: 17/01/2012 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Revoked
C	439m NE	Site Name: - Site Address: C T Skip Hire, C T Skip Hire, Drome Road, Deeside Industrial Park, Deeside, Clwyd, CH5 2LR Correspondence Address: -	Type of Site: 75kte HCI Waste TS + treatment Size: - Environmental Permitting Regulations (Waste) Licence Number: DB3332RH EPR reference: - Operator: Carl Thompson Waste Management licence No: 103589 Annual Tonnage: 74999	Issue Date: 17/01/2012 Effective Date: 17/01/2012 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Effective
C	439m NE	Site Name: - Site Address: C T Skip Hire, C T Skip Hire, Drome Road, Deeside Industrial Park, Deeside, Clwyd, CH5 2LR Correspondence Address: -	Type of Site: 75kte HCI Waste TS + treatment Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: DB3332RH EPR reference: - Operator: - Waste Management licence No: 103589 Annual Tonnage: 74999	Issue Date: 17/01/2012 Effective Date: 17/01/2012 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Effective
C	439m NE	Site Name: - Site Address: C T Skip Hire, C T Skip Hire, Drome Road, Clwyd, Deeside, Flintshire, CH5 2LR Correspondence Address: -	Type of Site: - Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: DB3332RH EPR reference: - Operator: Carl Thompson Waste Management licence No: 103589 Annual Tonnage: 74999	Issue Date: 17/01/2012 Effective Date: 17/01/2012 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Effective





ID	Location	Details		
C	440m NE	Site Name: C T Skip Hire Site Address: C T Skip Hire, Drome Road, Deeside Industrial Park, Deeside, Clwyd, CH5 2LR Correspondence Address: -	Type of Site: 75kte HCI Waste TS + treatment Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: CAR283 EPR reference: DB3332RH/A001 Operator: Thompson Carl Waste Management licence No: 103589 Annual Tonnage: 0	Issue Date: 17/01/2012 Effective Date: - Modified: - Surrendered Date: 0 Expiry Date: 0 Cancelled Date: 0 Status: Issued

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

### 3.7 Waste exemptions

<b>Records within 500m</b>	<b>15</b>
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Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on **page 28**

ID	Location	Site	Reference	Category	Sub-Category	Description
B	322m N	PARKWAY, DEESIDE INDUSTRIAL PARK, DEESIDE, CH5 2NS	WEX099485	Storing waste exemption	Not on a farm	Storage of waste in secure containers
B	322m N	PARKWAY, DEESIDE INDUSTRIAL PARK, DEESIDE, CH5 2NS	WEX099485	Storing waste exemption	Not on a farm	Storage of waste in a secure place
B	322m N	Paperback Collection & Recycling Limited, Unit 1-1A & 2, Parkway, Deeside Industrial Park, Deeside, Flintshire, CH52NS	NRW-WME007566	Storing waste exemption	Not on a farm	Storage of waste in a secure place
B	322m N	Mondi Consumer Goods Packaging Ltd, Mondi & Deeside, Parkway, Deeside, Flintshire, CH52NS	NRW-WME029178	Treating waste exemption	Not on a farm	Preparatory treatments (baling, sorting, shredding etc)
B	322m N	Mondi Consumer Goods Packaging Ltd, Mondi & Deeside, Parkway, Deeside, Flintshire, CH52NS	NRW-WME029178	Treating waste exemption	Not on a farm	Recovery of scrap metal

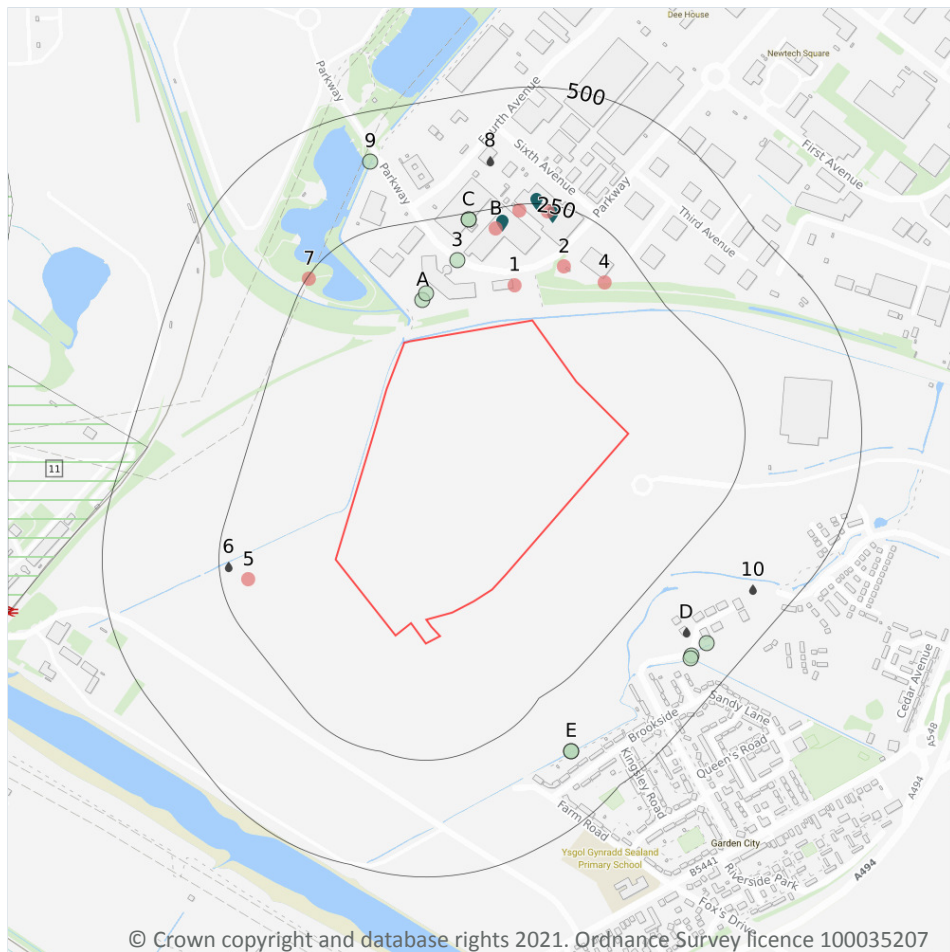


ID	Location	Site	Reference	Category	Sub-Category	Description
B	322m N	Mondi Consumer Goods Packaging Ltd, Mondri & Deeside, Parkway, Deeside, Flintshire, CH52NS	NRW-WME029178	Storing waste exemption	Not on a farm	Storage of waste in secure containers
B	322m N	Mondi Consumer Goods Packaging Ltd, Mondri & Deeside, Parkway, Deeside, Flintshire, CH52NS	NRW-WME029178	Storing waste exemption	Not on a farm	Storage of waste in a secure place
B	322m N	AD Recycling Ltd, Units 1,1a & 2 Parkway, Parkway, Deeside Industrial Park, Deeside, Flintshire, CH52NS	NRW-WME034257	Treating waste exemption	Not on a farm	Sorting mixed waste
B	322m N	AD Recycling Ltd, Units 1,1a & 2 Parkway, Parkway, Deeside Industrial Park, Deeside, Flintshire, CH52NS	NRW-WME034257	Treating waste exemption	Not on a farm	Preparatory treatments (baling, sorting, shredding etc)
B	322m N	Parkway, Zone 2, Deeside, Flintshire, CH5 2NS	NRW-WME001077	Treating waste exemption	Waste Exemption - Agricultural and Non-Agricultural	Preparatory treatments (baling, sorting, shredding etc)
B	322m N	Parkway, Zone 2, Deeside, Flintshire, CH5 2NS	NRW-WME001077	Treating waste exemption	Waste Exemption - Non-Agricultural	Recovery of scrap metal
B	322m N	Parkway, Zone 2, Deeside, Flintshire, CH5 2NS	NRW-WME001077	Storing waste exemption	Waste Exemption - Non-Agricultural	Storage of waste in secure containers
B	322m N	Parkway, Zone 2, Deeside, Flintshire, CH5 2NS	NRW-WME001077	Storing waste exemption	Waste Exemption - Non-Agricultural	Storage of waste in a secure place
1	417m W	4R Group, Wood Farm, Deeside Lane, Sealand, Chester, Flintshire, CH1 6BP	NRW-WME053733	Storing waste exemption	Not on a farm	Storage of sludge
2	469m SW	United Utilities Water PLC, Garden City, Deeside Lane, Sealand, Chester, Flintshire, CH1 6BP	NRW-WME059657	Storing waste exemption	Not on a farm	Storage of sludge

*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
- Control of Major Accident Hazards
- Licensed pollutant release (Part A(2)/B)
- Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

### 4.1 Recent industrial land uses

Records within 250m

8

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 36**

ID	Location	Company	Address	Activity	Category
1	81m N	Electricity Sub Station	Clwyd, CH5	Electrical Features	Infrastructure and Facilities
2	134m NE	Electricity Sub Station	Clwyd, CH5	Electrical Features	Infrastructure and Facilities
4	173m NE	Tank	Clwyd, CH5	Tanks (Generic)	Industrial Features



ID	Location	Company	Address	Activity	Category
5	191m W	Mast (Telecommu nication)	Clwyd, CH5	Telecommunications Features	Infrastructure and Facilities
B	207m N	Mondi	Parkway, Deeside Industrial Park, Deeside, Clwyd, CH5 2NS	Packaging	Industrial Products
B	236m N	Ardagh Metal Beverage UK Ltd	Sixth Avenue, Deeside Industrial Park, Deeside, Clwyd, CH5 2LB	Packaging	Industrial Products
B	237m N	Tank	Clwyd, CH5	Tanks (Generic)	Industrial Features
7	245m NW	Pylon	Clwyd, CH5	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

1

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.

Features are displayed on the Current industrial land use map on **page 36**

ID	Location	Company	Address	Operational status	Tier
11	455m W	Tata Steel UK Limited	Tata Steel UK Limited, Shotton Works, Shotton Works, Deeside, Flintshire, CH5 2NH	Current COMAH Site	COMAH Lower Tier Operator

*This data is sourced from the Health and Safety Executive.*

## 4.7 Regulated explosive sites

Records within 500m

0

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

*This data is sourced from the Health and Safety Executive.*

## 4.8 Hazardous substance storage/usage

Records within 500m

0

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

*This data is sourced from Local Authority records.*



## 4.9 Historical licensed industrial activities (IPC)

Records within 500m

0

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

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

## 4.10 Licensed industrial activities (Part A(1))

Records within 500m

0

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

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

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

Records within 500m

3

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

Features are displayed on the Current industrial land use map on **page 36**

ID	Location	Address	Details	
B	216m N	Excelsior Technologies Ltd, Parkway, Deeside Industrial Park, Deeside, Flintshire, CH5 2NS	Process: Printing Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
B	229m N	Ball Packaging, Sixth Avenue, Deeside Industrial Park, Deeside, CH5 2LB	Process: Surface Cleaning Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
B	255m N	Graphoprint (Clwyd) Ltd, Parkway, Deeside Industrial Park, Deeside, Flintshire, CH5 2NS	Process: Printing Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

*This data is sourced from Local Authority records.*



## 4.12 Radioactive Substance Authorisations

### Records within 500m

**0**

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

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

## 4.13 Licensed Discharges to controlled waters

### Records within 500m

**4**

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 36**

ID	Location	Address	Details	
6	230m W	GENERAL OFFICE STW SHOTTON WORKS, GENERAL OFFICE STW, SHOTTON WORKS, DEESIDE, CH5 2NH	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: CM0015801 Permit Version: 1 Receiving Water: SHOTWICK BROOK	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 22/05/1970 Effective Date: 22/05/1970 Revocation Date: 22/12/1992
8	352m N	DEESIDE IND PARK CHESTER CHESHIRE, DEESIDE IND PARK CHESTER CHESH, CHESTER CHESHIRE, CHESHIRE	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: CM0084601 Permit Version: 1 Receiving Water: TRIB. OF SHOTWICK BROOK	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 08/01/1979 Effective Date: 08/01/1979 Revocation Date: 22/12/1992
D	372m SE	DEESIDE GARDEN CITY, GARDEN CITY	Effluent Type: UNSPECIFIED Permit Number: CM0096201 Permit Version: 1 Receiving Water: GARDEN CITY DRAIN	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 21/10/1983 Effective Date: 21/10/1983 Revocation Date: 05/04/1995
10	420m SE	Northern Access Road, Chester Millenium Greenway, Chester, CH5 2RD	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE Permit Number: AB3295HG Permit Version: 1 Receiving Water: River Dee	Status: Effective Issue date: 01/11/2016 Effective Date: 01/11/2016 Revocation Date: -

*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****11**

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 36**

ID	Location	Details	
A	82m N	Incident Date: 19/07/2016 Incident Identification: 1604014 Pollutant: - Pollutant Description: -	Water Impact: Other Land Impact: Other Air Impact: Other
A	96m N	Incident Date: 24/09/2013 Incident Identification: 1161816 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: - Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
3	154m N	Incident Date: 08/12/2014 Incident Identification: 1299935 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Smoke	Water Impact: - Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
C	235m N	Incident Date: 24/03/2016 Incident Identification: 1601232 Pollutant: - Pollutant Description: -	Water Impact: Category 3 (Minor) Land Impact: No Details Air Impact: No Details
C	235m N	Incident Date: 24/03/2016 Incident Identification: 1601232 Pollutant: Organic Chemicals / Products Pollutant Description: Solvents	Water Impact: Category 3 (Minor) Land Impact: No Details Air Impact: No Details
E	373m SE	Incident Date: 15/02/2017 Incident Identification: 1700771 Pollutant: - Pollutant Description: -	Water Impact: Category 3 (Minor) Land Impact: No Details Air Impact: Category 3 (Minor)
E	373m SE	Incident Date: 15/02/2017 Incident Identification: 1700771 Pollutant: Oils and Fuels Pollutant Description: Diesel	Water Impact: Category 3 (Minor) Land Impact: No Details Air Impact: Category 3 (Minor)
9	394m N	Incident Date: 13/04/2013 Incident Identification: 1102423 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Algae	Water Impact: - Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
D	412m SE	Incident Date: 30/04/2001 Incident Identification: 3830 Pollutant: Oils and Fuel Pollutant Description: Unidentified Oil	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
D	415m SE	Incident Date: 22/01/2016 Incident Identification: 1405256 Pollutant: Specific Waste Materials Pollutant Description: Other Specific Waste Material	Water Impact: - Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)



ID	Location	Details	
D	420m SE	Incident Date: 22/10/2013 Incident Identification: 1169672 Pollutant: Specific Waste Materials Pollutant Description: Commercial Waste	Water Impact: - Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

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

## 4.19 Pollution inventory substances

<b>Records within 500m</b>	<b>0</b>
----------------------------	----------

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

<b>Records within 500m</b>	<b>0</b>
----------------------------	----------

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

<b>Records within 500m</b>	<b>0</b>
----------------------------	----------

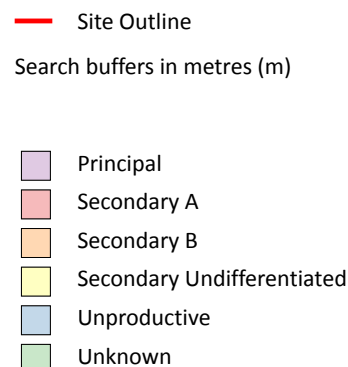
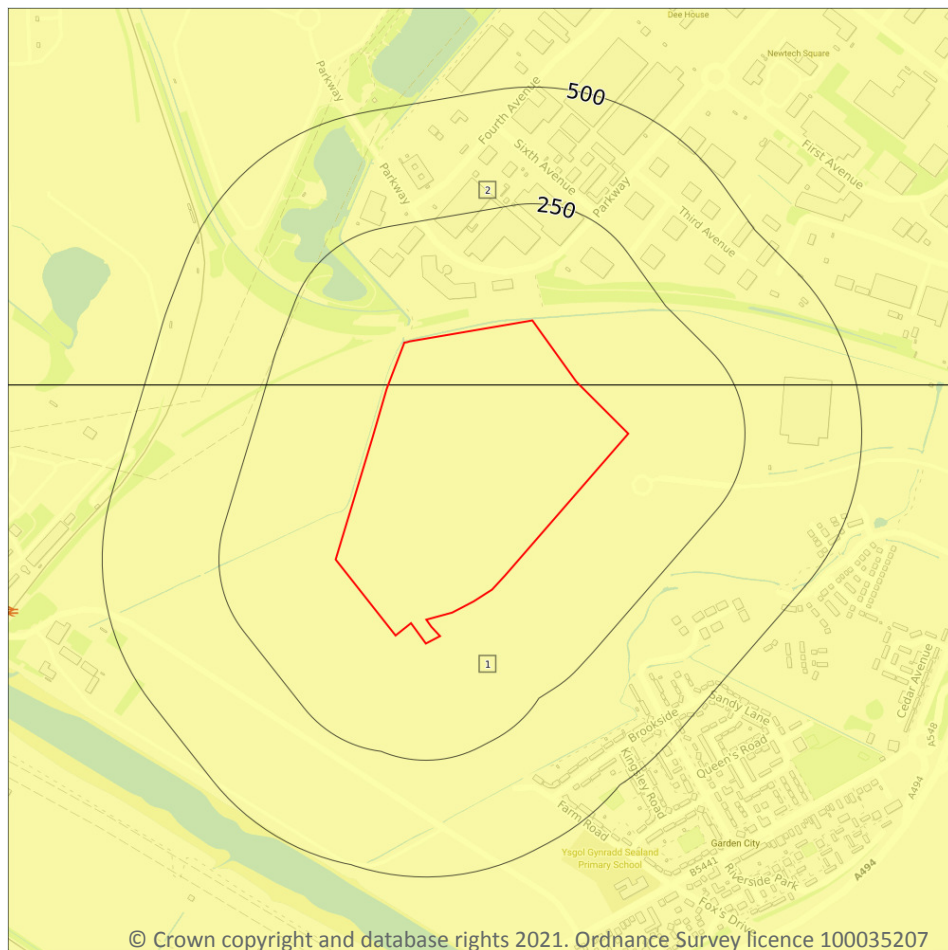
The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*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

2

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 44**

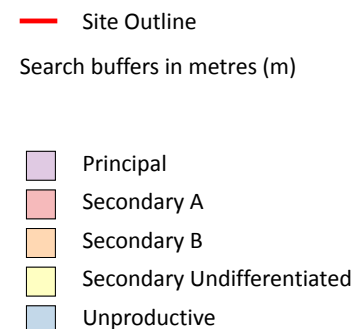
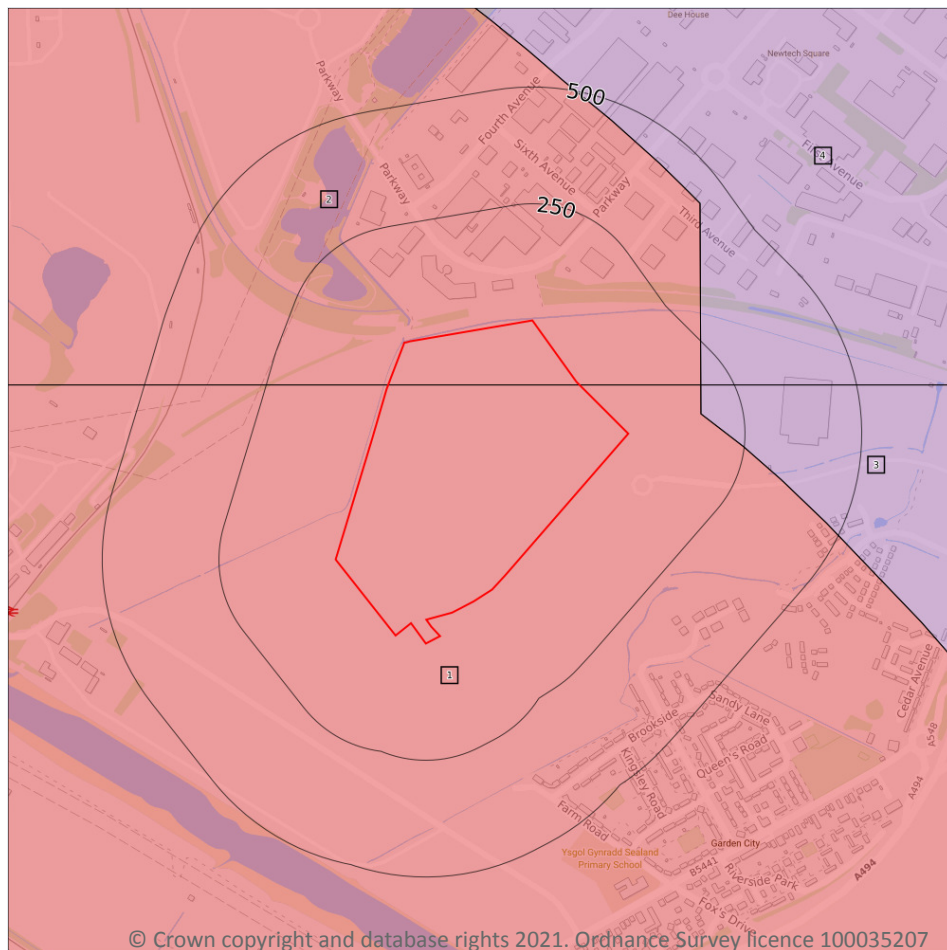
ID	Location	Designation	Description
1	On site	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics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



