REFA

CONSULTING ENGINEERS

CIVIL • STRUCTURAL

GEOTECHNICAL • ENVIRONMENTAL

PROPOSED RESIDENTIAL DEVELOPMENT PHASE 2, GLYN FARM HEOL DIRION, COLWYN BAY

FOR

ANWYL HOMES

MAY 2022

GEO-ENVIRONMENTAL INVESTIGATION REPORT

06063/GEIR

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EXECUTIVE SUMMARY

Site	*The site is irregular in shape and extends to an area of approximately 1.84 hectares. The site is located east of Heol Dirion road and 1.4km to the north west of Colwyn Bay town centre.*
NGR	*SH 8551 77617*
Site History	*The site has remained in agricultural usage throughout the whole of its recorded history. It has not at any time contained any potentially contaminative features. There are no records of any potentially contaminative industrial land uses surrounding the site which may be a source of contamination.*
Investigations	*The investigations have extended to:-* • *Walkover survey* • *Desk study* • *Extensive intrusive investigations by trial pit techniques.* • *Geotechnical & chemical analyses of soil samples*
Ground Conditions	*The investigations have confirmed the presence of topsoil extending over the whole site area, typically to a depth ranging from 0.20 to 0.40m. Underlying the surface topsoil the investigations have proved the presence of a thin layer of weathered bedrock, having become weathered to either gravel, cobble size fragments or completely weathered gravelly clays. TP404, TP409 and TP411 recorded a thin band of Glacial Till comprised predominantly of a friable reddish brown slightly gravelly silty clay which extends from 0.35m to 0.90m below ground level. Bedrock has been located at depths varying typically between approximately 0.30m to 1.40m below ground level.*
Groundwater	*All trial pits have been excavated in effectively dry conditions with no presence of groundwater ingress. The natural groundwater table is considered to lie at significant depth below the site within the bedrock.*
Environmental	*This investigation has not identified any elevated levels of the contaminants tested. Consequently, the topsoil is considered suitable for reuse within the proposed residential development.*
Trees	*The walkover survey has identified trees and vegetation adjacent to the north western corner of the proposed development. Consequently, an arboriculturist tree survey should be undertaken.*
Foundations	*Based upon the results of this ground investigation strip foundations may be formed on the weathered mudstone bedrock which is considered to offer a safe bearing capacity of at least 150kN/m^2 at a minimum depth of 0.30m below ground level. As you advance further through the bedrock the safe bearing capacity will likely rise in excess of 350 kN/m^2 It is anticipated that the majority of the site will adopt traditional strip type foundations constructed typically at depths of 0.75m- 1.40m below ground level. The natural clay stratum is considered to have a* ***low volume*** *change potential in accordance with NHBC chapter 4.2.*
Slabs	*It is recommended that suspended ground floor construction be adopted for all properties located within this site. These floors may be of a pre cast concrete beam and block arrangement or of a suitably designed cast in-situ reinforced concrete. In those areas where tree root effects are important it is recommended that a pre cast concrete beam and block type floor is utilised to allow for the provision of a suitable air void below the ground floor construction.*
SUDS	*Assessment of the ground conditions present within this site in terms of sustainable urban drainage confirms that the majority of the site comprises of impermeable mudstone bedrock and it is considered that the site will not be capable of sustaining a soakaway system of surface water disposal. Surface water drainage will need to be addressed using a traditional piped gravity system to a discharge point.*
Remediation	*No remediation work is required for the proposed development.*

This brief summary should not be assumed to represent a complete account of all the potential geo-environmental issues that may exist at the site. As such it is strongly recommended that the report be read in its entirety.

GEO-ENVIRONMENTAL INVESTIGATION WORKS

GLYNN FARM, HOEL DIRION

1.0 INTRODUCTION

1.1 Instructions

1.1.1 We are instructed by Anwyl Homes, Anwyl House, Clos Dewi Sant to undertake a programme of ground investigation works at a site located off Hoel Dirion, Colwyn Bay which they intend to re-develop in a residential manner.

1.2 Object

1.2.1 The object of these investigations are as follows:

- To determine the engineering properties of the soils present within the site to form a basis upon which foundation and general infrastructure recommendations and design may be based;
- To enable sufficient information regarding ground conditions to be obtained from which risks to end users and the environment can be assessed;
- To utilise the information obtained from the investigations to provide recommendations for remediation measures where required.

1.3 Scope

1.3.1 The investigations considered within this report have comprised of the following elements:

- An initial environmental and engineering desk study based upon existing reports, services location information, geological, hydrogeology and hydrological information, a commercially available database and old Ordnance Survey maps;
- Undertake ground investigation works by trial pitting techniques;
- Determine the presence, nature and extent of any soil and groundwater contamination at the site;
- Determination of the engineering properties of the soils present within the site to form a basis upon which recommendations for foundations and infrastructure construction may be based;
- Identify the potential requirements for any remedial action, where required.

1.4 Development Proposals

1.4.1 We understand that it is our client's intention that the site will be developed in a residential manner and an initial development proposal has been provided. A copy of the proposed site layout sketch is appended to this report for reference. It is however acknowledged that amendments may be made to these proposals as a result of planning consultations and commercial considerations. It is anticipated that the development will be carried out generally in accordance with the principles of the current layout.

1.4.2 The proposed site layout shows the site be developed by the construction of up to twenty- three (23 No.) residential properties in detached and semi-detached configurations.

All residential properties within the site are to be provided with appropriate private garden areas and associated soft landscaping with road access and vehicular parking. The currently proposed site layout is appended to this report for reference.

1.5 Services

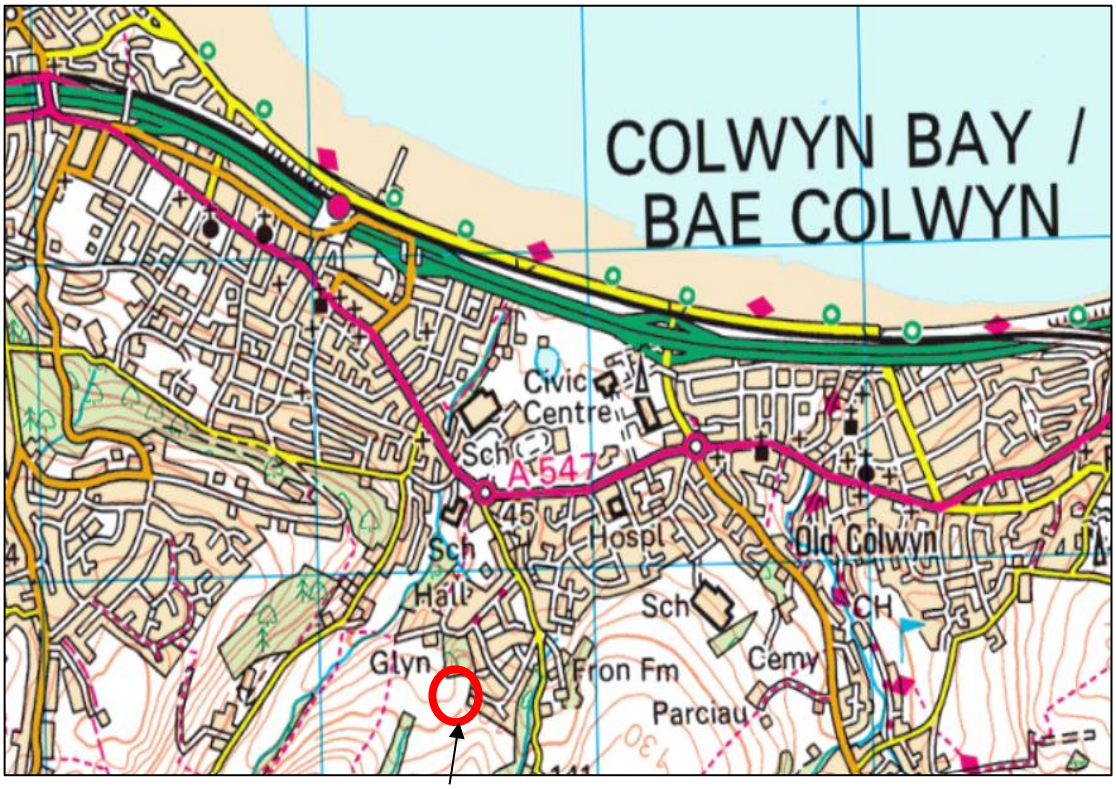
1.5.1 Service records, provided by the client, show no services within the sites boundary. Regardless of the records all investigation locations have been proceeded by a survey utilising a cable avoidance tool (CAT).

2.0 THE SITE

2.1 Location

2.1.1 The site is irregular in shape and extends to an area of approximately 1.84 hectares. The site is located east of Heol Dirion road and 1.4km to the north west of Colwyn Bay town centre. The centre of the site is situated at approximate National Grid Reference SH 8551 77617 within a predominantly rural area, though an existing residential development does lie immediately to the east. The site location is shown in figure 1 below.

Figure 1 Site Location



2.2 Boundaries

2.2.1 The northern boundary of the site is formed by an area of woodland. The southern boundary is not defined and forms a line from an adjoining field boundary across to the existing residential development to the east. The eastern boundary is formed by residential developments off Hoel Dirion road. The western boundary is not defined on site.

2.3 Access

2.3.1 Currently access to the site is gained by means of a temporary gate located upon the eastern boundary. Reference to the proposed site layout indicates that permanent vehicular access will be made which will connect the site to Hoel Dirion.

2.4 Topography

2.4.1 The site comprises of a hill which slopes east towards Hoel Dirion. The western portion of the site, slopes steeper and to the west. The site also slopes south from the north western boundary. It is anticipated that retaining wall features will be present to accommodate the final development and deal with the complexity of the sites sloping nature.

2.5 Site Conditions

2.5.1 At the time of the investigation the site was in a vacant condition with a surface of short grass. Reference to Walkover Survey, drawing 06063/32, suggests that the site has been used for pastoral grazing for livestock.

2.6 Trees

2.6.1 Trees are not located within the site, however mature trees are present adjacent to the north western boundary. As such a detailed arboriculturist tree survey should be undertaken.

2.7 Walkover Survey

2.7.1 Prior to commencing the ground investigation works, we have undertaken an initial walkover survey of the site to identify any areas which may impact upon the proposed site redevelopment works. The walkover survey plan, photograph location plan and site photographs have been appended to this report for reference, drawing number 06063/32.

2.7.2 The site walkover was conducted on the 15th March 2022 and at the time of the walkover the weather conditions were dry. The survey has confirmed that the site surface comprises of grass with a firm underlying topsoil layer.

2.7.3 The walkover survey has confirmed that the site comprises of two main slopes. The first slopes east towards Hoel Dirion. The second, at the crest of the hill falls away west. The slopes are considered to represent significant topographical features and consequent may impact upon the development of the site. There are no other significant topographical features within the site area in terms of retaining walls etc.

3.0 DESK STUDY

3.0.1 As part of our environmental desk studies we have commissioned an Enviro-Insight report by Groundsure which gives details of all recorded environmental features relating to the site and its immediately surrounding area. We have also obtained copies of all available old Ordnance Survey maps for the area and these give some historical guidance regarding the former usage of the site area and its immediate vicinity. A Geo-Insight report has also been commissioned which assesses the geological structures within the general area of the site. It should be noted that the area of desk study extends to a greater area than the proposed development site.

3.1 Historical Industrial Sites

3.1.1 The Enviro-Insight report has identified fourteen (14 No.) records of potentially contaminative past land uses located within 250m of the search boundary. The closest of these features are an unspecified heap located west of the proposed development. Given the sites proximity to the features and the sites topography, it is unlikely that this will significantly impact the proposed development.

3.1.2 There is one record of a historical energy feature which relate to electricity substations situated within 250m of the site boundary. Here again, the closest of these features is some 40m to the north east and would not be anticipated to represent a long term hazard to a residential development.

3.1.3 There are no records of historical tanks, garages or petrol filling stations located within 250m of the study site.

3.2 Waste and Landfill

3.2.1 The environmental report has identified no records of any active, recent or historical landfill sites situated within 250m of the study site boundary. External landfilling sites are therefore not considered to represent a potential for ground gas migration.

3.3 Current Land Uses

3.3.1 The environmental report has identified two (2 No.) records of potentially contaminative industrial sites, the nearest being an electricity substation 44m north east and a pumping station 223m north

3.3.2 The Groundsure report has identical five (5 No.) records for the discharge of treated or untreated effluent to controlled waters under the Water Resources Act 1991 within 250m of the site boundary. The nearest record being 125m north west of the site boundary.

3.3.3 The Groundsure report has identified one (1 No.) record of substantiated pollutant events. The incident occurred in 2013, 225m north west of the site boundary. The event had a minor impact on land, no impact on air and no information regarding its impact on water. Given the events proximity to the site and the date it occurred, it is unlikely that this event will have any significant impact on site.

3.4 Hydrogeology & Hydrology

3.4.1 There are no superficial deposits and subsequently no aquifer indicated to be present within the area of the proposed development.

3.4.2 The bedrock of the site comprises of interbedded sandstone, siltstone and mudstone, which is indicated to be a Secondary (B) aquifer. A Secondary (B) aquifer comprise predominately of lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin impermeable horizons and weathering. These are generally the water bearing parts of the former non-aquifers. The development of this site is not considered to pose a potential hazard to the underlying aquifers within the superficial and bedrock deposits.

3.4.3 The vulnerability of groundwater to a pollutant found across the site and its immediate surrounding area has been assessed as High", areas able to easily transmit pollution to groundwater.

3.4.4 The environmental report has confirmed that there is no groundwater abstraction licenses within 2000m of the study site. Additionally, there are two (2 No.) records of surface water abstractions, the nearest being 251m south east and one (1 No.) potable abstraction point 251m south east of the site boundary. Clearly the redevelopment of this site on a residential basis is unlikely to represent any particular environmental hazard to groundwater abstraction within the general vicinity.

3.4.5 There are no Source Protection Zones within 500m of the site boundary.

3.4.6 There are fifteen (15 No.) records of surface water features within the general proximity of the site. These references predominantly relate to small inland stream which are predominantly located 100m to the west of the site. Reference to the general topography suggests that these water courses will not be impacted by any development activities undertaken within this site. It is however important to recognise that ground water runoff during the development process must not be allowed to enter any surface water features or surface water drainage system.

3.5 Flooding

3.5.1 Flooding data is maintained by the Environment Agency and Natural Resources Wales. The Risk of Flooding from Rivers and Sea (RoFRaS) database indicates that the site and within 50 metres of the site boundary the highest risk of flooding is Very Low.

3.5.2 In the period since records began in 1946, there have been no historical flood events within 250m of the site boundary.

3.5.3 Within 250m, there are no flood defences, no areas benefitting from flood defences, and no flood storage areas.

3.5.4 The site is not within 50m of a Flood Zone 2 area or a Flood Zone 3 area.

3.5.5 According to Ambiental Risk Analytics surface water "FloodMap" there is a 1 in 100 year, 0.1 - 0.3m risk on site and within 50m, a 1 in 30 year, 0.1-0.3m risk of flooding.

3.5.6 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. Ambiental Risk Analytics indicated a negligible risk of groundwater flooding on site and a negligible risk of ground water flooding within 50m of the site boundary. Given the above, it is unlikely that a Flood Risk Assessment will be required for this site.

3.6 Geology

3.6.1 The Geo-Insight report has indicated that there are no superficial deposits within the vicinity of the proposed development.

3.6.2 The solid geology below the site comprises of the Elwy Formation comprising of interbedded mudstone, siltstone and sandstone. The bedrock below the site is considered to have a moderate to low permeability with a fracture flow type.

3.6.3 No records of geological faults have been identified within the site or in close proximity and therefore geological faulting is not considered to pose a potential source of minor ground movements within the proposed development.

3.6.4 The risk from, running sands, compressible deposits/ strata and dissolution of soluble rocks is negligible. On-site shrinking/ swelling clays and collapsible deposits/ strata is very low and landslides is low.

3.6.5 The site is located within an area where between 5% and 10% of properties are above the action level for radon gas and therefore according to publication BR211 by the Building Research Establishment basic radon protective measures are necessary.

3.7 Mining

3.7.1 The geological report has confirmed that the site is not located within an area known to be impacted by coal mining operations. Reference is made to the possible presence of non-coal mining having taken place within vein materials but the risk associated with such activities is considered to be extremely low and no mining works are considered to have occurred within the site area.

3.8 Background Soil Chemistry

3.8.1 The Geo-Insight report includes an estimated geometric mean soil concentration of various elements. Assessment of this information suggests that all determinands listed are at concentrations below the current tier 1 assessment criteria in relation to human health. Therefore, the underlying natural strata are not considered to contain naturally occurring contaminants.

3.9 Site History

3.9.1

Table 1 – Review of Historical Maps

Date	Site	Adjacent Land
1875-1876	The site comprises of open greenfield areas. The north eastern portion of the site comprises of woodland.	All adjacent land is recorded to be in agricultural usage with no significant surrounding development. Buildings associated with Glyn Farm are situated adjacent to the north western boundary of the site.
1898-1900	A pump has been added in the centre of the northern boundary of the site.	No significant changes.
1911	The pump has been lost from the survey.	No significant changes.
1948	No significant changes.	No significant changes.
1961-1964	No significant changes.	Severn Road residential development has been added, north east of the site.
1987	No significant changes.	No significant changes.
1994	The site not covered by the survey.	Hoel Dirion residential development has been added to the southern half of the eastern boundary.
2001 2003	No significant changes.	No significant changes.
2022	No significant changes.	No significant changes.

3.9.2 Careful appraisal of the historical maps has identified that the site has remained in agricultural usage throughout the whole of its recorded history. The only significant development to have taken place within the proximity of the site relates to the adjoining residential developments of Severn Road and Hoel Dirion.

3.10 Anticipated Ground Conditions

3.10.1 Based upon the information obtained during the initial desk study phase, the anticipated ground conditions are expected to comprise of strata as detailed in table 2 below.

Table 2 – Anticipated Ground Conditions

Ground Material	Anticipated Condition
Topsoil	Topsoil is likely to be present over the whole site area.
Superficial Deposits	Unlikely to be present. There may be a thin residual rock head separating the topsoil from the underlying bedrock.
Bedrock	Elwy Formation comprising of mudstone, siltstone and sandstone
Groundwater	Expected to lie at depth within bedrock.

3.10.2 Based upon the data available within the desk study and tables 1 and 2 above, potential ground related issues associated with the proposed redevelopment of this site are likely to include the elements noted in table 3 overleaf.

Table 3 – Potential Ground Related Issues

Type of Issue	Site Specific issue	Remarks (refer to walk over survey plan)
Potential on Site Contamination Sources	1. Naturally occurring contamination in the natural soil. 2. Potential made ground deposits.	1. Generally over the site area. 2. Within developed areas of the site.
Potential off Site Contamination Sources	1. None identified.	1. None identified.
Potential Geotechnical Hazards	1. The Groundsure report has indicated a moderate risk of landslides within the area of the proposed development.	1. Potential for slope instability within the area of the proposed development.

3.11 Preliminary Conceptual Model

3.11.1 The information presented within this Desk Study section of this report has been used to compile a preliminary conceptual model for the site. The identified potential contaminant and receptors have been considered along with any possible pathways that may link them. The resulting pollution linkages are considered in table 4 below. The risk classification has been estimated in accordance with the terms and definitions based upon CIRIA C552 Contaminated Land Risk Assessment, A Guide to Good Practice.

Table 4 – Preliminary Conceptual Site Model						
Potential Source	**Potential Receptor**	**Possible Pathway**	**Probability**	**Consequence**	**Risk**	**Mitigation / Investigation**
Contaminated soils	*Future site users*	*Direct contact of soils Inhalation or ingestion of soil / dust*	*Ul*	*Md*	*Low*	*Soil sampling during intrusive investigations. Laboratory analysis of samples.*
	Surface water in the vicinity of the site	*Leaching of contaminants through drainage system*	*Lw*	*Mi*	*Low*	
	Ground water in aquifer	*Leaching of contaminants to ground water*	*Ul*	*Md*	*Low*	
	Future site users	*Vapour migration from soils*	*Ul*	*Md*	*Low*	
	Proposed buildings and services	*Direct contact with contaminated soils*	*Ul*	*Md*	*Low*	
	Plants in gardens and soft landscaping	*Direct contact*	*Ul*	*Md*	*Low*	
Contaminated ground water	*Site personnel during construction*	*Water entering excavations*	*Lw*	*Mi*	*Low*	*Sampling of ground water (where encountered)*
	Future site Users	*Retained surface water*	*Lw*	*Mi*	*Low*	
Toxic and explosive gases	*Proposed buildings and occupiers*	*Ground gas migration into buildings*	*Ul*	*Md*	*Low*	*No evident sources of any potential toxic or explosive ground gases.*
Radon gases	*Proposed buildings and occupiers*	*Ground gas migration into buildings*	*Li*	*Md*	*Moderate*	*Basic Radon ground gas protection required.*
Key: Consequence: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor Probability: Hi = High, Li = Likely, Lw = Low Likelihood, Ul = Unlikely						

4.0 SITE WORKS

4.1 Intrusive Works

4.1.1 The ground conditions present within this site have been investigated utilising a series of twelve (12 No.) trial pits excavated by a 13 tonne tracked mechanical excavator and supervised by an experienced geo-technical engineer. The trial pitting exercise was undertaken on 15th March 2022.

4.1.2 Representative samples of strata encountered during these investigation works have been retained for laboratory analyses and testing where considered to be appropriate.

4.2 Locations

4.2.1 The locations of the trial pits were chosen by ourselves in conjunction with the desk study information and accessible areas. The locations were chosen in an effort to identify the representative ground conditions and shallow geology present across the whole site area.

4.2.2 The locations of each of the trial pits are indicated upon the appended exploratory hole location plan see drawing 06063/31-1. These locations are shown in relation to site features present at the time of the investigations.

4.3 Records

4.3.1 During the investigations details of the strata types, water entries, ground conditions and levels have been maintained by the site engineer. This information has been collated into a series of trial pit journals which are appended to this report for reference. Also, during these investigations representative samples of the strata encountered have been retained for laboratory testing as required.

4.4 Targeting

4.4.1 The investigation locations were undertaken to identify the shallow bedrock strata present over the whole site area, though it is acknowledged that ground conditions may vary between investigation locations.

4.4.2 The investigation locations have been spread over the whole area of the site in accordance with the recommendations laid down in BS10175: 2011 “Investigation of Potentially Contaminated Sites”. The initial ground investigation strategy is detailed within table 5 below.

Table 5 - Initial Ground Investigation Strategy

Exploratory Hole No.	***Target***	***Purpose***
TP01 – TP12	*Generally over the site*	*To determine the general nature of underlying soils and geology including:* *1. Nature, distribution and thickness of Made Ground, if any.* *2. Nature, degree and extent of potential contamination.* *3. Content of unacceptable material e.g. peat and biodegradable matter etc.* *4. Suitability of the ground for the founding of structures.* *5. Engineering properties of the ground.*

5.0 GROUND CONDITIONS

Table 6– Summary of Strata Depths				
Hole ID	***Depth of Topsoil (m)***	***Depth of Cohesive deposits (m)***	***Depth of Bedrock (m)***	***Final Depth (m)***
TP401	*0.40*	*-*	*1.30*	*1.30*
TP402	*0.20*	*-*	*1.10*	*1.10*
TP403	*0.20*	*-*	*1.55*	*1.55*
TP404	*0.35*	*0.60*	*1.50*	*1.50*
TP405	*0.30*	*-*	*0.60*	*0.60*
TP406	*0.45*	*-*	*0.50*	*0.50*
TP407	*0.20*	*-*	*1.10*	*1.10*
TP408	*0.30*	*-*	*0.35*	*0.35*
TP409	*0.35*	*1.10*	*1.20*	*1.20*
TP410	*0.35*	*0.85*	*0.90*	*0.90*
TP411	*0.40*	*0.80*	*0.85*	*0.85*
TP412	*0.25*	*1.10*	*1.30*	*1.30*

5.1 Topsoil

5.1.1 Topsoil deposits have been identified over the whole site area of the site and have been proven to a depth ranging from 0.20m to 0.45m. No visual or olfactory evidence of contamination or potentially hazardous materials have been identified within the topsoil material. Samples of the topsoil have been obtained for laboratory testing to determine their suitability for reuse within the proposed residential development.

5.2 Made Ground

5.2.1 These investigations have not located the presence of any Made Ground deposits. There are no records of any anthropogenic materials present within the topsoil or underlying strata.

5.3 Natural Strata

5.3.1 These investigations have identified the presence of thin band of friable reddish brown, slightly gravelly silty clay within TP404, TP409 and TP411. Generally, these materials extend to a depth of approximately 0.60m – 0.90m below ground level.

5.3.2 These investigations also identified a completely weathered bedrock recovered as a greyish brown, grey and dark grey gravelly silty clay with high mudstone cobble size fragments within TP409 and TP412. Generally, these materials extend to a depth of approximately 1.10m bgl.

5.4 Bedrock

5.4.1 These intrusive investigations have confirmed the presence of bedrock of varying degrees of weathering immediately underlying the surface clay. The bedrock is initially generally recovered as a highly weathered gravel or cobble size fragments as identified TP401- TP404, TP407 and TP410 and extend to depths of 0.25- 1.50m bgl.

5.4.1 Generally, a moderately to slightly weathered bedrock has been proved to be present at depths varying between 0.30m and 1.50m below existing ground level. The final depths of each of the trial pits as seen in table 1, terminated at rock head with failure to progress.

The rock material is considered to offer a safe bearing capacity within the highly weathered zones of at least 150kN/m^2 but this rapidly increases with depth and within the un-weathered material bearing capacities in excess of 350kN/m^2 are available.

5.5 Groundwater

5.5.1 These intrusive investigations have identified no groundwater ingress. The groundwater table is considered to lie at a significant depth below the site within the bedrock. Groundwater is not considered to represent an important hazard to the development of the site but water entries to excavations and consequent cannot and should not be discounted.

5.5.2 The natural strata within this site comprises predominantly of cohesive impermeable clays and it is considered that during periods of inclement weather perched water may become present within excavations with the cohesive materials. If localised temporary flooding does occur, then standing water may be removed by simple sump pumping operations.

5.6 Excavations

5.6.1 The natural strata across the site comprises of varying states of weathered bedrock though these are recorded as cohesive clay bands and lenses across the site.

5.6.2 The trial pit's recorded spalling within the highly weathered mudstone which was recovered as gravel and cobble size fragments. These areas were largely less than a 1.00m in thickness with the exception of TP403 where the highly weathered band was recorded as 1.30m in thickness. Due to the weaknesses within the highly weathered zone, appropriate side support should be provided in areas where the highly weathered zone extends 1.00m below ground level in order to prevent sudden catastrophic collapse of excavations made within this. Accordingly, all excavations made within the site should be provided with appropriate side support.

5.6.3 It is essential that personnel should not be allowed to approach or enter any excavation made upon this site unless appropriate precautions have been adopted to ensure that hazardous side instability has been prevented. This is particularly important in relation to foundation and drainage construction where personnel may be specifically required to enter deeper excavations for essential construction purposes. Reference should be made to H.S.E. publication HSG 150 for guidance.

5.7 Contamination

5.7.1 The intrusive investigations have identified topsoil deposits, locally overlying thin bands of clay deposits which in turn overlie shallow bedrock. These investigations have not identified any visual or olfactory evidence of contamination or potentially hazardous materials. It is possible that topsoil deposits within the site may be impacted by naturally occurring contaminants and, accordingly, representative samples of the topsoil materials have been returned to the laboratory for chemical analyses. These test results are intended to inform developers of the site regarding the suitability of the topsoil for reuse within the final residential development.

5.8 Index Testing

5.8.1 A total of four (4 No.) samples of clay strata encountered during these investigations have been returned to a civil engineering laboratory to determine their index properties.

Copies of the laboratory tests are appended to this report for reference. Consideration of these results confirms that generally the clay soils within the site have a plasticity index in the range of 14% - 19%. Assessment of the modified plasticity index confirms that that the clay soils within this site are considered to have a **low volume change potential** as defined by NHBC Handbook Chapter 4.2.

5.9 Ground Gases

5.10.1 The desk study information has not identified any landfill or licensed waste sites within 500m of the site area and this investigation has not identified any buried or deep deposits of made ground or organic material that may have a potential for generating ground gases within the development itself. Therefore, we consider there is no potential source of toxic or explosive gases within the site and the site may be classified as Characteristic Situation 1 as defined by CIRIA C665 and Green as defined by the NHBC Report No. 4.

5.10 SUDS

5.10.1 Assessment of the ground conditions present within this site in terms of sustainable urban drainage confirms that the majority of the site comprises of impermeable mudstone bedrock and it is considered that the site will not be capable of sustaining a soakaway system of surface water disposal. Surface water drainage will need to be addressed using a traditional piped gravity system to a discharge point.

5.11 Trial Pits for Proposed Drainage Works.

5.11.1 As part of the ground investigation, the client has also requested trial pits to be undertaken close to the watercourse, west of the proposed development, drawing 06063/31-2. Four (4 No.) trial pits (see appended TP413 to 416 journals) were excavated in order to aid future design proposals for future attenuation structures within this area.

5.11.2 The trial pits encountered topsoil to a maximum depth of 0.35m which overlie slightly gravelly slightly sandy silty clays to a depth ranging from 1.00 to 1.20m bgl. Each of the trail pits then encountered a completely weathered mudstone bedrock recovered as a friable firm to stiff slightly gravelly slightly sandy silty clay with a low mudstone cobble content. These deposits extended to a depth of 2.65m to 3.20m bgl. A moderately weathered bedrock was recorded within TP413 and TP414, with the trial pits being terminated at 2.70m and 2.65m bgl, respectively.

6.0 CONTAMINATION ANALYSIS & ASSESSMENT CRITERIA

6.1 Sampling

6.1.1 This investigation has identified topsoil and Made Ground deposits within the site area. A total of seven (7 No.) samples of strata have been retained during this investigation for chemical analysis. These samples are considered to be representative of the ground conditions within the site and form a basis for assessment of their potential for reuse within a residential environment.

6.1.2 All samples obtained from this site were considered to be subject to a program of PAH analyses. Accordingly all samples have been placed into a 500ml wide necked brown glass jar. All soil samples have been stored in cool boxes at temperatures of approximately 4º (+ or - 2ºC) until delivery to the selected laboratory.

All sample containers were marked with the site address, trial pit or borehole number, depth and date of sampling. All samples have been tested within the specified handling period to accord with the sampling protocol presented by Element Materials Technology Laboratories.

6.2 Range

6.2.1 Topsoil deposits has been identified extending over the whole of the site area. Representative samples of the topsoil have been retained for analysis to determine its suitability for reuse and retention within a proposed residential development.

6.2.2 Natural strata has been identified within all the exploratory holes underlying the topsoil strata. This natural strata comprises of varying degrees of weathered mudstone bedrock which do not contain any visual or olfactory evidence of contamination. Accordingly, the natural strata present within this site is considered to be suitable for retention within the residential environment.

6.3 Laboratory

6.3.1 All samples selected for chemical analyses have been returned to Element Materials Technology., who are an MCERTS and UKAS accredited laboratory facility. Each sample has been subject to a range of chemical analyses to determine the concentrations of a wide range of common contaminants applicable to the former use of this site and the materials present. Details of the analysis programme are shown in table 6 below. Confirmation of the UKAS and MCERTS accreditations for each test is indicated within the results which are appended to this report.

6.4 Development Proposals

6.4.1 We understand that the site is to be re-developed in a residential manner with associated rear garden areas, areas of hard standing and access roads. It is essential to ensure that the materials present within the sensitive site areas are suitable for retention within a residential environment.

6.5 Analysis Range

6.5.1 The preliminary conceptual model identifies that there is the potential for a pollutant pathway linkage to be present at the site and that further assessment is required. Table 7 below confirms the range of analyses undertaken upon the samples of topsoil obtained from this site.

Table 7: Chemical Testing Schedule

Analysis	***Determinands***	***No. of Samples***
Metals	*Arsenic, Cadmium, Chromium (total), Copper, Lead, Mercury, Nickel, Selenium, Zinc*	*7*
Organics 1	*PAH – USEPA 16 suite, Phenol*	*7*
Inorganics	*Cyanide, Soluble sulphates, Sulphide, pH, TOC*	*7*

6.6 Results

6.6.1 Full details of the chemical analyses results are appended to this report for reference and should be read in conjunction with the comments and recommendations regarding risk assessments. Summaries of the test results are presented in conjunction with the current assessment criteria in Section 7 of this report.

6.7 Approach

6.7.1 The current UK approach to the consideration of contaminated land is based upon the principles of risk assessment. This in turn is founded upon the use of a source-pathway-target principle in order to establish the presence of a potential pollutant linkage. Our approach to the risk assessment is consistent with UK guidance and best practice. As advocated in the EA Policy Statement: Guidelines for Environmental Risk Assessment and Management a tiered approach has been adopted. This tiered approach is central to Part IIA of the Environmental Protection Act 1990 and the Town and Country Planning Act 1990.

6.8 Site Classification

6.8.1 A sketch of the proposed site layout has been made available to us and we can confirm that it is intended to be developed on a private residential basis utilising large areas of private gardens. Accordingly, the site usage has been considered on the basis of an end land use of r**esidential with plant uptake** as defined by EA Science Report SC050021/SR3 2009 in relation to the most recent soil guideline values.

6.9 Criteria

6.9.1 The concentrations of contaminants within the ground have been compared to a range of generic soil guideline values that have been prepared by DEFRA and the Environment Agency. Where published, soil guideline values (SGV) have been utilised as intervention values for the purpose of an initial tier 1 assessment.

6.9.2 At the time of the preparation of this report soil guideline values were available only for a limited number of contaminants and the development of both the CLEA model and additional soil guideline values is on-going. Where published soil guideline values are available they have been utilised as intervention values for the purposes of an initial tier 1 assessment. A number of SGV's have recently been updated to reflect a modern approach to the protection of human health.

6.9.3 In March 2014 the Department for Environment Food & Rural Affairs published SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination Policy Companion Document. This document provides a series of Category 4 screening levels based upon differing land uses. Reference has been made to the values presented within this report in relation to the appropriate land usage.

6.9.4 Where soil guideline values were not published at the time of preparing this report, generic assessment criteria (GAC) published by Land Quality Management Ltd., in conjunction with the Chartered Institute Of Environmental Health have been adopted. The values published in the "LQM/CIEH S4UL's for Human Health Risk Assessment" Registration No. S4UL3265.

6.9.5 Reference has also been made to published soil screening values presented by Atkins Ltd., under their Atrisk Subscription Service. The SSVs have been adopted where SGVs or GACs are not available. The remaining contaminants have been considered based upon information that was the best available at the time of the study.

7.0 RESULTS OF ANALYSIS & QUALITATIVE RISK ASSESSMENT

7.1 Model

7.1.1 As discussed above, assessment of contaminated land is based upon a simple assessment of pollutant linkages referred to as the source-pathway-target model. This assessment considers the current or proposed usage of the site in terms of suitability for use. This implies the use of risk assessment in principle in order to evaluate the potential effects and concerns of contamination on a site-specific basis.

7.1.2 Initial assessment of the chemical analyses results has been undertaken to assess the concentrations of determinands in relation to tier 1 assessment criteria. The summary of these test results is detailed below.

7.2 Results Summary

7.2.1 The samples were obtained from the topsoil and made ground deposits across the whole of the site. Tables 8 and 9 have been prepared as a summary of the laboratory analyses depending upon the class of analyses undertaken and the strata type present. The test results have been compared to the adopted assessment criteria, relating to a proposed residential with home grown produce land usage.

7.3 Metals & Inorganics

7.3.1 Table 8 below indicates the range of contaminants that were included within the metals and inorganics analyses along with their respective assessment criteria. A review of the results has not identified any elevated concentrations of metals or inorganics within the topsoil.

Table 8: Summary of Contamination Analysis: Metals & Inorganics

	No. of Samples	*Range of Values (mg/kg)*	*Assessment Criteria (mg/kg)*	*No. of Samples Failing*	*Locations*
Arsenic	*7*	*9.0 – 12.1*	*37*[3]	*0*	-
Cadmium	*7*	*<0.1*	*11.0*[3]	*0*	-
Chromium (total)	*7*	*44.0 – 66.5*	*910*[3]	*0*	-
Copper	*7*	*22 - 28*	*2400*[3]	*0*	-
Lead	*7*	*15 - 27*	*200*[1]	*0*	-
Mercury	*7*	*0.1 – 0.2*	*40*[3]	*0*	-
Nickel	*7*	*33.8 – 40.4*	*180*[3]	*0*	-
Selenium	*7*	*<1*	*250*[3]	*0*	-
Zinc	*7*	*72 - 95*	*3700*[3]	*0*	-
Total Cyanide	*7*	*<1.5 – 5.0*	*34.0*[2]	*0*	-
Phenol	*7*	*<0.15*	*200*[3]	*0*	-
pH	*7*	*5.77 – 7.08*	-	*0*	-
SOM	*7*	*2.00- 5.43%*		*0*	
TOC %	*7*	*1.22 – 3.16%*	-	*0*	-
SO_4 (2:1)	*7*		*0.5*[4]	*0*	-

[1] DEFRA : SP1010 : Category 4 Screening Levels
[2] Atkins Atrisk SSV residential with home grown produce (2.5% SOM)
[3] LQM and CIEH S4UL's for Human Health Risk Assessment (Registration No. S4UL 3265) residential with home grown produce (2.5% SOM)
[4] BRE Special Digest 1:2005 DS-1 (units in g/l) *ND – None Detected*

7.4 Speciated PAH

7.4.1 The topsoil and Made Ground samples retained from the site investigation have been subject to a programme of analyses which have assessed the concentrations of the individual constituents of the polycyclic aromatic hydrocarbon series. A review of the results have not identified any elevated concentrations of individual constituents belonging to polycyclic aromatic hydrocarbon series.

