AtkinsRéalis

**Preliminary Risk Assessment**

Sellafield Ltd.

12 April 2024
For issue

# TARN HEAD FARM GROUND INVESTIGATION: DESK STUDY

# Notice

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## Client signoff

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# Contents



## Tables

## Figures



## Appendices

# 1. Introduction

## 1.1 Scope and objectives

AtkinsRéalis UK Limited (AtkinsRéalis) has been appointed by Sellafield Limited (Sellafield) to undertake a Preliminary Risk Assessment (PRA) for the proposed ground investigation works to be undertaken in a localised area at Tarn Head Farm (hereby referred to as “the site”). The PRA is presented in this report with the objective to assess land contamination risks relevant to the proposed ground investigation activities in accordance with National Planning Policy Framework (NPPF) [1] requirements. A planning application is due to be submitted for the ground investigation and the PRA is to support the application.

This report has been prepared in line with BS 10175:2011+A2:2017 [2] and Environment Agency guidance Land Contamination: Risk Management (LCRM) [3]. Published in 2020 (updated in 2023), LCRM has replaced CLR11 - Model Procedures for the Management of Land Contamination, 2004 [4], as the key technical framework (and signposts other key guidance) for identifying and remediating contamination through the application of a risk management process.

Based on the PRA presented, this report assesses whether there is any unacceptable risk [3] requiring onward management and whether the site is suitable for the proposed use (temporary ground investigation activities).

The sources of information accessed to prepare this report are detailed in Section 8

A site location plan is included as Figure 1.

## 1.2 Proposed development

The scope of proposed works includes only limited temporary ground investigation activities, subsequent return monitoring visits, and the required support infrastructure e.g. provision of temporary welfare. The PRA presented herein assesses this temporary site use.

The ground investigation will include drilling of circa three boreholes to approximately 30 m below ground level (bgl) in external areas at the site (see Figure 2). Rota-sonic drilling methods are being considered and borehole diameters will be approximately 200 millimetres (mm), but the final ground investigation and drilling details are subject to change. However, the details above provide a good indication of the limited scale of ground investigation proposed.

After drilling, each borehole will be installed with a monitoring well and then protective fencing will be erected. The specific details of site visits for sampling and monitoring of newly installed boreholes is still to be determined. However, it is assumed visits will be made on an approximate monthly basis to access the wells for data collection. The return visits are initially proposed to continue for 12 months but could continue for up to three years post drilling.

An example of what the completed headworks and protective fencing could look like is provided in Appendix A.

## 1.3 Assumptions and limitations

The findings and opinions conveyed in this report are based on third party information obtained from a variety of sources, as detailed within this report, which AtkinsRéalis believe are reliable. Reasonable endeavours have been made to source information from reputable organisations, but AtkinsRéalis cannot and do not guarantee the authenticity or reliability of the information. No attempt has been made to independently verify any data collected by others or from other sources.

The accuracy of maps cannot be guaranteed, and it should be recognised that different conditions on site may have existed between subsequent to the various map surveys.

Any borehole data from British Geological Survey (BGS) sources are included on the basis that 'The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation'.

This desk study has been based on the current site boundary and land use at the time of writing. Should the land use alter then a further desk study review may be required.

The information presented in this report are geological in nature. Geological considerations are based on site works and are subject to the inherent limitations of any such study, whereby the nature of the work means that only a proportion of the site conditions can be observed/documented. Conditions can vary between observation transects and vary seasonally; therefore, unexpected, and unforeseen conditions could occur.

This assessment has been carried out under current guidance and legislation, if these are to be updated the assessment contained within this report may also need to be updated.

AtkinsRéalis has assumed that all proposed ground investigation works will be undertaken in accordance with current good practice and applicable legislation, regulations and policy.

This report does not advise on measures to deal with asbestos. Advice should be sought from an asbestos specialist, as necessary.

Risks / constraints relating to health and safety, energy management, planning, fire risk, ecology (including invasive plants), flooding, unexploded ordnance, heritage and landscape etc. are beyond the remit of this report, other than highlighting where information sources have identified a potential concern and that advice should be sought from the appropriate specialist.

This desk study was conducted, and this report prepared for use solely by Sellafield. Thereafter, this report shall not be relied upon, or transferred to any other parties without the express written consent of AtkinsRéalis. If an unauthorised third party comes into possession of this report, they rely on its contents at their own risk.

# 2. Site characterisation

## 2.1 Site location

Tarn Head Farm (“the site”), is located approximately 195 m west of the Sellafield nuclear licensed site in West Cumbria (nearest postcode CA20 1DT). Access is via track road from the public highway (Sellafield A595 Access Road). The site is centred on grid reference E 302122, N 504398 and is shown on the site location plan presented as Figure 1. The site is currently owned by the Nuclear Decommissioning Authority (NDA).


**Figure 1 - Tarn Head Farm - Site Location**

## 2.2 Site description

The site is irregularly shaped and covers an area of approximately 7900m$^2$ (0.79 ha), with a relatively flat topography and elevation recorded at approximately 19 metres Above Ordnance Datum (m AOD). The site predominantly comprises vegetation (40%), buildings (40%) and concrete hardstanding (20%).

The north-western part of the site contains active farm buildings, including a storage shed, cow shed, and slurry tank. The remainder of the site comprises an overgrown grass field, and some derelict and disused buildings awaiting demolition. There are localised areas of concrete hardstanding in the vicinity of these buildings, one of which is currently being used to store equipment. The site is generally surrounded by agricultural land.


**Figure 2 – Tarn Head Farm Red Line Boundary and Indicative Borehole Locations**

## 2.3 Site walkover

A site walkover was conducted by AtkinsRéalis on 08 February 2023. Figure 3 shows the key features of the site identified during the site walkover.

Key features identified in the site walkover included:

- Three derelict farm buildings (including a house) are present on the site. One of these buildings in the central site area is surrounded by a fence (labelled with 'dangerous building' signage), preventing access; and
- three active farm structures: a slurry tank, cow shed (with livestock) and storage shed.

No visual or olfactory evidence of contamination was identified during the site walkover.


**Figure 3 - Tarn Head Farm - Site Walkover Summary**

# 3. Site History

## 3.1 Historical Land Use

The history of the site and surrounding area (within 250 m of the site) has been determined principally by reference to historical maps obtained from Groundsure [5]. In addition, historical aerial imagery has also been viewed (1943-present) and a summary is provided below.

The site has comprised farmland and associated buildings since the earliest available Ordnance Survey map, dated 1860. Whilst there have been incremental changes in respect of the layout of specific buildings on-site, the overall use appears to have remained as agricultural.

The construction and expansion of the current Sellafield nuclear licensed site, commencing in the early 1940s, represents the most significant industrial development in the vicinity of the site. The Sellafield facility was originally developed as a Royal Ordnance Factory during World War 2, responsible for the production of Trinitrotoluene (TNT) and ammunitions. Subsequently, the focus turned to the development of atomic weapons, the production of civil nuclear power, the reprocessing

and management of nuclear waste, and ultimately working towards decommissioning of the legacy structures and facilities. The Sellafield facility is located approximately 195 m east of the site.

An area of very wet, low lying peat bog labelled as Sellafield Tarn is identified on historical mapping, approximately 38 m east of the site. Sellafield has provided evidence which indicates that this area was used to place demolition waste from the demolition of the former Royal Ordnance Factory (located on the current Sellafield site) between 1946-1948. Aerial photographs record the placement of demolition waste into the Sellafield Tarn between 1948 and 1951, after which two sports pitches were created on the Tarn area, with the rest becoming heavily vegetated. It has been suggested by Sellafield that the predominant demolition waste materials are likely to comprise broken concrete and bricks, asphalt and asbestos containing materials (ACMs). Some evidence suggests that controls were put in place to ensure that significant (e.g. detonable) volumes of free TNT, its constituents, or its degradation products were not disposed of in Sellafield Tarn, however there is potential that some of the demolition material deposited in the Tarn was contaminated with these substances. Sellafield has advised that there is no record which indicates any radiological waste from the subsequent usage of the Sellafield site as a nuclear licensed site, was deposited at the Tarn.

Figure 4 below shows the location of the waste deposition area in relation to the Tarn Head Farm site.


**Figure 4 - Aerial Photo of Tarn Head Farm from the East, 1950.**

# 4. Environmental setting

## 4.1 Published geology

Information provided by Groundsure [5] and the British Geological Survey (BGS) GeoIndex [6] indicates that the following geology is present underlying the site.

Figure 5 below visually shows the superficial deposits at and within 250 m of the site.

Figure 6 below visually shows the bedrock deposits at and within 250 m of the site.

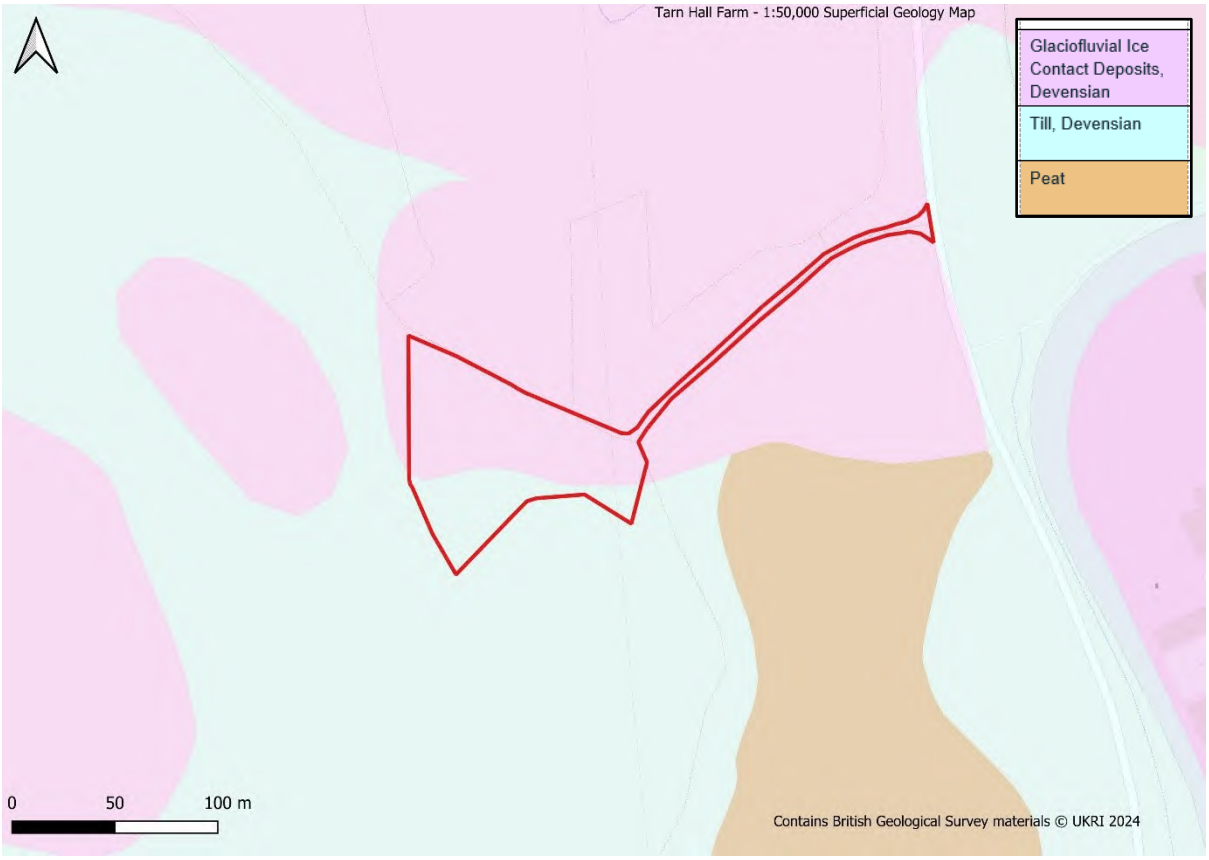


**Figure 5 - BGS 1:50,000 superficial geology map**

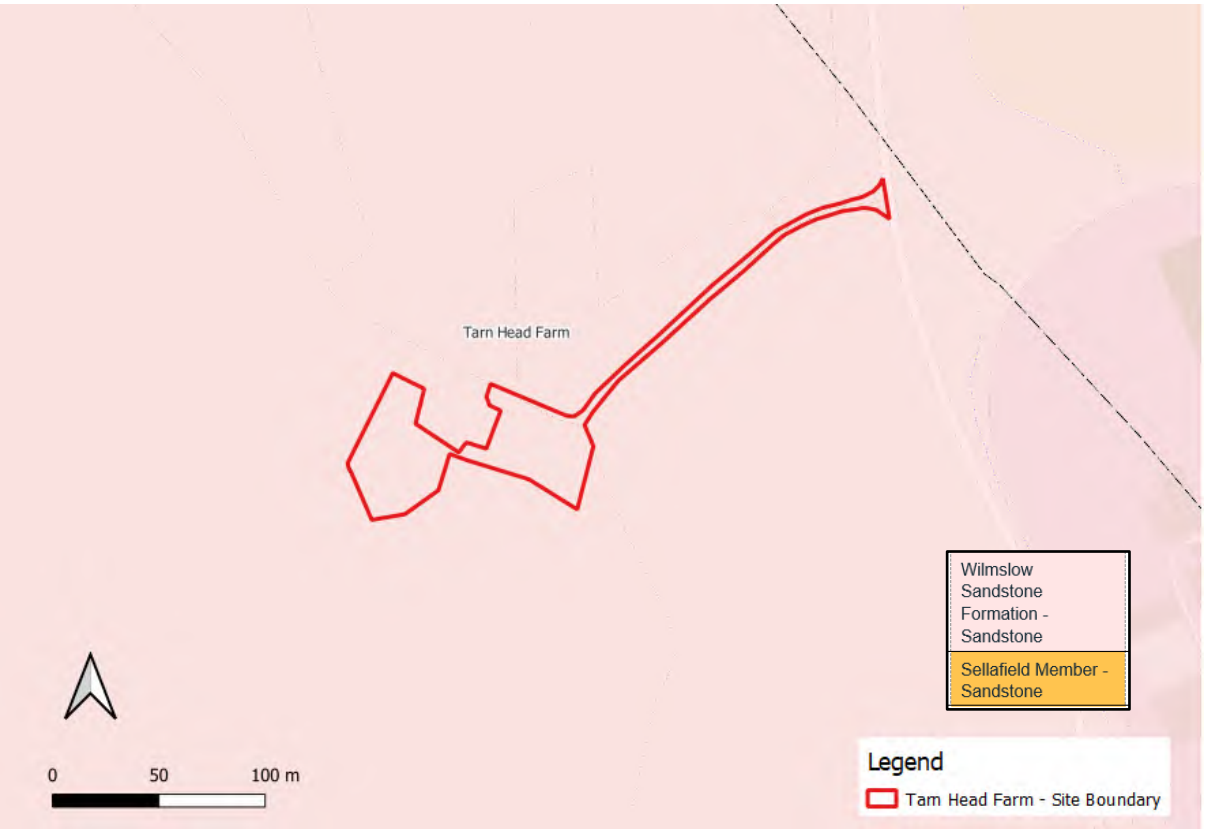


**Figure 6 - BGS 1:50,000 bedrock geology map**

### 4.1.1 Artificial ground

No Made Ground or artificial ground was identified on the BGS 1:10,000 mapping provided as part of the Groundsure report [5].

However, it is anticipated that localised Made Ground will be present on site associated with its historical usage as agricultural land (with associated buildings). Within the wider area, demolition waste is understood to have been placed at the Sellafield Tarn approximately 38 m east of the site.

The nearby Sellafield nuclear licensed site has an extensive industrial history and will have associated Made Ground deposits underlying it.

### 4.1.2 Superficial deposits

A summary of the superficial geology encountered on site and within 250 m of the site boundary is provided in Table 4-1.

**Table 4-1 – Superficial geology summary**

| Data source (scale) | Description | Direction from site boundary | Distance from site boundary | Additional details |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Superficial Geology (1:50,000) | Glaciofluvial Ice Contact Deposits, Devensian | On site | | Sand, Gravel and Boulders |
| Superficial Geology (1:50,000) | Till, Devensian | On site | | Diamicton |
| Superficial Geology (1:50,000) | Peat | East | 38 m | Peat |

Colours relate to geology key for BGS Superficial Geology Map in Figure 5.

Table 4-1 does not present a deposition sequence.

### 4.1.3 Bedrock

A summary of the bedrock geology encountered on site and within 250 m of the site boundary is provided in Table 4-2.

Two faults are recorded within 250 m of the site from the Groundsure report [5]. The closest is 11 m north east of the site, trending north-west to south-east. The second is located 76 m south-east of the site, trending south-west to north-east.

**Table 4-2 – Bedrock geology summary**

| Data source (scale) | Description | Direction from site boundary | Distance from site boundary |
|---|---|---|---|
| Bedrock Geology (1:50,000) | Wilmslow Sandstone Formation - Sandstone | On site | On-Site |
| Bedrock Geology (1:50,000) | Sellafield Member - Sandstone | South-east | 76 m |

Colours relate to geology key for BGS Bedrock Geology Map in Figure 6.

## 4.2 Historical borehole records

There are no BGS boreholes on site, and the nearest recorded historical BGS boreholes are located approximately 175 m from the site, along the present Sellafield A595 Access Road. These are considered too far from the site to assess the geology, and are therefore not considered on Figure 7 (however are listed within the Groundsure Report [5]).

A ground investigation undertaken by NuGen in 2018 included part of the Tarn Head Farm site. The logs from the investigation were assessed by Sellafield in a report [7] covering the area, and superficial geology encountered within the boreholes reviewed in this report are generally described as bands of granular sands and gravels with interbedded clay or silt horizons.
This report also indicates that the site overlies the Ehen buried channel – an incised feature within the sandstone bedrock. Bedrock, where encountered, has been recorded on site at -40 m AOD. If this is consistent across the site then the proposed boreholes to approximately 30 m bgl will not reach bedrock.


**Figure 7 - Existing borehole records**

## 4.3 Mining

Coal Authority viewer [8] indicates that the site is not within a coal mining reporting area, or a development high risk area. The Groundsure report [5] does not record any other underground workings within the wider area. Underground mine workings are therefore not considered to be a potential constraint to the proposed ground investigation activities temporary use.

## 4.4 Radon

Information from the BGS and Public Health England (PHE) provided by Groundsure [5] indicates that the site has a less than 1% of properties having a radon potential at or above the action level. The UK Radon Map [9] indicates that the maximum radon potential is <1%. Radon is not considered to be a potential constraint to the proposed ground investigation activities temporary use.

## 4.5 Hydrogeology

The Groundsure report [5] was used to identify hydrology features on and within 250 m of the site. Identified features have been listed within Table 4-3.

**Table 4-3 – Hydrogeology**

| Feature | Description |
|---|---|
| Superficial aquifers | Glaciofluvial deposits are designated as secondary A aquifers. Till is designated as a secondary undifferentiated aquifer.<br>Peat is designated as an unproductive aquifer |
| Bedrock aquifers | Wilmslow Sandstone Formation sandstone is designated as a principal aquifer. |
| Groundwater vulnerability | Superficial and bedrock aquifers at the site are designated as high vulnerability. |
| Groundwater source protection zone | No groundwater source protection zones are located on or within 250m of the site. |
| Groundwater abstractions | No groundwater abstractions have been identified on or within 250m of the site. |
| Groundwater discharge consents | No groundwater discharge consents have been identified on or within 250m of the site. |

Aquifer descriptions:

**Principal aquifer:** 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

**Secondary A aquifer:** 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.

**Unproductive strata:** These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

## 4.6 Hydrology

The Groundsure report [5] was used to identify hydrology features on and within 250 m of the site. Identified features have been listed within Table 4-4.

**Table 4-4 – Hydrology**

| Feature | Description |
|---|---|
| Surface water courses | According to the Environment Agency "Catchment Data Explorer" there are no Water Framework Directive (WFD) [10] water bodies within 250 m of the site. The closest is the River Ehen (Lower) located approximately 398 m south west of the site.<br><br>The Groundsure report lists a number of surface water features within 250 m of the site, described as "inland rivers not influenced by normal tidal action". These are typically associated with areas of marshy or boggy wetlands to the east and south of the site. |

| Feature | Description |
|---|---|
| Surface water discharge consents | No surface water discharge consents have been identified within 250 m of the site. |
| Surface Water Abstraction Licences | No surface water abstractions have been identified on or within 250 m of the site. |
| Flood risk | No risk of flooding from rivers and seas have been identified on site or within 50 m of the site.<br>The highest surface water flooding return period is 1 in 30 years, with a maximum depth of 1.0 m.<br>A high risk of groundwater flooding is present across the majority of the site and within 50m of the site.<br>This report does not purport to be a formal flood risk assessment. |

# 5. Environmental records

Environmental records were reviewed from the Groundsure report [5], available online sources, and site walkover notes. The following relevant items were identified as part of this review:

- The data from Groundsure indicates there is one Control of Major Accident Hazards (COMAH) sites/planning hazardous substance consents within 250 m of the site. This is the Sellafield nuclear licensed site, located approximately 195 m east of the site.
- The data from Groundsure identified a grade three agricultural land classification on site. The classification was described as good to moderate quality agricultural land.
- According to freely available online risk maps [11], there is a low risk of UXO on the site.
- No radioactive substance authorisations were recorded on site, or within 250 m. It should be noted that the Sellafield facility (195 m east) is a nuclear licensed site with a long legacy of the production, reprocessing, storage and discharge of radioactive materials under relevant site licenses and permits.
- No evidence of archaeological features, contaminated land designations or petrol stations were identified.

# 6. Initial Conceptual Site Model and Preliminary Risk Assessment

## 6.1 Introduction

This report has been prepared to assist in the identification of potential constraints that land contamination might pose to the proposed temporary ground investigation works by presenting a PRA. The assessment methodology used is similar to that derived for the determination of statutory Contaminated Land, as defined in Part 2A of the Environmental Protection Act 1995 [12] which is assessed through the identification and assessment of contaminant linkages (Source-Pathway-Receptor relationships). Implicit in the Defra statutory guidance [12] is the application of risk assessment to consider whether potential contaminant linkages may be significant.

Primary guidance for assessing and managing land contamination is presented in LCRM [3]. This provides a technical framework for identifying and remediating contamination through the application of a risk management process. The question of whether risk is unacceptable in any particular case involves not only scientific and technical assessments, but also appropriate criteria by which to judge the risk and conclude exactly what risk would be unacceptable. In accordance with guidance provided in LCRM [3], human health, property/services and wider environmental receptors and pathways have been assessed based on the proposed temporary site use for ground investigation.

An initial conceptual site model (CSM) has been developed based on the available information, to enable the assessment of the potential land contamination. An initial CSM describes the relationship between potential sources of contamination (resulting from both on- and off-site historical and current activities) and receptors to the potential contamination. As part of the initial CSM development, three elements are identified and assessed:

- Potential source of contamination and associated contaminants.
- Receptors to that contamination – human beings, controlled waters (surface water/groundwater), ecological systems and property/services; and
- Pathways between the potential sources and receptors.

Where all three elements are present or are likely to be present, they are described as a potential contaminant linkage (PCL), which can then be subjected to the risk assessment and risk management process (if necessary).

The preliminary risk categorisations presented are based on an assessment of the potential consequence of each PCL occurring along with the likelihood that each PCL will occur. Potential contaminants that might be present have been identified through knowledge of the current and historical land uses on or adjoining the site.

## 6.2 Initial Conceptual Site Model

### 6.2.1 Potential sources

A number of potentially contaminative sources have been identified within the site boundary, and in close proximity to the site.

On site:

- Localised Made Ground from general historical site activities;
- Localised contamination from historical site activities (for example, leakage of oil, petrol or diesel from farming equipment, slurry tank leakage, use and/or leak of pesticides, herbicides and fertilisers);
- Possible ACMs within the fabric of the existing buildings.
- Potentially contaminated groundwater.

- Off site:
  - Demolition waste deposits from the Royal Ordnance Factory (infill at Sellafield Tarn);
  - Peat at Sellafield Tarn (natural source of ground gas);
  - Agricultural use;
  - Sellafield facility (195 m east); and
  - Potentially contaminated groundwater.

Potential contaminants associated with the above on-site sources include:
- inorganics including metals and metalloids, cyanide, sulphate, ammonia;
- organics including phenols, Total Petroleum Hydrocarbons (TPH), Polycyclic Aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene, and xylenes (BTEX), volatile and semi volatile organic compounds (VOCs/SVOCs);
- fertilisers, herbicides and pesticides;
- asbestos; and
- ground gases.

Potential contaminants associated with the above off-site sources include:
- inorganics including metals and metalloids, cyanide, sulphate, ammonia;
- organics including phenols, TPHs, PAHs, BTEX, VOCs and SVOCs;
- fertilisers, herbicides and pesticides;
- asbestos;
- explosives (TNT and associated chemicals);
- radionuclides; and
- ground gases.

Note – There is potential for contamination from off-site sources to have migrated onto the site.

### 6.2.2 Potential receptors

The following receptors have been identified:
- Human Health:
  - On-site – Site operatives for the temporary ground investigation and return monitoring visits.
  - On-site – Farm workers accessing buildings in northwestern site area (e.g. storage shed and cow shed).

- Controlled Waters:
  - Groundwater – secondary A superficial aquifer.
  - Groundwater – principal bedrock aquifer.

No relevant surface water receptors have been identified. The nearest WFD surface water body is the River Ehen (Lower) located approximately 398 m south west of the site.

- Property and Services:
  - On-site derelict buildings;
  - On-site active buildings (e.g. slurry tank, cow shed, equipment shed).
  - On-site livestock (e.g. cows).

No potentially sensitive ecological land designations have been identified as described in Defra statutory guidance [12].

Given the limited nature of the proposed works, viable PCLs to off-site farmland (including farm operatives, buildings, crops and livestock) have been discounted.

### 6.2.3 Potential pathways

Considering the identified potential sources and receptors, the following pathways are considered plausible based on the information gathered to date:

- On-site Human Health
  - Dermal contact, ingestion and/or inhalation of soil/dust/groundwater from the site.
  - Inhalation of vapours and/or ground gasses sourced from the site or off-site.
- Controlled Waters
  - Possible creation of preferential pathways during drilling and monitoring well installation.
- On-site Property and Services:
  - Possible creation of preferential pathways during drilling and monitoring well installation.

Site operatives for the drilling works and return monitoring may come into contact with soil/dust, groundwater, ground gas and vapours during their works.

Drilling and monitoring well installation have the potential to create preferential pathways between shallow and deep groundwater.

The proposed works are temporary ground investigation activities and not a permanent change to site use. No changes to the permanent structures are proposed. Therefore, the PCLs relevant to farm workers, property and services are limited to the possible creation of preferential pathways for ground gas and vapour only.

## 6.3 Preliminary Risk Assessment

Table 6-1 below provides the qualitative risk matrix, based on CIRIA guidance [13], in which the likelihood or probability of each contaminant linkage being realised is ranked against the severity of the consequences. The result is the relative risk classification, the results of which can inform the decision of whether risk management measures are needed or not.

