Lewis Homes (South Wales) Limited

LAND AT SANDY LANE, YSTRADOWEN

Site Investigation Report

12604/JJ/20/SI Rev B

Intégral
Géotechnique

CLIENT: **Lewis Homes (South Wales) Limited**

PROJECT: **Land at Sandy Lane, Ystradowen**

TITLE: **Site Investigation Report**

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1.0 INTRODUCTION

1.1 GENERAL

Lewis Homes (South Wales) Limited are proposing to develop a site at Sandy Lane in Ystradowen for residential end-use.

Intégral Géotechnique (Wales) Limited have been appointed as the Geotechnical Engineers to undertake an intrusive site investigation to enable a geotechnical and geoenvironmental appraisal of the site and provide a basis for design.

This report presents the findings of the intrusive site investigation and gives recommendations for the design of foundations, floor slabs and other geotechnical and geoenvironmental aspects of the project.

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1.2 PROPOSED DEVELOPMENT

The proposed development will comprise the construction of forty-five residential units, including associated infrastructure such as access roads, car parking areas and private driveways and also areas of landscaping and private gardens.

1.3 SCOPE OF WORKS

The work instructed included a desk study of available information, site reconnaissance and intrusive investigation. This was followed by laboratory testing and geotechnical and geoenvironmental reporting.

The desk study comprised a review of:

- An Envirocheck Report obtained for the site
- Old Ordnance Survey maps covering the site, included within the Envirocheck Report
- A Radon Report obtained from the British Geological Survey (BGS)

1.3 SCOPE OF WORKS (CONTINUED)

- Geological maps of the area provided by the BGS
- the Environment Agency/Natural Resources Wales groundwater vulnerability map and aquifer database for the area.

The desk study information was used to make an initial assessment of the site and to design an intrusive site investigation to be carried out by Intégral Géotechnique. The intrusive site investigation was designed in accordance with BS5930+A2:2010, the Code of Practice for Site Investigations, BS10175:2011, the code of practice for investigation of potentially contaminated sites, and 'Development of Land Affected by Contamination: A Guide for Developers' prepared by Welsh Local Government Association (WLGA)/Natural Resources Wales (NRW) Land Contamination Working Group, 2017.

The intrusive site investigation comprised:

- 18No machine excavated trial pits and 6No windowless sample boreholes
- Soil infiltration testing within 6No trial pits
- Sampling of soil for laboratory chemical and geotechnical testing.

1.4 LIMITATIONS

This document is intended to be a working document for further development in discussion with all concerned including the Local Planning Authority, Natural Resources Wales, and the NHBC as appropriate.

"Contamination" is taken throughout the report to mean the "presence of one or more potentially harmful substances as a result of human activity". The use of the term in this way does not imply that harm is being or might be caused by the contamination. It should be noted that "contamination" can have different meanings under different regulatory regimes, for example, planning, building control and Part IIA of the Environmental Protection Act 1990. Naturally elevated concentrations of potentially harmful substances may also be of concern and the significance of any that have been found is also evaluated in this report.

It is important to recognise that there may be areas of contamination that have not been found, or that contaminants are present at concentrations above those that have been found. It is also important to recognise that contamination may be localised and that no investigation, however comprehensive, is capable of finding such occurrences other than by chance.

1.4 LIMITATIONS (CONTINUED)

It should also be noted that vertical and lateral changes in ground conditions may be present between exploratory hole locations.

It should be noted that the ground surface in the northern half of the site was soft and waterlogged at the time of the intrusive site investigation works and could not be fully investigated by a wheeled excavator. Consequently, additional site investigation works were subsequently carried out by using a tracked excavator.

2.0 THE SITE

2.1 SITE LOCATION AND DESCRIPTION

The site is located off Sandy Lane in the village of Ystradowen approximately 3.8km northeast of Cowbridge at a National Grid Reference of 301560, 177850, see Figure 1.

The site is irregular in shape and occupies an area of approximately 1.6 hectares. The boundaries of the site are defined by Sandy Lane to the southeast, existing properties off Sandy Lane and Badgers Brook Close to the southwest and west, and undeveloped fields to the north and northeast. A site plan is presented in Figure 2.

The site is situated on sloping ground which falls to the north from an approximate maximum elevation of 68m AOD at the entrance gateway off Sandy Lane dropping some 11m in elevation to approximately 57m AOD within the northern corner of the site.

At the time of the site investigation works the site was covered by hummocky grass vegetation. Much of the northern half of the site was notably waterlogged/boggy. Mature trees and hedgerows were present along the northern, western and eastern site boundaries. A hedgerow was present along the southern site boundary forming the site boundary with Sandy Lane.

Although no invasive plant species were observed at the time of the site investigation works, a full vegetation survey should be carried out.

2.2 SITE OPERATIONS

The site is currently undeveloped and utilised for grazing cattle.

2.3 SURROUNDING LAND USE

The surrounding areas are utilised for a combination of residential and agricultural use. Existing established residential developments are located to the south and west and with undeveloped fields to the north and east.

2.4 AVAILABLE SITE INVESTIGATION DATA

There is no available site investigation data to our knowledge.

2.5 CONSULTATIONS WITH REGULATORS

The regulators have not been contacted at this stage.

3.0 SITE HISTORY

The recent history of the site has been traced with the aid of an Envirocheck Report, a copy of which is included in Appendix A. The Envirocheck Report includes the following scaled historical maps:

Map Scale	Dates
1:2,500	1877, 1899, 1919, 1972, 1987, 1989, 1993, 2000(aerial photo)
1:10,560	1885, 1900, 1921, 1947-1952, 1947(aerial photo)
1:10,000	1964, 1974, 1999, 2006, 2019

The earliest edition of the map dated 1877 indicated the site and the surrounding areas to be undeveloped fields. An existing road formed the south eastern boundary of the site. The site was indicated to be the site of a supposed early medieval battle in A.D. 1032. The nearest development at this time was Ffos-y-gwtter located on the opposite side of the road to the southeast of the site. The Cowbridge Branch of the Taff Vale Railway ran within a cutting on a northeast to southwest orientation, approximately 80m to the southeast of the site.

The site remained relatively unchanged and undeveloped over the subsequent years. There was little change to the site or the surrounding area until the edition of the map dated 1972. By this time a new residential development known at St Owains Crescent had been constructed approximately 50m to the southwest of the site. Further residential development had also taken place along the main road, known as Cowbridge Road, which passed through the village. The railway line to the southeast of the site was now indicated to have been dismantled. The site itself remained undeveloped.

Throughout the 1980's and the 1990's residential development continued within Ystradowen to the west. By the edition of the map dated 2000 residential development was indicated up to the western and south western boundaries of the site. By 2016 a new development had been constructed on the opposite side of Sandy Lane to the south of the site.

The site and the area to the north and northeast remained undeveloped up until the present day.

4.0 SITE ENVIRONMENTAL SETTING

4.1 PHYSICAL SETTING

The site is located within the established village of Ystradowen. The site lies on sloping ground which falls to the north from an approximate maximum elevation of 68m AOD at the entrance gateway off Sandy Lane dropping some 11m in elevation to approximately 57m AOD within the northern corner of the site.

4.2 GEOLOGY

The 1:50,000 scale geological map of the area indicates the site to be underlain by Blue Lias Formation (marginal facies) of the Jurassic period. These rocks typically comprise thinly interbedded limestones and calcareous mudstones.

Superficial Devensian Till deposits of the Quaternary period are indicated to overlie the solid strata. These deposits are generally poorly sorted and variable in nature and comprise clays, sands and gravel.

The geological boundary of superficial Head deposits, also of the Quaternary period, are indicated to encroach across the northwest boundary of the site. These deposits are very similar in nature to the Devensian Till deposits.

It should also be noted that superficial Glaciolacustrine deposits are indicated just to the north of the site boundary and there is a possibility that these deposits may underlie parts of the site. Glaciolacustrine deposits were laid down in glacial lakes and typically comprise laminated silt and clay and are often rich in organic matter and can be locally interbedded with peat.

Due to the site being historically undeveloped, a significant thickness of made ground is not anticipated above the superficial deposits across the site. Localised areas particularly on field boundaries or in gateways should not be completely ruled out.

The Envirocheck Report does not indicate any natural cavities on site or within 1km of the site boundary. The potential for ground dissolution stability hazards on site is classified as very low to low by the British Geological Survey.

A summary of the anticipated geological succession is given below in Table 1.

4.2 GEOLOGY (CONTINUED)

Table 1: Summary of Anticipated Site Geology		
Geological unit	**Horizon**	**Description**
Recent	Topsoil/subsoil	Various materials
Quaternary	Devensian Till (possible localised head deposits and glaciolacustrine deposits)	Poorly sorted and variable in nature and comprise clays, sands and gravel (possible locally laminated silt and clay, organic rich, interbedded with peat)
Jurassic	Blue Lias Formation (marginal facies)	Thinly interbedded limestones and calcareous mudstones

4.3 RADON

Information with regard to Radon Protective Measures is provided on the Landmark Radon Information Map as presented in Appendix B. The updated map based on current data indicates that the site is located within an intermediate probability area as between 3% and 5% of properties are above action level, and that therefore basic radon protective measures would be necessary in the construction of new buildings within the site.

4.4 MINING

The site is not located within an area that would be affected by past, present or future underground mining.

4.5 HYDROLOGY, HYDROGEOLOGY AND FLOOD RISK

The Envirocheck Report indicates that the nearest surface water feature is located 40m to the northwest of the site boundary. The OS Water Network Lines map indicates this to be an unnamed surface water feature.

The Environment Agency/Natural Resources Wales groundwater vulnerability map and aquifer database classifies the bedrock beneath the site as a Principal Aquifer. Principal Aquifers are layers of rock or drift deposits that have high inter-granular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as a major aquifer.

4.5 HYDROLOGY, HYDROGEOLOGY AND FLOOD RISK (CONTINUED)

The Environment Agency/Natural Resources Wales groundwater vulnerability map and aquifer database classifies the superficial deposits beneath the site as a Secondary Aquifer-Undifferentiated. This classification has been assigned in cases where it has not been possible to attribute either category A or B to a strata type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the strata type.

A perched water body could be encountered within the granular superficial deposits. Vertical migration of groundwater is likely to be limited by the high clay content of the Devensian Till.

It is considered possible that any existing site drainage could act as a pathway for potential surface contaminants.

There are twelve discharge consents recorded within 500m of the site boundary, one of which is indicated to be on site. The on-site consent was a sewage discharge which has now expired. It is considered that this consent has been incorrectly positioned on site and is actually associated with a filter bed situated approximately 21m to the north of the site.

The nearest effective discharge consents are recorded 72m to the north of the site, there are seven in total. They are all public sewage discharges received by an unnamed stream. The next effective discharge consent is recorded 387m to the northeast of the site and is a sewage discharge received by Nant Dyfrgi.

The Envirocheck Report states that there are no water abstractions recorded within 500m of the site boundary.

Tables 2 and 3 present a summary of the hydrological features and key hydrogeological nature of the site.

4.5 HYDROLOGY, HYDROGEOLOGY AND FLOOD RISK (CONTINUED)

Table 2: Summary of Site Hydrology					
Feature	Distance from site	Flow	Classification	Abstraction	Discharge
Unnamed surface water feature	40m northwest	North easterly	Not known	No	Not known
Surface run-off	On site	Flows on to site or into site drainage if present	N/A	No	Not known
Site Drainage	On site	Not known	N/A	No	Not known

Table 3: Summary of Site Hydrogeology				
Geological Unit	Aquifer Classification	Aquifer Characteristics	Source Protection Zone	Groundwater Abstractions
Made ground	Not classified	Highly variable permeability and porosity. Perched water may be present with variable flow directions.	No	None
Devensian Till	Secondary Aquifer Undifferentiated	Variable low permeability and porosity with intergranular flow possible. High clay content likely to restrict flow.	No	None
Blue Lias Formation (marginal facies)	Principal Aquifer	High permeability limestones and mudstones. High fractures usually provide a high level of water storage	No	None

The Groundwater Vulnerability map of the area indicates that the secondary aquifer is classified as having a high vulnerability. The pollutant speed is high with well-connected fractures in the bedrock.

The Environment Agency/Natural Resources Wales Flood Risk Map as presented within the Envirocheck Report indicates that the site is not at risk to extreme flooding from rivers or sea without defences.

The BGS Groundwater Flooding Susceptibility map indicates that the site has limited potential for groundwater flooding to occur.

4.6 LANDFILL SITES

The Envirocheck Report indicates that there are no BGS recorded, historical or current landfill sites recorded within 1km of the site boundary.

There is one area of potentially infilled land (water) located within 500m of the site boundary. The area is recorded 223m to the west of the site and is at the location of a former pond according to the historical maps.

4.7 POTENTIAL CONTAMINATION

Previous Uses

The various activities in the vicinity of the site which may have resulted in ground or water resource contamination on this site are listed below in Tables 4 and 5. A summary of the potential contaminants can be found in the tables.

Table 4: Potential Contaminants		
Land Use: Undeveloped land until present day		
Material/Process	**Contamination/Hazard**	**Evidence**
Agricultural land	No potential contaminants	Historical maps
Possible localised areas of made ground on field boundaries or in gateways from agricultural activity	Metals, semi metals, non-metals, PAH, asbestos	Anecdotal

Existing Uses

No existing potentially contaminative site uses have been identified.

Adjacent Site Uses

Table 5: Potential Contaminants: Adjacent Site Uses		
Potential Contamination Source	**Boundary**	**Associated Contaminants and Hazards**
Residential	Western and south western	No Potential Contaminants
Sandy Lane with residential development beyond	South eastern	No Potential Contaminants
Undeveloped fields	Northern and north eastern	No Potential Contaminants

4.8 OTHER ENVIRONMENTAL ISSUES

The Envirocheck Report indicates an area of Ancient Woodland to be located 193m to the west of the site. No other environmentally sensitive land is indicated in the vicinity of the site.

The Envirocheck Report indicates that there have been no pollution incidents to controlled waters recorded on site but two recorded within 500m of the site boundary. The incidents were recorded 176m and 181m to the north of the site and they were Category 3-Minor Incidents involving chlorinated water.

There have been no substantiated pollution incidents registered on site or recorded within 1km of the site boundary.

There have been no prosecutions relating to controlled waters or to authorised processes recorded on site or within 1km of the site boundary.

Invasive plants were not noted during the site walkover, but it is recommended that a full vegetation survey is carried out prior to development.

5.0 PRELIMINARY CONCEPTUAL SITE MODEL

5.1 RISK ASSESSMENT FRAMEWORK

In order to be consistent with current UK government policies and legislation, it is necessary to identify, make decisions on, and take appropriate action to deal with land contamination, in accordance with the procedures specified in the Environment Agency document 'Model Procedures for the Management of Land Contamination CLR-11' (Environment Agency 2004).

The risk assessment process is designed to provide a reasoned, structured and pragmatic mechanism for the identification of any potential human health and controlled waters risks associated with land contamination and where necessary to develop a robust remediation strategy to ensure protection of the sensitive receptors (human health of future residents, controlled waters, etc).

In accordance with the CLR-11 framework, risk is defined as:

'a combination of the probability, or frequency, of occurrence of a defined hazard and the magnitude of the consequence of the occurrence'.

The three essential elements to any risk are defined by CLR-11 as follows:

- A contaminant, or hazard, which is in, on, or under the land and has the potential to cause harm (Source)
- A means by which a receptor can be exposed to, or affected by a contaminant or hazard (Pathway)
- A receptor, i.e. something which could be adversely affected by a contaminant or hazard, such as human health or groundwater (Receptor).

In order for there to be a potential risk, all three of the above elements must be present. If there is a source of contamination and a receptor (for example a resident or site user), then there is only a potential risk if there is a pathway linking the two. Such an active pathway is known as a relevant pollutant linkage. It is possible for the same contaminant to be linked to a receptor via a number of pathways, and hence it is important that all relevant pollutant linkages, to both human health and controlled waters, are separately identified on a site in order that a comprehensive conceptual model can be formed and ultimately a robust remediation strategy designed.

5.1 RISK ASSESSMENT FRAMEWORK (CONTINUED)

Current practice during Generic Quantitative Risk Assessment of land affected by contamination is to use generic soil screening values based on the appropriate proposed end use. These usually comprise risk-based Soil Guideline Values (SGVs) or Generic Assessment Criteria (GACs) derived by the Environment Agency's Contaminated Land Exposure Assessment Model (CLEA). The SGVs and the supporting technical guidance were developed in order to assist in the assessment of long-term risk to human health from the exposure to contaminated soils.

Revised Statutory Guidance, published in 2012, to support Part 2A of the Environmental Protection Act 1990, introduced a new four category system for classifying land under Part 2A. Category 1 includes land where the level of risk is clearly unacceptable and Category 4 includes land where the level of risk posed is considered to be acceptably low. Under Part 2A, land would be determined as contaminated if it falls within Categories 1 or 2.

The revised Part 2A Statutory Guidance was accompanied by an Impact Assessment that identified a role for new 'Category 4 Screening Levels' (C4SLs) that would provide a simple test for determining when land is suitable for use and definitely not contaminated land. A Policy Companion Document including the C4SLs was published in March 2014 (England) and May 2014 (Wales).

The C4SLs have been based on the CLEA methodology and derived using the CLEA model, with modified toxicological and exposure parameters. To date, C4SLs have been released for six substances (arsenic, cadmium, chromium (VI), lead, benzo(a)pyrene and benzene).

The C4SLs have been derived on the assumption that where they exist, they will be used as generic screening criteria within generic quantitative risk assessment.

Following publication of the C4SLs, Land Quality Management (LQM), in conjunction with the Chartered Institute for Environmental Health (CIEH) released Suitable 4 Use Levels (S4ULs) in January 2015.

The S4ULs have been derived in accordance with UK legislation, and using a modified version of the Environment Agency's CLEA software. As such, the S4ULs are based on the concept of minimal or tolerable risk as described in Human Health Toxicological Assessment of Contaminants in Soil (Science Report SR2, Environment Agency 2009a).

S4ULs have been derived for a wider number of substances.

5.1 RISK ASSESSMENT FRAMEWORK (CONTINUED)

In addition to the existing SGVs, C4SLs and S4ULs, Atkins ATRISK^{soil} also provide a set of Soil Screening Values. These are currently intended to be used in conjunction with SGVs, although they intend to update these values in line with the C4SLs in due course.

We have reviewed all sets of values and intend to use the most appropriate assessment criteria as Tier 1 screening values in the first instance. Where a published S4UL is available, and considered appropriate, this will be used in the first instance.

5.2 CONCEPTUAL MODEL FRAMEWORK

The preliminary stage of the risk assessment process is to develop and define a conceptual site model, based on the desk study and any existing site investigation data. This is used to establish any potential contaminant sources, identify existing and future receptors and assess if there are any potentially active pathways by which a potential risk may be present.

The preliminary conceptual site model will be developed and refined as site specific data is gathered, such as actual ground conditions and chemical data, resulting in a more robust conceptual understanding of the site.

5.3 CRITICAL SENSITIVE RECEPTOR – HUMAN HEALTH

The proposed redevelopment of the site is for a residential end use. Therefore, the critical sensitive receptor from a human health perspective is an on-site residential receptor.

In accordance with S4UL/C4SL and CLEA guidance for a standard residential with homegrown produce scenario, the critical sensitive receptor for a residential end use risk assessment is a female child, with exposure from 0 to 6 years.

The standard residential with homegrown produce end use conceptual model defined by S4UL/C4SL and CLEA is considered to be suitable for the purposes of this assessment.

5.4 CRITICAL SENSITIVE RECEPTOR – CONTROLLED WATERS

Based on the proposed redevelopment of the site for a residential end use, and the findings of the desk study, the critical sensitive receptor from a controlled water perspective is groundwater within the Principal Aquifer of the Blue Lias Formation (marginal facies).

5.4 CRITICAL SENSITIVE RECEPTOR – CONTROLLED WATERS (CONTINUED)

By considering groundwater as the critical sensitive receptor for controlled waters, the groundwater/hydrogeological risk assessment will also be protective of any nearby surface water features.

5.5 POTENTIAL CONTAMINANT SOURCES

As identified in the desk study, the site has remained undeveloped up until the present day. Significant made ground deposits would not be anticipated within the site but localised areas could be encountered.

If any made ground was encountered, the potential types of contaminants of concern are listed below:

- Metals, semi-metals, and inorganics within the shallow made ground
- Polyaromatic hydrocarbons (PAH) within the shallow made ground
- Asbestos within the shallow made ground.

5.6 POTENTIAL EXPOSURE PATHWAYS

Potential exposure pathways for the critical receptors (both human health and controlled waters) are listed below:

- Dermal contact with soil and/or soil derived dust
- Ingestion of soil and/or soil attached to home-grown produce
- Ingestion of home-grown produce
- Inhalation of soil derived dust
- Inhalation of vapours – indoor and outdoor air
- Leaching of contaminants from made ground to groundwater
- Transportation of contaminants within groundwater.

In addition, the following exposure pathways have also been considered:

- Ground gas generation and migration
- Building materials durability.

5.7 SUMMARY OF CONCEPTUAL EXPOSURE MODEL

A preliminary conceptual exposure model has been developed for the site. This is based on the findings of the desk study and historical review and includes all potential sources, pathways and receptors that may be present on site. Those that have been identified as being potentially active require further investigation in the form of sampling and testing of soils and/or groundwater, followed by appropriate risk assessment.

The preliminary conceptual exposure model will be reviewed and refined following the completion of the site works and laboratory testing.

The preliminary conceptual exposure model is presented below in Table 6.

Table 6: Preliminary Conceptual Exposure Model

Source		Receptor	Pathway	Potentially Active Pathway?
Origin	Contaminant			
Potential localised made ground of unknown origin and historical land uses In situ topsoil and subsoil	Metals, semi-metals, non-metals, PAH, asbestos	Resident – human health	Dermal Contact with made ground/dust	✓
			Ingestion of soil and/or soil attached to home-grown produce	✓
			Ingestion of home-grown produce	✓
			Inhalation of dust	✓
			Inhalation of vapours – indoor/outdoor	✓
	Metals, semi-metals, inorganics, PAH	Groundwater quality	Leaching from made ground	✓
		Surface water quality	Transportation within groundwater	✓
Potential localised made ground of unknown origin and natural ground	pH and water-soluble sulphate	Building Materials Durability	Direct contact	✓
Ground gas – organic, gas producing materials	Methane, carbon dioxide	Human health	Accumulation of gases in confined spaces, and/or migration off site, leading to asphyxiation, or risk of explosion	X Significant thickness of gas generating material not anticipated. No off-site sources identified.

6.0 THE SITE INVESTIGATION

6.1 FIELDWORKS

An intrusive site investigation was designed in accordance with BS5930+A2:2010, the Code of Practice for Site Investigations, BS10175:2011, the Code of Practice for Investigation of Potentially Contaminated Sites, and 'Development of Land Affected by Contamination: A Guide for Developers' prepared by Welsh Local Government Association (WLGA)/Natural Resources Wales (NRW) Land Contamination Working Group, 2017.

The intrusive site investigation was also designed to provide information to support and refine the preliminary conceptual site model/conceptual exposure model.

An initial intrusive investigation comprising 7No trial pits (referenced TP01 to TP06 and TP05-A) was carried out on 05 February 2020 using a wheeled JCB 3CX backhoe excavator. However, it should be noted that the ground surface across the northern half of the site was found to be very soft and waterlogged and access to this area was not possible with a wheeled excavator. As such, further intrusive site investigation works were carried out on the 21 February 2020 comprising a further 11No trial pits (referenced TP07 to TP17) excavated by using a tracked excavator, and 6No windowless sample boreholes (referenced WS01 to WS06).

The trial pits were excavated to a maximum depth of 2.8m below existing ground level (bgl).

Soil infiltration testing was carried out at 6No trial pit locations (see TP03, TP05-A, TP06, TP07, TP08 and TP12). Water was rapidly added to the trial pits from a tractor-towed agricultural bowser and the water level monitored over a period of time.

The windowless sample boreholes were located across the site and drilled to a maximum depth of 5.0m below existing ground level. The purpose of the windowless sample boreholes was to prove the deeper ground conditions and correlate the findings of the trial pitting. In situ strength testing (SPT/CPTs) was carried out at 1m depth intervals in the windowless sample boreholes.

Representative soil samples were taken from the trial pits for laboratory chemical and geotechnical testing and placed in the appropriate sample containers deemed suitable for the analysis required. Strict protocols were adopted during this process to limit the cross contamination of samples.

6.1 FIELDWORKS (CONTINUED)

The fieldworks were supervised by a qualified Geotechnical Engineer from Intégral Géotechnique (Wales) Limited who also logged the trial pits and windowless sample boreholes, monitored the soil infiltration/soakaway tests and prepared their detailed engineering logs in accordance with the requirements of BS5930+A2: 2010. The engineering logs provide descriptions of the materials encountered in accordance with BSEN ISO 14688-1 (2002) and 14689-1 (2003) for soils and rocks respectively.

The approximate locations of the trial pits and windowless sample boreholes are shown on Figure 2, while their logs are presented in Appendices C and D respectively. The results of the soil infiltration tests are presented in Appendix E.

6.2 FIELD OBSERVATIONS

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

6.3 LABORATORY CHEMICAL TESTING

Representative soil samples were taken from the trial pits excavated across the site, stored at the appropriate temperature and dispatched to the laboratories of i2 Analytical for laboratory chemical testing within 24 hours.

The samples were tested for a range of contaminants that reflects the historical use of the site, the findings of the desk study and the preliminary conceptual site model/conceptual exposure model. A list of the soil testing carried out is given below:

Beryllium	Cadmium
Total Chromium	Hexavalent Chromium (VI)
Copper	Lead
Mercury	Nickel
Vanadium	Zinc
Arsenic	Boron
Selenium	Elemental Sulphur
Total Cyanide	Total Sulphate
Sulphide	Water Soluble Sulphate
pH	Monohydric Phenol
Polyaromatic Hydrocarbons (PAH)	Asbestos screen

6.3 LABORATORY CHEMICAL TESTING (CONTINUED)

The results of the soil testing are presented in Appendix F.

6.4 LABORATORY GEOTECHNICAL TESTING

Representative soil samples taken from the trial pits were sent to the laboratories of i2 Analytical for geotechnical testing. The samples were tested for Atterberg Limits in order to determine the volume change potential of the soils.

A copy of the geotechnical test results is presented in Appendix G.

7.0 GROUND CONDITIONS

A summary of the typical ground conditions encountered across the site is presented below in Table 7.

Table 7: Summary of Ground Conditions

Depth (m) From	Depth (m) To	Stratum
0.00	0.15/0.20	TOPSOIL: Soft brown silty CLAY with rootlets.
0.15/0.20	>1.50/>5.00	Variable GLACIAL TILL deposits: Loose or loose to medium dense, becoming medium dense, brown variably clayey variably gravelly fine to medium SAND with variable cobble content. and/or Soft, soft to firm, sometimes firm, orange brown, brown sometimes red brown, variably sandy variably gravelly silty CLAY.
2.50/4.00	3.40/>5.00	Suspected localised GLACIOLACUSTRINE deposits: Soft to firm or firm brown or red brown thinly laminated SILT/CLAY. *Encountered at WS04 and WS05 only.*

A high degree of excavation instability (comprising overbreak and spalling of excavation sides, sometimes resulting in collapse to ground level) was observed during the excavation of the trial pits. Running sand conditions were also noted within a number of the trial pit excavations.

7.1 TOPSOIL

A layer of topsoil, typically between approximately 0.15m and 0.35m thick, was encountered immediately below the ground surface at each exploratory hole location. The encountered topsoil typically comprised soft brown silty clay with rootlets.

7.2 SUPERFICIAL DEPOSITS

Superficial glacial till deposits underlie the topsoil beneath the site. The encountered glacial deposits were recorded to be variable, comprising both granular and cohesive soils with varying degrees of secondary constituents including clay, silt, sand, gravel and cobbles.

7.2 SUPERFICIAL DEPOSITS (CONTINUED)

The base of the superficial deposits was not proven within the exploratory holes which were terminated at depths ranging between approximately 1.50m bgl and 5.00m bgl.

The encountered granular superficial deposits typically comprised loose or loose to medium dense, becoming medium dense, brown variably clayey variably gravelly fine to medium sand with variable cobble content. Running sand conditions (and associated fast groundwater inflows) were recorded within these deposits at TP09, TP10, TP11, TP16 and TP17. Highly variable SPT N values were recorded within the granular soils, ranging between 4 and 47.

The encountered cohesive superficial deposits typically comprised soft, soft to firm, sometimes firm, orange brown, brown, and sometimes red brown, variably sandy variably gravelly silty clay. Hand Shear Vane (HSV) testing recorded undrained shear strength values ranging between approximately 30kPa and 50kPa within the cohesive deposits.