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



## Bedrock aquifer



### 5.2 Bedrock aquifer

#### Records within 500m

4

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 46**

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

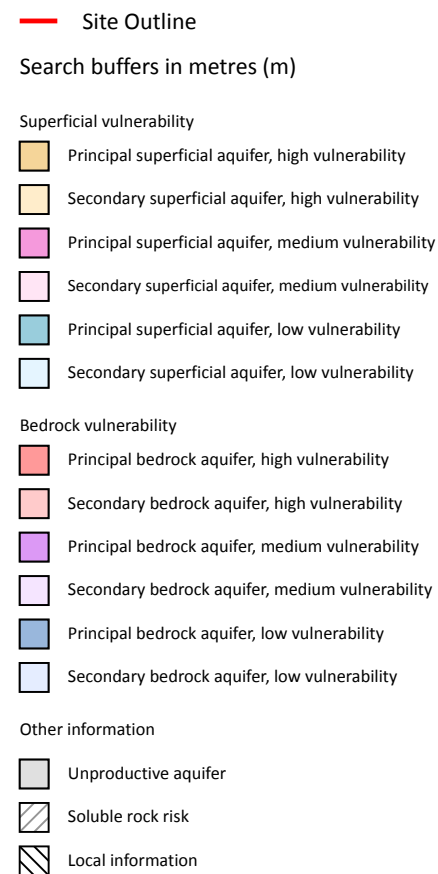
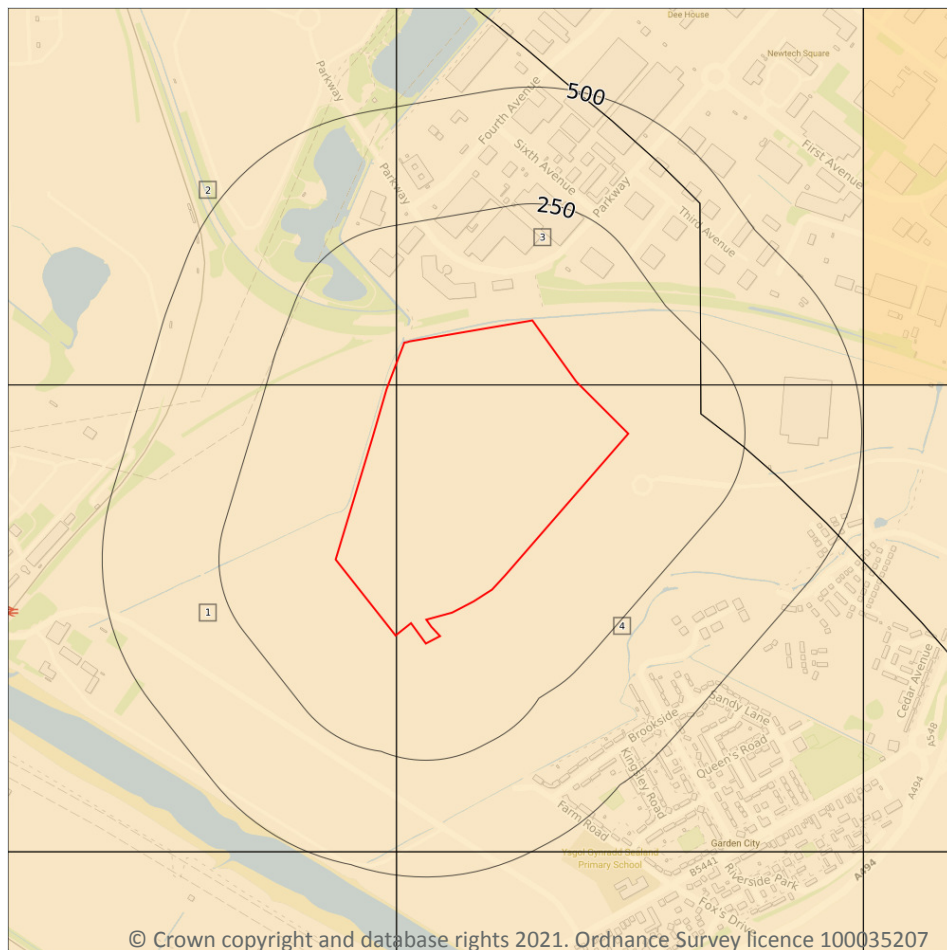


ID	Location	Designation	Description
3	161m E	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
4	187m NE	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

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



## Groundwater vulnerability



### 5.3 Groundwater vulnerability

#### Records within 50m

4

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

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

Features are displayed on the Groundwater vulnerability map on **page 48**





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

0

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

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



## 5.5 Groundwater vulnerability- local information

### Records on site

**0**

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on [enquiries@environment-agency.gov.uk](mailto: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  
Polygon features
- Drinking water abstraction licences  
Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

### 5.6 Groundwater abstractions

Records within 2000m

8

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 51**

ID	Location	Details	
-	982m SE	Status: Historical Licence No: 24/67/10/0046 Details: General Farming & Domestic Direct Source: EAW Groundwater Point: BOREHOLE Data Type: Point Name: Jones Balers Ltd Easting: 332780 Northing: 368760	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 24/02/1967 Expiry Date: - Issue No: 100 Version Start Date: 06/06/1967 Version End Date: -
-	1451m N	Status: Active Licence No: WA/067/0010/0015 Details: Pollution Remediation - Very Low Direct Source: Deeside Industrial Estate Point: - Data Type: Poly4 Name: - Easting: 331947 Northing: 371621	Annual Volume (m <sup>3</sup> ): 7,500 Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: Feb 3 2020 12:00AM Expiry Date: Mar 31 2027 12:00AM Issue No: - Version Start Date: - Version End Date: -
-	1567m S	Status: Historical Licence No: 24/67/10/0106 Details: Process water Direct Source: EAW Groundwater Point: WELL A Data Type: Point Name: Knauf Insulation Ltd Easting: 332420 Northing: 367920	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 15/12/1983 Expiry Date: - Issue No: 103 Version Start Date: 01/01/2003 Version End Date: -
-	1693m S	Status: Historical Licence No: 24/67/10/0106 Details: Process water Direct Source: EAW Groundwater Point: WELL B Data Type: Point Name: Knauf Insulation Ltd Easting: 332500 Northing: 367810	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 15/12/1983 Expiry Date: - Issue No: 103 Version Start Date: 01/01/2003 Version End Date: -
-	1722m NE	Status: Historical Licence No: 24/67/10/0090 Details: Process Water Direct Source: EAW Groundwater Point: BOREHOLE 1A Data Type: Point Name: Tata Steel UK Limited Easting: 333670 Northing: 371170	Annual Volume (m <sup>3</sup> ): 500000 Max Daily Volume (m <sup>3</sup> ): 6000 Original Application No: - Original Start Date: 27/11/1980 Expiry Date: - Issue No: 104 Version Start Date: 18/03/2015 Version End Date: -



ID	Location	Details	
-	1722m NE	Status: Active Licence No: 24/67/10/0090 Details: Process Water - Medium Direct Source: - Point: - Data Type: Point Name: - Easting: 333670 Northing: 371170	Annual Volume (m <sup>3</sup> ): 500,000 Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: Mar 18 2015 12:00AM Expiry Date: - Issue No: - Version Start Date: - Version End Date: -
-	1765m N	Status: Historical Licence No: 24/67/10/0090 Details: Process Water Direct Source: EAW Groundwater Point: BOREHOLE 4 Data Type: Point Name: Tata Steel UK Limited Easting: 332940 Northing: 371780	Annual Volume (m <sup>3</sup> ): 500000 Max Daily Volume (m <sup>3</sup> ): 6000 Original Application No: - Original Start Date: 27/11/1980 Expiry Date: - Issue No: 104 Version Start Date: 18/03/2015 Version End Date: -
-	1765m N	Status: Active Licence No: 24/67/10/0090 Details: Process Water - Medium Direct Source: - Point: - Data Type: Point Name: - Easting: 332940 Northing: 371780	Annual Volume (m <sup>3</sup> ): 500,000 Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: Mar 18 2015 12:00AM Expiry Date: - Issue No: - Version Start Date: - Version End Date: -

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

## 5.7 Surface water abstractions

### Records within 2000m

4

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 51**





ID	Location	Details	
-	1214m SE	Status: Historical Licence No: 24/67/10/0103 Details: Spray Irrigation - Direct Direct Source: EAW Surface Water Point: MANOR DRAIN POINT B Data Type: Point Name: Jones Balers Ltd Easting: 333370 Northing: 369050	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 17/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 27/04/1989 Version End Date: -
-	1725m NE	Status: Historical Licence No: 24/67/10/0151 Details: Dust Suppression Direct Source: EAW Surface Water Point: BOUNDARY DRAIN (SEALAND / SHOTWICK PARISH) Data Type: Point Name: Carillion Roads Easting: 333900 Northing: 370900	Annual Volume (m <sup>3</sup> ): 23562 Max Daily Volume (m <sup>3</sup> ): 178.5 Original Application No: - Original Start Date: 01/02/2007 Expiry Date: 01/12/2008 Issue No: 1 Version Start Date: 01/02/2007 Version End Date: -
-	1806m N	Status: Historical Licence No: 24/67/10/0111 Details: Spray Irrigation - Direct Direct Source: EAW Surface Water Point: BURTON & PUDDINGTON ARTERIAL DITCH Data Type: Line Name: WT Banks & Co (Farming) Ltd Easting: 330860 Northing: 372660	Annual Volume (m <sup>3</sup> ): 54550 Max Daily Volume (m <sup>3</sup> ): 2180 Original Application No: - Original Start Date: 14/06/1988 Expiry Date: - Issue No: 102 Version Start Date: 01/04/2003 Version End Date: -
-	1878m NE	Status: Historical Licence No: 24/67/10/0151 Details: Dust Suppression Direct Source: EAW Surface Water Point: BALANCING POND AT SHOTWICK PARK PARISH Data Type: Point Name: Carillion Roads Easting: 334030 Northing: 370980	Annual Volume (m <sup>3</sup> ): 23562 Max Daily Volume (m <sup>3</sup> ): 178.5 Original Application No: - Original Start Date: 01/02/2007 Expiry Date: 01/12/2008 Issue No: 1 Version Start Date: 01/02/2007 Version End Date: -

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

## 5.8 Potable abstractions

### Records within 2000m

0

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.



*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

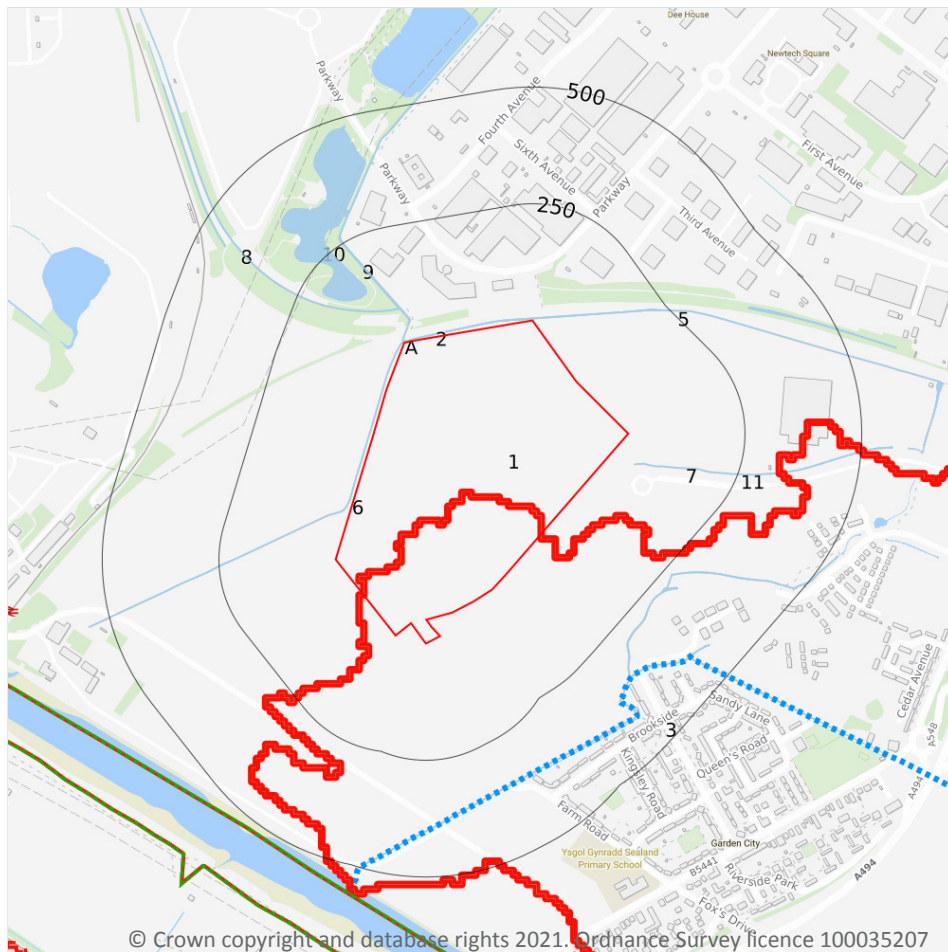
0

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

10

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

Features are displayed on the Hydrology map on **page 56**

ID	Location	Type of water feature	Ground level	Permanence	Name
5	1m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

ID	Location	Type of water feature	Ground level	Permanence	Name
6	3m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Shotwick Brook
A	3m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Shotwick Brook
A	11m N	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	Shotwick Brook
A	33m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Shotwick Brook
7	52m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
8	73m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
9	76m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Shotwick Brook
10	183m NW	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
11	239m E	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-

*This data is sourced from the Ordnance Survey.*

## 6.2 Surface water features

### Records within 250m

2

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

Features are displayed on the Hydrology map on **page 56**

*This data is sourced from the Ordnance Survey.*



### 6.3 WFD Surface water body catchments

#### Records on site

**2**

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 56**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
2	On site	Coastal catchment	Not part of a river WB catchment	166	Dee Estuary	Dee
3	On site	River WB catchment	Shotwick Brook	GB111067056960	Dee Estuary	Dee

*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.

Features are displayed on the Hydrology map on **page 56**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
G	347m SE	River	Shotwick Brook	GB111067056960	Moderate	Good	Moderate	2016

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

### 6.5 WFD Groundwater bodies

#### Records on site

**1**

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place.

Features are displayed on the Hydrology map on **page 56**



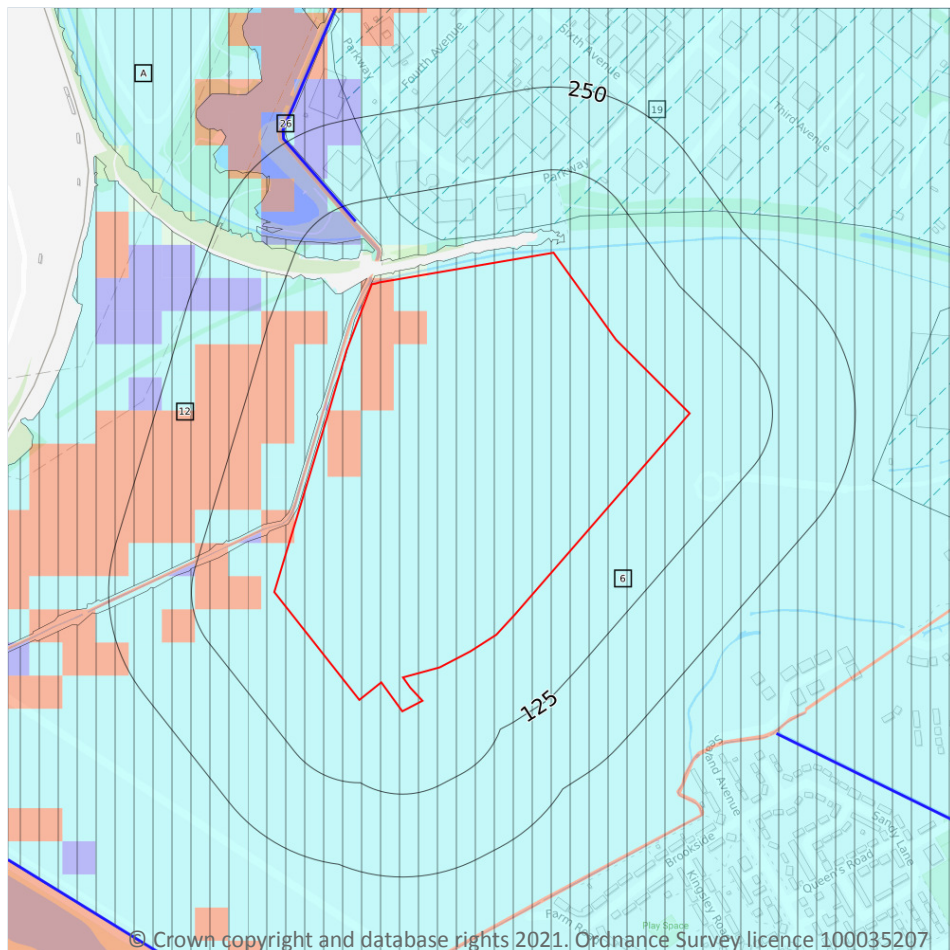


ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
1	On site	Dee Carboniferous Coal Measures	GB41102G204800	Poor	Poor	Good	2016

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



## 7 River and coastal flooding



- Site Outline
- Search buffers in metres (m)
- Environment Agency river and coastal flooding:
  - High
  - Medium
  - Low
  - Very Low
- Historical Flood Events
- Areas Used for Flood Storage
- Areas Benefiting from Flood Defences
- Flood Defences

### 7.1 Risk of Flooding from Rivers and Sea (RoFRaS)

#### Records within 50m

18

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).

Features are displayed on the River and coastal flooding map on **page 60**

Distance	RoFRaS flood risk
<b>On site</b>	<b>High</b>
0 - 50m	High



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

## 7.2 Historical Flood Events

### Records within 250m

**1**

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.

Features are displayed on the River and coastal flooding map on **page 60**

ID	Location	Event name	Date of flood	Flood source	Flood cause	Type of flood
19	43m N	Deeside Ind. Park 1964 01	1964-01-01 1964-01-01	Main river	Channel capacity exceeded (no raised defences)	Fluvial

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

## 7.3 Flood Defences

### Records within 250m

**1**

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.

Features are displayed on the River and coastal flooding map on **page 60**

ID	Location	Update
26	98m N	25/05/2021

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

## 7.4 Areas Benefiting from Flood Defences

### Records within 250m

**3**

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.

Features are displayed on the River and coastal flooding map on **page 60**



ID	Location	
6	On site	Area benefiting from flood defences
12	11m NW	Area benefiting from flood defences
A	45m NW	Area benefiting from flood defences

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

## 7.5 Flood Storage Areas

Records within 250m

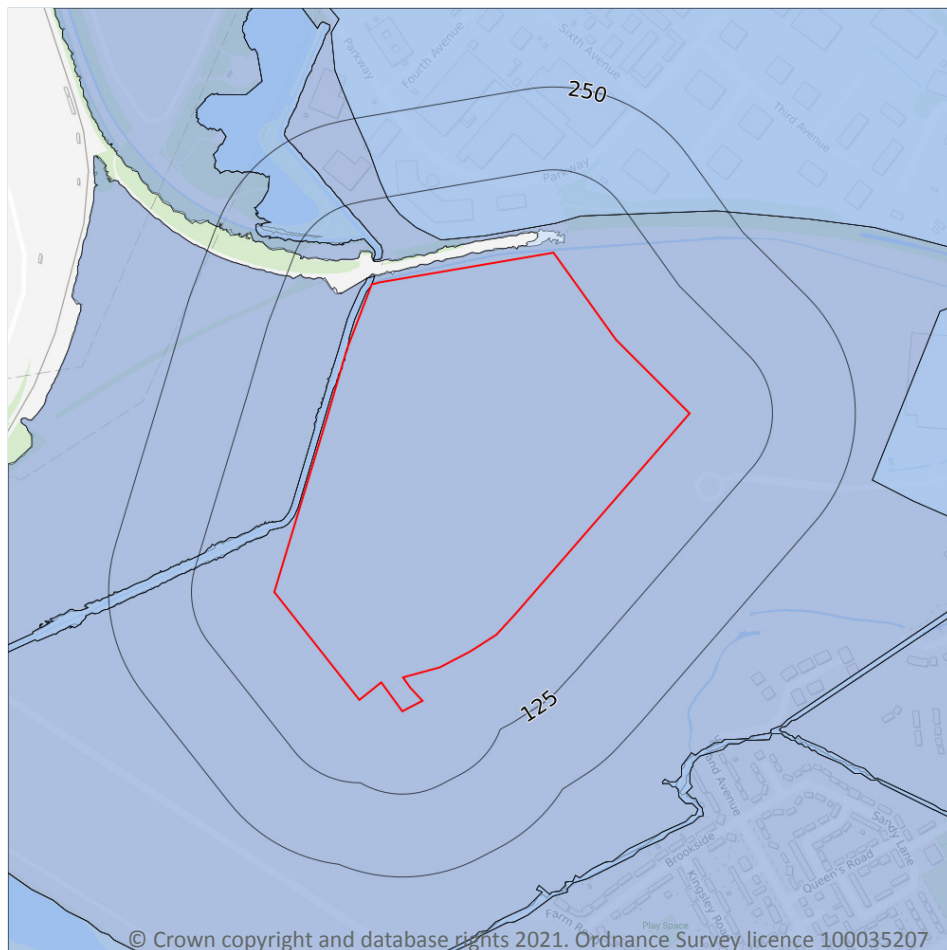
0

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



- Site Outline
- Search buffers in metres (m)
- Flood zone 2
- Flood zone 3

### 7.6 Flood Zone 2

#### Records within 50m

1

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.