**Table 6-1 - Qualitative Risk Matrix**

| Risk Matrix | | Severity of Consequence | | | |
|---|---|---|---|---|---|
| | | Severe | Medium | Mild | Mild |
| Probability of Contaminant Linkage | High Likelihood | Very High Risk | High Risk | Moderate Risk | Moderate/Low Risk |
| | Likely | High Risk | Moderate Risk | Moderate/Low Risk | Low Risk |
| | Low Likelihood | Moderate Risk | Moderate/Low Risk | Low Risk | Very Low Risk |
| | Unlikely | Moderate/Low Risk | Low Risk | Very Low Risk | Very Low Risk |

Definitions of the risk and probability classifications presented in the guidance are given in Table 6-2 and Table 6-3 below.

**Table 6-2 - Risk Classifications**

| Risk Classification | Definition |
|---|---|
| Very High Risk | There is a high probability that severe harm could arise to a designated receptor from an identified source, or there is evidence that severe harm to a designated receptor is currently happening. |
| High Risk | Harm is likely to arise to a designated receptor from an identified source. |
| Moderate Risk | It is possible that harm could arise to a designated receptor from an identified source. However, it is relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. |
| Low Risk | It is possible that harm could arise to a designated receptor from an identified source, but it is likely that this harm, if realised, would at worst normally be mild. |
| Very Low Risk | There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe. |

**Table 6-3 - Classification of Probability**

| Risk Classification | Definition |
|---|---|
| High Likelihood | There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the longer term, or there is evidence at the receptor of harm or pollution. |
| Likely | There is a pollution linkage and all the elements are present and in the right place, which means that it is probably that an event will occur. |

| Risk Classification | Definition |
|---|---|
| Low Likelihood | There is a pollution linkage and circumstances are possible under which an even could occur. |
| Unlikely | There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term. |

The individual sources, pathways and receptors identified in previous sections are judged against this risk matrix and professional judgement has been used to estimate the combination of probability of a contaminant linkage being realised and the consequence of the harm that might result in line with CIRIA C552 [13]. Details of the potential contaminant linkages and associated risks are recorded in Table 6-4.

**Table 6-4 - Initial Conceptual Site Model**

| Sources | Pathway | Receptor | Probability | Consequence | Classification of Risk |
|---|---|---|---|---|---|
| Potential contaminants in soil/groundwater from on-site sources:<br>Localised Made Ground from historical site activities;<br>Localised contamination from historical site activities (for example, leakage of oil, petrol or diesel from farming equipment, slurry tank leakage, use and/or leak of pesticides, herbicides and fertilisers);<br>Possible ACMs within the fabric of the existing buildings;<br>Potentially contaminated groundwater. | Dermal contact, ingestion and inhalation of soil/dust/groundwater contaminated by on-site sources | Site operatives for the temporary ground investigation and return monitoring visits | Unlikely | Minor | VERY LOW RISK<br>Under current health and safety legislation, construction site workers are required to carry out appropriate risk assessments and instigate appropriate mitigating measures for contamination. The relevant risks must be adequately mitigated in accordance with the Construction Design Management (CDM) Regulations [14].On this basis, it has been assumed that suitable personal protective equipment (PPE) (where necessary) and health and safety good practices will be adopted during the ground investigation activities. Therefore, the probability of a PCL is unlikely.<br>Human health effects easily prevented by use of PPE fall under the definition of minor consequence. |
| | Inhalation of vapours and/or ground gasses sourced from the site | | Unlikely | Minor | |
| | Possible creation of preferential pathways for ground gas and/or vapours during drilling and well installation | On-site property and services | Unlikely | Mild | VERY LOW RISK<br>It has also been assumed that the ground investigation contractor would implement standard good practice by not installing monitoring wells bridging between significant contamination or ground gas source zones (if identified) and uncontaminated ground. Therefore, the probability of a PCL is unlikely.<br>Damage to building/services rendering them unsafe to occupy falls under the definition of mild consequence. |
| | | Farm workers accessing buildings in northwestern site area | Unlikely | Medium | LOW RISK<br>It has also been assumed that the ground investigation contractor would implement standard good practice by not installing monitoring wells bridging between significant contamination or ground gas source zones (if identified) and uncontaminated ground. Therefore, the probability of a PCL is unlikely.<br>Chronic damage to human health from gas or vapour inhalation falls under the definition of medium consequence. |
| | Possible creation of preferential pathways during drilling and well installation resulting in increased contaminant migration to groundwaters | Controlled waters (secondary A superficial aquifer and principal bedrock aquifer) | Unlikely | Medium | LOW RISK<br>It has been assumed that in accordance with standard good practice the Principal Contractor for the ground investigation would ensure robust risk assessment of site activities and implement clean drilling techniques if necessary (if significant evidence of contamination was encountered, for instance).<br>It has also been assumed that the ground investigation contractor would implement standard good practice by not installing monitoring wells bridging between significant contamination (if identified) and uncontaminated ground. Therefore, the probability of a PCL is unlikely.<br>Pollution of sensitive water resources falls under the definition of medium consequence. |
| Potential contaminants originating from the following off-site sources:<br>Demolition waste from the Royal Ordnance Factory (infill at Sellafield Tarn);<br>Peat at Sellafield Tarn;<br>Agricultural use | Dermal contact, ingestion and inhalation of soil/dust/groundwater contaminated by off-site sources | Site operatives for the temporary ground investigation and return monitoring visits | Unlikely | Minor | VERY LOW RISK<br>Under current health and safety legislation, construction site workers are required to carry out appropriate risk assessments and instigate appropriate mitigating measures for contamination. The relevant risks must be adequately mitigated in accordance with the CDM Regulations [14]. On this basis, it has been assumed that suitable PPE (where necessary) and health and safety good practices will be adopted during the ground investigation activities. Therefore, the probability of a PCL is unlikely.<br>Human health effects easily prevented by use of PPE fall under the definition of minor consequence. |

| Sources | Pathway | Receptor | Probability | Consequence | Classification of Risk |
|---|---|---|---|---|---|
| Sellafield facility (195 m east)<br>Potentially contaminated groundwater. | Inhalation of vapours and/or ground gasses sourced from off-site | | Unlikely | Minor | |
| | | Farm workers accessing buildings in northwestern site area | Unlikely | Medium | LOW RISK<br>It has also been assumed that the ground investigation contractor would implement standard good practice by not installing monitoring wells bridging between significant contamination or ground gas source zones (if identified) and uncontaminated ground. Therefore, the probability of a PCL is unlikely.<br>Chronic damage to human health from gas or vapour inhalation falls under the definition of medium consequence. |

# 7. Conclusions

The PRA for the proposed temporary use of the site for ground investigation activities has identified PCLs with a maximum 'low risk' classification. Although the ground at the site and in the surrounding area has the potential to include some contamination, the land contamination risks applicable for the proposed ground investigation activities can be suitably managed by the implementation of standard good practice for site investigation e.g. contractor risk assessments and method statements in accordance with CDM Regulations [14], and appropriate PPE. On this basis there is no unacceptable risk [3] and the site is suitable for the proposed use in accordance with the NPPF [1]. No further land contamination risk assessment in accordance with the LCRM process is necessary and no remediation is required.

This report can be submitted to the local planning authority in support of the proposed planning application for the ground investigation activities. On acceptance of the report by the local planning authority (and acceptance of all other relevant planning submissions), the ground investigation can proceed in accordance with the assessments herein.

# 8. References


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# APPENDICES

# Appendix A. **Example Borehole Photograph**

# Appendix B. Groundsure Report

Groundsure LOCATION INTELLIGENCE

Enviro+Geo Insight

# Combined Mid and Head Tarn

## Order Details

**Date:** 03/04/2024

**Your ref:** Combined

**Our Ref:** GSIP-2024-14785-18147

## Site Details

**Location:** 302125 504299

**Area:** 1.48 ha

**Authority:** Cumberland Council ↗






Contact us with any questions at:
info@groundsure.com ↗
01273 257 755

## Summary of findings

| Page | Section | Past land use > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 14 > | 1.1 > | Historical industrial land uses > | 0 | 0 | 3 | 20 | - |
| 15 > | 1.2 > | Historical tanks > | 0 | 0 | 1 | 16 | - |
| 16 | 1.3 | Historical energy features | 0 | 0 | 0 | 0 | - |
| 17 | 1.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 17 | 1.5 | Historical garages | 0 | 0 | 0 | 0 | - |
| 17 > | 1.6 > | Historical military land > | 0 | 0 | 1 | 0 | - |
| Page | Section | Past land use - un-grouped > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 18 > | 2.1 > | Historical industrial land uses > | 0 | 0 | 4 | 32 | - |
| 20 > | 2.2 > | Historical tanks > | 0 | 0 | 2 | 24 | - |
| 21 | 2.3 | Historical energy features | 0 | 0 | 0 | 0 | - |
| 21 | 2.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 22 | 2.5 | Historical garages | 0 | 0 | 0 | 0 | - |
| Page | Section | Waste and landfill > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 23 | 3.1 | Active or recent landfill | 0 | 0 | 0 | 0 | - |
| 23 | 3.2 | Historical landfill (BGS records) | 0 | 0 | 0 | 0 | - |
| 24 | 3.3 | Historical landfill (LA/mapping records) | 0 | 0 | 0 | 0 | - |
| 24 | 3.4 | Historical landfill (EA/NRW records) | 0 | 0 | 0 | 0 | - |
| 24 > | 3.5 > | Historical waste sites > | 0 | 0 | 0 | 1 | - |
| 25 | 3.6 | Licensed waste sites | 0 | 0 | 0 | 0 | - |
| 25 > | 3.7 > | Waste exemptions > | 0 | 0 | 0 | 1 | - |
| Page | Section | Current industrial land use > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 26 > | 4.1 > | Recent industrial land uses > | 0 | 0 | 5 | - | - |
| 27 | 4.2 | Current or recent petrol stations | 0 | 0 | 0 | 0 | - |
| 27 | 4.3 | Electricity cables | 0 | 0 | 0 | 0 | - |
| 27 | 4.4 | Gas pipelines | 0 | 0 | 0 | 0 | - |
| 27 | 4.5 | Sites determined as Contaminated Land | 0 | 0 | 0 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 27 > | 4.6 > | Control of Major Accident Hazards (COMAH) > | 0 | 0 | 1 | 0 | - |
| 28 | 4.7 | Regulated explosive sites | 0 | 0 | 0 | 0 | - |
| 28 | 4.8 | Hazardous substance storage/usage | 0 | 0 | 0 | 0 | - |
| 28 | 4.9 | Historical licensed industrial activities (IPC) | 0 | 0 | 0 | 0 | - |
| 28 | 4.10 | Licensed industrial activities (Part A(1)) | 0 | 0 | 0 | 0 | - |
| 29 > | 4.11 > | Licensed pollutant release (Part A(2)/B) > | 0 | 0 | 0 | 1 | - |
| 29 | 4.12 | Radioactive Substance Authorisations | 0 | 0 | 0 | 0 | - |
| 29 > | 4.13 > | Licensed Discharges to controlled waters > | 0 | 0 | 0 | 4 | - |
| 30 | 4.14 | Pollutant release to surface waters (Red List) | 0 | 0 | 0 | 0 | - |
| 30 | 4.15 | Pollutant release to public sewer | 0 | 0 | 0 | 0 | - |
| 30 | 4.16 | List 1 Dangerous Substances | 0 | 0 | 0 | 0 | - |
| 30 > | 4.17 > | List 2 Dangerous Substances > | 0 | 0 | 0 | 2 | - |
| 31 | 4.18 | Pollution Incidents (EA/NRW) | 0 | 0 | 0 | 0 | - |
| 31 | 4.19 | Pollution inventory substances | 0 | 0 | 0 | 0 | - |
| 31 | 4.20 | Pollution inventory waste transfers | 0 | 0 | 0 | 0 | - |
| 31 | 4.21 | Pollution inventory radioactive waste | 0 | 0 | 0 | 0 | - |

| Page | Section | Hydrogeology > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 33 > | 5.1 > | Superficial aquifer > | Identified (within 500m) | | | | |
| 35 > | 5.2 > | Bedrock aquifer > | Identified (within 500m) | | | | |
| 36 > | 5.3 > | Groundwater vulnerability > | Identified (within 50m) | | | | |
| 38 | 5.4 | Groundwater vulnerability- soluble rock risk | None (within 0m) | | | | |
| 38 | 5.5 | Groundwater vulnerability- local information | None (within 0m) | | | | |
| 39 > | 5.6 > | Groundwater abstractions > | 0 | 0 | 0 | 1 | 1 |
| 40 > | 5.7 > | Surface water abstractions > | 0 | 0 | 0 | 0 | 6 |
| 42 > | 5.8 > | Potable abstractions > | 0 | 0 | 0 | 0 | 1 |
| 42 | 5.9 | Source Protection Zones | 0 | 0 | 0 | 0 | - |
| 42 | 5.10 | Source Protection Zones (confined aquifer) | 0 | 0 | 0 | 0 | - |

| Page | Section | Hydrology > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 43 > | 6.1 > | Water Network (OS MasterMap) > | 1 | 5 | 6 | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 45 > | 6.2 > | Surface water features > | 1 | 3 | 5 | - | - |
| 45 > | 6.3 > | WFD Surface water body catchments > | 1 | - | - | - | - |
| 45 > | 6.4 > | WFD Surface water bodies > | 0 | 0 | 0 | - | - |
| 46 > | 6.5 > | WFD Groundwater bodies > | 1 | - | - | - | - |
| Page | Section | River and coastal flooding | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 47 | 7.1 | Risk of flooding from rivers and the sea | None (within 50m) | | | | |
| 47 | 7.2 | Historical Flood Events | 0 | 0 | 0 | - | - |
| 47 | 7.3 | Flood Defences | 0 | 0 | 0 | - | - |
| 48 | 7.4 | Areas Benefiting from Flood Defences | 0 | 0 | 0 | - | - |
| 48 | 7.5 | Flood Storage Areas | 0 | 0 | 0 | - | - |
| 49 | 7.6 | Flood Zone 2 | None (within 50m) | | | | |
| 49 | 7.7 | Flood Zone 3 | None (within 50m) | | | | |
| Page | Section | Surface water flooding > | | | | | |
| 50 > | 8.1 > | Surface water flooding > | 1 in 30 year, Greater than 1.0m (within 50m) | | | | |
| Page | Section | Groundwater flooding > | | | | | |
| 52 > | 9.1 > | Groundwater flooding > | High (within 50m) | | | | |
| Page | Section | Environmental designations > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 53 > | 10.1 > | Sites of Special Scientific Interest (SSSI) > | 0 | 0 | 0 | 0 | 1 |
| 54 | 10.2 | Conserved wetland sites (Ramsar sites) | 0 | 0 | 0 | 0 | 0 |
| 54 | 10.3 | Special Areas of Conservation (SAC) | 0 | 0 | 0 | 0 | 0 |
| 54 | 10.4 | Special Protection Areas (SPA) | 0 | 0 | 0 | 0 | 0 |
| 54 | 10.5 | National Nature Reserves (NNR) | 0 | 0 | 0 | 0 | 0 |
| 55 | 10.6 | Local Nature Reserves (LNR) | 0 | 0 | 0 | 0 | 0 |
| 55 > | 10.7 > | Designated Ancient Woodland > | 0 | 0 | 0 | 0 | 5 |
| 55 | 10.8 | Biosphere Reserves | 0 | 0 | 0 | 0 | 0 |
| 56 | 10.9 | Forest Parks | 0 | 0 | 0 | 0 | 0 |
| 56 > | 10.10 > | Marine Conservation Zones > | 0 | 0 | 0 | 0 | 8 |
| 56 | 10.11 | Green Belt | 0 | 0 | 0 | 0 | 0 |
| 57 | 10.12 | Proposed Ramsar sites | 0 | 0 | 0 | 0 | 0 |

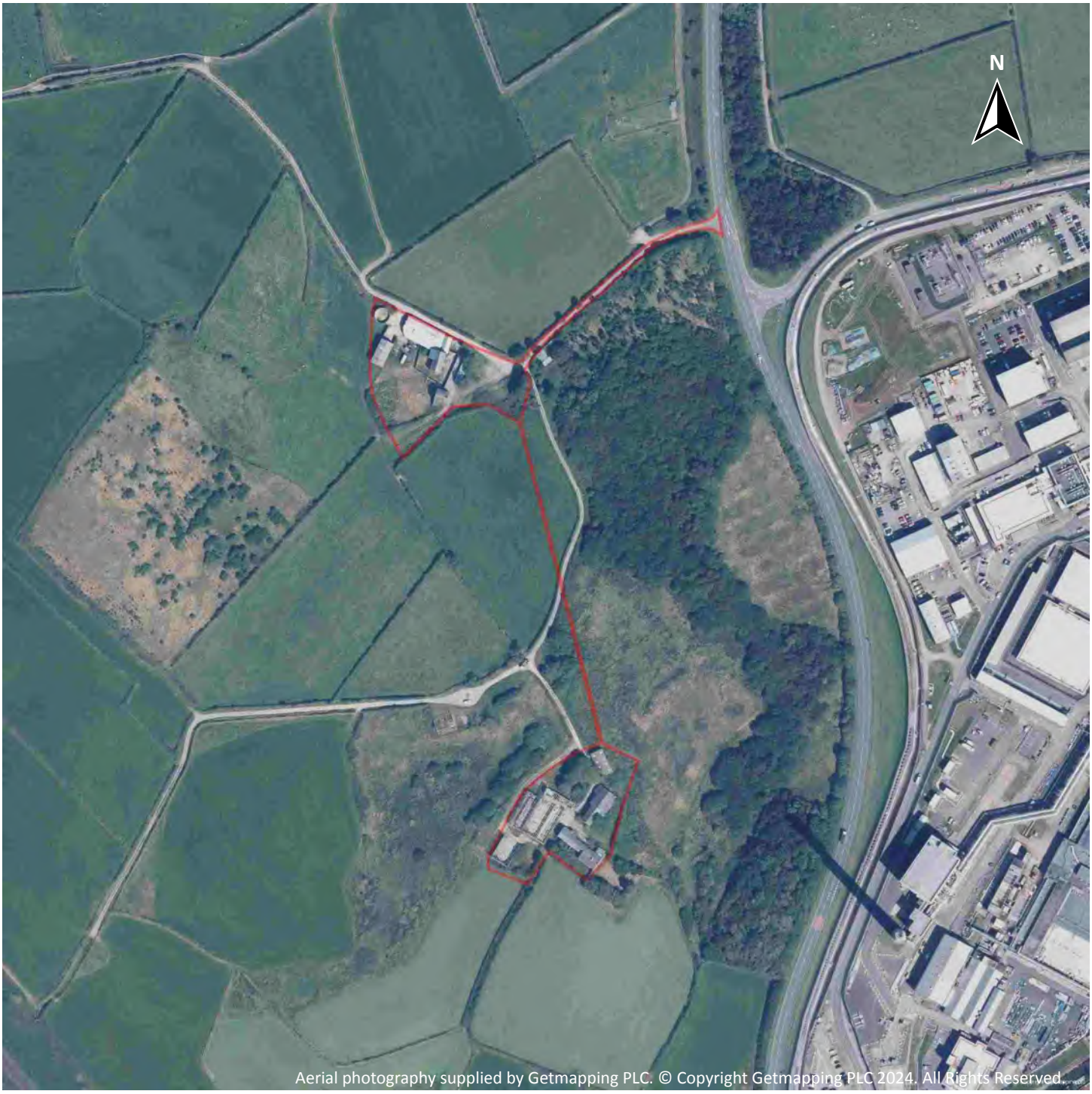
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 57 | 10.13 | Possible Special Areas of Conservation (pSAC) | 0 | 0 | 0 | 0 | 0 |
| 57 | 10.14 | Potential Special Protection Areas (pSPA) | 0 | 0 | 0 | 0 | 0 |
| 57 | 10.15 | Nitrate Sensitive Areas | 0 | 0 | 0 | 0 | 0 |
| 58 | 10.16 | Nitrate Vulnerable Zones | 0 | 0 | 0 | 0 | 0 |
| 59 > | 10.17 > | SSSI Impact Risk Zones > | 1 | - | - | - | - |
| 60 > | 10.18 > | SSSI Units > | 0 | 0 | 0 | 0 | 1 |
| Page | Section | Visual and cultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 62 | 11.1 | World Heritage Sites | 0 | 0 | 0 | - | - |
| 62 | 11.2 | Area of Outstanding Natural Beauty | 0 | 0 | 0 | - | - |
| 62 | 11.3 | National Parks | 0 | 0 | 0 | - | - |
| 62 | 11.4 | Listed Buildings | 0 | 0 | 0 | - | - |
| 63 | 11.5 | Conservation Areas | 0 | 0 | 0 | - | - |
| 63 | 11.6 | Scheduled Ancient Monuments | 0 | 0 | 0 | - | - |
| 63 | 11.7 | Registered Parks and Gardens | 0 | 0 | 0 | - | - |
| Page | Section | Agricultural designations > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 64 > | 12.1 > | Agricultural Land Classification > | Urban (within 250m) | | | | |
| 65 > | 12.2 > | Open Access Land > | 0 | 1 | 0 | - | - |
| 65 | 12.3 | Tree Felling Licences | 0 | 0 | 0 | - | - |
| 65 | 12.4 | Environmental Stewardship Schemes | 0 | 0 | 0 | - | - |
| 66 | 12.5 | Countryside Stewardship Schemes | 0 | 0 | 0 | - | - |
| Page | Section | Habitat designations > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 67 > | 13.1 > | Priority Habitat Inventory > | 1 | 5 | 5 | - | - |
| 68 | 13.2 | Habitat Networks | 0 | 0 | 0 | - | - |
| 68 | 13.3 | Open Mosaic Habitat | 0 | 0 | 0 | - | - |
| 68 | 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 |
| 70 > | 14.1 > | 10k Availability > | Identified (within 500m) | | | | |
| 71 | 14.2 | Artificial and made ground (10k) | 0 | 0 | 0 | 0 | - |
| 72 | 14.3 | Superficial geology (10k) | 0 | 0 | 0 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 72 | 14.4 | Landslip (10k) | 0 | 0 | 0 | 0 | - |
| 73 | 14.5 | Bedrock geology (10k) | 0 | 0 | 0 | 0 | - |
| 73 | 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 |
| 74 > | 15.1 > | 50k Availability > | Identified (within 500m) | | | | |
| 75 | 15.2 | Artificial and made ground (50k) | 0 | 0 | 0 | 0 | - |
| 75 | 15.3 | Artificial ground permeability (50k) | 0 | 0 | - | - | - |
| 76 > | 15.4 > | Superficial geology (50k) > | 6 | 2 | 2 | 12 | - |
| 77 > | 15.5 > | Superficial permeability (50k) > | Identified (within 50m) | | | | |
| 78 | 15.6 | Landslip (50k) | 0 | 0 | 0 | 0 | - |
| 78 | 15.7 | Landslip permeability (50k) | None (within 50m) | | | | |
| 79 > | 15.8 > | Bedrock geology (50k) > | 1 | 0 | 3 | 3 | - |
| 80 > | 15.9 > | Bedrock permeability (50k) > | Identified (within 50m) | | | | |
| 80 > | 15.10 > | Bedrock faults and other linear features (50k) > | 0 | 1 | 3 | 7 | - |
| Page | Section | **Boreholes >** | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 82 > | 16.1 > | BGS Boreholes > | 0 | 2 | 25 | - | - |
| Page | Section | **Natural ground subsidence >** | | | | | |
| 85 > | 17.1 > | Shrink swell clays > | Very low (within 50m) | | | | |
| 87 > | 17.2 > | Running sands > | Low (within 50m) | | | | |
| 89 > | 17.3 > | Compressible deposits > | High (within 50m) | | | | |
| 91 > | 17.4 > | Collapsible deposits > | Very low (within 50m) | | | | |
| 92 > | 17.5 > | Landslides > | Very low (within 50m) | | | | |
| 93 > | 17.6 > | Ground dissolution of soluble rocks > | Negligible (within 50m) | | | | |
| Page | Section | **Mining and ground workings >** | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 95 | 18.1 | BritPits | 0 | 0 | 0 | 0 | - |
| 96 > | 18.2 > | Surface ground workings > | 0 | 3 | 0 | - | - |
| 96 | 18.3 | Underground workings | 0 | 0 | 0 | 0 | 0 |
| 96 | 18.4 | Underground mining extents | 0 | 0 | 0 | 0 | - |
| 96 | 18.5 | Historical Mineral Planning Areas | 0 | 0 | 0 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 97 | 18.6 | Non-coal mining | 0 | 0 | 0 | 0 | 0 |
| 97 | 18.7 | JPB mining areas | None (within 0m) | | | | |
| 97 | 18.8 | The Coal Authority non-coal mining | 0 | 0 | 0 | 0 | - |
| 97 | 18.9 | Researched mining | 0 | 0 | 0 | 0 | - |
| 98 | 18.10 | Mining record office plans | 0 | 0 | 0 | 0 | - |
| 98 | 18.11 | BGS mine plans | 0 | 0 | 0 | 0 | - |
| 98 | 18.12 | Coal mining | None (within 0m) | | | | |
| 98 | 18.13 | Brine areas | None (within 0m) | | | | |
| 98 | 18.14 | Gypsum areas | None (within 0m) | | | | |
| 99 | 18.15 | Tin mining | None (within 0m) | | | | |
| 99 | 18.16 | Clay mining | None (within 0m) | | | | |
| Page | Section | Ground cavities and sinkholes | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 100 | 19.1 | Natural cavities | 0 | 0 | 0 | 0 | - |
| 100 | 19.2 | Mining cavities | 0 | 0 | 0 | 0 | 0 |
| 100 | 19.3 | Reported recent incidents | 0 | 0 | 0 | 0 | - |
| 100 | 19.4 | Historical incidents | 0 | 0 | 0 | 0 | - |
| 101 | 19.5 | National karst database | 0 | 0 | 0 | 0 | - |
| Page | Section | **Radon** > | | | | | |
| **102** > | **20.1** > | **Radon** > | Less than 1% (within 0m) | | | | |
| Page | Section | **Soil chemistry** > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **104** > | **21.1** > | **BGS Estimated Background Soil Chemistry** > | 10 | 7 | - | - | - |
| 105 | 21.2 | BGS Estimated Urban Soil Chemistry | 0 | 0 | - | - | - |
| 105 | 21.3 | BGS Measured Urban Soil Chemistry | 0 | 0 | - | - | - |
| Page | Section | **Railway infrastructure and projects** > | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 106 | 22.1 | Underground railways (London) | 0 | 0 | 0 | - | - |
| 106 | 22.2 | Underground railways (Non-London) | 0 | 0 | 0 | - | - |
| 107 | 22.3 | Railway tunnels | 0 | 0 | 0 | - | - |
| **107** > | **22.4** > | **Historical railway and tunnel features** > | 0 | 0 | 3 | - | - |
| 107 | 22.5 | Royal Mail tunnels | 0 | 0 | 0 | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 107 | 22.6 | Historical railways | 0 | 0 | 0 | - | - |
| 108 | 22.7 | Railways | 0 | 0 | 0 | - | - |
| 108 | 22.8 | Crossrail 1 | 0 | 0 | 0 | 0 | - |
| 108 | 22.9 | Crossrail 2 | 0 | 0 | 0 | 0 | - |
| 108 | 22.10 | HS2 | 0 | 0 | 0 | 0 | - |