Suspected glaciolacustrine deposits were encountered in WS04 and WS05 from approximately 2.50/4.00m bgl. These deposits comprised soft to firm or firm brown or red brown thinly laminated silt/clay.

Due to the variable physical nature of the superficial deposits underlying the site, the encountered strata recorded within the depths of the trial pits would often change from a cohesive to a granular soil over short lateral and vertical distances.

The laboratory plasticity test results indicate that the superficial deposits underlying the site have plasticity indices ranging between non-plastic (NP) and 15%. The modified plasticity indices range between non-plastic (NP) and 11%, indicating that the volume change potential of superficial soils underlying the site ranges between non-shrinkable to low.

7.3 GROUNDWATER

Shallow groundwater was encountered within the superficial deposits beneath the site.

The presence of groundwater and the loose nature of the granular soils frequently resulted in significant spalling / collapse of excavation sides and running sand conditions within a number of trial pit excavations.

A summary of the encountered groundwater depths and locations is presented in Table 8.

7.3 GROUNDWATER (CONTINUED)

Table 8: Summary of Encountered Groundwater

Exploratory Hole Reference	Groundwater Depth (m bgl)	Comments
TP01	2.6m bgl	Moderate seepage
TP04	2.1m bgl	Moderate seepage
TP05	1.6m bgl	Moderate seepage
TP05-A	1.5m bgl	Moderate seepage
TP06	1.3m bgl	No seepage but strata notably damp/wet below 1.3m bgl.
TP08	1.0m bgl	No seepage but strata notably damp/wet below 1.0m bgl.
TP09	1.0m bgl	Fast inflow with associated running sands.
TP10	0.9m bgl	Fast inflow with associated running sands.
TP11	0.9m bgl	Fast inflow with associated running sands.
TP14	2.4m bgl	Fast inflow with associated running sands.
TP16	1.4m bgl	Fast inflow with associated running sands.
TP17	1.7m bgl	Moderate inflow with associated running sands.

Groundwater was also encountered within the windowless sample boreholes at depths ranging between approximately 2.1m and 3.0m bgl.

The groundwater conditions are based on observations made at the time of the fieldwork. It should be noted that groundwater levels may vary due to seasonal and other effects.

7.4 SOIL INFILTRATION TESTS

Soil infiltration testing was carried out at 6No locations across the site in trial pits TP03, TP06, TP05-A, TP07, TP08 and TP12.

The trial pits were rapidly filled with water from a tractor-towed agricultural bowser and the water level monitored over a period of time. Where infiltration and time allowed, repeat cycle tests were carried out in general accordance with BRE365.

The results of the soakaway testing are summarised below and presented in Appendix E. A summary of the results is presented in Table 9.

Table 9: Summary of Soil Infiltration Test Results

Test Location	Test Depth (m bgl)	Soil Infiltration Rate (m/s)		
		Test Cycle 1	Test Cycle 2	Test Cycle 3
TP03	2.6	$7.0x10^{-6}$	n/a	n/a
TP06	2.1	$7.4x10^{-6}$	n/a	n/a
TP05-A	1.5*	$1.2x10^{-5}$	n/a	n/a
TP07	1.7	$2.1x10^{-5}$	$2.1x10^{-5}$	n/a
TP08	1.4	$8.2x10^{-6}$	n/a	n/a
TP12	2.0	$7.9x10^{-6}$	n/a	n/a

* It should be noted that the sides of the excavation in TP05-A collapsed during the soakaway test from 1.50m back up to 0.80m bgl. The soakaway test was continued and a soil infiltration rate of $1.2x10^{-5}$ m/s was calculated. This result should be used with caution.

The results indicate a range in soil infiltration rates of between $2.1x10^{-5}$ m/s and $7.0x10^{-6}$ m/s.

It should be noted that the results of the soil infiltration testing had to be extrapolated in order to determine the soil infiltration rates, and therefore actual infiltration may vary. It should also be noted that the soakaway test results are specific to the locations and depths of the tests undertaken.

It should be noted that this initial testing should only be regarded as indicative. If it should be proposed to use soakaways for this site, then more extensive location and depth specific follow-up tests will be required and should fully comply with BRE 365, in order to confirm the suitability of the site and to satisfy the local authority.

8.0 CONTAMINATION

8.1 AVERAGING AREAS

In order to assess the laboratory test results reliably and in context, the data have been grouped into an averaging area. An averaging area (or area of interest) is that area of soil to which a receptor is exposed or which otherwise contributes to the creation of hazardous conditions. This may be an area of historical industrial usage, a soil type, or a specific proposed end use.

In the case of this analysis, a site wide averaging area has been determined according to the proposed residential end use.

8.2 SOIL CONTAMINATION

The Suitable 4 Use Levels (S4ULs) derived by LQM for a residential with homegrown produce end use have been adopted as critical concentrations against which soil contaminant concentrations can be compared. In the absence of additional published S4ULs, the Category 4 Screening Levels (C4SLs) published by DEFRA, Soil Guideline Values (SGVs) and Soil Screening Values (SSVs) derived by Atkins ATRISK^{soil} for a residential with the consumption of home grown produce end use have been adopted, where considered appropriate.

Since the results of the testing indicate total organic carbon content (TOC) in the range of 0.3% to 3.2%, the results have been compared to the respective guidelines, where applicable, for 1% soil organic matter content.

The soil test results for topsoil and subsoil have been summarised and are shown in Appendix H.

8.2.1 Topsoil & Subsoil

The results of the laboratory testing carried out on two representative samples of topsoil and two representative samples of subsoil indicate that most of the analysed chemical elements or compounds are present at concentrations below the appropriate thresholds. However, the initial screening indicates a localised exceedance of a number of speciated polyaromatic hydrocarbon (PAH) compounds at one location only.

Asbestos was not detected within any of the samples tested.

8.2 SOIL CONTAMINATION (CONTINUED)

Elevated concentrations of the PAH compounds benzo(a)pyrene, benzo(b)fluoranthene and dibenzo(a,h)anthracene were detected within the subsoil at 0.4m depth at the location of trial pit TP03. It should be noted that elevated concentrations were not detected within the overlying topsoil. It should also be noted that there were no obvious visual indications of a potential source of PAH contamination, such as ash or charcoal from a former fire.

The identified PAH contamination was therefore considered a possible anomalous result and four further soil samples (referred to as TP03A, TP03B, TP03C and TP03D) were obtained from around the location of TP03 from the same depth (0.4m bgl) and tested for PAH compounds only.

The results of the further testing have not identified any elevated PAH concentrations.

9.0 REVISED CONCEPTUAL EXPOSURE MODEL

The preliminary conceptual exposure model has been reviewed and revised to reflect the findings of the intrusive site investigation and the results of the laboratory testing of soils. Pathways identified as a relevant pollutant linkage require appropriate risk assessment or mitigation measures (see Section 10).

Table 10: Revised Conceptual Exposure Model

Source		Receptor	Pathway	Preliminary Active Pathway? (see Sect. 5.8)	Relevant Pollutant Linkage	Justification/ Mitigation
Origin	Contaminant					
Potential localised made ground of unknown origin and historical land uses In situ topsoil and subsoil	Metals, semi-metals, non-metals, PAH, asbestos	Resident – human health	Dermal Contact with made ground/dust	✓	X	No significantly elevated concentrations identified.
			Ingestion of soil and/or soil attached to home-grown produce	✓	X	
			Ingestion of home-grown produce	✓	X	
			Inhalation of dust	✓	X	
			Inhalation of vapours – indoor/outdoor	✓	X	No sufficiently volatile contaminants identified.
	Metals, semi-metals, inorganics, PAH	Groundwater quality	Leaching from made ground	✓	X	No sources of contamination identified.
		Surface water quality	Transportation within groundwater	✓	X	No sources of contamination identified.

9.0 REVISED CONCEPTUAL EXPOSURE MODEL (CONTINUED)

Source		Receptor	Pathway	Preliminary Active Pathway?	Relevant Pollutant Linkage	Justification/ Mitigation
Origin	Contaminant					
Potential localised made ground of unknown origin and natural ground	pH and water-soluble sulphate	Building Materials Durability	Direct contact	✓	✓	Building materials will be in contact with natural ground – risk assess
Ground gas – organic, gas producing materials	Methane, carbon dioxide	Human health	Accumulation of gases in confined spaces, and/or migration off site, leading to asphyxiation, or risk of explosion	X	X	Potential gas producing materials not identified. No off-site sources identified – risk assess

10.0 RISK ASSESSMENT

10.1 METHODOLOGY

The risk of pollution, health effects or environmental harm occurring as a result of ground contamination is dependent upon three principal factors:

- The scale of the contamination sources;
- The presence of sensitive “receptors,” eg Humans: health of the general public, site occupiers, redevelopment workers. Environment: flora, fauna, etc;
- The existence of migration pathways by which contaminants can reach the sensitive receptors.

This section assesses each of these factors in order to evaluate the overall level of risk and potential harm to receptors. The receptor may be human, a water resource, an eco-system or construction materials. Pathways connecting a perceived hazard to a receptor are referred to as exposure pathways.

The sources of contamination and the links connecting the hazards to the sensitive receptors will represent the basis for the risk assessment.

10.2 SOURCE-PATHWAY-RECEPTOR MODEL

The preliminary conceptual site model was based on the findings of the desk study. This was later reviewed and refined according to the findings of the site investigation, allowing for the ground conditions encountered and the results of laboratory testing of soil and groundwater. Any pathways considered to be inactive were removed from the model and all remaining potentially active pathways require risk assessment.

The pathways shown as potentially active in the Revised Conceptual Site Model in Section 9.0 above have been assessed below.

10.3 HUMAN HEALTH RISK ASSESSMENT

10.3.1 Site in its Present Condition

The site does not pose any risks to casual visitors or trespassers. The site is an undeveloped field used for grazing livestock.

10.3 HUMAN HEALTH RISK ASSESSMENT (CONTINUED)

10.3.2 Future Site Users

The contamination test results, and investigation observations do not show significantly elevated concentrations within the topsoil and subsoil beneath the site.

Although slightly elevated PAH concentrations were identified within the subsoil at 0.4m depth in one location, the results of additional testing carried out around this location did not identify any elevated concentrations. Based on the results of the testing, the lack of a potential contaminant source and the agricultural site history, with no history of any previous development, it is considered that the initial result may be considered an anomaly.

It is therefore considered that the site does not present a significant risk to end users and no specific remedial mitigation measures are required.

10.3.3 Construction Workers

Normal good hygiene practices should be adequate to protect the health and safety of redevelopment workers, and should include:

- Minimum handling of materials;
- Washing of hands prior to all meal breaks, which should be taken in a designated clean area;
- The use of standard protective clothing such as boots and overalls and gloves, where considered relevant.

In dry weather, inhalation of dust and gases should be avoided preferably by the use of dust suppression techniques to minimise fugitive emissions and minimisation of exposed materials at any particular time.

All excavations should be regularly checked for safe atmospheres.

Additionally, a system should be established by which any ‘unusual’ materials that may be encountered are reported rapidly to the site management, so that the appropriate action may be taken, following specialist advice if necessary. An unusual material may be identified on site by colour, odour or physical nature.

Reference should be made to the Health and Safety Executive document “Protection of Workers and the General Public during the development of contaminated land” for detailed guidance on these matters.

10.4 RISKS TO VEGETATION

The concentrations of phytotoxic metals in the topsoil and subsoil do not indicate the potential for adverse effects to vegetation. All gardens and areas of soft landscaping will require provision of a minimum thickness of 150mm of clean topsoil.

10.5 GROUNDWATER RISK ASSESSMENT

The site does not have a history of any previous development and has remained in agricultural use. Similarly, the results of the testing of representative samples of the topsoil and subsoil have not identified any significant levels of contamination.

It is therefore considered that the site does not present a potential risk to groundwater/controlled waters.

10.6 GROUND GAS RISK ASSESSMENT

Ground gas monitoring has not been carried out at the site.

However, the historical use of the site as agricultural land, without any previous development, the lack of any on site and/or offsite sources of potential ground gas, and the nature of the underlying soils encountered, including only natural in situ soils without any made ground or potentially organic rich materials, indicate that the site is not at risk from ground gas and no specific ground gas protective measures are required.

Information with regard to Radon Protective Measures is provided on the Landmark Radon Information Map as presented in Appendix B. The site would require basic radon protective measures.

10.7 RISKS TO BUILDINGS AND MATERIALS DURABILITY

10.7.1 Concrete Classification

A summary of the laboratory chemical test results for the chemicals water soluble sulphate, and pH, which may adversely affect the durability of building materials is presented in Appendices G and H.

In accordance with BRE Digest SD1:2005 and adopting the assessment procedure specified therein for greenfield sites, the laboratory chemical test results indicate a characteristic value (taking the highest test result) for water soluble sulphate within the natural ground of 27.0mg/l.

10.7 RISKS TO BUILDINGS AND MATERIALS DURABILITY (CONTINUED)

Using Table C2 of BRE Digest SD1:2005, this characteristic value corresponds to Design Sulphate Class DS-1.

The groundwater regime of the site has been assessed as 'mobile' and a characteristic pH value within the natural ground of 5.7 has been determined (adopting the lowest test result). The Design Sulphate Class has been modified to give a site ACEC class of AC-1 for concrete structures constructed within the natural ground.

10.7.2 Water Services

Water supply pipes will need to be protected from any contamination present within the ground. In particular, the presence of organic contaminants should be addressed when selecting pipe materials. Based on the results of the soil contamination testing, measures to protect pipes will likely comprise clean backfill to trenches.

10.8 WASTE DISPOSAL

Excavated materials generated by the development may be considered as waste and subject to waste controls. Any re-use of excavated materials on-site should be undertaken in accordance with current waste and environmental legislation and which may require the production of an approved Materials Management Plan (MMP) prepared in accordance with the CL:AIRE Code of Practice.

It is recommended that a sustainable development strategy is adopted which reduces to a practicable minimum the generation of waste materials and the need for disposal to a licensed tip. Emphasis should be on recovery and re-use rather than disposal.

However, any waste or surplus materials that are generated will need to be classified in accordance with current EC regulations and Environment Agency guidance prior to disposal. It is the responsibility of the waste producer to classify the waste.

Based on the data obtained from the site investigation works, any waste materials comprising of the existing natural ground are likely to be classified as non-hazardous waste.

Any asbestos containing materials (ACMs) will be classified as hazardous waste.

This classification is provisional and indicative of the likely waste classification based on the data obtained to date (including chemical composition, moisture content, etc.). It also assumes that the materials tested will be representative of future generated waste.

10.8 WASTE DISPOSAL (CONTINUED)

In order to minimise disposal, the materials generated should be segregated and examined, with appropriate testing as necessary, to enable the materials to be sorted or treated into lower classifications, with the resultant benefit of potentially generating re-use rather than disposal.

Once final waste sources and volumes are known, the waste stockpile to be disposed off-site will need to be classified in accordance with Environment Agency/Natural Resources Wales Waste Classification – Guidance on the Classification and Assessment of Waste Technical Guidance WM3 (2015). This is likely to require additional sampling and testing of the generated waste materials to provide an up-to-date current basis for classification.

Depending on the waste classification, waste acceptance criteria (WAC) testing may be required, in order to determine which class of landfill site the waste can be sent to. It is recommended that the results of the waste classification and any WAC test results are sent to the intended licensed waste operator prior to disposal in order to confirm their classification and acceptance.

10.9 UNCERTAINTIES

It is important to recognise that there may be areas of contamination within the site that have not been found or that contaminants may be present at concentrations above those that have been found.

It is also important to recognise that contamination may be localised and that no investigation, however comprehensive, is capable of finding such occurrences, other than by chance.

The near-surface drainage patterns have not been fully established.

11.0 ENGINEERING CONSIDERATIONS AND RECOMMENDATIONS

11.1 DETAILS OF PROPOSED DEVELOPMENT

The proposed development will comprise the construction of forty-five residential units, including associated infrastructure such as access roads, car parking areas and private driveways and also areas of landscaping and private gardens.

The following recommendations should be reviewed once the development layout, engineering levels and the extent of any required cut and fill earthworks are confirmed.

11.2 SITE PREPARATION

Prior to any works commencing on site, the locations of any services should be established and either relocated or protected. Any diversion works should be carried out under the supervision, and to the specification, of the appropriate statutory authorities. Any resulting excavations should be backfilled with suitable fill materials.

Dense vegetation surrounds the majority of the site, comprising mature trees and hedgerows along the north, west and part of the eastern boundary, and hedgerows along the southern and part of the eastern boundary. Although Japanese Knotweed was not observed at the site at the time of the site works, it is recommended that a full vegetation survey of the site is carried out. Any areas where invasive plant species are identified should undergo appropriate treatment/eradication by a specialist contractor.

There are a number of mature trees/hedges along the edges of the site. Allowances should be made for the removal of any associated roots that may become exposed in any proposed nearby earthworks and foundation excavations. Any such works should be conducted in accordance with the code of practice recommended by the National House Building Council (NHBC).

All protection orders relating to existing vegetation/ecology should be adhered to during the development of the site.

All existing topsoil should be stripped off from beneath the proposed buildings and access roads. These excavated materials will be unacceptable as structural fill and should be stockpiled for re-use in landscaped areas and gardens, with any surplus materials being removed from site.

11.2 SITE PREPARATION (CONTINUED)

Exposed formations should be protected from site traffic and inclement weather in order to preserve their integrity. Any soft spots/areas should be removed and replaced with well compacted site won or imported granular fill material.

A system should be established by which any 'unusual' materials that may be encountered are reported rapidly to the site management so that appropriate action can be taken following specialist advice if necessary. Any unusual material may be identified on site by colour, odour or physical nature.

The site slopes down towards the north and cut and fill earthworks will likely be required in order to create suitable development plateaux.

If any fill is to be placed onto an existing sloping area, then the original ground should be adequately cut and benched, in order to prevent the possibility of slippage at the interface between the new fill and the original ground. All works should be carried out in accordance with the DTp Specification for Highways Works.

Any cut and/or fill slopes should be no steeper than 1v in 2h. Cut off drains should be provided at the top and French drains at the bottom of any cut and/or fill slopes. In areas of cut and/or fill, the slopes should be topsoiled and seeded with grass, in order to minimise any future maintenance problems caused by surface water run-offs.

The existing in situ soils are considered to be suitable for re-use as structural fill, subject to appropriate handling. Any shortfall in fill quantities should be made up with clean, inert, imported granular materials in accordance with an agreed specification. These materials will need to be placed and compacted in accordance with the DTp Specification for Highways Works.

Any reduced formations should be brought back up to the required level with granular fill materials. All fill materials should be placed and well compacted in layers, in accordance with Department of Transport Specification for Highway Works.

Some surface and groundwater management will be required in order to ensure the protection of the earthworks and materials. Surface water protective measures should be implemented to prevent surface water run-off leaving the site.

11.3 FOUNDATIONS AND FLOOR SLABS

Given the high variability and the generally low shear strength/density of the shallow superficial deposits underlying the site, conventional strip/trench fill foundations are not considered suitable for the proposed development due to the potential for unacceptable levels of total and / or differential settlements.

Additionally, a shallow groundwater table and excavation instability issues (including significant spalling/collapse of excavation sides and running sand conditions) were recorded during the excavation of the trial pits. As such difficulties in controlling groundwater inflows and excavation sides should be anticipated during construction.

Considering the geotechnical constraints outlined above, a number of potential foundation solutions have been considered, as outlined below. The following foundation recommendations will require a review once the final development layout and engineering levels have been confirmed.

11.3.1 Raft Foundations

Based on the ground conditions encountered during the intrusive site investigation, a lightly loaded raft foundation solution is considered to be the most suitable foundation solution for the proposed development.

Following site strip and proof rolling of formations, it is considered that the proposed raft foundations could either bear onto the existing natural superficial soils or suitably prepared engineered fill.

To minimise the potential for differential movements, it is recommended that beneath the raft foundations there should be a suitably thick layer of well compacted imported granular fill throughout the plan area of the building. Department of Transport Type 1 Sub-base, or similar approved, could be used and should be compacted in layers in accordance with current DTp Specification for Highway Works.

Subject to the results of confirmatory plate load testing on prepared formations, the proposed rafts should be designed to an allowable maximum bearing pressure of 50kN/m^2, with an average pressure of less than 30kN/m^2. At this intensity of loading, the total settlements should not exceed 30mm and any angular distortions caused by differential movements should be less than 1:750. Rafts should be designed to span a 1.0m soft spot and 1.0m cantilever at build corners.

All foundations should be designed for low shrinkability tree influence criteria in accordance with NHBC guidelines.

11.3 FOUNDATIONS AND FLOOR SLABS (CONTINUED)

All formations should be proof rolled with any soft spots and / or any obstructions that could form hard spots removed.

Thickening of the raft is likely to be required beneath the load bearing walls/columns.

Information with regard to Radon Protective Measures is provided on the Radon Information Map and allowances should be made for basic radon protective measures across the site.

11.3.2 Vibro-Stone Columns

Alternatively, it is considered that the proposed buildings could be founded using reinforced strip/trench fill foundations bearing onto improved ground using vibro-stone columns, subject to controlling groundwater inflows into excavations.

Ground improvement using vibro-stone columns would involve the construction of closely spaced stone columns beneath the proposed buildings. The aim is to ensure 'stiffening' of the ground, thereby spreading and dissipating the new development loads in order to minimise total and differential settlements within the underlying soils.

The advice of a specialist vibro-compaction contractor should be sought in order to fully explore the precise bearing capacities which can reasonably be achieved. It should be noted that vibro contractors generally will not treat areas of recently placed cohesive fill material, so an idea of cut and fill levels is advised prior to seeking the advice of a specialist.

Based on the encountered ground conditions (i.e. the presence of loose/soft, collapsible superficial soils and a shallow groundwater table) it is recommended that ‘bottom feed’ vibro techniques are used.

Allowances should be made by the vibro contractor for carrying out suitable in-situ strength testing of the prepared formations.

Upon completion of the vibro-stone columns, buildings may be founded on reinforced strip/trench fill foundations designed in line with design requirements of the specialist vibro contractor. Allowances should be made for shallow groundwater inflows and potential excavation instability / localised running sand conditions.

Foundations should penetrate the founding strata by a minimum of 200mm and be at a minimum depth of 900mm below development level in order to protect against the effects of frost heave and/or thermal shrinkage.

11.3 FOUNDATIONS AND FLOOR SLABS (CONTINUED)

Footings should be deepened in accordance with NHBC guidance for foundations constructed within low volume change potential soils adjacent to mature trees and hedgerows.

Floor slabs should be designed as suspended incorporating appropriate basic radon protective measures.

11.4 EXCAVATIONS AND FORMATIONS

Excavations should be possible with normal soil excavating machinery, without the use of hydraulic breaker attachments.

Based on the findings of the site investigation works, excavations below 1.5 to 2.0m depth are likely to encounter groundwater inflows.

Locally, running sand conditions and significant excavation instability were noted during the intrusive site investigation. Allowances should be made for these constraints during construction.

Allowances should be made for overbreak and spalling/collapse in the sides of the excavations and for the requirement for increased volumes of concrete.

The sides of excavations deeper than 1.0m should be supported by trench boxes or temporarily battered at gradients of typically 30°.

The exposed formations within the in-situ materials will be extremely susceptible to damage, softening and deterioration by wet weather and site traffic. They should therefore be protected by blinding concrete or a 100mm thick layer of hard-core immediately after exposure.

11.5 ACCESS ROADS AND CAR PARKING AREAS

For access roads and car parking areas, a California Bearing Ratio (CBR) value of between 2% and 4% could be assumed for pavement formations within the shallow soils. The design CBR could be increased to greater than 5% if the pavement formations are within well compacted granular fill materials.

11.5 ACCESS ROADS AND CAR PARKING AREAS (CONTINUED)

After proof rolling, the pavement formations, any 'soft spots/areas' and any obstructions that could form hard spots should be removed and replaced with well-compacted imported granular materials. Department of Transport (DTp) Type 1 Sub-Base, or similar approved, could be used and should be compacted in layers in accordance with the current DTp Specification for Highway Works.

Formations within cohesive deposits should be regarded as frost susceptible.

11.6 DRAINAGE

Soil infiltration testing has been undertaken at 6 No. trial pit locations across the site (TP03, TP06, TP05-A, TP07, TP08 and TP12), as indicated on Figure 2.

The results of soakaway tests are summarised in Section 7.3 above (see Table 9).

It should be noted that the sides of the excavation in TP05-A collapsed during the soakaway test and it was not possible to calculate a soil infiltration rate.

The results indicate a range in soil infiltration rates of between 2.1×10^{-5} m/s and 7.0×10^{-6} m/s.

Note that the soakaway test results are specific to the locations and depths of the tests undertaken. The soakaway results should be provided to a suitably qualified drainage engineer so that a soakaway design specific to the development can be completed and provided.

It should be noted that this initial testing should only be regarded as indicative. If it should be proposed to use soakaways for this site, then more extensive location and depth specific follow-up tests will be required and should fully comply with BRE 365, in order to confirm the suitability of the site and to satisfy the local authority.