Features are displayed on the River and coastal flooding map on **page 60**

Location	Type
On site	Zone 2 - (Fluvial /Tidal Models)

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



## 7.7 Flood Zone 3

### Records within 50m

**1**

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.

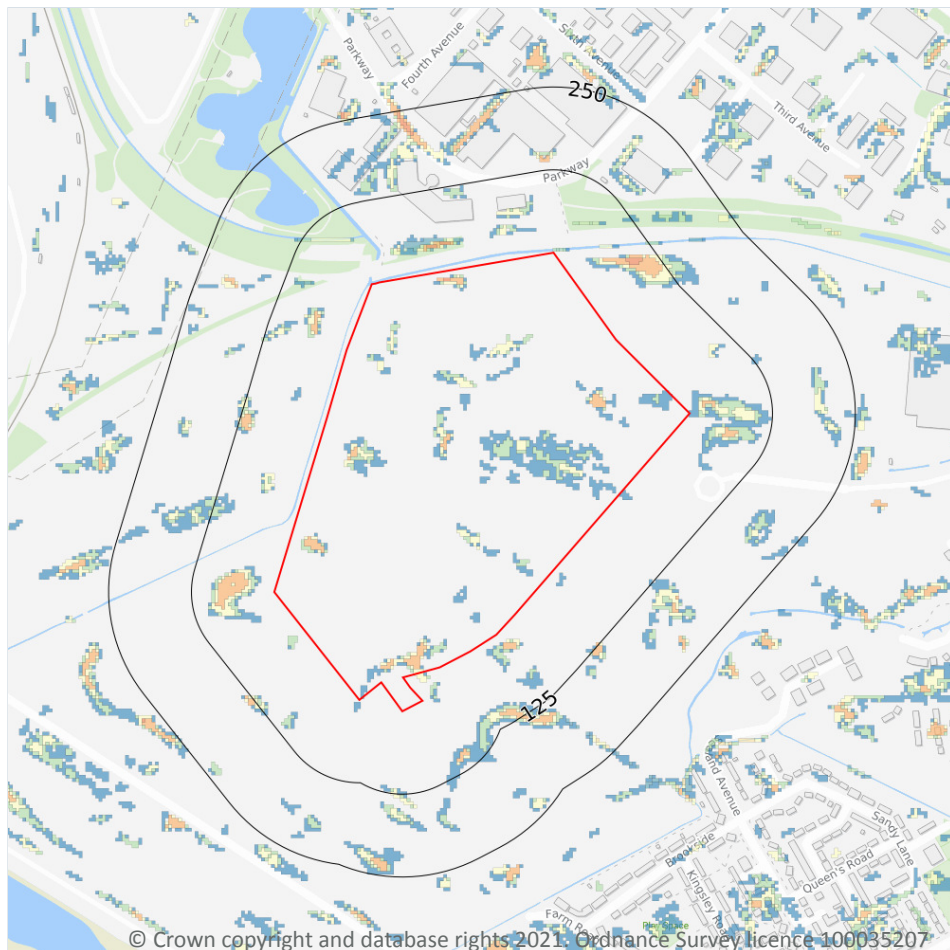
Features are displayed on the River and coastal flooding map on **page 60**

Location	Type
On site	Zone 3 - (Fluvial Models)

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



## 8 Surface water flooding



— Site Outline

Search buffers in metres (m)

1 in 1000 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

### 8.1 Surface water flooding

**Highest risk on site**

**1 in 30 year, 0.3m - 1.0m**

**Highest risk within 50m**

**1 in 30 year, 0.3m - 1.0m**

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

Features are displayed on the Surface water flooding map on **page 65**

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

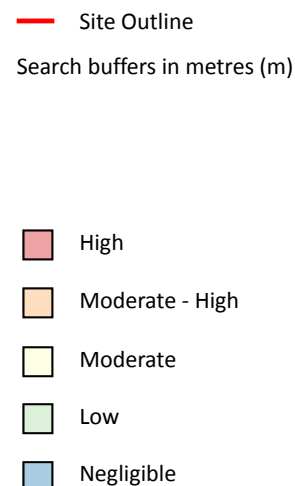
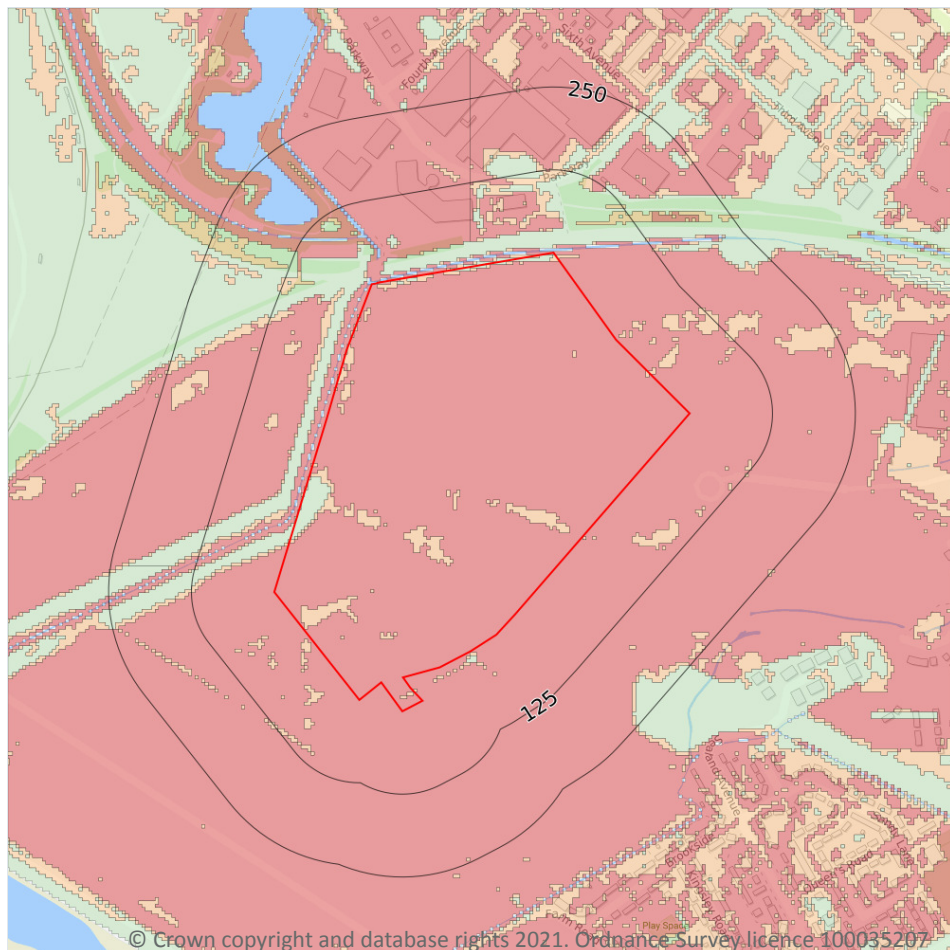
The table below shows the maximum flood depths for a range of return periods for the site.

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

*This data is sourced from Ambiantal Risk Analytics.*



## 9 Groundwater flooding



### 9.1 Groundwater flooding

Highest risk on site

High

Highest risk within 50m

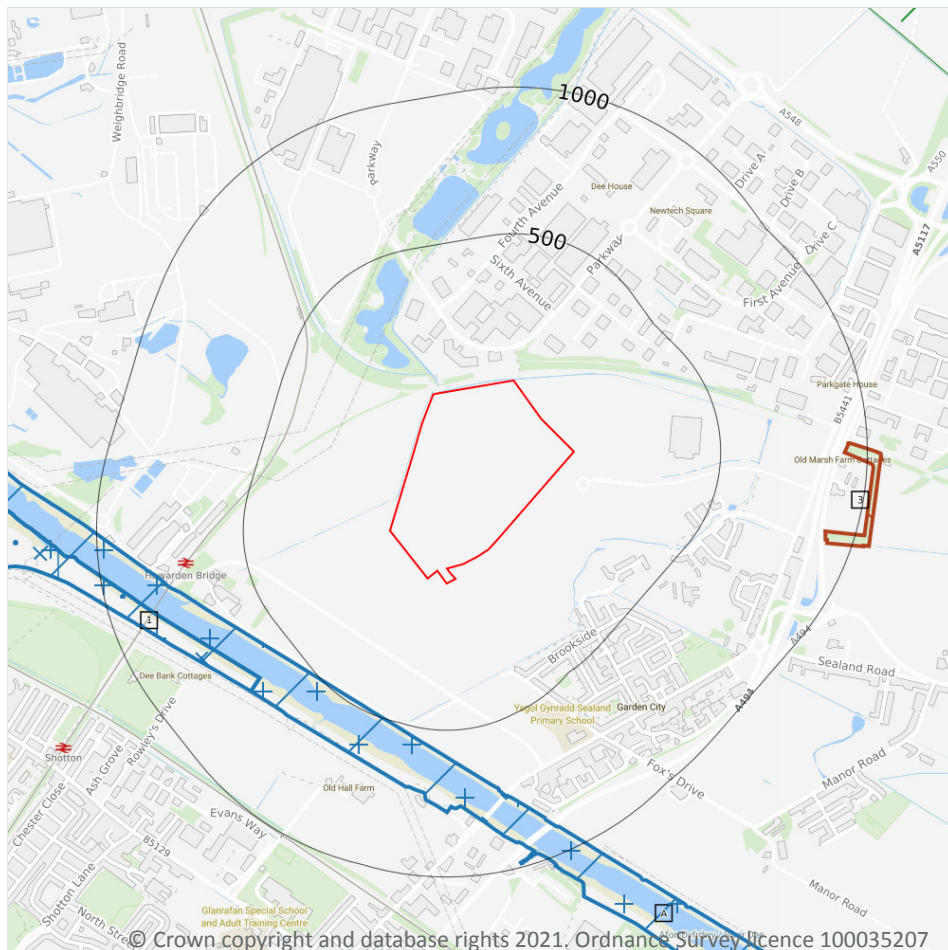
High

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

Features are displayed on the Groundwater flooding map on **page 67**

*This data is sourced from Ambiantal Risk Analytics.*

## 10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Sites of Special Scientific Interest (SSSI)
- X Conserved wetland sites (Ramsar sites)
- + Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- / Designated Ancient Woodland
- / Green Belt

### 10.1 Sites of Special Scientific Interest (SSSI)

#### Records within 2000m

2

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

Features are displayed on the Environmental designations map on **page 68**

ID	Location	Name	Data source
A	485m SW	Afon Dyfrdwy (River Dee)	Natural Resources Wales





ID	Location	Name	Data source
2	659m SW	Dee Estuary / Aber Afon Dyfrdwy	Natural Resources Wales

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

## 10.2 Conserved wetland sites (Ramsar sites)

### Records within 2000m

**1**

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

Features are displayed on the Environmental designations map on **page 68**



ID	Location	Site	Details
B	659m SW	Name: The Dee Estuary (Wales) Site status: - Data source: Natural Resources Wales	<p>Overview: The Dee is a large funnel-shaped sheltered estuary and is one of the top ten estuaries in the UK for wintering and passage waterfowl populations. The estuary supports internationally important numbers of waterfowl and waders. The estuary is an accreting system and the extent of saltmarsh continues to expand as the estuary seeks to achieve a new equilibrium situation following large-scale historical land-claim at the head of the estuary which commenced in the 1730s. Nevertheless, the estuary still supports extensive areas of intertidal sand and mudflats as well as saltmarsh. Where land-claim has not occurred, the saltmarshes grade into transitional brackish and freshwater swamp vegetation, on the upper shore. The site includes the three sandstone islands of Hilbre with their important cliff vegetation and maritime heathland/grassland, the sand dune system between the Point of Ayr and Prestatyn in Wales and Red Rocks in England, various Welsh coastal fields historically reclaimed from the estuary but used by the Dee Estuary wintering waterfowl populations, freshwater lagoons and reedbeds at Shotton supporting the largest common tern breeding colony in Wales and freshwater lagoons at Inner Marsh Farm used by waterfowl throughout the year but particularly in winter. The two shorelines of the estuary show a marked contrast between the industrialised usage of the coastal belt in Wales and residential and recreational usage in England.</p> <p>Ramsar criteria: Ramsar criterion 1 Extensive intertidal mud and sand flats (20 km by 9 km) with large expanses of saltmarsh towards the head of the estuary. Habitats Directive Annex I features present on the pSAC include: H1130 Estuaries H1140 Mudflats and sandflats not covered by seawater at low tide H1210 Annual vegetation of drift lines H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts H1310 Salicornia and other annuals colonising mud and sand H1330 Atlantic salt meadows (Glaucopuccinellietalia maritimae) H2110 Embryonic shifting dunes H2120 Shifting dunes along the shoreline with Ammophila arenaria ("white dunes") H2130 Fixed dunes with herbaceous vegetation ("grey dunes") H2190 Humid dune slacks Criterion 2, it supports breeding colonies of the vulnerable Natterjack Toad, Epidalea calamita</p>

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

### 10.3 Special Areas of Conservation (SAC)

#### Records within 2000m

2

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.



Features are displayed on the Environmental designations map on **page 68**

ID	Location	Name	Features of interest	Habitat description	Data source
A	485m SW	River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid (Wales)	Rivers with floating vegetation often dominated by water-crowfoot; Mixed woodland on base-rich soils associated with rocky slopes; Western acidic oak woodland; Alder woodland on floodplains; Sea lamprey; Brook lamprey; River lamprey; Twaite shad; Atlantic salmon; Bullhead; Freshwater pearl mussel; Otter; Floating water-plantain.	Broad-leaved deciduous woodland; Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Improved grassland; Inland water bodies (Standing water, Running water); Salt marshes, Salt pastures, Salt steppes	Natural Resources Wales
B	659m SW	Dee Estuary / Aber Dyfrdwy (Wales)	Estuaries; Intertidal mudflats and sandflats; Lagoons; Annual vegetation of drift lines; Vegetated sea cliffs; Glasswort and other annuals colonising mud and sand; Cord-grass swards; Atlantic salt meadows; Shifting dunes; Shifting dunes with marram; Dune grassland; Humid dune slacks; Dry heaths; Sea lamprey; River lamprey; Twaite shad; Otter; Grey seal; Petalwort.	Shingle, Sea cliffs, Islets; Salt marshes, Salt pastures, Salt steppes; Humid grassland, Mesophile grassland; Improved grassland; Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Bogs, Marshes, Water fringed vegetation, Fens; Broad-leaved deciduous woodland; Coastal sand dunes, Sand beaches, Machair; Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	Natural Resources Wales

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

## 10.4 Special Protection Areas (SPA)

**Records within 2000m**

**2**

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

Features are displayed on the Environmental designations map on **page 68**



ID	Location	Name	Species of interest	Habitat description	Data source
1	659m SW	The Dee Estuary (Wales)	Common shelduck; Eurasian teal; Northern pintail; Eurasian oystercatcher; Grey plover; Red knot; Bar-tailed godwit; Eurasian curlew; Common redshank; Common redshank; Sandwich tern; Common tern; Little tern; Black-tailed godwit; Dunlin	Broad-leaved deciduous woodland; Shingle, Sea cliffs, Islets; Coastal sand dunes, Sand beaches, Machair; Mixed woodland; Dry grassland, Steppes; Inland water bodies (Standing water, Running water); Other land (including Towns, Villages, Roads, Waste plac	
4	1133m W	The Dee Estuary (Wales)	Common shelduck; Eurasian teal; Northern pintail; Eurasian oystercatcher; Grey plover; Red knot; Bar-tailed godwit; Eurasian curlew; Common redshank; Common redshank; Sandwich tern; Common tern; Little tern; Black-tailed godwit; Dunlin	Broad-leaved deciduous woodland; Shingle, Sea cliffs, Islets; Coastal sand dunes, Sand beaches, Machair; Mixed woodland; Dry grassland, Steppes; Inland water bodies (Standing water, Running water); Other land (including Towns, Villages, Roads, Waste plac	

*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

1

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 68**

ID	Location	Name	Woodland Type
3	899m E	Unknown	Ancient Semi Natural Woodland

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

## 10.8 Biosphere Reserves

**Records within 2000m**

**0**

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

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

## 10.9 Forest Parks

**Records within 2000m**

**0**

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

*This data is sourced from the Forestry Commission.*

## 10.10 Marine Conservation Zones

**Records within 2000m**

**0**

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

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

## 10.11 Green Belt

**Records within 2000m**

**1**

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

Features are displayed on the Environmental designations map on **page 68**





ID	Location	Name	Local Authority name
5	1747m NE	Merseyside and Greater Manchester	Cheshire West and Chester

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

## 10.12 Proposed Ramsar sites

<b>Records within 2000m</b>	<b>0</b>
-----------------------------	----------

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)

<b>Records within 2000m</b>	<b>0</b>
-----------------------------	----------

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)

<b>Records within 2000m</b>	<b>0</b>
-----------------------------	----------

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

<b>Records within 2000m</b>	<b>0</b>
-----------------------------	----------

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 fall 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

8

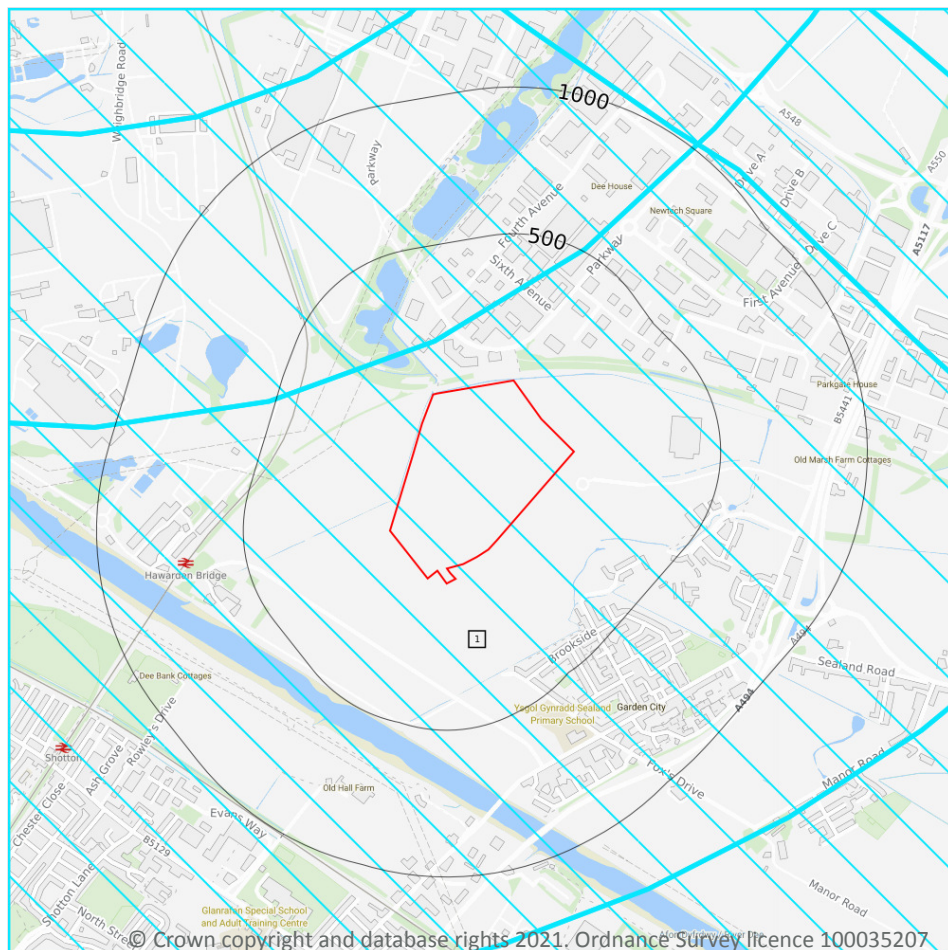
Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
On site		Surface Water	708	New
On site	Shotwick Brook NVZ	Surface Water	S708	Existing
72m N		Groundwater	148	Existing
1596m E		Surface Water	708	New
1596m NE	Shotwick Brook NVZ	Surface Water	S708	Existing
1744m N	Neston, England	Groundwater	G3	Existing
1745m NE		Groundwater	3	Existing
1787m NE		Groundwater	3	Existing

*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 76**

ID	Location	Type of developments requiring consultation
1	On site	<p>Infrastructure - Airports, helipads and other aviation proposals.</p> <p>Air pollution - Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock &amp; poultry units with floorspace &gt; 500m<sup>2</sup>, slurry lagoons &gt; 750m<sup>2</sup> &amp; manure stores &gt; 3500t)</p> <p>Combustion - General combustion processes &gt;50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion</p>

*This data is sourced from Natural England.*

## 10.18 SSSI Units

<b>Records within 2000m</b>	<b>0</b>
-----------------------------	----------

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

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



## 11 Visual and cultural designations

### 11.1 World Heritage Sites

Records within 250m

0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

### 11.2 Area of Outstanding Natural Beauty

Records within 250m

0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

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

### 11.3 National Parks

Records within 250m

0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

*This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.*

### 11.4 Listed Buildings

Records within 250m

0

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.