## Recent aerial photograph




Capture Date: 20/04/2022

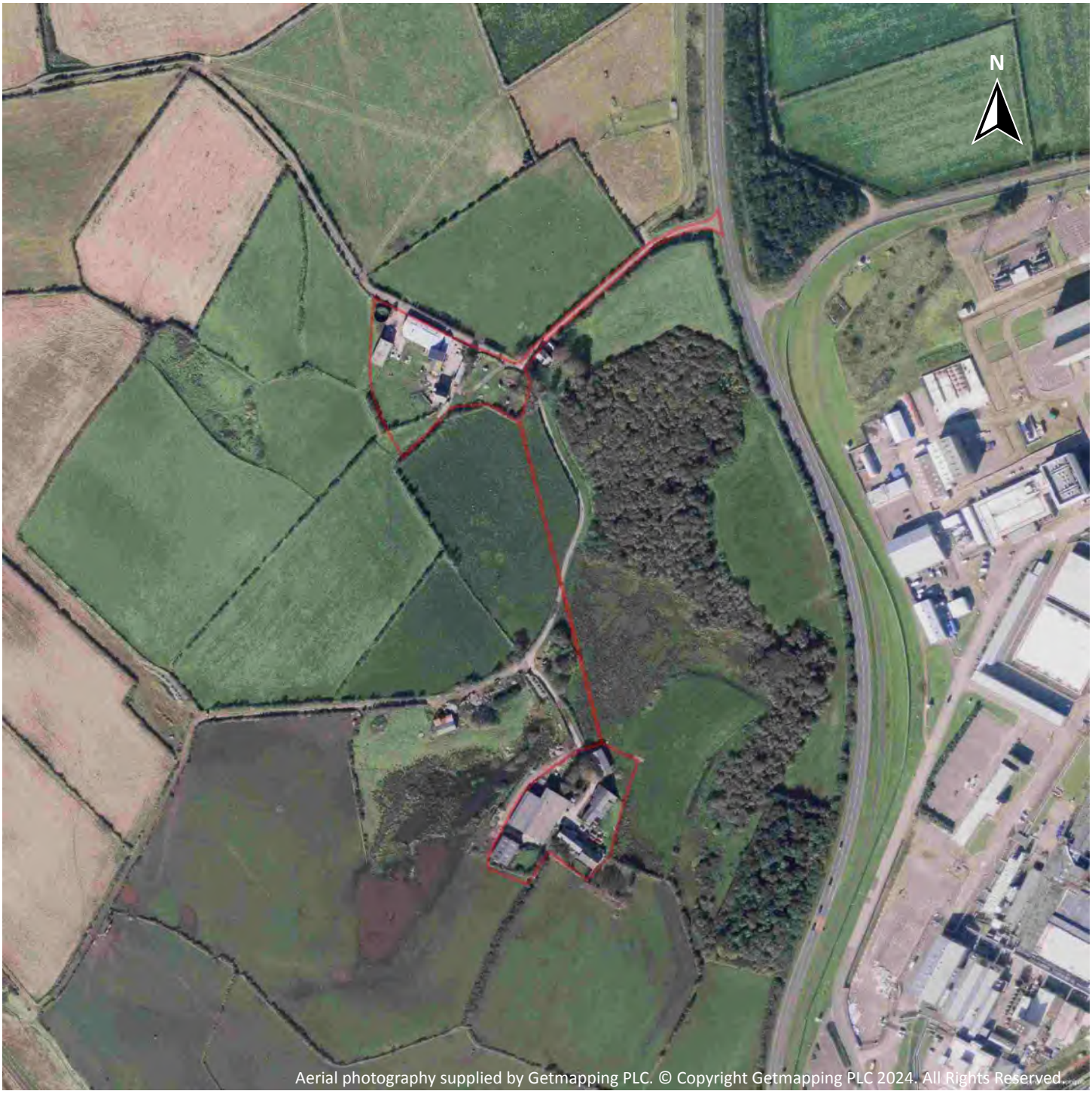
Site Area: 1.48ha

## Recent site history - 2018 aerial photograph


Capture Date: 10/10/2018

Site Area: 1.48ha

## Recent site history - 2008 aerial photograph




Capture Date: 05/10/2008

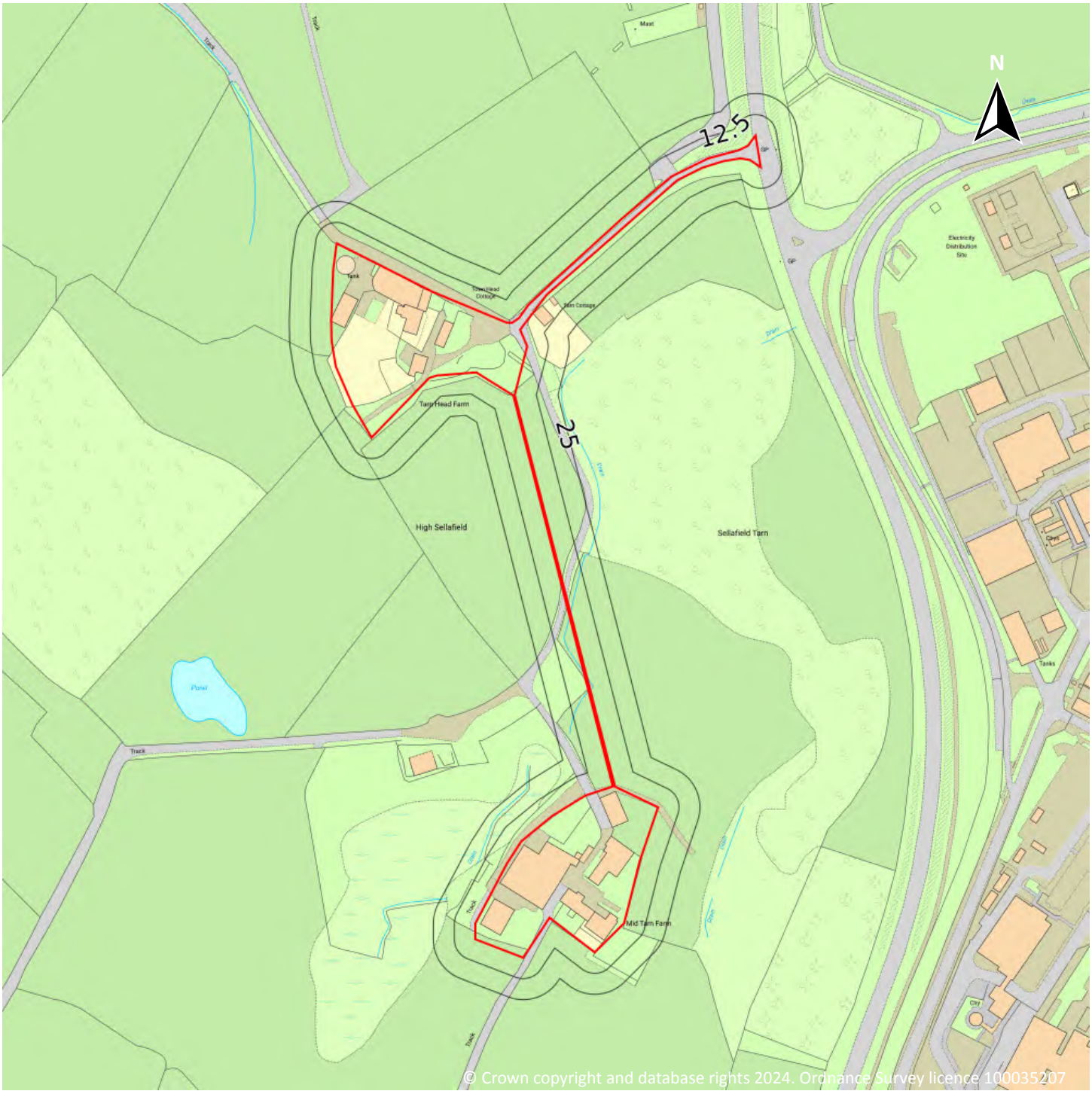
Site Area: 1.48ha

## Recent site history - 2000 aerial photograph


Capture Date: 16/06/2000

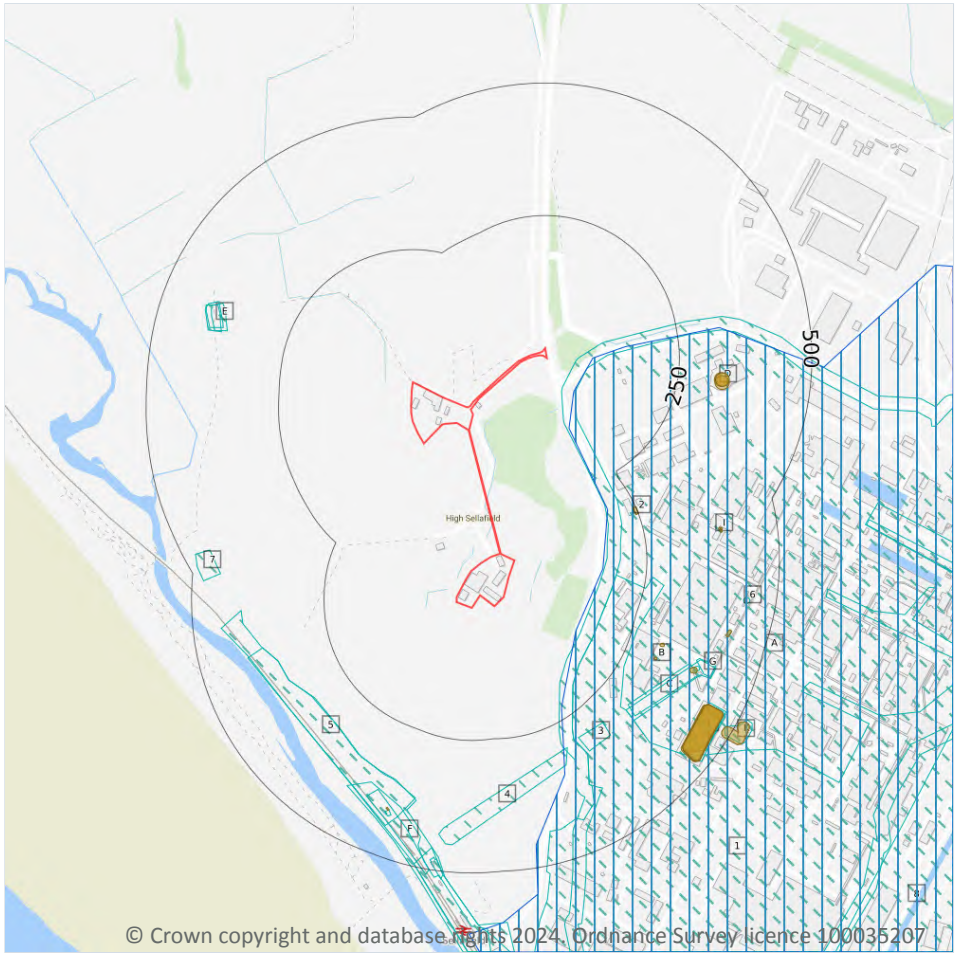
Site Area: 1.48ha

## OS MasterMap site plan




Site Area: 1.48ha

# 1 Past land use




Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical military land

## 1.1 Historical industrial land uses

| Records within 500m | 23 |
|---|---|

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

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

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| A | 51m NE | Unspecified Works | 1971 - 1976 | 626733 |

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| A | 76m NE | Unspecified Works | 1991 | 598174 |
| 1 | 184m SE | Railway Sidings | 1971 - 1976 | 604228 |
| 3 | 294m SE | Cuttings | 1971 - 1991 | 612403 |
| 4 | 300m S | Cuttings | 1971 - 1991 | 621437 |
| C | 310m SE | Cuttings | 1991 | 607022 |
| C | 314m SE | Cuttings | 1971 - 1976 | 622470 |
| 5 | 323m SW | Railway Sidings | 1976 - 1991 | 620940 |
| E | 363m NW | Cuttings | 1976 - 1991 | 636675 |
| E | 372m NW | Cuttings | 1900 | 605186 |
| E | 373m NW | Cuttings | 1951 | 629453 |
| F | 376m S | Railway Sidings | 1951 | 604683 |
| G | 383m SE | Cuttings | 1991 | 613574 |
| H | 383m S | Railway Sidings | 1900 | 616947 |
| G | 384m SE | Unspecified Tank | 1991 | 550972 |
| H | 412m S | Railway Building | 1900 - 1951 | 635613 |
| J | 435m SE | Unspecified Tanks | 1971 - 1976 | 629642 |
| J | 436m SE | Unspecified Tanks | 1991 | 589802 |
| 6 | 439m E | Unspecified Tank | 1991 | 551001 |
| 7 | 448m W | Cuttings | 1976 - 1991 | 631677 |
| 8 | 458m S | Railway Sidings | 1991 | 632873 |
| F | 476m S | Railway Building | 1976 - 1991 | 598121 |
| K | 486m SE | Unspecified Tanks | 1991 | 570310 |

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

## 1.2 Historical tanks

| **Records within 500m** | **17** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or

succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

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

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| 2 | 245m E | Tanks | 1990 - 1996 | 77757 |
| B | 307m SE | Unspecified Tank | 1967 | 72944 |
| B | 308m SE | Unspecified Tank | 1984 - 1996 | 77778 |
| D | 319m NE | Unspecified Tank | 1990 | 77319 |
| D | 321m NE | Unspecified Tank | 1996 | 77595 |
| D | 321m NE | Unspecified Tank | 1967 - 1986 | 76759 |
| G | 377m SE | Unspecified Tank | 1984 - 1996 | 77624 |
| I | 390m E | Unspecified Tank | 1990 | 76526 |
| I | 392m E | Unspecified Tank | 1996 | 72942 |
| I | 393m E | Unspecified Tank | 1986 | 77151 |
| H | 408m S | Unspecified Tank | 1967 | 72945 |
| A | 424m SE | Tanks | 1967 | 74985 |
| J | 428m SE | Tanks | 1984 - 1990 | 76953 |
| J | 430m SE | Tanks | 1967 | 77507 |
| J | 430m SE | Tanks | 1986 | 76780 |
| J | 431m SE | Tanks | 1996 | 76656 |
| K | 483m SE | Tanks | 1990 | 74986 |

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

## 1.3 Historical energy features

| **Records within 500m** | **0** |
|---|---|

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

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

## 1.4 Historical petrol stations

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

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

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

## 1.5 Historical garages

| Records within 500m | 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 un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

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

## 1.6 Historical military land

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

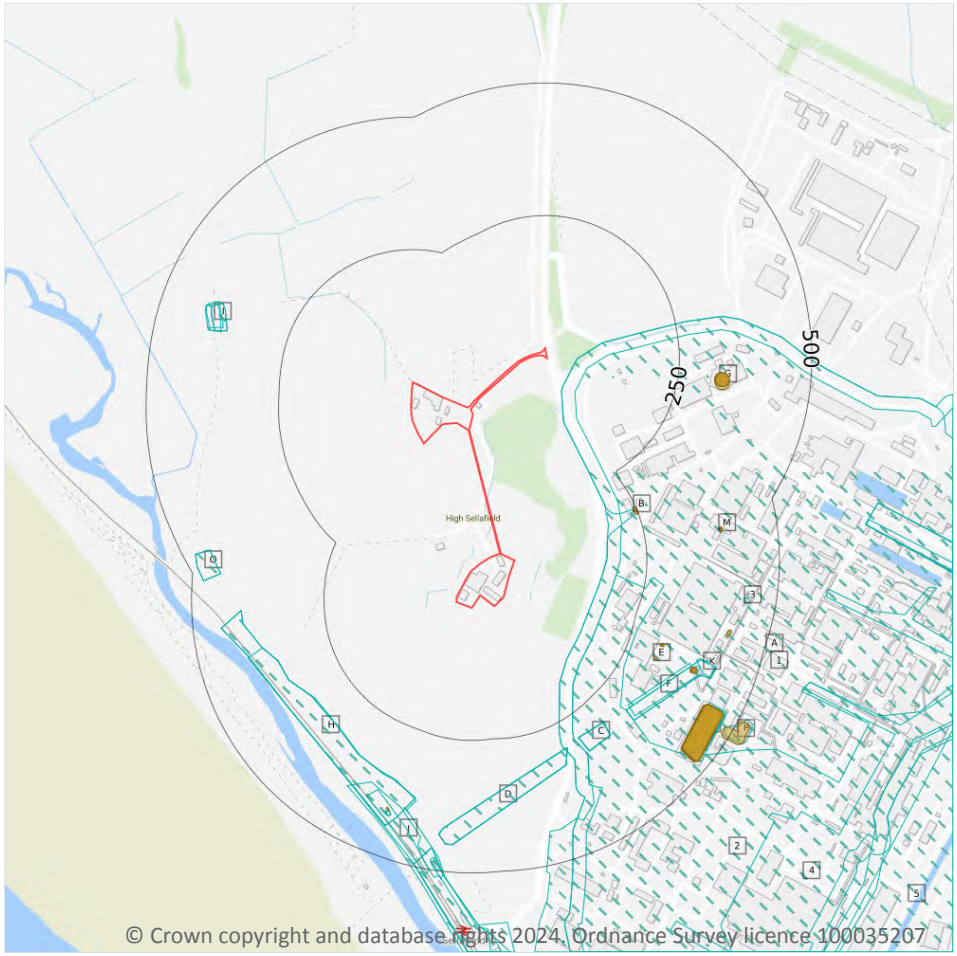
Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

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

| ID | Location | Site Name | Date of Operation | Activities |
|---|---|---|---|---|
| A | 75m NE | ROF Sellafield | c.1943 - Present | c.1942: Site construction; February 1943: TNT production, inspection/packaging of small arms ammunition; since c.1947: Production of nuclear weapons. |

*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

## 2.1 Historical industrial land uses

| Records within 500m | 36 |
|---|---|

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

Features are displayed on the Past land use - un-grouped map on **page 18 >**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| A | 51m NE | Unspecified Works | 1971 | 626733 |
| A | 51m NE | Unspecified Works | 1976 | 626733 |
| 1 | 76m NE | Unspecified Works | 1991 | 598174 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| 2 | 184m SE | Railway Sidings | 1971 | 604228 |
| C | 294m SE | Cuttings | 1971 | 612403 |
| C | 294m SE | Cuttings | 1976 | 612403 |
| C | 294m SE | Cuttings | 1991 | 612403 |
| D | 300m S | Cuttings | 1971 | 621437 |
| D | 300m S | Cuttings | 1976 | 621437 |
| D | 300m S | Cuttings | 1991 | 621437 |
| F | 310m SE | Cuttings | 1991 | 607022 |
| F | 314m SE | Cuttings | 1971 | 622470 |
| F | 314m SE | Cuttings | 1976 | 622470 |
| H | 323m SW | Railway Sidings | 1976 | 620940 |
| H | 323m SW | Railway Sidings | 1991 | 620940 |
| I | 363m NW | Cuttings | 1976 | 636675 |
| I | 363m NW | Cuttings | 1991 | 636675 |
| I | 372m NW | Cuttings | 1900 | 605186 |
| I | 373m NW | Cuttings | 1951 | 629453 |
| J | 376m S | Railway Sidings | 1951 | 604683 |
| K | 383m SE | Cuttings | 1991 | 613574 |
| L | 383m S | Railway Sidings | 1900 | 616947 |
| K | 384m SE | Unspecified Tank | 1991 | 550972 |
| L | 412m S | Railway Building | 1951 | 635613 |
| L | 413m S | Railway Building | 1900 | 635613 |
| N | 435m SE | Unspecified Tanks | 1971 | 629642 |
| N | 435m SE | Unspecified Tanks | 1976 | 629642 |
| N | 436m SE | Unspecified Tanks | 1991 | 589802 |
| 3 | 439m E | Unspecified Tank | 1991 | 551001 |
| O | 448m W | Cuttings | 1976 | 631677 |
| O | 448m W | Cuttings | 1991 | 631677 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| 4 | 458m S | Railway Sidings | 1976 | 604228 |
| 5 | 458m S | Railway Sidings | 1991 | 632873 |
| J | 476m S | Railway Building | 1991 | 598121 |
| J | 478m S | Railway Building | 1976 | 598121 |
| P | 486m SE | Unspecified Tanks | 1991 | 570310 |

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

## 2.2 Historical tanks

| **Records within 500m** | **26** |
|---|---|

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

Features are displayed on the Past land use - un-grouped map on **page 18 >**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| B | 245m E | Tanks | 1990 | 77757 |
| B | 245m E | Tanks | 1996 | 77757 |
| E | 307m SE | Unspecified Tank | 1967 | 72944 |
| E | 308m SE | Unspecified Tank | 1984 | 77778 |
| E | 308m SE | Unspecified Tank | 1990 | 77778 |
| E | 311m SE | Unspecified Tank | 1986 | 77778 |
| E | 311m SE | Unspecified Tank | 1996 | 77778 |
| G | 319m NE | Unspecified Tank | 1990 | 77319 |
| G | 321m NE | Unspecified Tank | 1996 | 77595 |
| G | 321m NE | Unspecified Tank | 1986 | 76759 |
| G | 321m NE | Unspecified Tank | 1967 | 76759 |
| K | 377m SE | Unspecified Tank | 1984 | 77624 |
| K | 377m SE | Unspecified Tank | 1990 | 77624 |
| K | 380m SE | Unspecified Tank | 1986 | 77624 |
| K | 380m SE | Unspecified Tank | 1996 | 77624 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| M | 390m E | Unspecified Tank | 1990 | 76526 |
| M | 392m E | Unspecified Tank | 1996 | 72942 |
| M | 393m E | Unspecified Tank | 1986 | 77151 |
| L | 408m S | Unspecified Tank | 1967 | 72945 |
| A | 424m SE | Tanks | 1967 | 74985 |
| N | 428m SE | Tanks | 1984 | 76953 |
| N | 428m SE | Tanks | 1990 | 76953 |
| N | 430m SE | Tanks | 1967 | 77507 |
| N | 430m SE | Tanks | 1986 | 76780 |
| N | 431m SE | Tanks | 1996 | 76656 |
| P | 483m SE | Tanks | 1990 | 74986 |

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

## 2.3 Historical energy features

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

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'.

*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.*

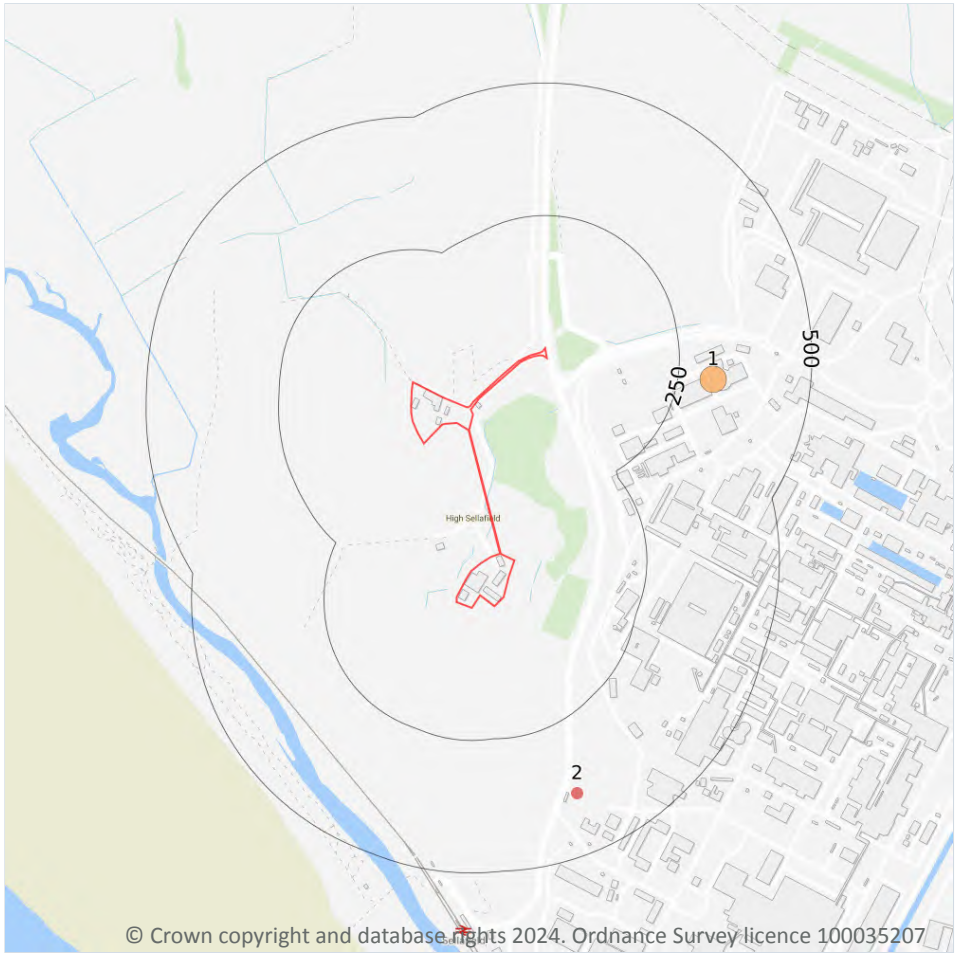
## 2.5 Historical garages

| 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)

Historical 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 | 1 |
|---|---|

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

Features are displayed on the Waste and landfill map on **page 23 >**

| ID | Location | Address | Further Details | Date |
|---|---|---|---|---|
| 1 | 291m NE | Site Address: Sellafield Works, Gosforth, Seascale, Cumbria, CA20 1A | Type of Site: Waste Transfer Building<br>Planning application reference: 4/13/9011/0F2<br>Description: Scheme comprises section 73 application to replace extant planning permission 4/11/9006 in order to extend the time limit for implementation for the construction of a building for the transit of containerised intermediate level radioactive waste. The ass ociated works include sewer systems, landscaping, infrastructure, enabling works, cable laying and access roads.<br>Data source: Historic Planning Application<br>Data Type: Point | 28/11/2013 |