APPENDIX A

ENVIROCHECK REPORT

Intégral
Géotechnique

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
231826780_1_1

Customer Reference:
12604/LP

National Grid Reference:
301560, 177850

Slice:
A

Site Area (Ha):
1.59

Search Buffer (m):
1000

Site Details:

Sandy Lane
Ystradowen
Cowbridge
CF71 7TW

Client Details:

MR H Pritchard
Integral Geotechnique
Integral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX

Intégral Géotechnique

Contents

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination.
For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client.
In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

Report Version v53.0

Intégral Géotechnique

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 2	1	10	1	2
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls					
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 5		Yes		
Pollution Incidents to Controlled Waters	pg 6		2		
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances					
River Quality					
River Quality Biology Sampling Points					
Substantiated Pollution Incident Register					
River Quality Chemistry Sampling Points					
Water Abstractions	pg 6				5 (*1)
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 7	Yes	n/a	n/a	n/a
Bedrock Aquifer Designations	pg 7	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 7	Yes	n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
OS Water Network Lines	pg 8		13	21	78

Intégral Géotechnique

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites					
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)					
Local Authority Landfill Coverage	pg 21	1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Potentially Infilled Land (Non-Water)	pg 21				1
Potentially Infilled Land (Water)	pg 21		1		3
Registered Landfill Sites					
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					

Intégral Géotechnique

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 22	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 22	Yes	Yes	Yes	Yes
BGS Recorded Mineral Sites	pg 24			1	2
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
Mining Instability			n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain	pg 24		Yes	n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 24	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 24		Yes	n/a	n/a
Potential for Ground Dissolution Stability Hazards	pg 24	Yes	Yes	n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 25	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 25	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 25	Yes	Yes	n/a	n/a
Radon Potential - Radon Affected Areas	pg 25	Yes	n/a	n/a	n/a
Radon Potential - Radon Protection Measures	pg 25	Yes	n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 26		2		
Fuel Station Entries	pg 26		1		
Points of Interest - Commercial Services	pg 26		4		
Points of Interest - Education and Health					
Points of Interest - Manufacturing and Production	pg 26			3	4
Points of Interest - Public Infrastructure	pg 27		3		
Points of Interest - Recreational and Environmental	pg 27		2		
Gas Pipelines					
Underground Electrical Cables					

Intégral Géotechnique

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland	pg 28		1	1	3
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NW (SW)	0	1	301557 177854
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NW (N)	0	1	301557 177900
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NE (NE)	25	1	301600 177950
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NW (NW)	34	1	301500 177950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (N)	83	1	301500 178000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (NW)	210	1	301300 178000
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (N)	223	1	301600 178150
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SE (NE)	317	1	301750 178200
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A8NE (S)	349	1	301650 177450
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A18SE (NE)	361	1	301750 178250
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SW (N)	373	1	301557 178300
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A18SE (N)	373	1	301600 178300
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SW (N)	375	1	301550 178300
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SE (N)	389	1	301700 178300
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SW (N)	423	1	301557 178350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SE (N)	423	1	301600 178350
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SW (N)	424	1	301550 178350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SE (N)	427	1	301650 178350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SW (N)	429	1	301500 178350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SW (N)	436	1	301450 178350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SE (N)	437	1	301700 178350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (E)	445	1	302100 177854

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SE (NE)	473	1	301800 178350
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A18SE (N)	473	1	301600 178400
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SW (N)	474	1	301550 178400
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SE (N)	477	1	301650 178400
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SW (N)	479	1	301500 178400
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SW (N)	485	1	301450 178400
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (E)	498	1	302150 177900
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SE (N)	499	1	301750 178400
1	**Discharge Consents** Operator: Vale Of Glamorgan Borough Council Property Type: Sewage Disposal Works - Water Company Location: Ystrad Owen Stw Authority: Natural Resources Wales Catchment Area: River Ely Reference: Ag0016301 Permit Version: 1 Effective Date: 29th June 1983 Issued Date: 29th June 1983 Revocation Date: 2nd February 1995 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Not Supplied Receiving Water: Ely Tributary **Status: Consent expired** Positional Accuracy: Located by supplier to within 100m	A13NW (NW)	0	2	301500 177900
2	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Ystrad Owen Ps Vale Of Glamorgan, Adjacent To The A4222, Cowbridge, Cf71 7sy Authority: Natural Resources Wales Catchment Area: ELY R - CONF NANT CLUN TO ALLOT GARDENS, ELY Reference: An0364101 Permit Version: 2 Effective Date: 31st March 2009 Issued Date: 31st March 2009 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Unnamed Stream **Status: Effective** Positional Accuracy: Located by supplier to within 10m	A13NW (N)	72	2	301563 177995

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
2	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Ystrad Owen Ps Vale Of Glamorgan, Adjacent To The A4222, Cowbridge, Cf71 7sy Authority: Natural Resources Wales Catchment Area: ELY R - CONF NANT CLUN TO ALLOT GARDENS, ELY Reference: An0364101 Permit Version: 2 Effective Date: 31st March 2009 Issued Date: 31st March 2009 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Unnamed Stream **Status:** **Effective** Positional Accuracy: Located by supplier to within 10m	A13NW (N)	72	2	301563 177995
2	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Ystrad Owen Ps Vale Of Glamorgan, Adjacent To The A4222, Cowbridge, Cf71 7sy Authority: Natural Resources Wales Catchment Area: ELY R - CONF NANT CLUN TO ALLOT GARDENS, ELY Reference: An0364101 Permit Version: 2 Effective Date: 31st March 2009 Issued Date: 31st March 2009 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Unnamed Stream **Status:** **Effective** Positional Accuracy: Located by supplier to within 10m	A13NW (N)	72	2	301563 177995
2	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Ystrad Owen Ps Vale Of Glamorgan, Adjacent To The A4222, Cowbridge, Cf71 7sy Authority: Natural Resources Wales Catchment Area: ELY R - CONF NANT CLUN TO ALLOT GARDENS, ELY Reference: An0364101 Permit Version: 2 Effective Date: 31st March 2009 Issued Date: 31st March 2009 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Unnamed Stream **Status:** **Effective** Positional Accuracy: Located by supplier to within 10m	A13NW (N)	72	2	301563 177995
2	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Ystrad Owen Ps Vale Of Glamorgan, Adjacent To The A4222, Cowbridge, Cf71 7sy Authority: Natural Resources Wales Catchment Area: Not Supplied Reference: An0364101 Permit Version: 2 Effective Date: 31st March 2009 Issued Date: 31st March 2009 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Unnamed Stream **Status:** **New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A13NW (N)	72	2	301563 177995

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
2	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Ystrad Owen Ps Vale Of Glamorgan, Adjacent To The A4222, Cowbridge, Cf71 7sy Authority: Natural Resources Wales Catchment Area: Not Supplied Reference: An0364101 Permit Version: 2 Effective Date: 31st March 2009 Issued Date: 31st March 2009 Revocation Date: Not Supplied Discharge Type: Public Sewage: Storm Sewage Overflow Discharge Environment: Freshwater Stream/River Receiving Water: Unnamed Stream **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A13NW (N)	72	2	301563 177995
2	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Ystrad Owen Ps Vale Of Glamorgan, Adjacent To The A4222, Cowbridge, Cf71 7sy Authority: Natural Resources Wales Catchment Area: Not Supplied Reference: An0364101 Permit Version: 1 Effective Date: 31st March 2010 Issued Date: 7th March 2005 Revocation Date: 30th March 2009 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Unnamed Stream **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A13NW (N)	72	2	301563 177995
3	**Discharge Consents** Operator: Davies W Property Type: Domestic Property (Single) Location: Cowbridge - Tudor Rose Bungalo Ystr, Ystradowen Authority: Natural Resources Wales Catchment Area: River Ely Reference: An0032401 Permit Version: 1 Effective Date: 8th July 1987 Issued Date: 8th July 1987 Revocation Date: 2nd December 1992 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Soakaway **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A13NW (NW)	107	2	301480 178020
4	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Pumping Staions Location: North Ystradowen Ps Adjacent To The, Adjacent To The A4222 Cowbridge, Cowbridge Authority: Natural Resources Wales Catchment Area: ELY R - CONF NANT CLUN TO ALLOT GARDENS, ELY Reference: AN0233201 Permit Version: 1 Effective Date: 12th March 1992 Issued Date: 12th March 1992 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Pumping Station - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Unnamed Trib Of Nant Dyfrygi **Status: Surrendered** Positional Accuracy: Located by supplier to within 100m	A13NW (N)	198	2	301540 178120

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Pumping Staions Location: North Ystradowen Ps Adjacent To The, Adjacent To The A4222 Cowbridge, Cowbridge Authority: Natural Resources Wales Catchment Area: ELY R - CONF NANT CLUN TO ALLOT GARDENS, ELY Reference: An0233201 Permit Version: 1 Effective Date: 12th March 1992 Issued Date: 12th March 1992 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Pumping Station - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Unnamed Trib Of Nant Dyfrygi **Status: Surrendered** Positional Accuracy: Located by supplier to within 10m	A13NW (N)	198	2	301540 178120
5	**Discharge Consents** Operator: T E & J H Rosier Property Type: Fish Farm Location: Seven Oaks Fishery Talygarn, Nr Pontyclun, Cf72 9ju Authority: Natural Resources Wales Catchment Area: ELY R - CONF NANT CLUN TO ALLOT GARDENS, ELY Reference: An0310901 Permit Version: 1 Effective Date: 23rd August 2001 Issued Date: 23rd August 2001 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Nant Dyfrgi **Status: Effective** Positional Accuracy: Located by supplier to within 10m	A18SE (NE)	387	2	301830 178230
6	**Discharge Consents** Operator: National Grid Plc Property Type: Production & Distribution Of Electricity Location: Cowbridge 275kv Substation Sandy Ln, Sandy Lane, Ystrad Owen, Vale Of Glamorgan Authority: Natural Resources Wales Catchment Area: Not Supplied Reference: An0335501 Permit Version: 1 Effective Date: 2nd July 2003 Issued Date: 2nd July 2003 Revocation Date: 13th April 2011 Discharge Type: Trade Discharges - Site Drainage Discharge Environment: Freshwater Stream/River Receiving Water: A Trib Of The Nant Rhydhalog **Status: Surrendered under EPR 2010** Positional Accuracy: Located by supplier to within 10m	A9NE (SE)	794	2	302353 177467
7	**Discharge Consents** Operator: Vale Holiday Homes Ltd Property Type: Domestic Property (Multiple) Location: Vale Holiday Homes Ltd Llwyn Nwydog, Llwyn Nwydog Farm Cowbridge Road, Cowbridge Road, Talygarn Pontycl, Pontyclun Authority: Natural Resources Wales Catchment Area: River Ely Reference: AN0274301 Permit Version: 1 Effective Date: 13th June 1997 Issued Date: 13th June 1997 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Nant Rhydhalog **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 100m	A19NW (NE)	965	2	302000 178800
	Nearest Surface Water Feature	A13NW (NW)	40	-	301479 177951

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
8	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Ystradowen, COWBRIDGE Authority: Environment Agency, Welsh Region Pollutant: Chlorinated Water Note: Tributary River Ely - Highway Drains At Ystradowen; Burst Incident Date: 1st June 1997 Incident Reference: 32532 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A13NW (N)	176	3	301500 178095
8	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Ystradowen Near, COWBRIDGE Authority: Environment Agency, Welsh Region Pollutant: Chlorinated Water Note: Not Supplied Incident Date: 1st June 1997 Incident Reference: 32532 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Burst Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A13NW (N)	181	3	301500 178100
9	**Water Abstractions** Operator: Mr & Mrs Terence & June Rosier Licence Number: 21/57/31/0055 Permit Version: Not Supplied Location: Not Supplied Authority: Natural Resources Wales Abstraction: Impounding Abstraction Type: Not Supplied Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A19SW (NE)	526	2	301960 178300
10	**Water Abstractions** Operator: Messrs R J Jenkins & Son Licence Number: 21/57/31/0054 Permit Version: 100 Location: Spring At Tal-Y-Fan Farm Authority: Natural Resources Wales Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Um-Named Spring Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A9NW (SE)	679	2	302120 177350
10	**Water Abstractions** Operator: Jenkins & Son Licence Number: 21/57/31/0054 Permit Version: Not Supplied Location: Abstraction From Spring At Tal-Y-Fan Farm Authority: Natural Resources Wales Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	679	2	302120 177350

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
11	**Water Abstractions** Operator: Vale Holiday Homes Ltd Licence Number: 21/57/31/0062 Permit Version: 2 Location: Borehole At Llwyn Nwydog Farm Authority: Environment Agency, Welsh Region Abstraction: Holiday Sites; Camp Sites And Tourist Attractions: Animal Watering And General Use In Non Farming Situations Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Llwyn Nwydog Farm Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 5th July 2000 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A19NW (N)	985	3	301960 178840
11	**Water Abstractions** Operator: Vale Holiday Homes Ltd Licence Number: 21/57/31/0062 Permit Version: 2 Location: Borehole At Llwyn Nwydog Farm Authority: Environment Agency, Welsh Region Abstraction: Holiday Sites; Camp Sites And Tourist Attractions: Drinking; Cooking; Sanitary; Washing; (Small Garden) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Land At Llwyn-Nwydog Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 5th July 2000 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A19NW (N)	985	3	301960 178840
	Water Abstractions Operator: J Thomas % Son Licence Number: 21/58/21/0026 Permit Version: 1 Location: Borehole At Newton House Farm Authority: Environment Agency, Welsh Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 11th December 2002 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A1SE (SW)	1980	3	300240 176260
	Groundwater Vulnerability Map Combined Classification: Secondary Superficial Aquifer - High Vulnerability Combined Vulnerability: High Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer Pollutant Speed: High Bedrock Flow: Well Connected Fractures Dilution: >550 mm/year Baseflow Index: >70% Superficial Patchiness: >90% Superficial Thickness: 3-10m Superficial Recharge: High	A13NW (SW)	0	2	301557 177854
	Bedrock Aquifer Designations Aquifer Designation: Principal Aquifer	A13NW (SW)	0	2	301557 177854
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - Undifferentiated	A13NW (NW)	0	2	301496 177901
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - Undifferentiated	A13NW (SW)	0	2	301557 177854

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
12	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 46.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NW (NW)	40	4	301481 177953
13	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 52.9 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NW (NW)	43	4	301455 177934
14	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NW (NW)	47	4	301493 177962
15	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 314.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NW (NW)	49	4	301496 177964
16	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 28.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NW (NW)	89	4	301403 177930
17	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 88.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NW (NW)	116	4	301379 177944
18	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NW (NW)	200	4	301300 177973

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
19	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 323.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NW (NW)	201	4	301299 177972
20	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 426.8 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NE (E)	206	4	301839 177938
21	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 215.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NE (E)	206	4	301839 177938
22	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NE (NE)	231	4	301777 178064
23	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 384.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NE (N)	236	4	301655 178154
24	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 45.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NE (NE)	236	4	301783 178066
25	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 100.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NE (NE)	279	4	301815 178094
26	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 34.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NE (NE)	335	4	301883 178099
27	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 902.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NW (E)	338	4	301957 177998

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
28	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 84.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NW (E)	338	4	301957 177998
29	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 135.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NE (NE)	366	4	301899 178130
30	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 14.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SE (NE)	368	4	301784 178239
31	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 386.4 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SE (N)	370	4	301648 178293
32	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 154.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SE (NE)	378	4	301812 178233
33	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 61.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NW (NE)	378	4	301950 178084
34	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SE (NE)	379	4	301798 178243
35	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 129.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NW (NE)	388	4	301922 178137
36	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thaw Cadoxton Primacy: 1	A12SE (SW)	415	4	301151 177570

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
37	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Thaw Cadoxton Primacy: 1	A12SE (SW)	418	4	301149 177568
38	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thaw Cadoxton Primacy: 1	A12SE (SW)	428	4	301146 177556
39	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 13.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thaw Cadoxton Primacy: 1	A12SE (SW)	442	4	301136 177544
40	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thaw Cadoxton Primacy: 1	A12SE (SW)	454	4	301126 177537
41	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 164.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14SW (SE)	461	4	302005 177544
42	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 64.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thaw Cadoxton Primacy: 1	A12SE (SW)	463	4	301115 177537
43	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 152.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NW (NE)	480	4	302077 178074
44	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 173.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	489	4	301952 178255
45	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	489	4	301952 178255

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
46	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	504	4	301970 178257
47	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 98.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 2	A19SW (NE)	505	4	301971 178257
48	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 45.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	505	4	301971 178257
49	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 127.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thaw Cadoxton Primacy: 1	A7NE (SW)	520	4	301085 177481
50	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	543	4	302016 178264
51	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	547	4	302021 178265
52	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 30.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 2	A19SW (NE)	557	4	302033 178266
53	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	557	4	302037 178261
54	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	557	4	302041 178257

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
55	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 40.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	559	4	302046 178254
56	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	562	4	302074 178226
57	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 74.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	566	4	302079 178226
58	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 55.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	569	4	302024 178295
59	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	569	4	302024 178295
60	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 175.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NW (E)	569	4	302181 178064
61	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	574	4	302030 178296
62	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 222.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	580	4	302037 178298
63	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 183.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SE (NE)	595	4	301887 178442

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
64	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	595	4	302009 178348
65	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 75.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	596	4	302009 178350
66	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 174.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	602	4	301956 178404
67	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 51.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	630	4	302151 178236
68	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 456.1 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Thaw Cadoxton Primacy: 1	A7NE (SW)	644	4	300993 177398
69	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 36.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thaw Cadoxton Primacy: 1	A7NE (SW)	644	4	300993 177398
70	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 278.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NE (E)	645	4	302248 178098
71	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	654	4	302021 178419
72	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 237.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	660	4	302023 178424

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
73	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 19.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	660	4	302023 178424
74	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 58.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NE (E)	665	4	302302 177996
75	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 45.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NE (E)	671	4	302299 178031
76	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	672	4	302039 178425
77	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 31.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	676	4	302202 178244
78	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 19.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	676	4	302202 178244
79	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 226.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	677	4	302042 178430
80	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 186.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	677	4	302042 178430
81	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 54.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	693	4	302220 178247

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
82	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 140.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18NW (N)	699	4	301377 178604
83	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18NW (N)	699	4	301432 178613
84	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 21.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18NW (N)	700	4	301431 178614
85	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 2.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18NW (N)	704	4	301410 178615
86	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 5.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18NW (N)	707	4	301408 178618
87	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 138.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SE (NE)	720	4	302287 178189
88	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 77.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 2	A19SE (NE)	743	4	302271 178259
89	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 157.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SE (NE)	743	4	302271 178259
90	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18NW (N)	757	4	301284 178640

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
91	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 227.6 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18NW (N)	761	4	301277 178642
92	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 78.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	763	4	301993 178575
93	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 145.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SE (NE)	772	4	302256 178335
94	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SW (NW)	799	4	300805 178320
95	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 41.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SE (NE)	823	4	302288 178377
96	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 62.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	836	4	302055 178622
97	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 81.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	836	4	302056 178621
98	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 236.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 2	A19SW (NE)	837	4	302222 178475
99	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	837	4	302222 178475

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
100	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 40.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant Dyfrgi Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SE (NE)	837	4	302310 178370
101	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 117.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	838	4	302224 178476
102	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 127.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant Dyfrgi Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SE (NE)	874	4	302349 178379
103	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 286.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	885	4	301052 178678
104	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 25.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	891	4	302115 178646
105	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NE (SE)	893	4	302452 177443
106	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 53.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	896	4	302129 178642
107	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 68.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NE (SE)	897	4	302456 177441
108	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 21.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	913	4	302121 178669

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
109	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 170.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	933	4	302131 178687
110	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	933	4	302131 178687
111	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	933	4	302133 178686
112	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 251.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SE (NE)	940	4	302454 178342
113	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 162.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant Dyfrgi Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SE (NE)	944	4	302338 178505
114	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	947	4	302149 178691
115	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 168.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NE (SE)	948	4	302520 177456
116	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 282.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NE (SE)	948	4	302520 177456
117	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	949	4	302151 178692

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
118	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 161.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	949	4	302151 178692
119	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 67.7 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SE (E)	952	4	302534 178210
120	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	961	4	302160 178699
121	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	963	4	302162 178701
122	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 224.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	969	4	302167 178705
123	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 296.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thaw Cadoxton Primacy: 1	A3NW (S)	995	4	301451 176780

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Local Authority Landfill Coverage Name: Vale Of Glamorgan County Borough Council - Has supplied landfill data		0	5	301557 177854
124	**Potentially Infilled Land (Non-Water)** Bearing Ref: NW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1974	A17NE (NW)	891	-	301048 178684
125	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1964	A13SW (W)	223	-	301270 177748
126	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1947	A9SW (SE)	800	-	302078 177167
127	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1964	A14NE (E)	873	-	302491 178098
128	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1964	A17NE (NW)	975	-	301053 178782

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Lias Group	A13NW (SW)	0	1	301557 177854
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 20 - 40 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NW (NW)	0	1	301496 177901
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13NW (SW)	0	1	301557 177854
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 40 - 60 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NW (N)	13	1	301544 177936
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NW (N)	59	1	301532 177982
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NW (NW)	60	1	301489 177973
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NE (NE)	346	1	301865 178138

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SE (NE)	436	1	301820 178297
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SW (E)	493	1	302125 177696
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 40 - 60 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SE (NE)	562	1	301853 178424
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A19NW (NE)	738	1	301928 178583
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 40 - 60 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A19SE (NE)	765	1	302286 178277
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A19NW (NE)	979	1	302000 178815

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
129	**BGS Recorded Mineral Sites** Site Name: Ffynnon Elan Location: Cowbridge, South Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 160976 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Brofiscin Oolite Formation Commodity: Limestone Positional Accuracy: Located by supplier to within 10m	A18SE (N)	305	1	301569 178232
130	**BGS Recorded Mineral Sites** Site Name: Fflad Location: Cowbridge, South Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 160979 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Jurassic Geology: Blue Lias Formation (Marginal Facies) Commodity: Limestone Positional Accuracy: Located by supplier to within 10m	A7SE (SW)	804	1	301143 177061
131	**BGS Recorded Mineral Sites** Site Name: Ty'N-Y-Pant Sand Pit Location: Cowbridge, South Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 160986 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Quaternary, Devensian Geology: Till, Devensian Commodity: Sand Positional Accuracy: Located by supplier to within 10m	A17NE (NW)	897	1	301051 178692
	BGS Measured Urban Soil Chemistry No data available				
	BGS Urban Soil Chemistry Averages No data available				
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Non Coal Mining Areas of Great Britain Risk: Highly Unlikely Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	59	1	301532 177982
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	1	301557 177854
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	1	301557 177854
	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	13	1	301544 177936
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	1	301557 177854
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	301498 177916
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	60	1	301489 177973
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	239	1	301637 178162

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	1	301557 177854
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	104	1	301466 178014
	Potential for Landslide Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	189	1	301458 178099
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	199	1	301290 177931
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	231	1	301368 178105
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	1	301557 177854
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	13	1	301544 177936
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	1	301557 177854
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	13	1	301544 177936
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	1	301557 177854
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Higher probability radon area (10 to 30% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	301524 177900
	Radon Potential - Radon Affected Areas Affected Area: The property is in an Intermediate probability radon area (5 to 10% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	0	1	301549 177854
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	1	301557 177854
	Radon Potential - Radon Protection Measures Protection Measure: Full radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	301524 177900
	Radon Potential - Radon Protection Measures Protection Measure: Basic radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	0	1	301549 177854

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
132	**Contemporary Trade Directory Entries** Name: Tudor Garage Ltd Location: Ystradowen, Cowbridge, South Glamorgan, CF71 7SY Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	50	-	301466 177953
133	**Contemporary Trade Directory Entries** Name: South Wales Location: 3, St. Owains Crescent, Ystradowen, Cowbridge, South Glamorgan, CF71 7TB Classification: Car Radiator Servicing & Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	76	-	301451 177737
134	**Fuel Station Entries** Name: Tudor Garage Location: A4222 , Ystradowen , Cowbridge, The Vale Of Glamorgan, CF71 7SY Brand: Murco Premises Type: Petrol Station **Status: Open** Positional Accuracy: Manually positioned to the address or location	A13NW (NW)	67	-	301452 177964
135	**Points of Interest - Commercial Services** Name: Tudor Garage Ltd Location: Ystradowen, Cowbridge, CF71 7SY Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13NW (NW)	49	6	301466 177952
135	**Points of Interest - Commercial Services** Name: Tudor Garage Ltd Location: Ystradowen, Cowbridge, CF71 7SY Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13NW (NW)	50	6	301466 177953
136	**Points of Interest - Commercial Services** Name: South Wales Radiator Services Location: 3 St. Owains Crescent, Ystradowen, Cowbridge, CF71 7TB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13SW (SW)	76	6	301451 177737
136	**Points of Interest - Commercial Services** Name: South Wales Radiator Services Location: 3 St. Owains Crescent, Ystradowen, Cowbridge, CF71 7TB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13SW (SW)	76	6	301451 177737
137	**Points of Interest - Manufacturing and Production** Name: Lime Kiln (Disused) Location: CF71 Category: Industrial Features Class Code: Lime Kilns Positional Accuracy: Positioned to address or location	A18SE (N)	261	6	301576 178188
137	**Points of Interest - Manufacturing and Production** Name: Limekiln (Disused) Location: CF71 Category: Industrial Features Class Code: Lime Kilns Positional Accuracy: Positioned to an adjacent address or location	A18SW (N)	266	6	301547 178190
137	**Points of Interest - Manufacturing and Production** Name: Quarry (Disused) Location: CF71 Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to an adjacent address or location	A18SW (N)	316	6	301539 178239
138	**Points of Interest - Manufacturing and Production** Name: Tank Location: CF71 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A7NW (SW)	862	6	300721 177419

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
139	**Points of Interest - Manufacturing and Production** Name: Limekiln (Disused) Location: CF71 Category: Industrial Features Class Code: Lime Kilns Positional Accuracy: Positioned to an adjacent address or location	A9SW (SE)	879	6	302143 177114
139	**Points of Interest - Manufacturing and Production** Name: Lime Kiln (Disused) Location: CF71 Category: Industrial Features Class Code: Lime Kilns Positional Accuracy: Positioned to an adjacent address or location	A9SW (SE)	880	6	302143 177113
140	**Points of Interest - Manufacturing and Production** Name: Poultry Houses Location: CF71 Category: Farming Class Code: Poultry Farming, Equipment and Supplies Positional Accuracy: Positioned to address or location	A8SE (S)	896	6	301664 176889
141	**Points of Interest - Public Infrastructure** Name: Filter Bed Location: CF71 Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to an adjacent address or location	A13NW (NW)	15	6	301517 177934
141	**Points of Interest - Public Infrastructure** Name: Tudor Garage Location: A4222 Ystradowen, Cowbridge, CF71 7SY Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A13NW (NW)	67	6	301452 177964
142	**Points of Interest - Public Infrastructure** Name: Sewage Pumping Station Location: CF71 Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to an adjacent address or location	A13SE (E)	59	6	301714 177839
143	**Points of Interest - Recreational and Environmental** Name: Play Area Location: Badgers Brook Drive, CF71 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A13SW (SW)	85	6	301478 177698
143	**Points of Interest - Recreational and Environmental** Name: Play Area Location: CF71 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13SW (SW)	117	6	301435 177691

Sensitive Land Use

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
144	**Ancient Woodland** Name: Not Supplied Reference: 18127 Area(m²): 11072.24 Type: Ancient and Semi-Natural Woodland	A13NW (W)	193	2	301295 177907
145	**Ancient Woodland** Name: Not Supplied Reference: 18128 Area(m²): 6018.87 Type: Ancient and Semi-Natural Woodland	A12NE (NW)	494	2	301030 178093
146	**Ancient Woodland** Name: Not Supplied Reference: 14715 Area(m²): 9928.5 Type: Ancient and Semi-Natural Woodland	A14SW (E)	509	2	302145 177706
147	**Ancient Woodland** Name: Not Supplied Reference: 14721 Area(m²): 18622.32 Type: Ancient and Semi-Natural Woodland	A19NW (NE)	753	2	301946 178590
148	**Ancient Woodland** Name: Not Supplied Reference: 21662 Area(m²): 5576.57 Type: Restored Ancient Woodland Site	A17NE (NW)	924	2	301030 178711

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices		
Vale Of Glamorgan County Borough Council - Environmental Health Department	January 2020	Annual Rolling Update
Rhondda Cynon Taff County Borough Council - Environmental Services	October 2017	Annual Rolling Update
Discharge Consents		
Environment Agency - Welsh Region	August 2014	Quarterly
Natural Resources Wales	November 2019	Quarterly
Enforcement and Prohibition Notices		
Environment Agency - Welsh Region	March 2013	Annual Rolling Update
Integrated Pollution Controls		
Environment Agency - Welsh Region	October 2008	Variable
Integrated Pollution Prevention And Control		
Natural Resources Wales	November 2019	Quarterly
Environment Agency - Welsh Region	October 2019	Quarterly
Local Authority Integrated Pollution Prevention And Control		
Vale Of Glamorgan County Borough Council - Environmental Health Department	June 2014	Variable
Rhondda Cynon Taff County Borough Council - Public Health and Protection Division	September 2014	Variable
Local Authority Pollution Prevention and Controls		
Vale Of Glamorgan County Borough Council - Environmental Health Department	June 2014	Annual Rolling Update
Rhondda Cynon Taff County Borough Council - Public Health and Protection Division	September 2014	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements		
Vale Of Glamorgan County Borough Council - Environmental Health Department	June 2014	Variable
Rhondda Cynon Taff County Borough Council - Public Health and Protection Division	September 2014	Variable
Nearest Surface Water Feature		
Ordnance Survey	November 2019	
Pollution Incidents to Controlled Waters		
Environment Agency - Welsh Region	December 1998	Not Applicable
Prosecutions Relating to Authorised Processes		
Environment Agency - Welsh Region	March 2013	Annual Rolling Update
Natural Resources Wales	March 2013	Annual Rolling Update
Prosecutions Relating to Controlled Waters		
Environment Agency - Welsh Region	March 2013	Annual Rolling Update
Natural Resources Wales	March 2013	Annual Rolling Update
Registered Radioactive Substances		
Natural Resources Wales	January 2015	Annually
Environment Agency - Welsh Region	June 2016	
Substantiated Pollution Incident Register		
Environment Agency Wales - South East Area	October 2019	Quarterly
Natural Resources Wales	October 2019	Quarterly
Water Abstractions		
Natural Resources Wales	November 2019	Quarterly
Environment Agency - Welsh Region	October 2019	Quarterly
Water Industry Act Referrals		
Natural Resources Wales	November 2019	Quarterly
Environment Agency - Welsh Region	October 2017	Quarterly
Groundwater Vulnerability Map		
Natural Resources Wales	June 2018	As notified
Bedrock Aquifer Designations		
Natural Resources Wales	January 2018	Annually
Superficial Aquifer Designations		
Natural Resources Wales	January 2018	Annually
Source Protection Zones		
Natural Resources Wales	November 2016	Annual Rolling Update

Data Currency

Agency & Hydrological	Version	Update Cycle
Extreme Flooding from Rivers or Sea without Defences Natural Resources Wales	August 2019	Quarterly
Flooding from Rivers or Sea without Defences Natural Resources Wales	November 2019	Quarterly
Areas Benefiting from Flood Defences Natural Resources Wales	November 2019	Quarterly
Flood Water Storage Areas Natural Resources Wales	August 2019	Quarterly
Flood Defences Natural Resources Wales	November 2019	Quarterly
OS Water Network Lines Ordnance Survey	October 2019	Quarterly
Surface Water 1 in 30 year Flood Extent Natural Resources Wales	October 2013	Annually
Surface Water 1 in 100 year Flood Extent Natural Resources Wales	October 2013	Annually
Surface Water 1 in 1000 year Flood Extent Natural Resources Wales	October 2013	Annually
Surface Water Suitability Natural Resources Wales	October 2013	Annually
BGS Groundwater Flooding Susceptibility British Geological Survey - National Geoscience Information Service	May 2013	Annually