*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 11.5 Conservation Areas

**Records within 250m**

**0**

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 11.6 Scheduled Ancient Monuments

**Records within 250m**

**0**

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 11.7 Registered Parks and Gardens

**Records within 250m**

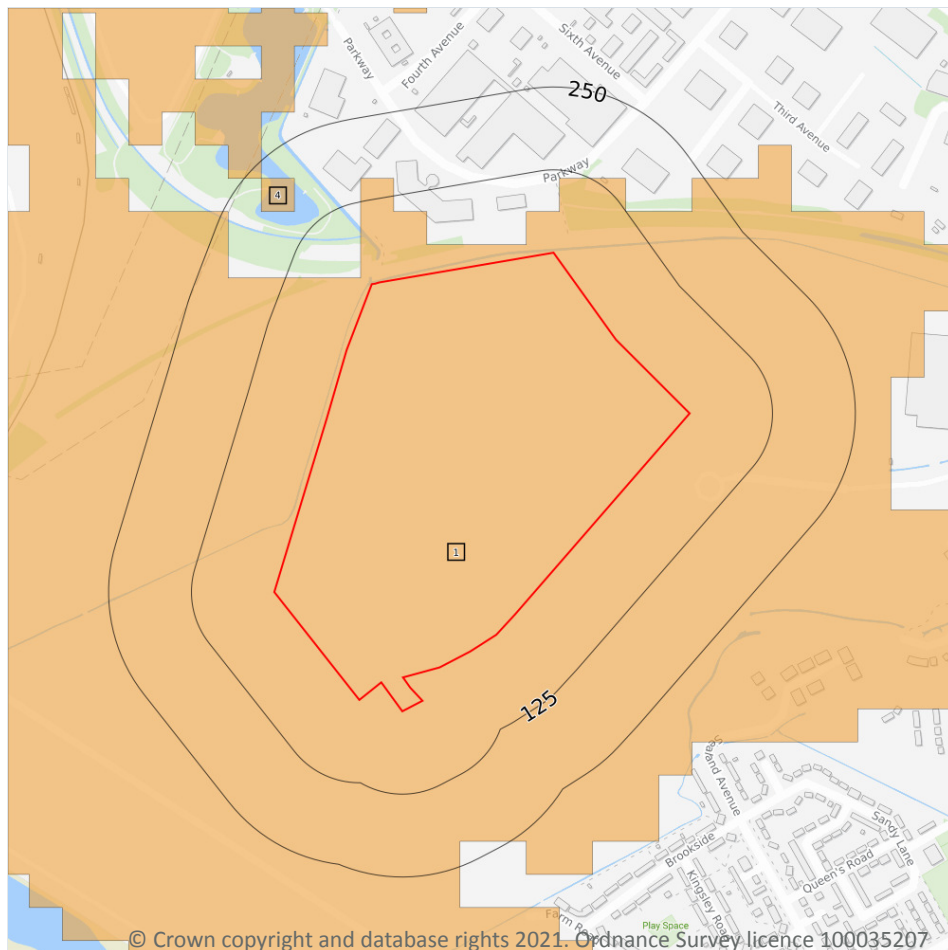
**0**

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*



## 12 Agricultural designations



- Site Outline
- Search buffers in metres (m)
- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Timber 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 80**

ID	Location	Classification	Description
1	On site	Grade 2	Good quality agricultural land
4	160m NW	Grade 2	Good quality agricultural land

*This data is sourced from Natural Resources Wales.*



## 12.2 Open Access Land

Records within 250m

0

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

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

## 12.3 Tree Felling Licences

Records within 250m

0

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

*This data is sourced from the Forestry Commission.*

## 12.4 Environmental Stewardship Schemes

Records within 250m

0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

*This data is sourced from Natural England.*

## 12.5 Countryside Stewardship Schemes

Records within 250m

0

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

*This data is sourced from Natural England.*

## 13 Habitat designations

### 13.1 Priority Habitat Inventory

Records within 250m

0

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

*This data is sourced from Natural England.*

### 13.2 Habitat Networks

Records within 250m

0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

*This data is sourced from Natural England.*

### 13.3 Open Mosaic Habitat

Records within 250m

0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

*This data is sourced from Natural England.*

### 13.4 Limestone Pavement Orders

Records within 250m

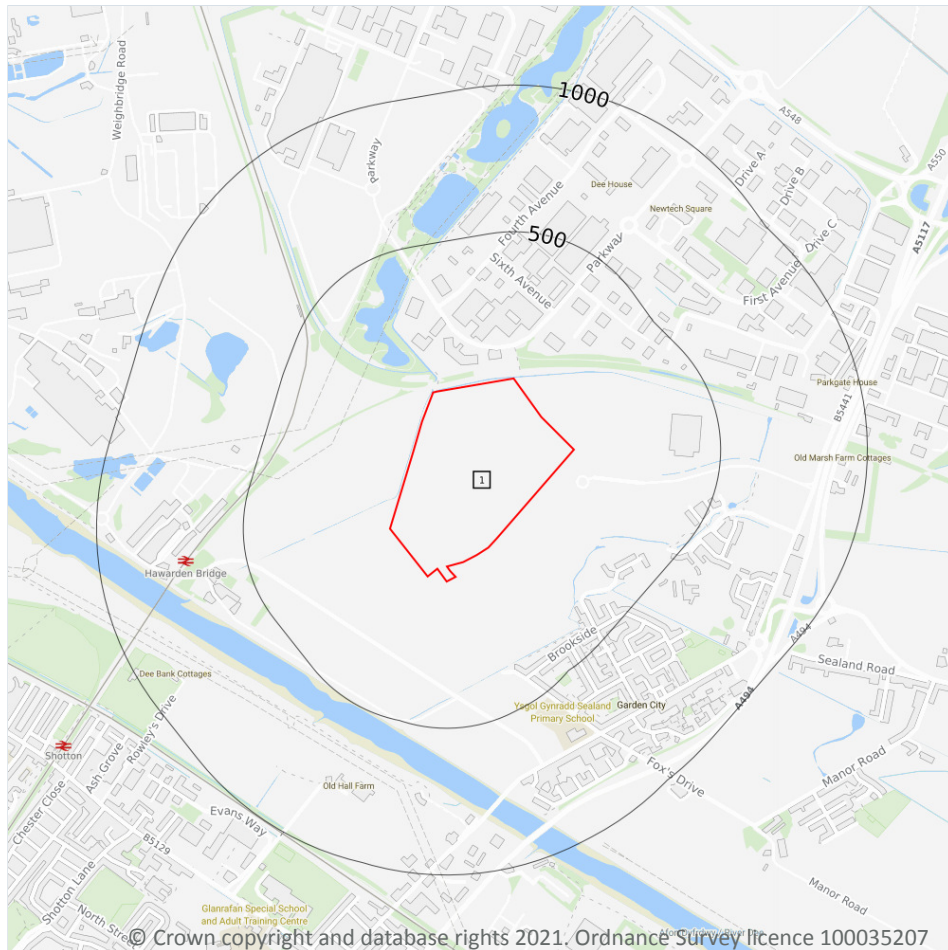
0

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

*This data is sourced from Natural England.*



## 14 Geology 1:10,000 scale - Availability



— Site Outline  
Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

### 14.1 10k Availability

#### Records within 500m

1

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 83**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov

*This data is sourced from the British Geological Survey.*





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

### 14.2 Artificial and made ground (10k)

Records within 500m

0

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.

*This data is sourced from the British Geological Survey.*



## Geology 1:10,000 scale - Superficial

### 14.3 Superficial geology (10k)

Records within 500m

0

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.

*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

### 14.5 Bedrock geology (10k)

Records within 500m

0

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.

*This data is sourced from the British Geological Survey.*

### 14.6 Bedrock faults and other linear features (10k)

Records within 500m

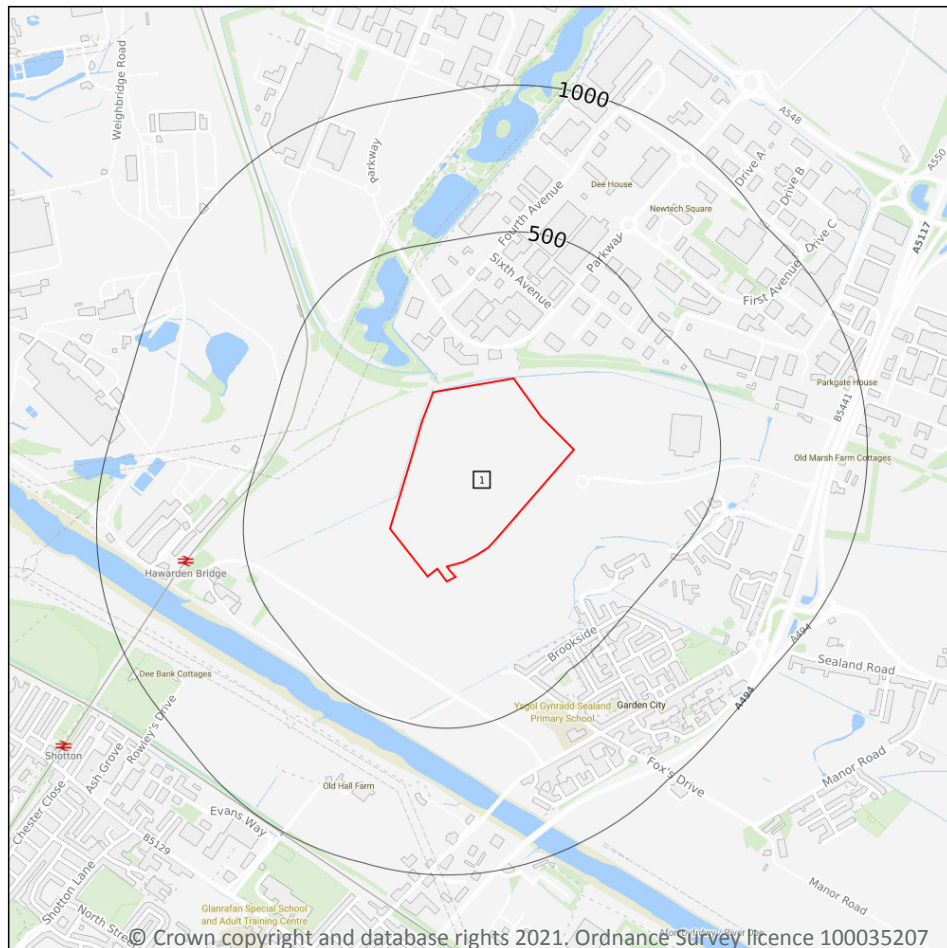
0

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

*This data is sourced from the British Geological Survey.*



## 15 Geology 1:50,000 scale - Availability



— Site Outline  
Search buffers in metres (m)

□ Geological map tile

### 15.1 50k Availability

#### Records within 500m

1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme. Where 50k data is not available, this area has been filled in with 625k scale data.

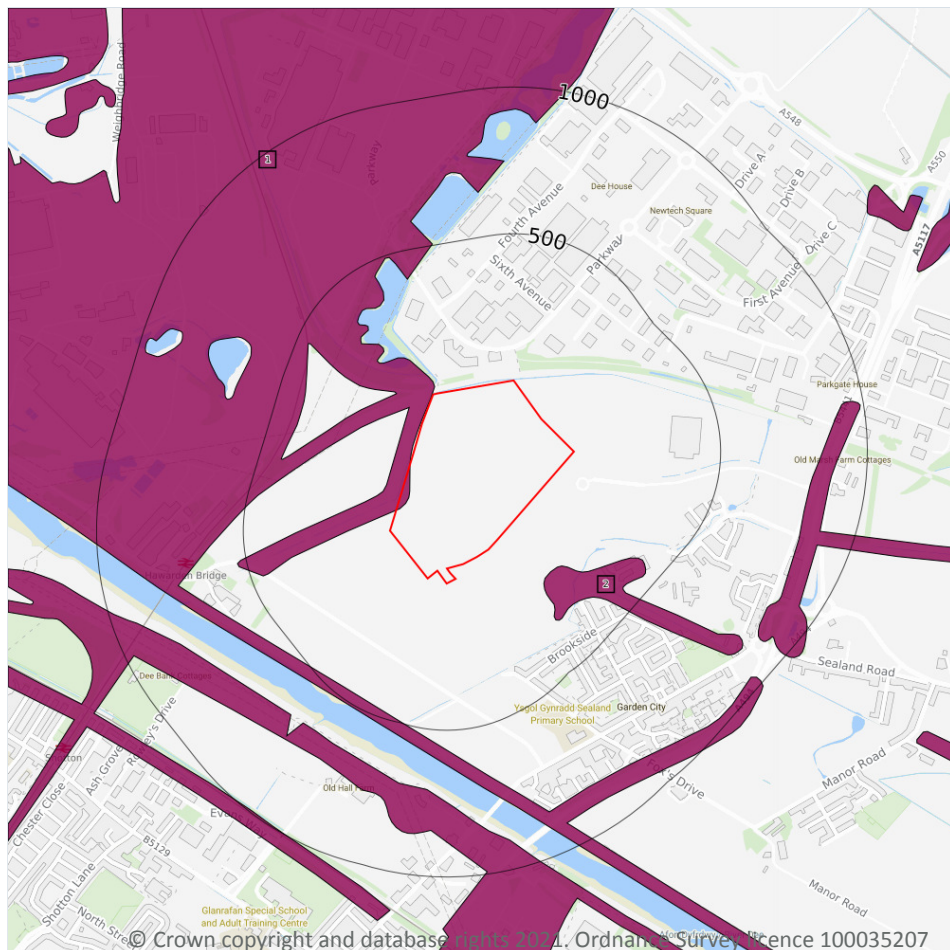
Features are displayed on the Geology 1:50,000 scale - Availability map on **page 87**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	EW108_flint_v4

*This data is sourced from the British Geological Survey.*



## Geology 1:50,000 scale - Artificial and made ground



- Site Outline**
- Search buffers in metres (m)**
- Made ground
  - Worked ground
  - Infilled ground
  - Disturbed ground
  - Landscaped ground

### 15.2 Artificial and made ground (50k)

#### Records within 500m

2

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.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 88**

ID	Location	LEX Code	Description	Rock description
1	On site	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
2	209m SE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

*This data is sourced from the British Geological Survey.*





## 15.3 Artificial ground permeability (50k)

### Records within 50m

**2**

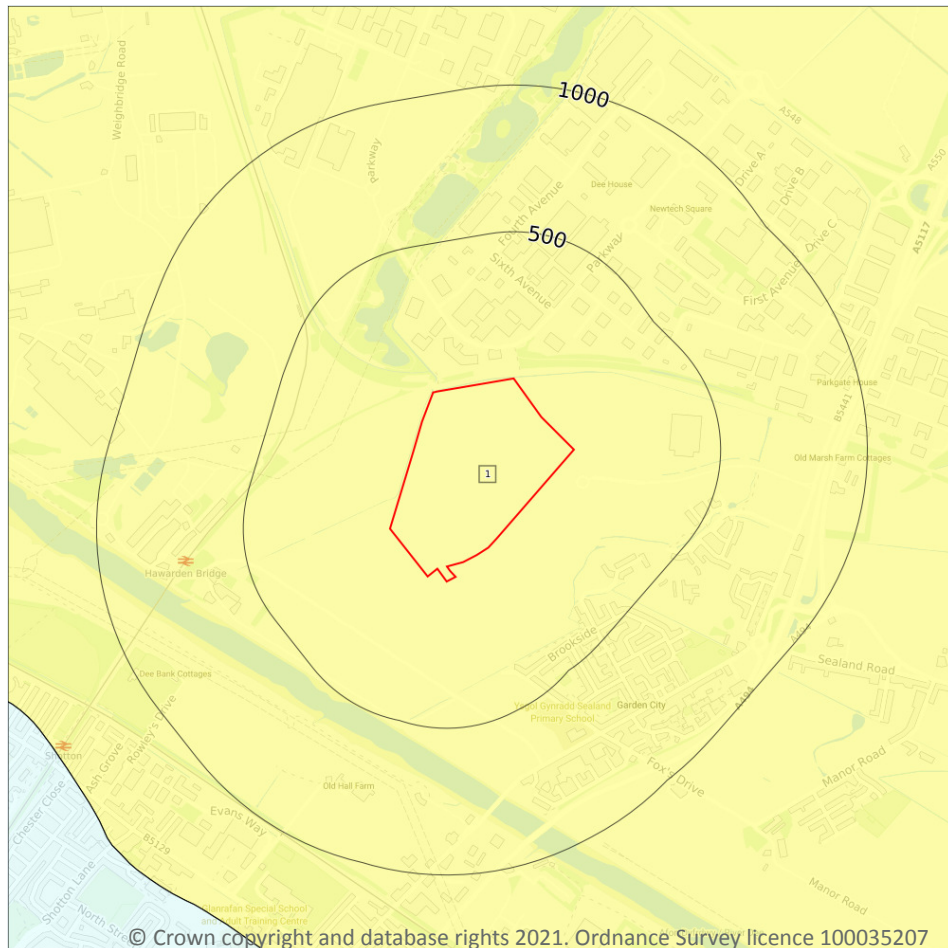
A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
<b>On site</b>	<b>Mixed</b>	<b>Very High</b>	<b>Low</b>
3m NW	Mixed	Very High	Low

*This data is sourced from the British Geological Survey.*



## Geology 1:50,000 scale - Superficial



**Site Outline**

Search buffers in metres (m)

**Landslip (50k)**

**Superficial geology (50k)**  
Please see table for more details.

### 15.4 Superficial geology (50k)

#### Records within 500m

1

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 90**

ID	Location	LEX Code	Description	Rock description
1	On site	TFD-XCZS	TIDAL FLAT DEPOSITS	CLAY, SILT AND SAND

*This data is sourced from the British Geological Survey.*



## 15.5 Superficial permeability (50k)

Records within 50m

2

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

Location	Flow type	Maximum permeability	Minimum permeability
On site	Intergranular	Moderate	Very Low
On site	Intergranular	Moderate	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)

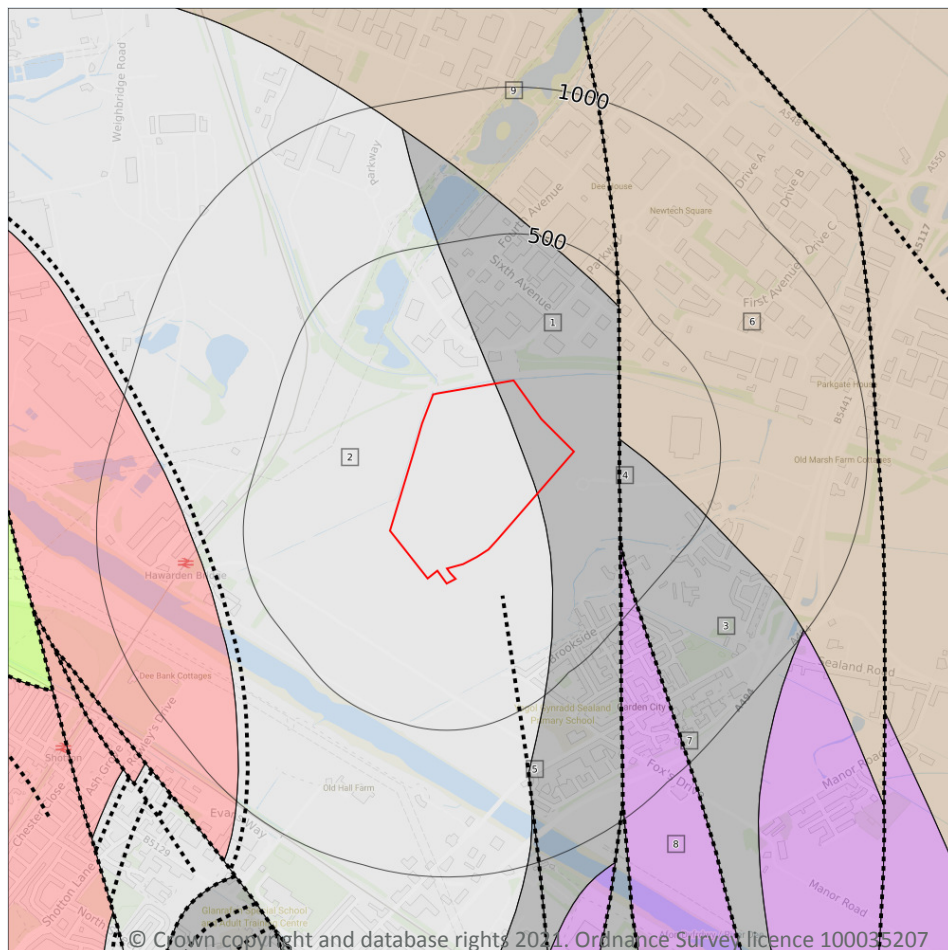
Records within 50m

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

6

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 92**

ID	Location	LEX Code	Description	Rock age
1	On site	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
2	On site	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN

ID	Location	LEX Code	Description	Rock age
3	155m E	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
6	161m E	KNSF-SDST	KINNERTON SANDSTONE FORMATION - SANDSTONE	-
8	315m SE	ETM-MDSC	ETRURIA FORMATION - MUDSTONE, SANDSTONE AND CONGLOMERATE	WESTPHALIAN
9	431m NE	KNSF-SDST	KINNERTON SANDSTONE FORMATION - SANDSTONE	-

*This data is sourced from the British Geological Survey.*

## 15.9 Bedrock permeability (50k)

<b>Records within 50m</b>	<b>4</b>
---------------------------	----------

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	Moderate	Low
On site	Fracture	High	Low
On site	Fracture	High	Low
On site	Fracture	Moderate	Low