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

## 3.6 Licensed waste sites

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

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

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

## 3.7 Waste exemptions

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

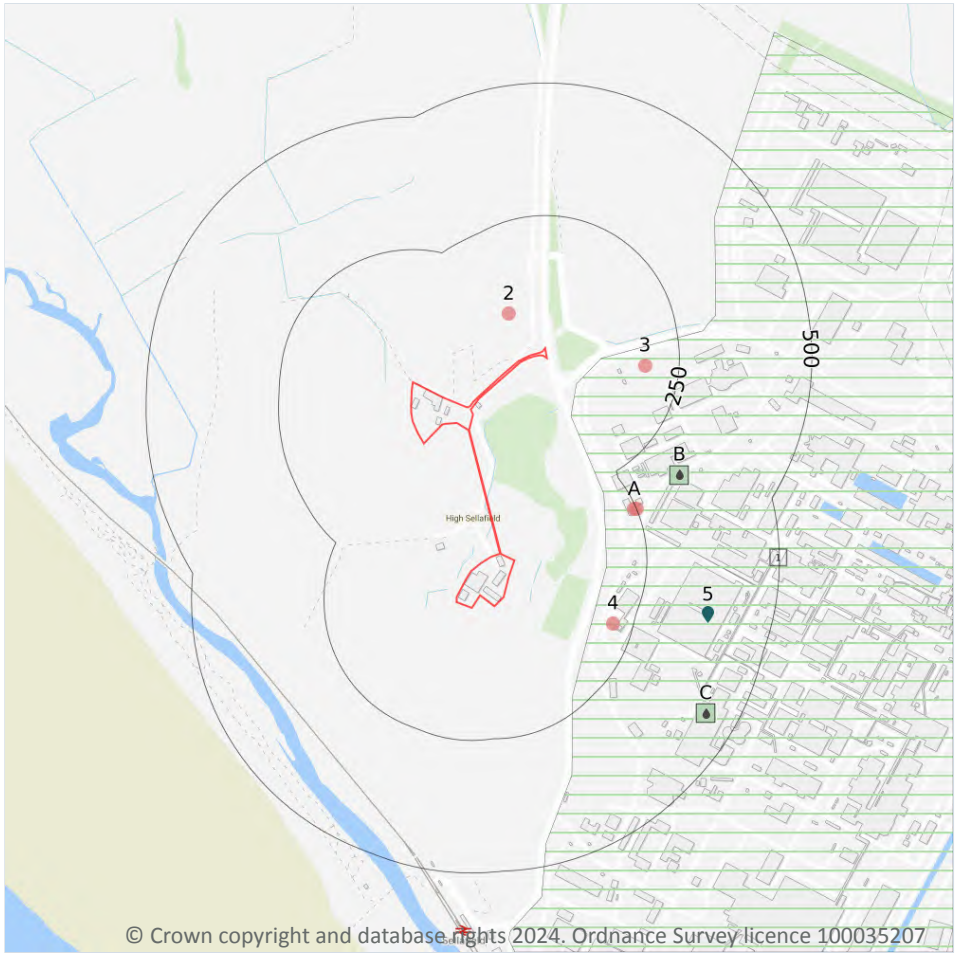
Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on **page 23 >**

| ID | Location | Site | Reference | Category | Sub-Category | Description |
|---|---|---|---|---|---|---|
| 2 | 386m S | HINTON HOUSE, BIRCHWOOD PARK AVENUE, BIRCHWOOD, WARRINGTON, WA3 6GR | WEX092584 | Using waste exemption | Not on a farm | Use of waste in construction |

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

# 4 Current industrial land use




Site Outline

Search buffers in metres (m)

Recent industrial land uses

Control of Major Accident Hazards

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

Licensed Discharges to controlled waters

List 2 Dangerous Substances

## 4.1 Recent industrial land uses

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

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 26 >**

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| 2 | 88m N | Mast | Cumbria, CA20 | Telecommunications Features | Infrastructure and Facilities |
| 3 | 185m NE | Pylon | Cumbria, CA22 | Electrical Features | Infrastructure and Facilities |
| 4 | 212m SE | Chimney | Cumbria, CA22 | Chimneys | Industrial Features |

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| A | 246m E | Tank | Cumbria, CA22 | Tanks (Generic) | Industrial Features |
| A | 250m E | Tank | Cumbria, CA22 | Tanks (Generic) | Industrial Features |

*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 26 >**

| ID | Location | Company | Address | Operational status | Tier |
|---|---|---|---|---|---|
| 1 | 74m NE | Sellafield Limited | Sellafield Limited, Sellafield, Nuclear Site, Seascale, Cumbria, CA20 1PG | Current COMAH Site | COMAH Upper 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 | 1 |
|---|---|

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 26 >**

| ID | Location | Address | Details | |
|---|---|---|---|---|
| 5 | 379m SE | Aea Technology B76/77, Sellafield, Seascale, Cumbria, CA20 1PG | Process: cement/lime/mortar process<br>Status: Historical Permit<br>Permit Type: Part B | Enforcement: No Enforcements Notified<br>Date of enforcement: No Enforcements Notified<br>Comment: No Enforcements 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 26 >**

| ID | Location | Address | Details | |
|---|---|---|---|---|
| B | 332m E | SEASCALE FORESHORE PUMPING STATION, SELLAFIELD, SEASCALE, CUMBRIA, CA20 1PG | Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER<br>Permit Number: 017490281<br>Permit Version: 3<br>Receiving Water: IRISH SEA | Status: REVOKED - UNSPECIFIED<br>Issue date: -<br>Effective Date: 12/07/1995<br>Revocation Date: 10/10/1996 |
| B | 332m E | SEASCALE FORESHORE PUMPING STATION, SELLAFIELD, SEASCALE, CUMBRIA, CA20 1PG | Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER<br>Permit Number: 017490281<br>Permit Version: 2<br>Receiving Water: IRISH SEA | Status: REVOKED - UNSPECIFIED<br>Issue date: -<br>Effective Date: 17/01/1994<br>Revocation Date: 11/07/1995 |

| ID | Location | Address | Details | |
|---|---|---|---|---|
| C | 439m SE | SEASCALE FORESHORE PUMPING STATION, SELLAFIELD, SEASCALE, CUMBRIA, CA20 1PG | Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER<br>Permit Number: 017490281<br>Permit Version: 2<br>Receiving Water: IRISH SEA | Status: REVOKED - UNSPECIFIED<br>Issue date: -<br>Effective Date: 17/01/1994<br>Revocation Date: 11/07/1995 |
| C | 439m SE | SEASCALE FORESHORE PUMPING STATION, SELLAFIELD, SEASCALE, CUMBRIA, CA20 1PG | Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER<br>Permit Number: 017490281<br>Permit Version: 3<br>Receiving Water: IRISH SEA | Status: REVOKED - UNSPECIFIED<br>Issue date: -<br>Effective Date: 12/07/1995<br>Revocation Date: 10/10/1996 |

*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 | 2 |
|---|---|

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.

Features are displayed on the Current industrial land use map on **page 26 >**

| ID | Location | Name | Status | Receiving Water | Authorised Substances |
|---|---|---|---|---|---|
| B | 333m E | Bnfl Plc, Sellafield Laundry Waste Discharge | Not Active | Cumbrian Coast (irish Sea) | Chromium, Copper, Lead, Nickel, Zinc |
| C | 440m SE | Bnfl Plc, Sellafield Sea Tanks Discharge | Not Active | Cumbrian Coast (irish Sea) | Chromium, Copper, Iron, Lead, Nickel, Zinc |

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

## 4.18 Pollution Incidents (EA/NRW)

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

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

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

## 4.19 Pollution inventory substances

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

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

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

## 4.20 Pollution inventory waste transfers

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

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

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

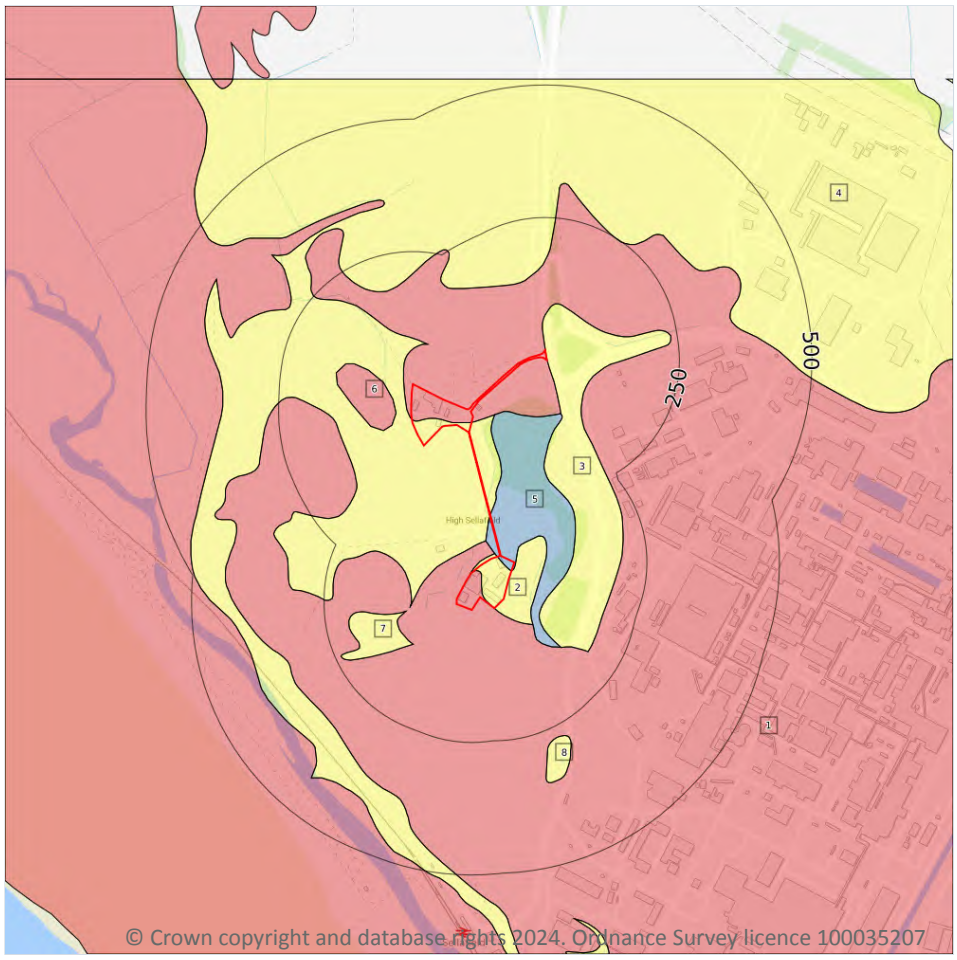
## 4.21 Pollution inventory radioactive waste

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

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

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

# 5 Hydrogeology - Superficial aquifer




Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive
- Unknown

## 5.1 Superficial aquifer

| Records within 500m | 8 |
|---|---|

Aquifer status of groundwater held within superficial geology.

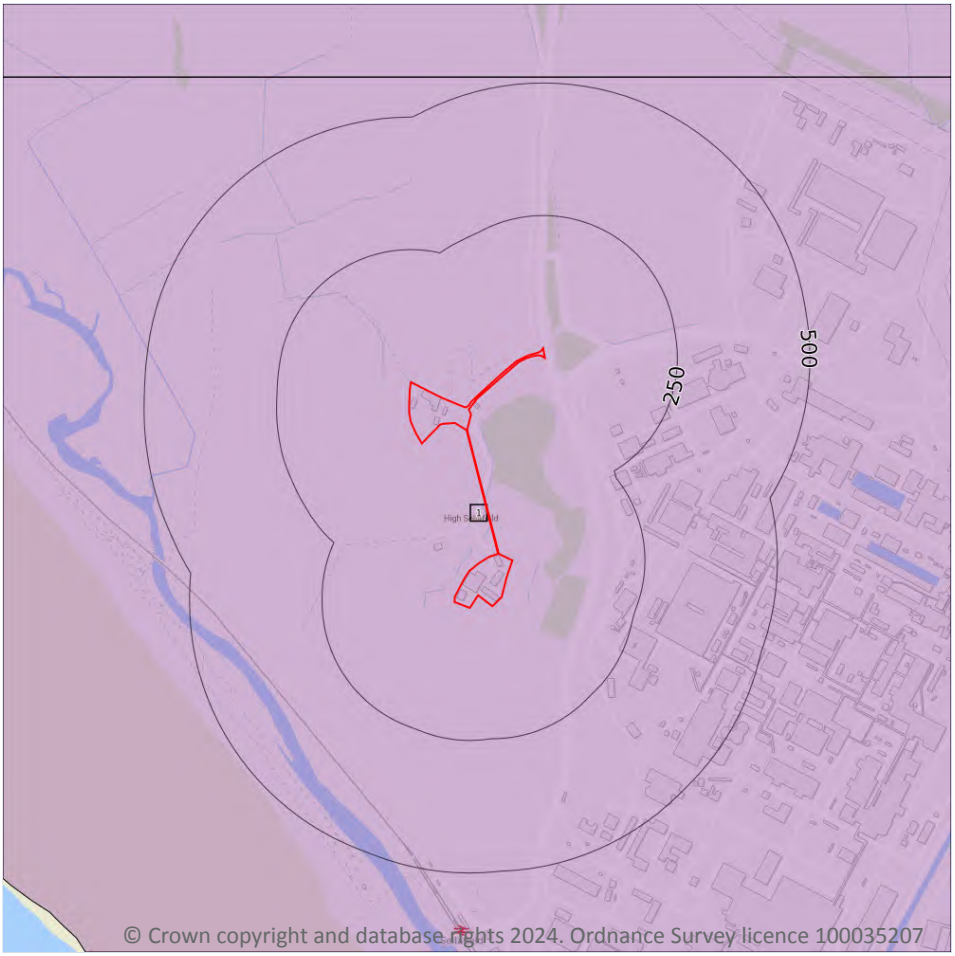
Features are displayed on the Hydrogeology map on **page 33 >**

| ID | Location | Designation | Description |
|---|---|---|---|
| 1 | On site | Secondary A | Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers |
| 2 | On site | Secondary Undifferentiated | Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type |

| ID | Location | Designation | Description |
|---|---|---|---|
| **3** | **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** |
| **4** | **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** |
| **5** | **On site** | **Unproductive** | **These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow** |
| 6 | 28m NW | Secondary A | Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers |
| 7 | 97m SW | 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 |
| 8 | 271m S | 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




Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive

## 5.2 Bedrock aquifer

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

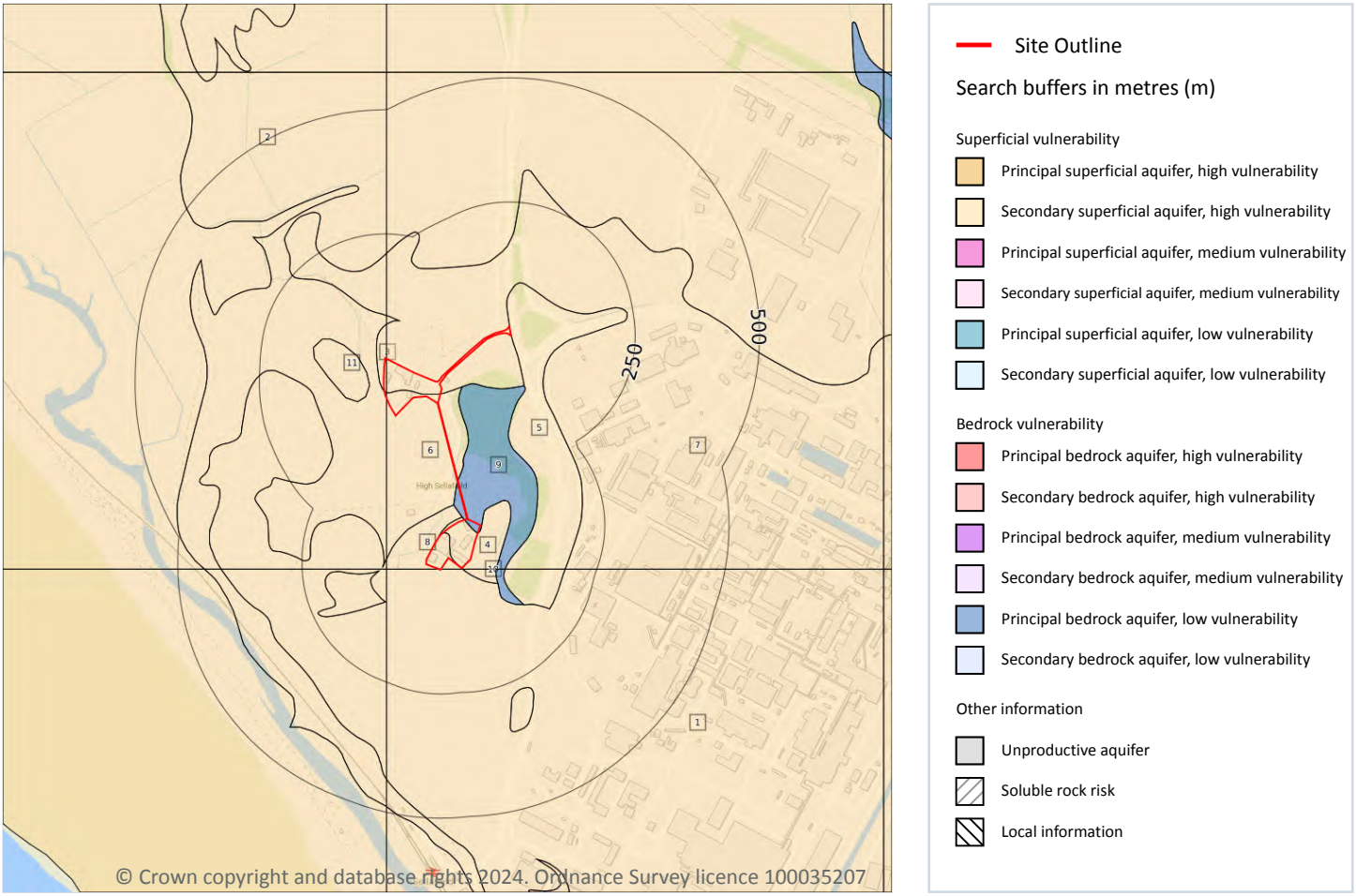
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 35 >**

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

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

# Groundwater vulnerability




## 5.3 Groundwater vulnerability

| Records within 50m | 11 |
|---|---|

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

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

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

| ID | Location | Summary | Soil / surface | Superficial geology | Bedrock geology |
|---|---|---|---|---|---|
| 1 | On site | Summary Classification: Secondary superficial aquifer - High Vulnerability<br>Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High<br>Infiltration value: >70%<br>Dilution value: >550mm/year | Vulnerability: High<br>Aquifer type: Secondary<br>Thickness: >10m<br>Patchiness value: >90%<br>Recharge potential: High | Vulnerability: Low<br>Aquifer type: Principal<br>Flow mechanism: Mixed |
| 2 | On site | Summary Classification: Secondary superficial aquifer - High Vulnerability<br>Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High<br>Infiltration value: >70%<br>Dilution value: >550mm/year | Vulnerability: High<br>Aquifer type: Secondary<br>Thickness: >10m<br>Patchiness value: >90%<br>Recharge potential: High | Vulnerability: Low<br>Aquifer type: Principal<br>Flow mechanism: Mixed |
| 3 | On site | Summary Classification: Secondary superficial aquifer - High Vulnerability<br>Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High<br>Infiltration value: >70%<br>Dilution value: >550mm/year | Vulnerability: High<br>Aquifer type: Secondary<br>Thickness: >10m<br>Patchiness value: >90%<br>Recharge potential: High | Vulnerability: Low<br>Aquifer type: Principal<br>Flow mechanism: Mixed |
| 4 | On site | Summary Classification: Secondary superficial aquifer - High Vulnerability<br>Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High<br>Infiltration value: >70%<br>Dilution value: >550mm/year | Vulnerability: High<br>Aquifer type: Secondary<br>Thickness: >10m<br>Patchiness value: >90%<br>Recharge potential: High | Vulnerability: Low<br>Aquifer type: Principal<br>Flow mechanism: Mixed |
| 5 | On site | Summary Classification: Secondary superficial aquifer - High Vulnerability<br>Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High<br>Infiltration value: >70%<br>Dilution value: >550mm/year | Vulnerability: High<br>Aquifer type: Secondary<br>Thickness: >10m<br>Patchiness value: >90%<br>Recharge potential: High | Vulnerability: Low<br>Aquifer type: Principal<br>Flow mechanism: Mixed |
| 6 | On site | Summary Classification: Secondary superficial aquifer - High Vulnerability<br>Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High<br>Infiltration value: >70%<br>Dilution value: >550mm/year | Vulnerability: High<br>Aquifer type: Secondary<br>Thickness: >10m<br>Patchiness value: >90%<br>Recharge potential: High | Vulnerability: Low<br>Aquifer type: Principal<br>Flow mechanism: Mixed |
| 7 | On site | Summary Classification: Secondary superficial aquifer - High Vulnerability<br>Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High<br>Infiltration value: >70%<br>Dilution value: >550mm/year | Vulnerability: High<br>Aquifer type: Secondary<br>Thickness: >10m<br>Patchiness value: >90%<br>Recharge potential: High | Vulnerability: Low<br>Aquifer type: Principal<br>Flow mechanism: Mixed |

| ID | Location | Summary | Soil / surface | Superficial geology | Bedrock geology |
|---|---|---|---|---|---|
| **8** | **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: >550mm/year** | **Vulnerability: High Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High** | **Vulnerability: Low Aquifer type: Principal Flow mechanism: Mixed** |
| **9** | **On site** | **Summary Classification: Principal bedrock aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Unproductive Superficial Aquifer** | **Leaching class: High Infiltration value: >70% Dilution value: >550mm/year** | **Vulnerability: Unproductive Aquifer type: Unproductive Thickness: >10m Patchiness value: >90% Recharge potential: High** | **Vulnerability: Low Aquifer type: Principal Flow mechanism: Mixed** |
| 10 | 2m S | Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High Infiltration value: >70% Dilution value: >550mm/year | Vulnerability: High Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High | Vulnerability: Low Aquifer type: Principal Flow mechanism: Mixed |
| 11 | 28m NW | Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High Infiltration value: >70% Dilution value: >550mm/year | Vulnerability: High Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High | Vulnerability: Low Aquifer type: Principal Flow mechanism: Mixed |

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

## 5.4 Groundwater vulnerability- soluble rock risk

| **Records on site** | **0** |
|---|---|

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

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

## 5.5 Groundwater vulnerability- local information

| **Records on site** | **0** |
|---|---|

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

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

# Abstractions and Source Protection Zones


Site Outline

Search buffers in metres (m)

Source Protection Zone 1
Inner catchment

Source Protection Zone 2
Outer catchment

Source Protection Zone 3
Total catchment

Source Protection Zone 4
Zone of Special Interest

Source Protection Zone 1c
Inner catchment - confined aquifer

Source Protection Zone 2c
Outer catchment - confined aquifer

Source Protection Zone 3c
Total catchment - confined aquifer

Drinking water abstraction licences

Drinking water abstraction licences
Polygon features

Drinking water abstraction licences
Linear features

Groundwater abstraction licence (point)

Groundwater abstraction licence (area)

Groundwater abstraction licence (linear)

Surface Water Abstractions (point)

Surface Water Abstractions (area)

Surface Water Abstractions (linear)

## 5.6 Groundwater abstractions

| Records within 2000m | 2 |
|---|---|

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 39 >**

| ID | Location | Details | |
|---|---|---|---|
| 1 | 270m SE | Status: Active<br>Licence No: NW/074/0006/001<br>Details: Dewatering<br>Direct Source: Ground Water - North West Region<br>Point: 3 BOREHOLES AT SELLAFIELD, SEASCALE<br>Data Type: Poly4<br>Name: Sellafield Limited<br>Easting: 302756<br>Northing: 504984 | Annual Volume ($m^3$): 788400<br>Max Daily Volume ($m^3$): 1728<br>Original Application No: NPS/NA/001867<br>Original Start Date: 30/12/2022<br>Expiry Date: 31/03/2026<br>Issue No: 1<br>Version Start Date: 30/12/2022<br>Version End Date: - |
| - | 1004m SE | Status: Active<br>Licence No: NW/074/0006/002<br>Details: Dewatering<br>Direct Source: Ground Water - North West Region<br>Point: SELLAFIELD IN CUMBRIA<br>Data Type: Poly4<br>Name: Sellafield Limited<br>Easting: 303137<br>Northing: 503739 | Annual Volume ($m^3$): 233600<br>Max Daily Volume ($m^3$): 640<br>Original Application No: NPS/WR/034056<br>Original Start Date: 13/11/2020<br>Expiry Date: 31/03/2027<br>Issue No: 1<br>Version Start Date: 13/11/2020<br>Version End Date: - |

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

## 5.7 Surface water abstractions

**Records within 2000m** **6**

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 39 >**

| ID | Location | Details | |
|---|---|---|---|
| - | 1011m E | Status: Historical<br>Licence No: 2774006007<br>Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R CALDER AT CALDER HALL<br>Data Type: Point<br>Name: NUCLEAR DECOMMISSIONING AUTHORITY<br>Easting: 303200<br>Northing: 504100 | Annual Volume ($m^3$): 9955740<br>Max Daily Volume ($m^3$): 27276<br>Original Application No: -<br>Original Start Date: 29/03/1966<br>Expiry Date: -<br>Issue No: 101<br>Version Start Date: 01/04/2006<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1011m E | Status: Historical<br>Licence No: 2774006007<br>Details: Evaporative Cooling<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R CALDER AT CALDER HALL<br>Data Type: Point<br>Name: NUCLEAR DECOMMISSIONING AUTHORITY<br>Easting: 303200<br>Northing: 504100 | Annual Volume ($m^3$): 9955740<br>Max Daily Volume ($m^3$): 27276<br>Original Application No: -<br>Original Start Date: 29/03/1966<br>Expiry Date: -<br>Issue No: 101<br>Version Start Date: 01/04/2006<br>Version End Date: - |
| - | 1011m E | Status: Historical<br>Licence No: 2774006007<br>Details: Process water<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R CALDER AT CALDER HALL<br>Data Type: Point<br>Name: NUCLEAR DECOMMISSIONING AUTHORITY<br>Easting: 303200<br>Northing: 504100 | Annual Volume ($m^3$): 9955740<br>Max Daily Volume ($m^3$): 27276<br>Original Application No: -<br>Original Start Date: 29/03/1966<br>Expiry Date: -<br>Issue No: 101<br>Version Start Date: 01/04/2006<br>Version End Date: - |
| - | 1949m NW | Status: Historical<br>Licence No: 2774005004<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R EHEN AT BRAYSTONES<br>Data Type: Point<br>Name: NUCLEAR DECOMMISSIONING AUTHORITY<br>Easting: 301000<br>Northing: 506100 | Annual Volume ($m^3$): 11467285<br>Max Daily Volume ($m^3$): 34095<br>Original Application No: -<br>Original Start Date: 29/03/1966<br>Expiry Date: -<br>Issue No: 101<br>Version Start Date: 01/04/2006<br>Version End Date: - |
| - | 1949m NW | Status: Historical<br>Licence No: 2774005004<br>Details: Evaporative Cooling<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R EHEN AT BRAYSTONES<br>Data Type: Point<br>Name: NUCLEAR DECOMMISSIONING AUTHORITY<br>Easting: 301000<br>Northing: 506100 | Annual Volume ($m^3$): 6637306<br>Max Daily Volume ($m^3$): 18183.80<br>Original Application No: 5526<br>Original Start Date: 29/03/1966<br>Expiry Date: -<br>Issue No: 103<br>Version Start Date: 26/11/2018<br>Version End Date: - |
| - | 1949m NW | Status: Historical<br>Licence No: 2774005004<br>Details: Process Water<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R EHEN AT BRAYSTONES<br>Data Type: Point<br>Name: NUCLEAR DECOMMISSIONING AUTHORITY<br>Easting: 301000<br>Northing: 506100 | Annual Volume ($m^3$): 6637306<br>Max Daily Volume ($m^3$): 18183.80<br>Original Application No: 5526<br>Original Start Date: 29/03/1966<br>Expiry Date: -<br>Issue No: 103<br>Version Start Date: 26/11/2018<br>Version End Date: - |