Table 9: Summary of Contamination Analysis: Organics: PAH USEPA 16 Suite

	No. of Samples	Range of Values (mg/kg)	Assessment Criteria[1] (mg/kg)	No. of Samples Failing	Locations
Naphthalene	*7*	*<0.04*	*5.6*	*0*	-
Acenaphthylene	*7*	*<0.03*	*420*	*0*	-
Acenaphthene	*7*	*<0.05*	*510*	*0*	-
Fluorene	*7*	*<0.04*	*400*	*0*	-
Phenanthrene	*7*	*0.31*	*220*	*0*	-
Anthracene	*7*	*<0.04*	*5400*	*0*	-
Fluoranthene	*7*	*<0.03 – 0.05*	*560*	*0*	-
Pyrene	*7*	*<0.03 – 0.04*	*1200*	*0*	-
Benzo{a}anthracene	*7*	*<0.06*	*11.0*	*0*	-
Chrysene	*7*	*<0.02 - 0.03*	*22.0*	*0*	-
Benzo{a}pyrene	*7*	*<0.04*	*5.0*[2]	*0*	-
Indeno{123-cd}pyrene	*7*	*<0.04*	*36.0*	*0*	-
Dibenz{ah}anthracene	*7*	*<0.04 – 1.51*	*0.28*	*0*	-
Benzo{ghi}perylene	*7*	*<0.04*	*340*	*0*	-
Benzo{b}fluoranthene	*7*	*<0.05*	*3.3*	*0*	-
Benzo{k}fluoranthene	*7*	*<0.02*	*93*	*0*	-

[1] LQM & CIEH S4UL's for human health risk assessment (Registration No. S4UL 3265) – Residential with home grown produce (2.5% SOM)
[2] DEFRA : SP1010 : Category 4 Screening Levels

7.5 Sulphates

7.5.1 Within the program of laboratory testing each sample has also been analysed to determine the concentration of water soluble sulphates within the ground. Reference to the laboratory results presented by Element Materials Technology confirms that soluble sulphates are present at concentrations of 0.002 – 0.132 g/l. Reference to BRE Special Publication 1 : 2005 "Concrete in Aggressive Ground" confirms that at <0.5g/l, the design sulphate class for this site is DS-1. Accordingly, the ACEC class for the site is assessed to be AC-1d on the basis that the site does not have mobile groundwater and the pH value is >5.5. Reference to Table D of BRE Special Publication 1 indicates that the DC class for this site should be considered to be DC-1.

8.0 DISCUSSIONS

8.1 General

8.1.1 The desk study information has identified a recorded history of the site as remaining in agricultural usage until the present day. It has no history of previous development and no history of surrounding potentially contaminative land uses. The desk study has also not identified any potential sources of toxic or explosive ground gases which may be present within the site or within the immediately surrounding area.

8.1.2 The ground investigation has identified relatively uniform ground conditions comprising of an upper veneer of topsoil overlying natural strata comprising of varying condition of mudstone bedrock which has been proved to lie at a shallow depth over the site area.

8.1.3 The results of the chemical analyses undertaken upon representative samples of strata obtained from this site have been assessed in Section 7 above and subject to further discussion below.

8.2 Metals & Inorganics

8.2.1 The chemical analyses have not identified any elevated concentrations of metals or inorganics within the topsoil, therefore it is considered suitable for reuse or retention within the proposed residential development.

8.3 PAH Suite

8.3.1 The laboratory analyses have confirmed no elevated concentrations of PAH factions tested within the topsoil.

8.4 Revised Conceptual Site Model

8.4.1 As a result of these intrusive ground investigations and subsequent programme of chemical analyses, it has been possible to revise the preliminary conceptual site model presented in Section 3. The revised conceptual site model is now shown in table 11 overleaf. This report adopts the methodology for risk evaluation presented in CIRIA report C552 'Contaminated Land Risk Assessment – A Guide to Good Practice', 2001. The method is qualitative and involves the classification of the following:

8.4.2 In the context of regulatory definition of 'Contaminated Land' (as defined by the EPA 1990), 'very high' and 'high' risks would fall under the classification of 'Contaminated Land'. 'Moderate' risk could also potentially be classified as 'Contaminated Land' but any lower risk rating would not. Thus the following potential exposure pathways between potential and known contaminant sources based on information provided to date and receptors are tentatively identified in table 10 below.

Table 10: Revised Conceptual Site Model

Potential Source	Potential Receptor	Possible Pathway	Probability	Consequence	Risk	Mitigation / Investigation
Natural strata	*Site personnel during construction*	*Direct contact of soils Inhalation or ingestion of soil / dust*	*Lw*	*Mi*	*Very Low*	*Topsoil is suitable for reuse.*
	Future site users	*Direct contact of soils Inhalation or ingestion of soil / dust*	*Ul*	*Md*	*Very Low*	
	Surface water in the vicinity of the site	*Leaching of contaminants through drainage system*	*Ul*	*Md*	*Very Low*	
	Ground water in aquifer	*Leaching of contaminants to ground water*	*Ul*	*Md*	*Very Low*	
	Future site users	*Vapour migration from soils*	*Lw*	*Mr*	*Very Low*	
	Proposed buildings and services	*Direct contact with contaminated soils*	*Lw*	*Mi*	*Very Low*	
	Plants in gardens and soft	*Direct contact*	*Lw*	*Mi*	*Very Low*	

	landscaping					
Contaminated ground water	*Site personnel during construction*	*Water entering excavations*	*Lw*	*Mi*	*Very Low*	*Groundwater considered to be at significant depth below the site.*
	Future site Users	*Retained surface water*	*Lw*	*Mi*	*Very Low*	
Toxic and explosive gases	*Proposed buildings and occupiers*	*Ground gas migration into buildings*	*Lw*	*Md*	*Very Low*	*CS1 (NHBC Green).*
Radon gases	*Proposed buildings and occupiers*	*Ground gas migration into buildings*	*Li*	*Md*	*Moderate*	*Basic Radon ground gas protection required.*
Key:	*Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor*		*Hi = High, Li = Likely, Lw = Low Likelihood, Ul = Unlikely*			

8.5 Foundations

8.5.1 This ground investigation has identified topsoil deposits overlying natural strata comprising of weathered mudstone bedrock which is considered to offer a safe bearing capacity of at least 150kN/m^2 at a minimum depth of 0.30m below ground level. As you advance further through the bedrock the safe bearing capacity will likely rise in excess of 350 kN/m^2 It is anticipated that the majority of the site will adopt traditional strip type foundations constructed typically at depths of 0.75- 1.40m below ground level.

8.5.3 The development of the site in close proximity to an area of woodland situated adjacent to the north western boundary which will require suitable foundation precautions in accordance with NHBC Handbook Chapter 4.2. The depth of foundation required will depend upon the relationship of the tree type and its distance from the proposed structure. The clay material within the site has been identified to have a **low volume** change potential A full appraisal of the foundation requirements and precautions should be undertaken by the foundation engineer in conjunction with the detailed arboriculturists report.

8.6 Ground Floor Construction

8.6.1 It is recommended that suspended ground floor construction be adopted for all properties located within this site. These floors may be of a pre cast concrete beam and block arrangement or of a suitably designed cast in-situ reinforced concrete. In those areas where tree root effects are important it is recommended that a pre cast concrete beam and block type floor is utilised to allow for the provision of a suitable air void and heave precautions below the ground floor construction.

8.7 Retaining Walls

8.7.1 The site comprises of a varied sloping topography with eight plots along the western boundary sloping west and the remaining plots largely situated east towards Hoel Dirion. As indicated from the Desk Study, there is a low risk of landslides and so slope stability should be carefully considered. The development of the site will require a series of retaining structures to support highways and between individual plots. It is recommended that the design of the external works to the development be undertaken at an early date to define the locations and retained heights of these features. Accordingly, it is possible that some elements of reprofiling for the current topography may be required.

9.0 CONCLUSIONS & RECOMMENDATIONS

9.1 Remediation

9.1.1 Chemical analysis has confirmed that the topsoil material present within the site is suitable for reuse within the proposed garden landscaped areas of the proposed residential development. As such, no remedial activities are required for this development.

9.2 Ground Floor Construction

9.2.1 It is recommended that suspended ground floor construction be adopted for all properties located within this site. These floors may be of a pre cast concrete beam and block arrangement or of a suitably designed cast in-situ reinforced concrete. In those areas where tree root effects are important it is recommended that a pre cast concrete beam and block type floor is utilised to allow for the provision of a suitable air void and heave precautions below the ground floor construction.

9.3 SUDS

9.3.1 Assessment of the ground conditions present within this site in terms of sustainable urban drainage confirms that the majority of the site comprises of impermeable mudstone bedrock and it is considered that the site will not be capable of sustaining a soakaway system of surface water disposal. Surface water drainage will need to be addressed using a traditional piped gravity system to a discharge point.

9.4 Excavations

9.4.1 These investigations have identified the presence of bedrock lying at a shallow depth over the site area. The bedrock was not easily excavated by a 13- tonne mechanical excavator, when the slightly weathered to moderately weathered bedrock was encountered; consequently difficulties may be experienced in removing un-weathered rock. It is therefore likely that some areas of the site may require the provision of specialist breaking plant where excavations are required to extend into the un-weathered zone of bedrock.

9.5 Further Work

9.5.1 If any unusual or suspicious strata or ground conditions are encountered during the subsequent site stripping preparation work, it will be necessary for these areas to be bought to the attention of the appropriate authorities so that all necessary inspection, sampling and testing may be undertaken to determine whether these materials present a hazard to human health. It is incumbent upon the site contractors to advise a responsible authority of any unusual findings within the site which may then be further investigated.

10.0 NOTES

10.1 *All reports are for advisory purposes only and all design decisions are the ultimate responsibility of others.*

10.2 *Unless stated otherwise the investigation has been undertaken in general accordance with the recommendations given in BS 5930 : 1999 "A Code of Practice for site Investigations" and the laboratory testing has been carried out in accordance with BS 1377 : 1990 "Methods of Test for Civil Engineering Purposes".*

10.3 *Soil and rock descriptions are generally based on the scales of strength and relative density within BS 5930 although it should be noted that in certain circumstances descriptions are based on site records or a qualitative assessment without the benefit of in-situ or laboratory test results.*

10.4 *The assessment of ground conditions given in this report is based on the results of the fieldwork and laboratory testing carried out and there may be other conditions at the site not encountered by these works, which have not been taken into account.*

10.5 *The scope of the investigation and information provided may not necessarily reflect all the geotechnical and environmental aspects related to the site, and the omission of certain items does not mean that the site is unaffected by such problems.*

10.6 *It should be noted that groundwater levels can vary and may at times be significantly different to those recorded during the investigation and attention is drawn to BS 5930 which indicates that measurements may be necessary over an extended period of time to investigate changes in groundwater pressures due to seasonal, tidal and other causes.*

10.7 *Any recommendations on construction methods within this report are for initial guidance only and all design proposals remain the responsibility of the appropriate contractor/consultant.*

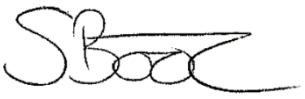
10.8 *Further assessment, investigation, construction activities or time may reveal conditions that were not found during the period of investigation and, therefore, could not have been taken into account in the preparation of the report and where such information might impact upon the stated opinion R. E. Fry & Associates Ltd request the opportunity to review such information and modify the report if necessary.*

10.9 *Where information has been obtained from sources other than the direct findings of the investigation, R. E. Fry & Associates Ltd cannot and does not guarantee the authenticity or reliability of this information.*

10.10 *Where opinions expressed in this report are based on current available guidelines and legislation, no liability can be accepted by R. E. Fry & Associates Ltd for the effects of any future changes to such guidelines and legislation.*

10.11 *This report has been prepared on the instructions and to the requirements of the named client and any unauthorised party using this information for any purpose does so at his own risk and any duty of care to that party is excluded.*

Signed for and on behalf of
R E FRY & ASSOCIATES LIMITED



Stephen Boot B.Sc. (Hons) FGS
R E FRY & ASSOCIATES LTD

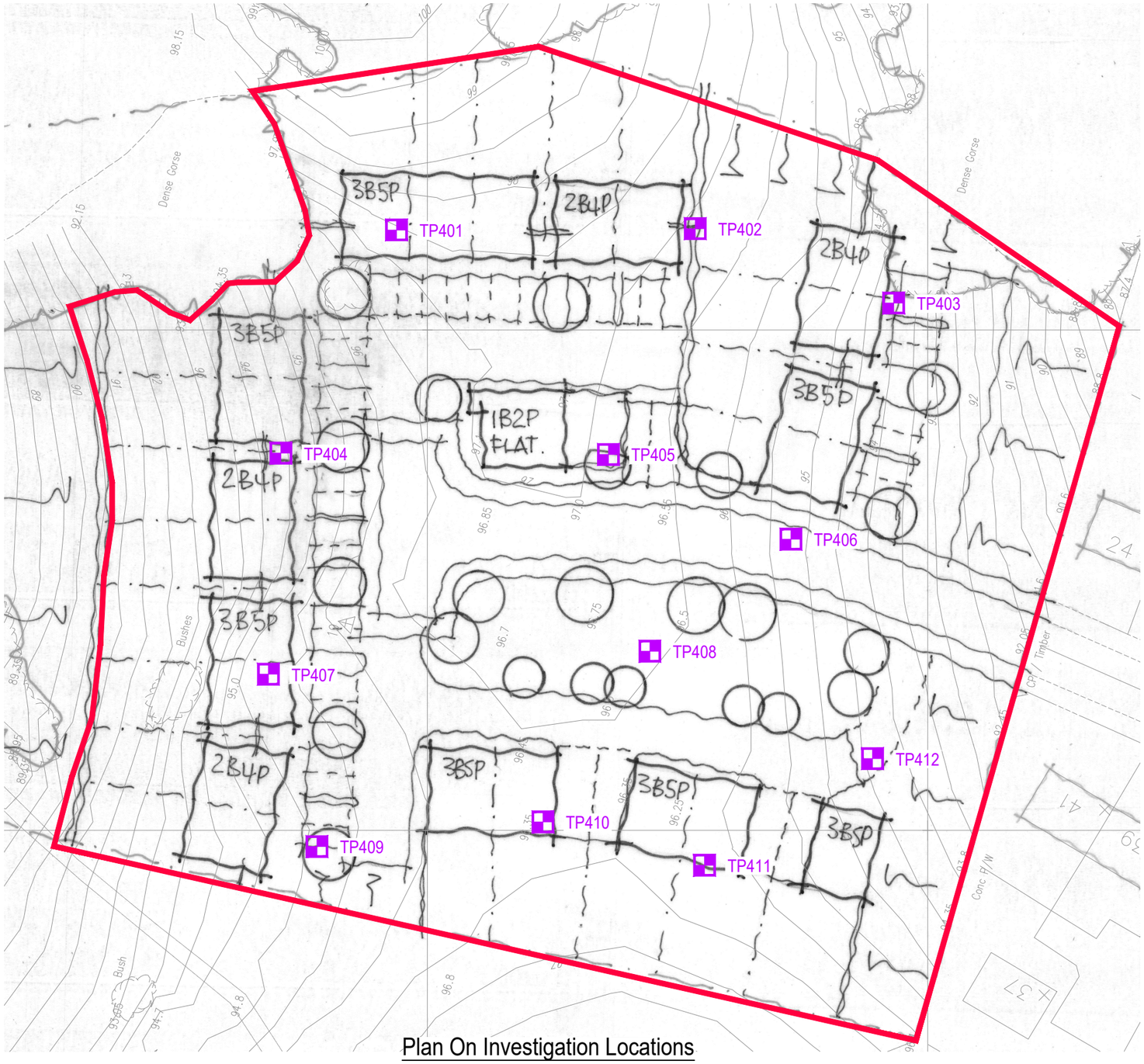
Signed for and on behalf of
R E FRY & ASSOCIATES LIMITED

Hollie Marengo BSc (Hons), MSc, FGS
Senior Geo-Environmental Manager

APPENDIX A

LEGEND:

TP401 Trial Pit Location



Plan On Investigation Locations

Location Image

revision suffix	Revision Details	Date

smas worksafe consultant as recognised by SSIP SAFETY SCHEMES IN PROCUREMENT www.smasltd.com

Drawing Stage		Drawing Status			
	Draft		Comments		Tender
●	Issued	●	Information		Construction
	Preliminary		Approval		As Built

This drawing is not authorised unless signed as checked & approved

Client
Anwyl Construction Ltd

Job title
Glyn Farm Phase 2
Colwyn Bay

Drawing title
Trial Pit
Location Plan

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CONSULTING ENGINEERS
CIVIL • STRUCTURAL
GEOTECHNICAL • ENVIRONMENTAL

Chkd	Appvd	date	scale	drawn
		17.05.22	1:500 @ A3	MA

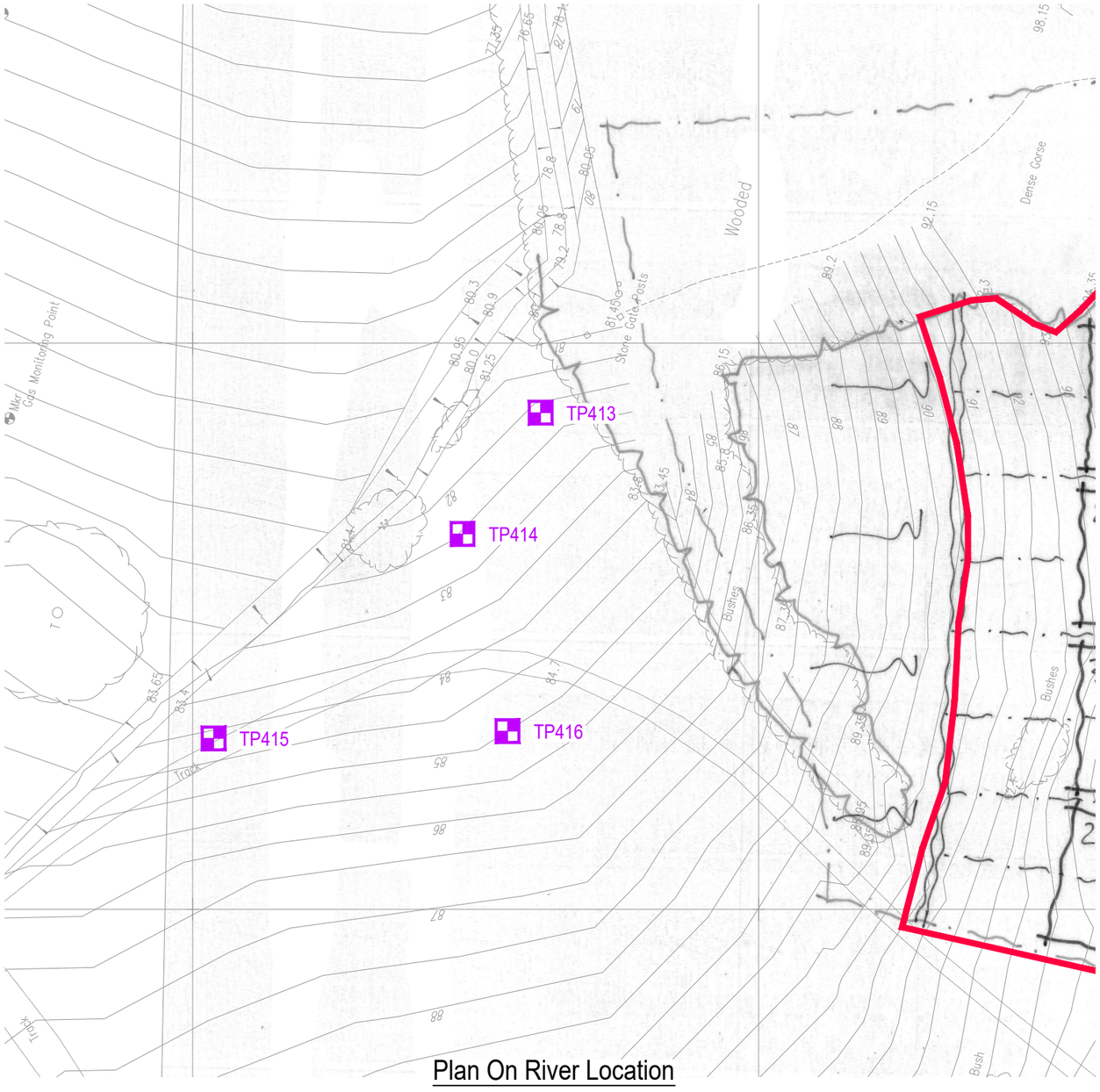
DRAWING No **06063/31-1** rev

APPENDIX B

LEGEND:

TP401 Trial Pit Location

Location Image



Plan On River Location

revision suffix	Revision Details	Date

smas worksafe consultant www.smasltd.com as recognised by SSIP SAFETY SCHEMES IN PROCUREMENT

Drawing Stage			Drawing Status				
	Draft			Comments			Tender
●	Issued		●	Information			Construction
	Preliminary			Approval			As Built

This drawing is not authorised unless signed as checked & approved

Client
Anwyl Construction Ltd

Job title
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Drawing title
Trial Pit Location Plan 2

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Chkd	Appvd	date	scale	drawn
		17.05.22	1:500 @ A3	MA

DRAWING No **06063/31-2** rev

APPENDIX C

Groundsure
LOCATION INTELLIGENCE

Enviro+Geo
Insight

285504 377631

Order Details

Date: 28/03/2022

Your ref: 06063

Our Ref: GS-8628159

Client: Robert Fry

Site Details

Location: 285456 377663

Area: 4.68 ha

Authority: Conwy County Borough Council

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

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
14	1.1	Historical industrial land uses	3	0	11	17	-
16	1.2	Historical tanks	0	0	0	2	-
16	1.3	Historical energy features	0	1	0	10	-
17	1.4	Historical petrol stations	0	0	0	0	-
17	1.5	Historical garages	0	0	0	0	-
17	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
18	2.1	Historical industrial land uses	6	0	15	22	-
20	2.2	Historical tanks	0	0	0	3	-
21	2.3	Historical energy features	0	5	0	14	-
22	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	0	-
24	3.6	Licensed waste sites	0	0	0	0	-
24	3.7	Waste exemptions	0	0	0	22	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
27	4.1	Recent industrial land uses	0	1	1	-	-
28	4.2	Current or recent petrol stations	0	0	0	0	-
28	4.3	Electricity cables	0	0	0	0	-
28	4.4	Gas pipelines	0	0	0	0	-
28	4.5	Sites determined as Contaminated Land	0	0	0	0	-

28	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
29	4.7	Regulated explosive sites	0	0	0	0	-
29	4.8	Hazardous substance storage/usage	0	0	0	0	-
29	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
29	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	0	-
30	4.12	Radioactive Substance Authorisations	0	0	0	0	-
30	**4.13**	**Licensed Discharges to controlled waters**	0	0	5	0	-
31	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
31	4.15	Pollutant release to public sewer	0	0	0	0	-
31	4.16	List 1 Dangerous Substances	0	0	0	0	-
31	4.17	List 2 Dangerous Substances	0	0	0	0	-
31	**4.18**	**Pollution Incidents (EA/NRW)**	0	0	1	1	-
32	4.19	Pollution inventory substances	0	0	0	0	-
32	4.20	Pollution inventory waste transfers	0	0	0	0	-
32	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)				
37	**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	0	0
40	**5.7**	**Surface water abstractions**	0	0	0	2	0
40	**5.8**	**Potable abstractions**	0	0	0	1	0
41	5.9	Source Protection Zones	0	0	0	0	-
41	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
42	**6.1**	**Water Network (OS MasterMap)**	2	1	12	-	-

44	**6.2**	**Surface water features**	1	0	4	-	-
44	**6.3**	**WFD Surface water body catchments**	1	-	-	-	-
44	6.4	WFD Surface water bodies	0	0	0	-	-
45	**6.5**	**WFD Groundwater bodies**	1	-	-	-	-

Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
46	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
46	7.2	Historical Flood Events	0	0	0	-	-
46	7.3	Flood Defences	0	0	0	-	-
47	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
47	7.5	Flood Storage Areas	0	0	0	-	-
48	7.6	Flood Zone 2	None (within 50m)				
48	7.7	Flood Zone 3	None (within 50m)				

Page	Section	Surface water flooding	
49	**8.1**	**Surface water flooding**	1 in 30 year, 0.1m - 0.3m (within 50m)

Page	Section	Groundwater flooding	
51	**9.1**	**Groundwater flooding**	Low (within 50m)

Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
52	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
53	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
53	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
53	**10.4**	**Special Protection Areas (SPA)**	0	0	0	0	4
54	10.5	National Nature Reserves (NNR)	0	0	0	0	0
54	**10.6**	**Local Nature Reserves (LNR)**	0	0	1	1	3
54	**10.7**	**Designated Ancient Woodland**	0	0	4	5	39
56	10.8	Biosphere Reserves	0	0	0	0	0
57	10.9	Forest Parks	0	0	0	0	0
57	10.10	Marine Conservation Zones	0	0	0	0	0
57	10.11	Green Belt	0	0	0	0	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
58	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
58	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	0	-	-	-	-
59	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
60	11.1	World Heritage Sites	0	0	0	-	-
61	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
61	11.3	National Parks	0	0	0	-	-
61	**11.4**	**Listed Buildings**	0	2	0	-	-
62	11.5	Conservation Areas	0	0	0	-	-
62	11.6	Scheduled Ancient Monuments	0	0	0	-	-
62	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
63	**12.1**	**Agricultural Land Classification**	Grade 3a (within 250m)				
64	12.2	Open Access Land	0	0	0	-	-
65	12.3	Tree Felling Licences	0	0	0	-	-
65	12.4	Environmental Stewardship Schemes	0	0	0	-	-
65	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
66	13.1	Priority Habitat Inventory	0	0	0	-	-
66	13.2	Habitat Networks	0	0	0	-	-
66	13.3	Open Mosaic Habitat	0	0	0	-	-
66	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
67	**14.1**	**10k Availability**	Identified (within 500m)				
68	14.2	Artificial and made ground (10k)	0	0	0	0	-
69	14.3	Superficial geology (10k)	0	0	0	0	-

69	14.4	Landslip (10k)	0	0	0	0	-
70	14.5	Bedrock geology (10k)	0	0	0	0	-
70	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
71	15.1	50k Availability	Identified (within 500m)				
72	15.2	Artificial and made ground (50k)	0	0	0	0	-
72	15.3	Artificial ground permeability (50k)	0	0	-	-	-
73	15.4	Superficial geology (50k)	1	0	7	1	-
74	15.5	Superficial permeability (50k)	Identified (within 50m)				
74	15.6	Landslip (50k)	0	0	0	0	-
74	15.7	Landslip permeability (50k)	None (within 50m)				
75	15.8	Bedrock geology (50k)	1	0	3	1	-
76	15.9	Bedrock permeability (50k)	Identified (within 50m)				
76	15.10	Bedrock faults and other linear features (50k)	1	0	1	1	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
77	16.1	BGS Boreholes	0	0	0	-	-
Page	Section	Natural ground subsidence					
78	17.1	Shrink swell clays	Very low (within 50m)				
79	17.2	Running sands	Very low (within 50m)				
81	17.3	Compressible deposits	Negligible (within 50m)				
82	17.4	Collapsible deposits	Very low (within 50m)				
83	17.5	Landslides	Moderate (within 50m)				
85	17.6	Ground dissolution of soluble rocks	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
87	18.1	Natural cavities	0	0	0	0	-
88	18.2	BritPits	0	0	0	1	-
88	18.3	Surface ground workings	6	0	11	-	-
89	18.4	Underground workings	0	0	0	0	0
89	18.5	Historical Mineral Planning Areas	0	0	0	0	-

89	**18.6**	**Non-coal mining**	1	0	0	1	0
90	18.7	Mining cavities	0	0	0	0	0
90	18.8	JPB mining areas	None (within 0m)				
90	18.9	Coal mining	None (within 0m)				
90	18.10	Brine areas	None (within 0m)				
91	18.11	Gypsum areas	None (within 0m)				
91	18.12	Tin mining	None (within 0m)				
91	18.13	Clay mining	None (within 0m)				

Page	Section	Radon	
92	**19.1**	**Radon**	Between 5% and 10% (within 0m)

Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
94	**20.1**	**BGS Estimated Background Soil Chemistry**	4	1	-	-	-
94	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
94	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-

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

Recent aerial photograph

Capture Date: 16/04/2020

Site Area: 4.68ha

Recent site history - 2018 aerial photograph

Capture Date: 26/07/2018

Site Area: 4.68ha

Recent site history - 2013 aerial photograph

Capture Date: 26/05/2013

Site Area: 4.68ha

Recent site history - 2009 aerial photograph

Capture Date: 31/05/2009

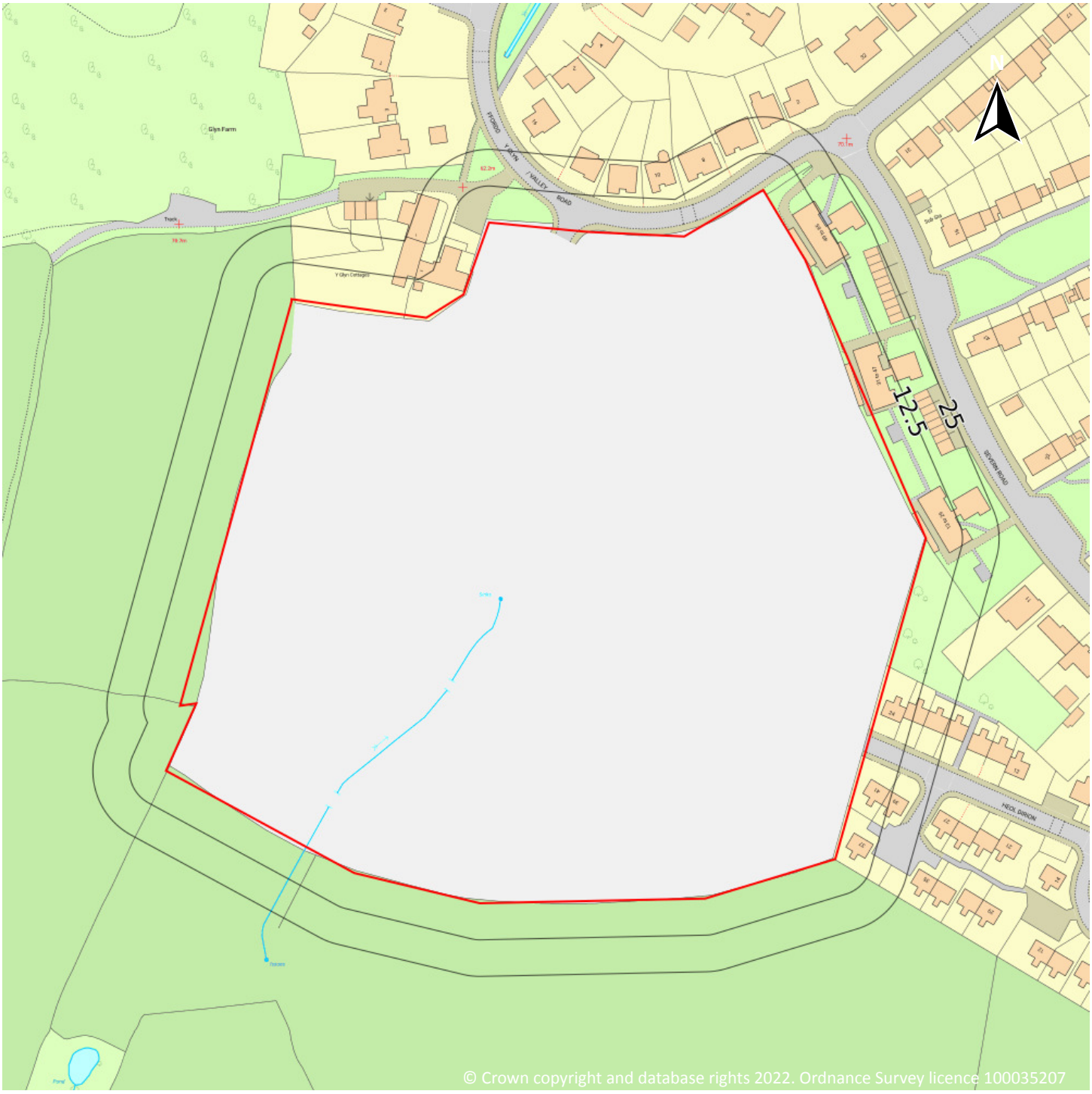
Site Area: 4.68ha

Recent site history - 2000 aerial photograph

Capture Date: 24/08/2000

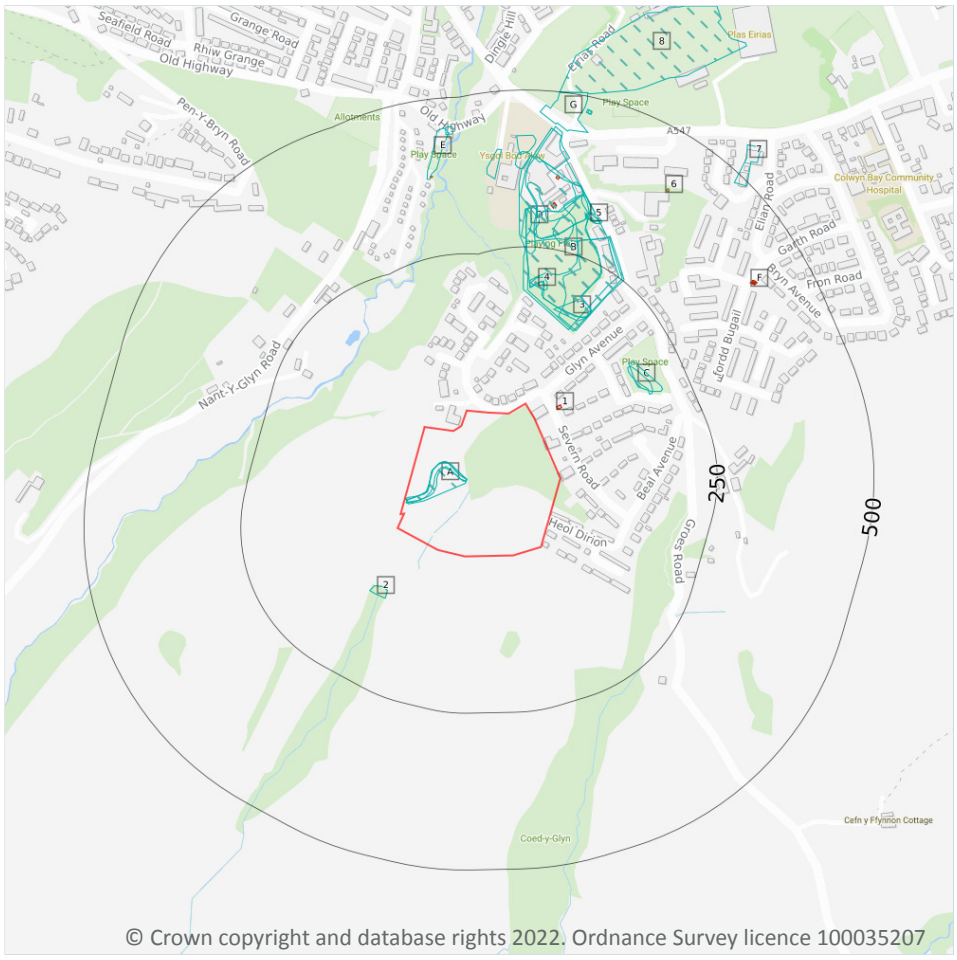
Site Area: 4.68ha

OS MasterMap site plan



Site Area: 4.68ha

1 Past land use



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

1.1 Historical industrial land uses

Records within 500m	31

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

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

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Unspecified Heap**	**1911**	**215951**

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Unspecified Ground Workings**	**1948**	**226505**
A	**On site**	**Unspecified Ground Workings**	**1911 - 1938**	**230686**
2	93m SW	Unspecified Pit	1964 - 1971	241946
B	136m NE	Nurseries	1898	247250
B	139m NE	Nurseries	1911	243811
B	141m NE	Nurseries	1911	250598
3	155m NE	Unspecified Pit	1964	250583
B	160m NE	Unspecified Pit	1948	229229
B	160m N	Sand Pit	1938	244250
C	167m NE	Sand Pit	1948	217721
C	171m NE	Unspecified Pit	1964 - 1987	226700
4	183m N	Unspecified Heap	1964	215941
D	239m N	Sand Pit	1948	227841
B	262m N	Sand Pit	1948	249608
D	264m N	Unspecified Heap	1964	215939
B	264m N	Ground Workings and Refuse Heap	1911	243200
B	264m N	Sand Pit	1898 - 1911	222588
B	298m N	Steam Laundry	1971	245789
5	308m N	Unspecified Ground Workings	1911	219844
B	362m N	Unspecified Heap	1911	215950
E	373m N	Corn Mill	1875	212194
B	375m N	Sand Pit	1938 - 1948	250416
B	377m N	Steam Laundry	1911	242603
B	397m N	Unspecified Pit	1964	220556
G	440m N	Steam Laundry	1898	218547
E	441m N	Smithy	1898	218885
G	473m N	Smithy	1911	245087
G	473m N	Smithy	1911	232644

ID	Location	Land use	Dates present	Group ID
7	485m NE	Fire Station	1971 - 1987	229550
8	500m N	Nursery	1898	214102

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	**2**

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
E	375m N	Unspecified Tank	1900	30537
6	407m NE	Unspecified Tank	1913 - 1937	32748

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	**11**

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

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

ID	Location	Land use	Dates present	Group ID
1	40m NE	Electricity Substation	1957 - 1994	16906
B	315m N	Electricity Substation	1970 - 1993	16213
B	315m N	Electricity Substation	1978	16891
B	361m N	Electricity Substation	1985 - 1993	16233

ID	Location	Land use	Dates present	Group ID
F	407m NE	Electricity Substation	1986	16952
F	407m NE	Electricity Substation	1988	17238
F	408m NE	Electricity Substation	1994	16652
F	408m NE	Electricity Substation	1993	16583
F	409m NE	Electricity Substation	1978	16596
F	409m NE	Electricity Substation	1970 - 1985	16702
F	410m NE	Electricity Substation	1978	16824

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.