*This data is sourced from the British Geological Survey.*

## 15.10 Bedrock faults and other linear features (50k)

<b>Records within 500m</b>	<b>3</b>
----------------------------	----------

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 92**

ID	Location	Category	Description
4	155m E	FAULT	Fault, inferred, displacement unknown
5	158m SE	FAULT	Fault, inferred, displacement unknown
7	315m SE	FAULT	Fault, inferred, displacement unknown

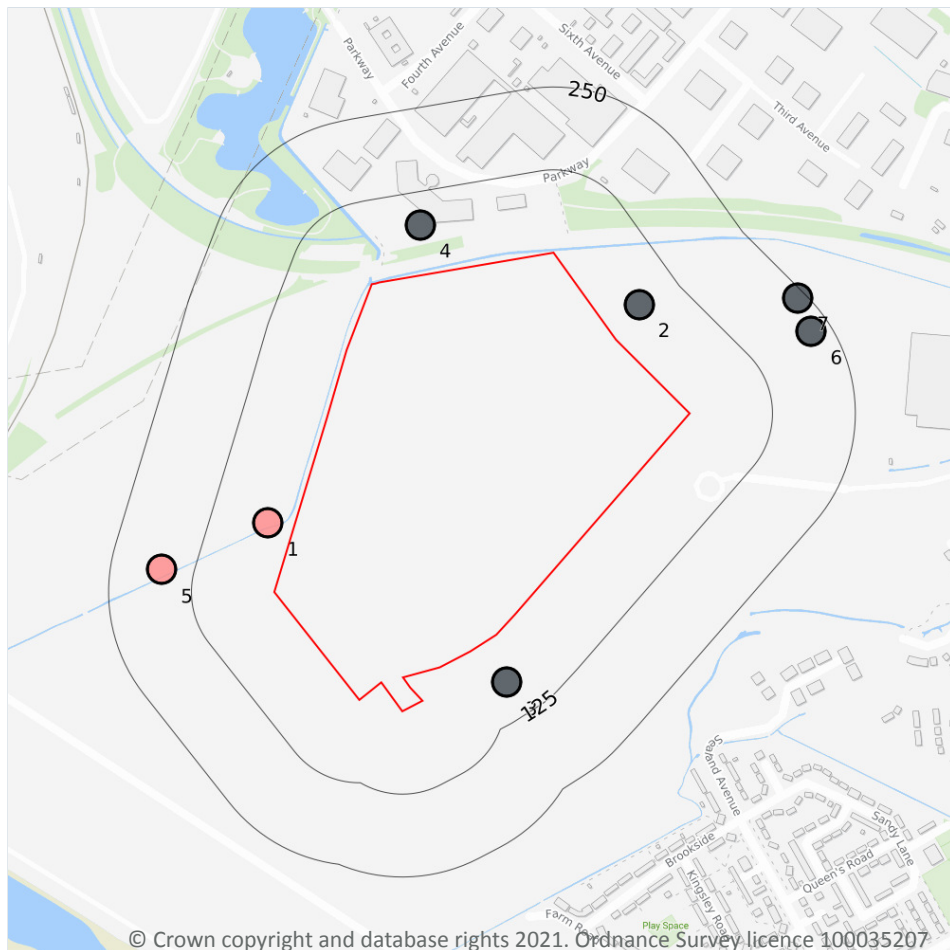




*This data is sourced from the British Geological Survey.*



## 16 Boreholes



— Site Outline  
Search buffers in metres (m)

- Confidential
- 0 - 10m
- 10 - 30m
- 30m+
- Unknown

### 16.1 BGS Boreholes

#### Records within 250m

7

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 95**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	39m W	331860 369730	SEALAND EXPLORATION CO 2	180.01	N	<a href="#">156057</a>
2	59m NE	332420 370060	RAF SEALAND 6	-	Y	N/A
3	69m SE	332220 369490	RAF SEALAND 7	-	Y	N/A

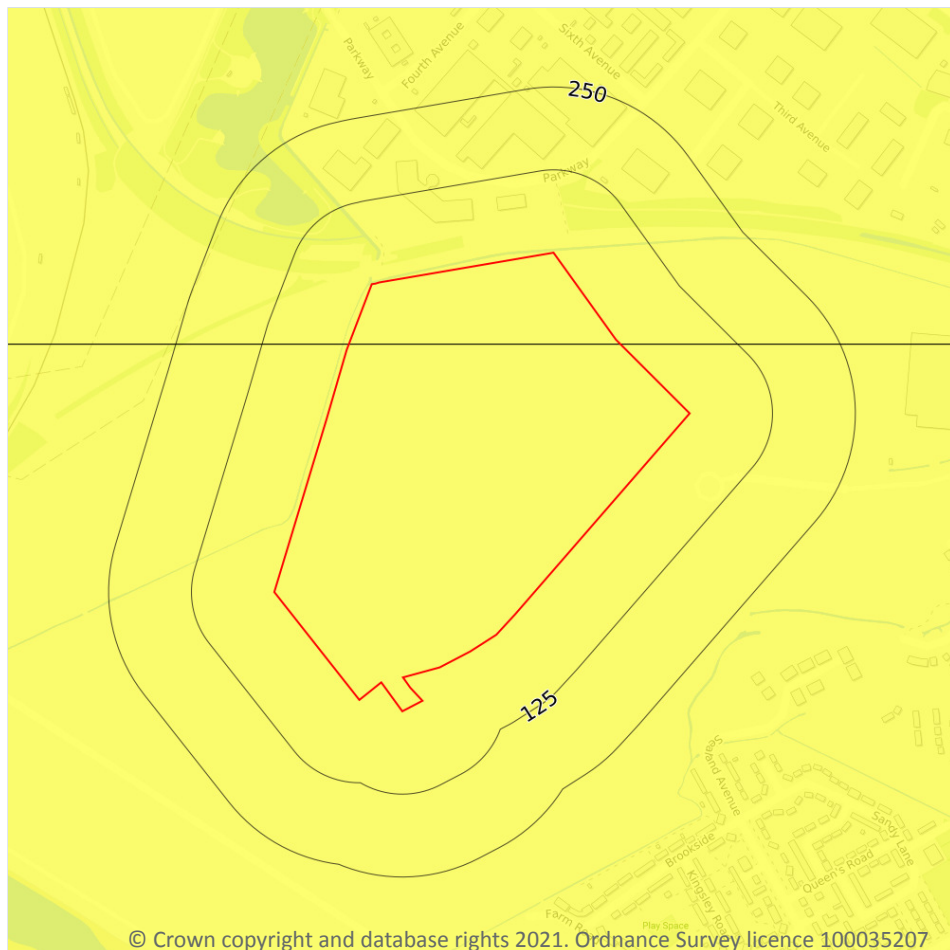


ID	Location	Grid reference	Name	Length	Confidential	Web link
4	75m N	332090 370180	SHOTTON S.I. 10	-	Y	N/A
5	173m W	331700 369660	N.W OF SEALAND BANK FARM HAWARDEN BRIDGE	68.58	N	<a href="#">156056</a>
6	222m NE	332680 370020	RAF SEALAND 5	-	Y	N/A
7	239m NE	332660 370070	RAF SEALAND 4	-	Y	N/A

*This data is sourced from the British Geological Survey.*



## 17 Natural ground subsidence - Shrink swell clays



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

### 17.1 Shrink swell clays

#### Records within 50m

1

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

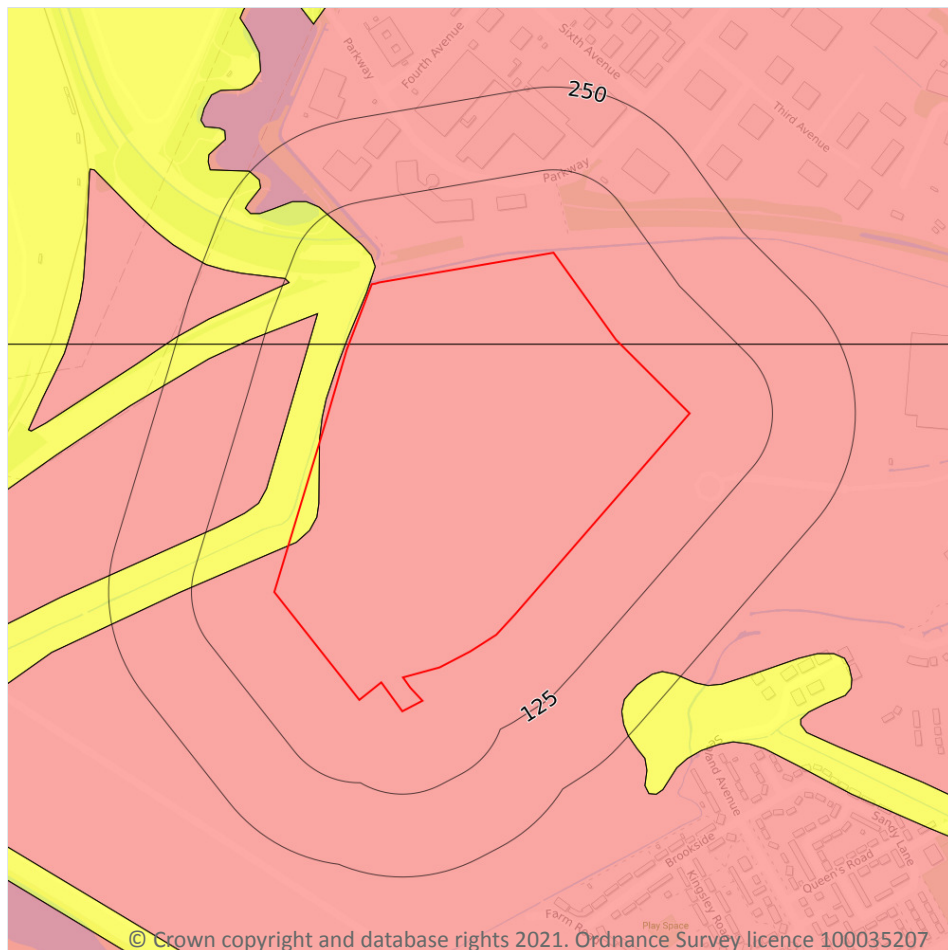
Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 97**

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

3

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 98**

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.

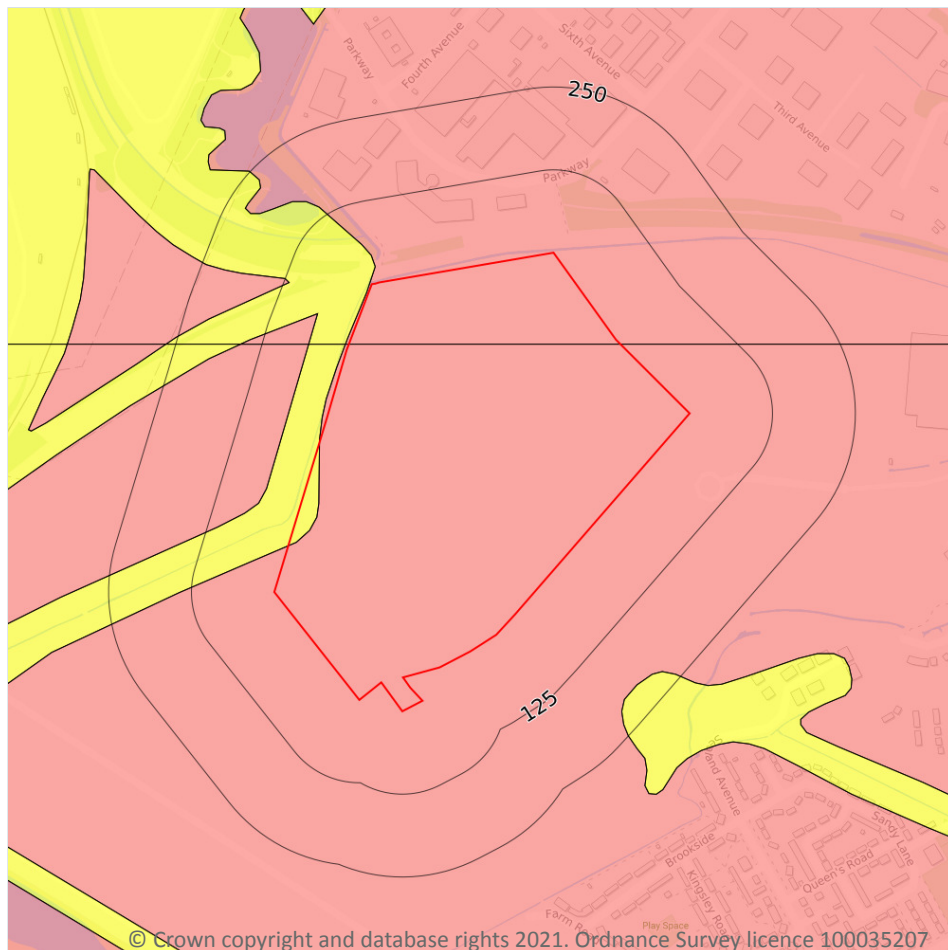


Location	Hazard rating	Details
On site	Moderate	Running sand conditions are probably present. Constraints may apply to land uses involving excavation or the addition or removal of water.
3m W	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions 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

3

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 100**

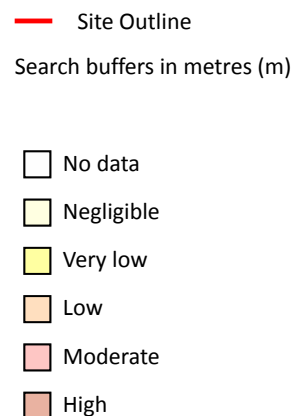
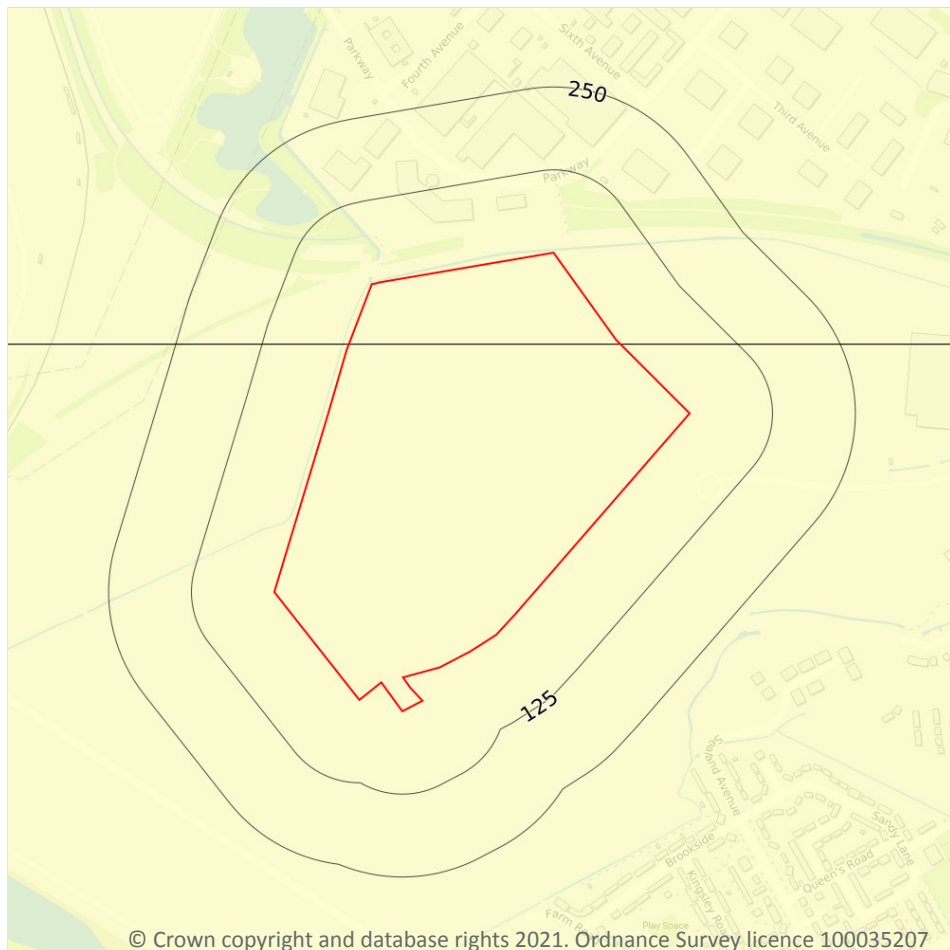
Location	Hazard rating	Details
On site	Very low	Compressibility and uneven settlement problems are not likely to be significant on the site for most land uses.

Location	Hazard rating	Details
On site	Moderate	Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.
3m W	Very low	Compressibility and uneven settlement problems are not likely to be significant on the site for most land uses.

*This data is sourced from the British Geological Survey.*



## Natural ground subsidence - Collapsible deposits



### 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 102**

Location	Hazard rating	Details
On site	Negligible	Deposits with potential to collapse when loaded and saturated are believed not 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

### 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 103**

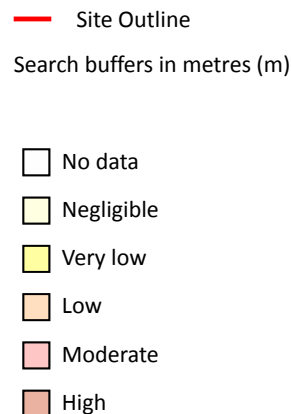
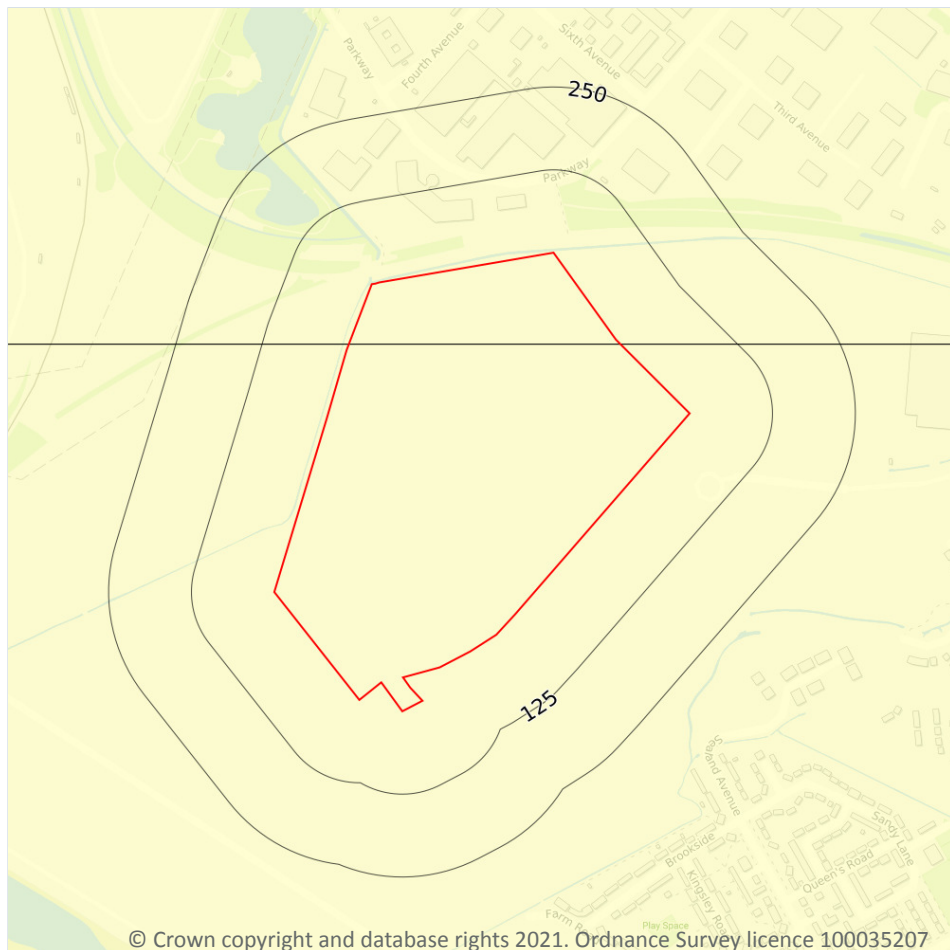
Location	Hazard rating	Details
On site	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

*This data is sourced from the British Geological Survey.*





## Natural ground subsidence - Ground dissolution of soluble rocks



### 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.

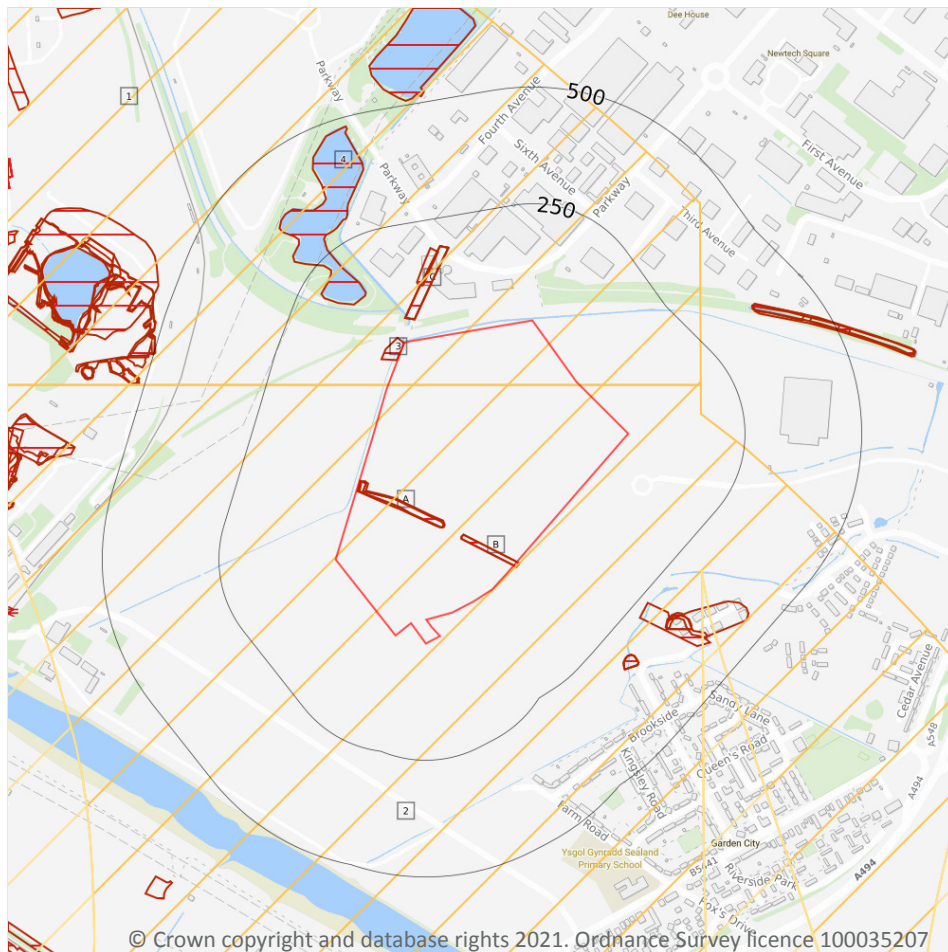
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 104**

Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.