Data Currency

Waste	Version	Update Cycle
BGS Recorded Landfill Sites		
British Geological Survey - National Geoscience Information Service	June 1996	Not Applicable
Historical Landfill Sites		
Natural Resources Wales	July 2017	Quarterly
Integrated Pollution Control Registered Waste Sites		
Environment Agency - Welsh Region	October 2008	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries)		
Environment Agency Wales - South East Area	November 2019	Quarterly
Natural Resources Wales	November 2019	Quarterly
Licensed Waste Management Facilities (Locations)		
Natural Resources Wales	November 2019	Quarterly
Environment Agency Wales - South East Area	October 2019	Quarterly
Local Authority Landfill Coverage		
Rhondda Cynon Taff County Borough Council	May 2000	Not Applicable
Vale Of Glamorgan County Borough Council	May 2000	Not Applicable
Local Authority Recorded Landfill Sites		
Rhondda Cynon Taff County Borough Council	May 2000	Not Applicable
Vale Of Glamorgan County Borough Council	May 2000	Not Applicable
Potentially Infilled Land (Non-Water)		
Landmark Information Group Limited	December 1999	Not Applicable
Potentially Infilled Land (Water)		
Landmark Information Group Limited	December 1999	Not Applicable
Registered Landfill Sites		
Environment Agency Wales - South East Area	March 2003	Not Applicable
Registered Waste Transfer Sites		
Environment Agency Wales - South East Area	March 2003	Not Applicable
Registered Waste Treatment or Disposal Sites		
Environment Agency Wales - South East Area	March 2003	Not Applicable
Hazardous Substances	**Version**	**Update Cycle**
Control of Major Accident Hazards Sites (COMAH)		
Health and Safety Executive	April 2018	Bi-Annually
Explosive Sites		
Health and Safety Executive	March 2017	Annually
Notification of Installations Handling Hazardous Substances (NIHHS)		
Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements		
Rhondda Cynon Taff County Borough Council - Planning Department	February 2016	Variable
Vale Of Glamorgan County Borough Council - Planning Department	January 2016	Variable
Planning Hazardous Substance Consents		
Rhondda Cynon Taff County Borough Council - Planning Department	February 2016	Variable
Vale Of Glamorgan County Borough Council - Planning Department	January 2016	Variable

Data Currency

Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	Not Applicable
BGS Estimated Soil Chemistry British Geological Survey - National Geoscience Information Service	October 2015	Annually
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	October 2019	Bi-Annually
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011	Not Applicable
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	Annual Rolling Update
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	Annually
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	Annually
Industrial Land Use	**Version**	**Update Cycle**
Contemporary Trade Directory Entries Thomson Directories	October 2019	Quarterly
Fuel Station Entries Catalist Ltd - Experian	December 2019	Quarterly
Gas Pipelines National Grid	July 2014	
Points of Interest - Commercial Services PointX	December 2019	Quarterly
Points of Interest - Education and Health PointX	December 2019	Quarterly
Points of Interest - Manufacturing and Production PointX	December 2019	Quarterly
Points of Interest - Public Infrastructure PointX	December 2019	Quarterly
Points of Interest - Recreational and Environmental PointX	December 2019	Quarterly
Underground Electrical Cables National Grid	December 2015	

Data Currency

Sensitive Land Use	Version	Update Cycle
Ancient Woodland		
Natural Resources Wales	August 2018	Bi-Annually
Areas of Adopted Green Belt		
Rhondda Cynon Taff County Borough Council	November 2019	As notified
Vale Of Glamorgan County Borough Council	November 2019	As notified
Areas of Unadopted Green Belt		
Rhondda Cynon Taff County Borough Council	November 2019	As notified
Vale Of Glamorgan County Borough Council	November 2019	As notified
Areas of Outstanding Natural Beauty		
Natural Resources Wales	June 2019	Bi-Annually
Environmentally Sensitive Areas		
The National Assembly for Wales - GI Services (Department of Planning & Countryside)	January 2017	
Forest Parks		
Forestry Commission	April 1997	Not Applicable
Local Nature Reserves		
Rhondda Cynon Taff County Borough Council	August 2018	Bi-Annually
Vale Of Glamorgan County Borough Council	August 2018	Bi-Annually
Marine Nature Reserves		
Natural Resources Wales	August 2018	Bi-Annually
National Nature Reserves		
Natural Resources Wales	June 2019	Bi-Annually
National Parks		
Natural Resources Wales	August 2018	Annually
Nitrate Vulnerable Zones		
Natural Resources Wales	July 2019	Bi-Annually
The National Assembly for Wales - GI Services (Department of Planning & Countryside)	October 2005	
Ramsar Sites		
Natural Resources Wales	July 2019	Bi-Annually
Sites of Special Scientific Interest		
Natural Resources Wales	March 2019	Bi-Annually
Special Areas of Conservation		
Natural Resources Wales	August 2018	Bi-Annually
Special Protection Areas		
Natural Resources Wales	August 2018	Bi-Annually

Data Suppliers

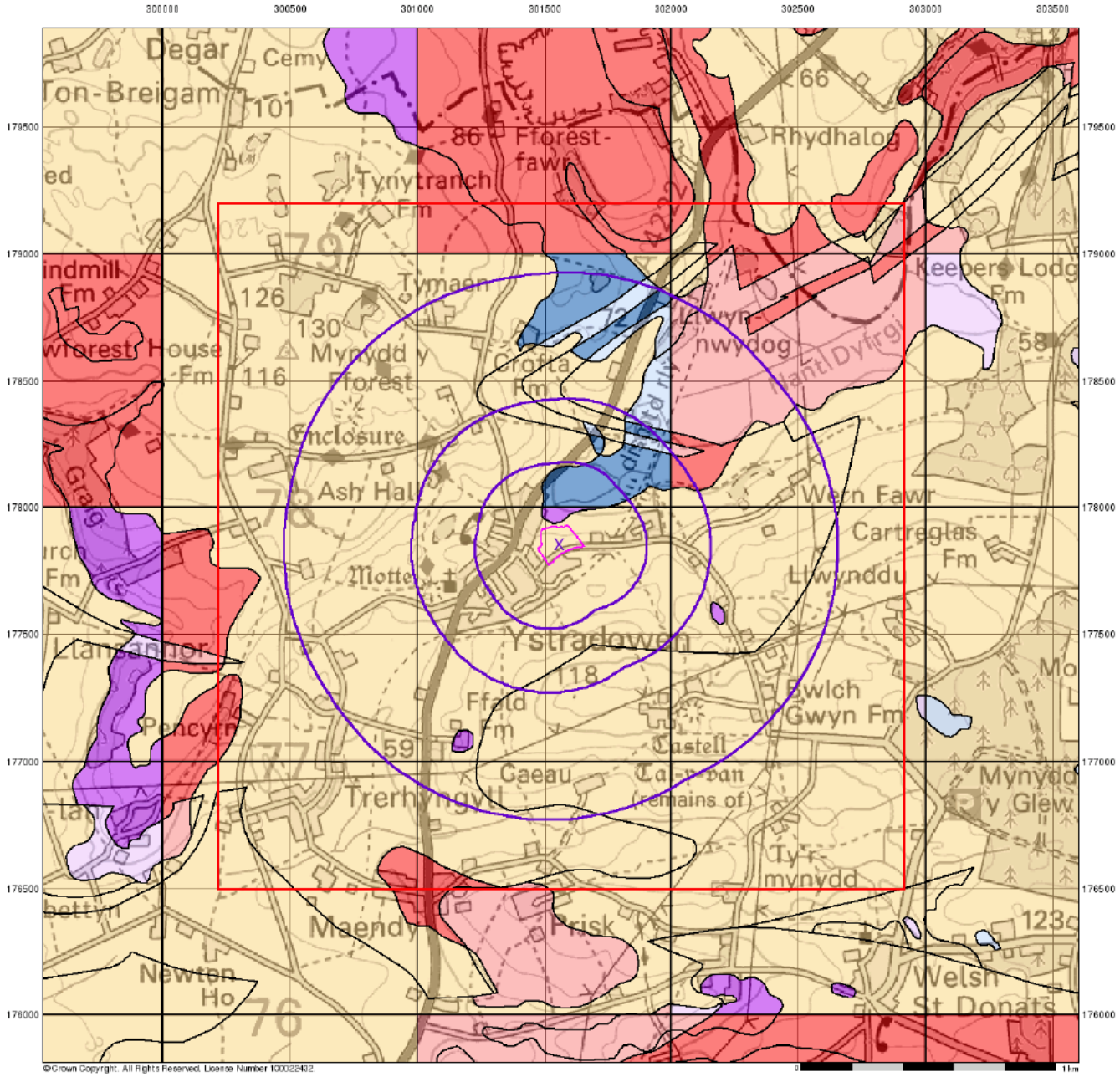
A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	
Centre for Ecology and Hydrology	
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Peter Brett Associates	

Useful Contacts

Contact	Name and Address	Contact Details
1	**British Geological Survey - Enquiry Service** British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	**Natural Resources Wales** Ty Cambria, 29 Newport Road, Cardiff, CF24 0TP	Telephone: 0300 065 3000 Email: enquiries@naturalresourceswales.gov.uk
3	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
4	**Ordnance Survey** Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.gov.uk
5	**Vale Of Glamorgan County Borough Council** Civic Offices, Holton Road, Barry, South Glamorgan, CF63 4RU	Telephone: 01446 700111 Fax: 01446 745566 Website: www.valeofglamorgan.gov.uk
6	**PointX** 7 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY	Website: www.pointx.co.uk
-	**Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards** Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.



Intégral Géotechnique

Groundwater Vulnerability

General

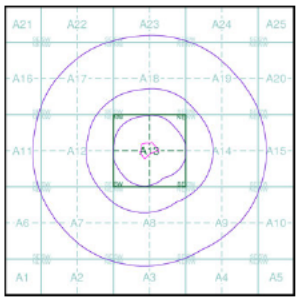
Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

Bedrock Aquifers	Superficial Aquifers
High Vulnerability, Principal Aquifer	High Vulnerability, Principal Aquifer
High Vulnerability, Secondary Aquifer	High Vulnerability, Secondary Aquifer
Medium Vulnerability, Principal Aquifer	Medium Vulnerability, Principal Aquifer
Medium Vulnerability, Secondary Aquifer	Medium Vulnerability, Secondary Aquifer
Low Vulnerability, Principal Aquifer	Low Vulnerability, Principal Aquifer
Low Vulnerability, Secondary Aquifer	Low Vulnerability, Secondary Aquifer

Unproductive Aquifer
Soluble Rock

Site Sensitivity Context Map - Slice A



Order Details

Order Number:	231826780_1_1
Customer Ref:	12604/LP
National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	1000

Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW

Landmark INFORMATION GROUP
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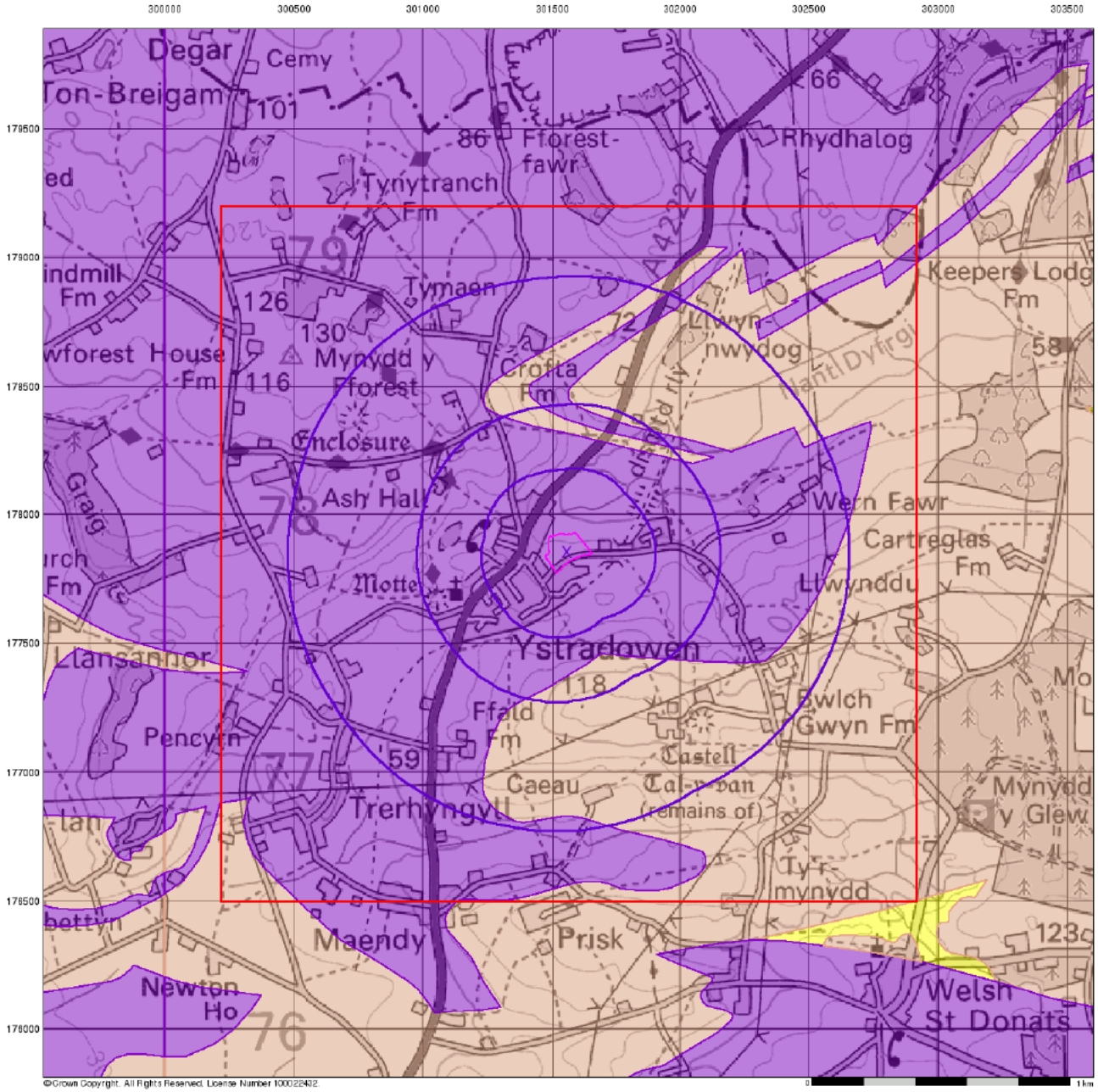


Intégral
Géotechnique

Bedrock Aquifer Designation

General

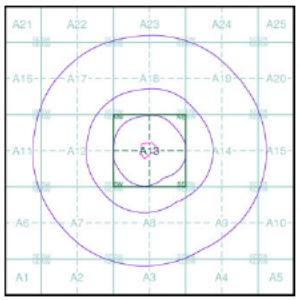
Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



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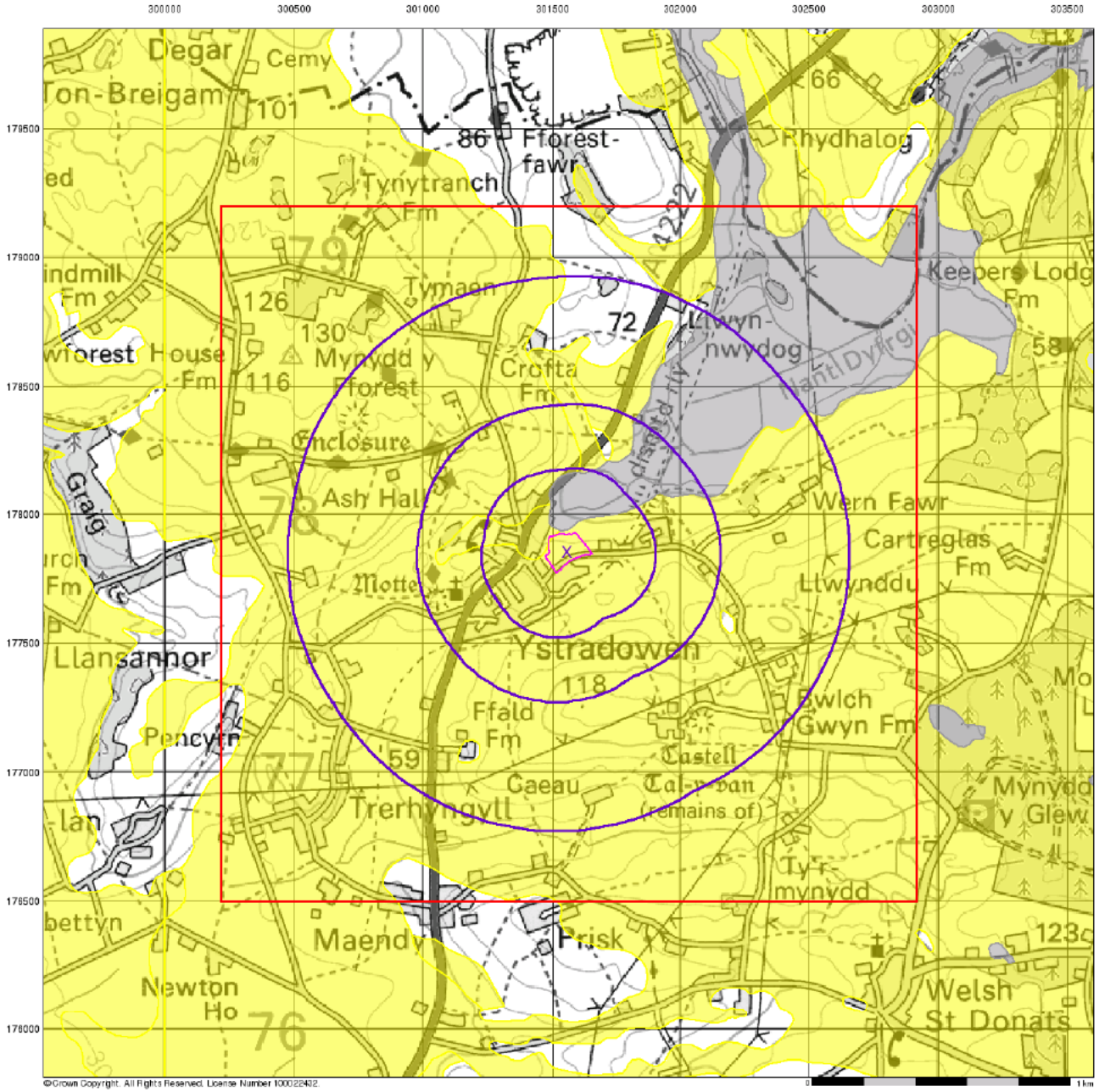


Intégral Géotechnique

Superficial Aquifer Designation

General

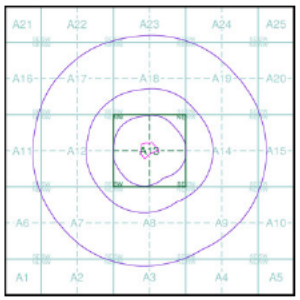
Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



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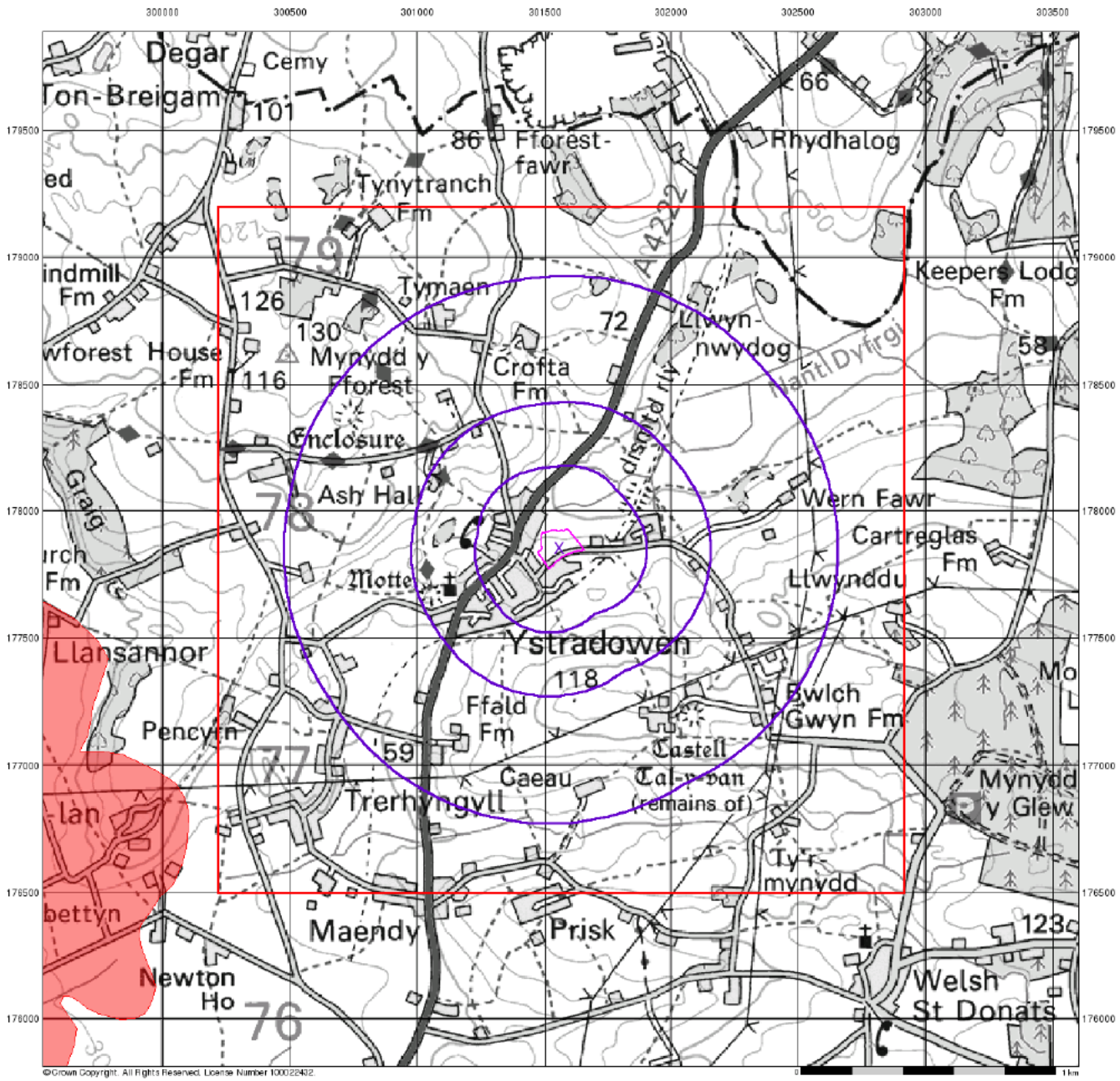


Intégral Géotechnique

Source Protection Zones

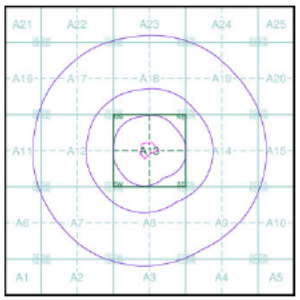
General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

Site Sensitivity Context Map - Slice A



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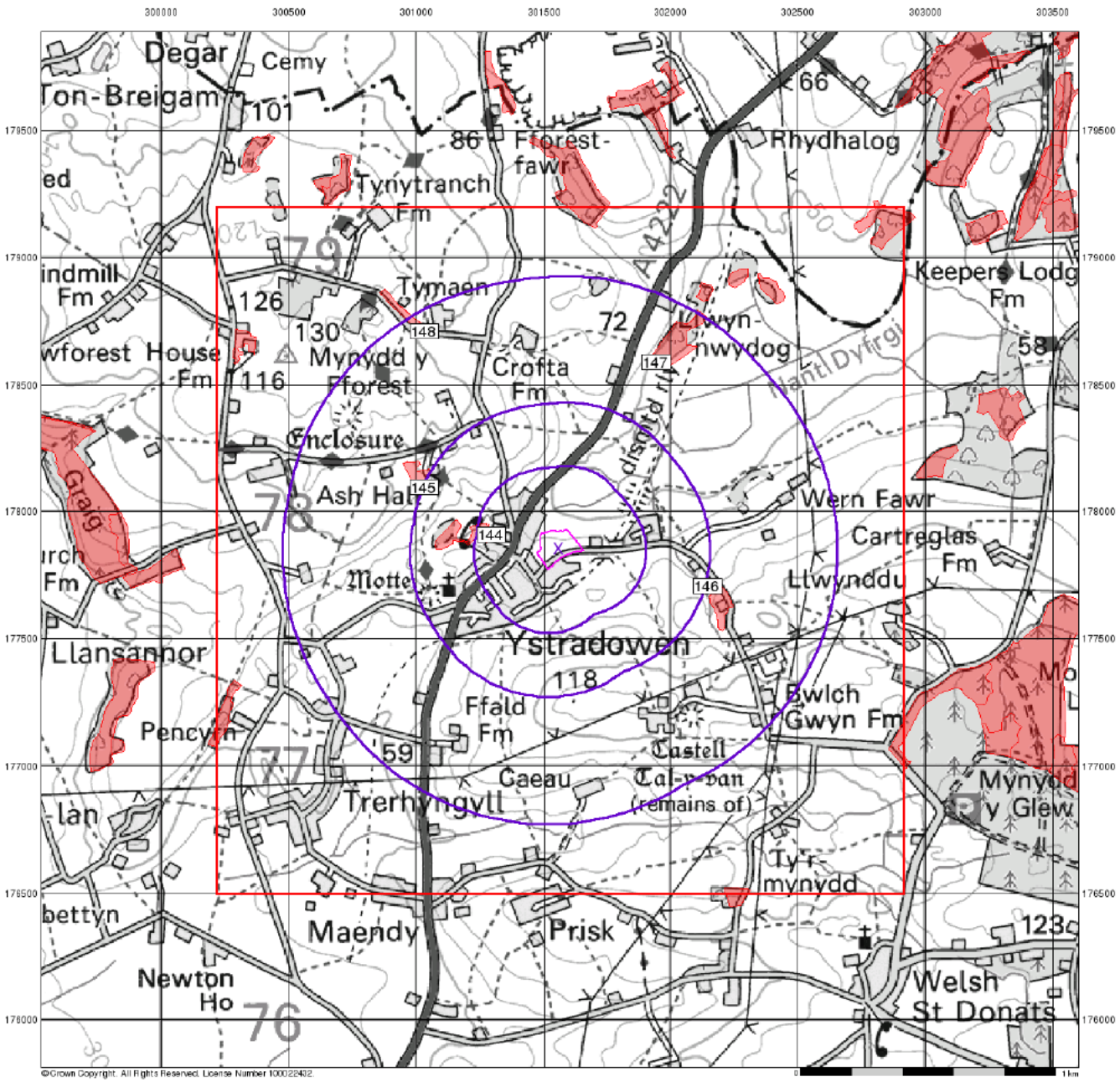


Intégral Géotechnique

Sensitive Land Uses

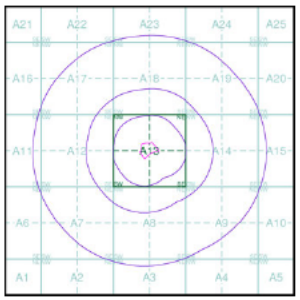
General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Sensitive Land Uses

- Ancient Woodland
- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area
- World Heritage Sites