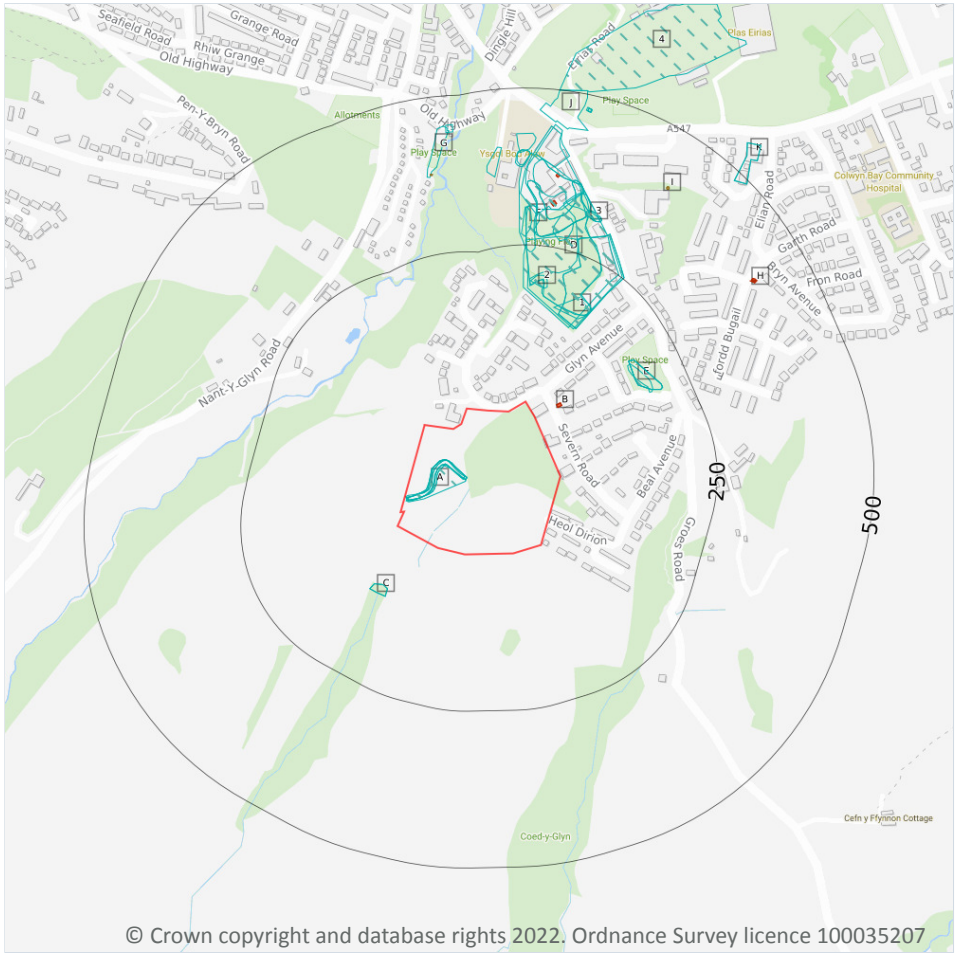
1.6 Historical military land

Records within 500m	0

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

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

2 Past land use - un-grouped



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

2.1 Historical industrial land uses

Records within 500m	43

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

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

ID	Location	Land Use	Date	Group ID
A	**On site**	**Unspecified Ground Workings**	**1911**	**230686**
A	**On site**	**Unspecified Ground Workings**	**1911**	**230686**
A	**On site**	**Unspecified Ground Workings**	**1948**	**226505**

ID	Location	Land Use	Date	Group ID
A	**On site**	**Unspecified Heap**	**1911**	**215951**
A	**On site**	**Unspecified Ground Workings**	**1938**	**230686**
A	**On site**	**Unspecified Ground Workings**	**1938**	**230686**
C	93m SW	Unspecified Pit	1971	241946
C	93m SW	Unspecified Pit	1964	241946
D	136m NE	Nurseries	1898	247250
D	139m NE	Nurseries	1911	243811
D	141m NE	Nurseries	1911	250598
D	141m NE	Nurseries	1911	250598
1	155m NE	Unspecified Pit	1964	250583
D	160m NE	Unspecified Pit	1948	229229
D	160m N	Sand Pit	1938	244250
E	167m NE	Sand Pit	1948	217721
E	171m NE	Unspecified Pit	1971	226700
E	171m NE	Unspecified Pit	1964	226700
E	171m NE	Unspecified Pit	1987	226700
2	183m N	Unspecified Heap	1964	215941
F	239m N	Sand Pit	1948	227841
D	262m N	Sand Pit	1948	249608
F	264m N	Unspecified Heap	1964	215939
D	264m N	Ground Workings and Refuse Heap	1911	243200
D	264m N	Ground Workings and Refuse Heap	1911	243200
D	264m N	Sand Pit	1911	222588
D	298m N	Steam Laundry	1971	245789
3	308m N	Unspecified Ground Workings	1911	219844
D	310m N	Sand Pit	1898	222588
D	362m N	Unspecified Heap	1911	215950
G	373m N	Corn Mill	1875	212194

ID	Location	Land Use	Date	Group ID
D	375m N	Sand Pit	1948	250416
D	377m N	Steam Laundry	1911	242603
D	378m N	Sand Pit	1938	250416
D	397m N	Unspecified Pit	1964	220556
J	440m N	Steam Laundry	1898	218547
G	441m N	Smithy	1898	218885
J	473m N	Smithy	1911	245087
J	473m N	Smithy	1911	232644
J	473m N	Smithy	1911	232644
K	485m NE	Fire Station	1971	229550
K	485m NE	Fire Station	1987	229550
4	500m N	Nursery	1898	214102

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	**3**

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
G	375m N	Unspecified Tank	1900	30537
I	407m NE	Unspecified Tank	1913	32748
I	407m NE	Unspecified Tank	1937	32748

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	**19**

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

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

ID	Location	Land Use	Date	Group ID
B	40m NE	Electricity Substation	1986	16906
B	40m NE	Electricity Substation	1988	16906
B	40m NE	Electricity Substation	1957	16906
B	40m NE	Electricity Substation	1978	16906
B	40m NE	Electricity Substation	1994	16906
D	315m N	Electricity Substation	1993	16213
D	315m N	Electricity Substation	1978	16891
D	315m N	Electricity Substation	1985	16213
D	315m N	Electricity Substation	1970	16213
D	361m N	Electricity Substation	1993	16233
D	362m N	Electricity Substation	1985	16233
H	407m NE	Electricity Substation	1986	16952
H	407m NE	Electricity Substation	1988	17238
H	408m NE	Electricity Substation	1994	16652
H	408m NE	Electricity Substation	1993	16583
H	409m NE	Electricity Substation	1978	16596
H	409m NE	Electricity Substation	1985	16702
H	409m NE	Electricity Substation	1970	16702
H	410m NE	Electricity Substation	1978	16824

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m	0

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

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m	0

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

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill

Site Outline

Search buffers in metres (m)

Waste exemptions

3.1 Active or recent landfill

Records within 500m	0

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

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

3.2 Historical landfill (BGS records)

Records within 500m	0

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

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	0

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

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

3.4 Historical landfill (EA/NRW records)

Records within 500m	0

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

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

3.5 Historical waste sites

Records within 500m	0

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

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

3.6 Licensed waste sites

Records within 500m	0

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

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

3.7 Waste exemptions

Records within 500m	22

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
A	289m E	Fron Farm, Groes Road, Colwyn Bay, Conwy, LL29 8YN	NRW-WME046613	Treating waste exemption	On a farm	Aerobic composting and associated prior treatment

ID	Location	Site	Reference	Category	Sub-Category	Description
A	289m E	Fron Farm, Groes Road, Colwyn Bay, Conwy, LL29 8YN	NRW-WME046613	Using waste exemption	On a farm	Burning of waste as a fuel in a small appliance
A	289m E	Fron Farm, Groes Road, Colwyn Bay, Conwy, LL29 8YN	NRW-WME046613	Using waste exemption	On a farm	Use of waste in construction
A	289m E	Fron Farm, Groes Road, Colwyn Bay, Conwy, LL29 8YN	NRW-WME046613	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
A	289m E	Fron Farm, Groes Road, Colwyn Bay, Conwy, LL29 8YN	NRW-WME046613	Using waste exemption	On a farm	Use of waste for a specified purpose
A	289m E	Fron Farm, Groes Road, Colwyn Bay, Conwy, LL29 8YN	NRW-WME046613	Disposing of waste exemption	On a farm	Deposit of waste from dredging of inland waters
A	289m E	Fron Farm, Groes Road, Colwyn Bay, Conwy, LL29 8YN	NRW-WME046613	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
A	289m E	Fron Farm, Groes Road, Colwyn Bay, Conwy, LL29 8YN	NRW-WME046613	Treating waste exemption	On a farm	Cleaning, washing, spraying or coating relevant waste
A	289m E	Fron Farm, Groes Road, Colwyn Bay, Conwy, LL29 8YN	NRW-WME046613	Disposing of waste exemption	On a farm	Burning waste in the open
A	289m E	Fron Farm, Groes Road, Colwyn Bay, Conwy, LL29 8YN	NRW-WME046613	Using waste exemption	On a farm	Use of mulch
A	289m E	Fron Farm, Groes Road, Colwyn Bay, Conwy, LL29 8YN	NRW-WME046613	Storing waste exemption	On a farm	Storage of waste in a secure place
A	289m E	Fron Farm Groes Road Bae Colwyn LL298YN	NRW-WME017626	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
A	289m E	Fron Farm Groes Road Bae Colwyn LL298YN	NRW-WME017626	Using waste exemption	On a farm	Use of waste for a specified purpose
A	289m E	Fron Farm Groes Road Bae Colwyn LL298YN	NRW-WME017626	Using waste exemption	On a farm	Use of waste in construction

ID	Location	Site	Reference	Category	Sub-Category	Description
A	289m E	Fron Farm Groes Road Bae Colwyn LL298YN	NRW-WME017626	Disposing of waste exemption	On a farm	Burning waste in the open
A	289m E	Fron Farm Groes Road Bae Colwyn LL298YN	NRW-WME017626	Disposing of waste exemption	On a farm	Deposit of waste from dredging of inland waters
A	289m E	Fron Farm Groes Road Bae Colwyn LL298YN	NRW-WME017626	Treating waste exemption	On a farm	Cleaning, washing, spraying or coating relevant waste
A	289m E	Fron Farm Groes Road Bae Colwyn LL298YN	NRW-WME017626	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
A	289m E	Fron Farm Groes Road Bae Colwyn LL298YN	NRW-WME017626	Treating waste exemption	On a farm	Aerobic composting and associated prior treatment
A	289m E	Fron Farm Groes Road Bae Colwyn LL298YN	NRW-WME017626	Using waste exemption	On a farm	Use of mulch
A	289m E	Fron Farm Groes Road Bae Colwyn LL298YN	NRW-WME017626	Using waste exemption	On a farm	Burning of waste as a fuel in a small appliance
1	483m N	Nant Y Glyn Holiday Park, Colwyn Bay, Conwy, LL29 7RD	NRW-WME001113	Disposing of waste exemption	Waste Exemption - Agricultural and Non-Agricultural	Burning waste in the open

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

4 Current industrial land use

Site Outline

Search buffers in metres (m)

Recent industrial land uses

Licensed Discharges to controlled waters

Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m	2

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 27**

ID	Location	Company	Address	Activity	Category
1	44m NE	Electricity Sub Station	Clwyd, LL29	Electrical Features	Infrastructure and Facilities
3	223m N	Pumping Station	Clwyd, LL29	Water Pumping Stations	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	0

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

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m	0

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

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m	0

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

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m	0

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

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

4.10 Licensed industrial activities (Part A(1))

Records within 500m	0

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

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

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

Records within 500m	0

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

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	0

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

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

4.13 Licensed Discharges to controlled waters

Records within 500m	5

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 27**

ID	Location	Address	Details	
2	125m NW	GLYN FARM DEVELOPMENT COLWYN BAY CL, GLYN FARM DEVELOPMENT COLWYN BAY, COLWYN BAY CLWYD, CLWYD	Effluent Type: UNSPECIFIED Permit Number: CG0117402 Permit Version: 1 Receiving Water: TRIB. OF NANT-Y-GROES STREAM	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 09/11/1984 Effective Date: 09/11/1984 Revocation Date: 05/04/1995
A	164m N	PS AT GLYN FARM RES DEV GLYN AV, PS AT GLYN FARM RES DEV, GLYN AVENUE, Colwyn Bay, LL29 8RB	Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - NOT WATER COMPANY Permit Number: CG0389601 Permit Version: 1 Receiving Water: NANT-Y-GROES	Status: Effective Issue date: 30/10/2000 Effective Date: 30/10/2000 Revocation Date: -
A	183m N	PS GLYN FARM COLWYN BAY CLWYD, COLWYN BAY CLWYD, CLWYD	Effluent Type: UNSPECIFIED Permit Number: CG0117501 Permit Version: 1 Receiving Water: TRIB OF NANT-Y-GROES STREAM	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 09/11/1984 Effective Date: 09/11/1984 Revocation Date: 05/04/1995
A	193m N	GLYN FARM DEVELOPMENT COLWYN BAY CL, GLYN FARM DEVELOPMENT COLWYN BAY, COLWYN BAY CLWYD, CLWYD	Effluent Type: UNSPECIFIED Permit Number: CG0117401 Permit Version: 1 Receiving Water: TRIB. OF NANT-Y-GROES STREAM	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 09/11/1984 Effective Date: 09/11/1984 Revocation Date: 05/04/1995
B	236m NW	COLWYN HEIGHTS COLWYN BAY -SURFACE, COLWYN HEIGHTS COLWYN BAY -SURFA, COLWYN BAY -SURFACE WATER SEWE	Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: CG0127001 Permit Version: 1 Receiving Water: AFON NANT-Y-GROES	Status: Effective Issue date: 26/03/1986 Effective Date: 26/03/1986 Revocation Date: -

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

4.14 Pollutant release to surface waters (Red List)

Records within 500m	0

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

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

4.15 Pollutant release to public sewer

Records within 500m	0

Discharges of Special Category Effluents to the public sewer.

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

4.16 List 1 Dangerous Substances

Records within 500m	0

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

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

4.17 List 2 Dangerous Substances

Records within 500m	0

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

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

4.18 Pollution Incidents (EA/NRW)

Records within 500m	2

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

Features are displayed on the Current industrial land use map on **page 27**

ID	Location	Details	
4	225m NW	Incident Date: 21/06/2013 Incident Identification: 1124736 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: - Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
B	262m NW	Incident Date: 03/02/2015 Incident Identification: 1310968 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Smoke	Water Impact: - Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

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

4.19 Pollution inventory substances

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.

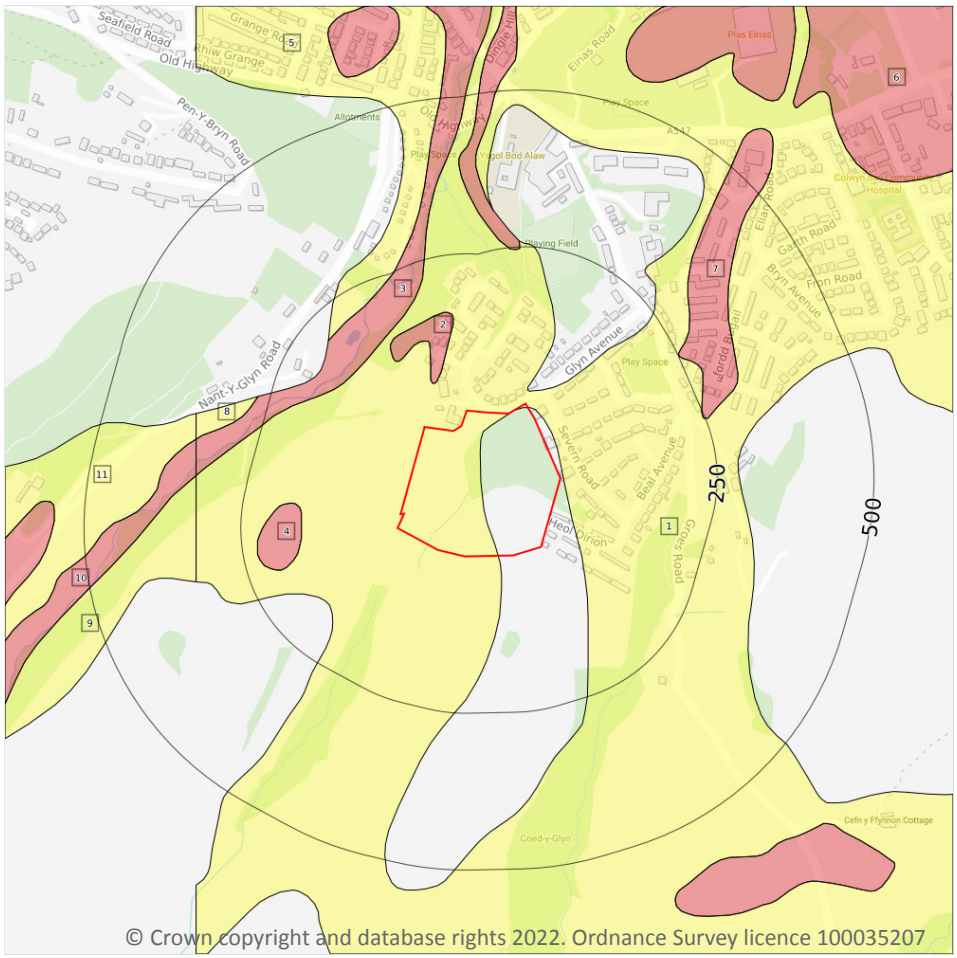
4.21 Pollution inventory radioactive waste

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	11

Aquifer status of groundwater held within superficial geology.

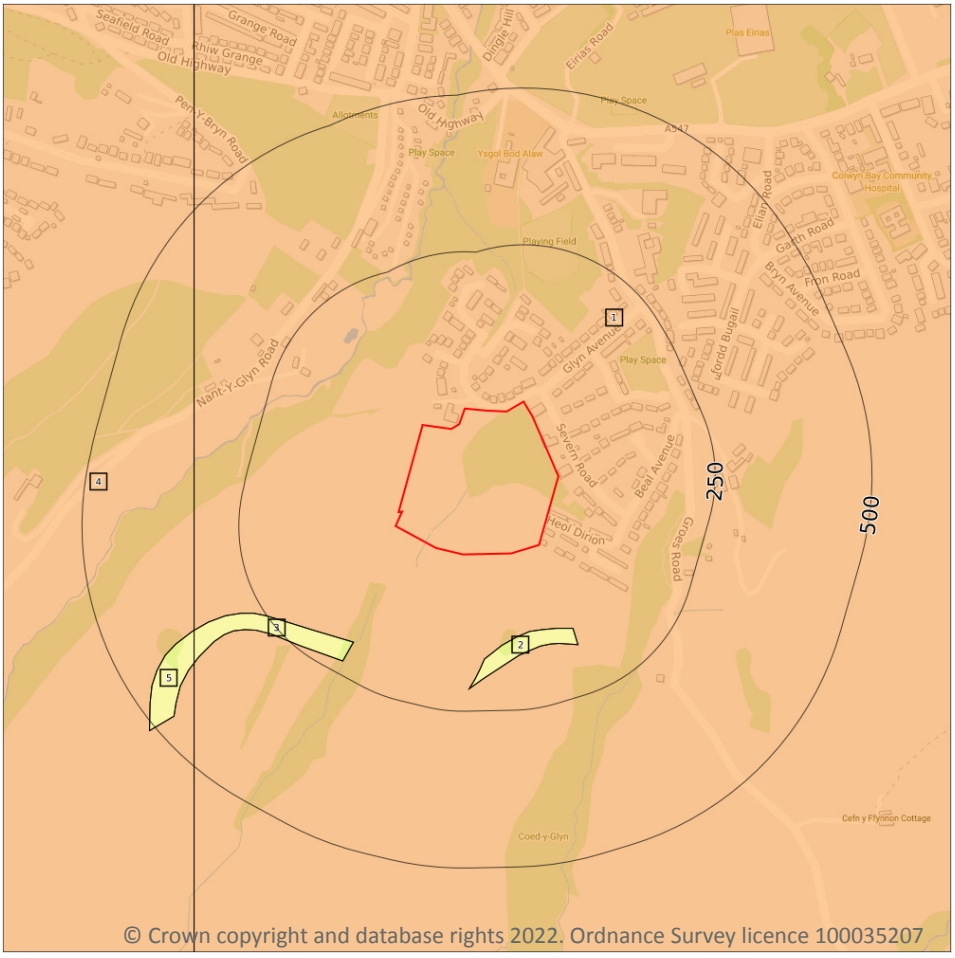
Features are displayed on the Hydrogeology map on **page 33**

ID	Location	Designation	Description
1	**On site**	**Secondary Undifferentiated**	**Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type**
2	67m 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

ID	Location	Designation	Description
3	141m 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
4	153m W	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
5	206m NW	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
6	246m N	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	247m NE	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
8	269m W	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
9	321m W	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
10	332m W	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
11	346m W	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

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

Bedrock aquifer



5.2 Bedrock aquifer

Records within 500m	5

Aquifer status of groundwater held within bedrock geology.

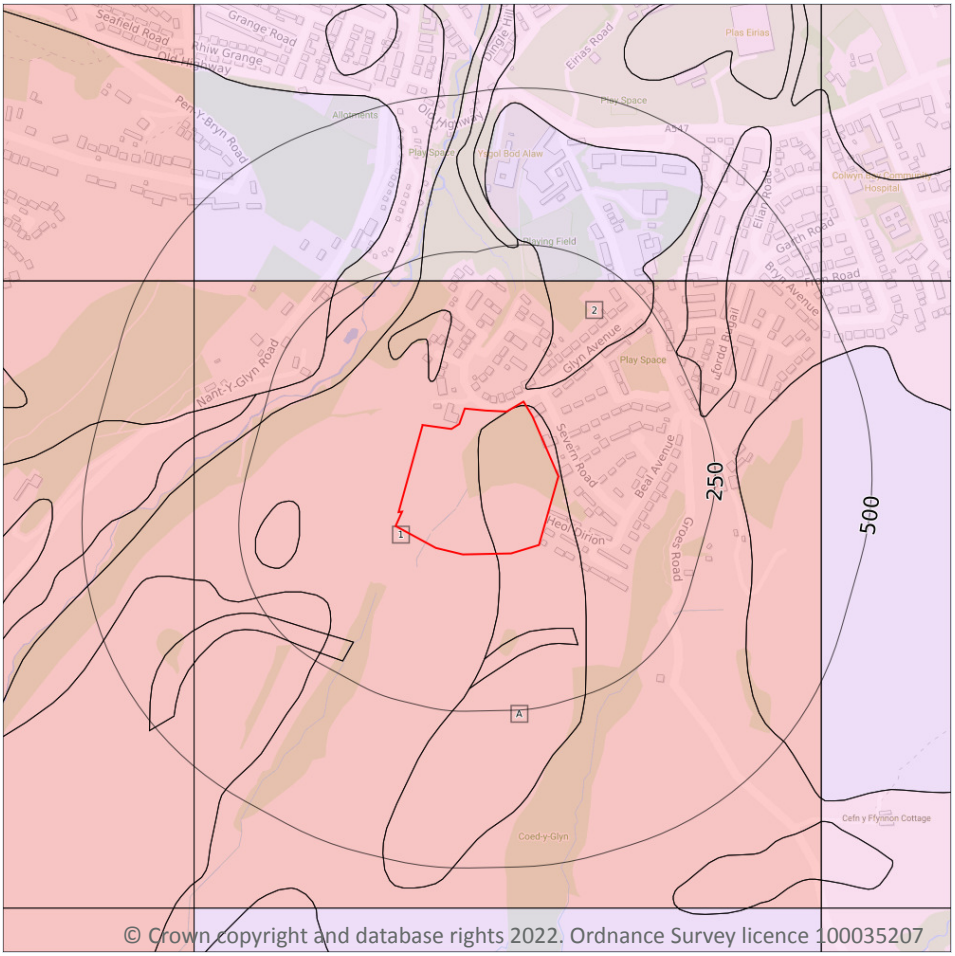
Features are displayed on the Bedrock aquifer map on **page 35**

ID	Location	Designation	Description
1	**On site**	**Secondary B**	**Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-aquifers**
2	128m 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

ID	Location	Designation	Description
3	195m 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
4	321m W	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-aquifers
5	362m 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

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

Groundwater vulnerability



Site Outline

Search buffers in metres (m)

Superficial vulnerability

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

Bedrock vulnerability

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

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m	3

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 37**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	**On site**	**Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer**	**Leaching class: Intermediate Infiltration value: <40% Dilution value: 300-550mm/year**	**Vulnerability: Medium Aquifer type: Secondary Thickness: <3m Patchiness value: <90% Recharge potential: No Data**	**Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures**
A	**On site**	**Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer**	**Leaching class: Intermediate Infiltration value: <40% Dilution value: 300-550mm/year**	**Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data**	**Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures**
2	20m N	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Intermediate Infiltration value: <40% Dilution value: 300-550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures

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

5.4 Groundwater vulnerability- soluble rock risk

Records on site	0

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

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

5.5 Groundwater vulnerability- local information

Records on site	0

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

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	0

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.

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

5.7 Surface water abstractions

Records within 2000m	2

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	
A	251m SE	Status: Historical Licence No: 23/66/12/0001 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: EAW Surface Water Point: SPRING NEAR FRON FARM, COLWYN BAY Data Type: Point Name: Meredith Easting: 285760 Northing: 377440	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 25/10/1965 Expiry Date: - Issue No: 100 Version Start Date: 02/12/1980 Version End Date: -
A	251m SE	Status: Historical Licence No: 23/66/12/0001 Details: General Farming & Domestic Direct Source: EAW Surface Water Point: SPRING NEAR FRON FARM, COLWYN BAY Data Type: Point Name: Meredith Easting: 285760 Northing: 377440	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 25/10/1965 Expiry Date: - Issue No: 100 Version Start Date: 02/12/1980 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	
A	251m SE	Status: Historical Licence No: 23/66/12/0001 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: EAW Surface Water Point: SPRING NEAR FRON FARM, COLWYN BAY Data Type: Point Name: Meredith Easting: 285760 Northing: 377440	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 25/10/1965 Expiry Date: - Issue No: 100 Version Start Date: 02/12/1980 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	15

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 42**

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

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)**	**-**
B	40m SW	Inland river not influenced by normal tidal action.	Not provided	Watercourse contains water year round (in normal circumstances)	-
2	56m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	95m SW	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	109m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
3	144m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
5	155m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Nant y Groes
6	173m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
8	192m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	218m E	Inland river not influenced by normal tidal action.	Not provided	Watercourse contains water year round (in normal circumstances)	-
9	219m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	219m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
10	224m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Nant y Groes

ID	Location	Type of water feature	Ground level	Permanence	Name
D	225m E	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	**5**

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 42**

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 42**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	**On site**	**Coastal catchment**	**Not part of a river WB catchment**	**337**	**Dulas Ganol**	**Conwy**

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

6.4 WFD Surface water bodies

Records identified	**0**

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

the site.

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

6.5 WFD Groundwater bodies

Records on site	1

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

Features are displayed on the Hydrology map on **page 42**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
A	**On site**	**Conwy**	**GB41002G203000**	**Poor**	**Poor**	**Good**	**2017**

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.

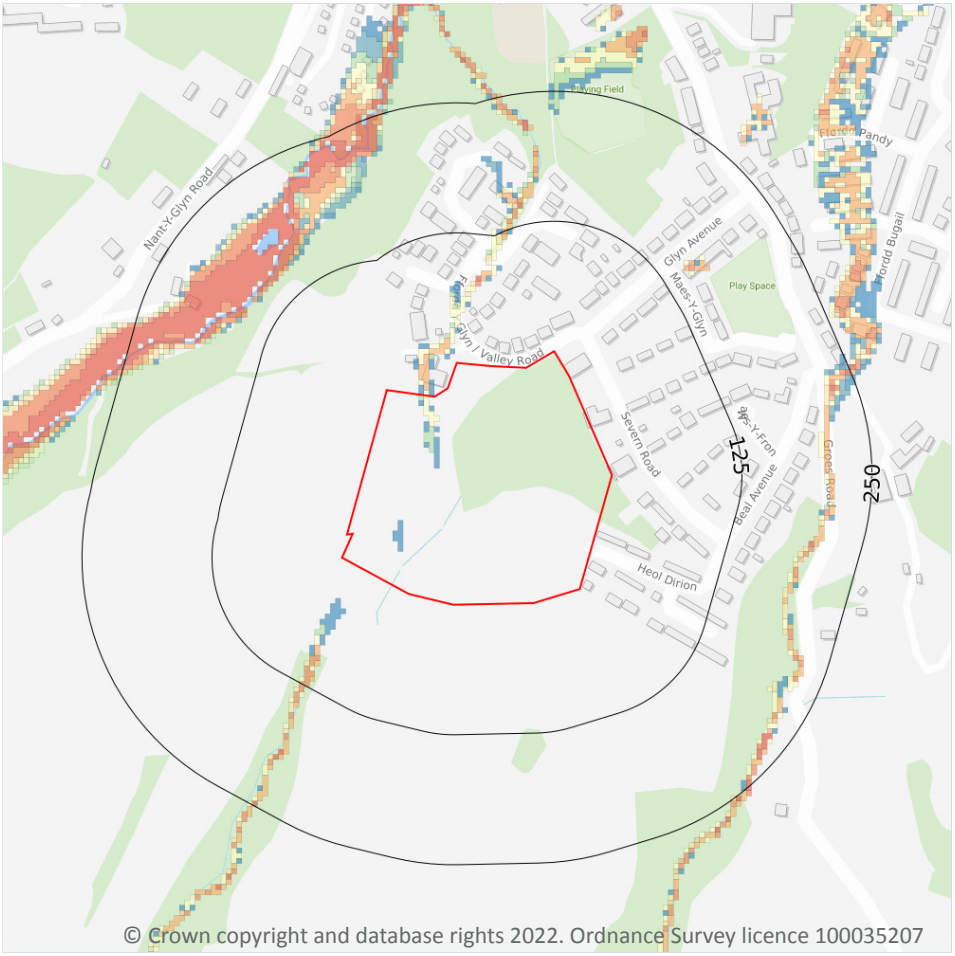
7.7 Flood Zone 3

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 100 year, 0.1m - 0.3m**
Highest risk within 50m	**1 in 30 year, 0.1m - 0.3m**

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 49**

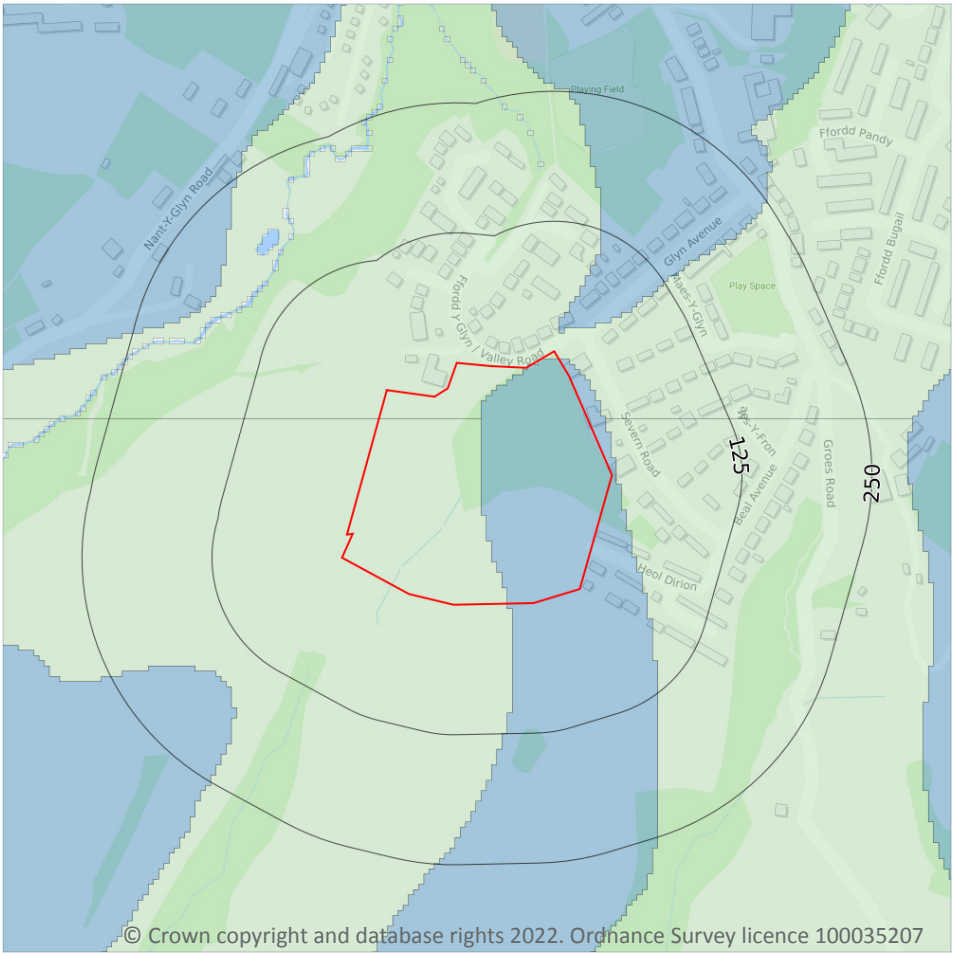
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on

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 0.1m and 0.3m
1 in 100 year	Between 0.1m and 0.3m
1 in 30 year	Negligible

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding



Site Outline

Search buffers in metres (m)

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

9.1 Groundwater flooding

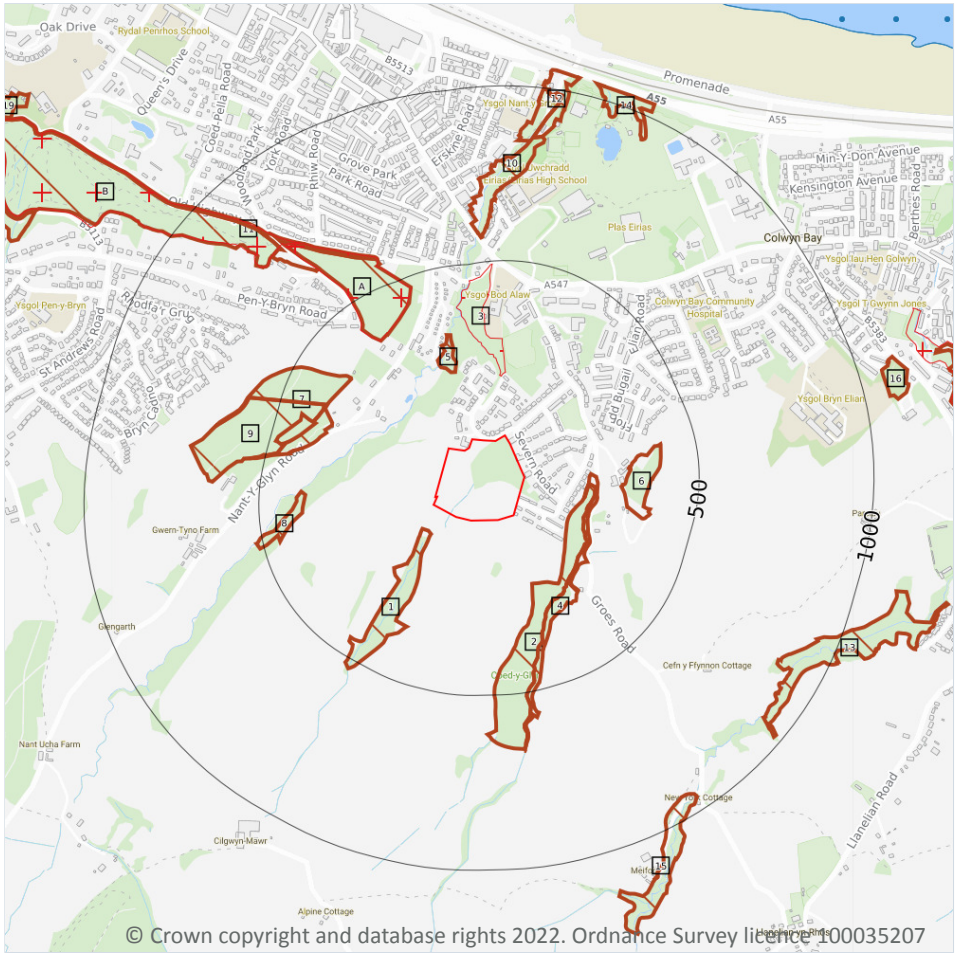
Highest risk on site	**Low**
Highest risk within 50m	**Low**

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

Features are displayed on the Groundwater flooding map on **page 51**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



Site Outline

Search buffers in metres (m)

Special Protection Areas (SPA)

Local Nature Reserves (LNR)

Designated Ancient Woodland

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	0

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

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

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	0

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

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

10.3 Special Areas of Conservation (SAC)

Records within 2000m	0

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

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

10.4 Special Protection Areas (SPA)

Records within 2000m	4

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

Features are displayed on the Environmental designations map on **page 52**

ID	Location	Name	Species of interest	Habitat description	Data source
D	1383m NE	Liverpool Bay / Bae Lerpwl (Wales)	Red-throated diver; Black (common) scoter; Little gull; Common tern; Little tern	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Marine areas, Sea inlets	Natural Resources Wales
D	1383m NE	Liverpool Bay	Red-throated diver; Black (common) scoter; Little gull; Common tern; Little tern	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Marine areas, Sea inlets	Natural England
-	1871m N	Liverpool Bay / Bae Lerpwl (Wales)	Red-throated diver; Black (common) scoter; Little gull; Common tern; Little tern	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Marine areas, Sea inlets	Natural Resources Wales
-	1871m N	Liverpool Bay	Red-throated diver; Black (common) scoter; Little gull; Common tern; Little tern	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Marine areas, Sea inlets	Natural England

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

10.5 National Nature Reserves (NNR)

Records within 2000m	0

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

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

10.6 Local Nature Reserves (LNR)

Records within 2000m	5

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.