*This data is sourced from the British Geological Survey.*



## 18 Mining, ground workings and natural cavities



- 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 Stantec UK Ltd.*

## 18.2 BritPits

Records within 500m

0

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

*This data is sourced from the British Geological Survey.*

## 18.3 Surface ground workings

Records within 250m

11

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 106**

ID	Location	Land Use	Year of mapping	Mapping scale
A	On site	Unspecified Ground Workings	1938	1:10560
A	On site	Unspecified Heap	1914	1:10560
A	On site	Unspecified Ground Workings	1938	1:10560
B	On site	Unspecified Heap	1938	1:10560
B	On site	Unspecified Heap	1938	1:10560
3	0m W	Cuttings	1913	1:10560
C	45m N	Cuttings	1981	1:10000
C	45m N	Cuttings	1960	1:10560
C	45m N	Cuttings	1969	1:10560
C	113m N	Unspecified Heap	1914	1:10560
4	131m NW	Water Body	1992	1:10000

*This is data is sourced from Ordnance Survey/Groundsure.*



## 18.4 Underground workings

### Records within 1000m

**2**

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

Features are displayed on the Mining, ground workings and natural cavities map on **page 106**

ID	Location	Land Use	Year of mapping	Mapping scale
L	909m W	Unspecified Workings	1960	1:10560
L	909m W	Unspecified Workings	1969	1:10560

*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

**5**

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 106**

ID	Location	Name	Commodity	Class	Likelihood
1	On site	Not available	Iron Ore (Bedded)	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
2	On site	Not available	Iron Ore (Bedded)	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered





ID	Location	Name	Commodity	Class	Likelihood
5	315m SE	Not available	Vein Mineral	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
9	643m W	Not available	Vein Mineral	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
-	932m W	Not available	Vein Mineral	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 Stantec UK Ltd.*

## 18.8 JPB mining areas

### Records on site

1

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

Location	Details
On site	Whilst outside of an area where The Coal Authority have information on coal mining activities, Johnson Poole & Bloomer (JPB) may have information such as mining plans and maps held within their archive that have occurred within 1km of this property. Please note, the plans held by JPB may also relate to non-mining records. Further details and a quote for services (if appropriate) can be obtained by emailing this report to <a href="mailto:enquiries.gs@jpb.co.uk">enquiries.gs@jpb.co.uk</a> .

*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.*

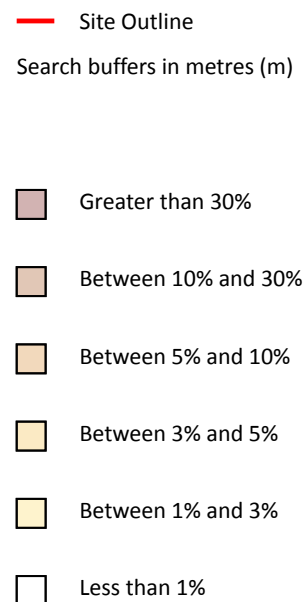
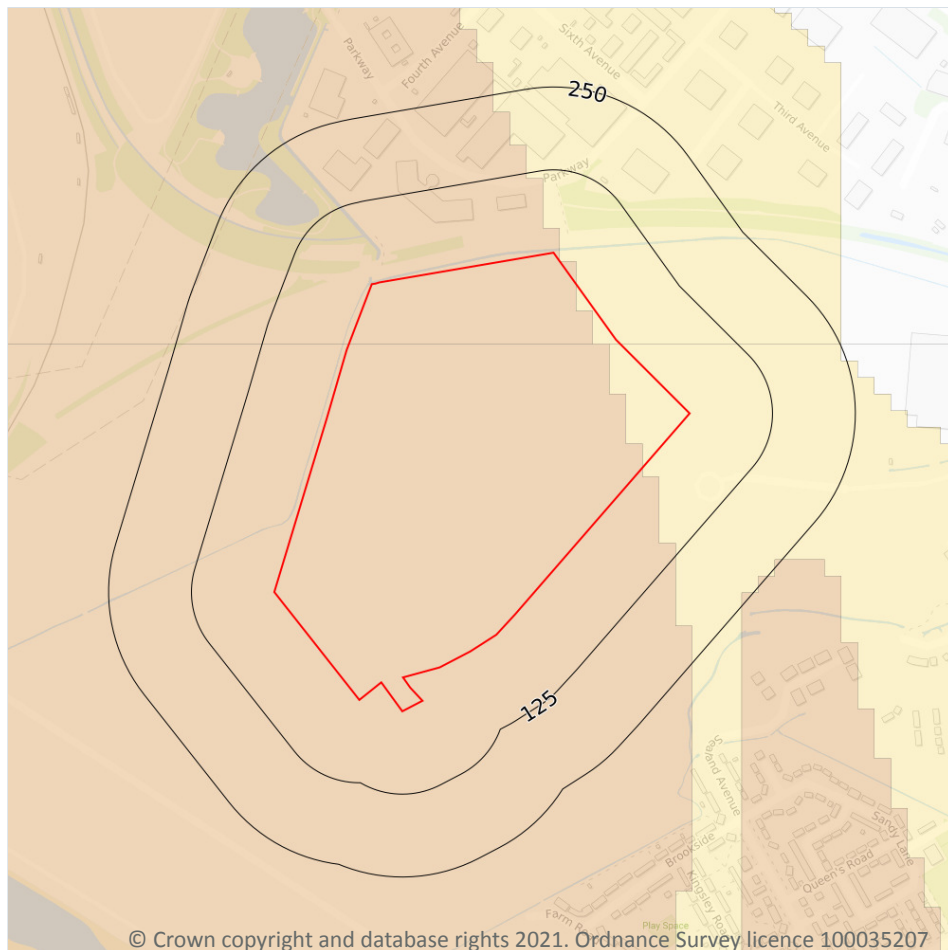
## 18.13 Clay mining

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

2

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 111**

Location	Estimated properties affected	Radon Protection Measures required
On site	Between 1% and 3%	None
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

12

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km<sup>2</sup>. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km<sup>2</sup>; 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	20 - 40 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	20 - 40 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	20 - 40 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	20 - 40 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	20 - 40 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	20 - 40 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	20 - 40 mg/kg	15 mg/kg
4m E	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	20 - 40 mg/kg	15 mg/kg

*This data is sourced from the British Geological Survey.*

### 20.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city





between the measured sample locations (4 per km<sup>2</sup>).

*This data is sourced from the British Geological Survey.*

## 20.3 BGS Measured Urban Soil Chemistry

Records within 50m

0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km<sup>2</sup>.

*This data is sourced from the British Geological Survey.*



## 21 Railway infrastructure and projects



- Site Outline
- Search buffers in metres (m)**
- C1 Crossrail 1 Stations
- Crossrail 1 Route
- Crossrail 1 Worksites
- C2 Crossrail 2 Stations
- Crossrail 2 Route
- Crossrail 2 Worksites
- Crossrail 2 Safeguarding
- Crossrail 2 Headhouses
- Railway stations
- Active railways
- Active tunnels
- Abandoned railways
- Historic railways
- Historic tunnels
- Underground stations
- Underground Lines
- Royal Mail tunnels
- HS2 optimised route
- HS2 Stations
- HS2 Depots
- HS2 Surface Safeguarding
- HS2 Subsurface Safeguarding

### 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**

**23**

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

Features are displayed on the Railway infrastructure and projects map on **page 115**

Location	Land Use	Year of mapping	Mapping scale
23m NW	Railway Sidings	1989	2500
26m N	Railway Sidings	1994	2500
26m N	Railway Sidings	1995	2500
26m N	Railway Sidings	1984	2500
26m N	Railway Sidings	1962	2500
26m N	Railway Sidings	1965	2500
26m N	Railway Sidings	1986	2500
26m N	Railway Sidings	1988	2500
26m N	Railway Sidings	1991	2500
27m NW	Railway Sidings	1962	2500
28m NW	Railway Sidings	1960	10560
28m NW	Railway Sidings	1969	10560
29m NW	Railway Sidings	1992	2500
30m N	Railway Sidings	1992	2500
30m N	Railway Sidings	1978	-
31m NW	Railway Sidings	1986	2500
31m NW	Railway Sidings	1988	2500



Location	Land Use	Year of mapping	Mapping scale
87m W	Railway Sidings	1992	10000
119m W	Railway Sidings	1978	-
120m W	Railway Sidings	1992	2500
123m W	Railway Sidings	1986	2500
123m W	Railway Sidings	1988	2500
210m W	Railway Sidings	1981	10000

*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**

**3**

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

Features are displayed on the Railway infrastructure and projects map on **page 115**

Location	Description
19m N	Abandoned
22m N	Abandoned
22m N	Abandoned

*This data is sourced from OpenStreetMap.*



## 21.7 Railways

Records within 250m

0

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

*This data is sourced from Ordnance Survey and OpenStreetMap.*

## 21.8 Crossrail 1

Records within 500m

0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

*This data is sourced from publicly available information by Groundsure.*

## 21.9 Crossrail 2

Records within 500m

0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

*This data is sourced from publicly available information by Groundsure.*

## 21.10 HS2

Records within 500m

0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

*This data is sourced from HS2 Ltd.*



## Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see <https://www.groundsure.com/sources-reference>.

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## Appendix I.3 - Ordnance Survey Maps 1869–2021

#### Site Details:

FARM ROAD, GARDEN CITY,  
CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** County Series

**Map date:** 1869

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1869  
Revised 1869  
Edition N/A  
Copyright N/A  
Levelled N/A

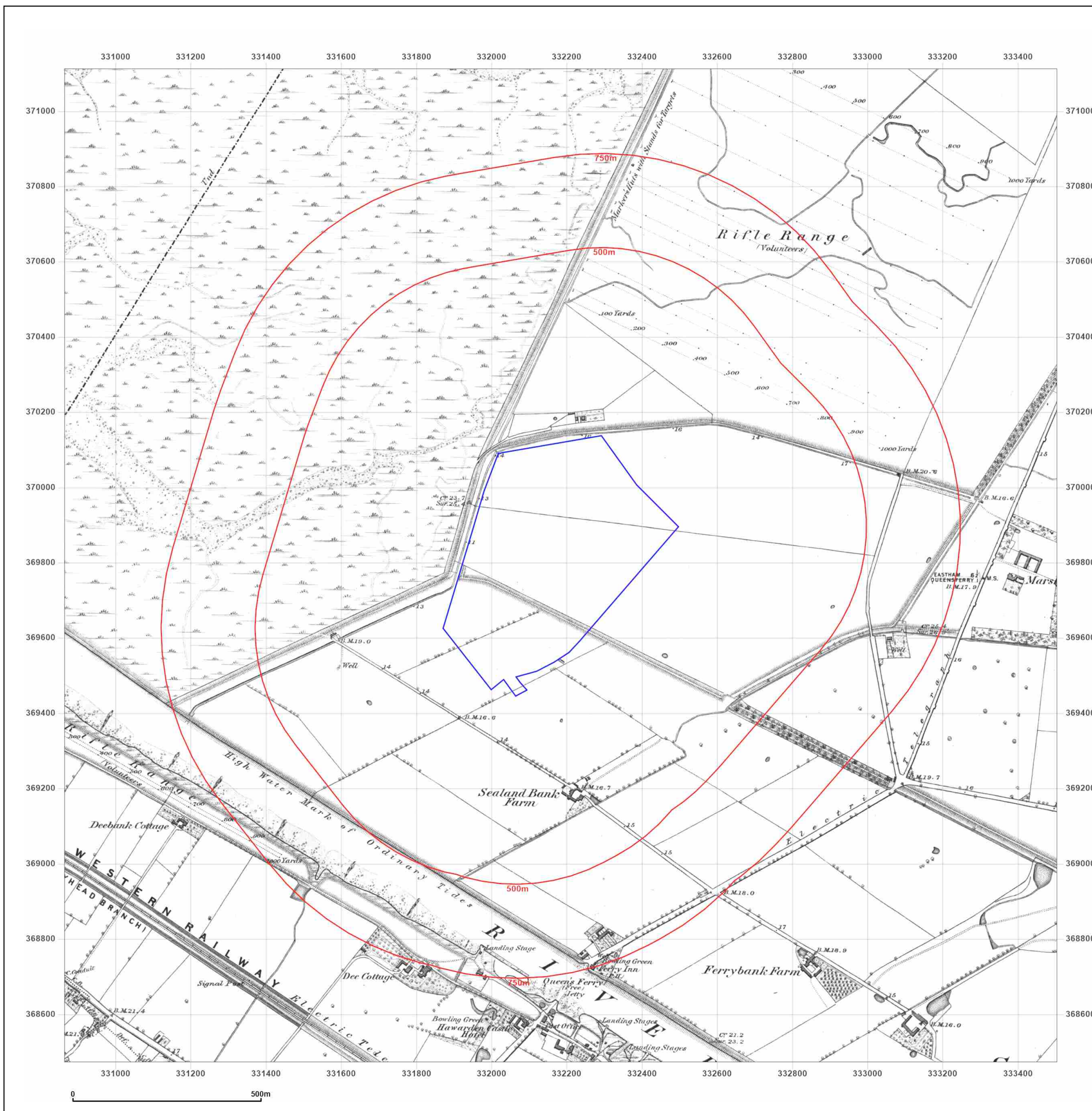


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**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** County Series

**Map date:** 1897-1898

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1872  
Revised 1897  
Edition N/A  
Copyright N/A  
Levelled N/A

Surveyed 1869  
Revised 1898  
Edition N/A  
Copyright N/A  
Levelled N/A

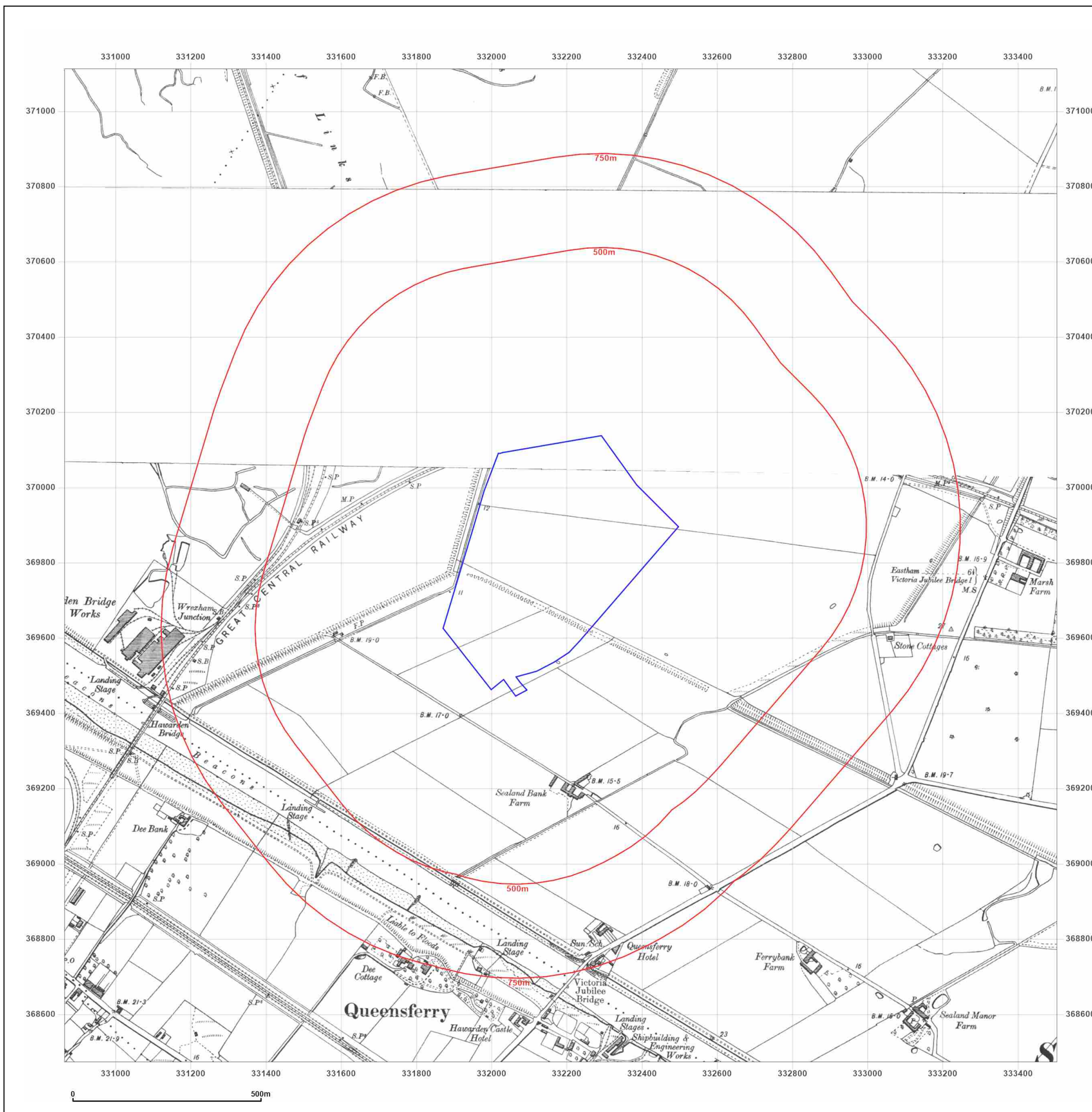


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CH5 2HJ

**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** County Series

**Map date:** 1898

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1869  
Revised 1898  
Edition N/A  
Copyright N/A  
Levelled N/A

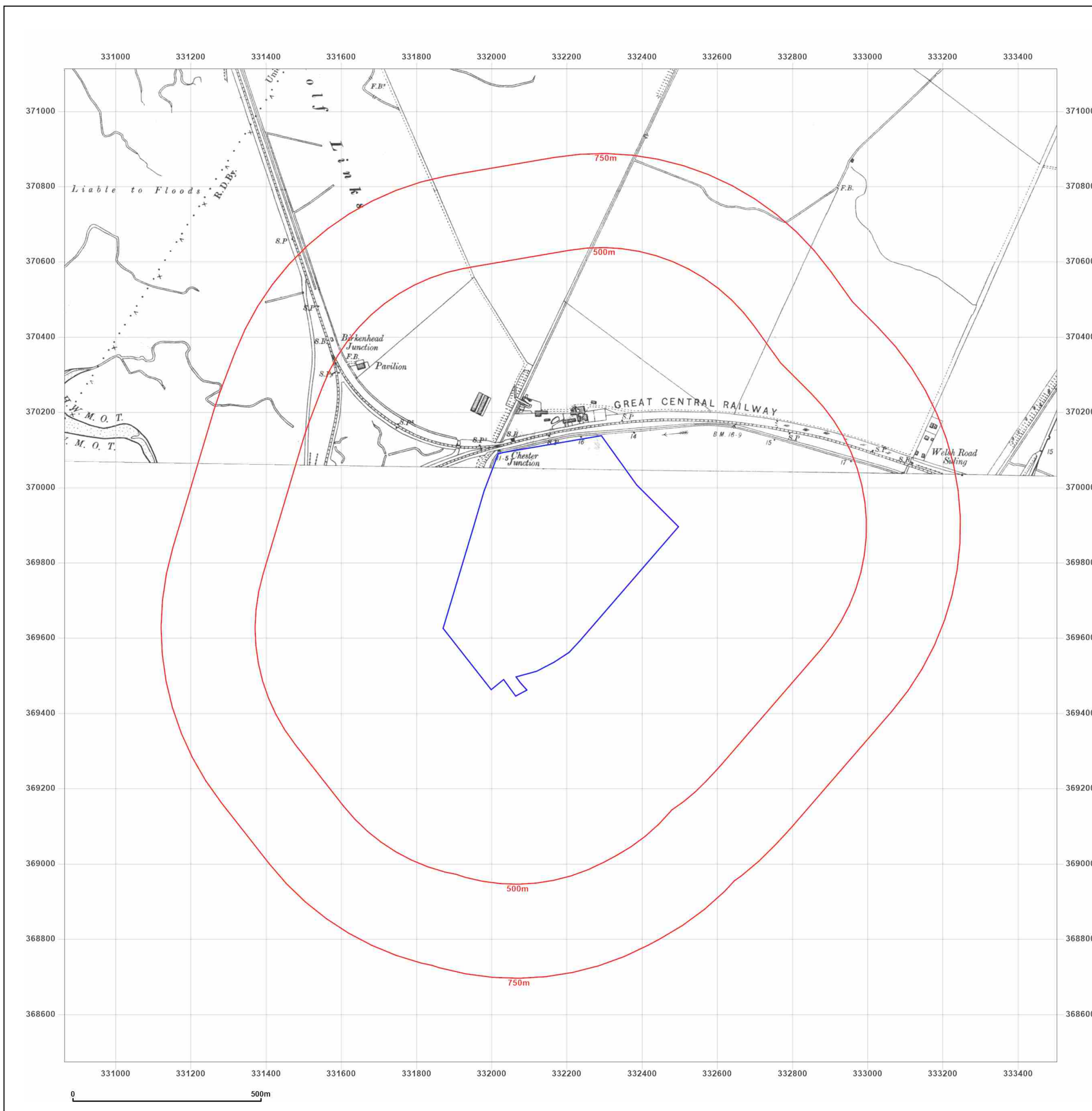


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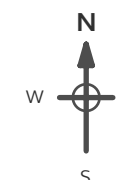
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**Map Name:** County Series