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

## 5.8 Potable abstractions

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

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 39 >**

| ID | Location | Details | |
|---|---|---|---|
| - | 1011m E | Status: Historical<br>Licence No: 2774006007<br>Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R CALDER AT CALDER HALL<br>Data Type: Point<br>Name: NUCLEAR DECOMMISSIONING AUTHORITY<br>Easting: 303200<br>Northing: 504100 | Annual Volume ($m^3$): 9955740<br>Max Daily Volume ($m^3$): 27276<br>Original Application No: -<br>Original Start Date: 29/03/1966<br>Expiry Date: -<br>Issue No: 101<br>Version Start Date: 01/04/2006<br>Version End Date: - |

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

## 5.9 Source Protection Zones

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

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

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

## 5.10 Source Protection Zones (confined aquifer)

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

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

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

# 6 Hydrology


Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

WFD River, canal and surface water transfer water bodies

WFD Lake water bodies

WFD Transitional and coastal water bodies

WFD Surface water body catchments boundaries

WFD Groundwater body boundaries

## 6.1 Water Network (OS MasterMap)

| **Records within 250m** | **12** |
|---|---|

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 43 >**

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

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| C | 15m S | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| D | 22m S | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| E | 46m SE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| E | 47m SE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| E | 47m SE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 50m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| F | 97m NE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| F | 99m NE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| G | 108m NE | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| H | 212m NW | Inland river not influenced by normal tidal action. | Underground | Watercourse contains water year round (in normal circumstances) | - |
| H | 219m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

*This data is sourced from the Ordnance Survey.*

## 6.2 Surface water features

| Records within 250m | 9 |
|---|---|

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 43 >**

*This data is sourced from the Ordnance Survey.*

## 6.3 WFD Surface water body catchments

| Records on site | 1 |
|---|---|

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

Features are displayed on the Hydrology map on **page 43 >**

| ID | Location | Type | Water body catchment | Water body ID | Operational catchment | Management catchment |
|---|---|---|---|---|---|---|
| **B** | **On site** | **River** | **Ehen (lower)** | **GB112074069980** | **Ehen-Calder** | **South West Lakes** |

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

## 6.4 WFD Surface water bodies

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

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

Features are displayed on the Hydrology map on **page 43 >**

| ID | Location | Type | Name | Water body ID | Overall rating | Chemical rating | Ecological rating | Year |
|---|---|---|---|---|---|---|---|---|
| 9 | 398m SW | River | Ehen (lower) | GB112074069980 ↗ | Moderate | Fail | Good | 2019 |

*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. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 43 >**

| ID | Location | Name | Water body ID | Overall rating | Chemical rating | Quantitative | Year |
|---|---|---|---|---|---|---|---|
| **1** | **On site** | **West Cumbria Permo-Triassic sandstone aquifers** | **GB41201G102000** ↗ | **Good** | **Good** | **Good** | **2019** |

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

# 7 River and coastal flooding

## 7.1 Risk of flooding from rivers and the sea

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

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; 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). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

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

## 7.2 Historical Flood Events

| Records within 250m | 0 |
|---|---|

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

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

## 7.3 Flood Defences

| Records within 250m | 0 |
|---|---|

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

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

## 7.4 Areas Benefiting from Flood Defences

| Records within 250m | 0 |
|---|---|

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

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

## 7.5 Flood Storage Areas

| Records within 250m | 0 |
|---|---|

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

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

# River and coastal flooding - Flood Zones

## 7.6 Flood Zone 2

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

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

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

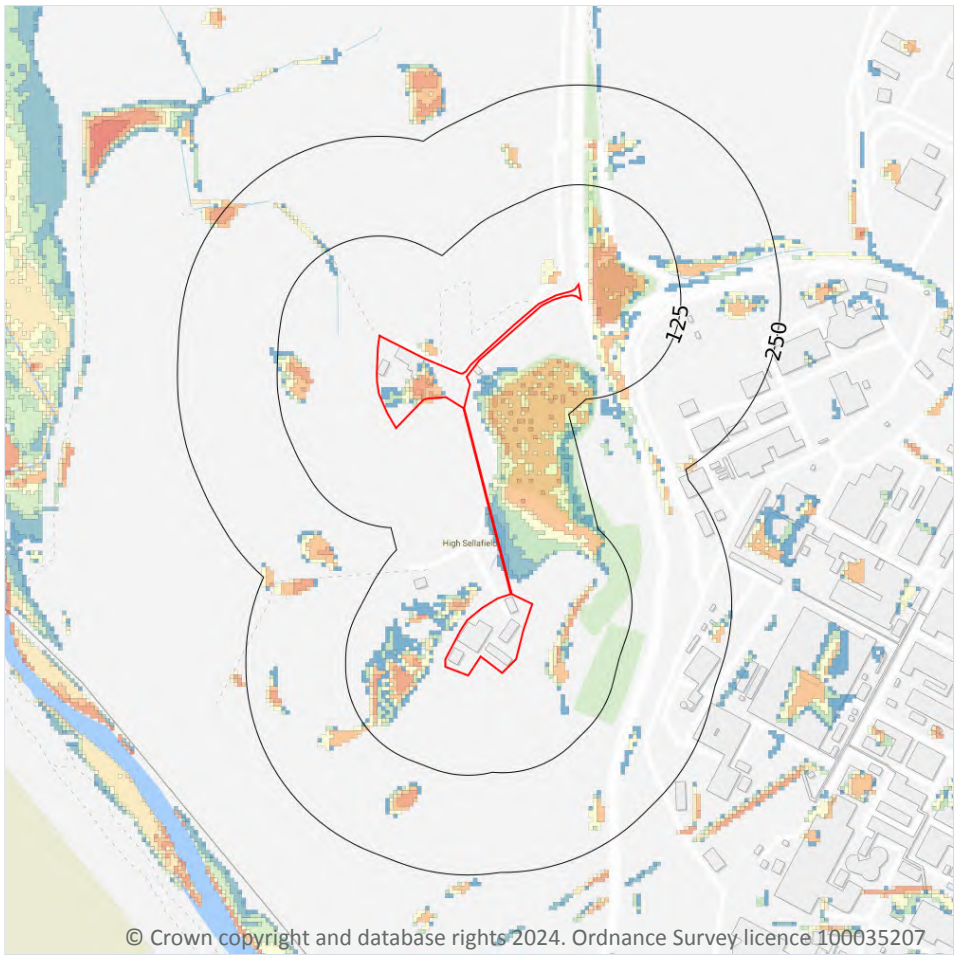
## 7.7 Flood Zone 3

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

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

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

# 8 Surface water flooding




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, Greater than 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 50 >**

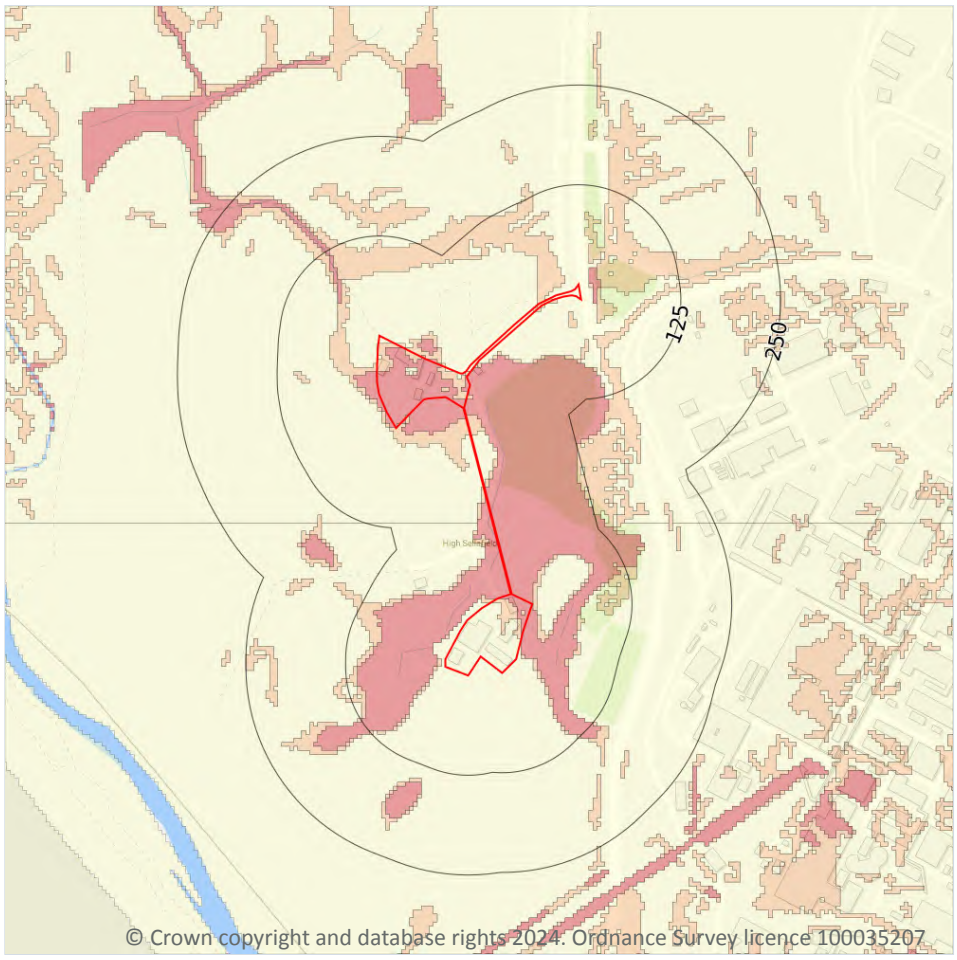
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

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

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

*This data is sourced from Ambiental Risk Analytics.*

# 9 Groundwater flooding




Site Outline

Search buffers in metres (m)

High

Moderate - High

Moderate

Low

Negligible

## 9.1 Groundwater flooding

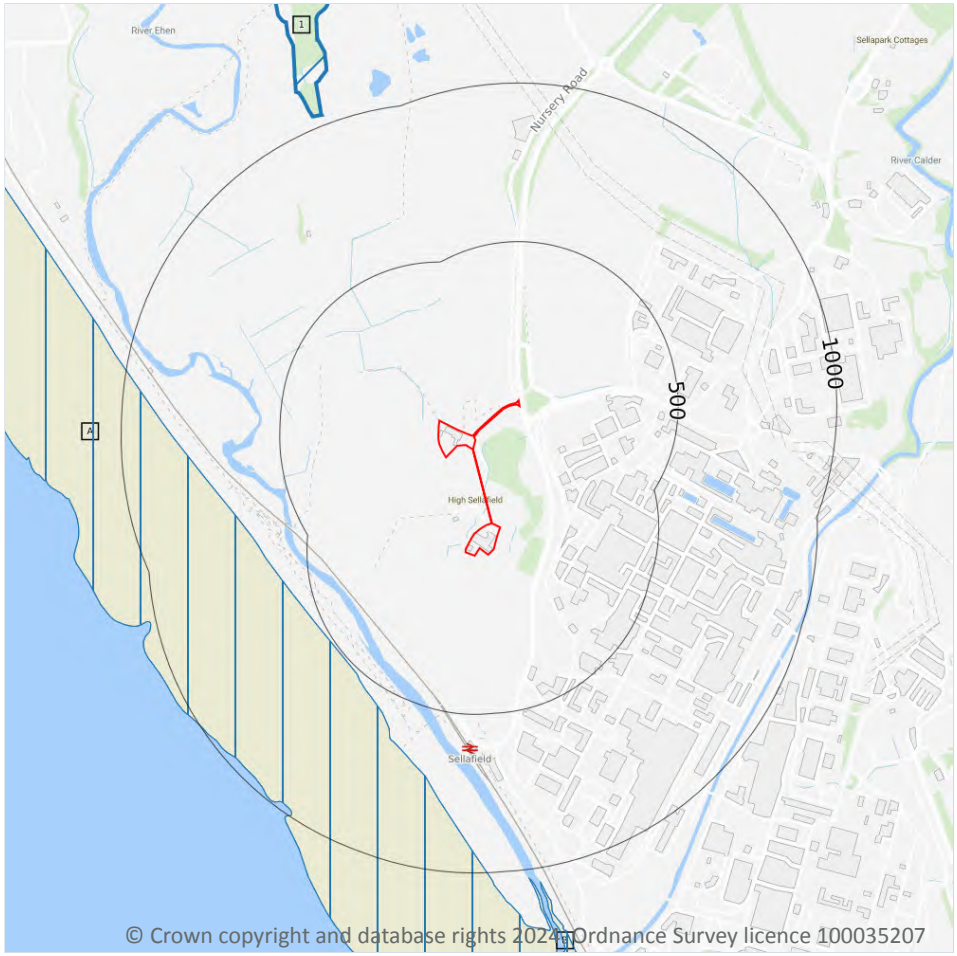
| | |
|---|---|
| **Highest risk on site** | **High** |
| **Highest risk within 50m** | **High** |

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 52 >**

*This data is sourced from Ambiental Risk Analytics.*

# 10 Environmental designations




Site Outline

Search buffers in metres (m)

Sites of Special Scientific Interest (SSSI)

Designated Ancient Woodland

Marine Conservation Zones

## 10.1 Sites of Special Scientific Interest (SSSI)

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

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

Features are displayed on the Environmental designations map on **page 53 >**

| ID | Location | Name | Data source |
|---|---|---|---|
| 1 | 1033m N | Low Church Moss | Natural England |

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

## 10.2 Conserved wetland sites (Ramsar sites)

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

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

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

## 10.3 Special Areas of Conservation (SAC)

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

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

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

## 10.4 Special Protection Areas (SPA)

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

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

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

## 10.5 National Nature Reserves (NNR)

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

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

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

## 10.6 Local Nature Reserves (LNR)

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

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

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

## 10.7 Designated Ancient Woodland

| Records within 2000m | 5 |
|---|---|

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 53 >**

| ID | Location | Name | Woodland Type |
|---|---|---|---|
| - | 1539m NE | Calder Bank Wood | Ancient Replanted Woodland |
| - | 1631m NE | Calder Bank Wood | Ancient & Semi-Natural Woodland |
| - | 1823m N | Unknown | Ancient & Semi-Natural Woodland |
| - | 1829m NE | Calder Bank Wood | Ancient Replanted Woodland |
| - | 1952m N | Unknown | Ancient Replanted 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 | 8 |
|---|---|

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.

Features are displayed on the Environmental designations map on **page 53 >**

| ID | Location | Name | Status |
|---|---|---|---|
| A | 508m SW | Cumbria Coast - Zone 1 | Designated |
| A | 508m SW | Cumbria Coast - Zone 2 | Designated |
| B | 1047m S | Cumbria Coast - Zone 1 | Designated |
| B | 1047m S | Cumbria Coast - Zone 2 | Designated |
| - | 1310m S | Cumbria Coast - Zone 1 | Designated |
| - | 1310m S | Cumbria Coast - Zone 2 | Designated |
| - | 1411m S | Cumbria Coast - Zone 1 | Designated |
| - | 1411m S | Cumbria Coast - Zone 2 | Designated |

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

## 10.11 Green Belt

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

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

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

## 10.12 Proposed Ramsar sites

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

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

*This data is sourced from Natural England.*

## 10.13 Possible Special Areas of Conservation (pSAC)

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

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

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

## 10.14 Potential Special Protection Areas (pSPA)

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

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

*This data is sourced from Natural England.*

## 10.15 Nitrate Sensitive Areas

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

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

*This data is sourced from Natural England.*

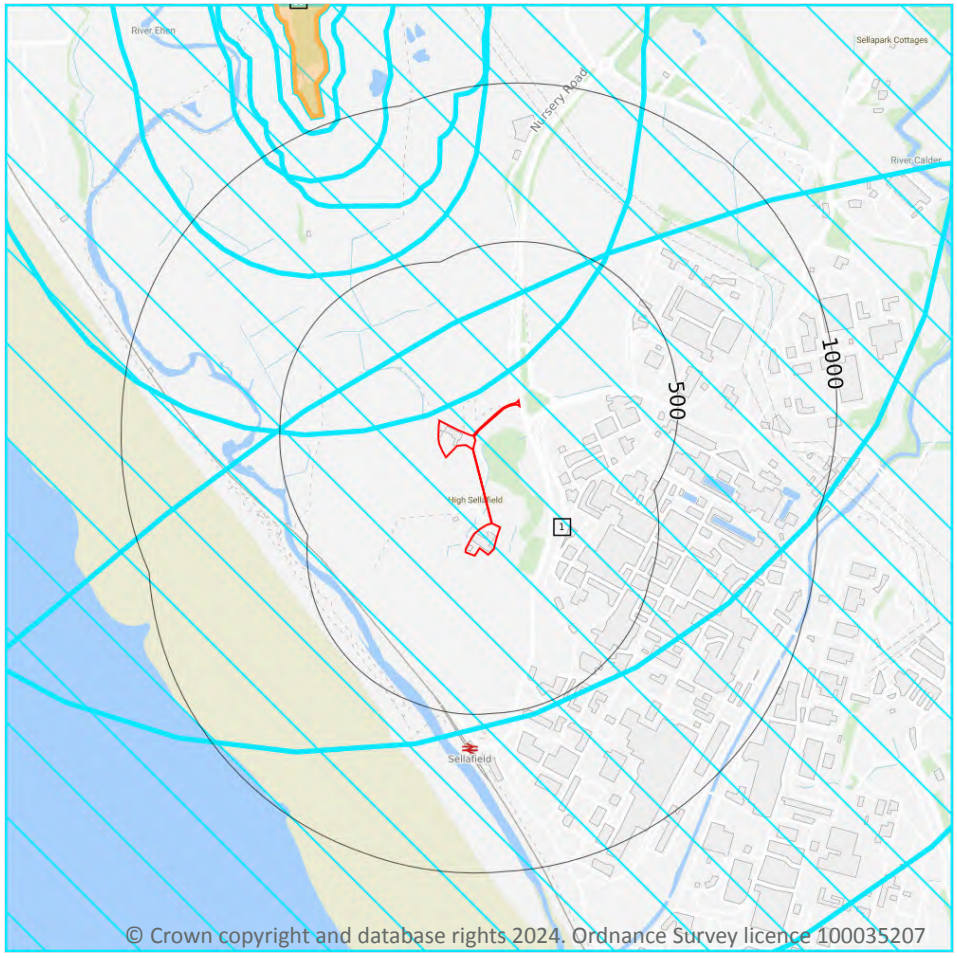
## 10.16 Nitrate Vulnerable Zones

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

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.

*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 59 >**

| ID | Location | Type of developments requiring consultation |
|---|---|---|
| 1 | On site | **Infrastructure - Pipelines and underground cables, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals.<br>Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines.<br>Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction.<br>Rural non-residential - Large non residential developments outside existing settlements/urban areas where footprint exceeds 1ha.<br>Rural residential - Any residential development of 50 or more houses outside existing settlements/urban areas.<br>Air pollution - Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 200m², manure stores > 250t).<br>Combustion - General combustion processes >20MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.<br>Waste - Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill.<br>Composting - Any composting proposal with more than 75000 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.<br>Water supply - Large infrastructure such as warehousing / industry where total net additional gross internal floorspace following development is 1,000m² or more.** |

*This data is sourced from Natural England.*

## 10.18 SSSI Units

| **Records within 2000m** | **1** |
|---|---|

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

Features are displayed on the SSSI Impact Zones and Units map on **page 59 >**

ID: A
Location: 1033m N
SSSI name: Low Church Moss
Unit name: Church Moss
Broad habitat:
Condition: Unfavourable - Declining
Reportable features:

| Feature name | Feature condition | Date of assessment |
|---|---|---|
| Basin fen (lowland) | Unfavourable - Declining | 02/09/2021 |
| Lowland mire grassland and rush pasture | Unfavourable - Declining | 02/09/2021 |

| Feature name | Feature condition | Date of assessment |
|---|---|---|
| Lowland wet heath | Unfavourable - Declining | 02/09/2021 |
| Wet woodland | Unfavourable - Recovering | 02/09/2021 |

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

# 11 Visual and cultural designations

## 11.1 World Heritage Sites

| Records within 250m | 0 |
|---|---|

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

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

## 11.2 Area of Outstanding Natural Beauty

| Records within 250m | 0 |
|---|---|

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

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

## 11.3 National Parks

| Records within 250m | 0 |
|---|---|

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

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

## 11.4 Listed Buildings

| Records within 250m | 0 |
|---|---|

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

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

## 11.5 Conservation Areas

| Records within 250m | 0 |
|---|---|

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

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

## 11.6 Scheduled Ancient Monuments

| Records within 250m | 0 |
|---|---|

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

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

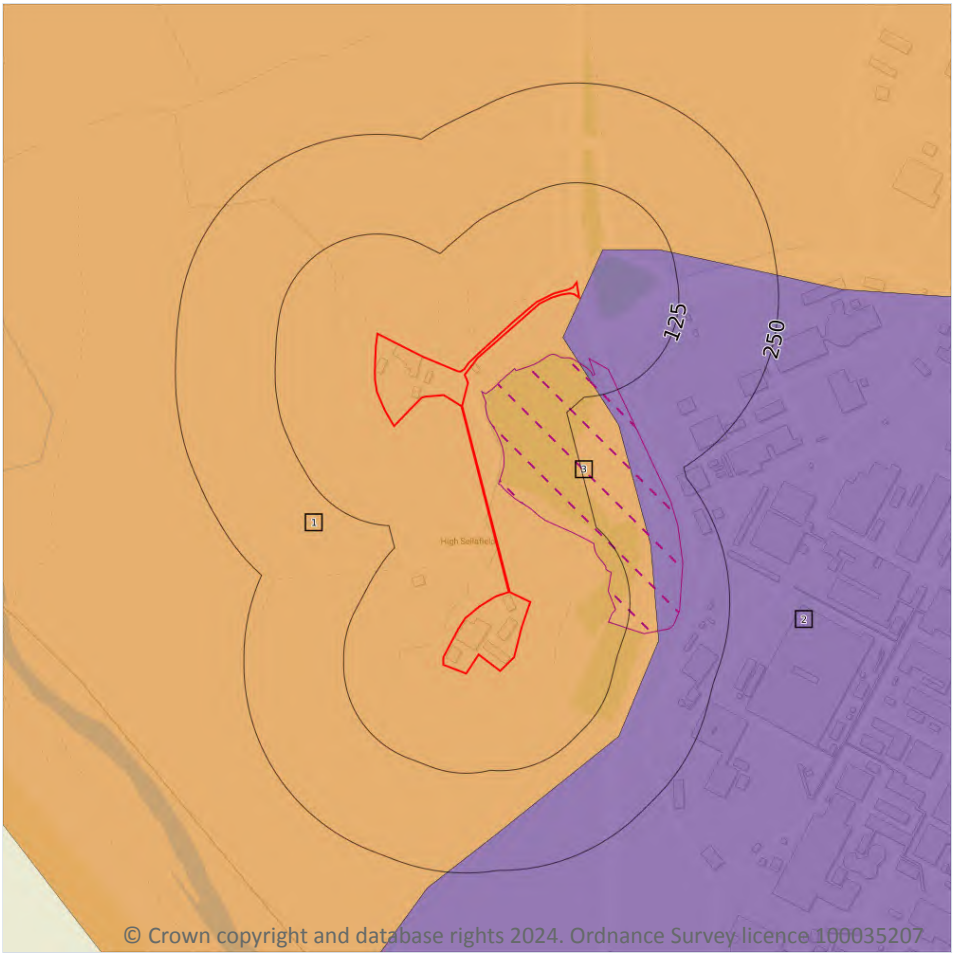
## 11.7 Registered Parks and Gardens

| Records within 250m | 0 |
|---|---|

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

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

# 12 Agricultural designations




Site Outline
Search buffers in metres (m)
Grade 1 - excellent quality
Grade 2 - very good quality
Grade 3 - good to moderate quality
Grade 3a - good quality
Grade 3b - moderate quality
Grade 4 - poor quality
Grade 5 - very poor quality
Non-agricultural land
Urban land
Exclusion land
Tree felling licences
Open Access land

## 12.1 Agricultural Land Classification

| Records within 250m | 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 64 >**

| ID | Location | Classification | Description |
|---|---|---|---|
| **1** | **On site** | **Grade 3** | **Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.** |
| 2 | 2m NE | Urban | - |

*This data is sourced from Natural England.*

## 12.2 Open Access Land

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

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.