Features are displayed on the Environmental designations map on **page 52**

ID	Location	Name	Data source
3	170m N	UPPER DINGLE WOODS	Natural Resources Wales
A	364m NW	PWLLYCROCHAN WOODS	Natural Resources Wales
B	726m NW	PWLLYCROCHAN WOODS	Natural Resources Wales
C	1166m E	FAIRY GLEN	Natural Resources Wales
-	1458m NW	PWLLYCROCHAN WOODS	Natural Resources Wales

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

10.7 Designated Ancient Woodland

Records within 2000m	48

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 52**

ID	Location	Name	Woodland Type
1	72m SW	Unknown	Restored Ancient Woodland Site
2	153m E	Unknown	Restored Ancient Woodland Site
4	180m E	Unknown	Restored Ancient Woodland Site
5	198m N	Unknown	Ancient Semi Natural Woodland
6	279m E	Unknown	Ancient Semi Natural Woodland
7	339m W	Unknown	Restored Ancient Woodland Site
A	364m NW	Unknown	Restored Ancient Woodland Site
8	368m W	Unknown	Ancient Semi Natural Woodland
9	375m W	Unknown	Restored Ancient Woodland Site
10	570m N	Unknown	Ancient Semi Natural Woodland
11	577m N	Unknown	Restored Ancient Woodland Site
B	736m NW	Unknown	Restored Ancient Woodland Site
12	855m N	Unknown	Ancient Semi Natural Woodland
13	863m SE	Unknown	Ancient Semi Natural Woodland
14	932m NE	Unknown	Ancient Semi Natural Woodland
15	938m SE	Unknown	Ancient Semi Natural Woodland
16	1067m E	Unknown	Ancient Semi Natural Woodland
C	1229m E	Unknown	Ancient Semi Natural Woodland
17	1362m NW	Unknown	Restored Ancient Woodland Site
-	1453m NE	Unknown	Restored Ancient Woodland Site
-	1466m NW	Unknown	Restored Ancient Woodland Site
19	1554m NW	Unknown	Restored Ancient Woodland Site
-	1630m NW	Unknown	Restored Ancient Woodland Site
-	1661m SW	Unknown	Plantation on Ancient Woodland Site
-	1663m SE	Unknown	Ancient Semi Natural Woodland
-	1669m E	Unknown	Ancient Woodland Site of Unknown Category
-	1687m NW	Unknown	Restored Ancient Woodland Site
-	1689m SW	Unknown	Plantation on Ancient Woodland Site

ID	Location	Name	Woodland Type
-	1710m E	Unknown	Ancient Semi Natural Woodland
-	1714m W	Unknown	Ancient Semi Natural Woodland
-	1718m SE	Unknown	Plantation on Ancient Woodland Site
-	1750m SE	Unknown	Restored Ancient Woodland Site
-	1758m SE	Unknown	Plantation on Ancient Woodland Site
-	1775m SE	Unknown	Restored Ancient Woodland Site
-	1786m SE	Unknown	Plantation on Ancient Woodland Site
-	1789m NW	Unknown	Restored Ancient Woodland Site
-	1830m SE	Unknown	Ancient Semi Natural Woodland
-	1877m SE	Unknown	Restored Ancient Woodland Site
-	1905m SE	Unknown	Ancient Semi Natural Woodland
-	1919m SE	Unknown	Ancient Semi Natural Woodland
-	1936m SE	Unknown	Plantation on Ancient Woodland Site
-	1937m SE	Unknown	Plantation on Ancient Woodland Site
-	1959m NW	Unknown	Ancient Semi Natural Woodland
-	1967m W	Unknown	Ancient Semi Natural Woodland
-	1976m W	Unknown	Restored Ancient Woodland Site
-	1981m SE	Unknown	Restored Ancient Woodland Site
-	1981m SE	Unknown	Plantation on Ancient Woodland Site
-	1996m SE	Unknown	Ancient Semi Natural Woodland

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

10.8 Biosphere Reserves

Records within 2000m	**0**

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

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

10.9 Forest Parks

Records within 2000m	0

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

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m	0

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

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

10.11 Green Belt

Records within 2000m	0

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

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

10.12 Proposed Ramsar sites

Records within 2000m	0

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

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m	0

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

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

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m	0

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

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m	0

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

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

Records within 2000m	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

10.17 SSSI Impact Risk Zones

Records on site	0

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.

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	0

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

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

11 Visual and cultural designations

Site Outline

Search buffers in metres (m)

Listed buildings

Conservation areas

Conservation areas - no data

National Parks

Areas of Outstanding Natural Beauty

Registered parks and gardens

Scheduled Monuments

World Heritage Sites

11.1 World Heritage Sites

Records within 250m	0

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

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

11.2 Area of Outstanding Natural Beauty

Records within 250m	0

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

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

11.3 National Parks

Records within 250m	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	2

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.

Features are displayed on the Visual and cultural designations map on **page 60**

ID	Location	Name	Grade	Reference Number	Listed date
A	19m N	Outbuildings Attached To Glyn Farmhouse, Set Back From The Road Down A Track, Towards The Bottom Of The Nant Valley	II	14680	25/07/1994
A	23m W	Glyn Farmhouse, Set Back From The Road Down A Track, Towards The Bottom Of The Nant Valley	II	141	21/06/1950

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

11.5 Conservation Areas

Records within 250m	0

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

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

11.6 Scheduled Ancient Monuments

Records within 250m	0

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

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

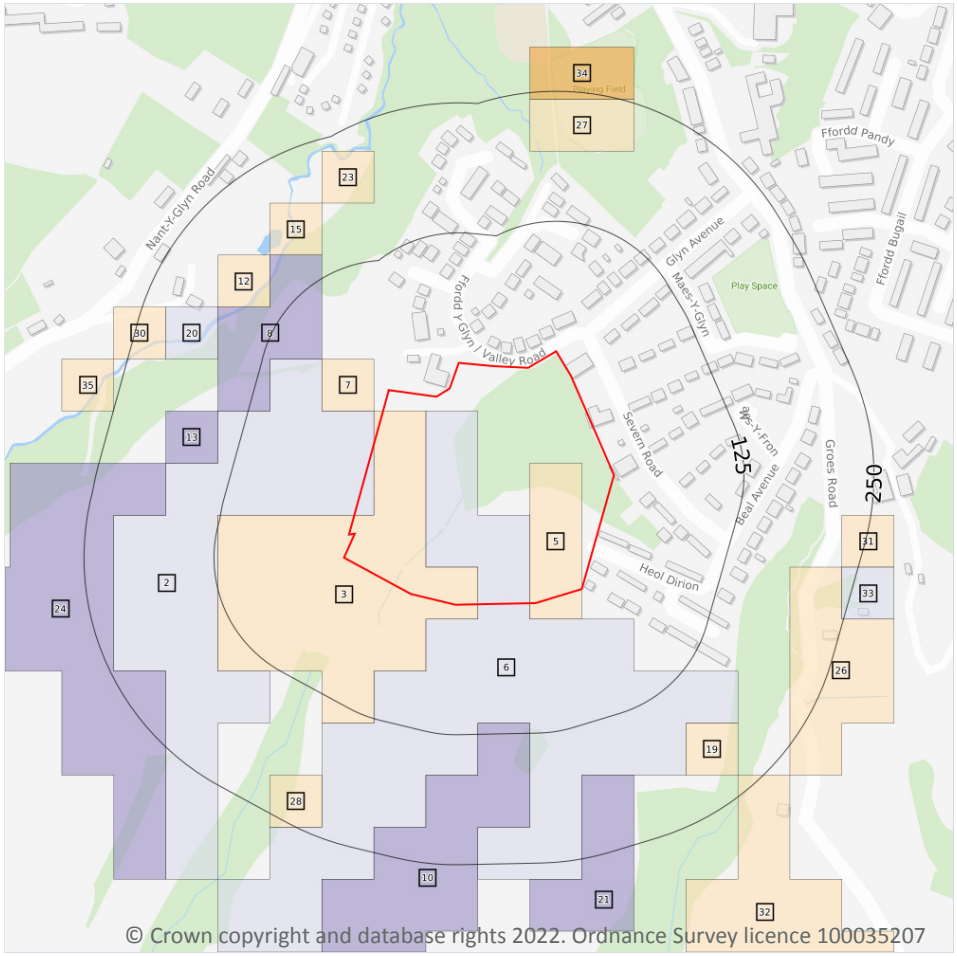
11.7 Registered Parks and Gardens

Records within 250m	0

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

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

12 Agricultural designations



Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Timber felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m	24

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 63**

ID	Location	Classification	Description
2	**On site**	**Grade 3b**	**Moderate quality agricultural land**
3	**On site**	**Grade 3a**	**Good to moderate quality agricultural land**
5	**On site**	**Grade 3a**	**Good to moderate quality agricultural land**

ID	Location	Classification	Description
6	**On site**	**Grade 3b**	**Moderate quality agricultural land**
7	9m W	Grade 3a	Good to moderate quality agricultural land
8	71m NW	Grade 4	Poor quality agricultural land
10	114m S	Grade 4	Poor quality agricultural land
12	139m NW	Grade 3a	Good to moderate quality agricultural land
13	140m W	Grade 4	Poor quality agricultural land
15	145m NW	Grade 3a	Good to moderate quality agricultural land
19	163m SE	Grade 3a	Good to moderate quality agricultural land
20	166m W	Grade 3b	Moderate quality agricultural land
21	171m S	Grade 4	Poor quality agricultural land
23	174m NW	Grade 3a	Good to moderate quality agricultural land
24	176m W	Grade 4	Poor quality agricultural land
26	187m E	Grade 3a	Good to moderate quality agricultural land
27	193m N	Grade 3a	Good to moderate quality agricultural land
28	194m SW	Grade 3a	Good to moderate quality agricultural land
30	215m W	Grade 3a	Good to moderate quality agricultural land
31	223m E	Grade 3a	Good to moderate quality agricultural land
32	234m SE	Grade 3a	Good to moderate quality agricultural land
33	235m E	Grade 3b	Moderate quality agricultural land
34	243m N	Grade 2	Good quality agricultural land
35	250m W	Grade 3a	Good to moderate quality agricultural land

This data is sourced from Natural Resources Wales.

12.2 Open Access Land

Records within 250m	**0**

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

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

12.3 Tree Felling Licences

Records within 250m	0

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

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	0

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

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m	0

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

This data is sourced from Natural England.

13 Habitat designations

13.1 Priority Habitat Inventory

Records within 250m	0

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

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	0

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

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m	0

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

This data is sourced from Natural England.

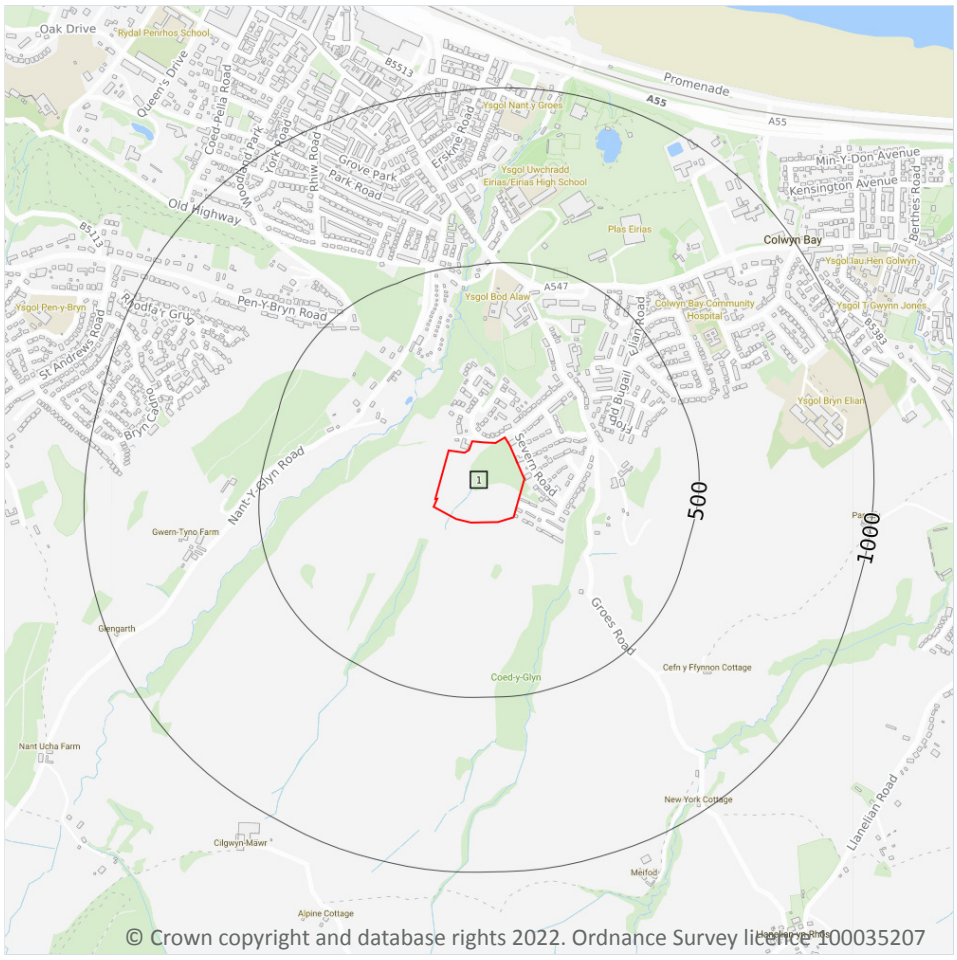
13.4 Limestone Pavement Orders

Records within 250m	0

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

This data is sourced from Natural England.

14 Geology 1:10,000 scale - Availability



Site Outline

Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

14.1 10k Availability

Records within 500m	1

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

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 67**

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

This data is sourced from the British Geological Survey.

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

14.2 Artificial and made ground (10k)

Records within 500m	0

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

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Superficial

14.3 Superficial geology (10k)

Records within 500m	0

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m	0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Bedrock

14.5 Bedrock geology (10k)

Records within 500m	0

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

This data is sourced from the British Geological Survey.

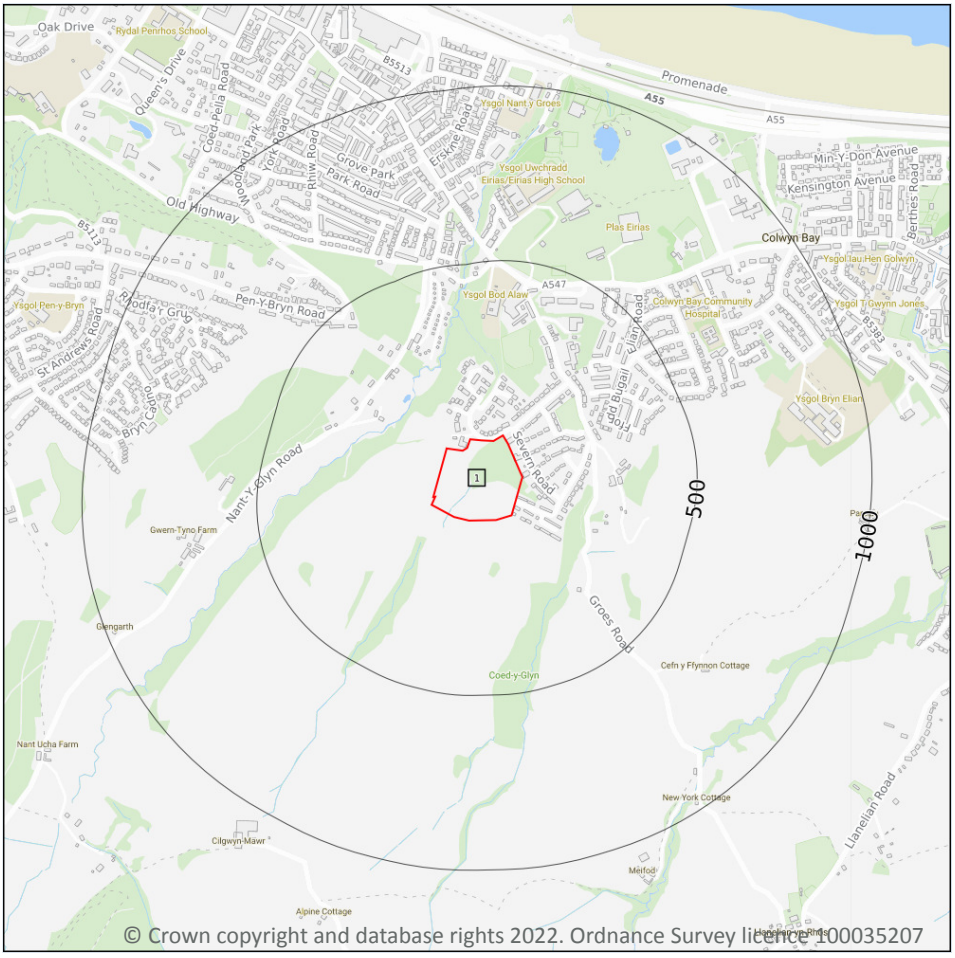
14.6 Bedrock faults and other linear features (10k)

Records within 500m	0

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

This data is sourced from the British Geological Survey.

15 Geology 1:50,000 scale - Availability



Site Outline

Search buffers in metres (m)

Geological map tile

15.1 50k Availability

Records within 500m	1

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

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 71**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**No coverage**	**Full**	**Full**	**Full**	**EW095_rhyl_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.

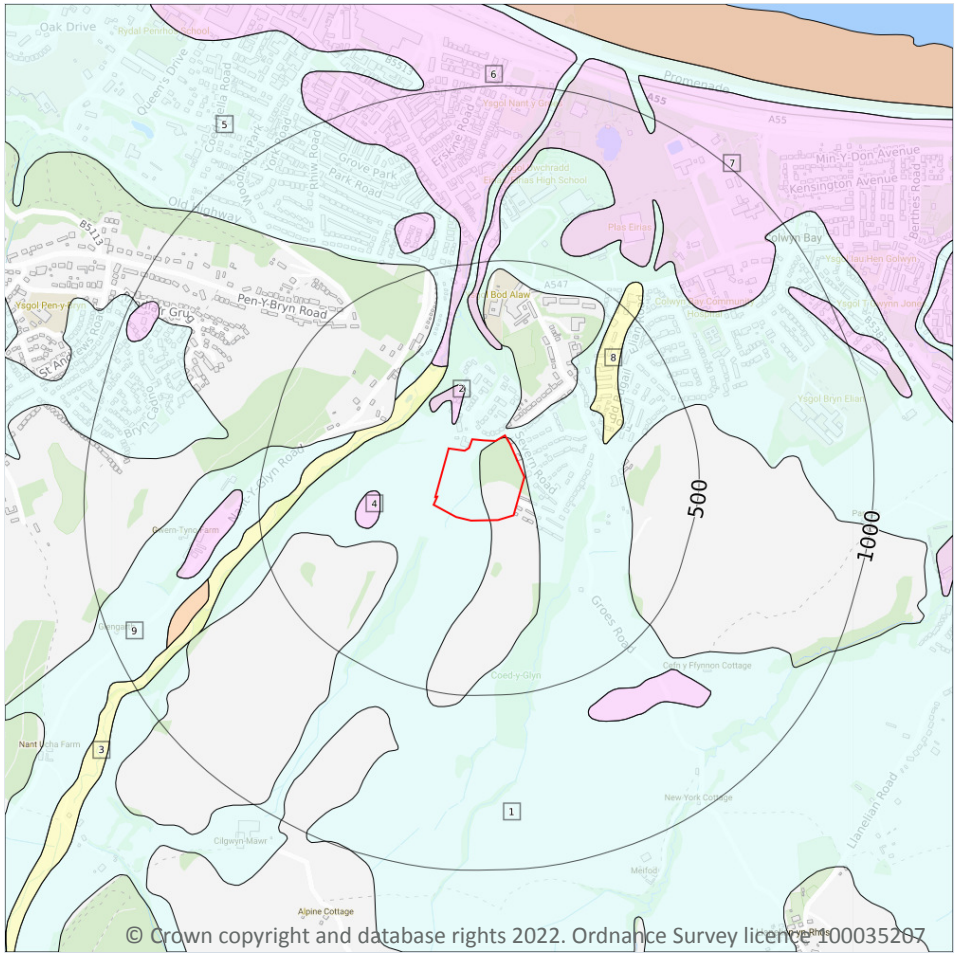
15.3 Artificial ground permeability (50k)

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 **9**

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 73**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**TILLD-DMTN**	**TILL, DEVENSIAN**	**DIAMICTON**
2	67m NW	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
3	141m NW	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

ID	Location	LEX Code	Description	Rock description
4	153m W	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
5	206m NW	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
6	221m N	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
7	246m N	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
8	247m NE	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
9	269m W	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	**1**

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

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Mixed**	**High**	**Low**

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	**0**

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

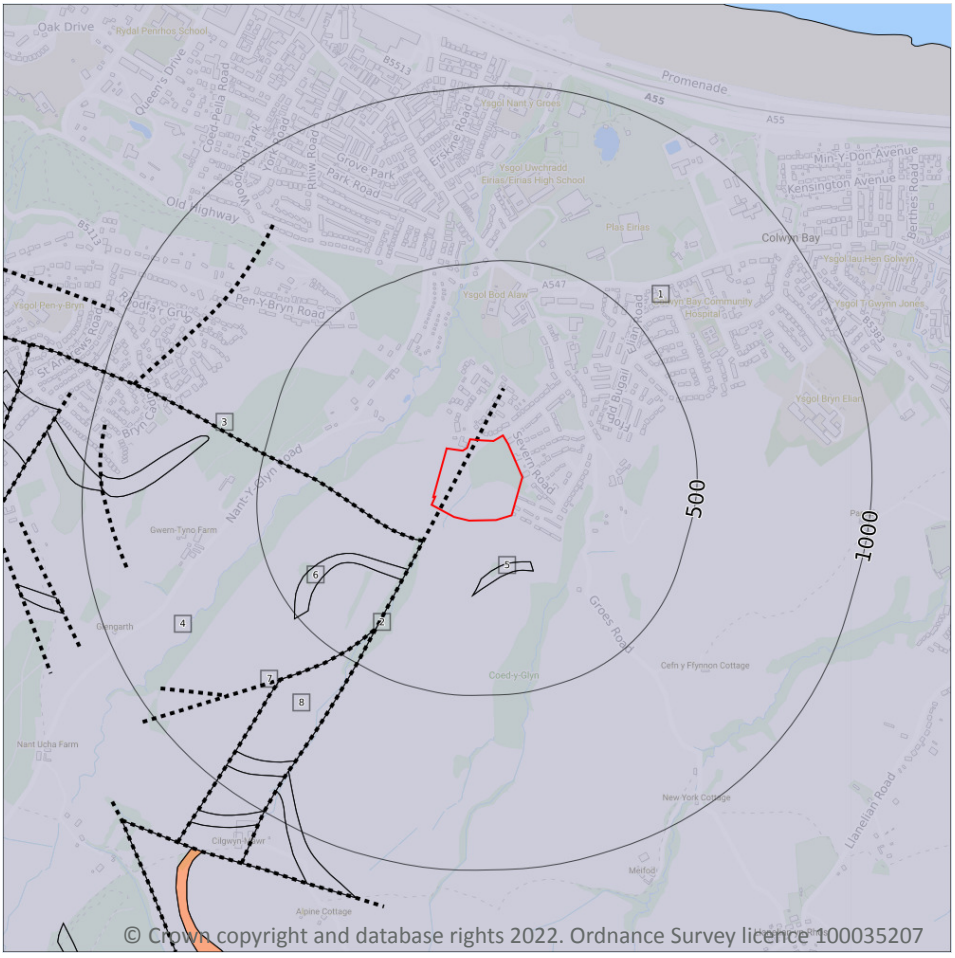
15.7 Landslip permeability (50k)

Records within 50m	**0**

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

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

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

15.8 Bedrock geology (50k)

Records within 500m	5

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 75**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**EY-MDSS**	**ELWY FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE**	**-**
4	102m SW	EY-MDSS	ELWY FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	-

ID	Location	LEX Code	Description	Rock age
5	128m S	EY-MSSSL	ELWY FORMATION - SLUMPED MUDSTONE, SLUMPED SILTSTONE AND SLUMPED SANDSTONE	-
6	195m SW	EY-MSSSL	ELWY FORMATION - SLUMPED MUDSTONE, SLUMPED SILTSTONE AND SLUMPED SANDSTONE	-
8	387m SW	EY-MDSS	ELWY FORMATION - MUDSTONE, SILTSTONE AND 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	**Fracture**	**Moderate**	**Low**

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m **3**

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

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 75**

ID	Location	Category	Description
2	**On site**	**FAULT**	**Fault, inferred, displacement unknown**
3	102m SW	FAULT	Fault, inferred, displacement unknown
7	387m SW	FAULT	Fault, inferred, displacement unknown

This data is sourced from the British Geological Survey.

16 Boreholes

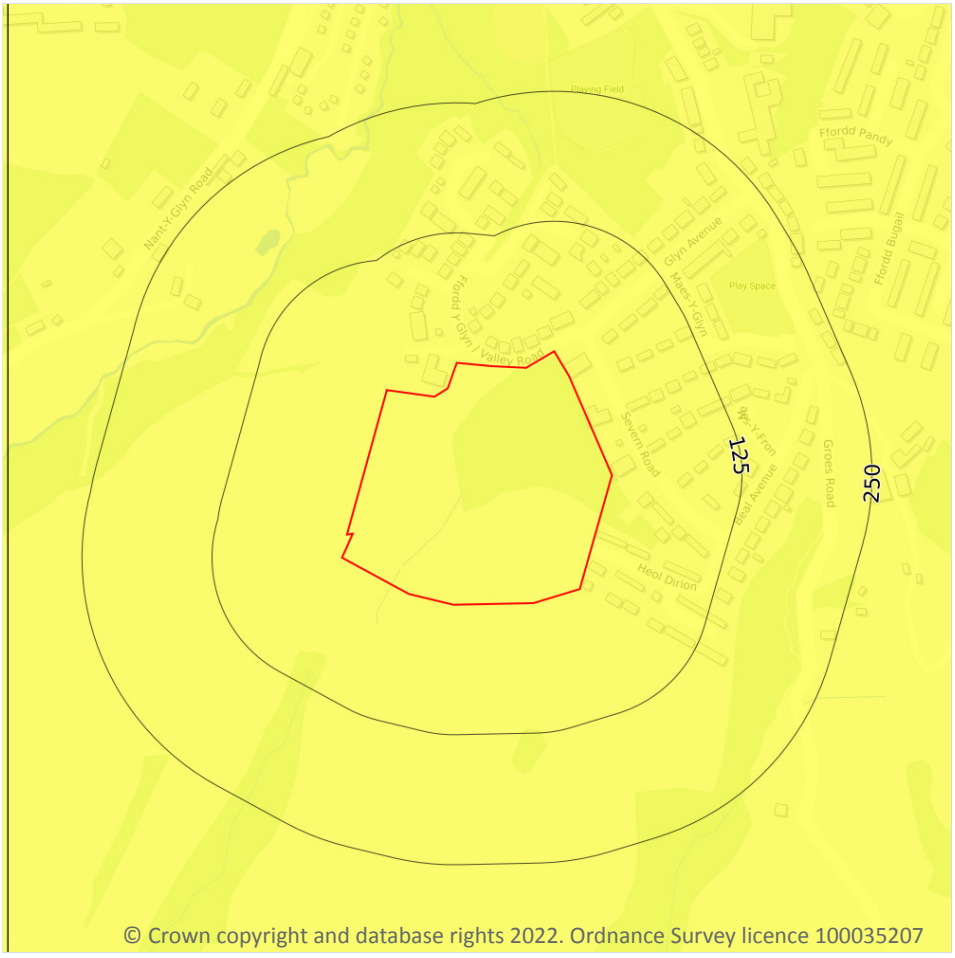
16.1 BGS Boreholes

Records within 250m	0

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.

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



Site Outline

Search buffers in metres (m)

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

17.1 Shrink swell clays

Records within 50m	1

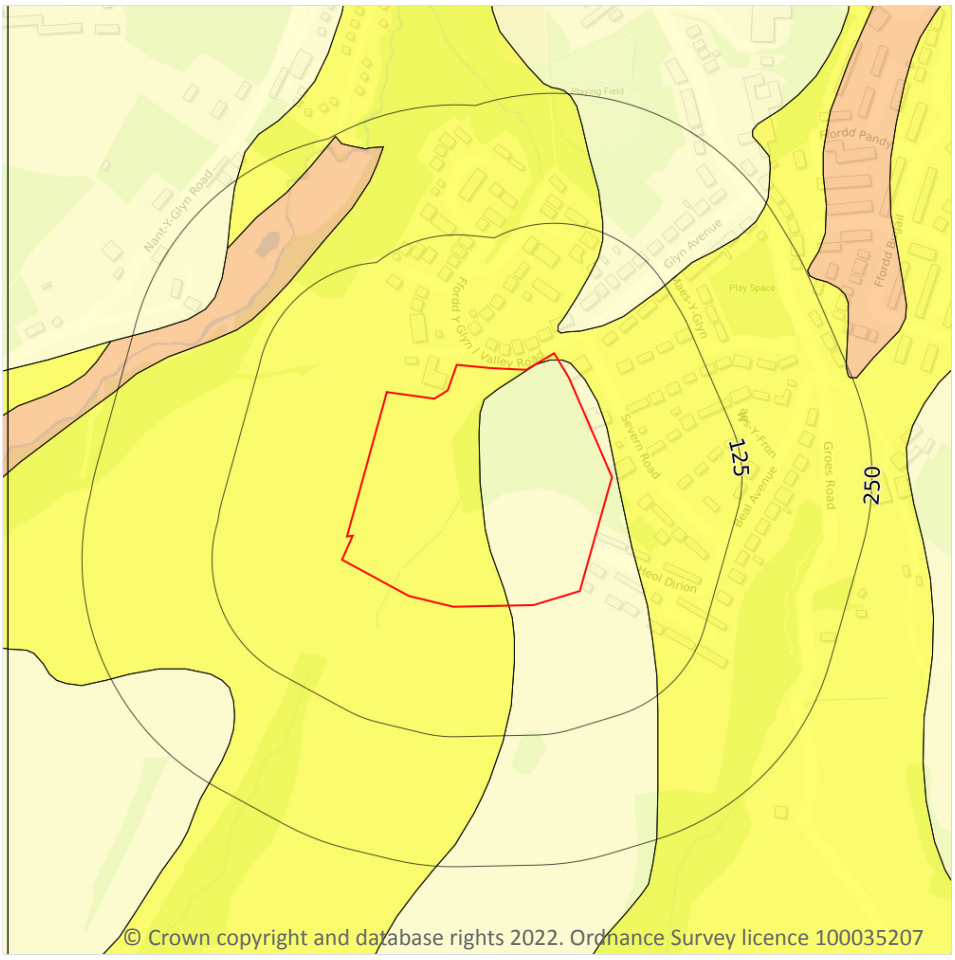
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 78**

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

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



Site Outline

Search buffers in metres (m)

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

17.2 Running sands

Records within 50m	3

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

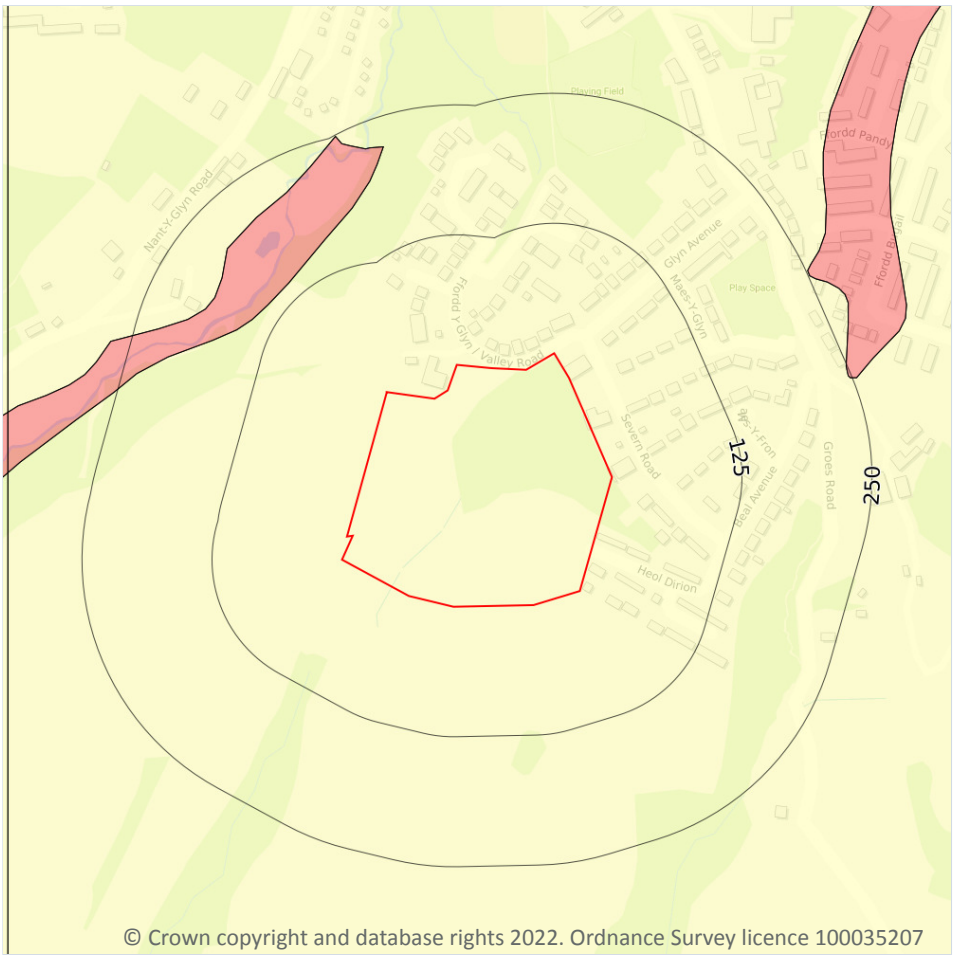
Features are displayed on the Natural ground subsidence - Running sands map on **page 79**