Site Sensitivity Context Map - Slice A



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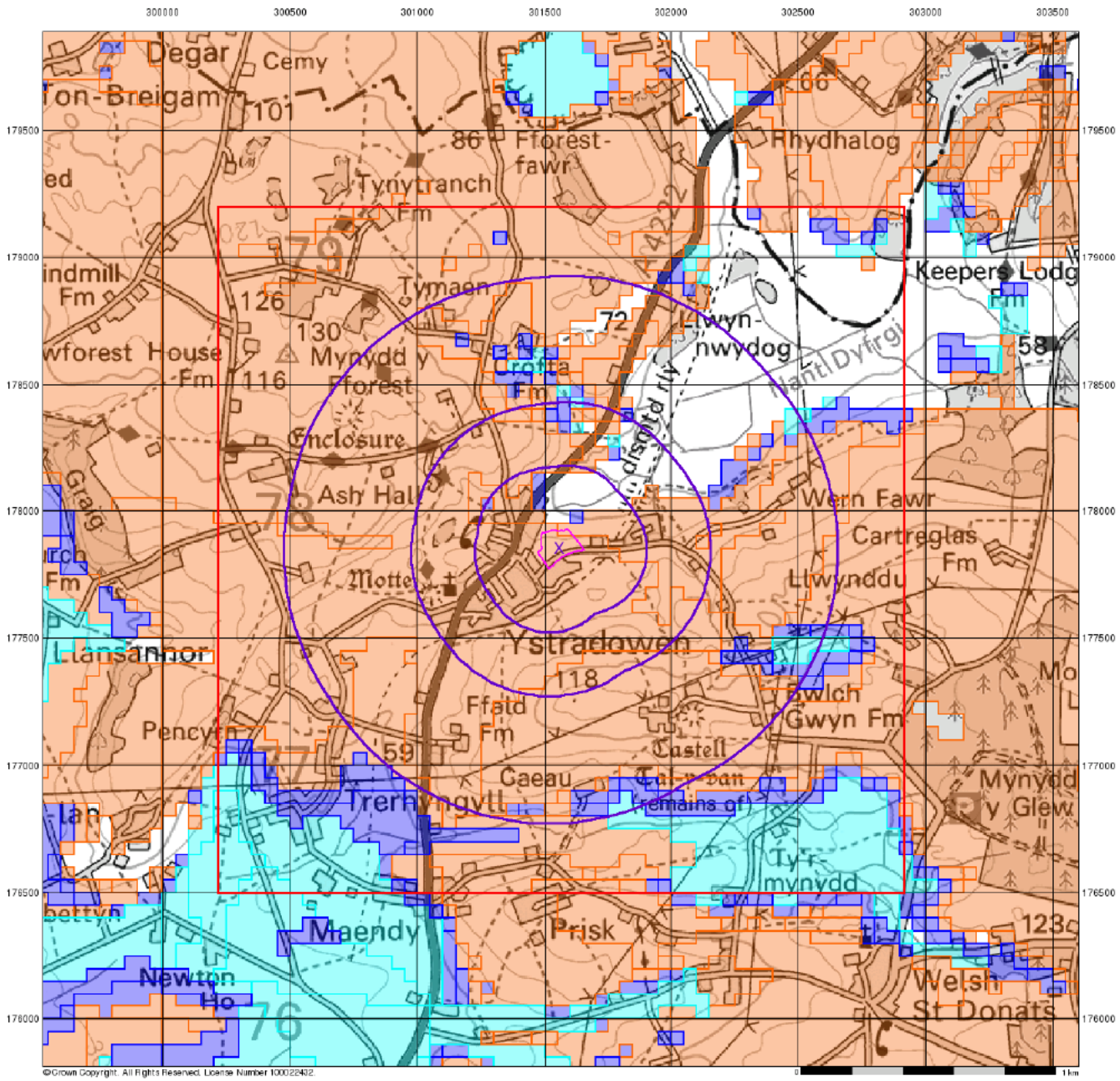


Intégral
Géotechnique

BGS Flood GFS Data

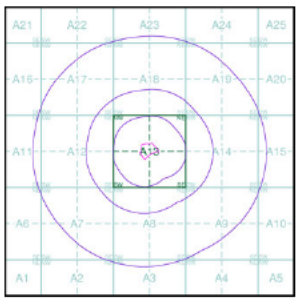
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



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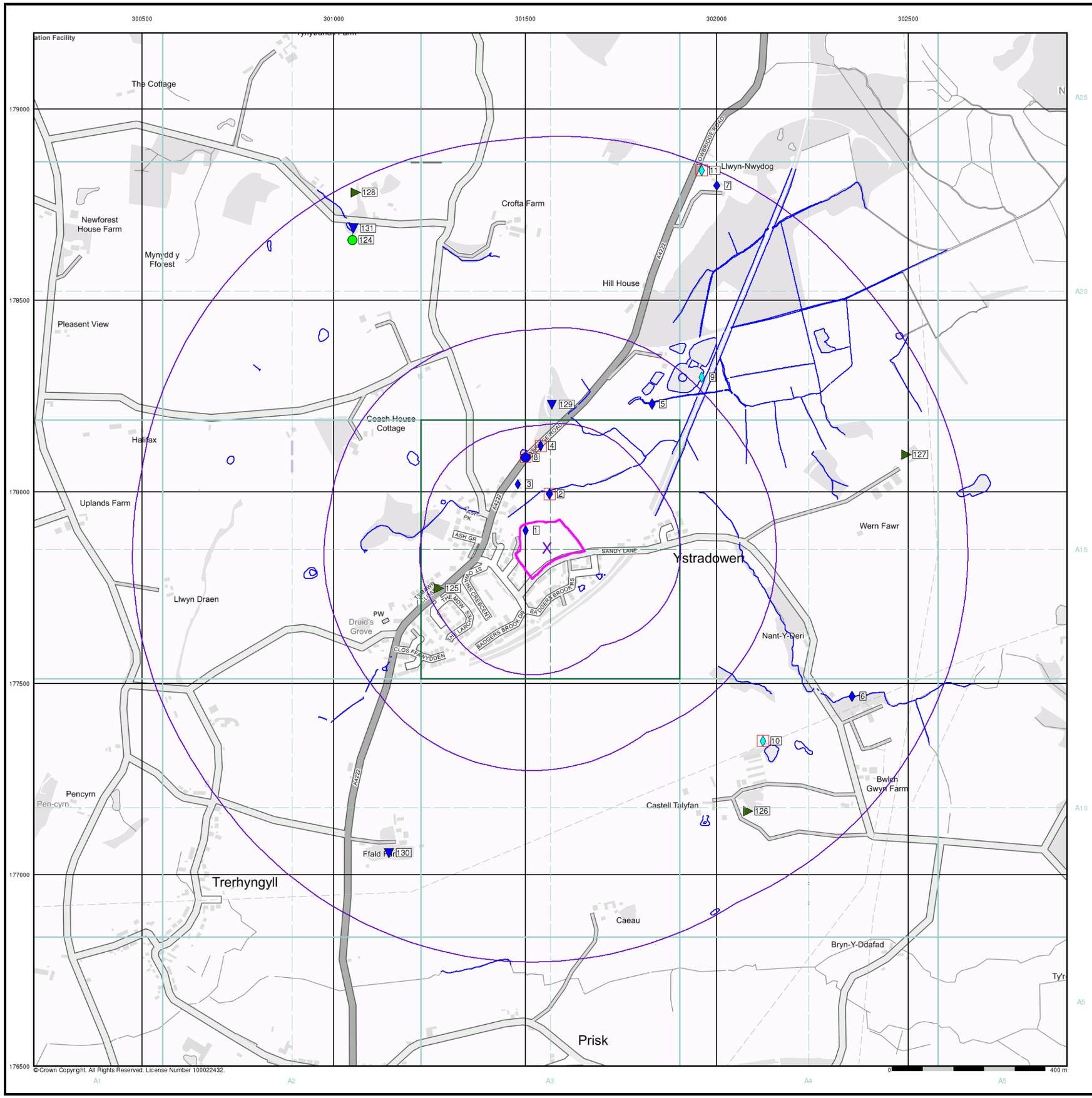


Intégral Géotechnique

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

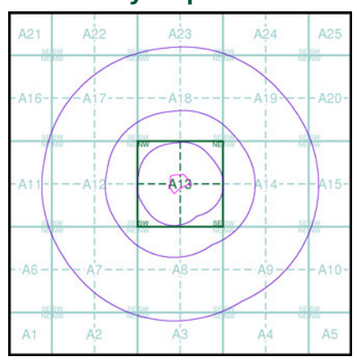
Geological

- BGS Recorded Mineral Site

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Slice A



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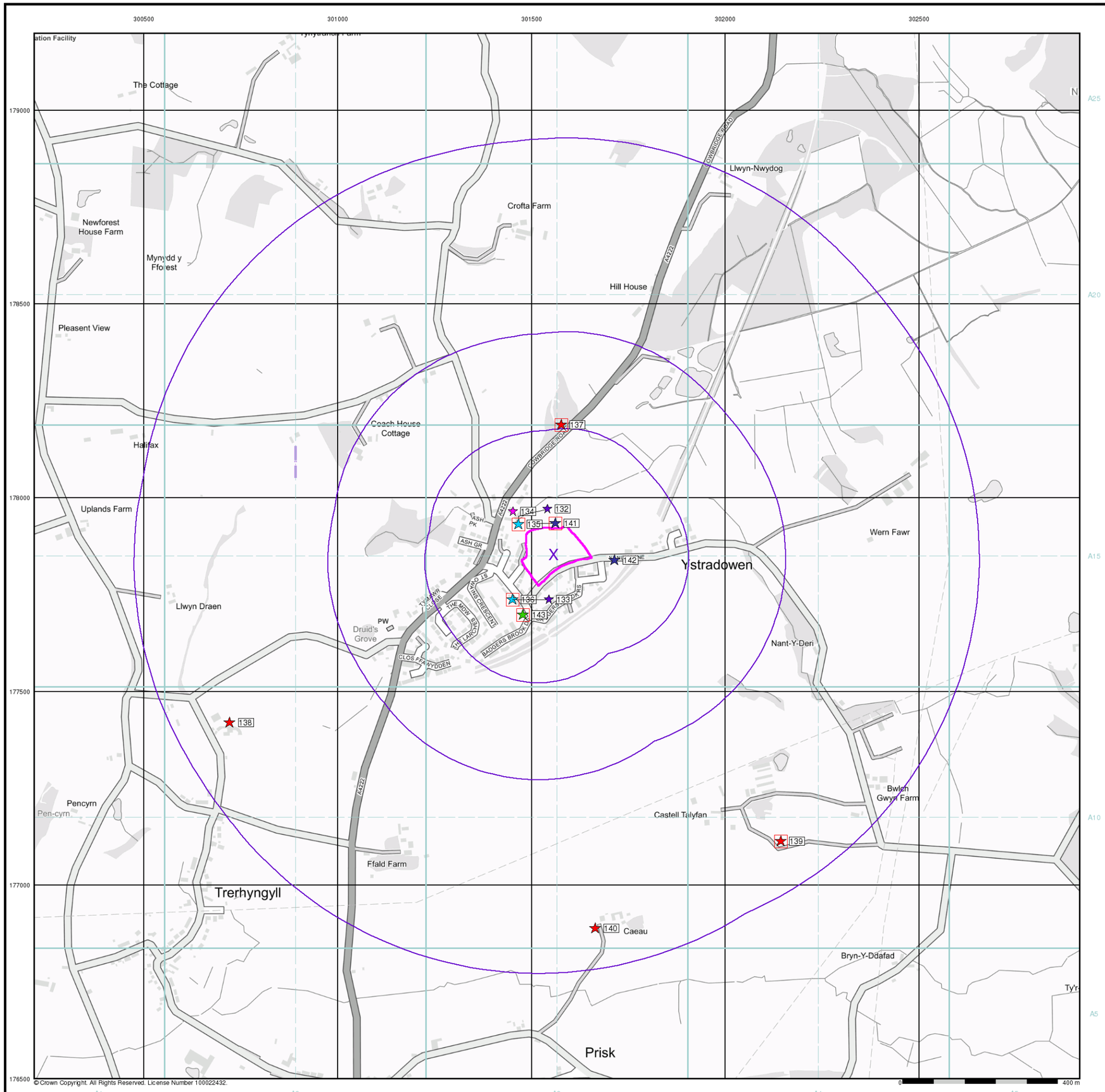


Intégral Géotechnique

Industrial Land Use Map

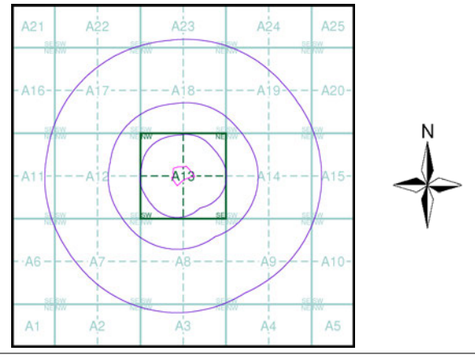
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Gas Pipeline
- Points of Interest - Commercial Services
- Points of Interest - Education and Health
- Points of Interest - Manufacturing and Production
- Points of Interest - Public Infrastructure
- Points of Interest - Recreational and Environmental
- Underground Electrical Cables

Industrial Land Use Map - Slice A



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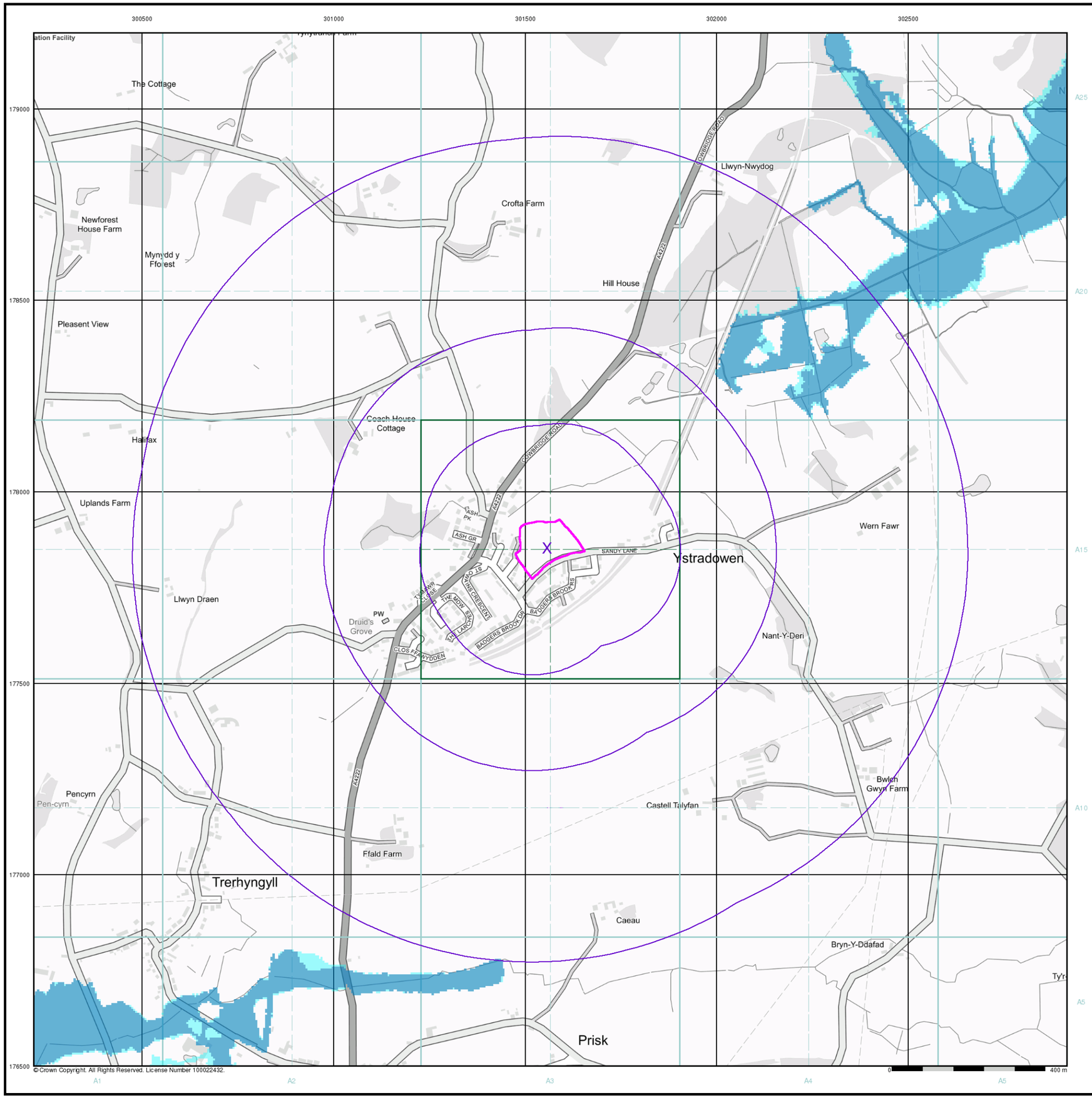


Intégral Géotechnique

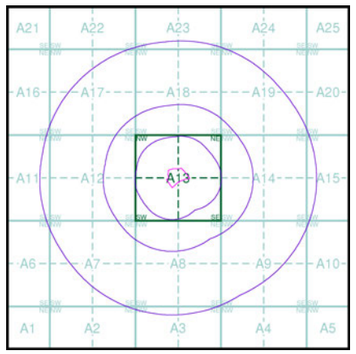
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



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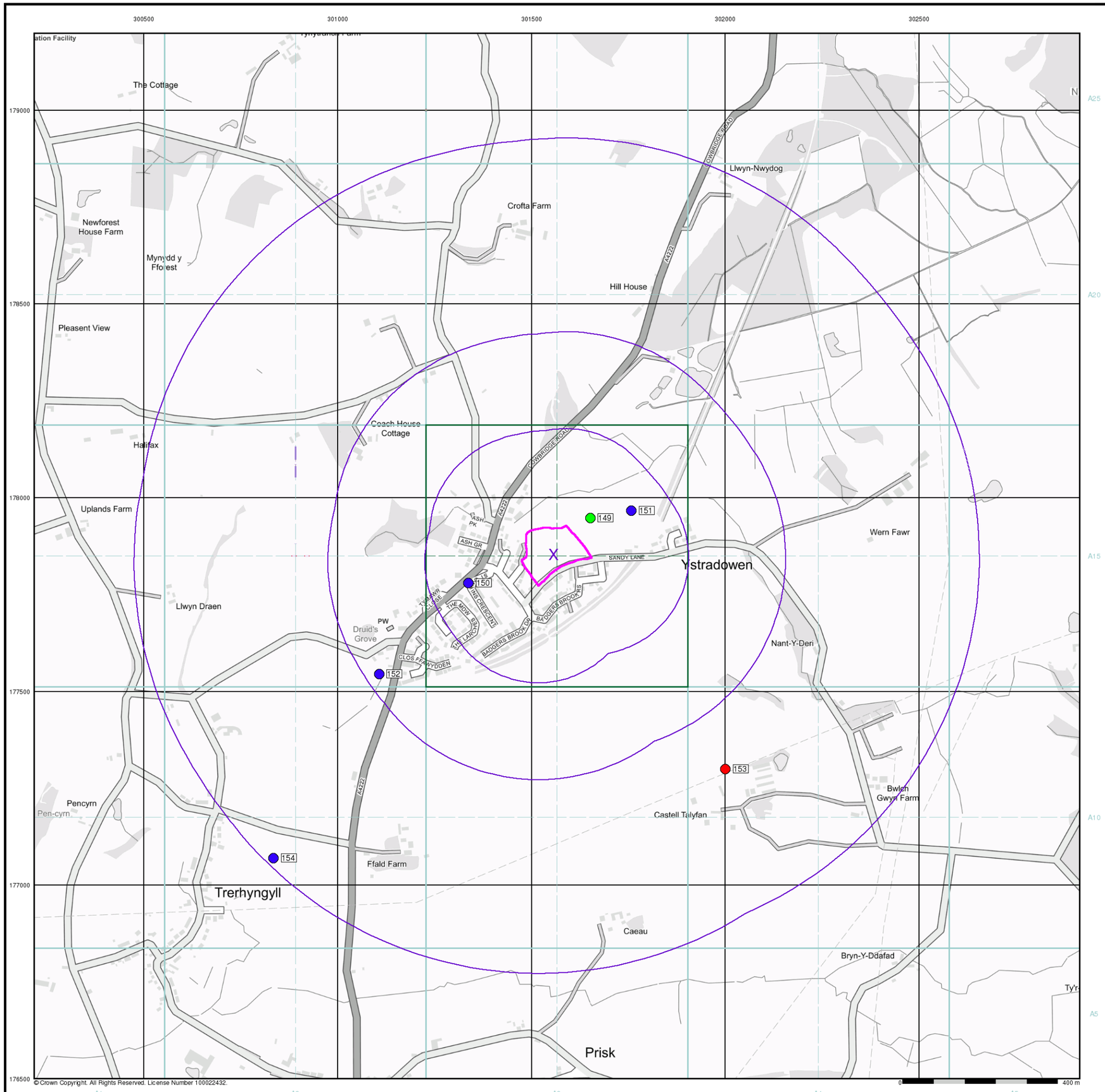


Intégral Géotechnique

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

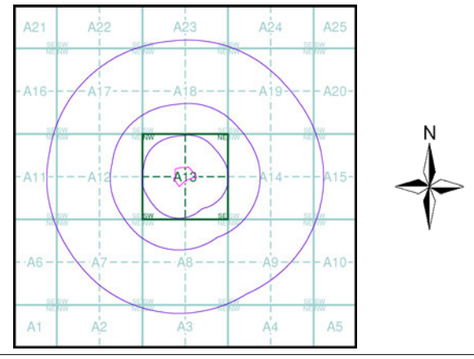
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



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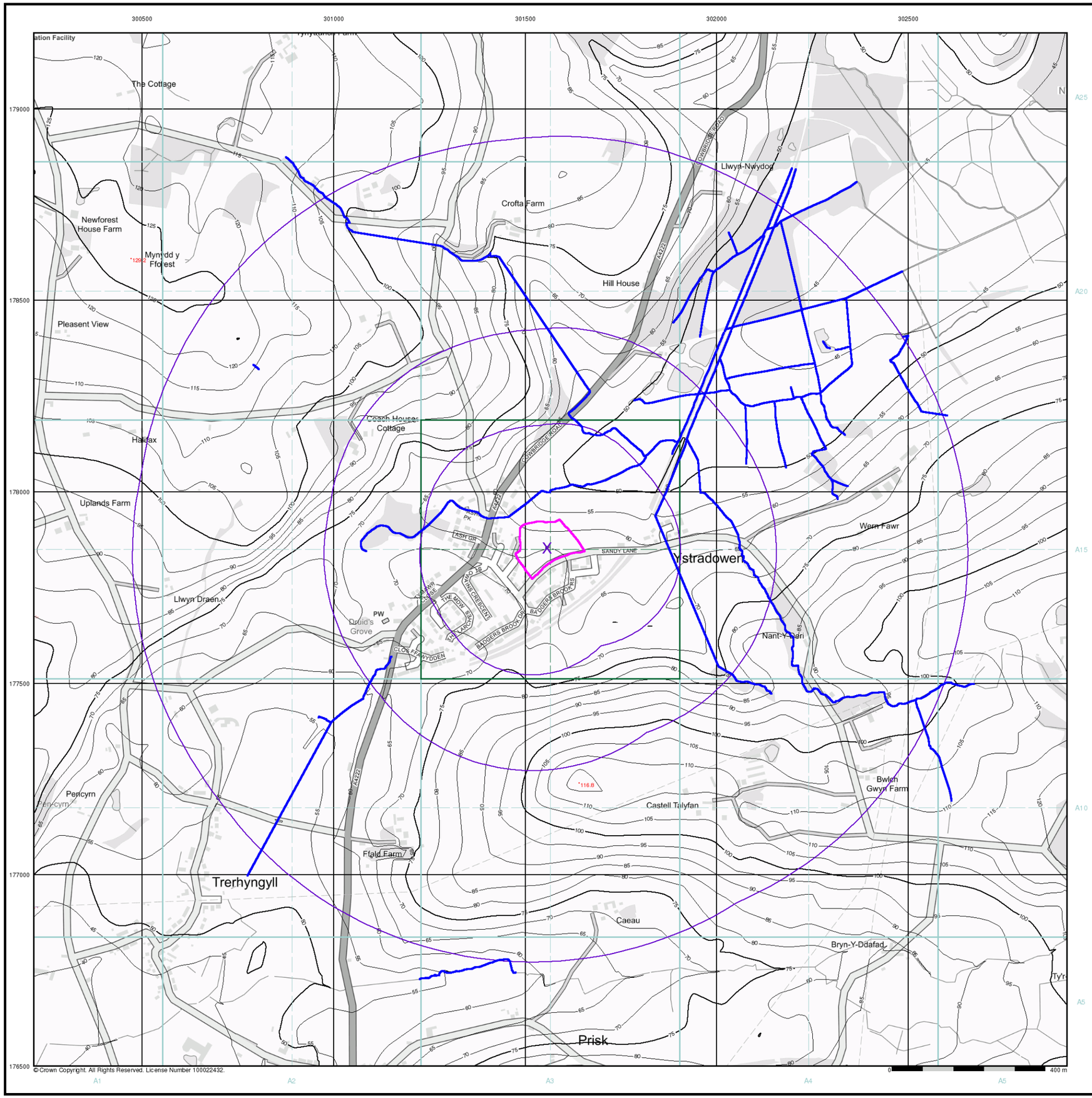


Intégral Géotechnique

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

OS Water Network Data

- Canal
- Reservoir
- Foreshore
- Marsh
- Tidal River
- Inland River
- Drain
- Other
- Lake
- Transfer
- Lock Or Flight Of Locks
- Sea

Contours (height in meters)

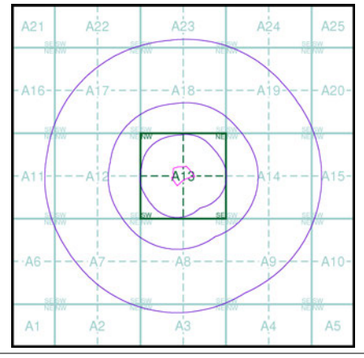
Standard Contour 105 100 95

Master Contour

Spot Height 167.3

- MLW Mean Low Water
- MHW Mean High Water

OS Water Network Map - Slice A



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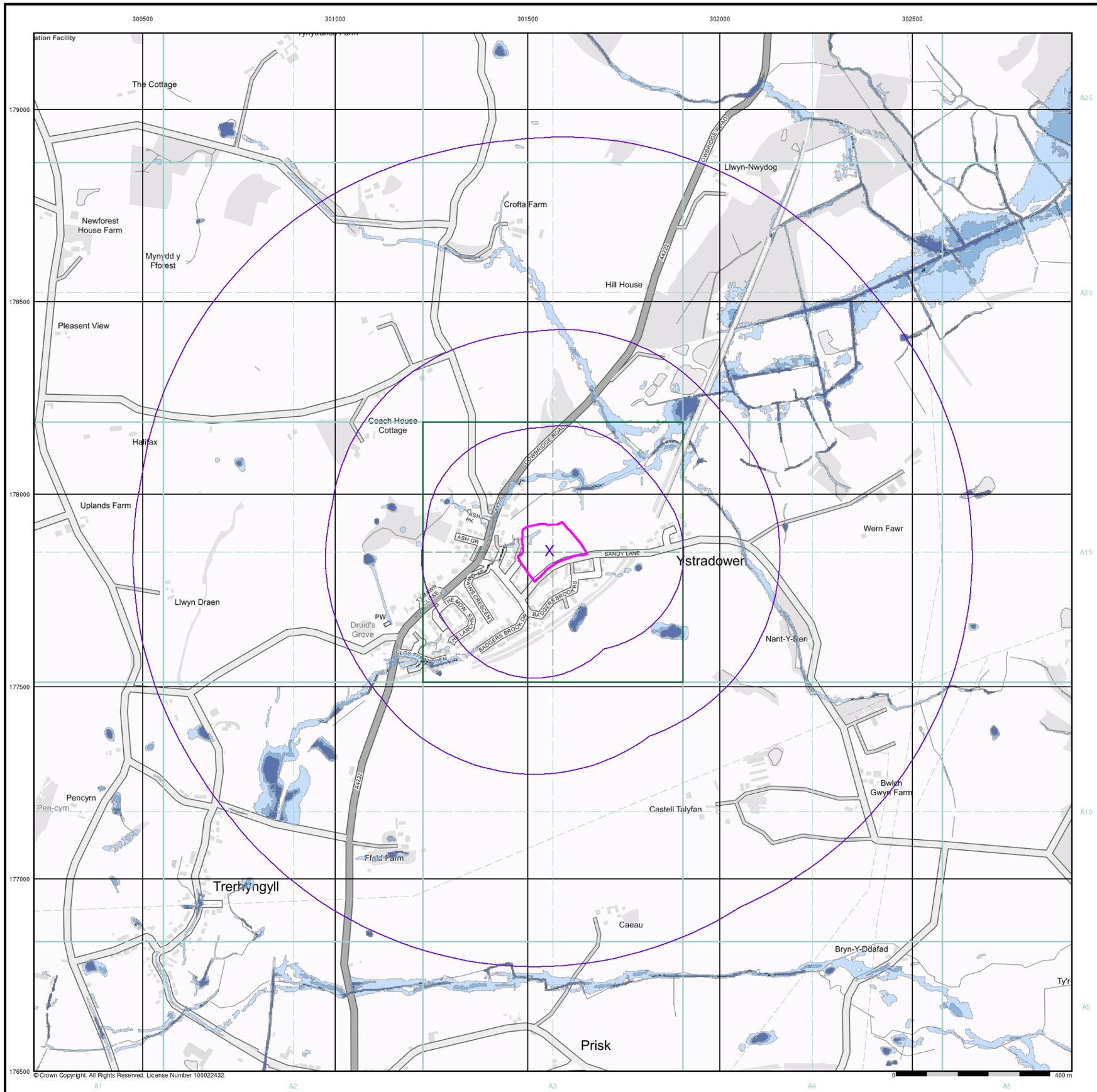


Intégral Géotechnique

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Risk of Flooding from Surface Water