Features are displayed on the Agricultural designations map on **page 64 >**

| ID | Location | Name | Classification | Other relevant legislation |
|---|---|---|---|---|
| 3 | 19m N | Field No. O.S.752 near Sellafield (Cumbria) | Section 4 Conclusive Registered Common Land | - |

*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.*

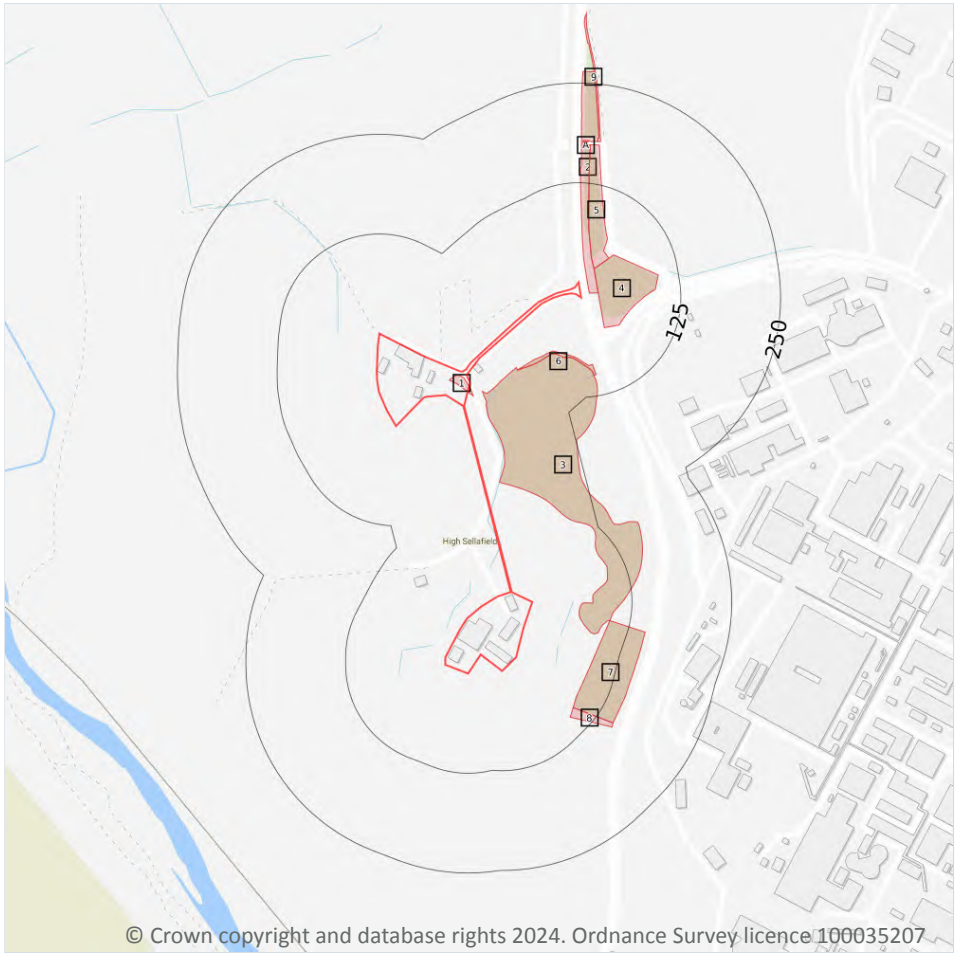
## 12.5 Countryside Stewardship Schemes

| 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




Site Outline

Search buffers in metres (m)

Priority Habitat Inventory
Open Mosaic Habitat
Limestone Pavement Orders

Habitat Networks
Primary Habitat
Restorable Habitat
Associated Habitats
Habitat Restoration-Creation
Network Enhancement Zone 1
Network Enhancement Zone 2

## 13.1 Priority Habitat Inventory

| Records within 250m | 11 |
|---|---|

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

Features are displayed on the Habitat designations map on **page 67 >**

| ID | Location | Main Habitat | Other habitats |
|---|---|---|---|
| **1** | **On site** | **Deciduous woodland** | **Main habitat: DWOOD (INV > 50%)** |
| 2 | 11m NE | Deciduous woodland | Main habitat: DWOOD (INV > 50%) |
| 3 | 18m N | Deciduous woodland | Main habitat: DWOOD (INV > 50%) |
| 4 | 22m NE | Deciduous woodland | Main habitat: DWOOD (INV > 50%) |

| ID | Location | Main Habitat | Other habitats |
|---|---|---|---|
| 5 | 26m NE | Deciduous woodland | Main habitat: DWOOD (INV > 50%) |
| 6 | 43m NE | Deciduous woodland | Main habitat: DWOOD (INV > 50%) |
| 7 | 89m SE | Deciduous woodland | Main habitat: DWOOD (INV > 50%) |
| 8 | 95m SE | Deciduous woodland | Main habitat: DWOOD (INV > 50%) |
| A | 172m N | Deciduous woodland | Main habitat: DWOOD (INV > 50%) |
| A | 176m N | Deciduous woodland | Main habitat: DWOOD (INV > 50%) |
| 9 | 178m N | Deciduous woodland | Main habitat: DWOOD (INV > 50%) |

*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 70 >**

| 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.*

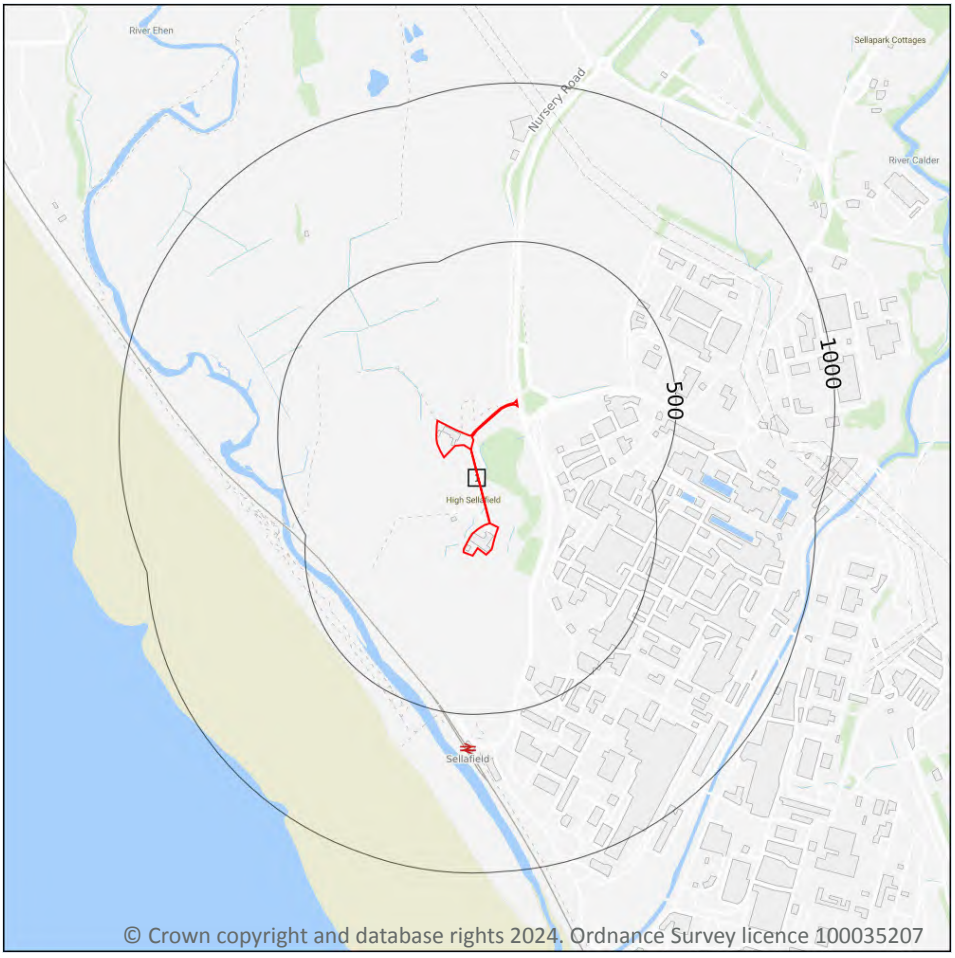
## 14.6 Bedrock faults and other linear features (10k)

| 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.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 74 >**

| ID | Location | Artificial | Superficial | Bedrock | Mass movement | Sheet No. |
|---|---|---|---|---|---|---|
| **1** | **On site** | **Full** | **Full** | **Full** | **Full** | **EW037_gosforth_v4** |

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

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

## 15.2 Artificial and made ground (50k)

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

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

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

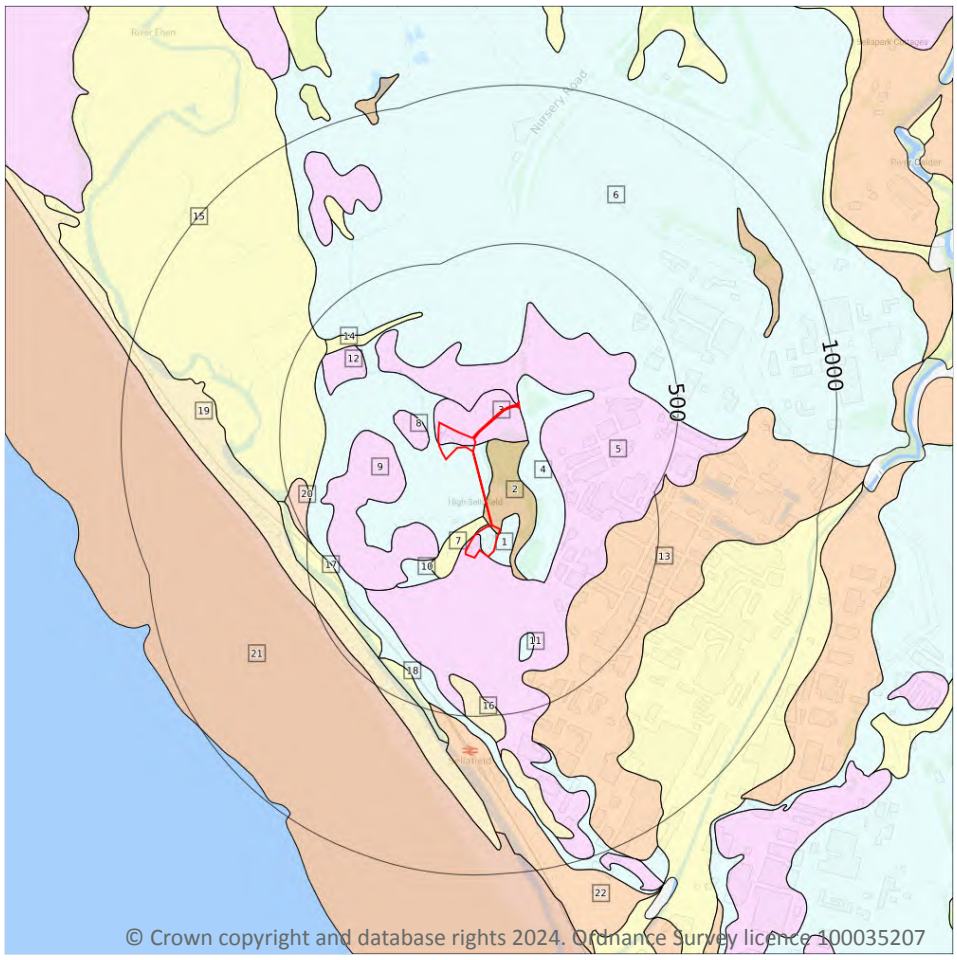
## 15.3 Artificial ground permeability (50k)

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

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

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

# Geology 1:50,000 scale - Superficial




Site Outline

Search buffers in metres (m)

Landslip (50k)

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

## 15.4 Superficial geology (50k)

**Records within 500m** **22**

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

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 76 >**

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| **1** | **On site** | **TILLD-DMTN** | **TILL, DEVENSIAN** | **DIAMICTON** |
| **2** | **On site** | **PEAT-P** | **PEAT** | **PEAT** |
| **3** | **On site** | **GFICD-XSVB** | **GLACIOFLUVIAL ICE CONTACT DEPOSITS, DEVENSIAN** | **SAND, GRAVEL AND BOULDERS** |

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| **4** | **On site** | **TILLD-DMTN** | **TILL, DEVENSIAN** | **DIAMICTON** |
| **5** | **On site** | **GFDUD-XSV** | **GLACIOFLUVIAL DEPOSITS, DEVENSIAN** | **SAND AND GRAVEL** |
| **6** | **On site** | **TILLD-DMTN** | **TILL, DEVENSIAN** | **DIAMICTON** |
| 7 | 1m S | ALV-XCZSV | ALLUVIUM | CLAY, SILT, SAND AND GRAVEL |
| 8 | 28m NW | GFICD-XSVB | GLACIOFLUVIAL ICE CONTACT DEPOSITS, DEVENSIAN | SAND, GRAVEL AND BOULDERS |
| 9 | 85m SW | GFICD-XSVB | GLACIOFLUVIAL ICE CONTACT DEPOSITS, DEVENSIAN | SAND, GRAVEL AND BOULDERS |
| 10 | 97m SW | TILLD-DMTN | TILL, DEVENSIAN | DIAMICTON |
| 11 | 271m S | TILLD-DMTN | TILL, DEVENSIAN | DIAMICTON |
| 12 | 274m NW | GFDUD-XSV | GLACIOFLUVIAL DEPOSITS, DEVENSIAN | SAND AND GRAVEL |
| 13 | 291m SE | RTDU-XSV | RIVER TERRACE DEPOSITS (UNDIFFERENTIATED) | SAND AND GRAVEL |
| 14 | 337m NW | ALV-XCZSV | ALLUVIUM | CLAY, SILT, SAND AND GRAVEL |
| 15 | 355m W | ALV-XCZSV | ALLUVIUM | CLAY, SILT, SAND AND GRAVEL |
| 16 | 374m S | BSA-S | BLOWN SAND | SAND |
| 17 | 378m SW | ALV-XCZSV | ALLUVIUM | CLAY, SILT, SAND AND GRAVEL |
| 18 | 405m S | ALV-XCZSV | ALLUVIUM | CLAY, SILT, SAND AND GRAVEL |
| 19 | 417m SW | BSA-S | BLOWN SAND | SAND |
| 20 | 435m W | RMD-XSVB | RAISED MARINE DEPOSITS | SAND, GRAVEL AND BOULDERS |
| 21 | 479m SW | MBD-XSV | MARINE BEACH DEPOSITS | SAND AND GRAVEL |
| 22 | 479m S | RTDU-XSV | RIVER TERRACE DEPOSITS (UNDIFFERENTIATED) | SAND AND GRAVEL |

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

## 15.5 Superficial permeability (50k)

**Records within 50m** **8**

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** | **Very High** | **High** |

| Location | Flow type | Maximum permeability | Minimum permeability |
|---|---|---|---|
| **On site** | **Mixed** | **Low** | **Very Low** |
| **On site** | **Mixed** | **High** | **Low** |
| **On site** | **Mixed** | **High** | **Low** |
| **On site** | **Mixed** | **High** | **Low** |
| **On site** | **Intergranular** | **Very High** | **High** |
| 1m S | Intergranular | High | Very Low |
| 28m NW | Intergranular | Very High | High |

*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.*

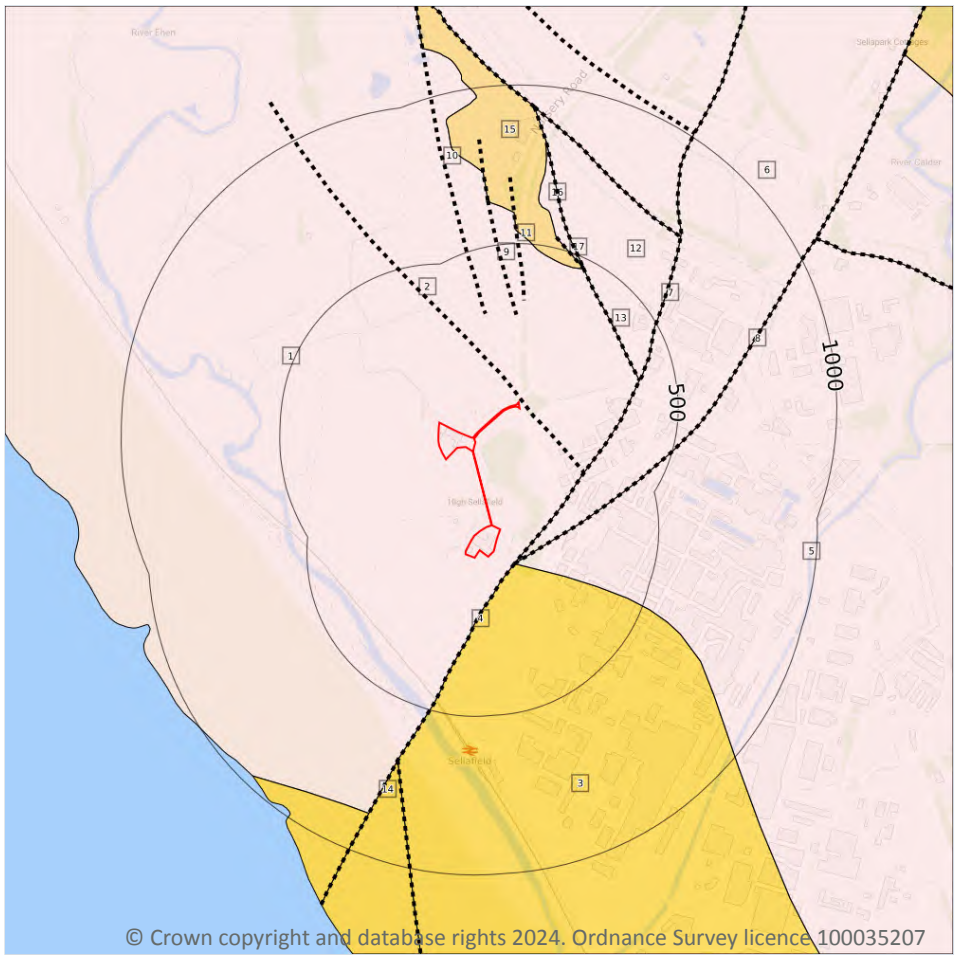
## 15.7 Landslip permeability (50k)

| 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** **7**

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 79 >**

| ID | Location | LEX Code | Description | Rock age |
|---|---|---|---|---|
| **1** | **On site** | **WLSF-SDST** | **WILMSLOW SANDSTONE FORMATION - SANDSTONE** | **-** |
| 3 | 76m SE | SELF-SDST | SELLAFIELD MEMBER - SANDSTONE | ANISIAN |
| 5 | 76m SE | WLSF-SDST | WILMSLOW SANDSTONE FORMATION - SANDSTONE | - |
| 6 | 76m SE | WLSF-SDST | WILMSLOW SANDSTONE FORMATION - SANDSTONE | - |

| ID | Location | LEX Code | Description | Rock age |
|---|---|---|---|---|
| 12 | 371m NE | WLSF-SDST | WILMSLOW SANDSTONE FORMATION - SANDSTONE | - |
| 15 | 457m NE | SBS-SDST | ST BEES SANDSTONE MEMBER - SANDSTONE | - |
| 16 | 470m NE | WLSF-SDST | WILMSLOW SANDSTONE FORMATION - SANDSTONE | - |

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

## 15.9 Bedrock permeability (50k)

**Records within 50m** **1**

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

| Location | Flow type | Maximum permeability | Minimum permeability |
|---|---|---|---|
| **On site** | **Intergranular** | **High** | **High** |

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

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

**Records within 500m** **11**

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.

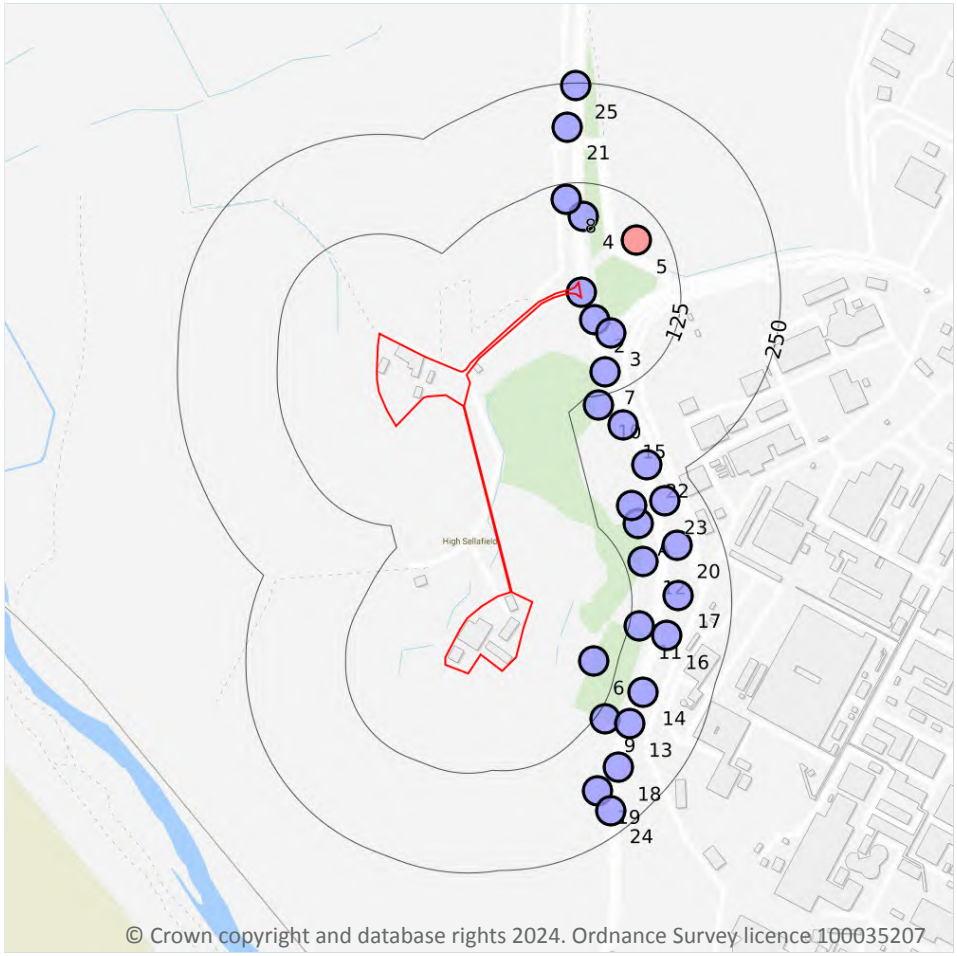
Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 79 >**

| ID | Location | Category | Description |
|---|---|---|---|
| 2 | 11m NE | FAULT | Fault, inferred, displacement unknown |
| 4 | 76m SE | FAULT | Fault, inferred, displacement unknown |
| 7 | 76m SE | FAULT | Fault, inferred, displacement unknown |
| 8 | 76m SE | FAULT | Fault, inferred, displacement unknown |
| 9 | 276m N | FAULT | Fault, inferred, displacement unknown |
| 10 | 298m N | FAULT | Fault, inferred, displacement unknown |
| 11 | 322m N | FAULT | Fault, inferred, displacement unknown |
| 13 | 371m NE | FAULT | Fault, inferred, displacement unknown |

| ID | Location | Category | Description |
|---|---|---|---|
| 14 | 427m S | FAULT | Fault, inferred, displacement unknown |
| 17 | 470m NE | FAULT | Fault, inferred, displacement unknown |
| 18 | 470m NE | 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 | 27 |
|---|---|

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 82 >**

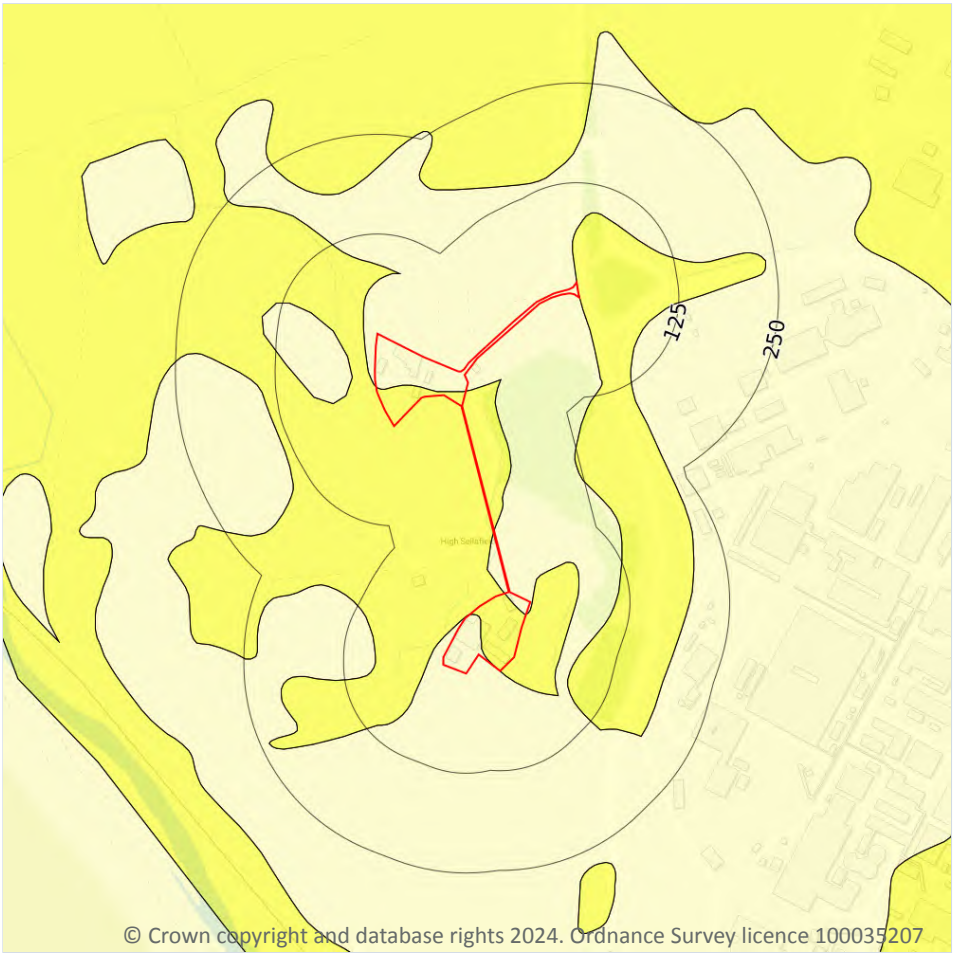
| ID | Location | Grid reference | Name | Length | Confidential | Web link |
|---|---|---|---|---|---|---|
| 1 | 2m NE | 302251 504477 | A595 ACCESS ROAD FROM SELLAFIELD 112/26 | 3.5 | N | 20043676 ↗ |
| 2 | 33m NE | 302267 504442 | A595 ACCESS ROAD FROM SELLAFIELD 111/25 | 3.6 | N | 20043674 ↗ |

| ID | Location | Grid reference | Name | Length | Confidential | Web link |
|---|---|---|---|---|---|---|
| 3 | 57m NE | 302287 504426 | A595 ACCESS ROAD FROM SELLAFIELD 65/24 | 3.8 | N | 20043673 ↗ |
| 4 | 83m NE | 302253 504572 | A595 ACCESS ROAD FROM SELLAFIELD 113/27 | 3.3 | N | 20043678 ↗ |
| 5 | 90m NE | 302320 504542 | OLD BECKERMET ROAD | 81.0 | N | 818388 ↗ |
| 6 | 96m SE | 302266 504014 | A595 ACCESS ROAD FROM SELLAFIELD 54/11 | 2.1 | N | 20043657 ↗ |
| 7 | 98m NE | 302280 504377 | A595 ACCESS ROAD FROM SELLAFIELD 64/23 | 6.0 | N | 20043672 ↗ |
| 8 | 105m N | 302231 504593 | A595 ACCESS ROAD FROM SELLAFIELD 114/28 | 3.5 | N | 20043679 ↗ |
| 9 | 135m SE | 302280 503942 | A595 ACCESS ROAD FROM SELLAFIELD 53/9 | 3.2 | N | 20043655 ↗ |
| 10 | 137m NE | 302272 504335 | A595 ACCESS ROAD FROM SELLAFIELD 63/22 | 3.3 | N | 20043671 ↗ |
| 11 | 137m SE | 302323 504058 | A595 ACCESS ROAD FROM SELLAFIELD 56/13 | 3.7 | N | 20043659 ↗ |
| 12 | 148m E | 302328 504139 | A595 ACCESS ROAD FROM SELLAFIELD 58/15 | 6.0 | N | 20043663 ↗ |
| 13 | 165m SE | 302311 503936 | A595 ACCESS ROAD FROM SELLAFIELD 103/8 | 3.9 | N | 20043654 ↗ |
| 14 | 165m SE | 302328 503975 | A595 ACCESS ROAD FROM SELLAFIELD 104/10 | 4.0 | N | 20043656 ↗ |
| A | 166m E | 302322 504187 | A595 ACCESS ROAD FROM SELLAFIELD 59/17 | 3.9 | N | 20043666 ↗ |
| 15 | 168m E | 302303 504310 | A595 ACCESS ROAD FROM SELLAFIELD 62/21 | 4.0 | N | 20043670 ↗ |
| A | 172m E | 302313 504209 | A595 ACCESS ROAD FROM SELLAFIELD 110/20 | 2.5 | N | 20043669 ↗ |
| 16 | 173m SE | 302357 504046 | A595 ACCESS ROAD FROM SELLAFIELD 105/12 | 4.0 | N | 20043658 ↗ |
| 17 | 183m SE | 302372 504097 | A595 ACCESS ROAD FROM SELLAFIELD 106/14 | 5.8 | N | 20043660 ↗ |
| 18 | 189m SE | 302297 503881 | A595 ACCESS ROAD FROM SELLAFIELD 102/7 | 2.7 | N | 20043653 ↗ |
| 19 | 192m SE | 302271 503852 | A595 ACCESS ROAD FROM SELLAFIELD 52/5 | 4.0 | N | 20043651 ↗ |

| ID | Location | Grid reference | Name | Length | Confidential | Web link |
|---|---|---|---|---|---|---|
| 20 | 196m E | 302371 504160 | A595 ACCESS ROAD FROM SELLAFIELD 107/16 | 2.7 | N | 20043665 ↗ |
| 21 | 196m N | 302233 504684 | A595 ACCESS ROAD FROM SELLAFIELD 116/29 | 3.3 | N | 20043680 ↗ |
| 22 | 203m E | 302332 504260 | A595 ACCESS ROAD FROM SELLAFIELD 109/19 | 3.7 | N | 20043668 ↗ |
| 23 | 209m E | 302355 504215 | A595 ACCESS ROAD FROM SELLAFIELD 108/18 | 3.2 | N | 20043667 ↗ |
| 24 | 221m SE | 302287 503827 | A595 ACCESS ROAD FROM SELLAFIELD 100/4 | 2.8 | N | 20043650 ↗ |
| 25 | 247m N | 302243 504736 | A595 ACCESS ROAD FROM SELLAFIELD 117/30 | 3.6 | N | 20043681 ↗ |