Location	Hazard rating	Details
On site	**Negligible**	**Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.**

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.**
21m N	Negligible	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits



17.3 Compressible deposits

Records within 50m	1

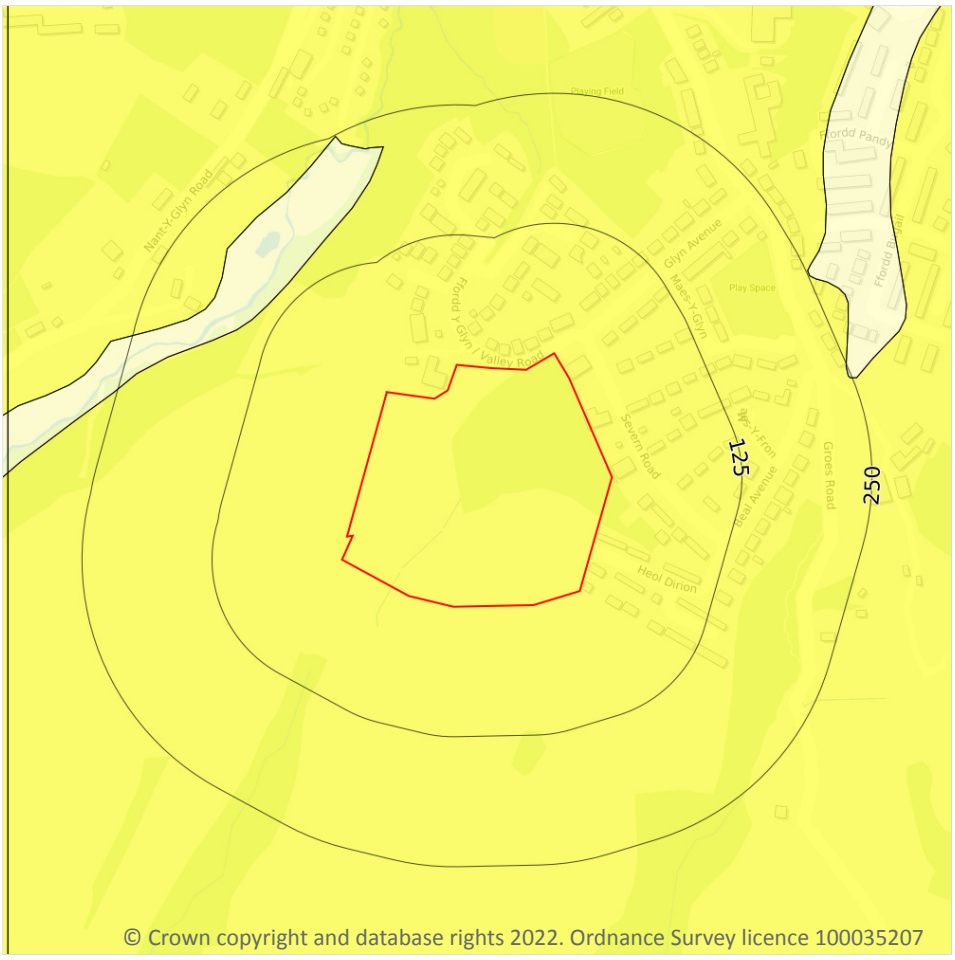
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

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

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

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



Site Outline

Search buffers in metres (m)

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

17.4 Collapsible deposits

Records within 50m	1

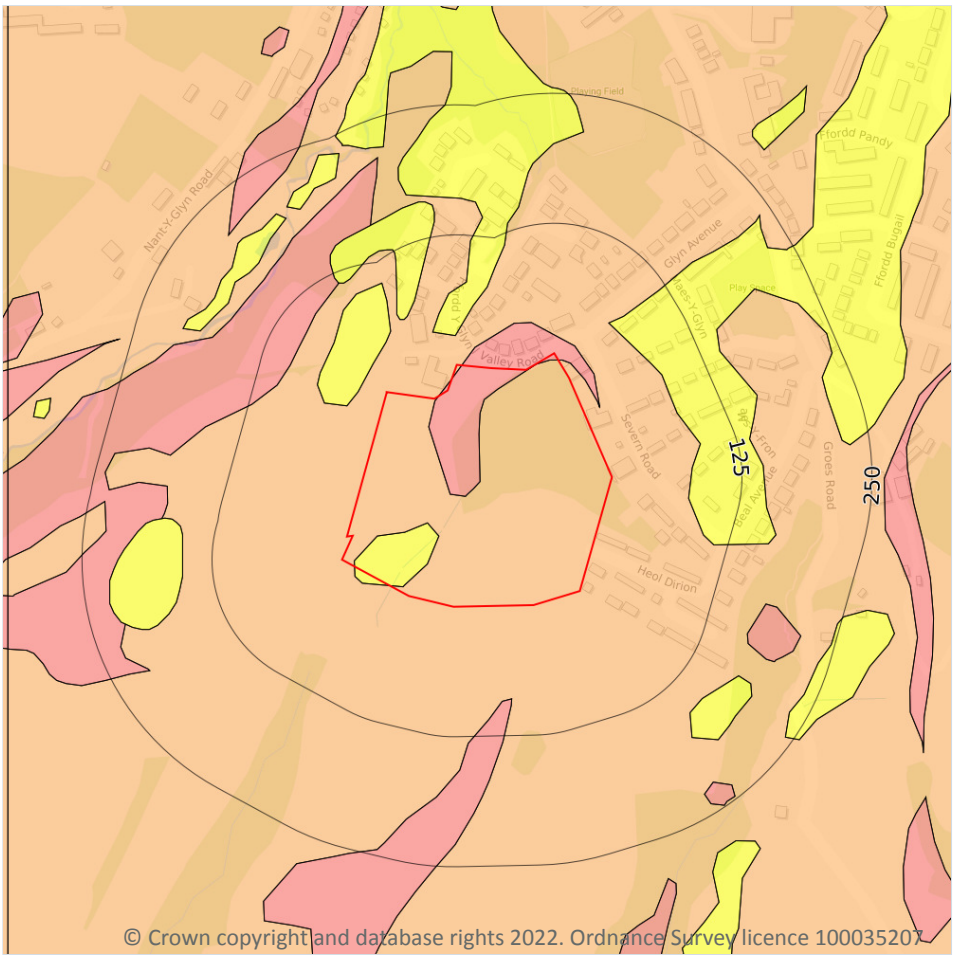
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 82**

Location	Hazard rating	Details
On site	**Very low**	**Deposits with potential to collapse when loaded and saturated are unlikely to be present.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



Site Outline

Search buffers in metres (m)

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

17.5 Landslides

Records within 50m	5

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

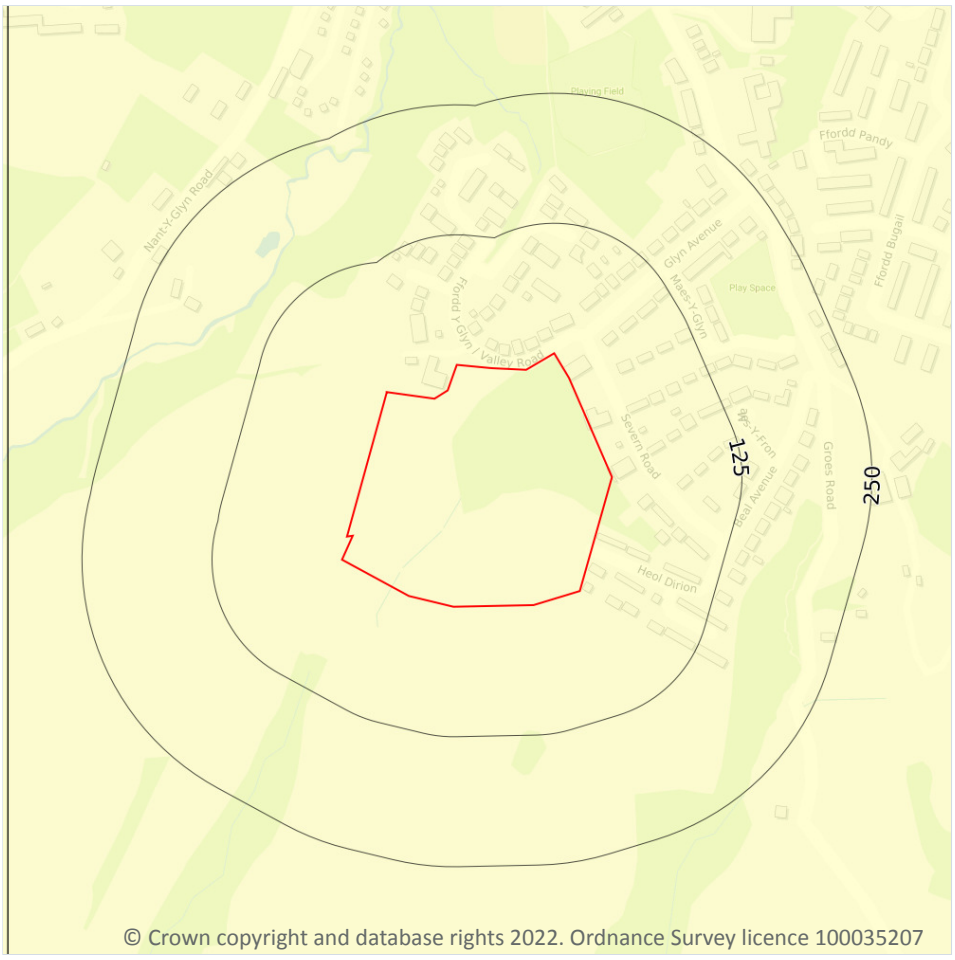
Features are displayed on the Natural ground subsidence - Landslides map on **page 83**

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

Location	Hazard rating	Details
On site	**Low**	**Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.**
On site	**Moderate**	**Slope instability problems are probably present or have occurred in the past. Land use should consider specifically the stability of the site.**
24m NW	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.
28m N	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

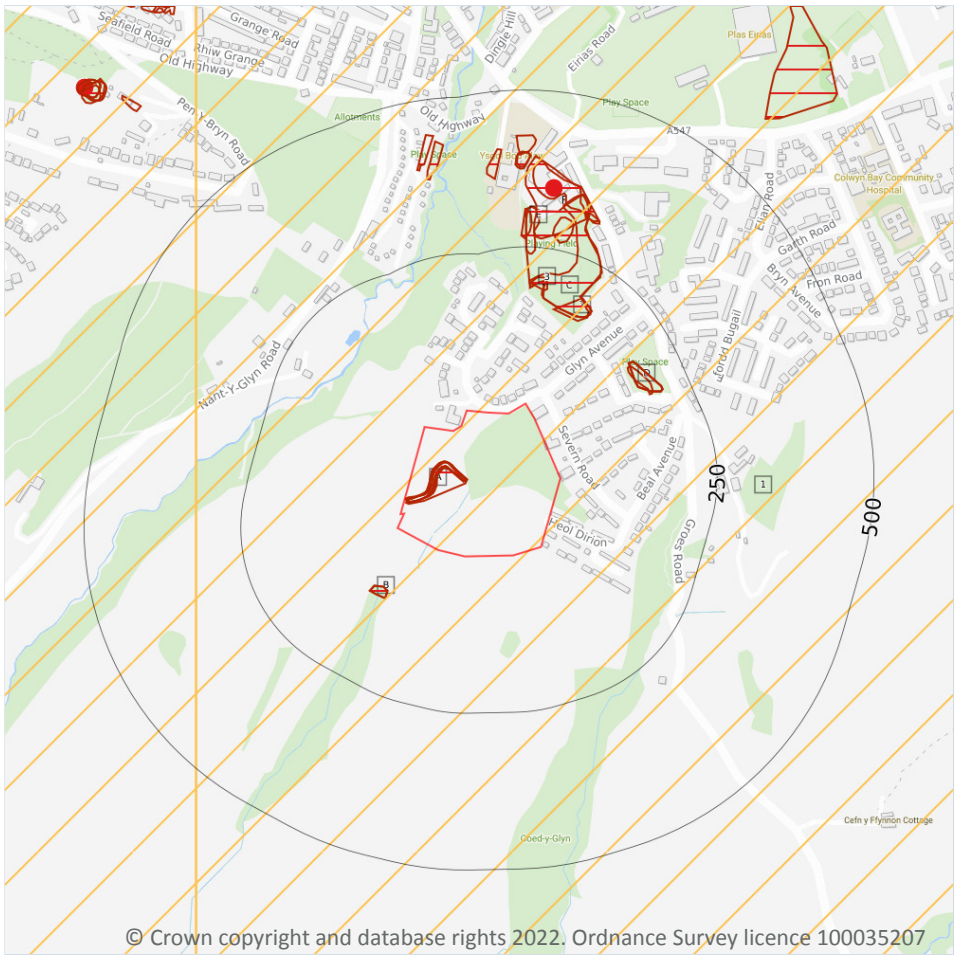
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 85**

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

This data is sourced from the British Geological Survey.

18 Mining, ground workings and natural cavities



Site Outline

Search buffers in metres (m)

- Natural cavities (Area)
- Natural cavities (Point)
- BritPits
- Surface ground workings
- Underground workings
- Historical Mineral Planning Areas
- Mining Cavities

Non Coal Mining

- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

18.1 Natural cavities

Records within 500m	0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

18.2 BritPits

Records within 500m	1

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

Features are displayed on the Mining, ground workings and natural cavities map on **page 87**

ID	Location	Details	Description
F	346m N	Name: Barberry Hill Address: Old Colwyn, LLANDUDNO, Conwy Commodity: Sand Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m	17

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 87**

ID	Location	Land Use	Year of mapping	Mapping scale
A	**On site**	**Unspecified Ground Workings**	**1938**	**1:10560**
A	**On site**	**Unspecified Ground Workings**	**1948**	**1:10560**
A	**On site**	**Unspecified Heap**	**1911**	**1:10560**
A	**On site**	**Unspecified Ground Workings**	**1938**	**1:10560**
A	**On site**	**Unspecified Ground Workings**	**1911**	**1:10560**
A	**On site**	**Unspecified Ground Workings**	**1911**	**1:10560**
B	93m SW	Unspecified Pit	1971	1:10000
B	93m SW	Unspecified Pit	1964	1:10560
2	155m NE	Unspecified Pit	1964	1:10560
C	160m NE	Unspecified Pit	1948	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
C	160m N	Sand Pit	1938	1:10560
D	167m NE	Sand Pit	1948	1:10560
D	171m NE	Unspecified Pit	1971	1:10000
D	171m NE	Unspecified Pit	1964	1:10560
D	171m NE	Unspecified Pit	1987	1:10000
3	183m N	Unspecified Heap	1964	1:10560
E	239m N	Sand Pit	1948	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m	0

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

This is data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m	0

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

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m	2

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

Features are displayed on the Mining, ground workings and natural cavities map on **page 87**

ID	Location	Name	Commodity	Class	Likelihood
1	**On site**	**Berwyn Hills**	**Vein Mineral**	**B**	**Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered**
5	321m W	Berwyn Hills	Vein Mineral	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m	**0**

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

18.8 JPB mining areas

Records on site	**0**

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

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site	**0**

Areas which could be affected by past, current or future coal mining.

This data is sourced from the Coal Authority.

18.10 Brine areas

Records on site	**0**

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.11 Gypsum areas

Records on site	0

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	0

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

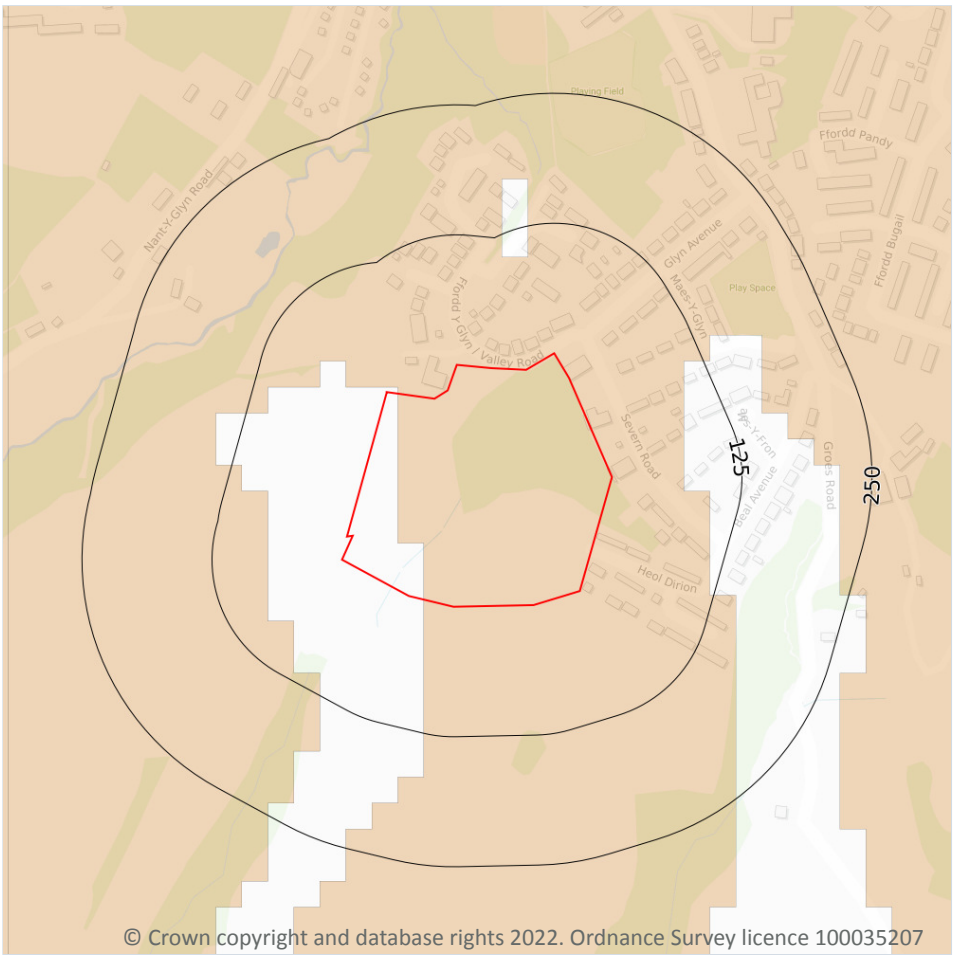
18.13 Clay mining

Records on site	0

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).

19 Radon



Site Outline

Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

19.1 Radon

Records on site	2

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 92**

Location	Estimated properties affected	Radon Protection Measures required
On site	**Less than 1%**	**None****
On site	**Between 5% and 10%**	**Basic**

This data is sourced from the British Geological Survey and Public Health England.

20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m	**5**

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**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
21m NE	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m	**0**

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

This data is sourced from the British Geological Survey.

20.3 BGS Measured Urban Soil Chemistry

Records within 50m	**0**

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

This data is sourced from the British Geological Survey.

21 Railway infrastructure and projects

21.1 Underground railways (London)

Records within 250m	0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m	0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m	0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m	0

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

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m	0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m	0

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

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m	0

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

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m	0

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

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m	0

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

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m	0

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

This data is sourced from HS2 ltd.

Data providers

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

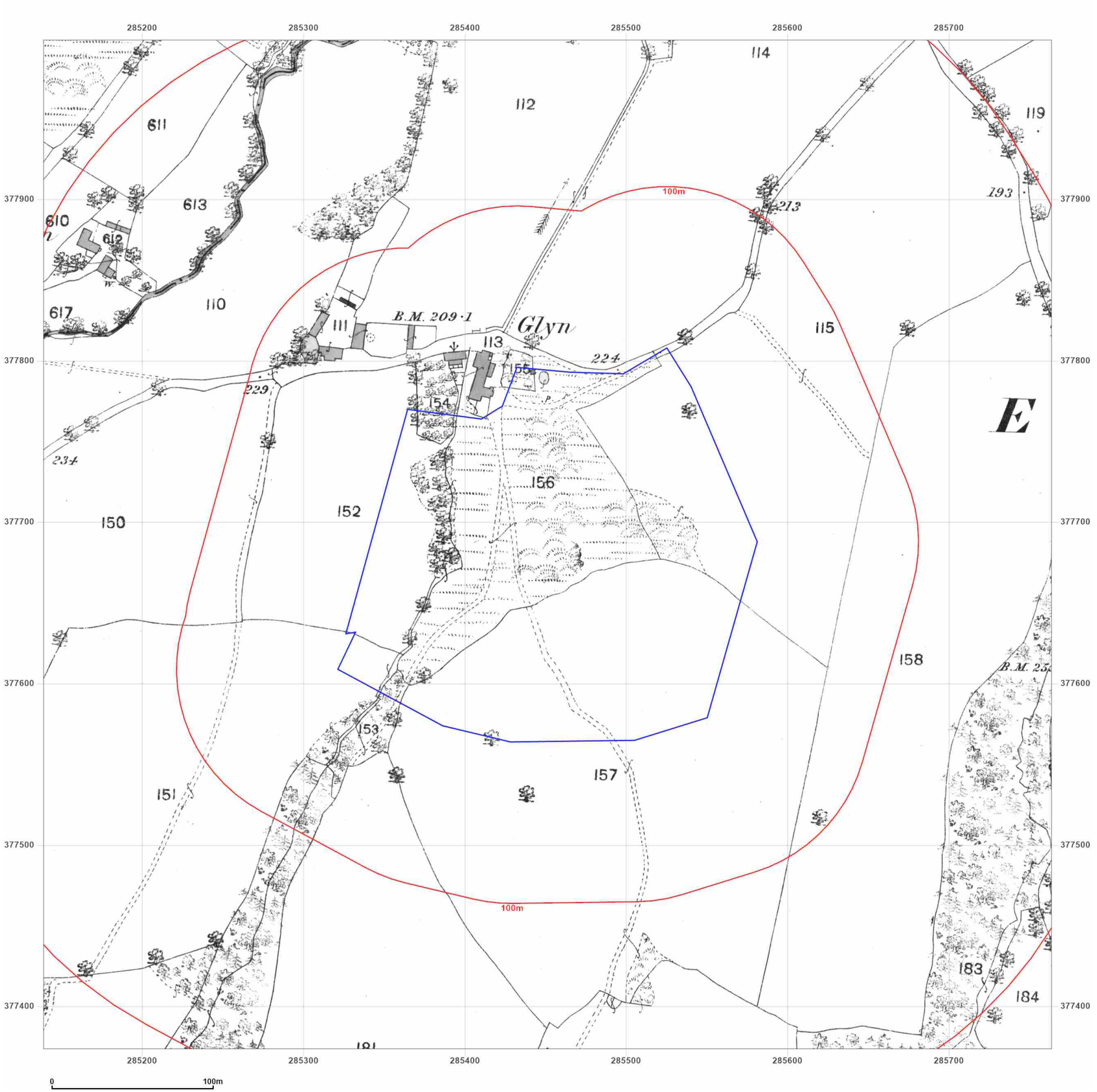
Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: https://www.groundsure.com/terms-and-conditions-jan-2020/.

APPENDIX D

These Ordnance Survey maps are not printed to scale and have been reduced to A4 size

A3 1/10,000 plans are available upon request



Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: County Series

Map date: **1876**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

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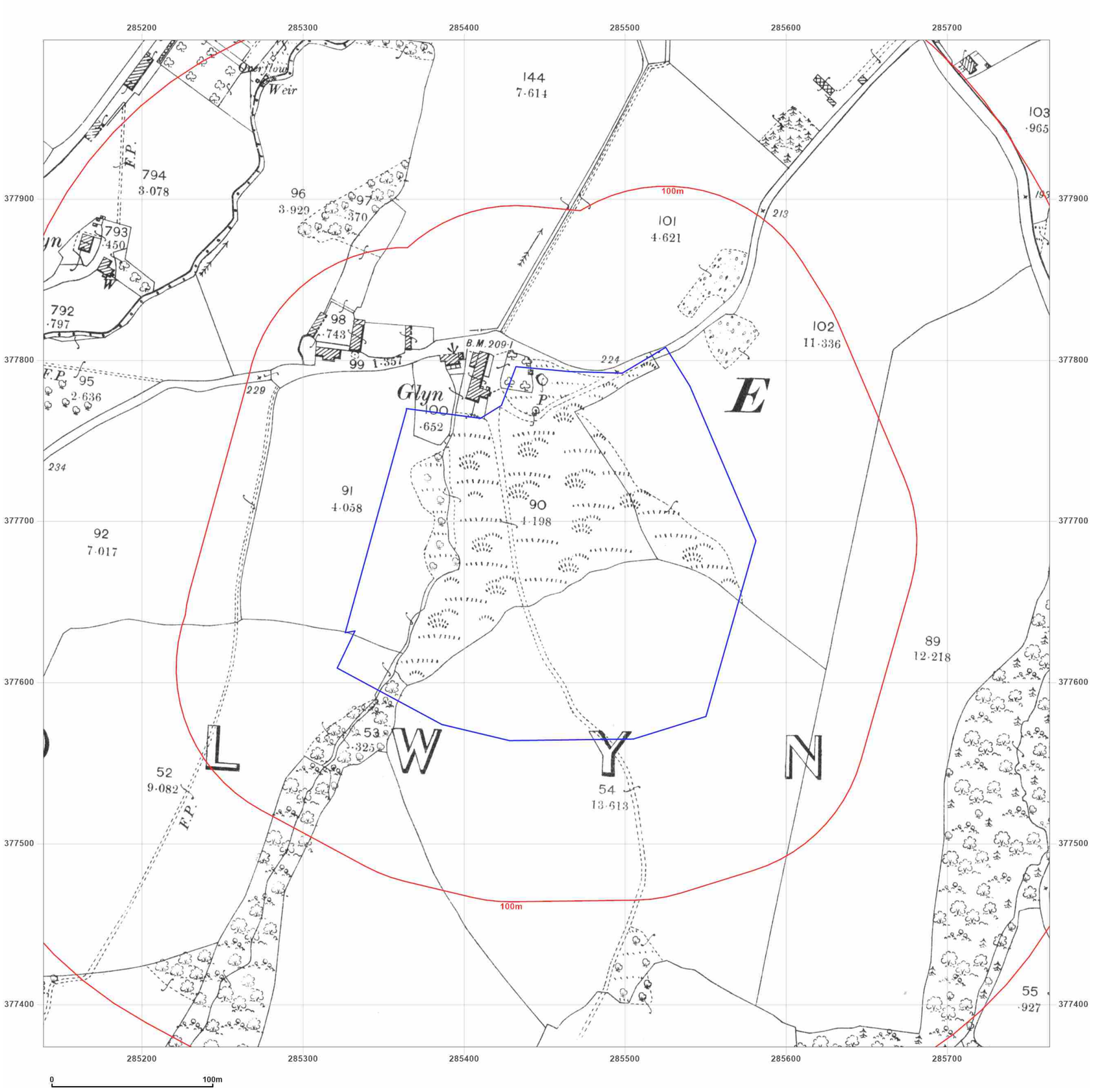

Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: County Series

Map date: **1900**

Scale: 1:2,500

Printed at: 1:2,500

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

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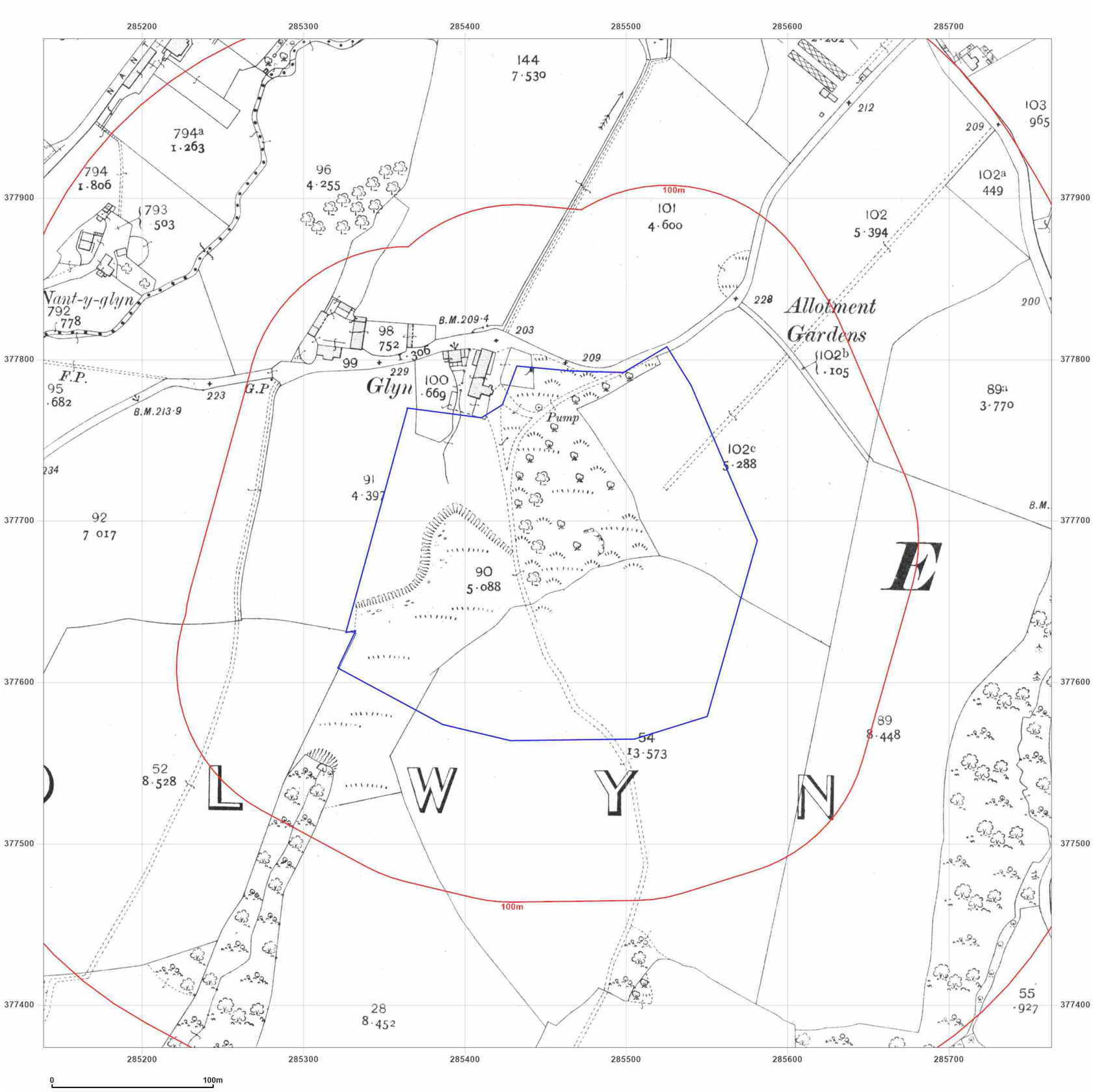

Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: County Series

Map date: **1913**

Scale: 1:2,500

Printed at: 1:2,500

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

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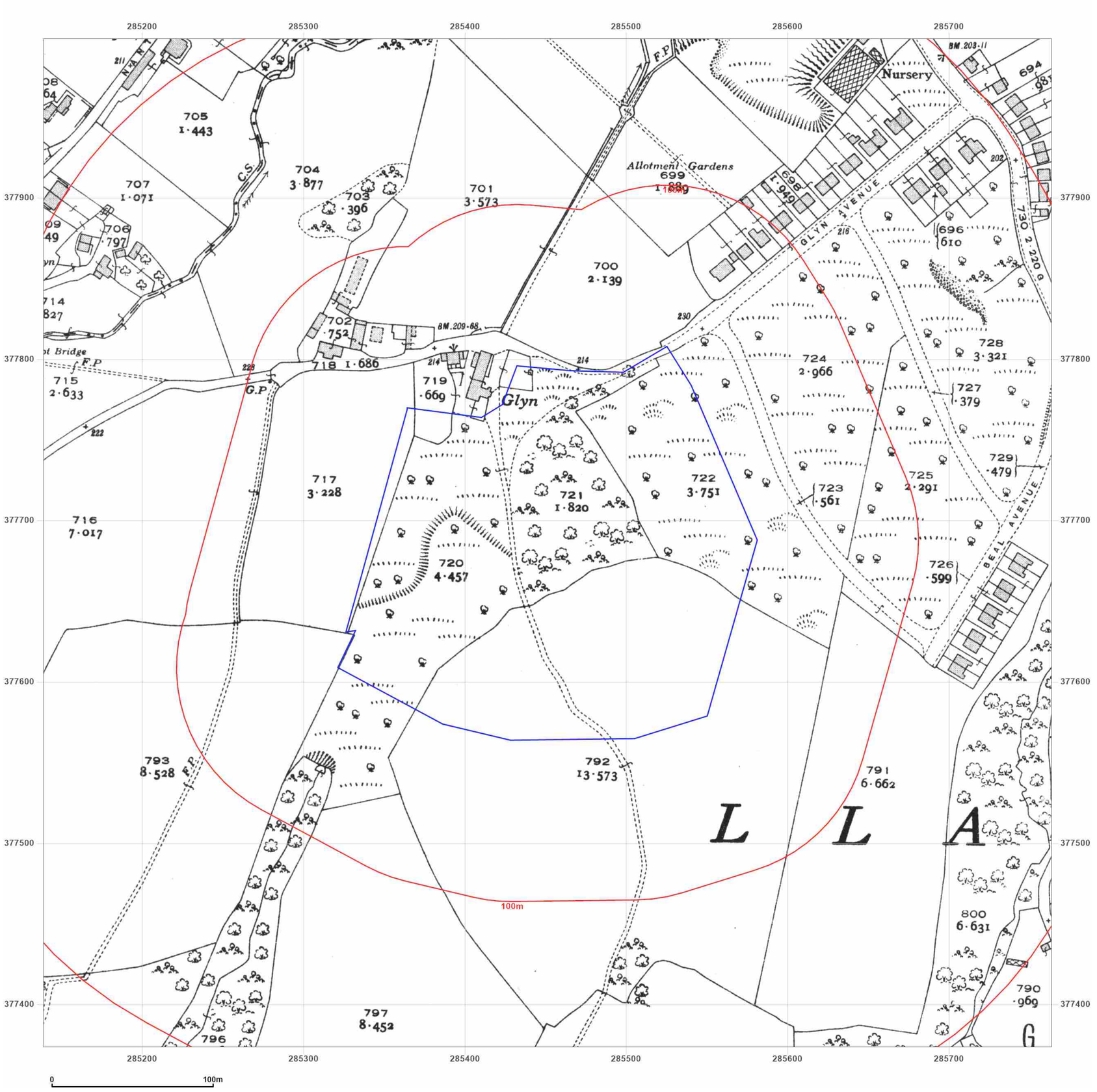

Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: County Series

Map date: **1937**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1937
Revised 1937
Edition N/A
Copyright N/A
Levelled N/A