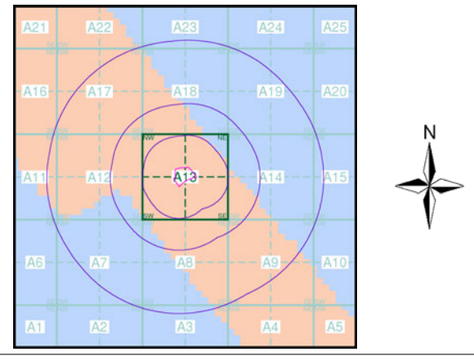
- High - 30 Year Return
- Medium - 100 Year Return
- Low - 1000 Year Return

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

EA/NRW Suitability Map - Slice A



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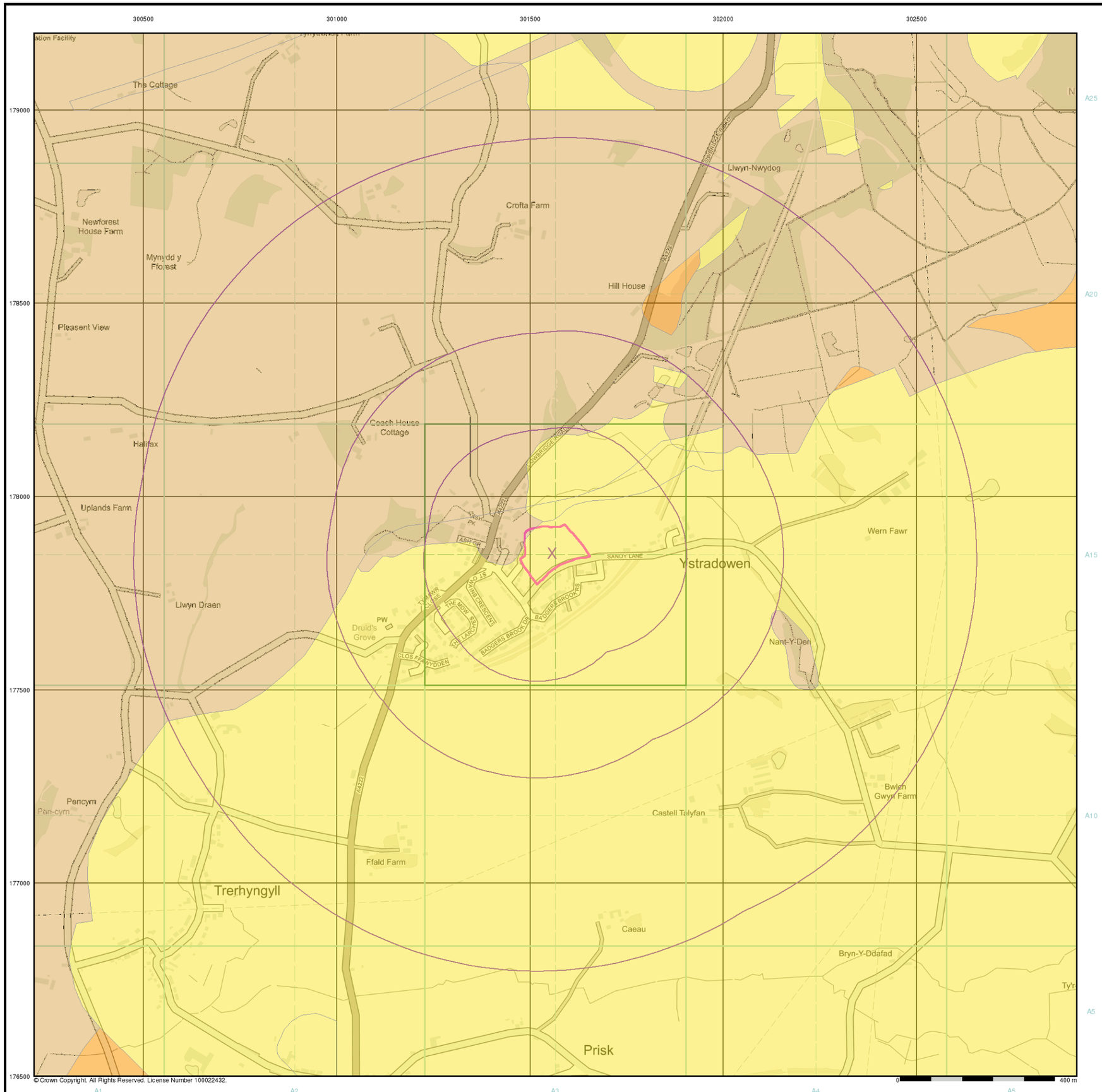


Intégral Géotechnique

General

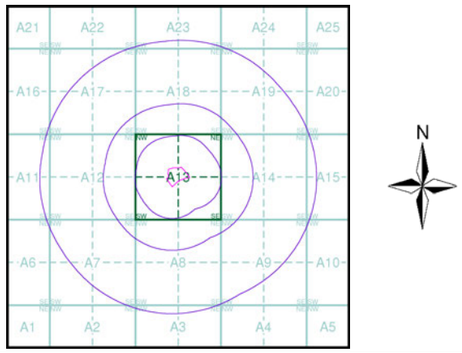
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Arsenic

Arsenic Concentrations mg/kg

- < 15
- 15 - 25
- 25 - 35
- 35 - 45
- 45 - 60
- 60 - 120
- > 120

Estimated Soil Chemistry Arsenic - Slice A



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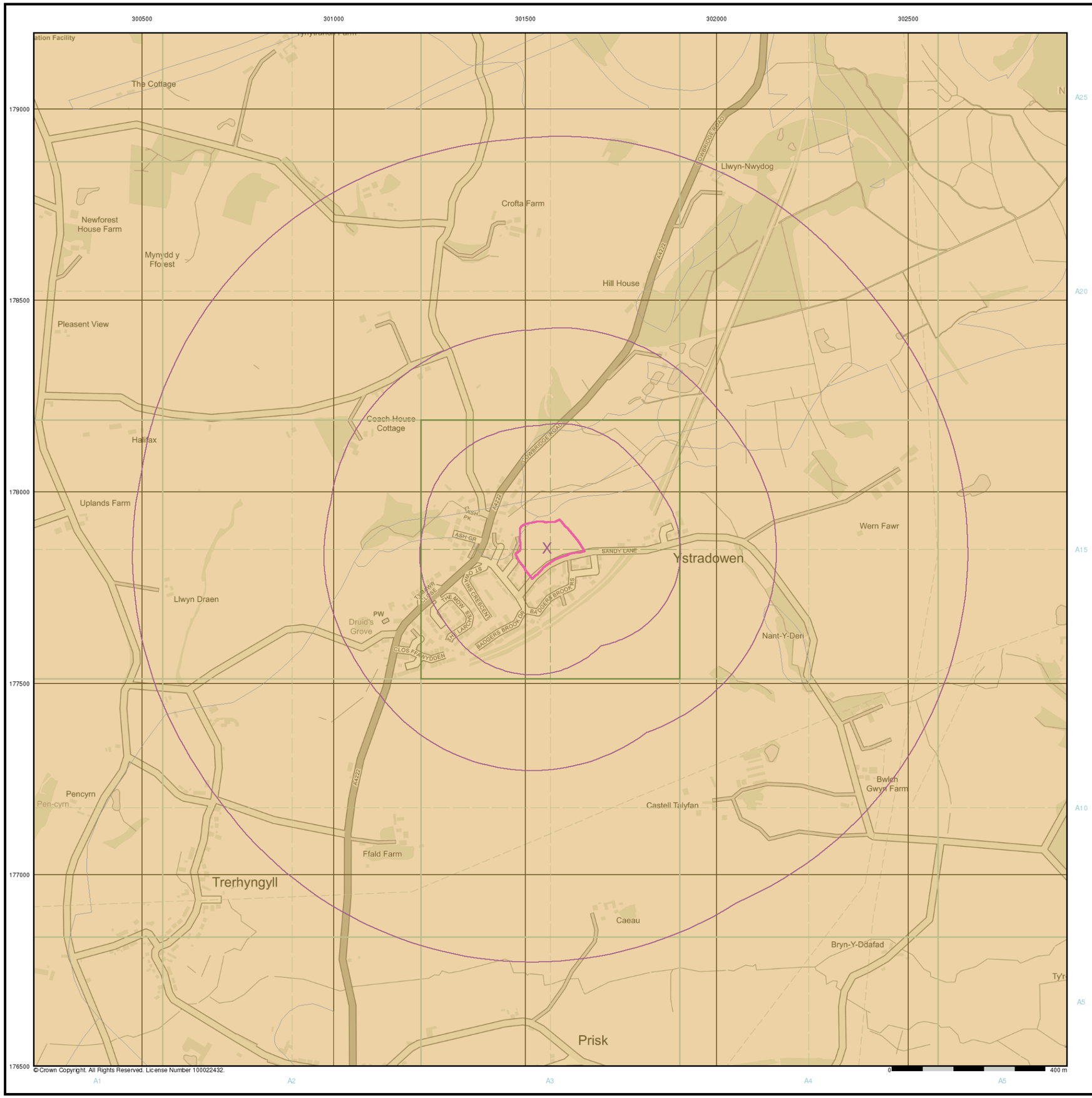


Intégral Géotechnique

General

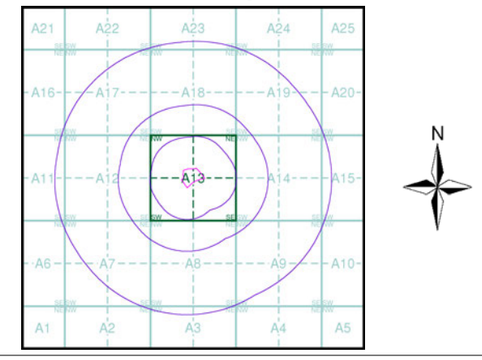
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Cadmium

Cadmium Concentrations mg/kg

- < 1.8
- 1.8 - 2.2
- 2.2 - 3.0
- > 3.0

Estimated Soil Chemistry Cadmium - Slice A



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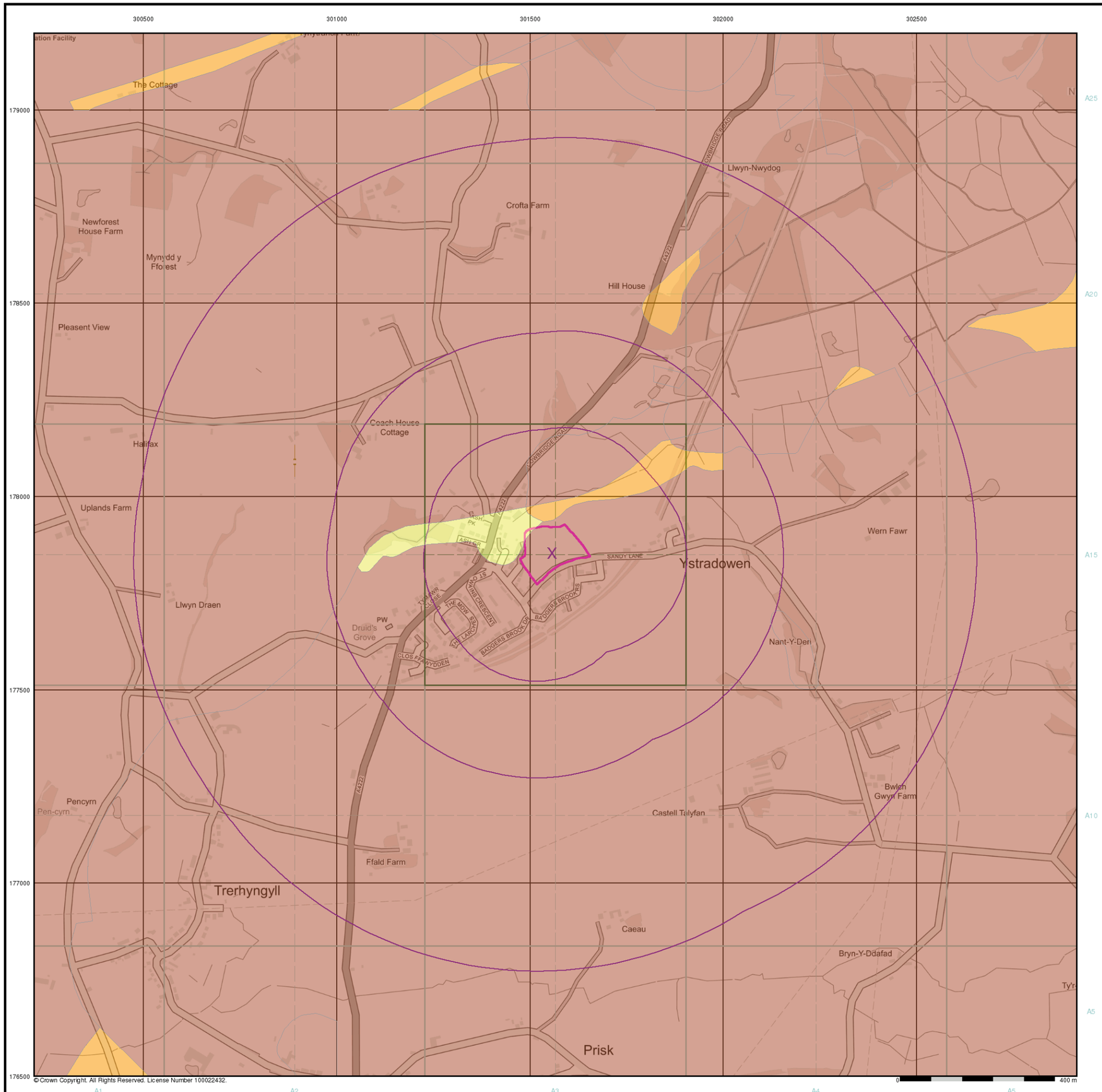


Intégral Géotechnique

General

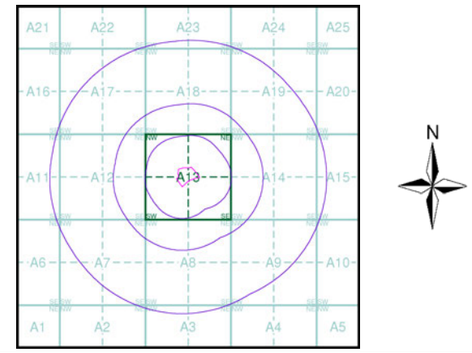
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Chromium

Chromium Concentrations mg/kg

- < 20
- 20 - 40
- 40 - 60
- 60 - 90
- 90 - 120
- 120 - 180
- > 180

Estimated Soil Chemistry Chromium - Slice A



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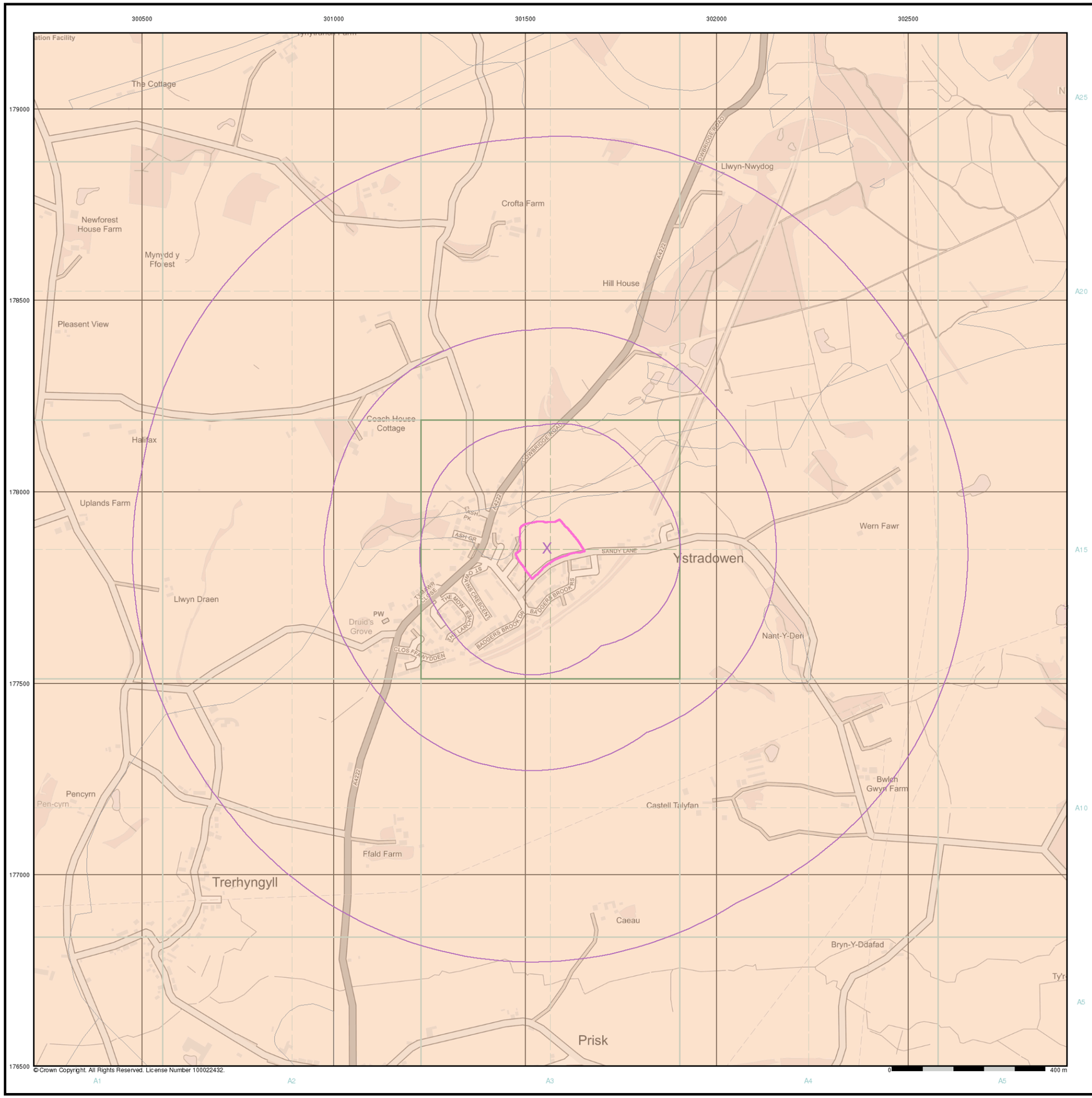


Intégral Géotechnique

General

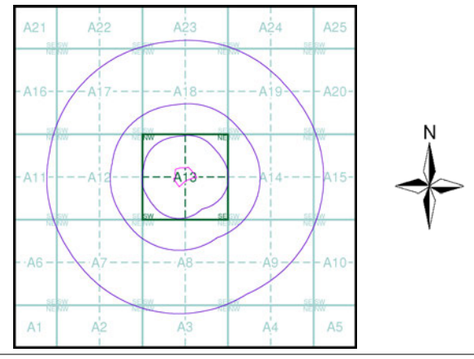
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Lead

Lead Concentrations mg/kg

- <100 mg/kg
- 100 - 200
- 200 - 300
- 300 - 600
- 600 - 1200
- >1200

Estimated Soil Chemistry Lead - Slice A



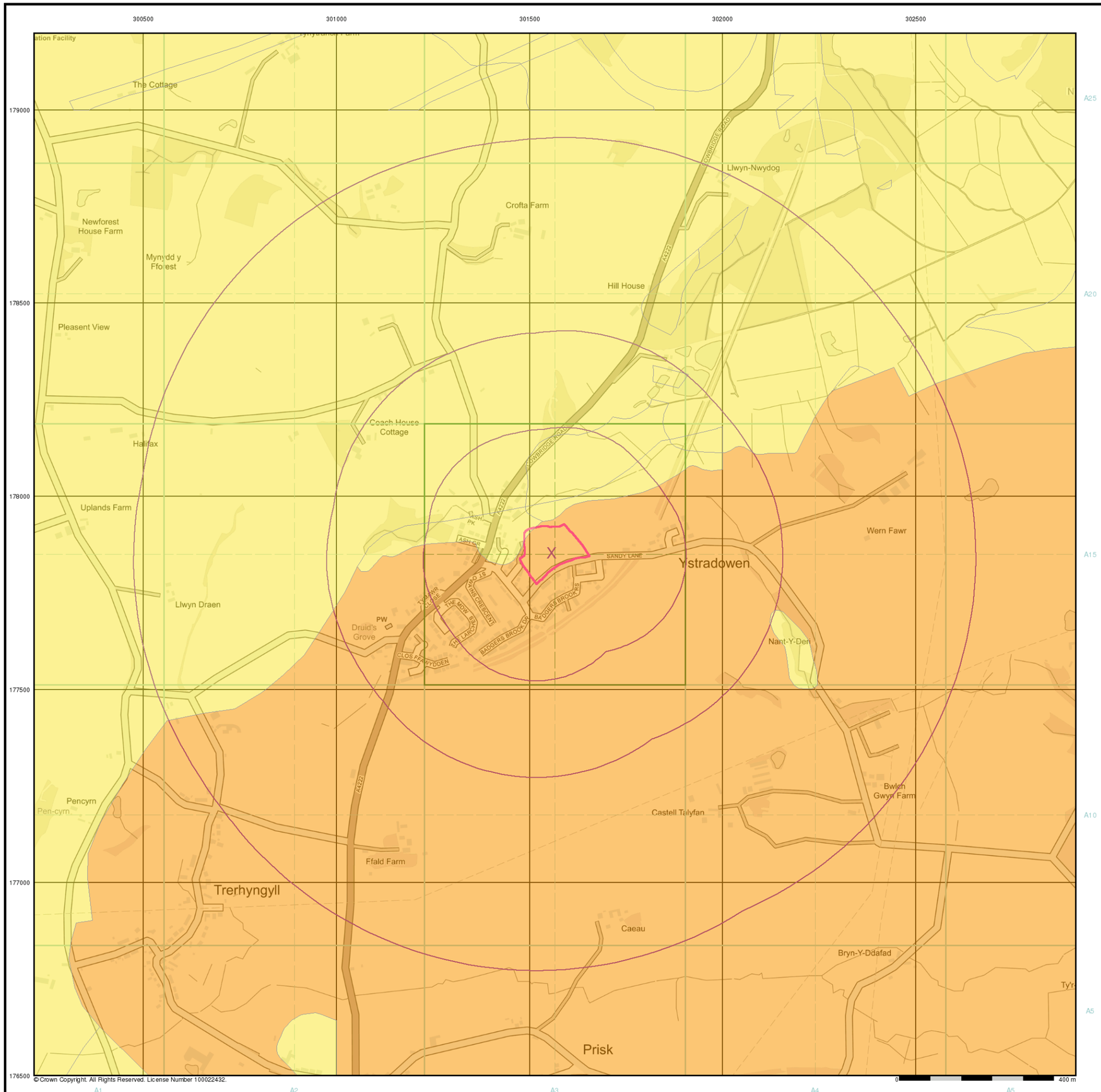
Order Details

Order Details:	231826780_1_1
Customer Ref:	12604/LP
National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	1000

Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Intégral Géotechnique

General

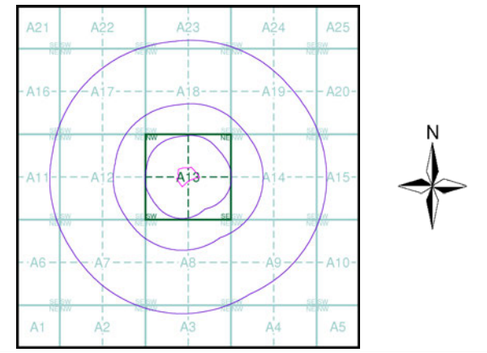
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Nickel

Nickel Concentrations mg/kg

- < 15
- 15 - 30
- 30 - 45
- 45 - 60
- 60 - 80
- 80 - 100
- > 100

Estimated Soil Chemistry Nickel - Slice A



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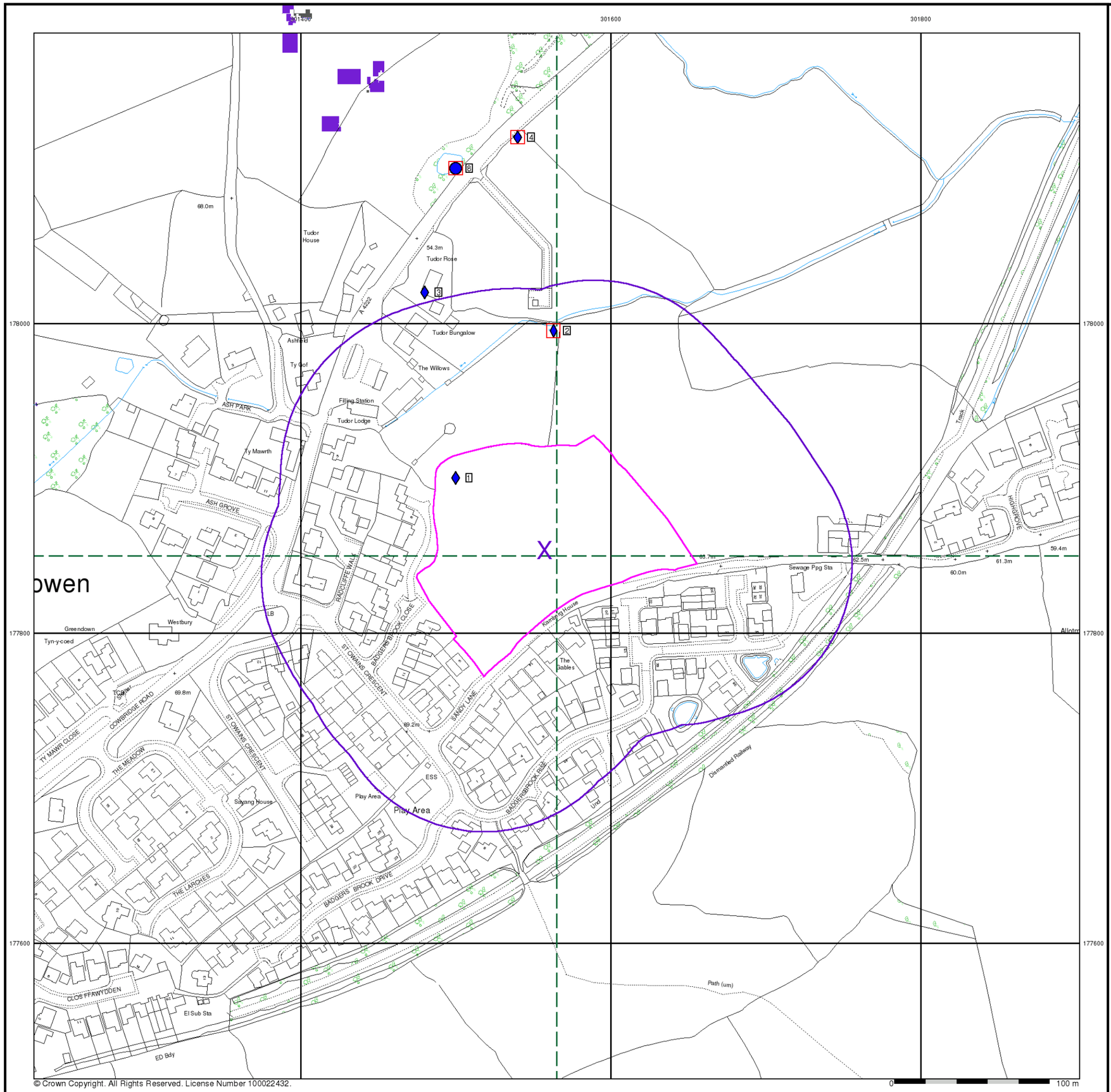


Intégral Géotechnique

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location
- Pylon
- Overhead Transmission Line

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

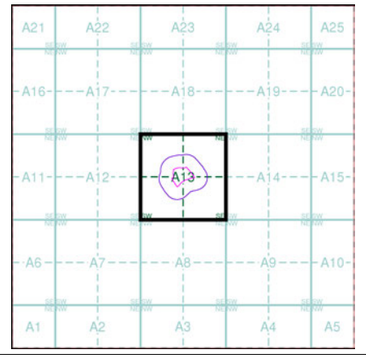
Geological

- BGS Recorded Mineral Site

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Segment A13



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Plot Buffer (m):	100

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Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	MGR	Made Ground (Undivided)	Artificial Deposit	Not Supplied - Holocene

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	TILLD	Till, Devensian	Diamicton	Not Supplied - Devensian
	GLLD	Glaciolacustrine Deposits	Clay and Silt	Not Supplied - Pleistocene
	HEAD	Head	Clay, Silt, Sand and Gravel	Not Supplied - Quaternary
	PEAT	Peat	Peat	Not Supplied - Quaternary