*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 | 3 |
|---|---|

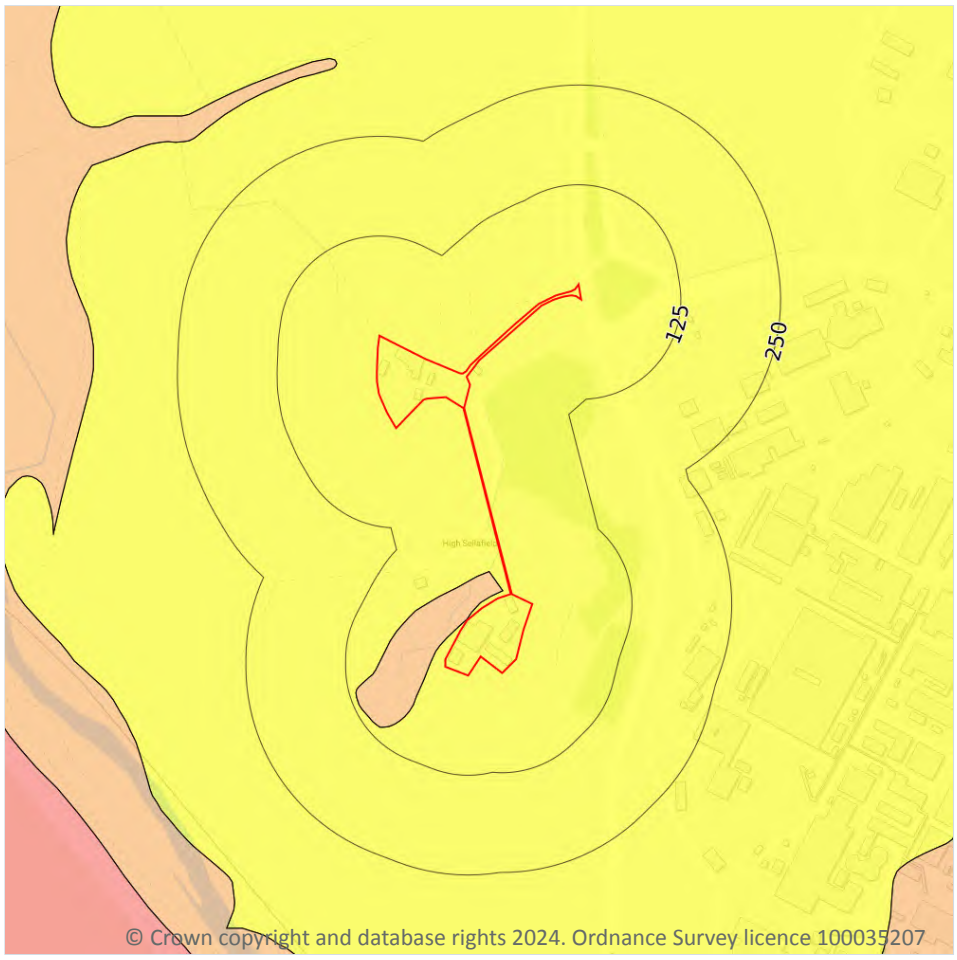
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 85 >**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Negligible** | **Ground conditions predominantly non-plastic.** |
| **On site** | **Very low** | **Ground conditions predominantly low plasticity.** |
| 28m NW | Negligible | Ground conditions predominantly non-plastic. |

*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 | 2 |
|---|---|

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

Features are displayed on the Natural ground subsidence - Running sands map on **page 87 >**

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

| Location | Hazard rating | Details |
|---|---|---|
| 1m S | Low | Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water. |

*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.

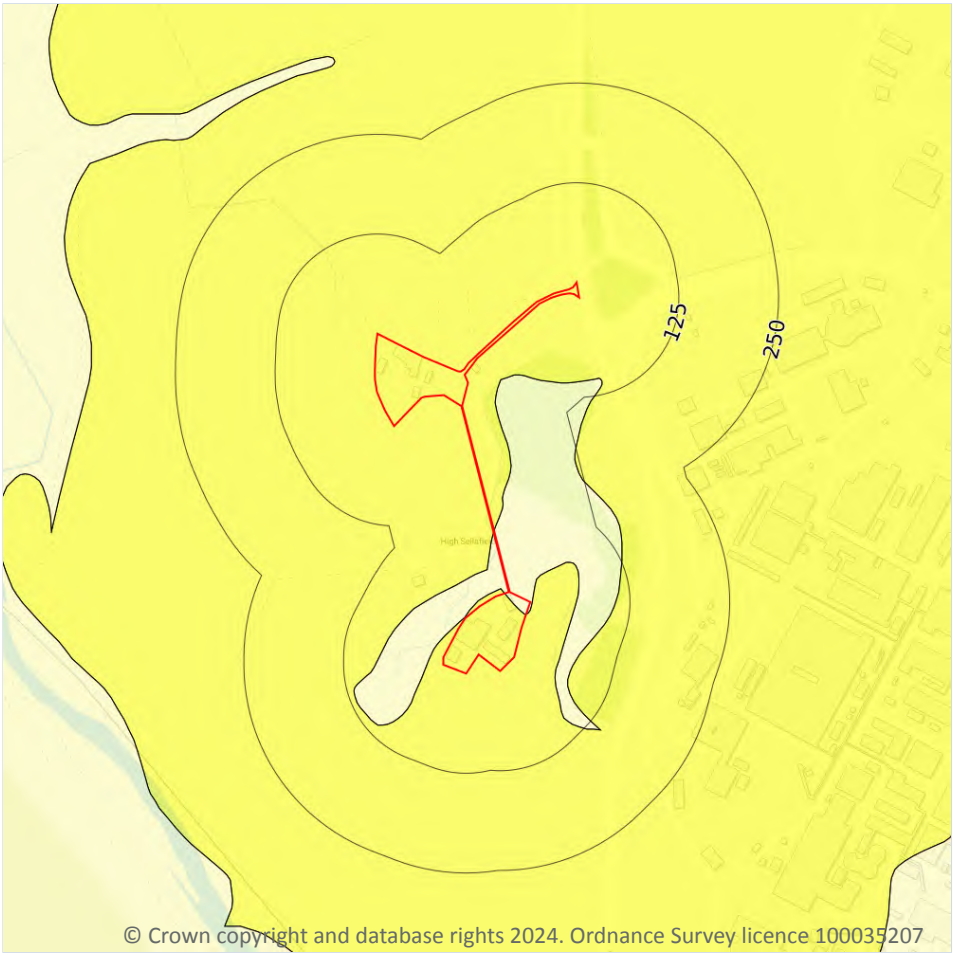
Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 89 >**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Negligible** | **Compressible strata are not thought to occur.** |
| **On site** | **High** | **Highly compressible strata present. Significant constraint on land use depending on thickness.** |

| Location | Hazard rating | Details |
|---|---|---|
| 1m S | Moderate | Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site. |

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

# Natural ground subsidence - Collapsible deposits




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.4 Collapsible deposits

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

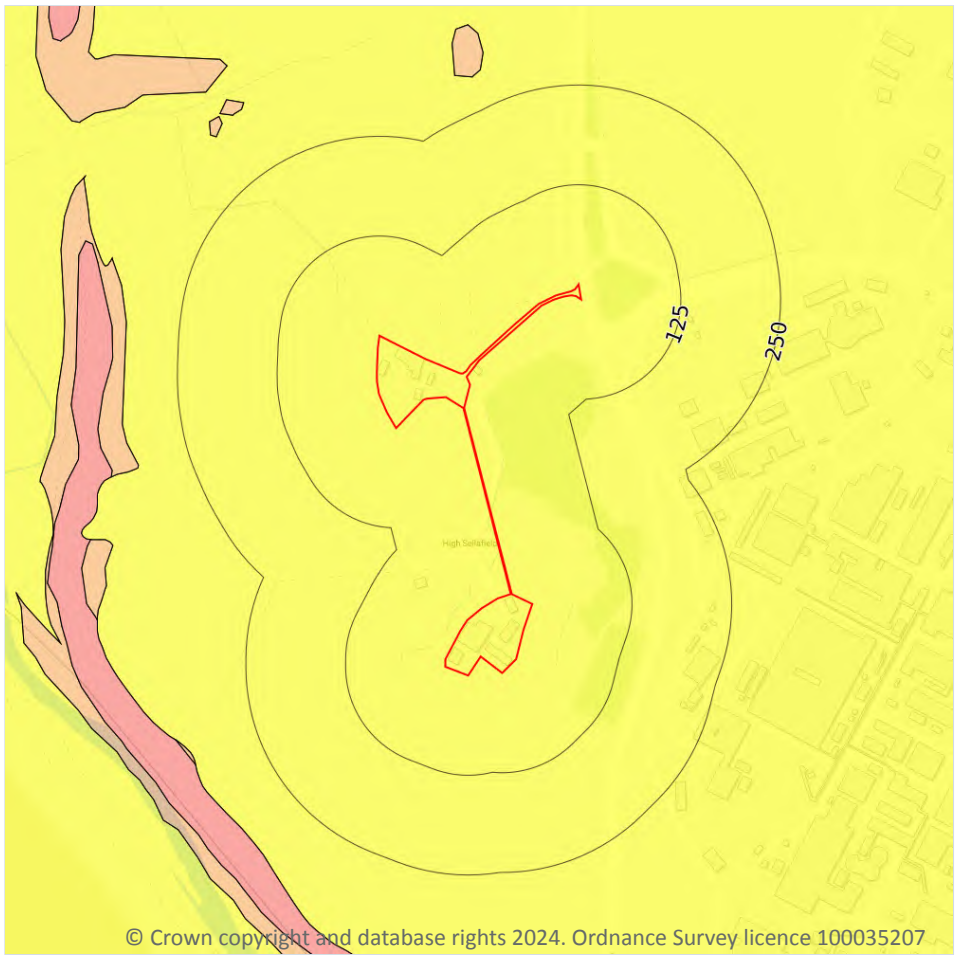
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 91 >**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Negligible** | **Deposits with potential to collapse when loaded and saturated are believed not to be present.** |
| **On site** | **Very low** | **Deposits with potential to collapse when loaded and saturated are unlikely to be present.** |

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

# Natural ground subsidence - Landslides




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.5 Landslides

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

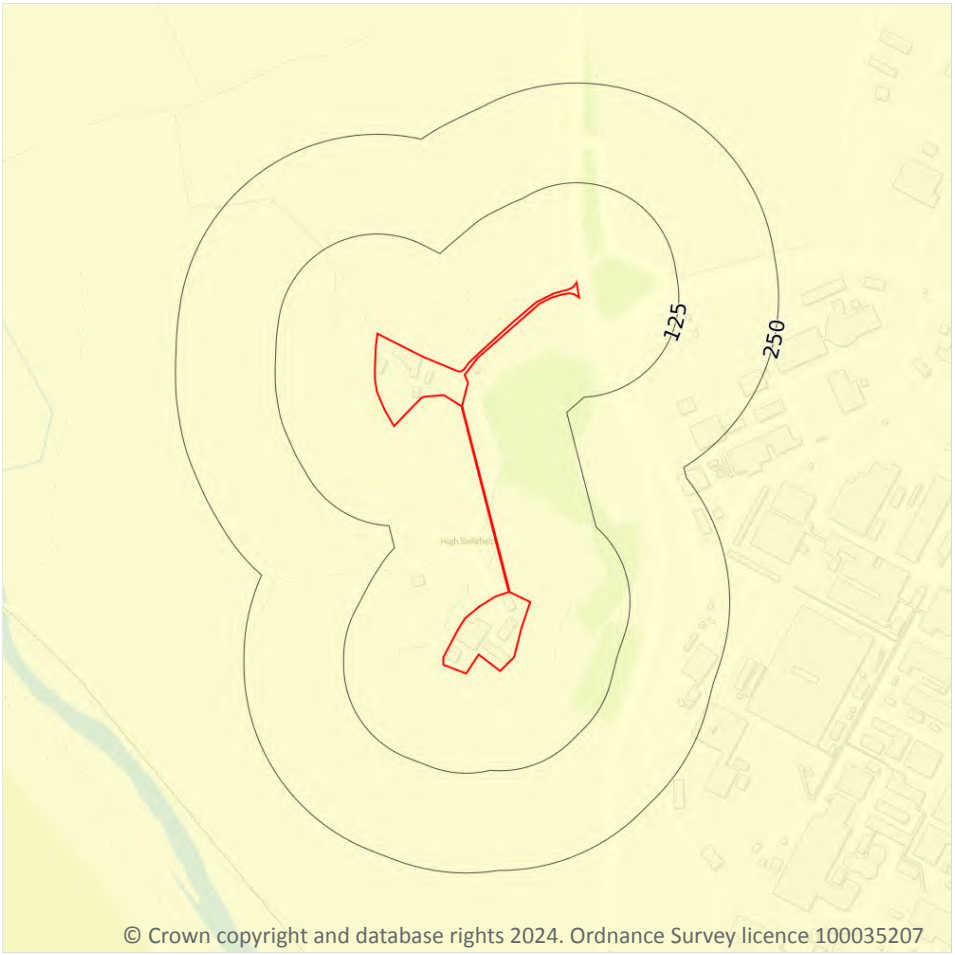
The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 92 >**

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

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

# Natural ground subsidence - Ground dissolution of soluble rocks




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.6 Ground dissolution of soluble rocks

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

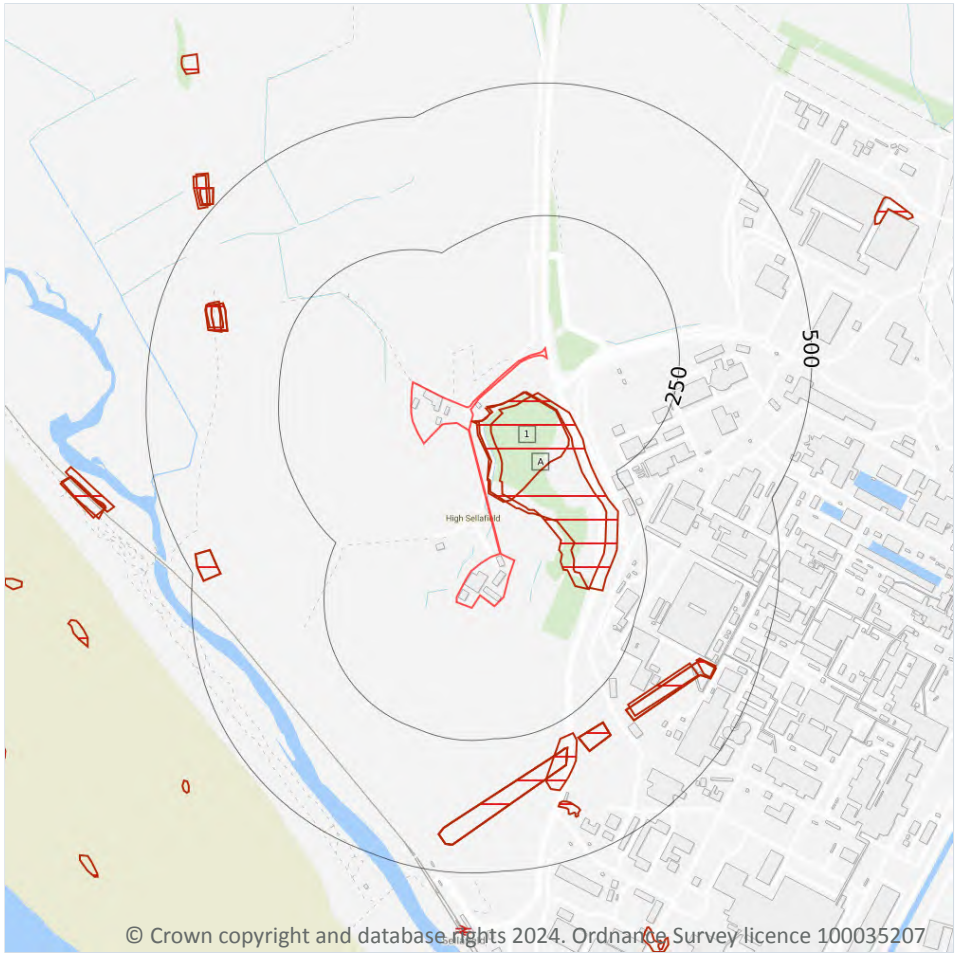
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 93 >**

| 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 and ground workings




Site Outline

Search buffers in metres (m)

BritPits

Surface ground workings

Underground workings

Underground mining extents

Historical mineral planning areas

TCA non-coal mining

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 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.*

## 18.2 Surface ground workings

| Records within 250m | 3 |
|---|---|

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 and ground workings map on **page 95 >**

| ID | Location | Land Use | Year of mapping | Mapping scale |
|---|---|---|---|---|
| 1 | 3m N | Pond | 1951 | 1:10560 |
| A | 7m N | Water Body | 1900 | 1:10560 |
| A | 31m E | Water Body | 1860 | 1:10560 |

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

## 18.3 Underground workings

| Records within 1000m | 0 |
|---|---|

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

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

## 18.4 Underground mining extents

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

This data identifies underground mine workings that could present a potential risk, including adits and seam workings. These features have been identified from BGS Geological mapping and mine plans sourced from the BGS and various collections and sources.

*This data is sourced from Groundsure.*

## 18.5 Historical Mineral Planning Areas

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

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

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

## 18.6 Non-coal mining

| Records within 1000m | 0 |
|---|---|

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

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

## 18.7 JPB mining areas

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

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

*This data is sourced from Johnson Poole and Bloomer.*

## 18.8 The Coal Authority non-coal mining

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

This data provides an indication of the potential zone of influence of recorded underground non-coal mining workings. Any and all analysis and interpretation of Coal Authority Data in this report is made by Groundsure, and is in no way supported, endorsed or authorised by the Coal Authority. The use of the data is restricted to the terms and provisions contained in this report. Data reproduced in this report may be the copyright of the Coal Authority and permission should be sought from Groundsure prior to any re-use.

*This data is sourced from The Coal Authority.*

## 18.9 Researched mining

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

This data indicates areas of potential mining identified from alternative or archival sources, including; BGS Geological paper maps, Lidar data, aerial photographs (from World War II onwards), archaeological data services, websites, Tithe maps, and various text/plans from collected books and reports. Some of this data is approximate and Groundsure have interpreted the resultant risk area and, where possible, specific areas of risk have been captured.

*This data is sourced from Groundsure.*

## 18.10 Mining record office plans

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

This dataset is representative of Mining Record Office and/or plan extents held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

*This data is sourced from Groundsure.*

## 18.11 BGS mine plans

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

This dataset is representative of BGS mine plans held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

*This data is sourced from Groundsure.*

## 18.12 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.*

## 18.13 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.*

## 18.14 Gypsum areas

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

Generalised areas that may be affected by gypsum extraction.

*This data is sourced from British Gypsum.*

## 18.15 Tin mining

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

Generalised areas that may be affected by historical tin mining.

*This data is sourced from Groundsure.*

## 18.16 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 Ground cavities and sinkholes

## 19.1 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.*

## 19.2 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.*

## 19.3 Reported recent incidents

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

This data identifies sinkhole information gathered from media reports and Groundsure's own records. This data goes back to 2014 and includes relative accuracy ratings for each event and links to the original data sources. The data is updated on a regular basis and should not be considered a comprehensive catalogue of all sinkhole events. The absence of data in this database does not mean a sinkhole definitely has not occurred during this time.

*This data is sourced from Groundsure.*

## 19.4 Historical incidents

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

This dataset comprises an extract of 1:10,560, 1:10,000, 1:2,500 and 1:1,250 scale historical Ordnance Survey maps held by Groundsure, dating back to the 1840s. It shows shakeholes, deneholes and other 'holes' as noted on these maps. Dene holes are medieval chalk extraction pits, usually comprising a narrow shaft with a number of chambers at the base of the shaft. Shakeholes are an alternative name for suffusion sinkholes, most commonly found in the limestone landscapes of North Yorkshire but also extensively noted around the Brecon Beacons National Park.

Not all 'holes' noted on Ordnance Survey mapping will necessarily be present within this dataset.

*This data is sourced from Groundsure.*

## 19.5 National karst database

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

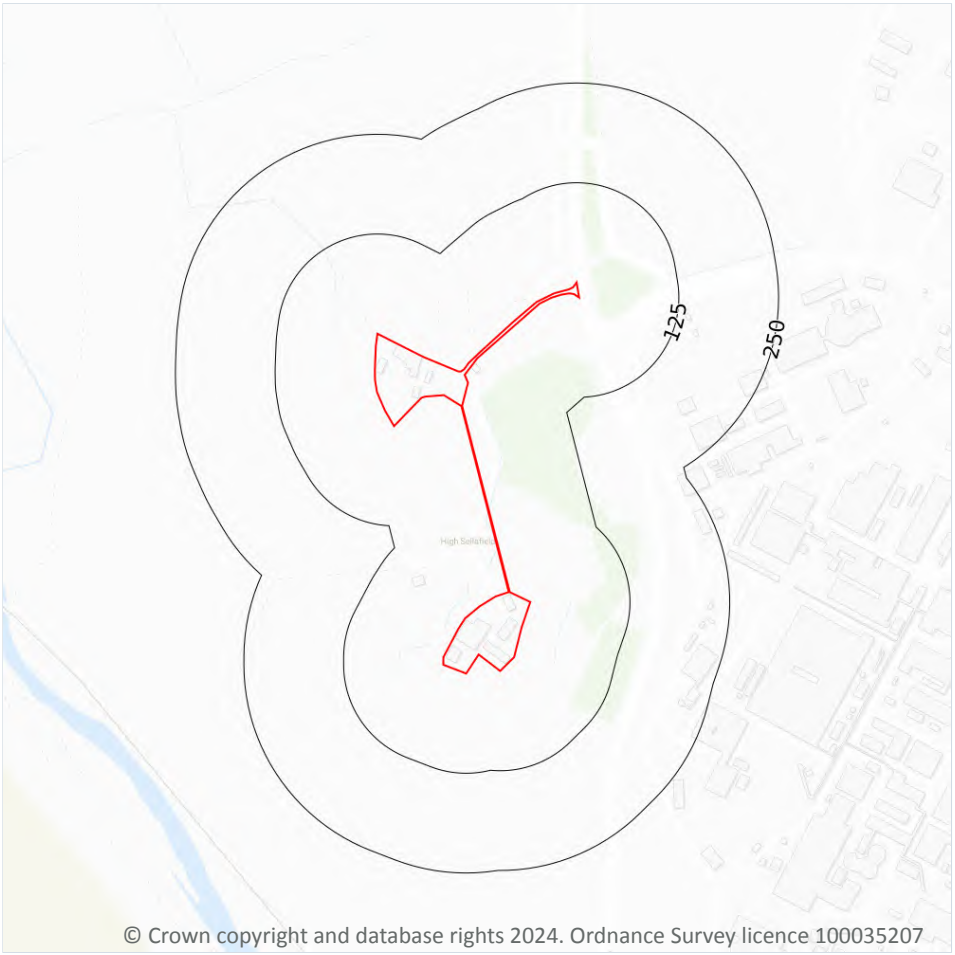
This is a comprehensive database of national karst information gathered from a wide range of sources. BGS have collected data on five main types of karst feature: Sinkholes, stream links, caves, springs, and incidences of associated damage to buildings, roads, bridges and other engineered works.

Since the database was set up in 2002 data covering most of the evaporite karst areas of the UK have now been added, along with data covering about 60% of the Chalk, and 35% of the Carboniferous Limestone outcrops. Many of the classic upland karst areas have yet to be included. Recorded so far are: Over 800 caves, 1300 stream sinks, 5600 springs, 10,000 sinkholes.

The database is not yet complete, and not all records have been verified. The absence of data does not mean that karst features are not present at a site. A reliability rating is included with each record.

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

# 20 Radon




Site Outline

Search buffers in metres (m)

Greater than 30%

Between 10% and 30%

Between 5% and 10%

Between 3% and 5%

Between 1% and 3%

Less than 1%

## 20.1 Radon

| Records on site | 1 |
|---|---|

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on **page 102 >**

| Location | Estimated properties affected | Radon Protection Measures required |
|---|---|---|
| **On site** | **Less than 1%** | **None** |

*This data is sourced from the British Geological Survey and UK Health Security Agency.*

# 21 Soil chemistry

## 21.1 BGS Estimated Background Soil Chemistry

| **Records within 50m** | **17** |
|---|---|

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 $km^2$. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 $km^2$; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

| Location | Arsenic | Bioaccessible Arsenic | Lead | Bioaccessible Lead | Cadmium | Chromium | Nickel |
|---|---|---|---|---|---|---|---|
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **90 - 120 mg/kg** | **15 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **90 - 120 mg/kg** | **15 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **90 - 120 mg/kg** | **15 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **90 - 120 mg/kg** | **15 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **90 - 120 mg/kg** | **15 mg/kg** |
| **On site** | **15 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 mg/kg** |
| 1m S | 15 mg/kg | No data | 100 mg/kg | 60 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 15 mg/kg |
| 3m S | 15 mg/kg | No data | 100 mg/kg | 60 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 15 mg/kg |
| 11m NE | 15 mg/kg | No data | 100 mg/kg | 60 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 15 mg/kg |
| 11m NE | 15 mg/kg | No data | 100 mg/kg | 60 mg/kg | 1.8 mg/kg | 90 - 120 mg/kg | 15 mg/kg |
| 22m NE | 15 mg/kg | No data | 100 mg/kg | 60 mg/kg | 1.8 mg/kg | 90 - 120 mg/kg | 15 mg/kg |
| 26m S | 15 mg/kg | No data | 100 mg/kg | 60 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 15 mg/kg |
| 28m NW | 15 mg/kg | No data | 100 mg/kg | 60 mg/kg | 1.8 mg/kg | 90 - 120 mg/kg | 15 mg/kg |

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

## 21.2 BGS Estimated Urban Soil Chemistry

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

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per $km^2$).