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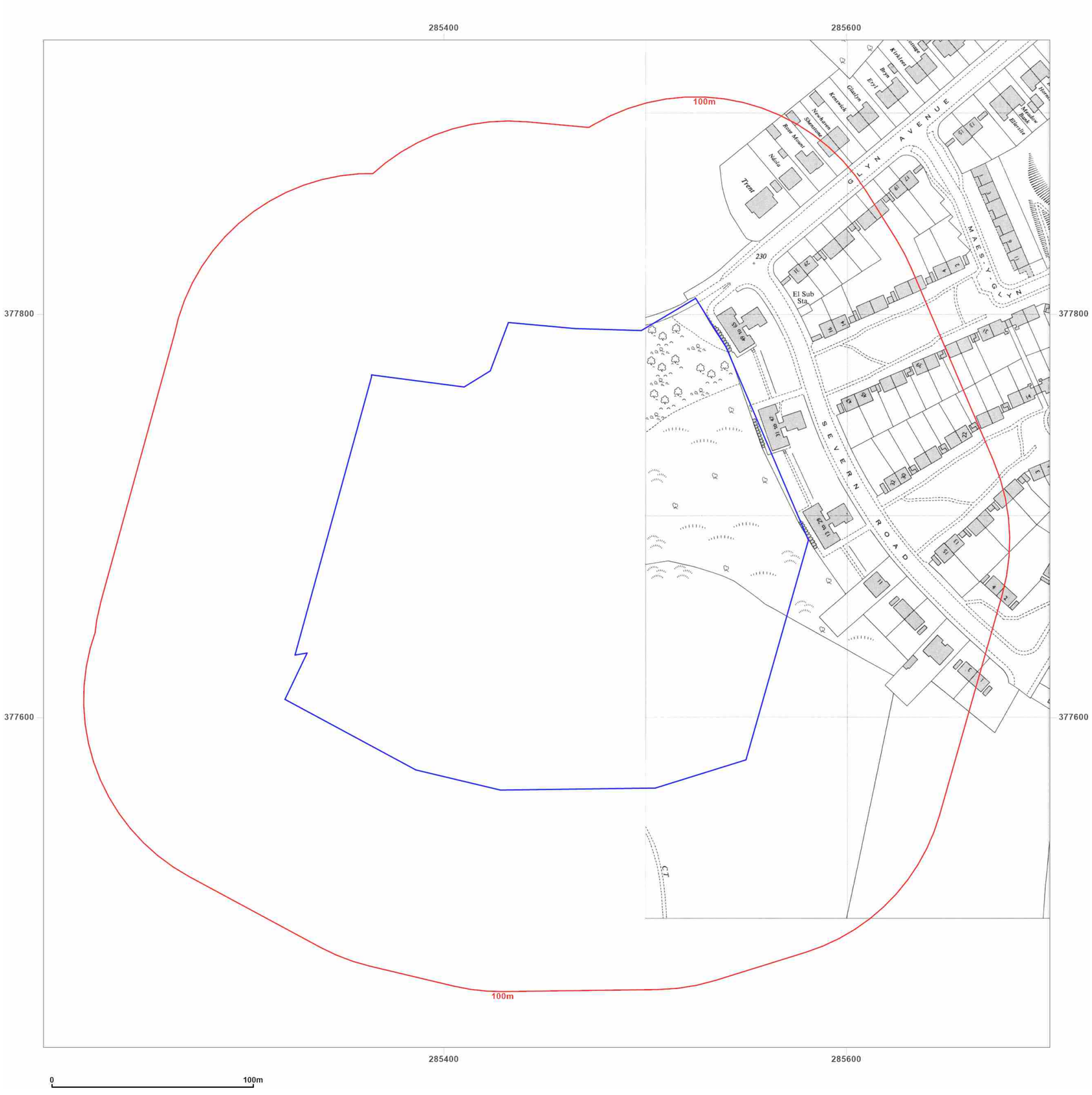

Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **1957**

Scale: 1:1,250

Printed at: 1:2,000

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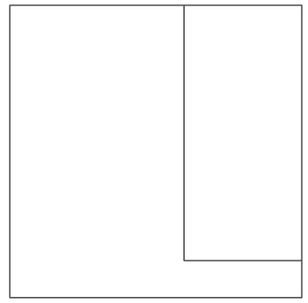

Surveyed 1957
Revised 1957
Edition N/A
Copyright N/A
Levelled 1953

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Production date: 28 March 2022

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Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **1961**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1959
Revised 1959
Edition 1961
Copyright 1961
Levelled 1954

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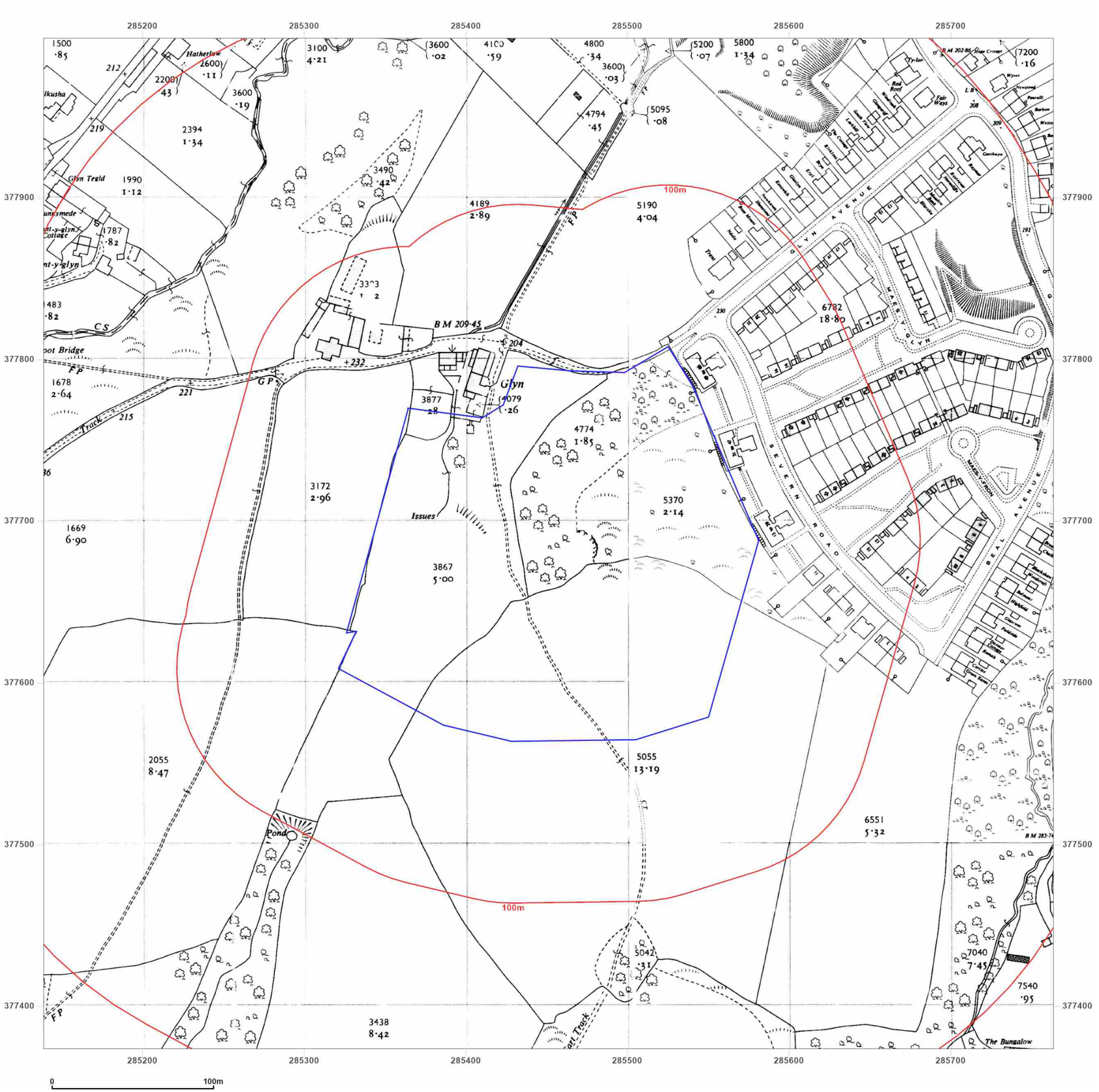

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **1961**

Scale: 1:2,500

Printed at: 1:2,500

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

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Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **1978**

Scale: 1:1,250

Printed at: 1:2,000

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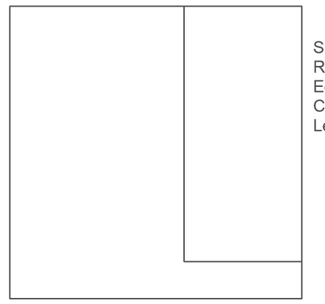

Surveyed 1957
Revised 1977
Edition N/A
Copyright 1978
Levelled 1970

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Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **1986**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1970
Revised 1986
Edition N/A
Copyright 1986
Levelled 1970

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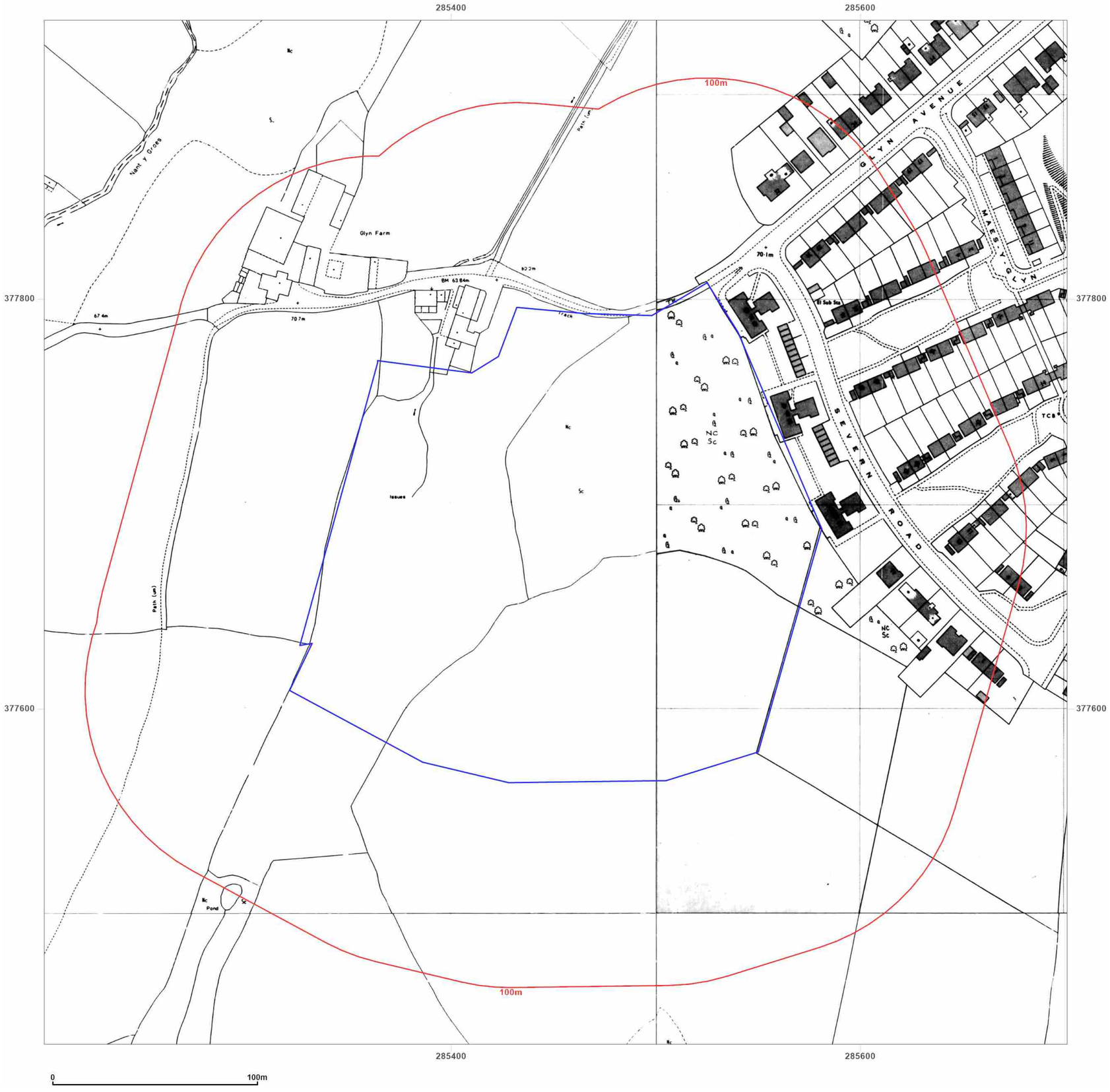

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **1988-1993**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A Revised N/A Edition N/A Copyright 1993 Levelled N/A	Surveyed 1970 Revised 1988 Edition N/A Copyright 1988 Levelled 1970
Surveyed N/A Revised N/A Edition N/A Copyright 1993 Levelled N/A	Surveyed N/A Revised N/A Edition N/A Copyright 1993 Levelled N/A

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Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **1993**

Scale: 1:1,250

Printed at: 1:2,000

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

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Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **1994**

Scale: 1:1,250

Printed at: 1:2,000

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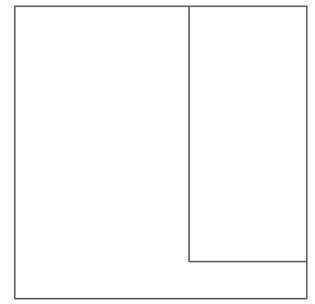

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1994
Levelled N/A

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Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **1994**

Scale: 1:1,250

Printed at: 1:2,000

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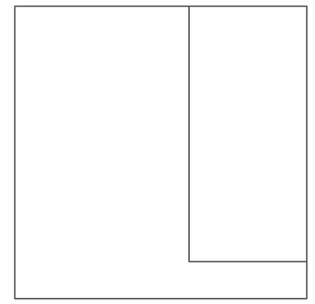

Surveyed 1994
Revised 1994
Edition N/A
Copyright 1994
Levelled N/A

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Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

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

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2003

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Production date: 28 March 2022

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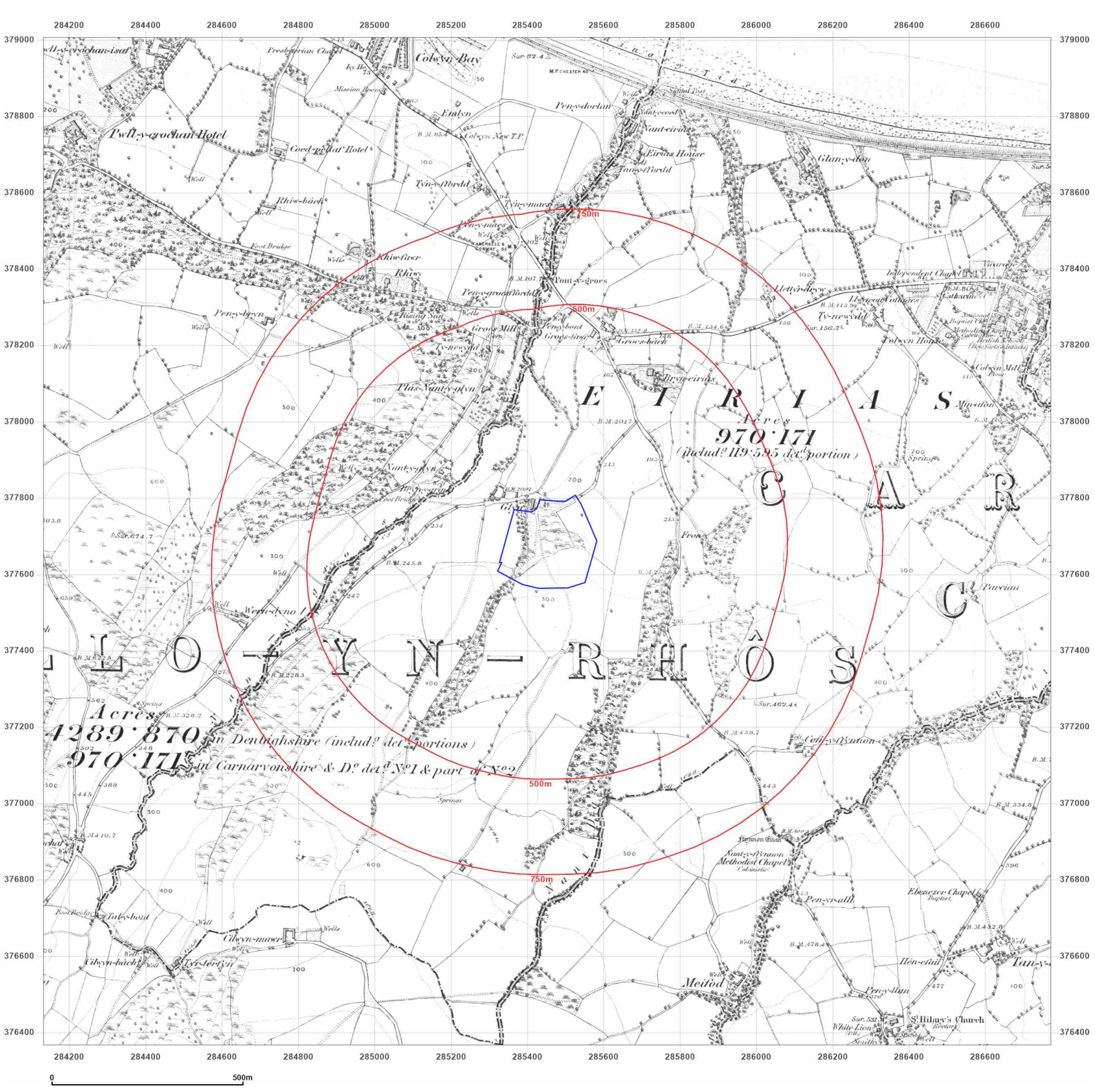

Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: County Series

Map date: **1875**

Scale: 1:10,560

Printed at: 1:10,560

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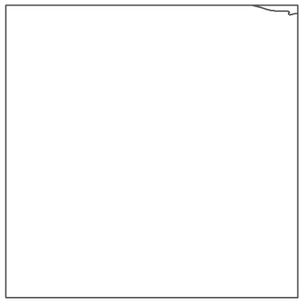
Surveyed 1875
Revised 1875
Edition N/A
Copyright N/A
Levelled N/A



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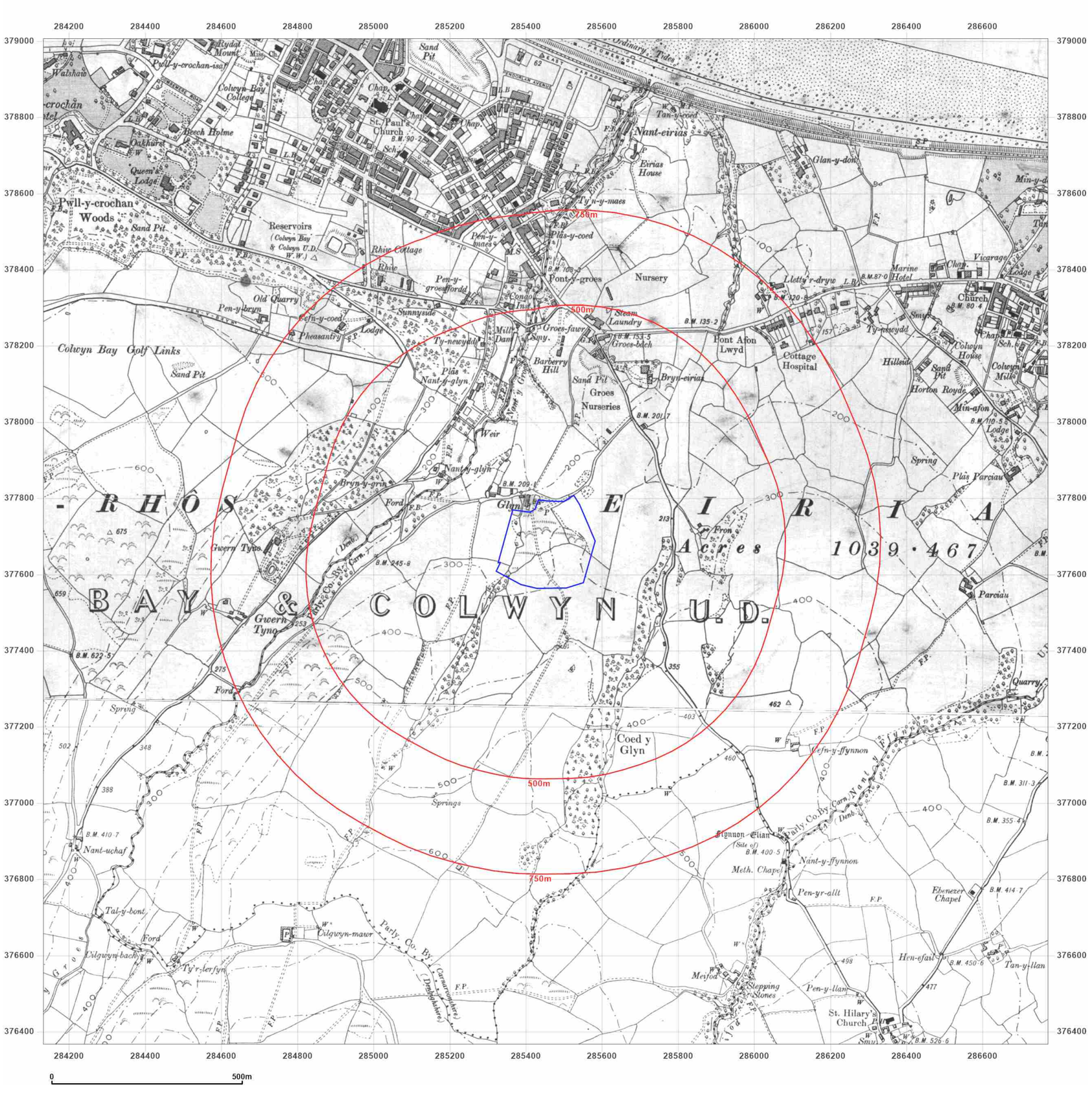

Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: County Series

Map date: **1898**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1874
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1898
Edition N/A
Copyright N/A
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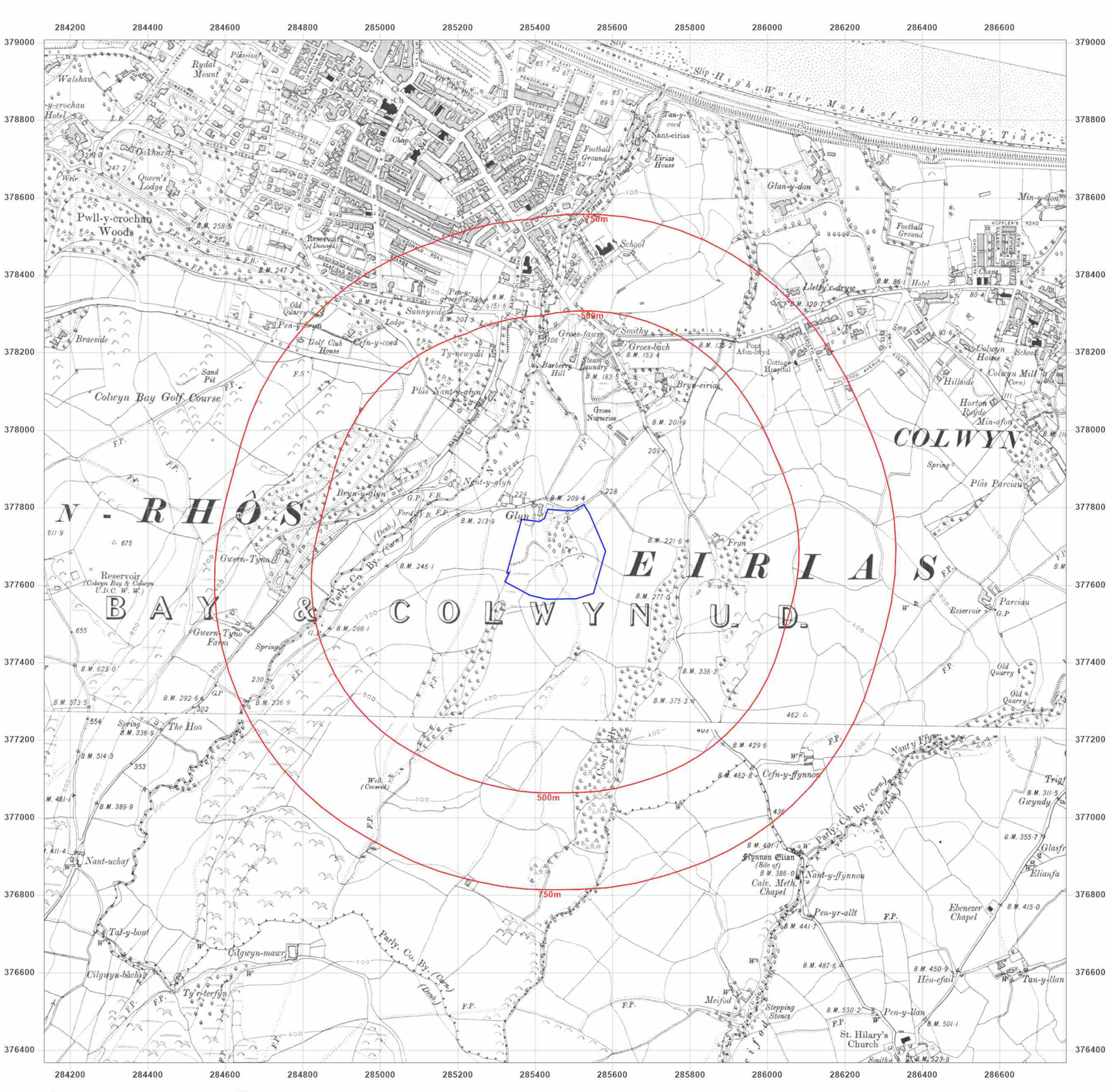

Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: County Series

Map date: **1911**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1871
Revised 1911
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1874
Revised 1911
Edition N/A
Copyright N/A
Levelled N/A

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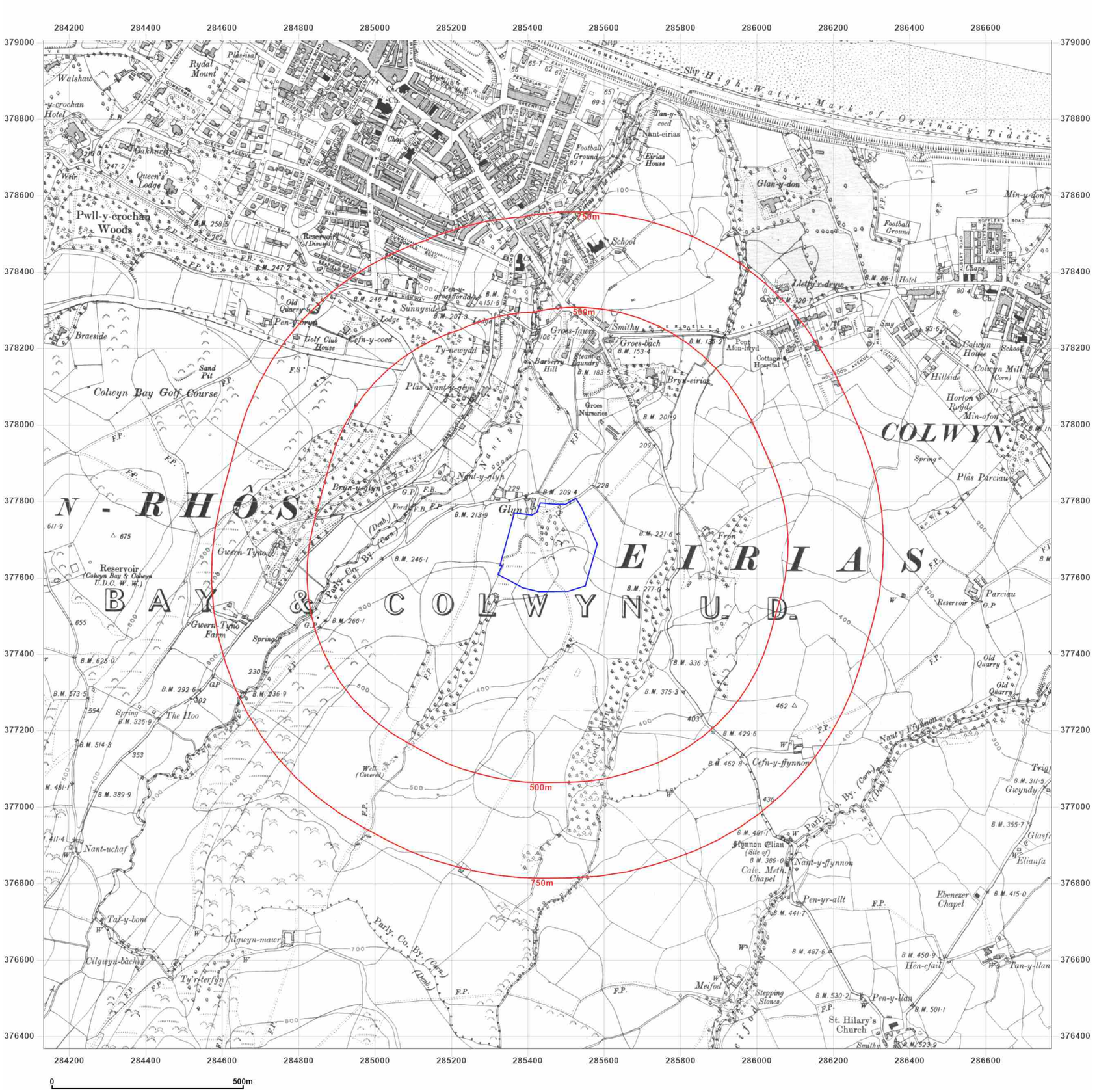

Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: County Series

Map date: **1911-1914**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1871
Revised 1911
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1874
Revised 1914
Edition 1914
Copyright N/A
Levelled N/A

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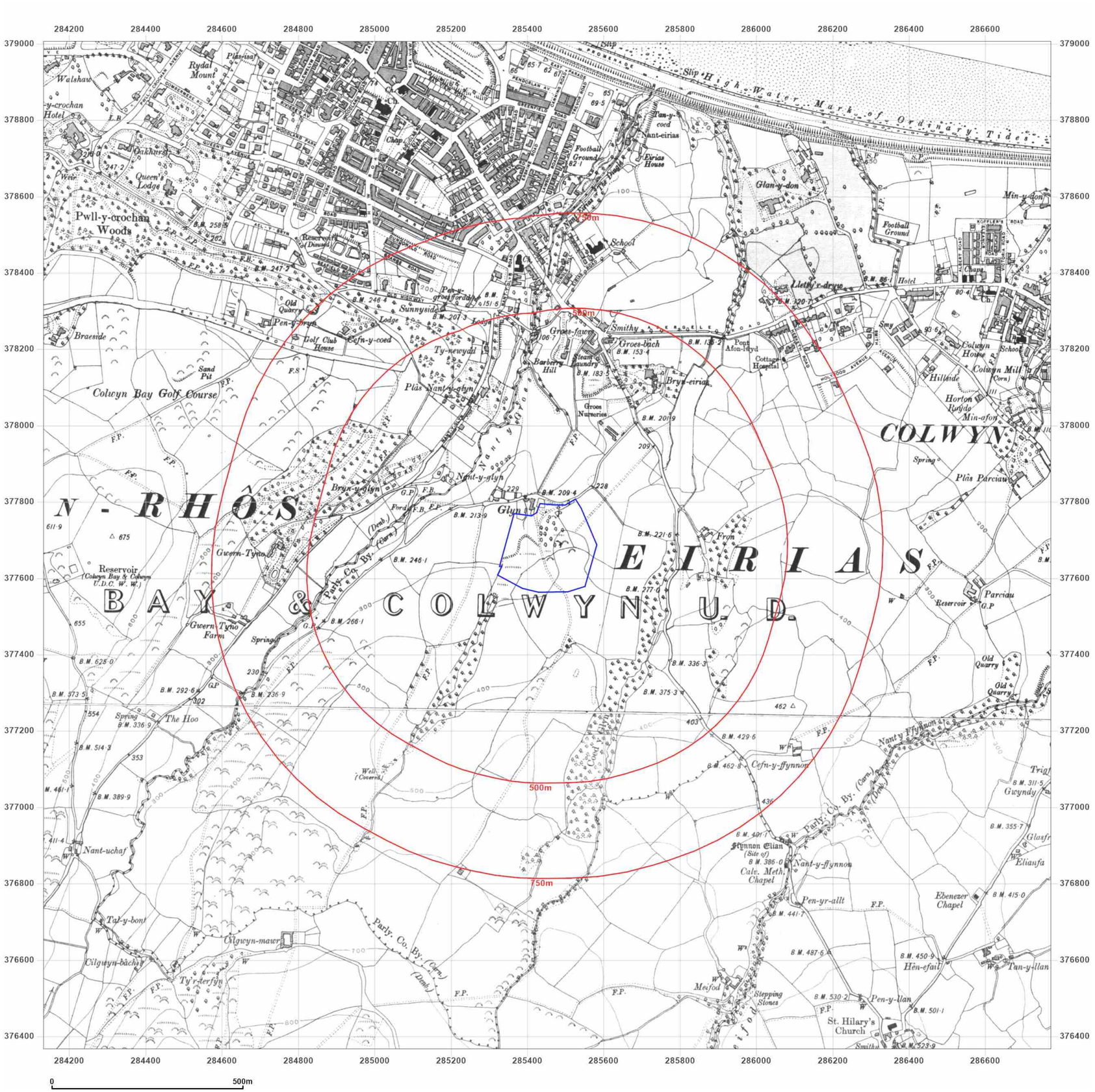

Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: County Series

Map date: **1911-1914**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1871
Revised 1911
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1874
Revised 1914
Edition N/A
Copyright N/A
Levelled N/A

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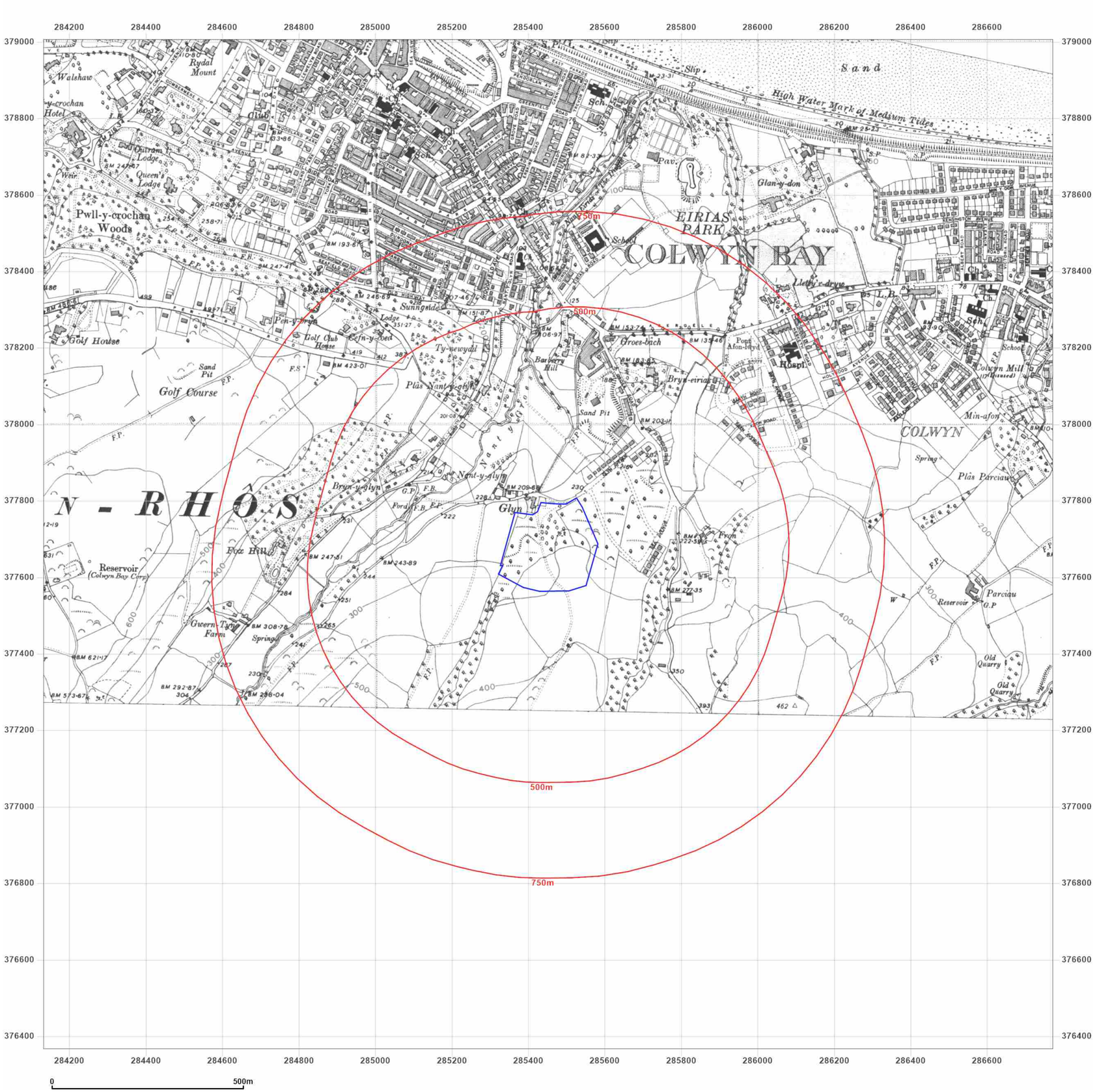

Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1871
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 28 March 2022