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	MRGF	Blue Lias Formation (Marginal Facies)	Shell-limestone	Not Supplied - Sinemurian
	PO	Porthkerry Member	Limestone and Mudstone, Interbedded	Not Supplied - Hettangian
	BLI	Blue Lias Formation	Limestone and Mudstone, Interbedded	Not Supplied - Rhaetian
	PNG	Penarth Group	Mudstone	Not Supplied - Rhaetian
	STM	St Mary's Well Bay Member	Limestone and Mudstone, Interbedded	Not Supplied - Rhaetian
	ARL	Argoed Limestone Member	Limestone	Not Supplied - Visean
	STYL	Stormy Limestone Formation	Limestone	Not Supplied - Visean
	HTL	High Tor Limestone Formation	Limestone	Not Supplied - Visean
	HTL	High Tor Limestone Formation	Limestone	Not Supplied - Visean
	CNLL	Cornelly Oolite Formation	Limestone, Ooidal	Not Supplied - Visean
	CBM	Caswell Bay Mudstone Formation	Limestone and Mudstone, Interbedded	Not Supplied - Visean
	CEO	Cefnyrhendy Oolite Member	Limestone, Ooidal	Not Supplied - Visean
	GUO	Gully Oolite Formation	Limestone, Ooidal	Not Supplied - Visean
	FPL	Friars Point Limestone Formation	Limestone	Not Supplied - Tournaisian
	BFO	Brofiscin Oolite Formation	Limestone, Ooidal	Not Supplied - Tournaisian
	BHL	Barry Harbour Limestone Formation	Limestone	Not Supplied - Tournaisian
	CCM	Cwmyniscoy Mudstone Formation	Mudstone and Limestone, Interbedded	Not Supplied - Tournaisian
	CCL	Castell Coch Limestone Formation	Limestone, Ooidal	Not Supplied - Tournaisian
	TGW	Tongwynlais Formation	Limestone and Mudstone, Interbedded	Not Supplied - Tournaisian
	FPL	Friars Point Limestone Formation	Dolomitised Limestone and Dolomite	Not Supplied - Tournaisian
	QCG	Quartz Conglomerate Group (South Wales)	Sandstone and Conglomerate, Interbedded	Not Supplied - Famennian
	CWA	Cwrt-Yr-Ala Formation	Sandstone and Siltstone, Interbedded	Not Supplied - Late Devonian
	UORS	Upper Old Red Sandstone	Sandstone and Siltstone, Interbedded	Not Supplied - Late Devonian
	BRS	Brownstones Formation	Sandstone and [Subequal/subordinate] Argillaceous Rocks, Interbedded	Not Supplied - Lochkovian
		Faults		

Intégral Géotechnique

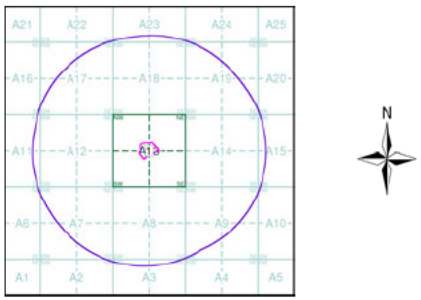
Geology 1:50,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.
The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID:	1
Map Sheet No:	262
Map Name:	Bridgend
Map Date:	1990
Bedrock Geology:	Available
Superficial Geology:	Available
Artificial Geology:	Available
Faults:	Not Supplied
Landslip:	Available
Rock Segments:	Not Supplied

Geology 1:50,000 Maps - Slice A



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Customer Reference:	12604/LP
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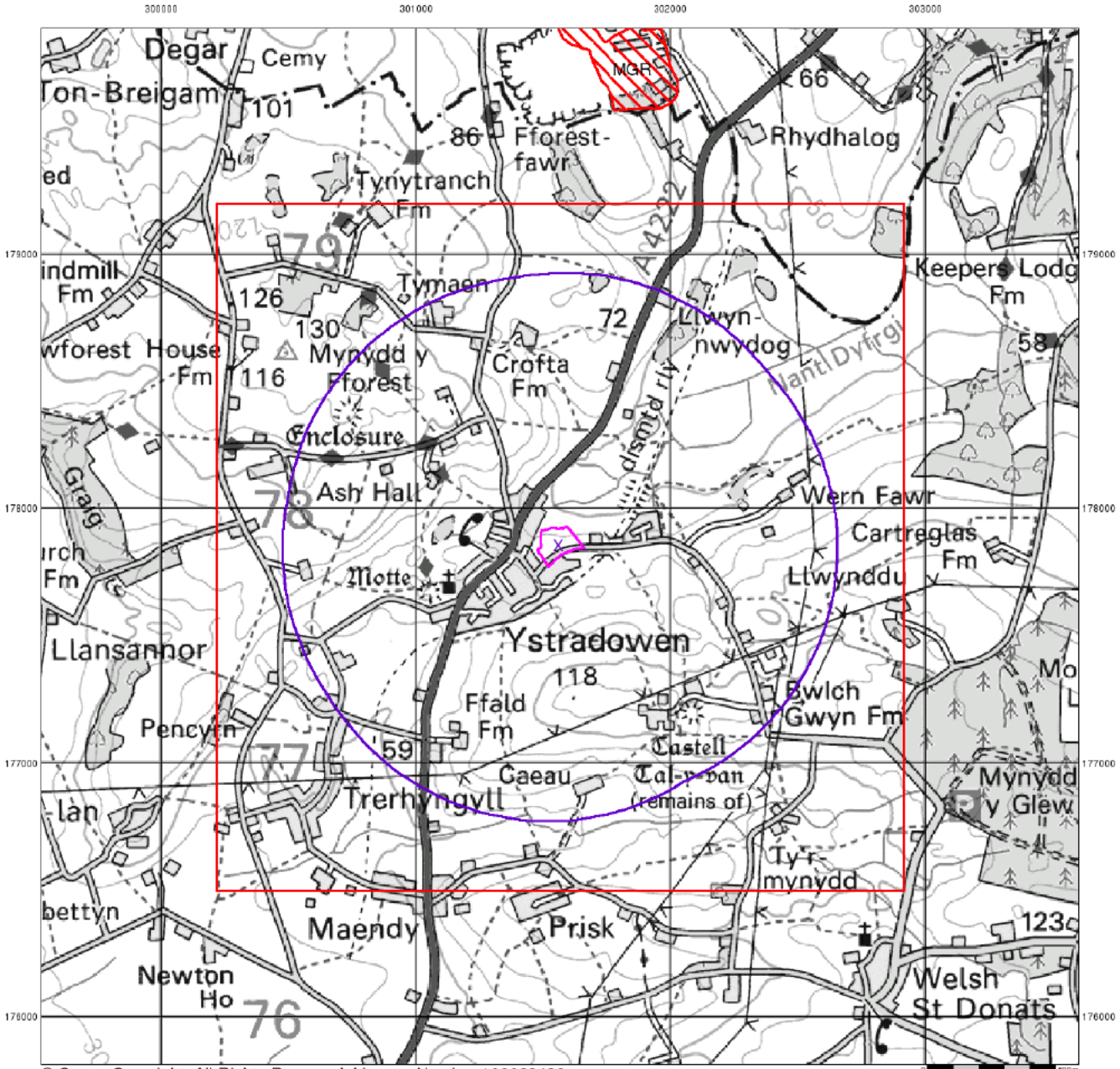
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	1000

Site Details:

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW



Intégral
Géotechnique

Artificial Ground and Landslip

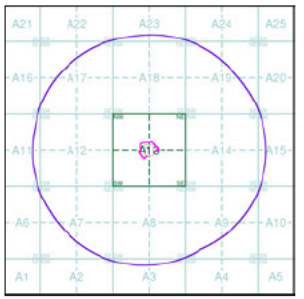
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



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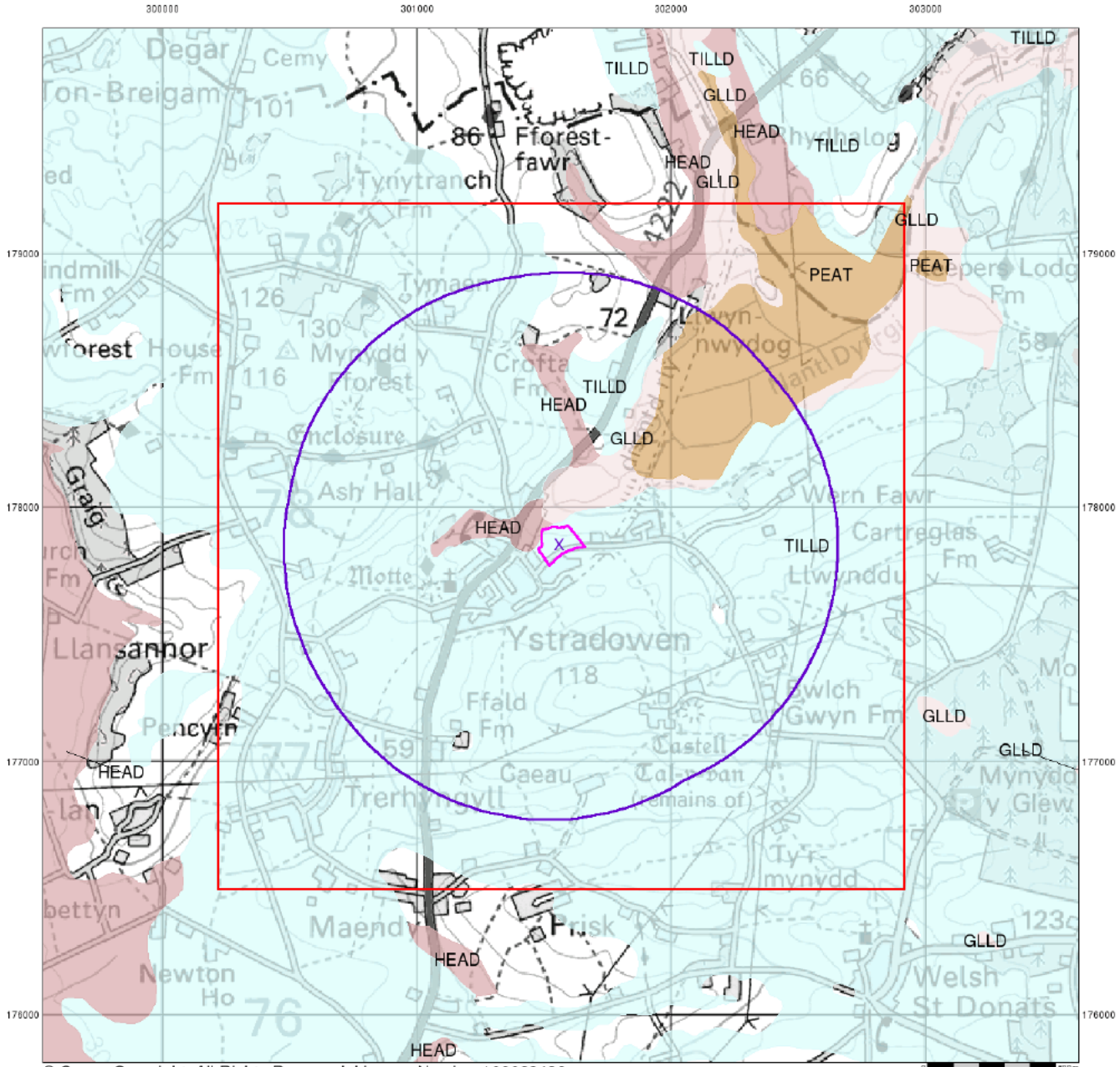


Intégral Géotechnique

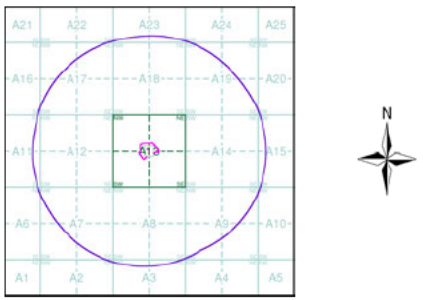
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



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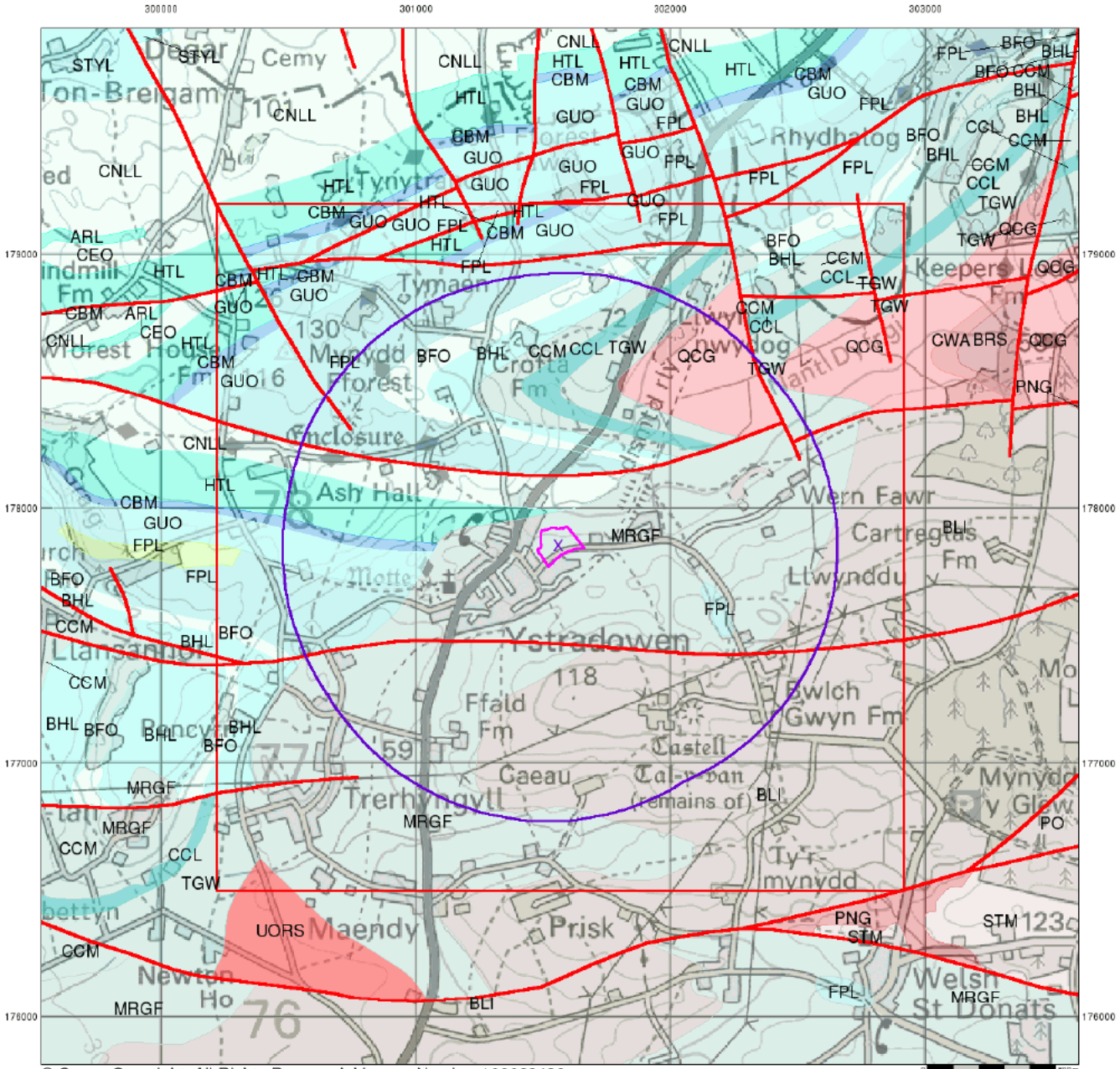


Intégral
Géotechnique

Bedrock and Faults

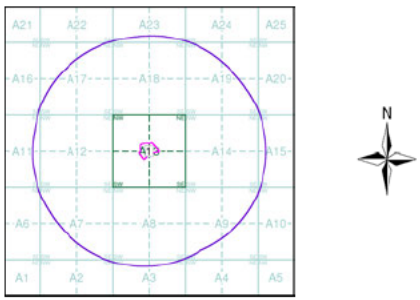
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



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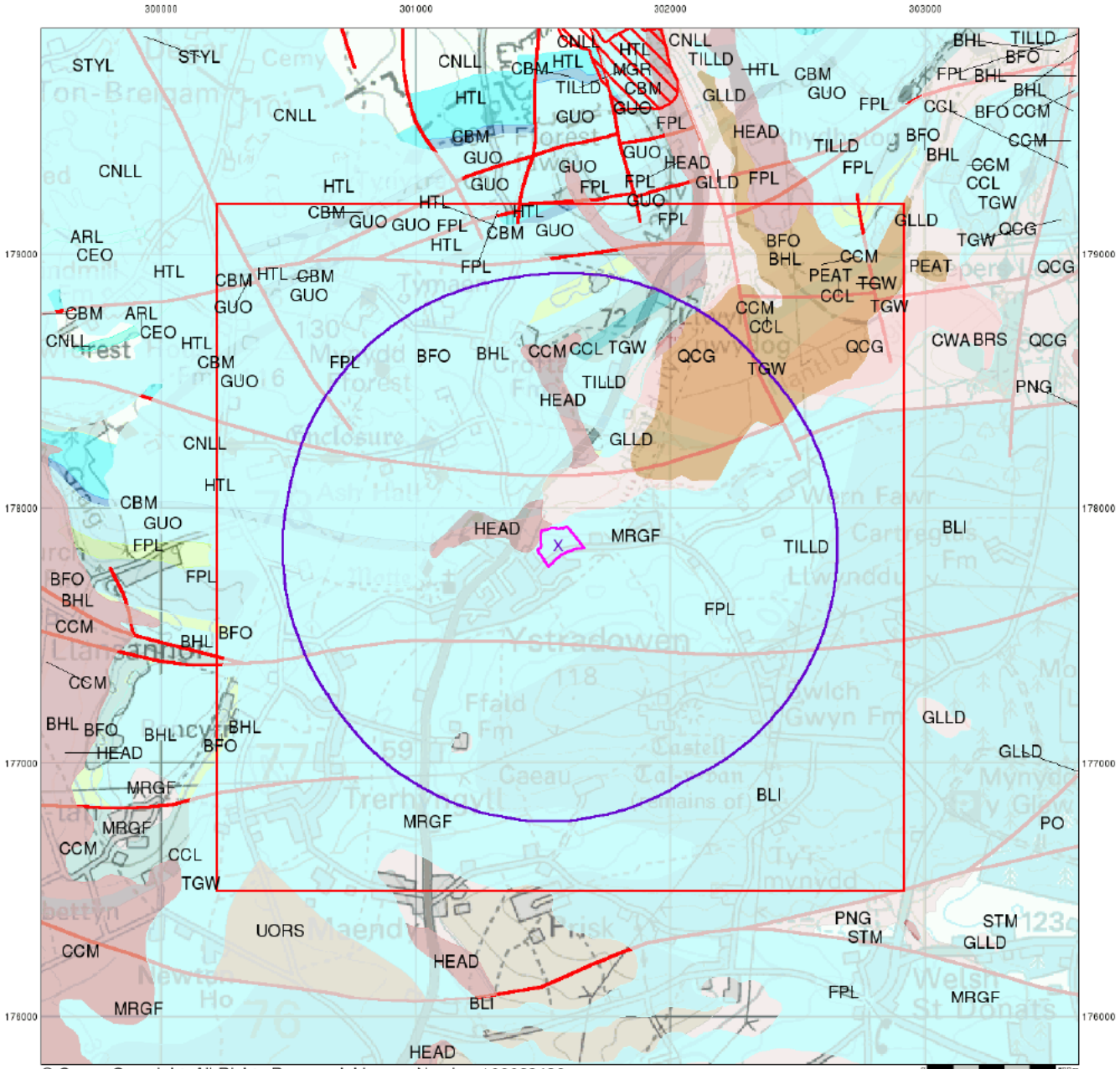


Intégral
Géotechnique

Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

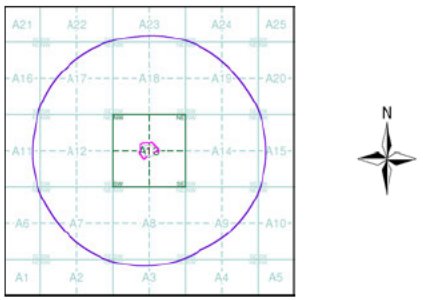
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A



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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
285 Surface Level
Sketched Contour
Instrumental Contour
Main Roads
Fenced
Un-Fenced
Minor Roads
Fenced
Un-Fenced
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy. County Borough Boundary (England)
Co. Burgh Bdy. County Burgh Boundary (Scotland)
R.D. Bdy. Rural District Boundary
Civil Parish Boundary

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Pylon
Electricity Transmission Line
Sloping Masonry
Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping

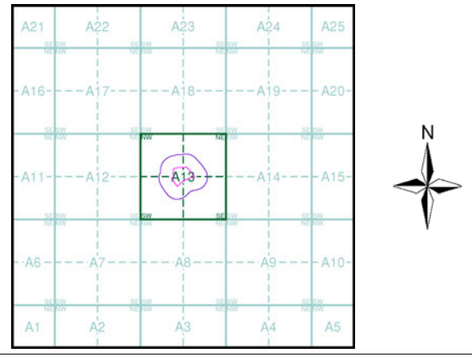
Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Mud
Sand
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

Intégral Géotechnique

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Glamorganshire	1:10,560	1885	2
Glamorganshire	1:10,560	1900	3
Glamorganshire	1:10,560	1921	4
Glamorganshire	1:10,560	1921	5
Glamorganshire	1:10,560	1947 - 1952	6
Historical Aerial Photography	1:10,560	1947	7
Ordnance Survey Plan	1:10,000	1964	8
Ordnance Survey Plan	1:10,000	1974	9
10K Raster Mapping	1:10,000	1999	10
10K Raster Mapping	1:10,000	2006	11
VectorMap Local	1:10,000	2019	12

Historical Map - Slice A



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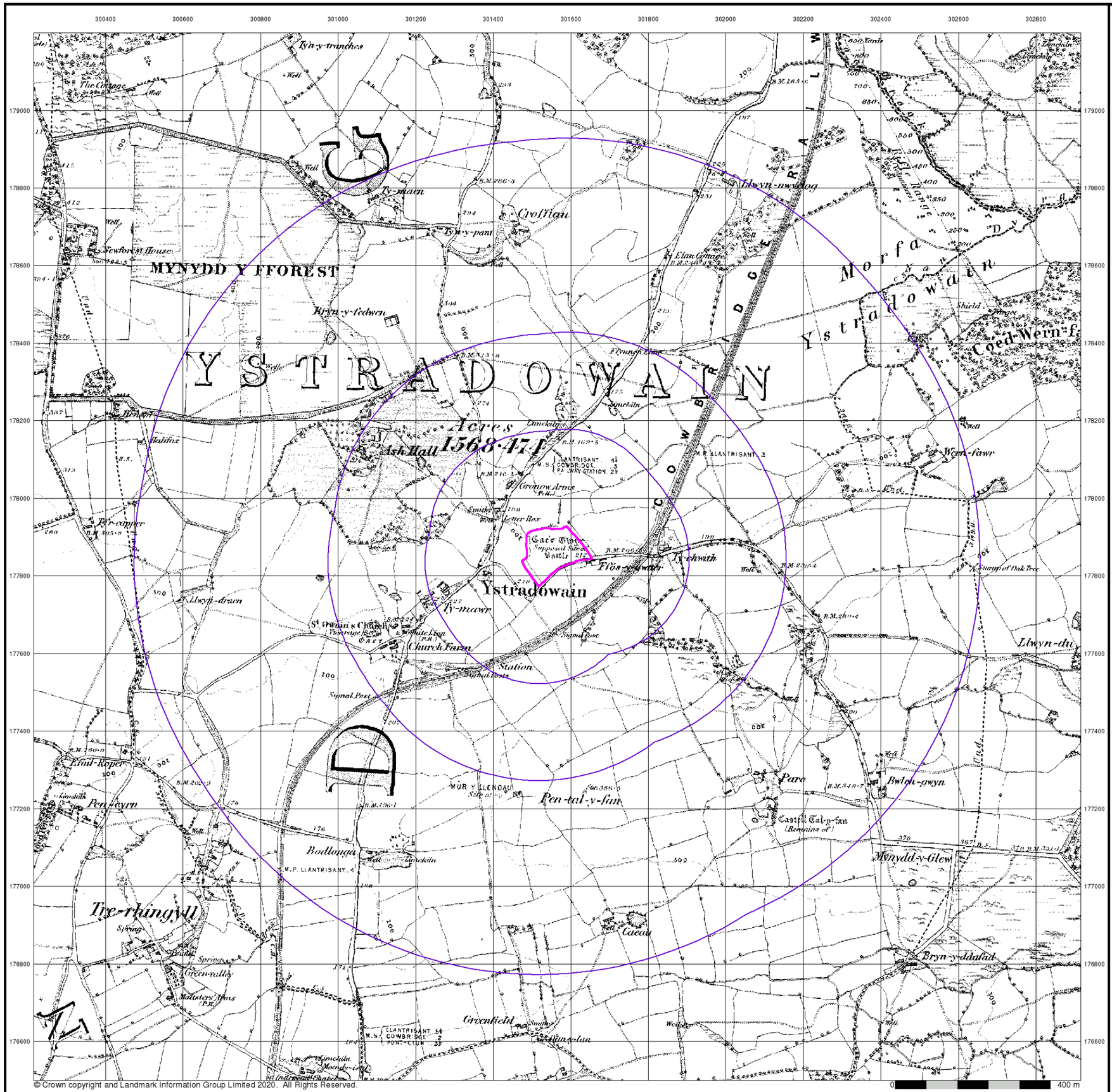

Intégral
Géotechnique

Glamorganshire

Published 1885

Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

Historical Map - Slice A

N

Order Details

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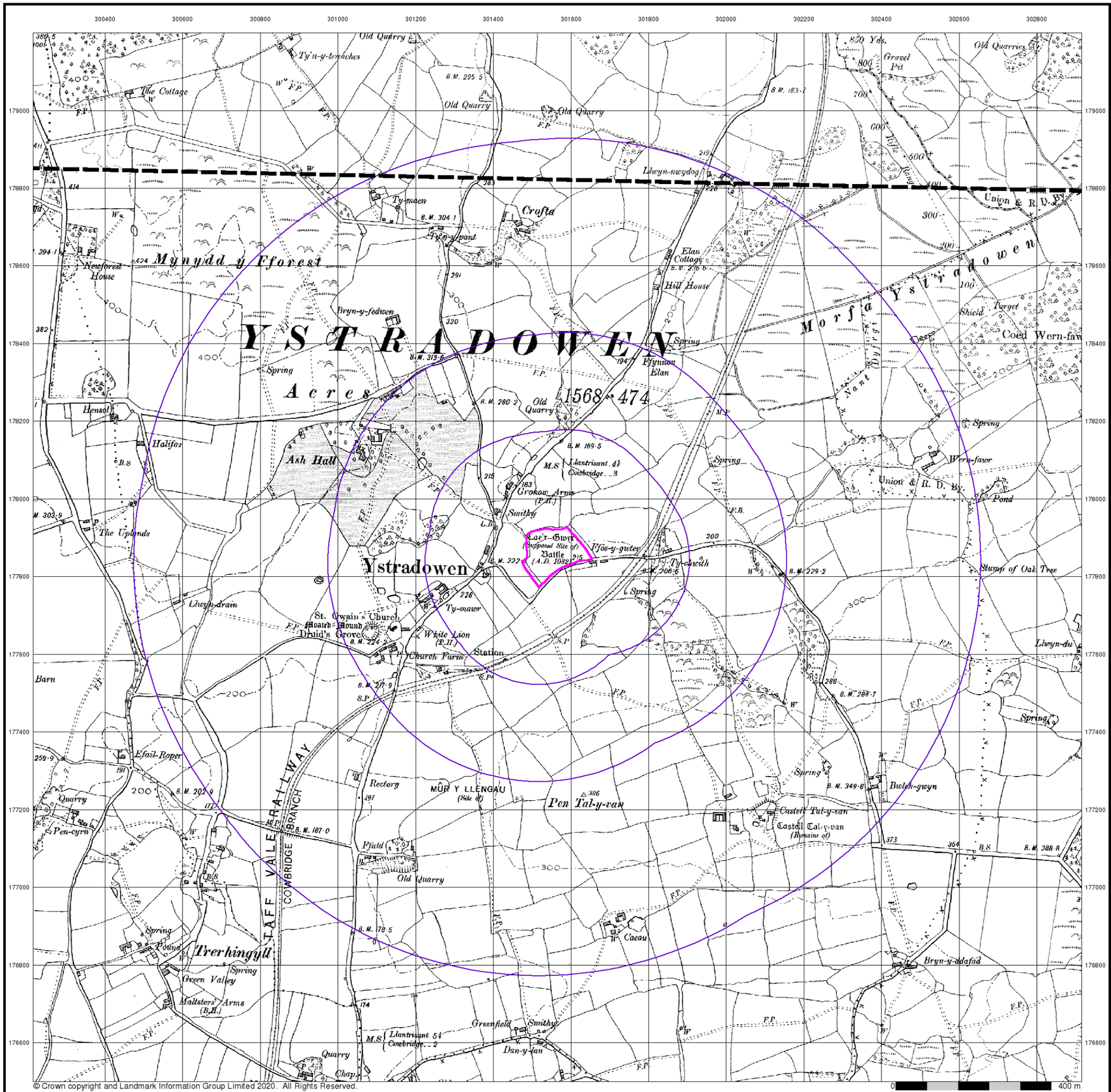