**Map date:** 1898

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1872  
Revised 1898  
Edition N/A  
Copyright N/A  
Levelled N/A

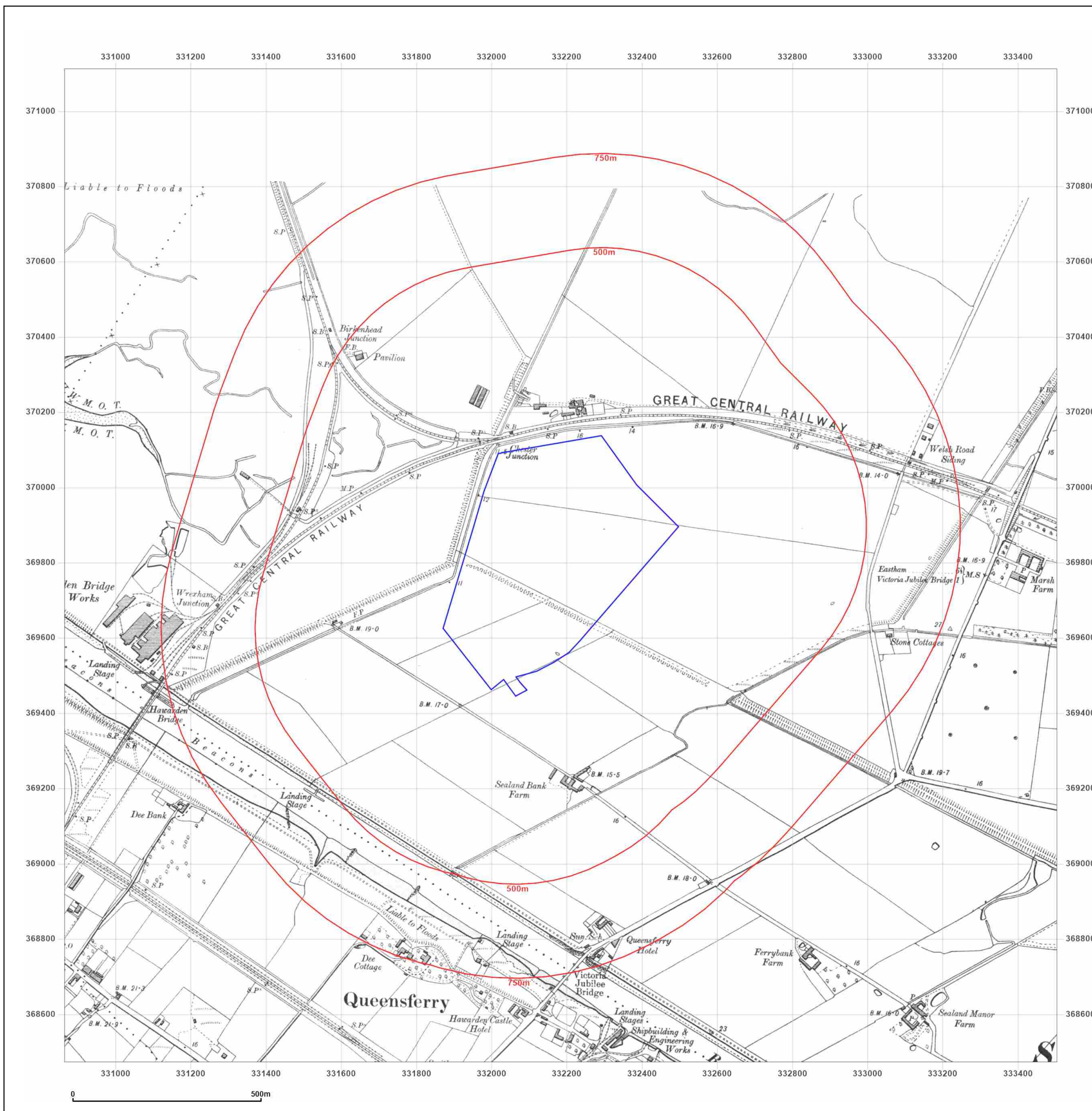


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**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** County Series

**Map date:** 1909-1913

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1869  
Revised 1913  
Edition 1913  
Copyright N/A  
Levelled N/A

Surveyed 1869  
Revised 1909  
Edition N/A  
Copyright N/A  
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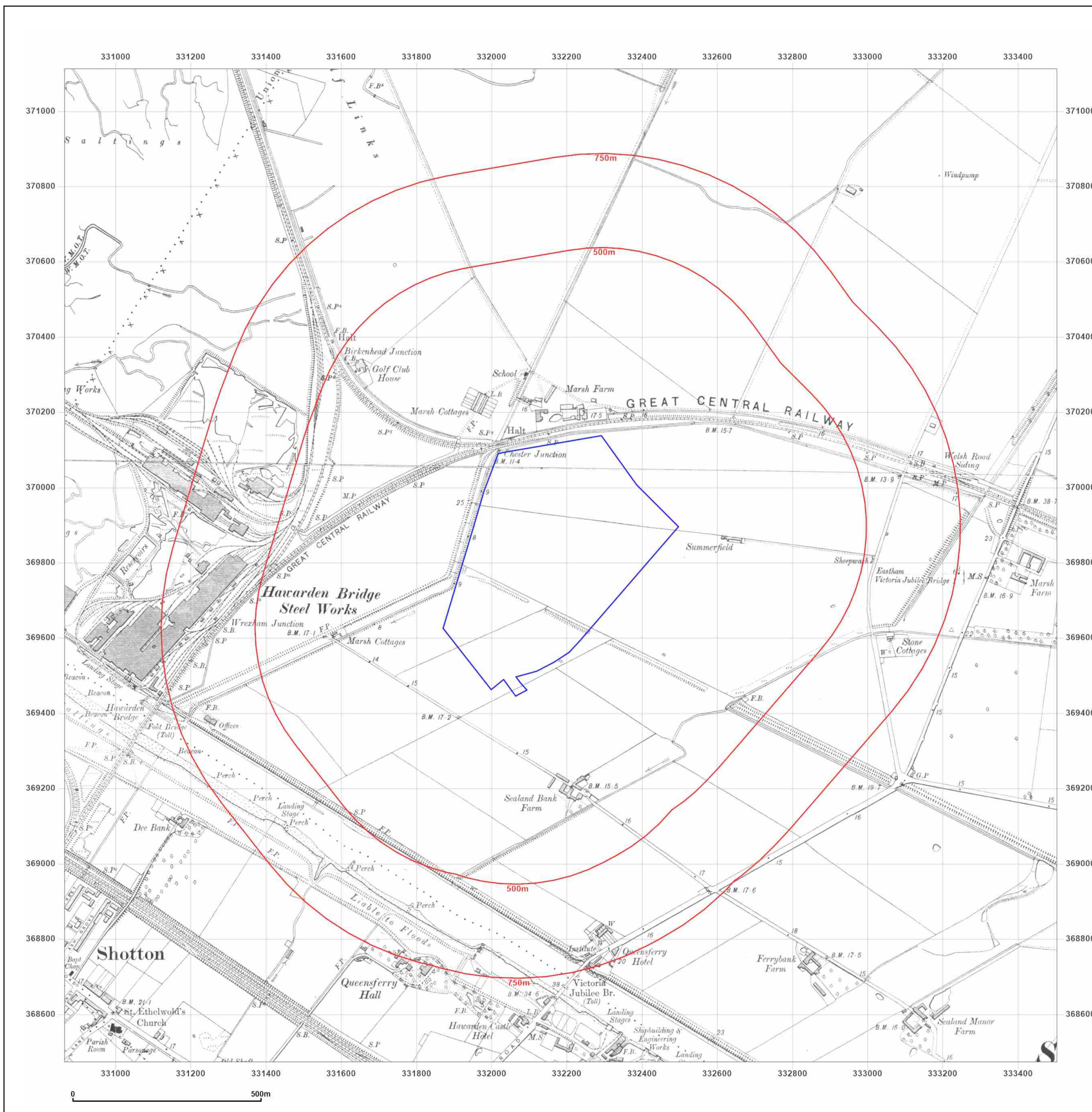


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**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** County Series

**Map date:** 1913-1914

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1872  
Revised 1913  
Edition N/A  
Copyright N/A  
Levelled N/A

Surveyed 1872  
Revised 1914  
Edition N/A  
Copyright N/A  
Levelled N/A

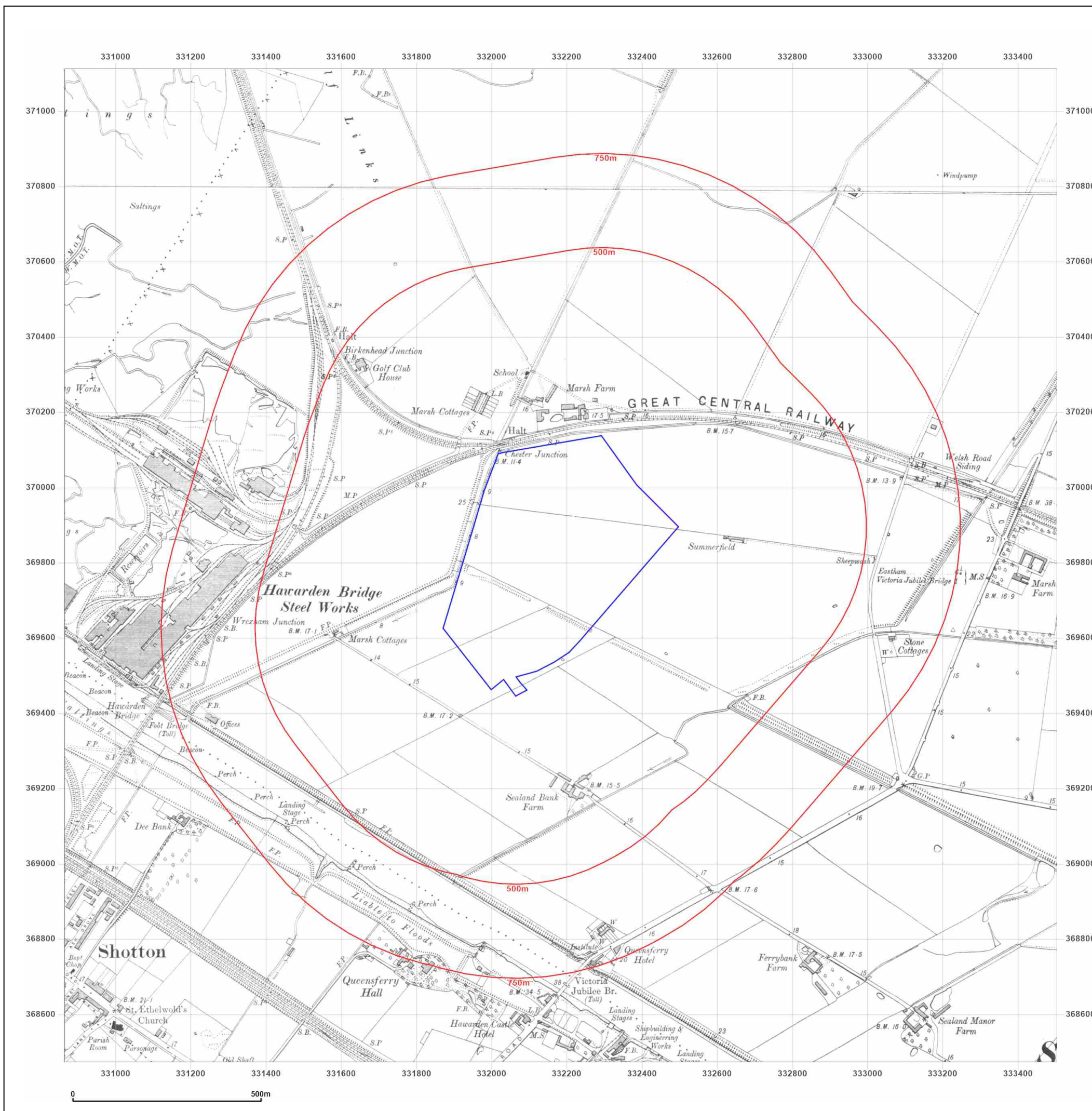


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**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** County Series

**Map date:** 1938

**Scale:** 1:10,560

**Printed at:** 1:10,560



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Revised 1938  
Edition N/A  
Copyright N/A  
Levelled N/A

Surveyed 1869  
Revised 1938  
Edition 1938  
Copyright N/A  
Levelled N/A

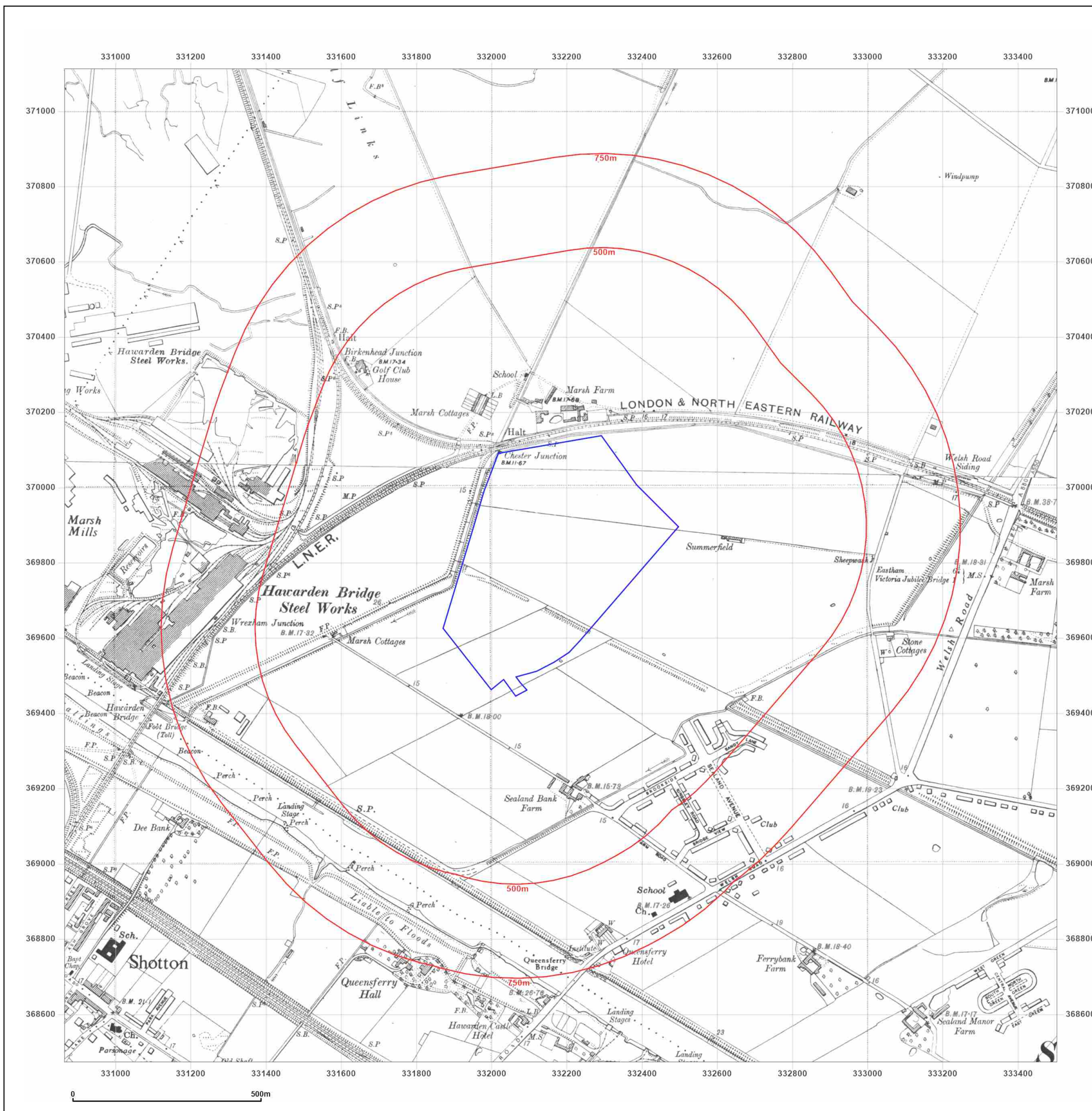


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**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** Provisional

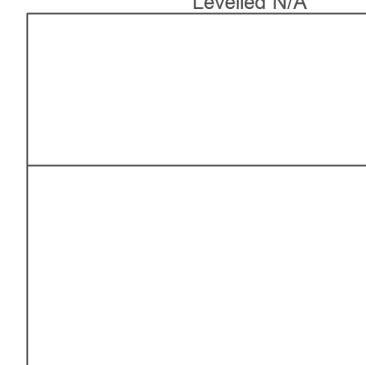
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**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed N/A  
Revised 1953  
Edition 1954  
Copyright N/A  
Levelled N/A

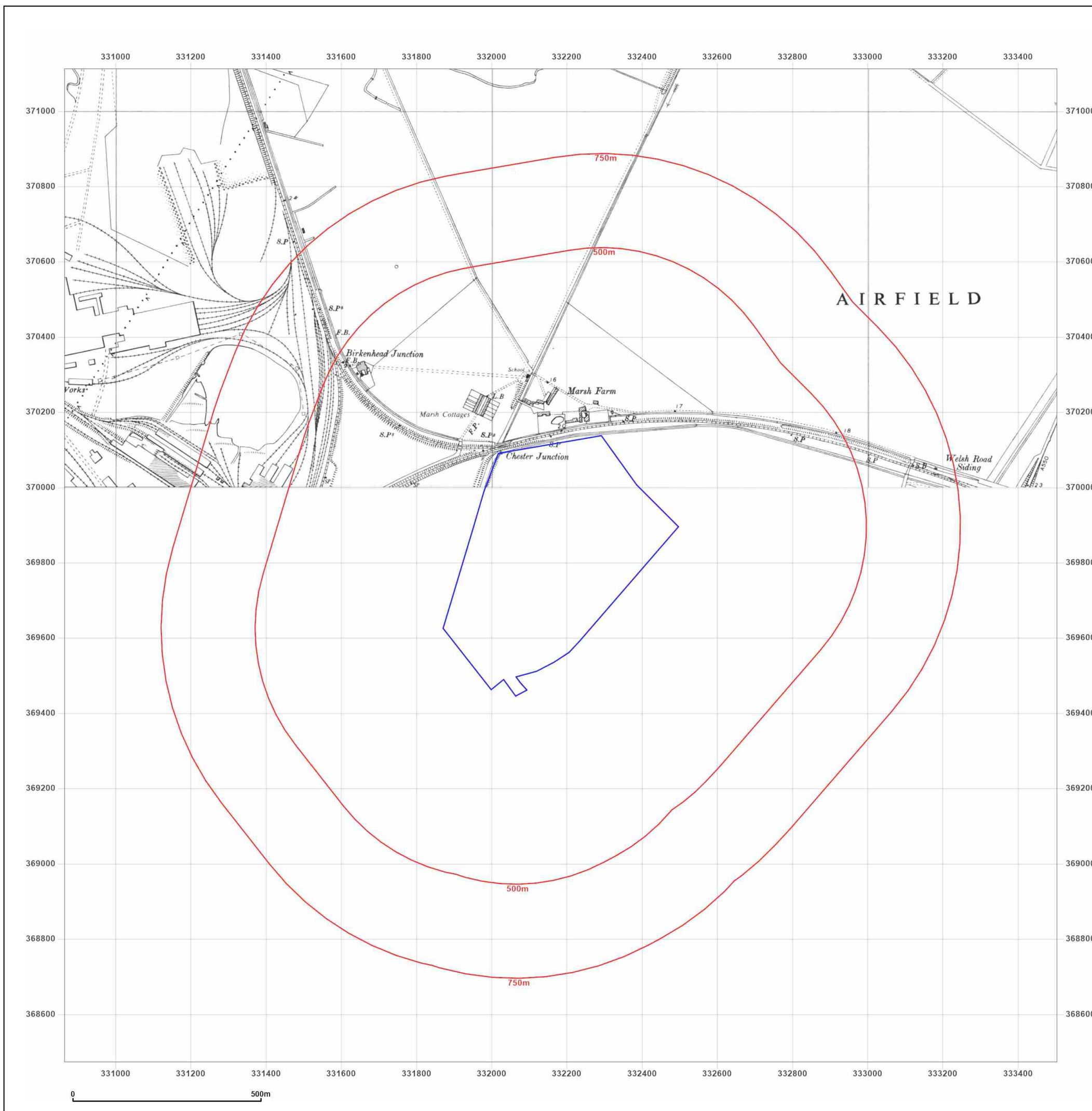


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**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** Provisional