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

## 21.3 BGS Measured Urban Soil Chemistry

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

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

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

# 22 Railway infrastructure and projects


Site Outline
Search buffers in metres (m)
Crossrail 1 Stations
Crossrail 1 Route
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

## 22.1 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.*

## 22.2 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.*

## 22.3 Railway tunnels

| Records within 250m | 0 |
|---|---|

Railway tunnels taken from contemporary Ordnance Survey mapping.

*This data is sourced from the Ordnance Survey.*

## 22.4 Historical railway and tunnel features

| Records within 250m | 3 |
|---|---|

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 106 >**

| Location | Land Use | Year of mapping | Mapping scale |
|---|---|---|---|
| 184m SE | Railway Sidings | 1971 | 10560 |
| 228m SE | Railway Sidings | 1967 | 2500 |
| 243m SE | Railway Sidings | 1967 | 2500 |

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

## 22.5 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.*

## 22.6 Historical railways

| Records within 250m | 0 |
|---|---|

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

*This data is sourced from OpenStreetMap.*

## 22.7 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.*

## 22.8 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.*

## 22.9 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.*

## 22.10 HS2

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

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

*This data is sourced from HS2 ltd.*

## Data providers

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

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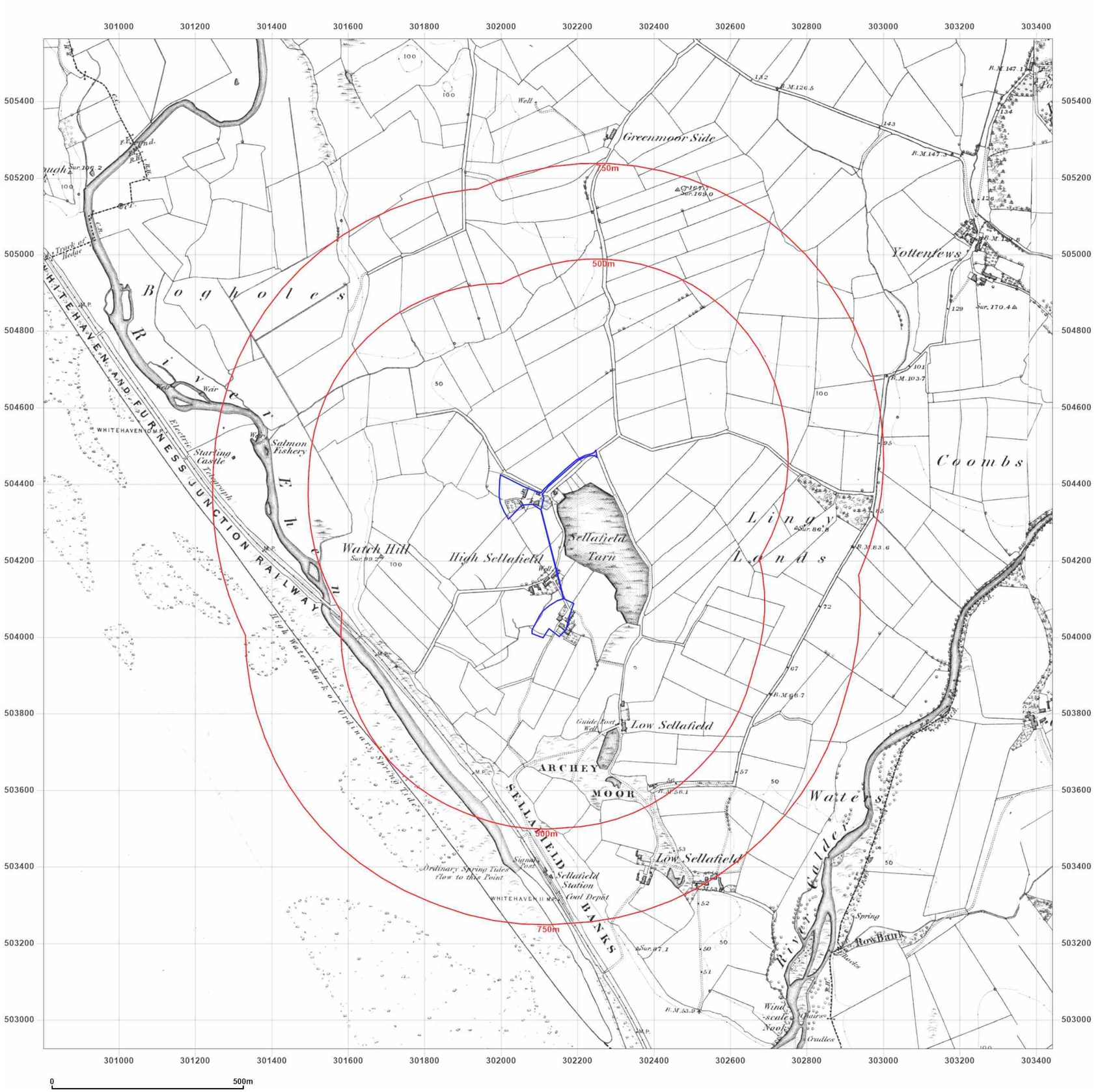


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**Site Details:**

Combined Mid and Head Tarn

**Client Ref:** Combined
**Report Ref:** GSIP-2024-14785-18146
**Grid Ref:** 302122, 504243

**Map Name:** County Series

**Map date:** **1860**

**Scale:** 1:10,560

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

N
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Surveyed 1860
Revised 1860
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1860
Revised 1860
Edition N/A
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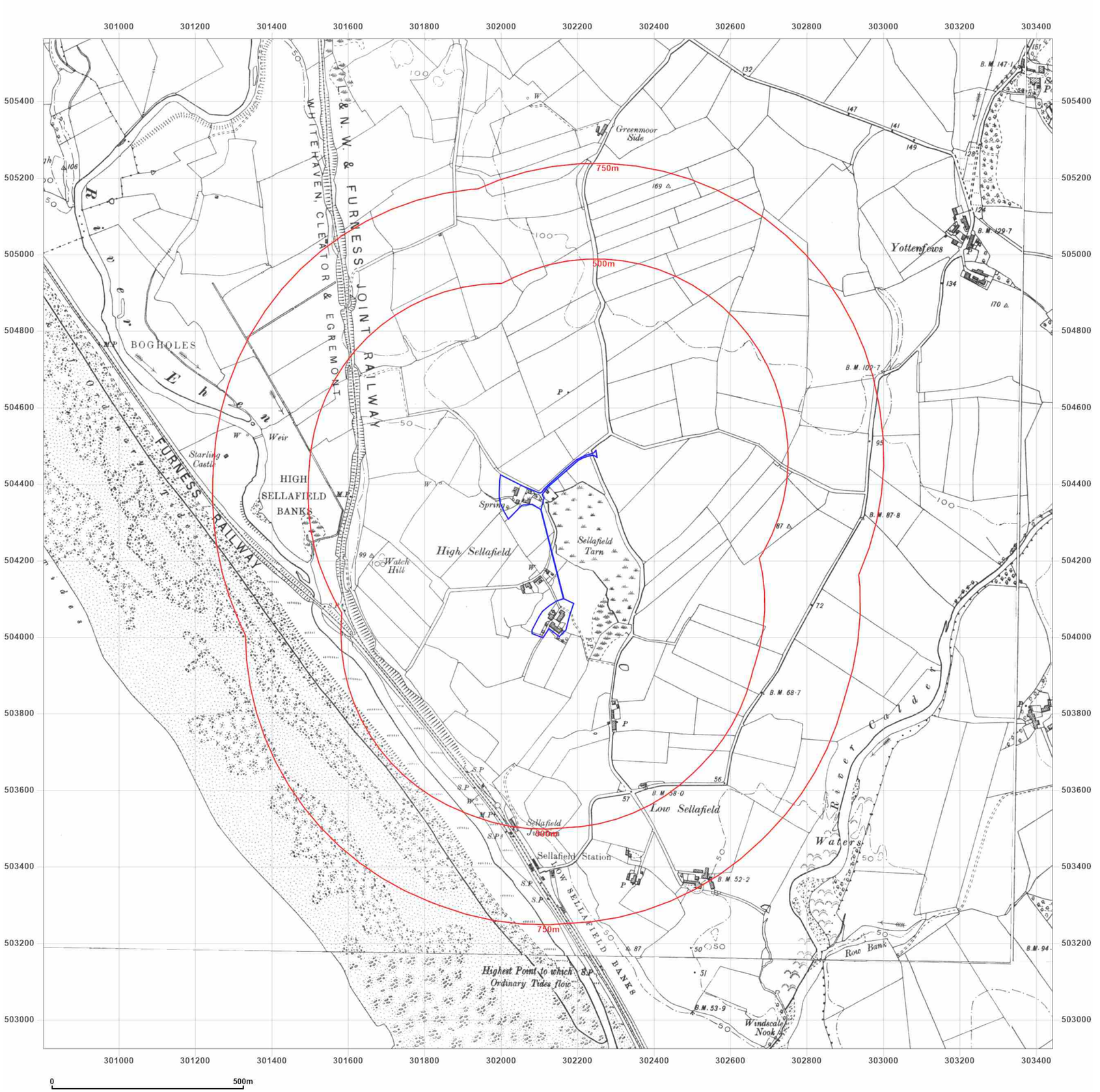


Groundsure INSIGHTS

**Site Details:**

Combined Mid and Head Tarn

**Client Ref:** Combined
**Report Ref:** GSIP-2024-14785-18146
**Grid Ref:** 302122, 504243

**Map Name:** County Series
**Map date:** **1900**
**Scale:** 1:10,560
**Printed at:** 1:10,560

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Surveyed 1860
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1860
Revised 1900
Edition N/A
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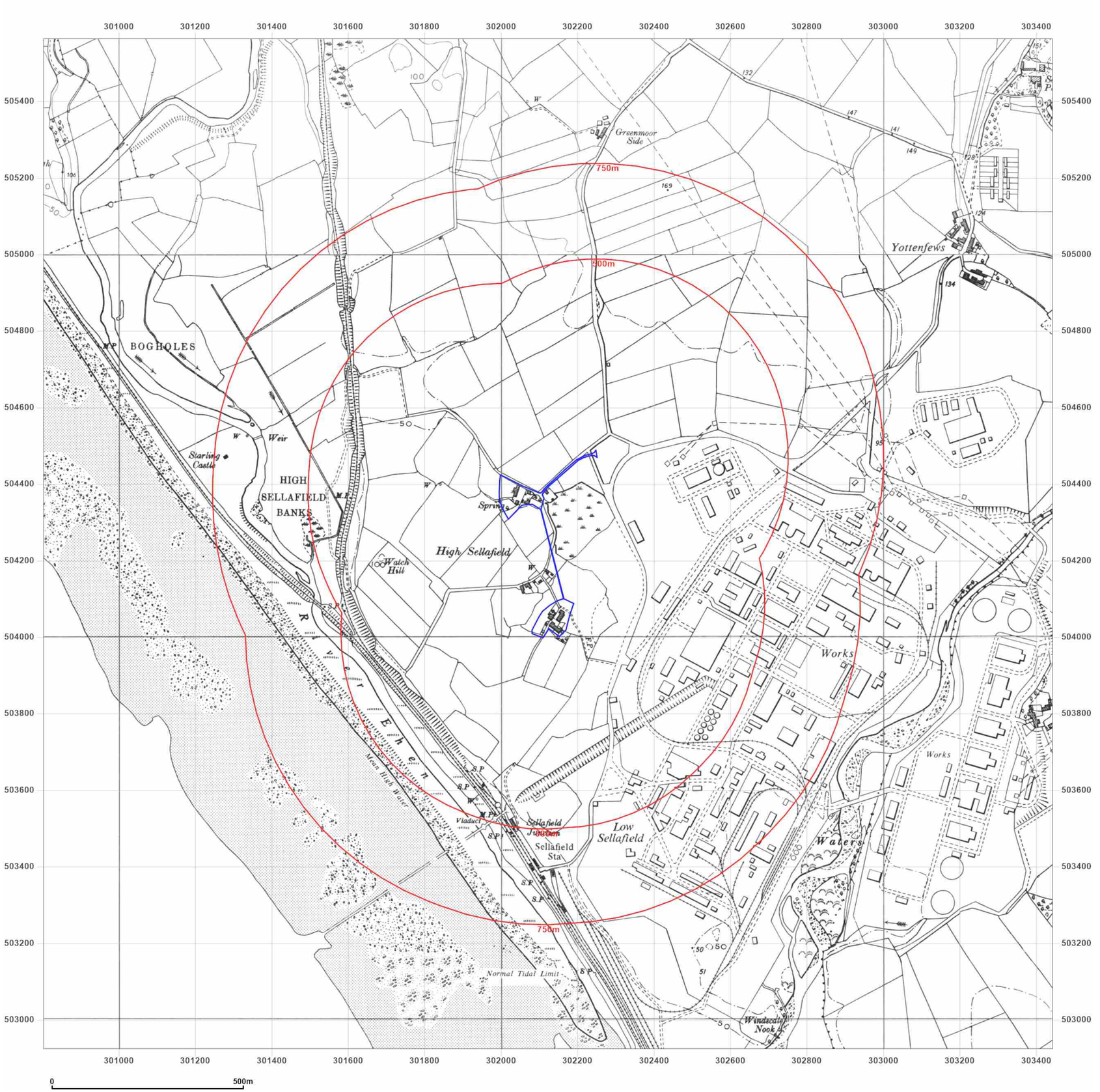


Groundsure INSIGHTS

**Site Details:**

Combined Mid and Head Tarn

**Client Ref:** Combined
**Report Ref:** GSIP-2024-14785-18146
**Grid Ref:** 302122, 504243

**Map Name:** Provisional
**Map date:** **1951**
**Scale:** 1:10,560
**Printed at:** 1:10,560

N
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Surveyed 1951
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Edition N/A
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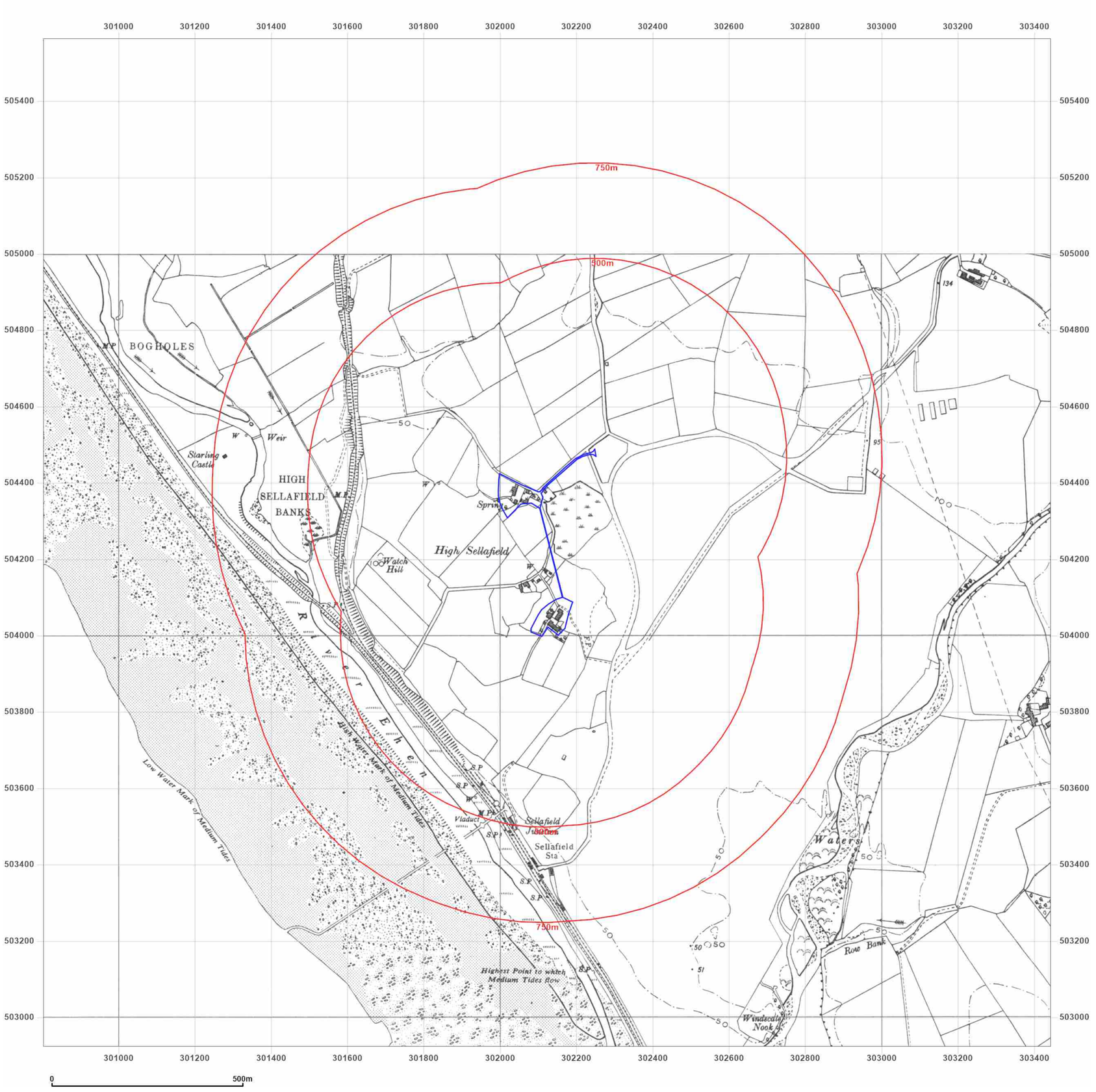


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**Site Details:**

Combined Mid and Head Tarn

**Client Ref:** Combined
**Report Ref:** GSIP-2024-14785-18146
**Grid Ref:** 302122, 504243

**Map Name:** Provisional
**Map date:** **1951**
**Scale:** 1:10,560
**Printed at:** 1:10,560

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Revised 1951
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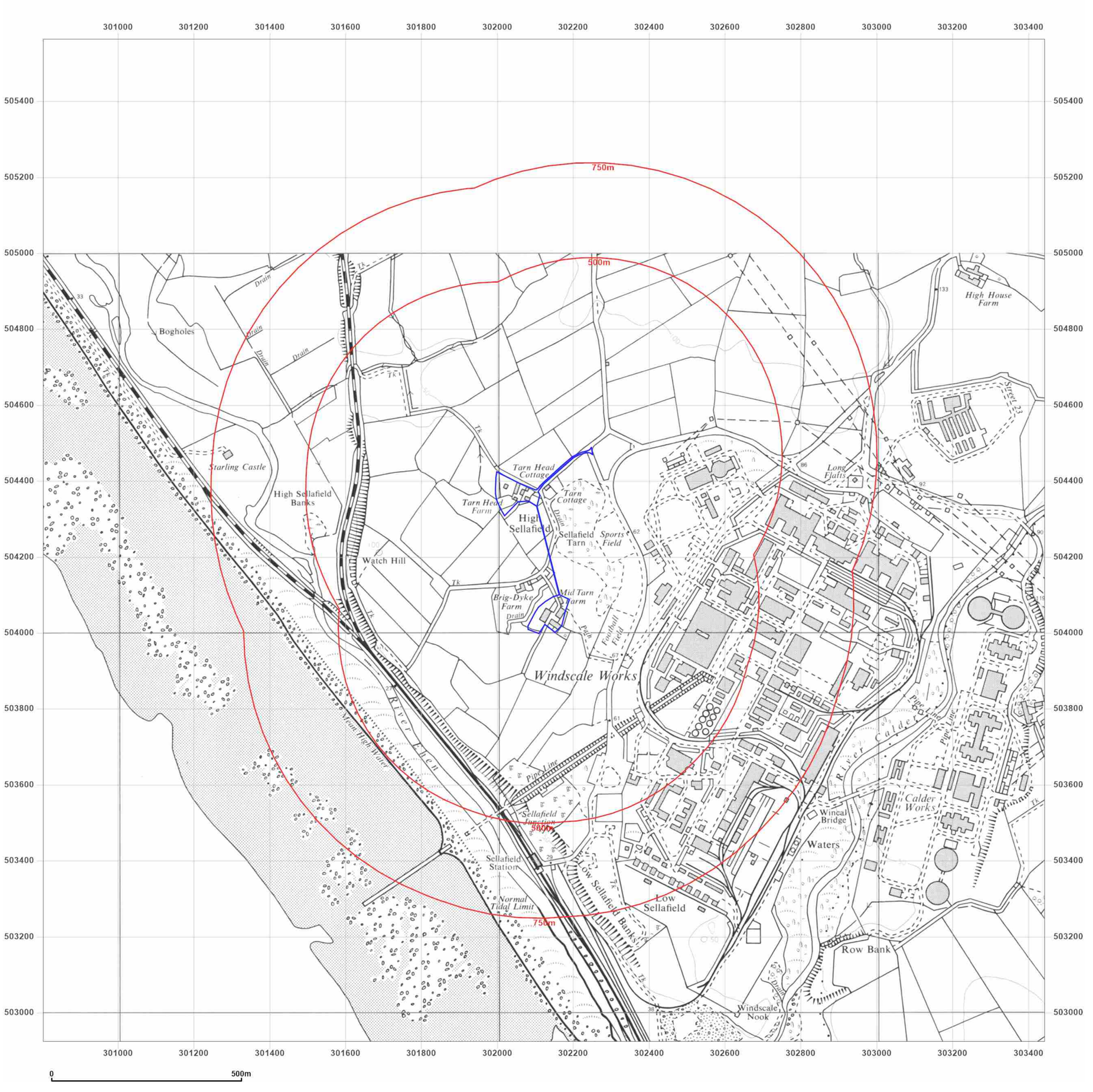


Groundsure INSIGHTS

**Site Details:**

Combined Mid and Head Tarn

**Client Ref:** Combined
**Report Ref:** GSIP-2024-14785-18146
**Grid Ref:** 302122, 504243

**Map Name:** Provisional

**Map date:** **1971**

**Scale:** 1:10,560

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

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Surveyed 1969
Revised 1971
Edition N/A
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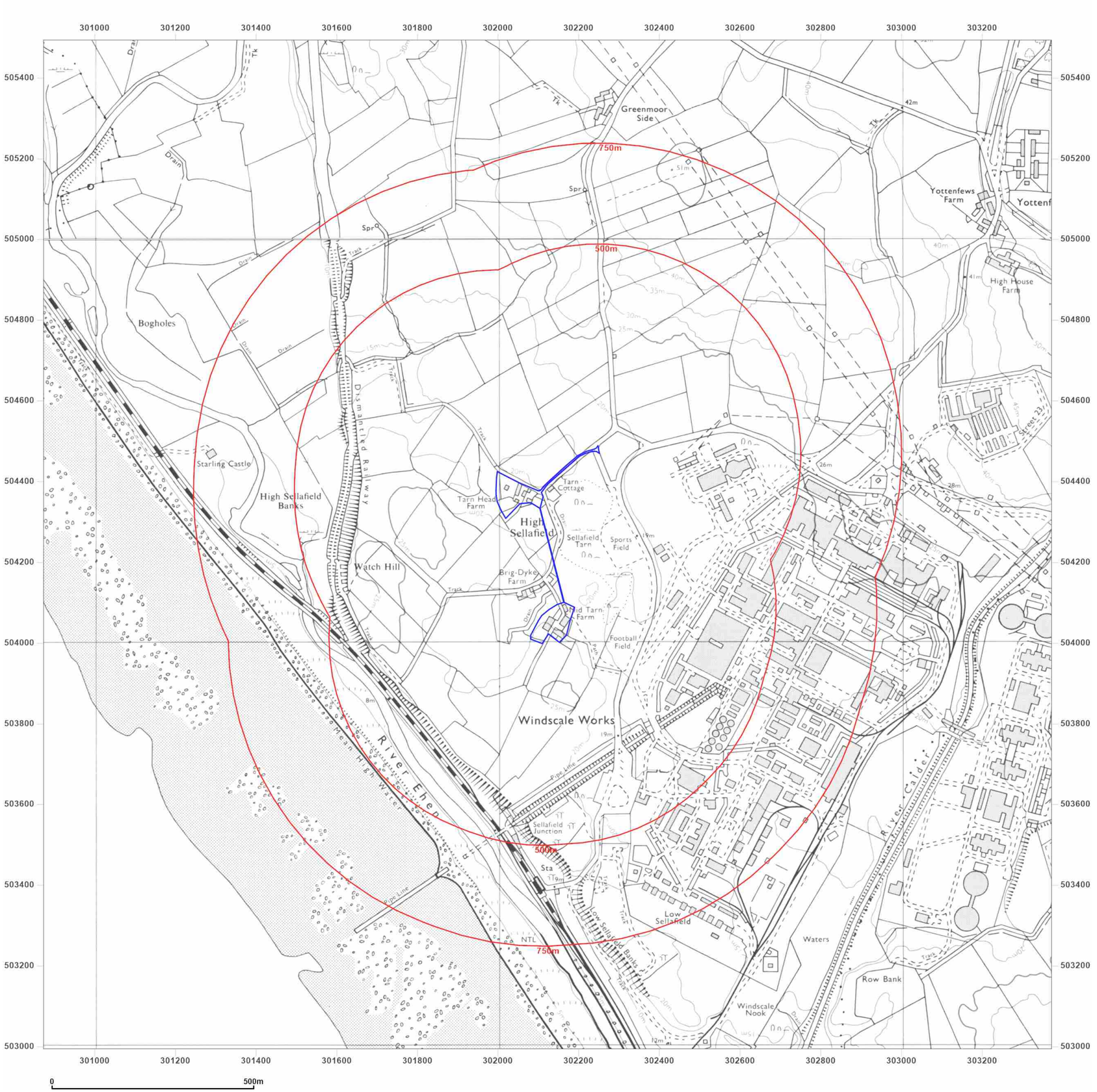


Tarn Head Farm
Ground Investigation Desk Study v1.1 (Final)

Groundsure INSIGHTS

**Site Details:**

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**Client Ref:** Combined
**Report Ref:** GSIP-2024-14785-18146
**Grid Ref:** 302122, 504243

**Map Name:** National Grid

**Map date:** **1976-1981**

**Scale:** 1:10,000

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

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Surveyed 1970
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**Site Details:**

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**Client Ref:** Combined
**Report Ref:** GSIP-2024-14785-18146
**Grid Ref:** 302122, 504243

**Map Name:** National Grid

**Map date:** **1991-1994**

**Scale:** 1:10,000

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

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Surveyed 1968
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Surveyed 1986
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**Site Details:**

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**Client Ref:** Combined
**Report Ref:** GSIP-2024-14785-18146
**Grid Ref:** 302122, 504243

**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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**Client Ref:** Combined
**Report Ref:** GSIP-2024-14785-18146
**Grid Ref:** 302122, 504243

**Map Name:** National Grid

**Map date:** **2010**

**Scale:** 1:10,000

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

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**Client Ref:** Combined
**Report Ref:** GSIP-2024-14785-18146
**Grid Ref:** 302122, 504243

**Map Name:** National Grid

**Map date:** **2024**

**Scale:** 1:10,000

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

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