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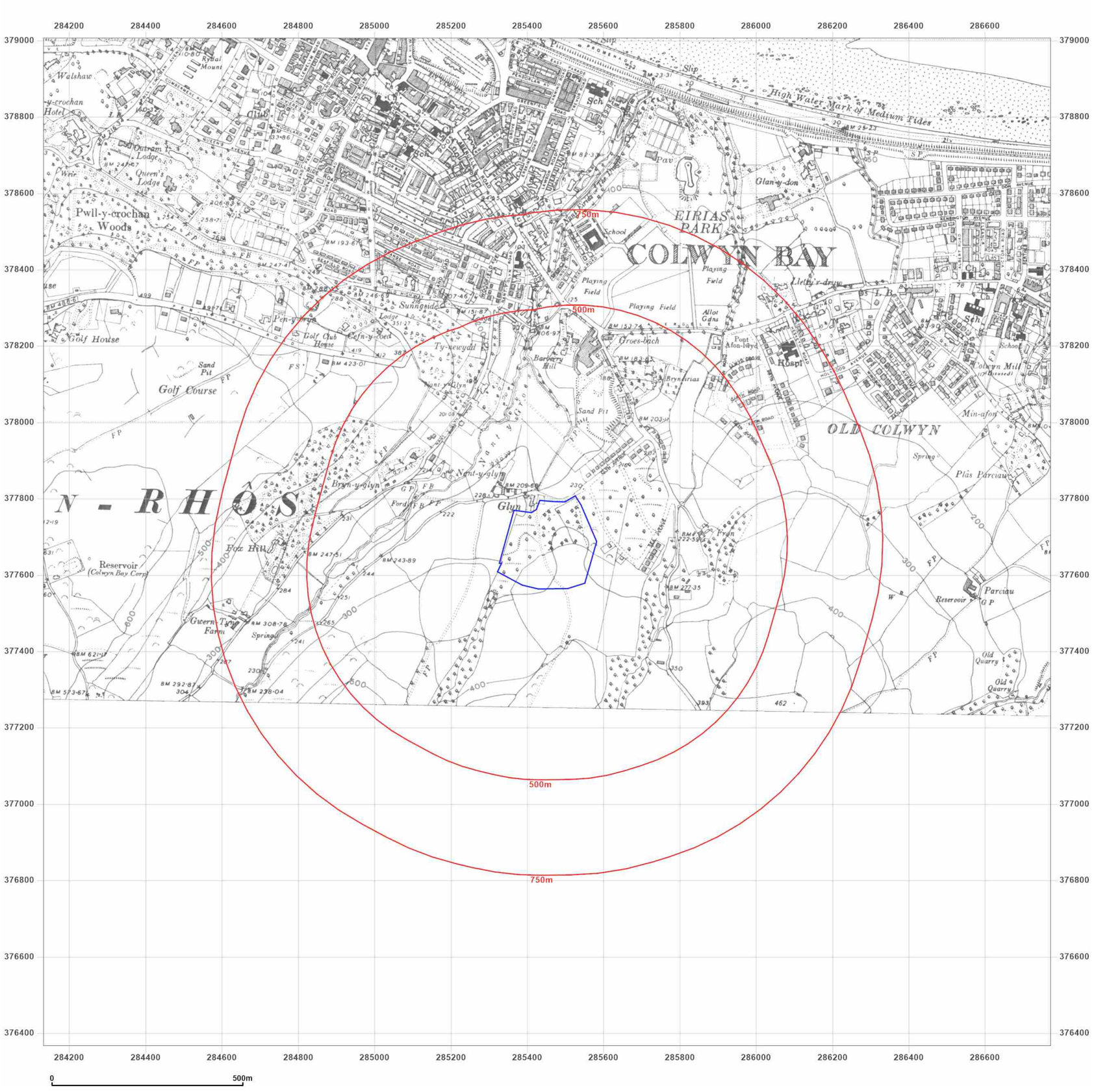

Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: County Series

Map date: **1948**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1871
Revised 1948
Edition N/A
Copyright N/A
Levelled N/A

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Map legend available at:
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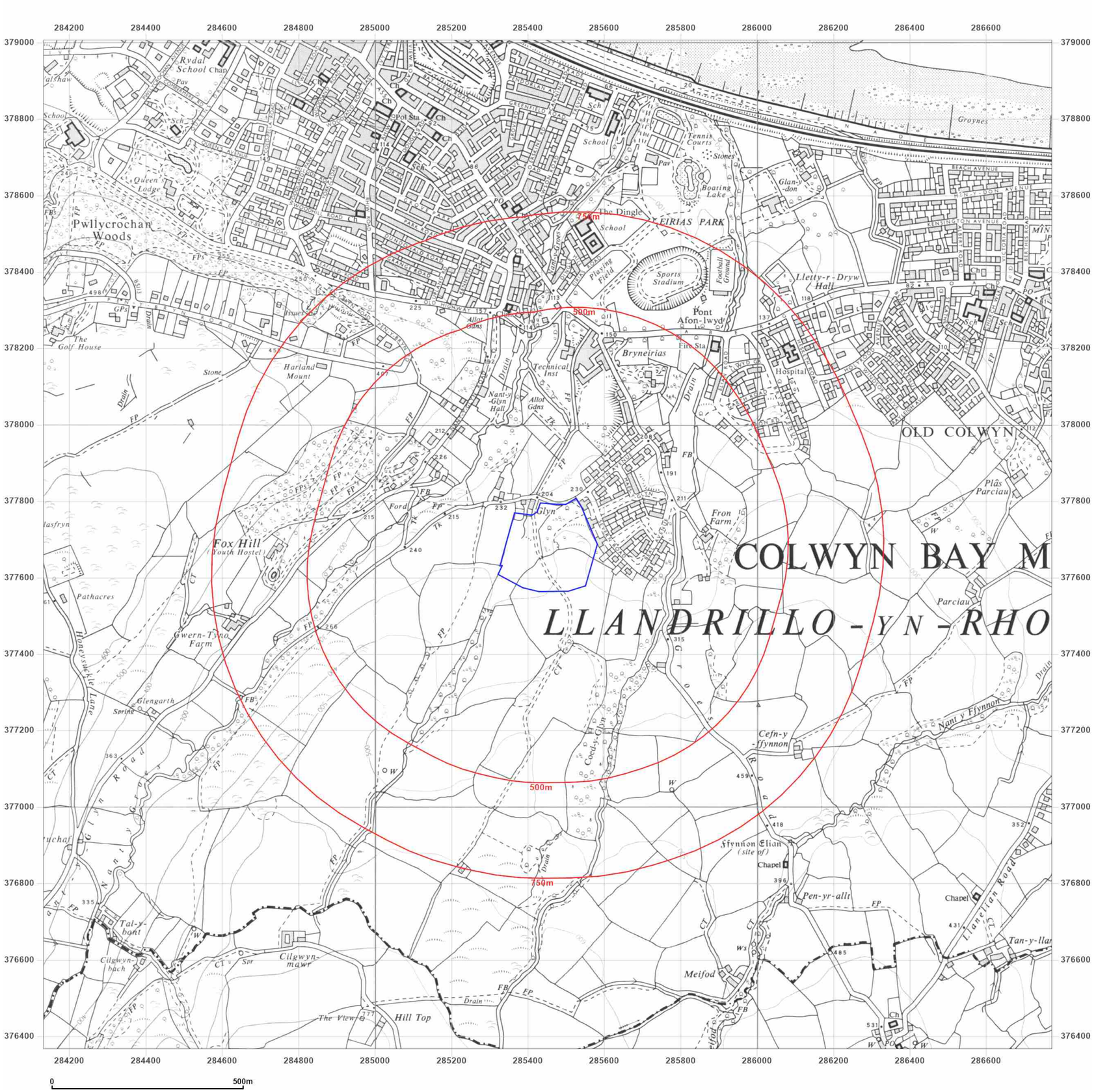

Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: Provisional

Map date: **1964**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1964
Revised 1964
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1964
Revised 1964
Edition N/A
Copyright N/A
Levelled N/A

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Map legend available at:
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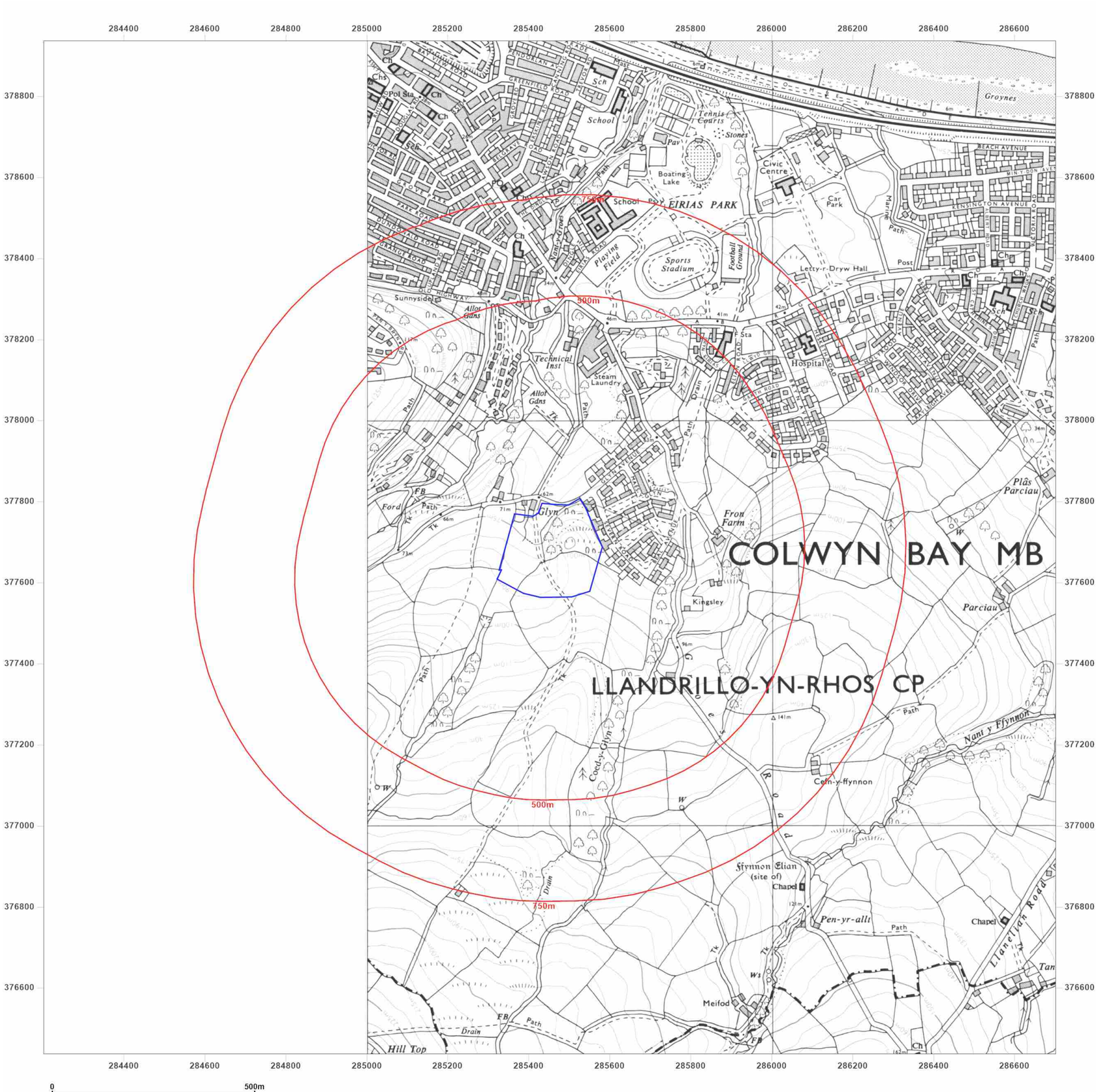

Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **1971**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1971
Revised 1971
Edition N/A
Copyright N/A
Levelled N/A

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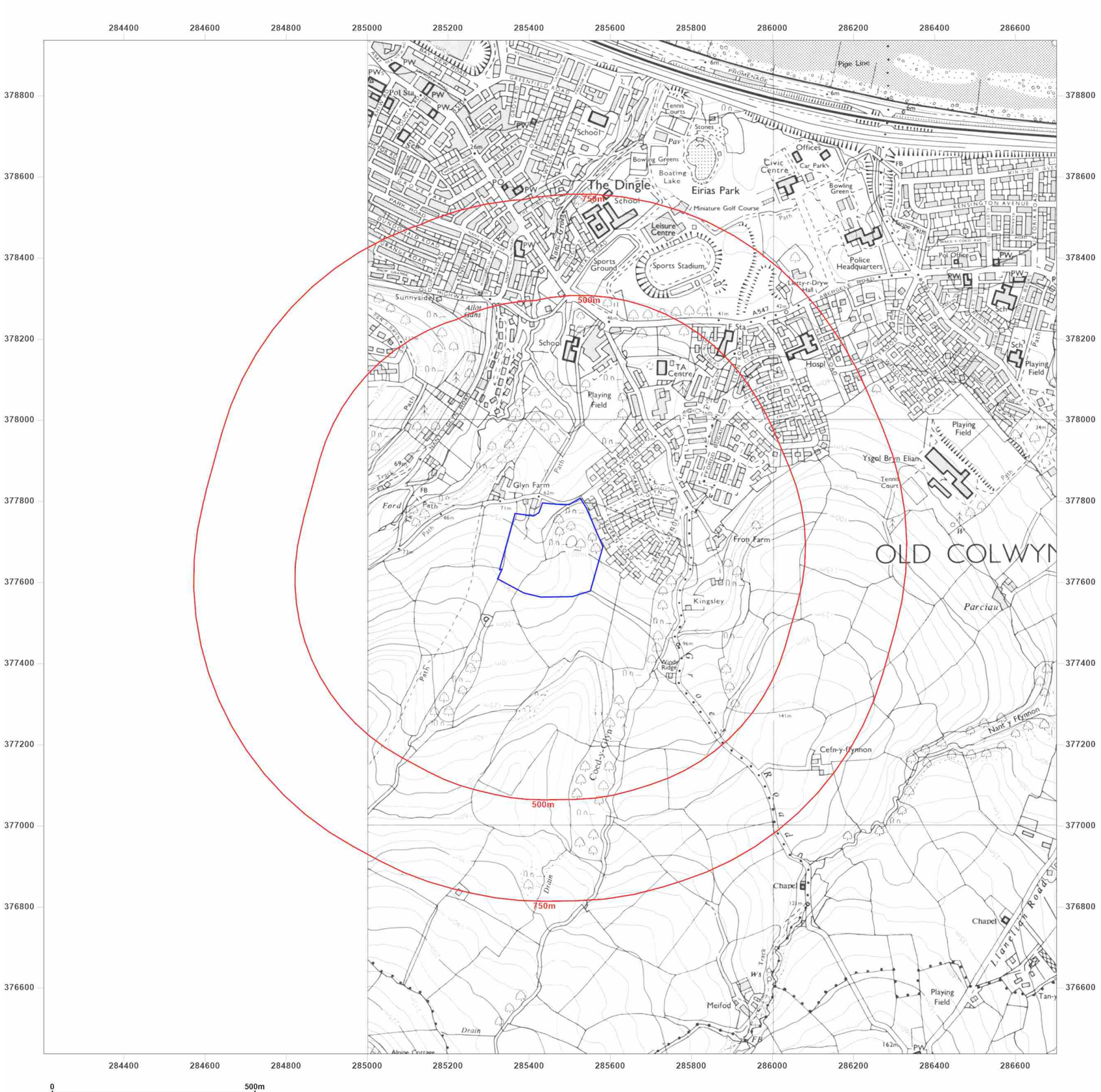
Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **1987**

Scale: 1:10,000

Printed at: 1:10,000

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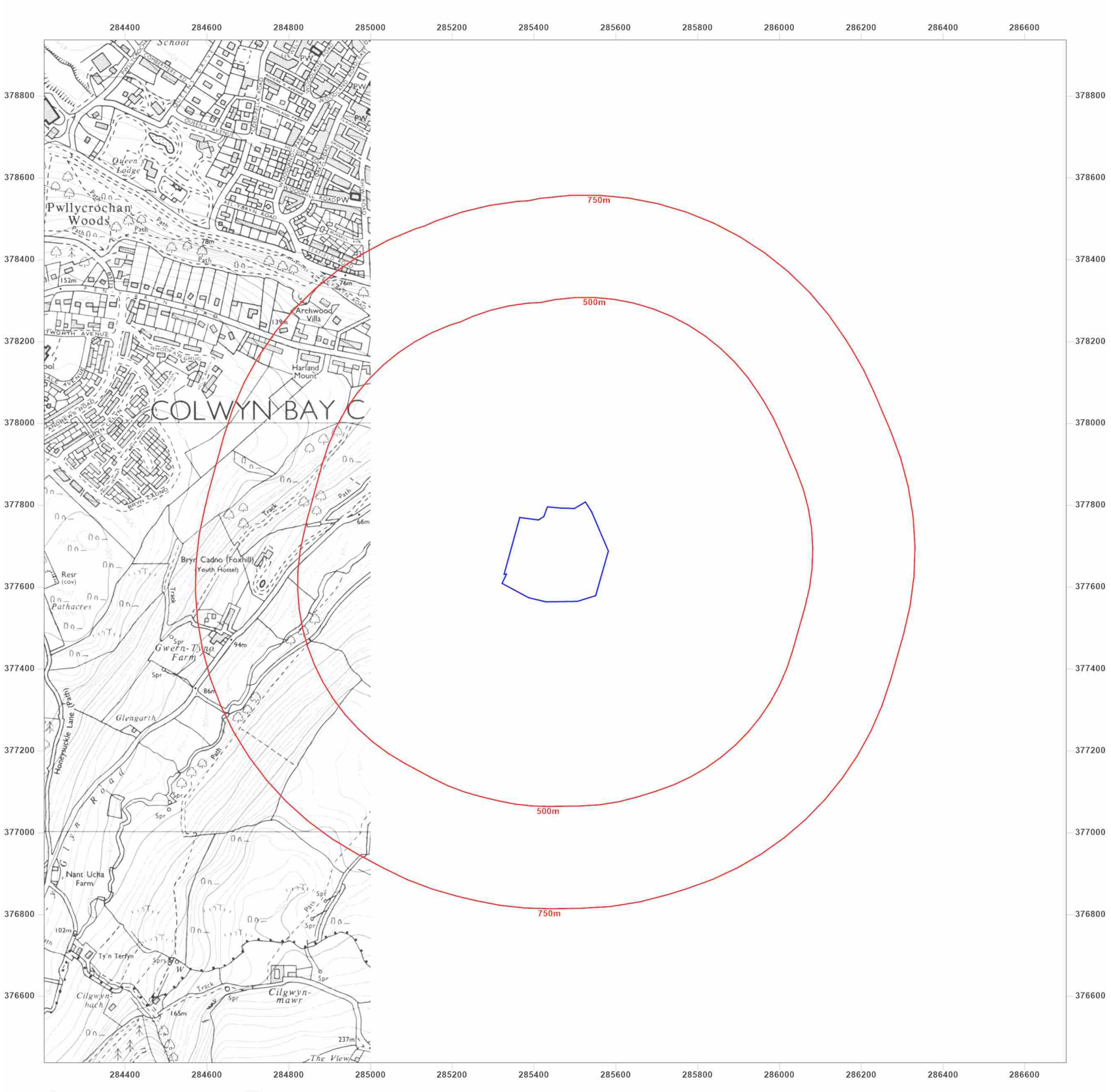
Surveyed 1987
Revised 1987
Edition N/A
Copyright N/A
Levelled N/A

Powered by

Produced by
Groundsure Insights
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 28 March 2022

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



Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **1993**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1987
Revised 1993
Edition N/A
Copyright N/A
Levelled N/A

Produced by
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E: info@groundsure.com
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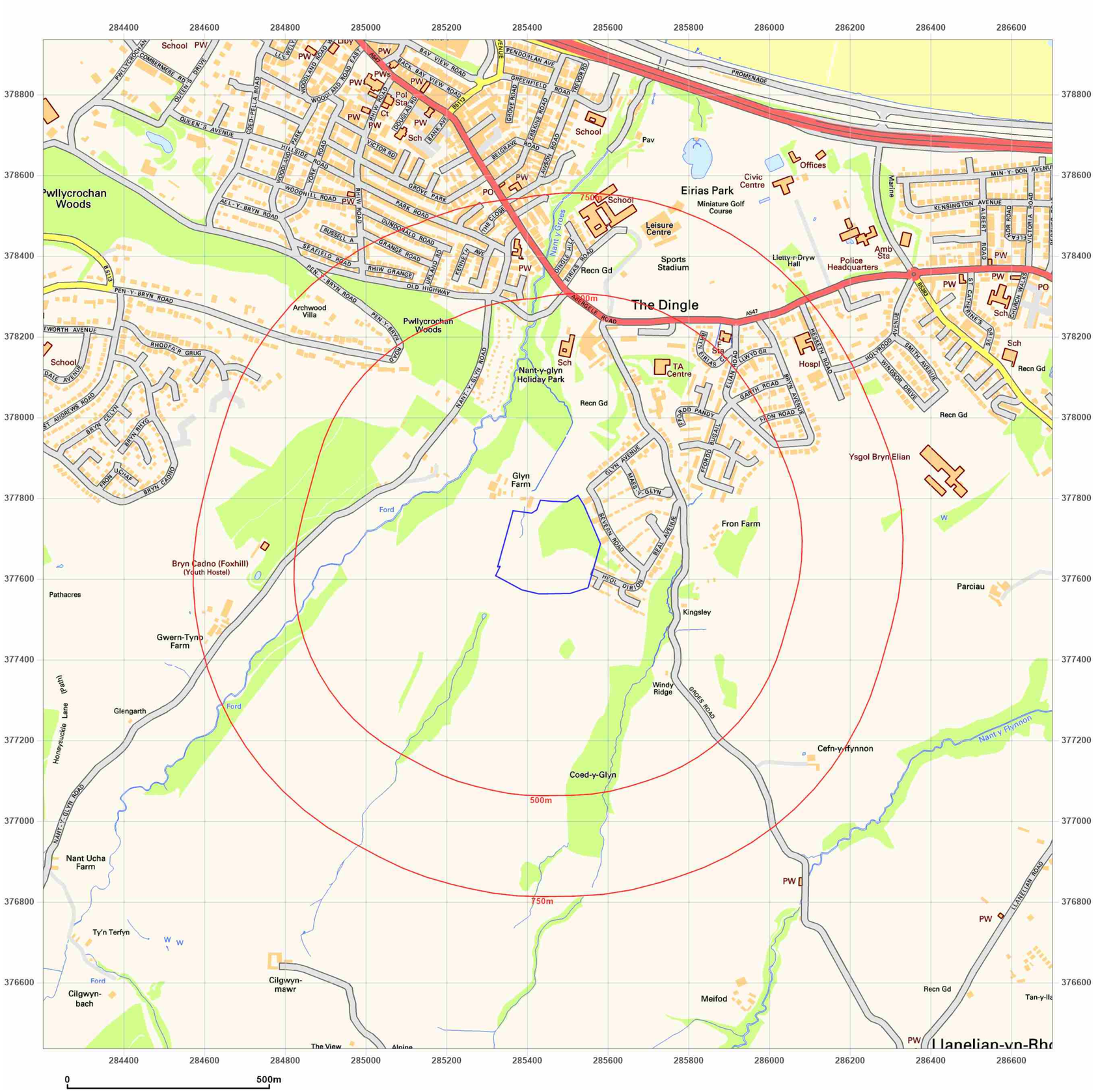
Production date: 28 March 2022

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



Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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2001

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Production date: 28 March 2022

Map legend available at:
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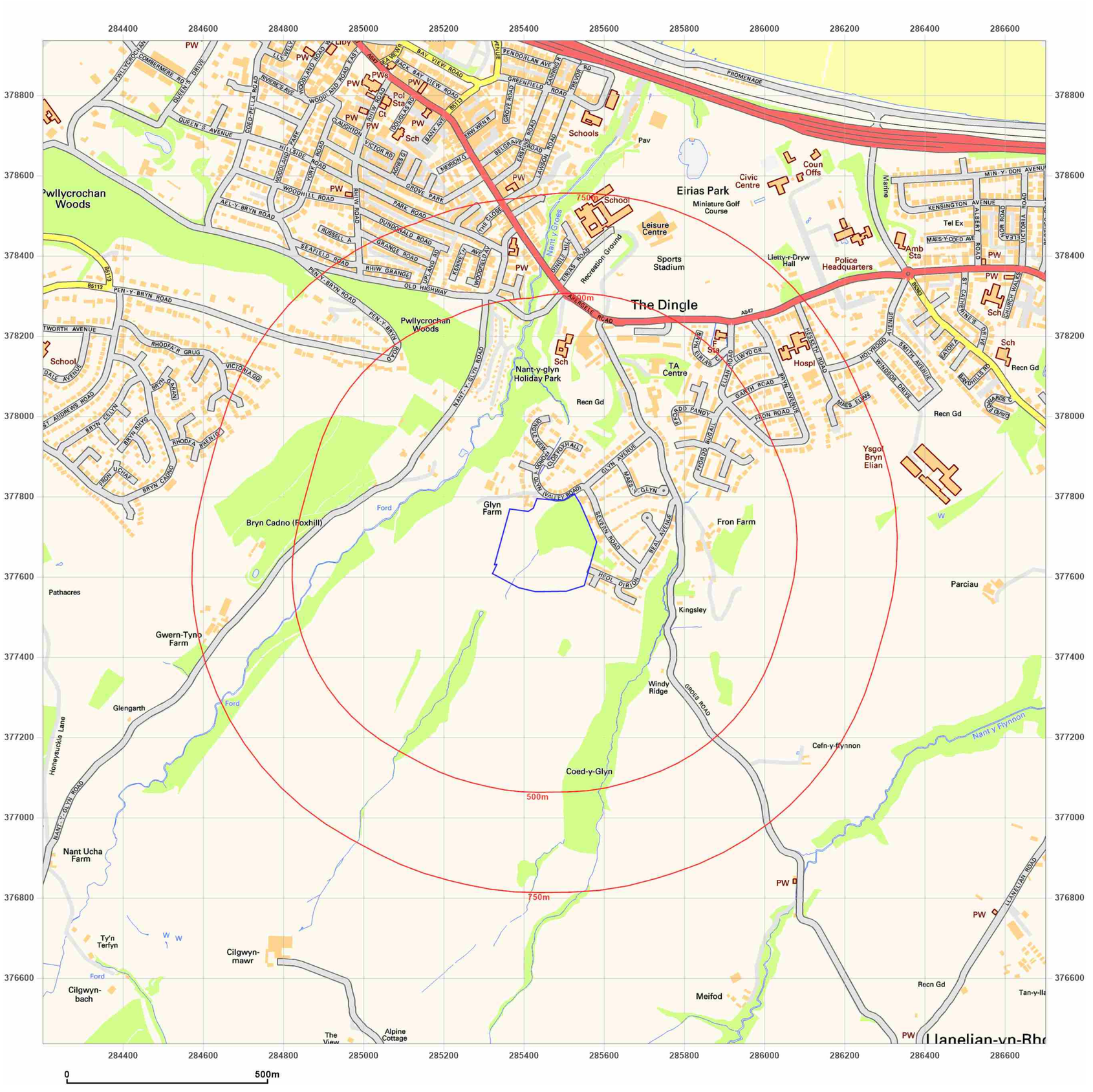

Groundsure INSIGHTS

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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2010

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Production date: 28 March 2022

Map legend available at:
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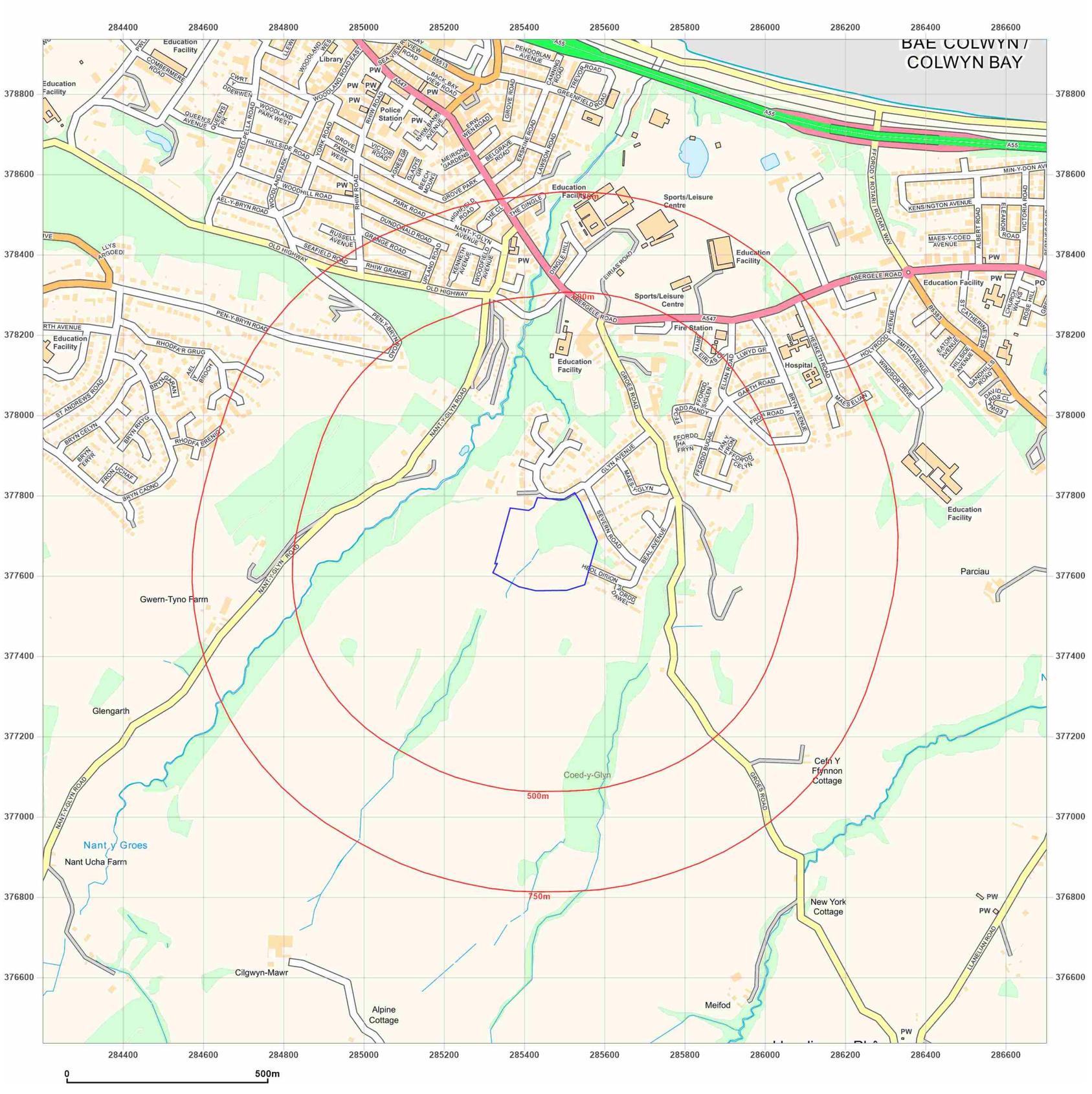

Site Details:

285504 377631

Client Ref: 06063
Report Ref: GS-8628158
Grid Ref: 285451, 377686

Map Name: National Grid

Map date: **2022**

Scale: 1:10,000

Printed at: 1:10,000

N
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2022

Powered by OS

Produced by
Groundsure Insights
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

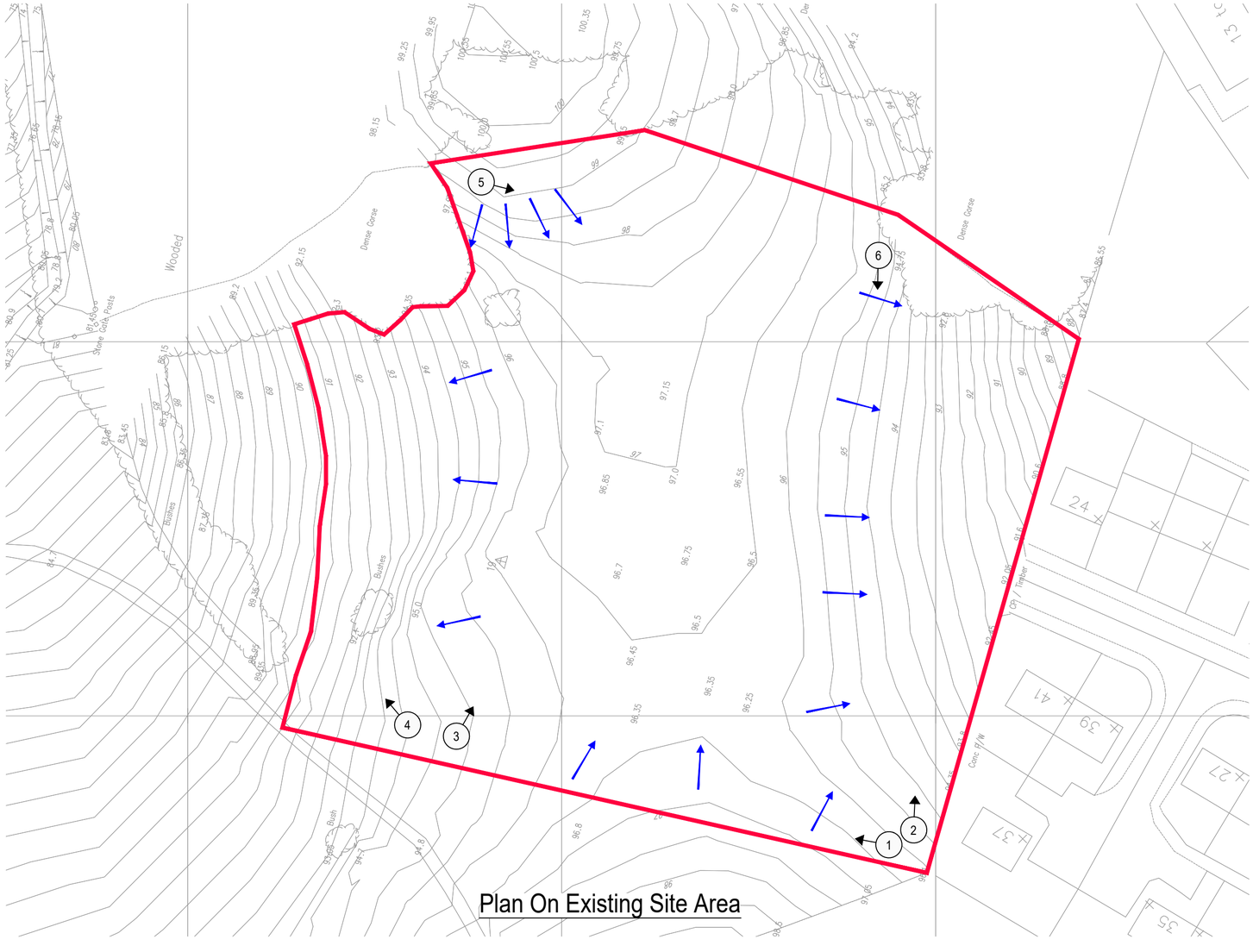
Production date: 28 March 2022

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

APPENDIX E

NOTE:

DO NOT SCALE OR CO-ORDINATE FROM THIS DRAWING
ALL CO-ORDINATES / GRID TO BE CONFIRMED BY SURVEYOR



Plan On Existing Site Area

Location Image

LEGEND:

- Approximate Site Boundary
- Indicates Slope Direction
- N — Indicates Photo Direction

DRG REFERENCES:

- Topographical Survey - Co Surveys Ltd 10647-1A (March 2022)

revision suffix	Revision Details	Date

smas worksafe consultant www.smasltd.com as recognised by SSIP SAFETY SCHEMES IN PROCUREMENT

Drawing Stage			Drawing Status			
	Draft		Comments	●	Tender
●	Issued		Information		Construction
	Preliminary		Approval		As Built

This drawing is not authorised unless signed as checked & approved

Client
Anwyl Construction Ltd

Job title
Glyn Farm Phase 2
Colwyn Bay

Drawing title
Walkover Survey

REFA
45 Bridgeman Terrace
Wigan, Lancs
WN1 1TT
Tel: –(01942) 826020
Fax: –(01942) 230816
CONSULTING ENGINEERS
CIVIL • STRUCTURAL
GEOTECHNICAL • ENVIRONMENTAL

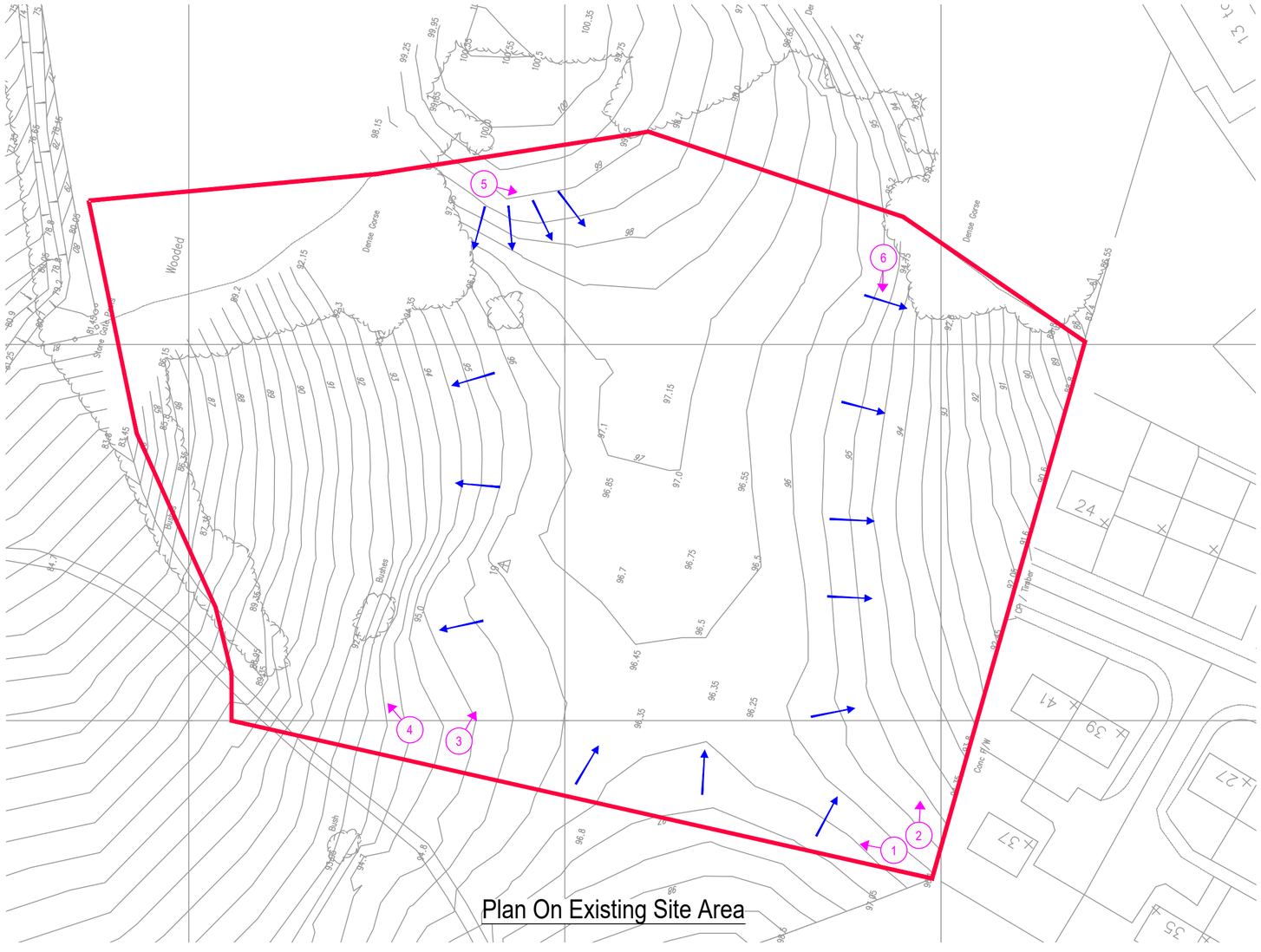
Chkd	Appvd	date	scale	drawn
		17.05.22	1:200 @ A2	MA

DRAWING No **06063/32** rev

Any discrepancies to this drawing discovered on site should be reported to REFA immediately. IF IN DOUBT ASK!