**Map date:** 1960-1963

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1872  
Revised 1960  
Edition N/A  
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Surveyed N/A  
Revised 1962  
Edition N/A  
Copyright 1963  
Levelled N/A

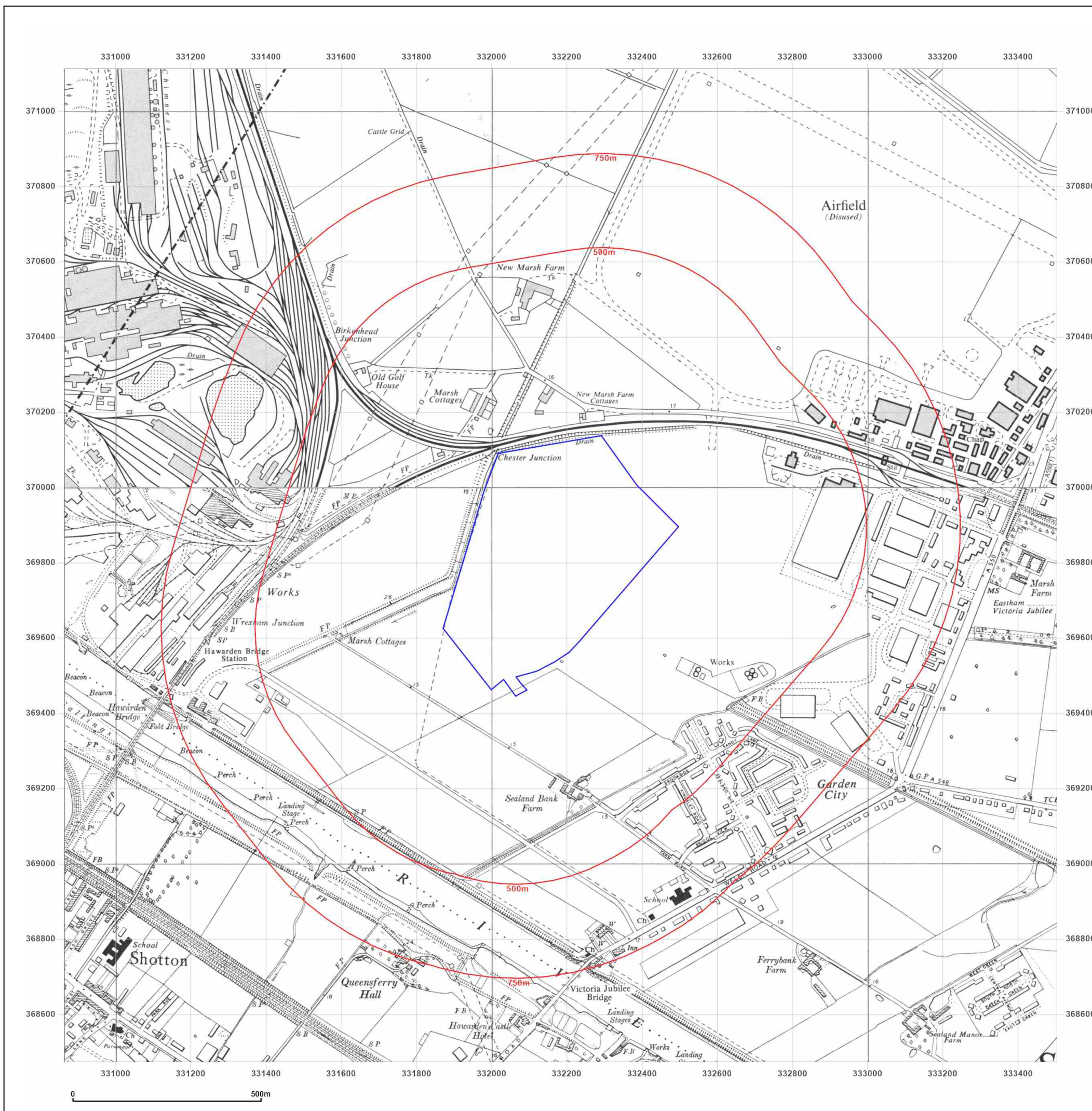


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**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** Provisional

**Map date:** 1963

**Scale:** 1:10,560

**Printed at:** 1:10,560



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

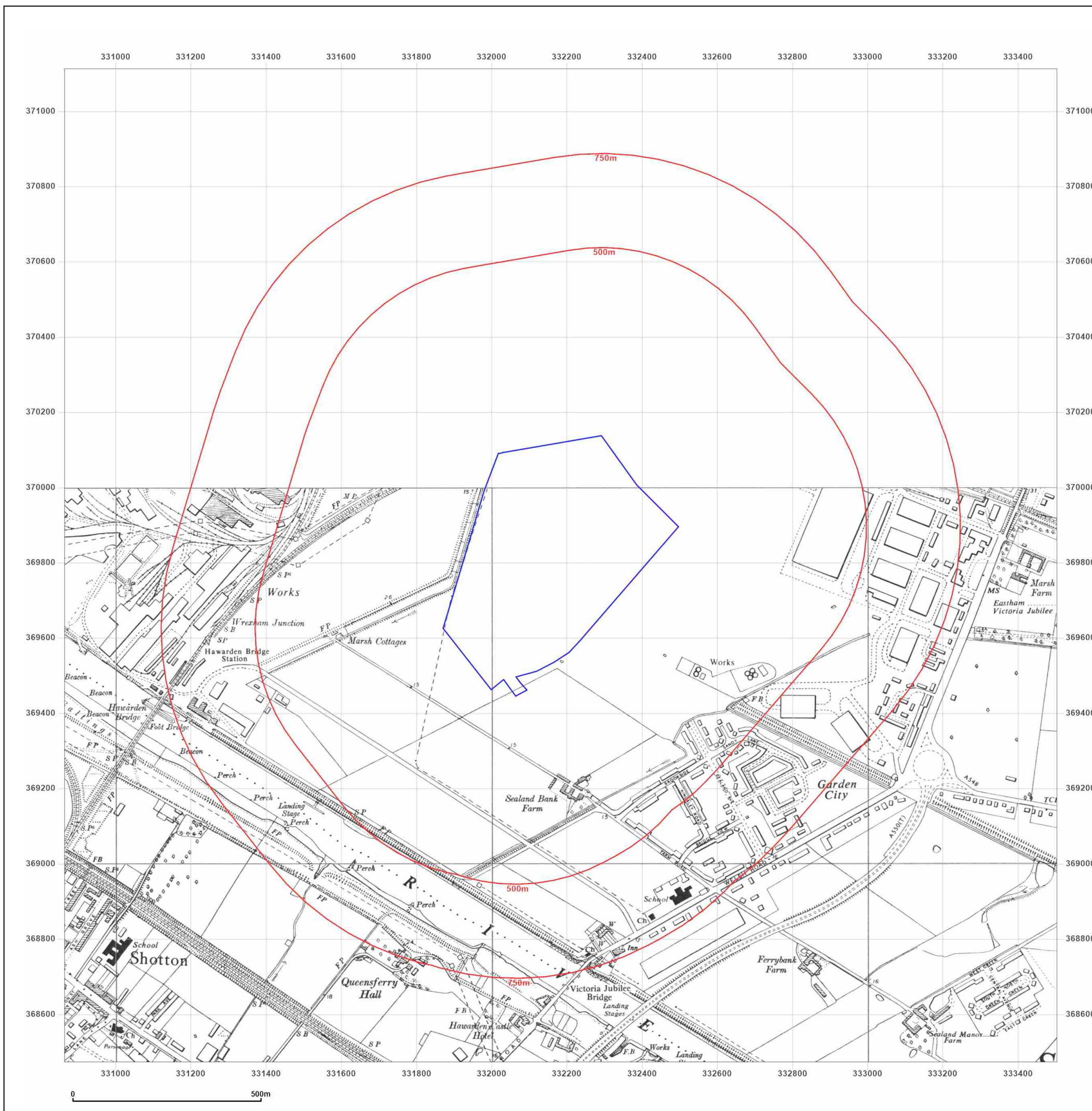


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**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** Provisional

**Map date:** 1969-1970

**Scale:** 1:10,560

**Printed at:** 1:10,560



Surveyed 1965  
Revised 1970  
Edition N/A  
Copyright 1970  
Levelled N/A

Surveyed 1965  
Revised 1968  
Edition N/A  
Copyright 1969  
Levelled N/A

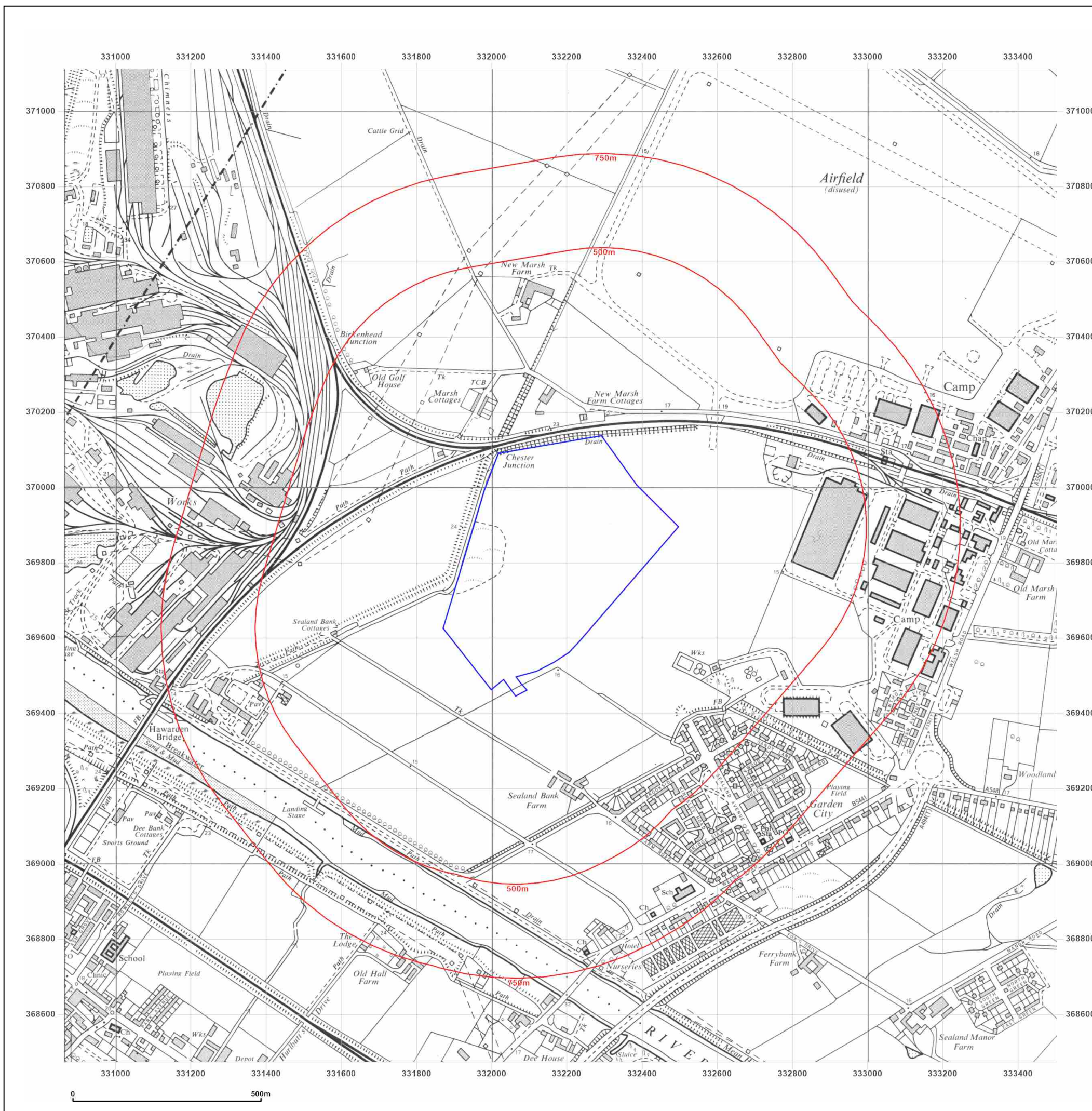


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**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** National Grid

**Map date:** 1978-1981

**Scale:** 1:10,000

**Printed at:** 1:10,000



Surveyed 1981  
Revised 1981  
Edition N/A  
Copyright N/A  
Levelled N/A

Surveyed 1969  
Revised 1978  
Edition N/A  
Copyright 1978  
Levelled 1965

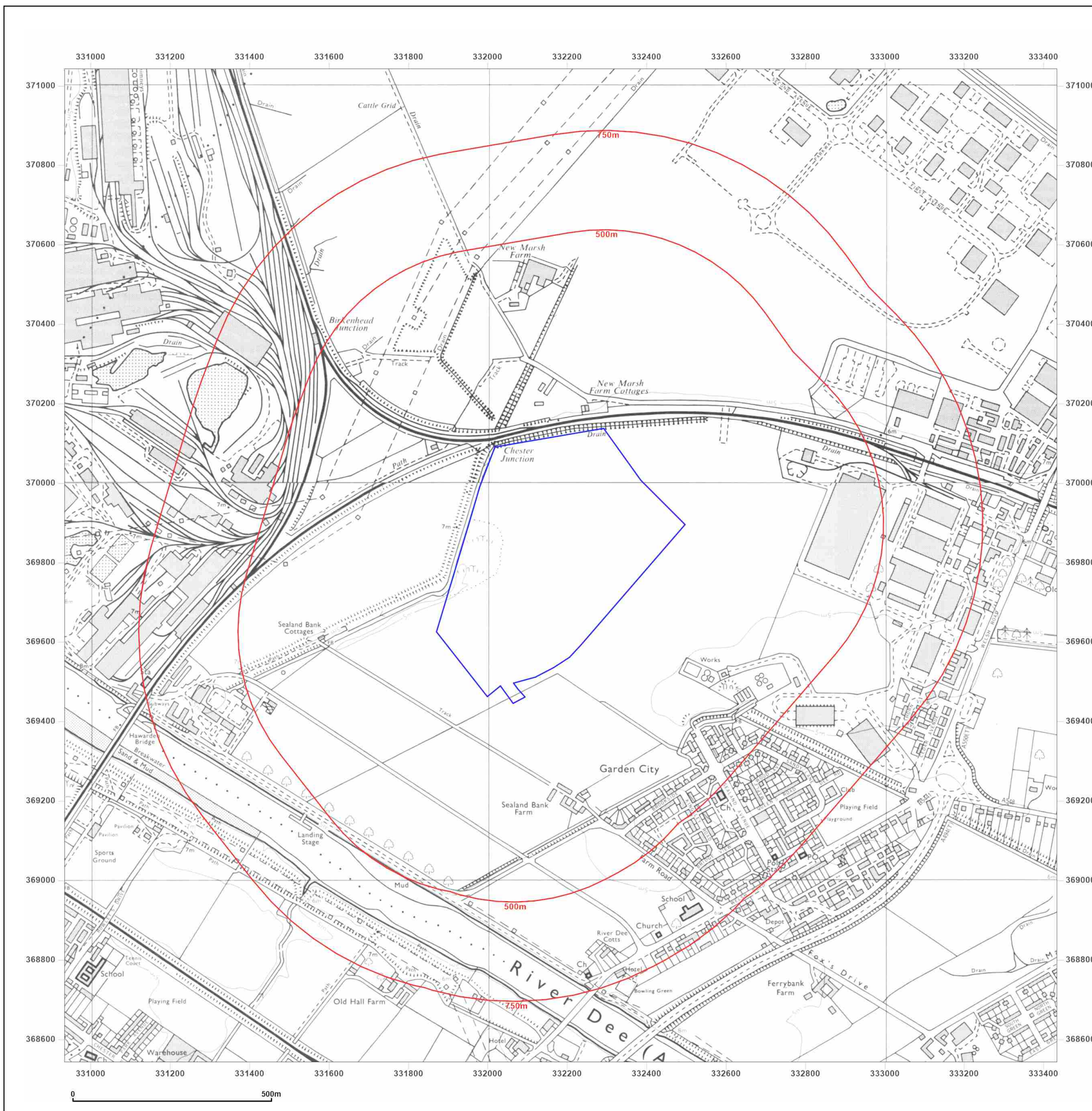


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**Client Ref:** 15-161-NG-A  
**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** National Grid

**Map date:** 1989-1992

**Scale:** 1:10,000

**Printed at:** 1:10,000



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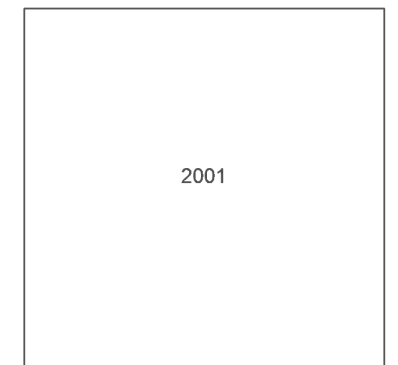
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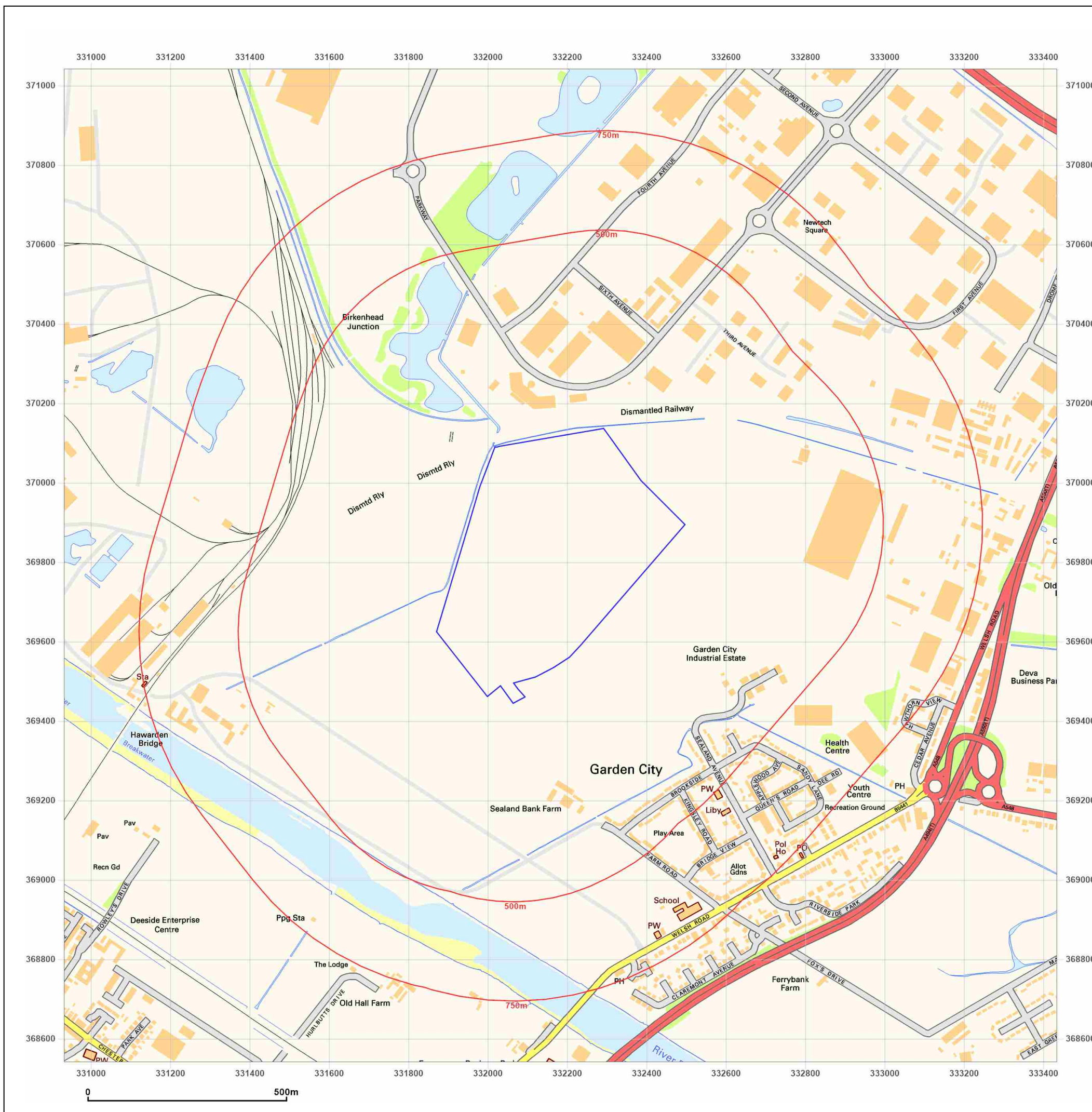


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**Report Ref:** GS-8066691  
**Grid Ref:** 332183, 369792

**Map Name:** National Grid

**Map date:** 2021

**Scale:** 1:10,000

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