NOTE:

DO NOT SCALE OR CO-ORDINATE FROM THIS DRAWING
ALL CO-ORDINATES / GRID TO BE CONFIRMED BY SURVEYOR



Plan On Existing Site Area

Location Image

LEGEND:

- Approximate Site Boundary
- Indicates Slope Direction
- N — Indicates Photo Direction

DRG REFERENCES:

- Topographical Survey - Co Surveys Ltd 10647-1A (March 2022)

revision suffix	Revision Details	Date

smas worksafe consultant www.smasltd.com as recognised by SSIP SAFETY SCHEMES IN PROCUREMENT

Drawing Stage			Drawing Status		
	Draft		Comments	●	Tender
●	Issued		Information		Construction
	Preliminary		Approval		As Built

This drawing is not authorised unless signed as checked & approved

Client
Anwyl Construction Ltd

Job title
Glyn Farm Ph.2
Colwyn Bay

Drawing title
Photo Location Plan

REFA
45 Bridgeman Terrace
Wigan, Lancs
WN1 1TT
Tel:-(01942) 826020
Fax:-(01942) 230816
CONSULTING ENGINEERS
CIVIL • STRUCTURAL
GEOTECHNICAL • ENVIRONMENTAL

Chkd	Appvd	date	scale	drawn
		09.05.22	1:200 @ A2	MA

DRAWING No **06063/01** rev

Any discrepancies to this drawing discovered on site should be reported to REFA immediately. IF IN DOUBT ASK!

APPENDIX F

REFA

Photographs

Site: Glyn Farm, Hoel Dirion, Colwyn Bay

Client: Anwyl Homes

Report Number: 6063

Sheet: 1/1

Survey Date: 15.03.22

WALKOVER SURVEY PHOTOGRAPHS

1

2

3

4

5

6

APPENDIX G


Wooded
Stone Gate Posts
Bushes
Bush
Dense Gorse
2B4P
3B5P
2B4P
3B5P
3B5P
1B2P FLAT
2B4P
3B5P
3B5P
3B5P
3B5P
2B4P
Dense Gorse
Dense Gorse
Conc P/W
CP / Timber
P/W
37
39
41
35
27
29
24
13 to 29

APPENDIX H

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mail@refa.co.uk

Trial Pit Log

TrialPit No
TP401
Sheet 1 of 1

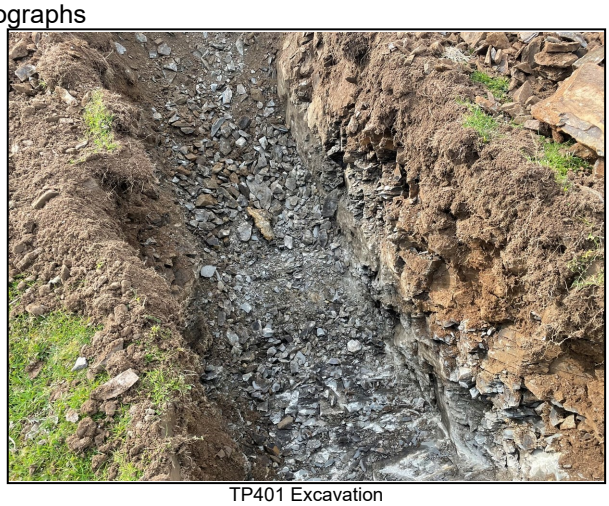
Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 1.30	2.80 / 0.80	Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.40			Friable greyish brown, slightly gravelly , slightly sandy silty CLAY with many rootlets (Topsoil)
				1.20			Dark grey, gravelly moderately weak to medium strong cobble size fragments (Highly weathered MUDSTONE bedrock)
				1.30			Medium strong, thinly laminated dark grey, slightly weathered MUDSTONE End of Pit at 1.30m

1
2
3

Trial Pit Photographs

TP401 Arisings



TP401 Excavation

Remarks: Unable to advance the hole further than 1.30m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Spalling from 0.40 to 1.30m

AGS

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Trial Pit Log

TrialPit No
TP402
Sheet 1 of 1

Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 1.10 (2.70 × 0.80)		Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20			Friable dark brown, slightly gravelly slightly sandy silty CLAY with many rootlets (Topsoil)
				0.80			Light grey and dark grey, slightly sandy fine to coarse moderately weak mudstone gravel size fragments with medium mudstone cobble size fragments (Highly weathered MUDSTONE bedrock)
				1.10			Medium Strong, thinly laminated dark grey moderately weathered MUDSTONE
							End of Pit at 1.10m

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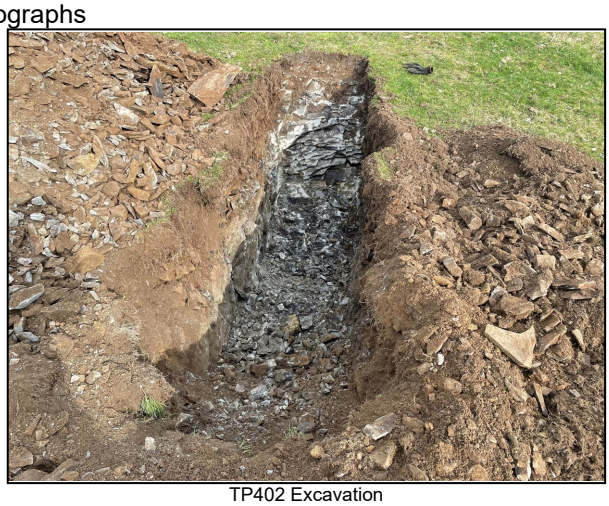
Trial Pit Photographs

TP402 Arisings



TP402 Excavation

Remarks: Unable to advance the hole further than 1.10m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Spalling from 0.20 to 0.90m

AGS

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Trial Pit Log

TrialPit No
TP403
Sheet 1 of 1

Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 1.55	2.80 / 0.80	Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.20			Friable dark brown, slightly gravelly slightly sandy silty CLAY with some rootlets (Topsoil)
							Light grey and dark grey, gravelly moderately weak mudstone cobble size fragments (Highly weathered MUDSTONE bedrock).
				1.50			Medium Strong, thinly laminated dark grey moderately weathered MUDSTONE
				1.55			End of Pit at 1.55m

1
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Trial Pit Photographs

TP403 Arisings

TP403 Excavation

Remarks: Unable to advance the hole further than 1.55m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Spalling from 0.20 to 1.50m

AGS

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Trial Pit Log

TrialPit No
TP404
Sheet 1 of 1

Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 1.50	2.50 / 0.80	Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.25	ES		0.35			Friable greyish brown, slightly gravelly, silty CLAY with some rootlets (Topsoil)
	0.40 - 0.60	D		0.60			Friable reddish brown slightly gravelly silty CLAY. Gravel is subangular to subrounded, fine to medium siltstone and mudstone.
	1.00	D		1.40			Dark grey, slightly sandy, fine to coarse moderately weak gravel size fragments. (Highly weathered MUDSTONE bedrock)
				1.50			Medium Strong, thinly laminated, dark grey, moderately weathered MUDSTONE
							End of Pit at 1.50m

1
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Trial Pit Photographs

TP204 Arisings

TP204 Excavation

Remarks: Unable to advance the hole further than 1.50m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Spalling from 0.60 to 1.40m

AGS

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mail@refa.co.uk

Trial Pit Log

TrialPit No
TP405
Sheet 1 of 1

Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 0.60	2.60 × 0.80	Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.30			Friable brown, slightly gravelly, slightly sandy silty CLAY with many rootlets (Topsoil)
				0.55			Dark grey, gravelly moderately weak mudstone cobble size fragments. (Highly weathered MUDSTONE bedrock)
				0.60			Medium strong, thinly laminated dark grey, slightly weathered MUDSTONE End of Pit at 0.60m

1
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Trial Pit Photographs

TP205 Excavation

TP405 Arisings

Remarks: Unable to advance the hole further than 0.60m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Spalling from 0.00 to 0.80m

AGS

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Trial Pit Log

TrialPit No
TP406
Sheet 1 of 1

Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 0.50	2.80 / 0.80	Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	D		0.45			Dark greyish brown, slightly gravelly, slightly sandy silty CLAY with many rootlets and medium mudstone cobble size fragments. (Topsoil)
				0.50			Medium Strong, thinly laminated, light grey slightly weathered MUDSTONE.
							End of Pit at 0.50m

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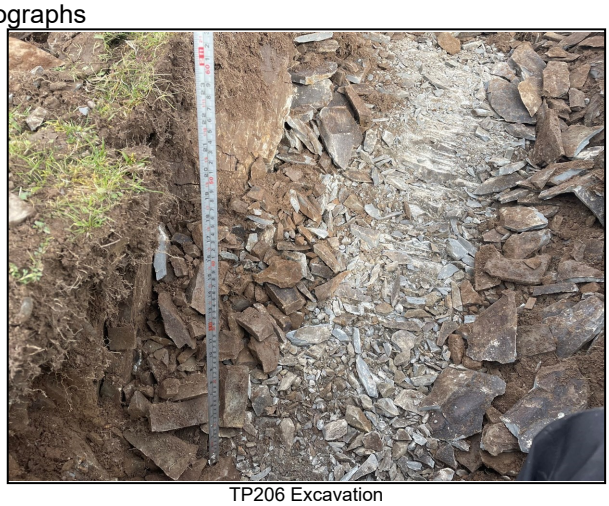
Trial Pit Photographs

TP206 Arisings



TP206 Excavation

Remarks: Unable to advance the hole further than 0.50m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Spalling from 0.00 to 0.80m

AGS

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mail@refa.co.uk

Trial Pit Log

TrialPit No
TP407
Sheet 1 of 1

Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 1.10	2.80 / 0.80	Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20			Friable greyish brown slightly gravelly silty CLAY with some rootlets (Topsoil)
				1.00			Dark grey and light grey, sandy fine to coarse very weak to moderately weak mudstone gravel size fragments. (Highly weathered MUDSTONE bedrock)
				1.10			Medium strong thinly laminated, dark grey moderately weathered MUDSTONE End of Pit at 1.10m

1
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Trial Pit Photographs

TP207 Arisings

TP407 Excavation

Remarks: Unable to advance the hole further than 1.10m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Spalling from 0.20 to 1.00m

AGS

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Trial Pit Log

TrialPit No
TP408
Sheet 1 of 1

Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 0.35	2.70 × 0.80	Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES					Greyish brown, slightly gravelly, slightly sandy, silty CLAY with many rootlets and medium cobble size fragments of mudstone. (Topsoil)
	0.35	D		0.30 0.35			Medium strong, thinly laminated, slightly weathered MUDSTONE End of Pit at 0.35m

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Trial Pit Photographs

TP408 Arisings

TP408 Excavation

Remarks: Unable to advance the hole further than 0.35m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Slight spalling from 0.00 to 0.35m

AGS

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Trial Pit Log

TrialPit No
TP409
Sheet 1 of 1

Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 1.20	2.50 / 0.80	Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	D		0.35			Friable greyish brown slightly gravelly silty CLAY with some rootlets (Topsoil)
	0.80	D		0.90			Firm reddish brown and occasional light grey mottled , slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse siltstone and mudstone.
				1.10			Friable stiff, light grey, gravelly silty CLAY . Gravel size fragments are fine to coarse moderately weak mudstone (Completely weathered mudstone bedrock)
				1.20			Medium strong thinly laminated, dark grey moderately weathered MUDSTONE
							End of Pit at 1.20m

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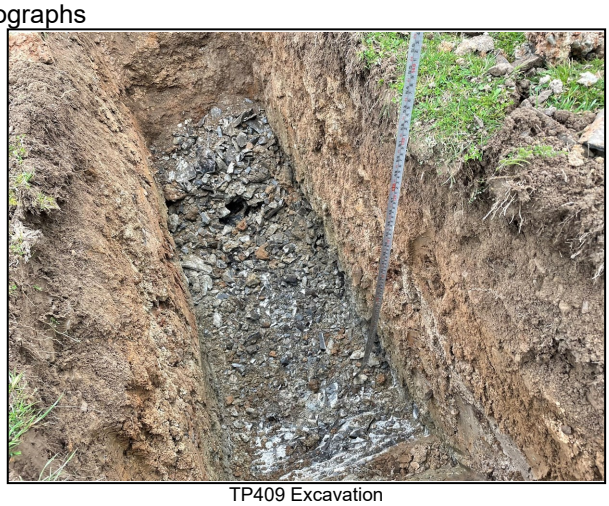
Trial Pit Photographs

TP409 Arisings



TP409 Excavation

Remarks: Unable to advance the hole further than 1.20m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Vertical and Stable

AGS

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Trial Pit Log

TrialPit No
TP410
Sheet 1 of 1

Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 0.90	2.70 / 0.80	Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	ES		0.35			Friable greyish brown slightly gravelly silty CLAY with some rootlets (Topsoil)
	0.75	D		0.85			Light grey and dark grey mottled, sandy slightly clayey moderately weak mudstone gravel size fragments (Highly weathered MUDSTONE bedrock)
				0.90			Medium strong thinly laminated, dark grey moderately weathered MUDSTONE End of Pit at 0.90m

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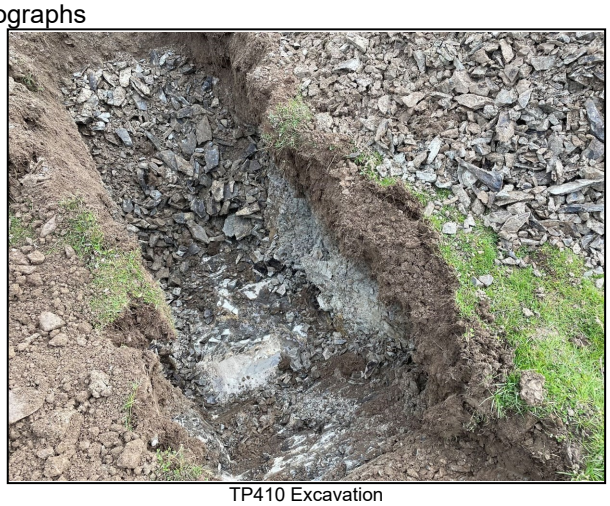
Trial Pit Photographs

TP410 Arisings



TP410 Excavation

Remarks: Unable to advance the hole further than 0.90m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Slight spalling from 0.35 to 0.75m

AGS

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45 Bridgeman Terrace, Wigan,
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Trial Pit Log

TrialPit No
TP411
Sheet 1 of 1

Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 0.85 (2.80 × 0.80)		Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.40			Friable greyish and dark brown mottled, gravelly silty CLAY with some rootlets (Topsoil)
	0.60	D		0.80			Firm to stiff, brown and occasional orange and light grey mottled, slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to medium, quartz and siltstone
				0.85			Medium strong thinly laminated, dark grey moderately weathered MUDSTONE End of Pit at 0.85m

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Trial Pit Photographs

TP411 Arisings

TP411 Excavation

Remarks: Unable to advance the hole further than 0.85m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Vertical and stable

AGS

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Trial Pit Log

TrialPit No
TP412
Sheet 1 of 1

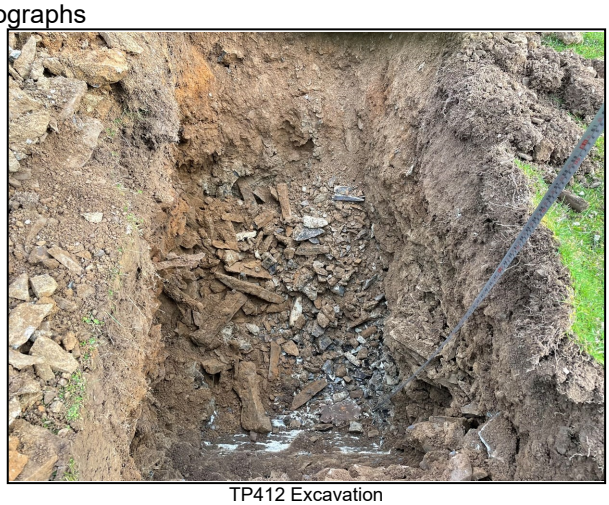
Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 1.30	2.00 × 0.80	Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.25	D		0.25			Friable stiff, dark brown, slightly gravelly, slightly sandy silty CLAY with many rootlets (Topsoil).
	0.75	D		1.10			Greyish brown, gravelly silty CLAY with high mudstone cobble size fragments. Gravel size fragments are fine to coarse moderately weak mudstone. (Completely weathered mudstone bedrock)
				1.30			Medium strong thinly laminated, dark grey highly weathered MUDSTONE
							End of Pit at 1.30m

1
2
3

Trial Pit Photographs

TP412 Arisings



TP412 Excavation

Remarks: Unable to advance the hole further than 1.30m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Spalling from 0.25 to 1.10m

AGS

Robert E. Fry & Associates,
45 Bridgeman Terrace, Wigan,
WN1 1TT
(01942) 826 020
mail@refa.co.uk

Trial Pit Log

TrialPit No
TP413
Sheet 1 of 1

Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 2.80	5.50 / 0.80	Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			Friable dark grey, slightly gravelly slightly sandy silty CLAY with some rootlets (Topsoil)
				1.00			Friable brown, slightly gravelly, slightly sandy silty CLAY. Gravel is subangular to subrounded fine to medium mudstone.
				2.70			Friable stiff, light grey, slightly gravelly slightly sandy silty CLAY with low mudstone cobble size fragments. Gravel size fragments are fine to coarse very weak mudstone (Completely weathered mudstone bedrock)
				2.80			Medium strong, thinly laminated, dark grey moderately weathered MUDSTONE.
							End of Pit at 2.80m

1
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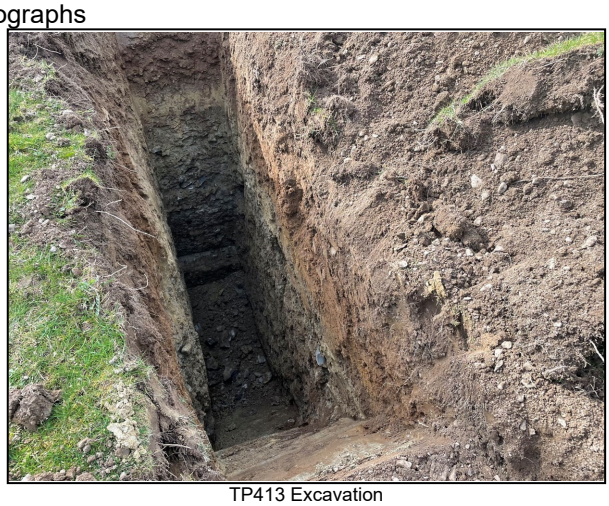
3

Trial Pit Photographs

TP413 Arisings



TP413 Excavation

Remarks: Unable to advance the hole further than 2.80m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Vertical and Stable

AGS

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Trial Pit Log

TrialPit No
TP414
Sheet 1 of 1

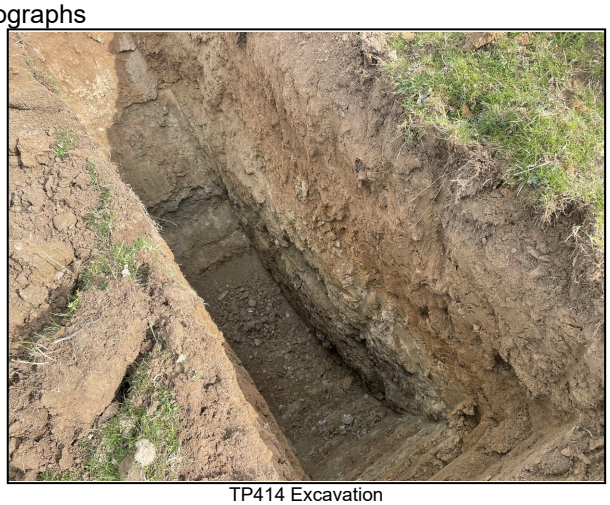
Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 2.70	3.00 × 0.80	Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Friable, dark brown, slightly gravelly, slightly sandy silty CLAY with some rootlets (Topsoil)
				0.35			Friable brown, slightly gravelly, slightly sandy silty CLAY. Gravel is subangular to subrounded fine to medium siltstone
				1.20			Friable firm to stiff slightly gravelly slightly sandy silty CLAY with low mudstone cobble size fragments. Gravel size fragments are fine to coarse extremely weak mudstone (Completely Weathered Sandstone Bedrock)
				2.65			Medium Strong , thinly laminated light grey moderately weathered bedrock.
				2.70			End of Pit at 2.70m

1
2
3

Trial Pit Photographs

TP214 Arisings



TP414 Excavation

Remarks: Unable to advance the hole further than 2.70m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Vertical and Stable

AGS

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Trial Pit Log

TrialPit No
TP415
Sheet 1 of 1

Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 3.00	3.00 / 0.80	Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.35			Friable dark brown, slightly gravelly slightly sandy silty CLAY with some rootlets (Topsoil)
							Friable brown, slightly gravelly slightly sandy silty CLAY with low mudstone cobble size fragments. Gravel size fragments are fine to coarse, very weak mudstone.. (Completely weathered bedrock)
				3.00			End of Pit at 3.00m

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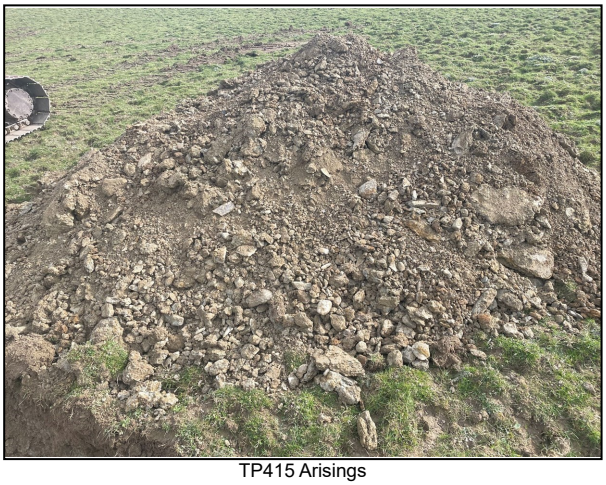
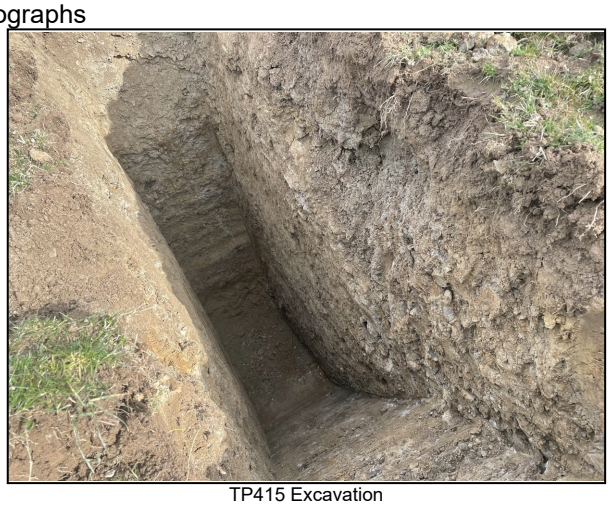
Trial Pit Photographs



TP415 Arisings



TP415 Excavation

Remarks: Trial pit completed at 3.00m. No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Vertical and Stable

AGS

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Trial Pit Log

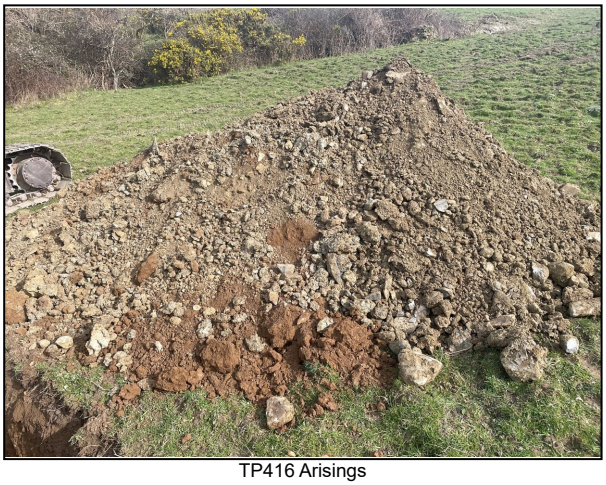
TrialPit No
TP416
Sheet 1 of 1

Project Name:	Glyn Farm (Phase 2), Colwyn Bay	Project No. 06063	Co-ords: - Level:	Date 15/03/2022
Location:	Glyn Farm, Colwyn Bay	Dimensions (m): Depth 3.20	3.00 × 0.80	Scale 1:25
Client:	Anwyl Construction Ltd			Logged SCB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			Greyish brown, slightly gravelly slightly sandy silty clay with some rootlets (Topsoil)
				1.10			Friable firm, slightly gravelly, slightly sandy silty CLAY. Gravel is subangular to subrounded fine to medium quartz and mudstone
				3.20			Friable stiff, light grey, slightly gravelly, slightly sandy silty CLAY with low mudstone cobble size fragments. Gravel size fragments are fine to coarse, very weak mudstone (Completely weathered mudstone bedrock).
							End of Pit at 3.20m

1
2
3

Trial Pit Photographs



TP416 Arisings

TP416 Excavation

Remarks: No groundwater encountered. On completion trial pit was backfilled with arisings.

Stability: Vertical and stable

AGS

APPENDIX I

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

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Robert E Fry & Associates Ltd
45 Bridgeman Terrace
Wigan
WN1 1TT

Attention :	Stephen Boot
Date :	28th March, 2022
Your reference :	06063
Our reference :	Test Report 22/4589 Batch 1
Location :	Glynn Farm
Date samples received :	21st March, 2022
Status :	Final Report
Issue :	1

Seven samples were received for analysis on 21st March, 2022 of which seven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Phil Sommerton BSc
Senior Project Manager

Element Materials Technology

Client Name: Robert E Fry & Associates Ltd
Reference: 06063
Location: Glynn Farm
Contact: Stephen Boot
EMT Job No: 22/4589

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1	2	3	4	5	6	7				LOD/LOR	Units	Method No.
Sample ID	TP01	TP03	TP04	TP05	TP07	TP10	TP11						
Depth	0.20	0.15	0.25	0.20	0.10	0.30	0.20						
COC No / misc													
Containers	J	J	J	J	J	J	J						
Sample Date	15/03/2022	15/03/2022	15/03/2022	15/03/2022	15/03/2022	15/03/2022	15/03/2022						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022						
Arsenic #	12.1	11.2	11.1	11.6	11.2	9.0	11.2				<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM30/PM15
Chromium #	44.0	50.6	66.5	49.8	64.9	50.6	56.3				<0.5	mg/kg	TM30/PM15
Copper #	22	23	25	26	25	26	28				<1	mg/kg	TM30/PM15
Lead #	27	15	26	19	24	19	24				<5	mg/kg	TM30/PM15
Mercury #	0.2	0.1	0.1	0.1	0.2	0.1	0.2				<0.1	mg/kg	TM30/PM15
Nickel #	34.4	40.4	35.1	35.1	33.8	35.4	37.0				<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1	<1	<1	<1				<1	mg/kg	TM30/PM15
Zinc #	80	72	80	82	85	86	95				<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				<0.03	mg/kg	TM4/PM8
Pyrene #	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06				<0.06	mg/kg	TM4/PM8
Chrysene #	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07				<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6				<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	86	80	84	72	86	85	83				<0	%	TM4/PM8
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15				<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	26.6	12.0	15.8	14.9	18.8	18.4	17.7				<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	21.0	10.7	13.6	13.0	15.8	15.5	15.0				<0.1	%	PM4/PM0
Sulphate as SO4 (2:1 Ext) #	0.0100	0.0053	0.0020	0.0138	0.0103	0.0074	0.0054				<0.0015	g/l	TM38/PM20
Total Cyanide #	<5.0 AB	<1.5 AA	<1.5 AA	<1.5 AA	<1.5 AA	<1.5 AA	<1.5 AA				<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	3.16	1.38	1.63	1.82	2.35	1.23	1.22				<0.02	%	TM21/PM24
Sulphide	<10	<10	<10	<10	<10	<10	<10				<10	mg/kg	TM107/PM45

Element Materials Technology

Client Name: Robert E Fry & Associates Ltd
Reference: 06063
Location: Glynn Farm
Contact: Stephen Boot
EMT Job No: 22/4589

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1	2	3	4	5	6	7				LOD/LOR	Units	Method No.
Sample ID	TP01	TP03	TP04	TP05	TP07	TP10	TP11						
Depth	0.20	0.15	0.25	0.20	0.10	0.30	0.20						
COC No / misc													
Containers	J	J	J	J	J	J	J						
Sample Date	15/03/2022	15/03/2022	15/03/2022	15/03/2022	15/03/2022	15/03/2022	15/03/2022						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022						
pH #	6.11	7.08	6.60	6.81	5.77	6.02	6.60				<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Robert E Fry & Associates Ltd
Reference: 06063
Location: Glynn Farm
Contact: Stephen Boot

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 22/4589						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/4589

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x3 Dilution
AB	x10 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 22/4589

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes

APPENDIX J

TD Construction Testing Ltd
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8011

TEST REPORT

Determination of Liquid and Plastic Limits

Client: Robert E.Fry Associates
Client Address: 45 Bridgeman Terrace, Wigan, WN1 1TT

Site: 06063 - Glynn Farm
Supplier/Source*: Client / Site Won
Test Method: 1 Point

Report No: TD22-R-03-A-01
Date Reported: 31/03/2022
Sampled By: Client
Date Sampled*: 18/03/2022
Date Received: 18/03/2022
Date Tested: 30/03/2022

Site Reference*	Lab Reference	Sample Location*	Sample Description	Sample Type	Sample Prep.	% Ret. 425µm sieve	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index %
TP04	Lab 22/643	TP04 0.40m - 0.60m	Brown Sandy Clay with Gravel & Organics	B	A	62	14	55	41	14

Sample Type: **D** = Disturbed, **B** = Bulk, **U** = Undisturbed *Sample Prep:* **N** = tested in natural condition, **A** = air dried before test, **W** = subject to wet sieving before test *Result:* **NP** = Non-plastic

Testing was carried out in accordance with BS 1377-2:1990 Methods 3.0, 4.4 and 5.3

Where sampling was not carried out by TD Construction Testing Ltd, the results relate to the sample as received.

Results relate only to the sample tested.

* Information supplied by client.

Comments/Deviations:

Signed:	[ ] T. Robinson (Technical Manager/Director)
	[ ] D. Ames (Laboratory Manager/Director)
	[X] J. Hopkinson (Laboratory Section Manager)

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TEST REPORT

Determination of Liquid and Plastic Limits

Client: Robert E.Fry Associates
Client Address: 45 Bridgeman Terrace, Wigan, WN1 1TT

Site: 06063 - Glynn Farm
Supplier/Source*: Client / Site Won
Test Method: 1 Point

Report No: TD22-R-03-A-02
Date Reported: 31/03/2022
Sampled By: Client
Date Sampled*: 18/03/2022
Date Received: 18/03/2022
Date Tested: 29/03/2022

Site Reference*	Lab Reference	Sample Location*	Sample Description	Sample Type	Sample Prep.	% Ret. 425µm sieve	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index %
TP09	Lab 22/644	TP09 0.80m	Brown/Grey Mottled Clay with Sand & Gravel	B	A	16	20	46	18	28

Sample Type: **D** = Disturbed, **B** = Bulk, **U** = Undisturbed *Sample Prep:* **N** = tested in natural condition, **A** = air dried before test, **W** = subject to wet sieving before test *Result:* **NP** = Non-plastic

Testing was carried out in accordance with BS 1377-2:1990 Methods 3.0, 4.4 and 5.3

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TEST REPORT

Determination of Liquid and Plastic Limits

Client:	Robert E.Fry Associates	Report No:	TD22-R-03-A-03
Client Address:	45 Bridgeman Terrace, Wigan, WN1 1TT	Date Reported:	31/03/2022
		Sampled By:	Client
Site:	06063 - Glynn Farm	Date Sampled*:	18/03/2022
Supplier/Source*:	Client / Site Won	Date Received:	18/03/2022
Test Method:	1 Point	Date Tested:	29/03/2022

Site Reference*	Lab Reference	Sample Location*	Sample Description	Sample Type	Sample Prep.	% Ret. 425µm sieve	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index %
TP11	Lab 22/645	TP11 0.6m	Brown/Orange Mottled Silty Clay with Gravel	B	A	22	18	34	15	19

Sample Type: **D** = Disturbed, **B** = Bulk, **U** = Undisturbed *Sample Prep:* **N** = tested in natural condition, **A** = air dried before test, **W** = subject to wet sieving before test *Result:* **NP** = Non-plastic

Testing was carried out in accordance with BS 1377-2:1990 Methods 3.0, 4.4 and 5.3

Where sampling was not carried out by TD Construction Testing Ltd, the results relate to the sample as received.

Results relate only to the sample tested.

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UKAS TESTING
8011

TEST REPORT

CONSTRUCTION TESTING

Determination of Liquid and Plastic Limits

Client:	Robert E.Fry Associates	Report No:	TD22-R-03-A-04
Client Address:	45 Bridgeman Terrace, Wigan, WN1 1TT	Date Reported:	31/03/2022
		Sampled By:	Client
Site:	06063 - Glynn Farm	Date Sampled*:	18/03/2022
Supplier/Source*:	Client / Site Won	Date Received:	18/03/2022
Test Method:	1 Point	Date Tested:	30/03/2022

Site Reference*	Lab Reference	Sample Location*	Sample Description	Sample Type	Sample Prep.	% Ret. 425µm sieve	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index %
TP12	Lab 22/646	TP12 0.75m	Brown very Gravelly Sandy Silty Topsoil	B	A	63	14	44	29	15

Sample Type: **D** = Disturbed, **B** = Bulk, **U** = Undisturbed *Sample Prep:* **N** = tested in natural condition, **A** = air dried before test, **W** = subject to wet sieving before test *Result:* **NP** = Non-plastic

Testing was carried out in accordance with BS 1377-2:1990 Methods 3.0, 4.4 and 5.3

Where sampling was not carried out by TD Construction Testing Ltd, the results relate to the sample as received.

Results relate only to the sample tested.

* Information supplied by client.

Comments/Deviations:

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