Intégral Géotechnique

Glamorganshire

Published 1900

Source map scale - 1:10,560

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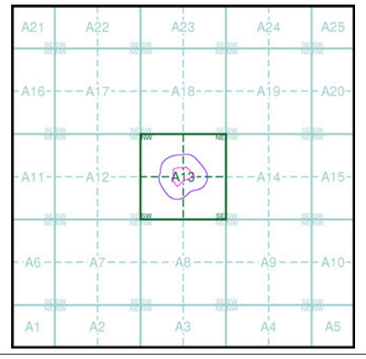
Map Name(s) and Date(s)

041NE
1900
1:10,560

041SE
1900
1:10,560

Historical Map - Slice A



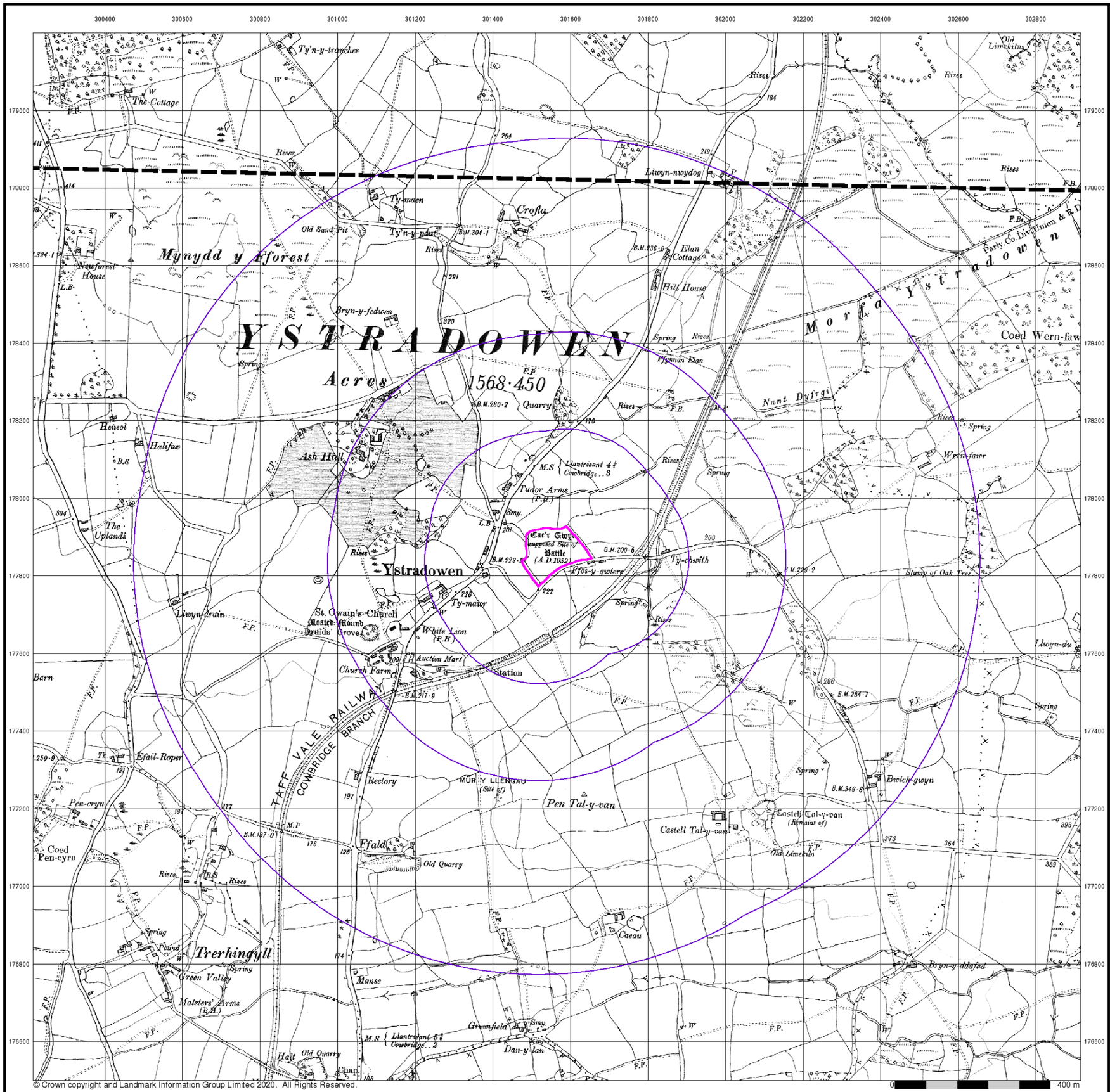
Order Details

Order Number:	231826780_1_1
Customer Ref:	12604/LP
National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	1000

Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Intégral Géotechnique

Glamorganshire

Published 1921

Source map scale - 1:10,560

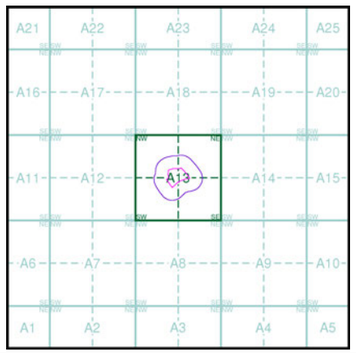
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

041NE
1921
1:10,560

041SE
1921
1:10,560

Historical Map - Slice A



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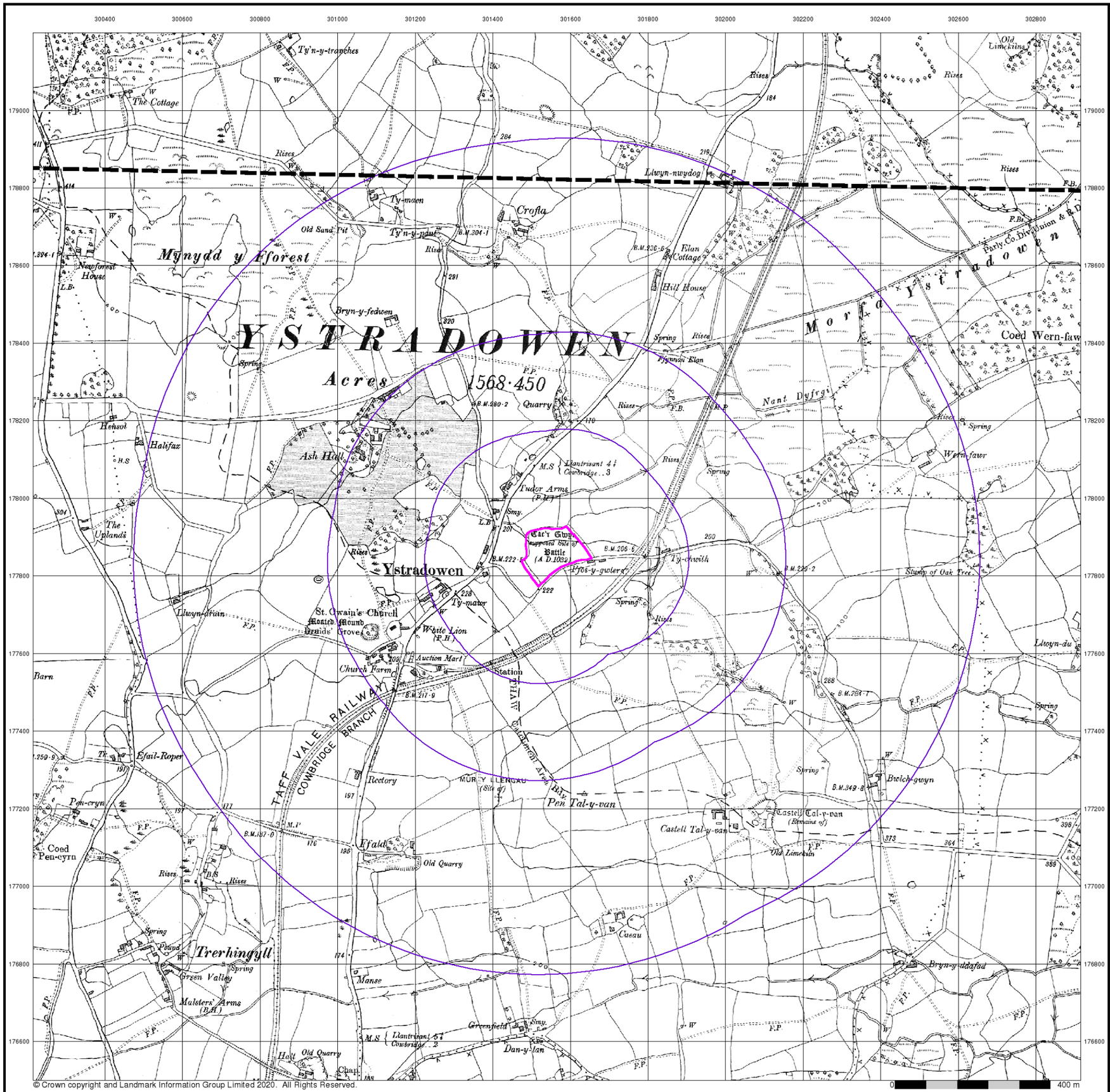

Intégral Géotechnique

Glamorganshire

Published 1921

Source map scale - 1:10,560

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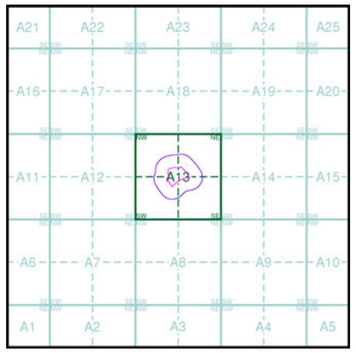
Map Name(s) and Date(s)

041NE
1921
1:10,560

041SE
1921
1:10,560

Historical Map - Slice A



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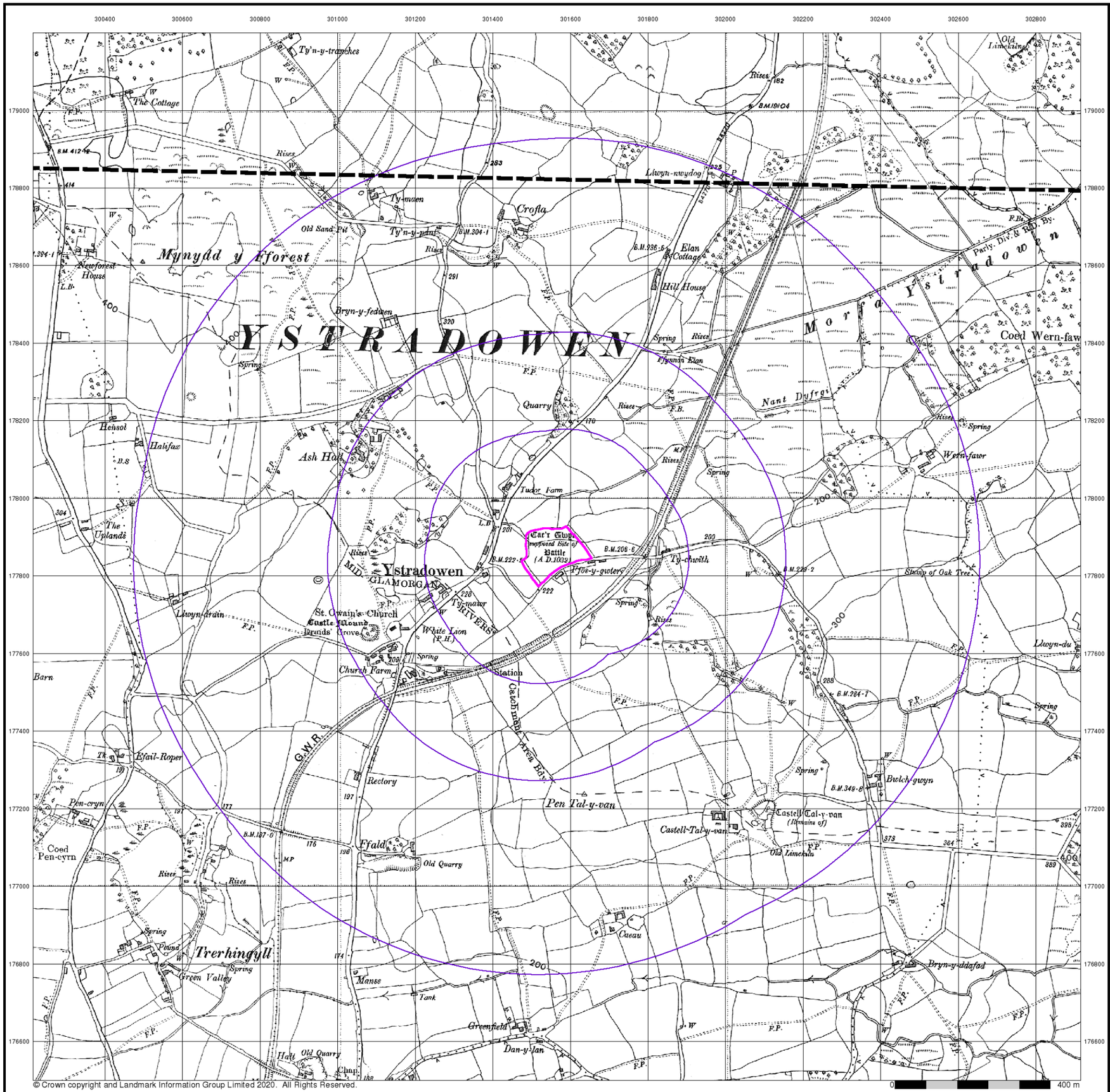


Intégral Géotechnique

Glamorganshire

Published 1947 - 1952

Source map scale - 1:10,560

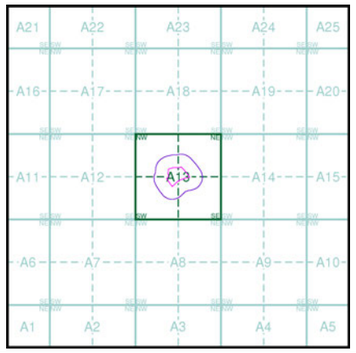
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

041NE
1952
1:10,560

041SE
1947
1:10,560

Historical Map - Slice A



Order Details

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Slice:	A
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Site Details

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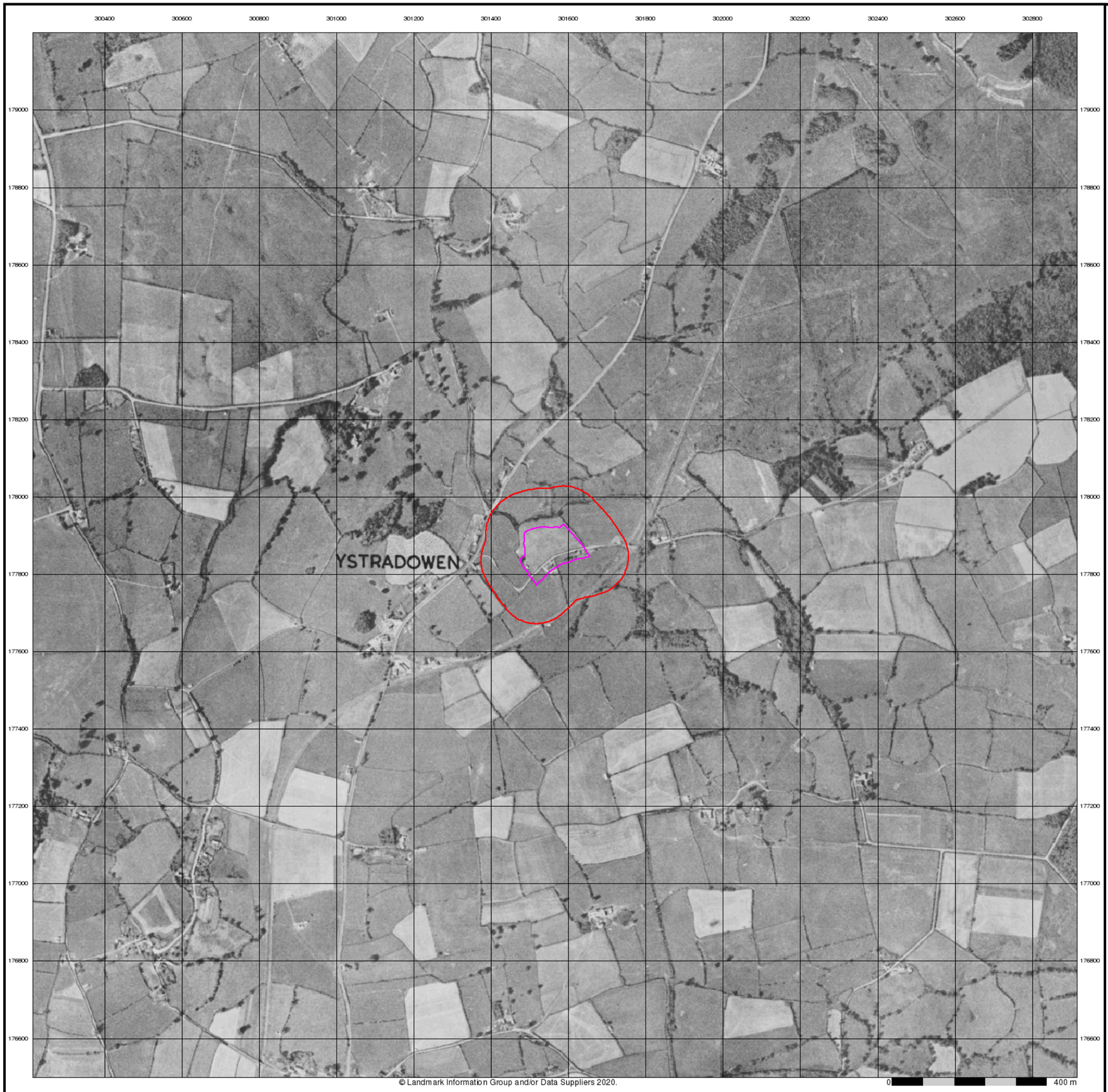


Intégral Géotechnique

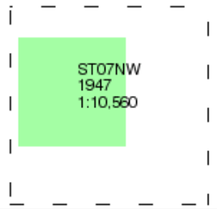
Historical Aerial Photography

Published 1947

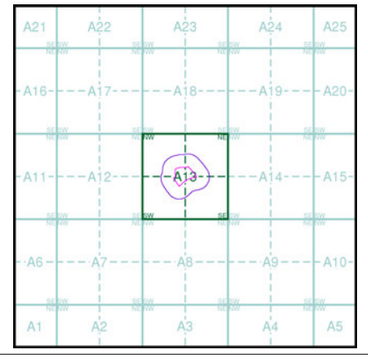
Source map scale - 1:10,560

The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

Map Name(s) and Date(s)



Historical Aerial Photography - Slice A



BRITISH LIBRARY

Order Details

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Site Area (Ha):	1.59
Search Buffer (m):	1000

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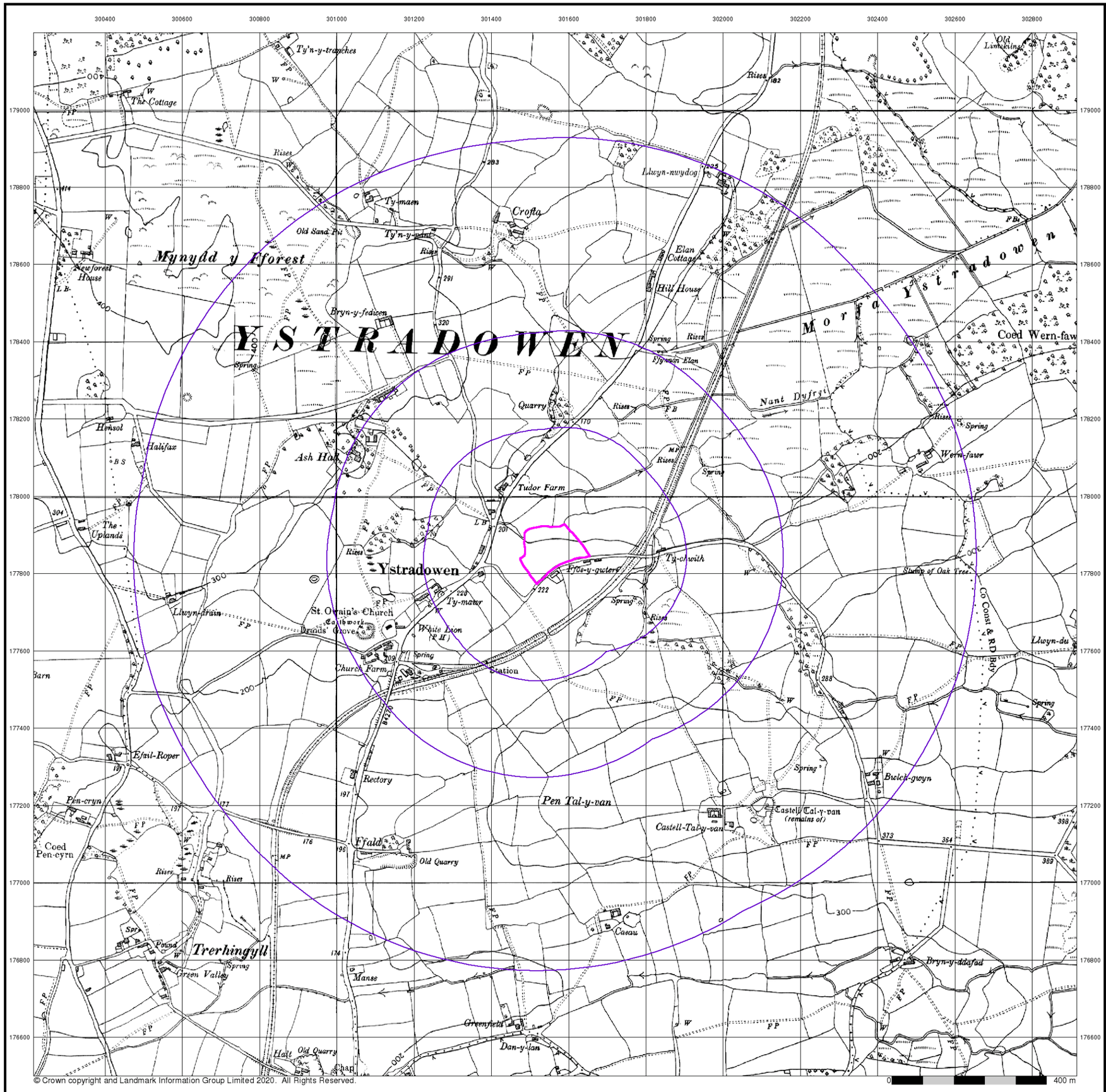


Intégral Géotechnique

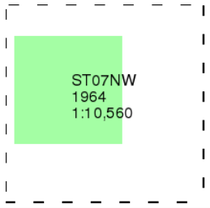
Ordnance Survey Plan

Published 1964

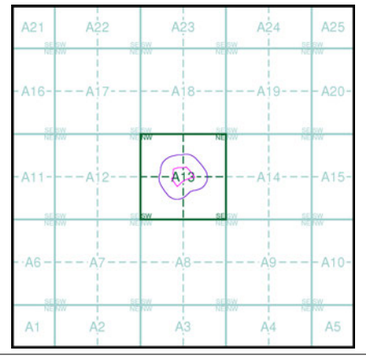
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



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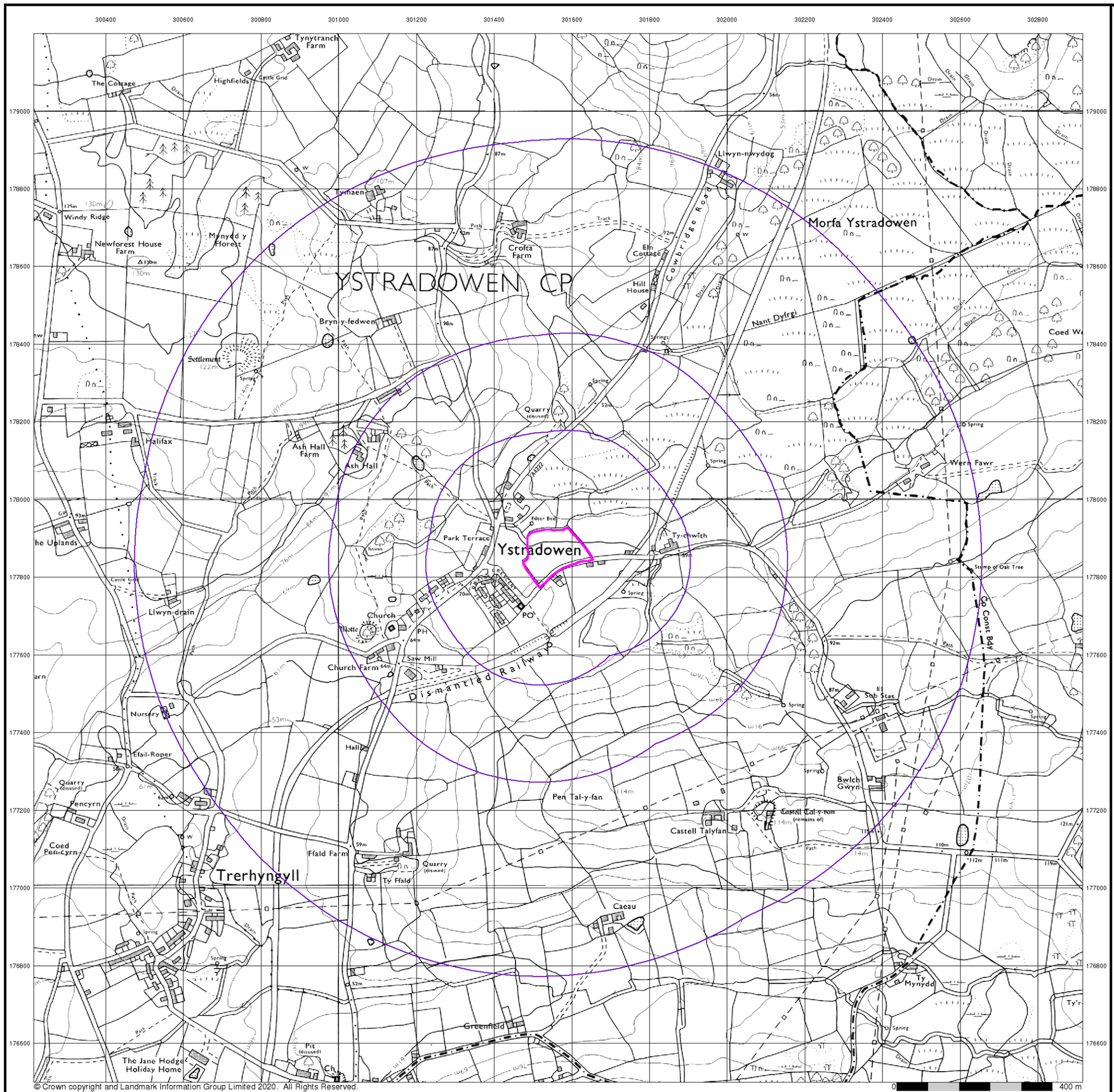


Intégral Géotechnique

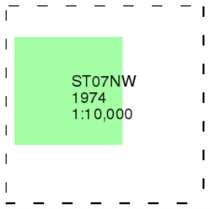
Ordnance Survey Plan

Published 1974

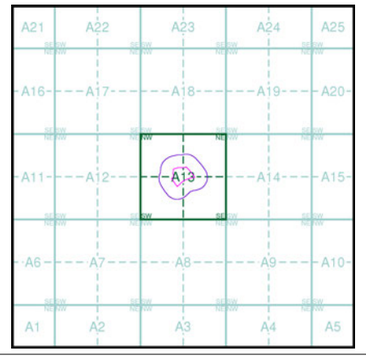
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



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Slice:	A
Site Area (Ha):	1.59
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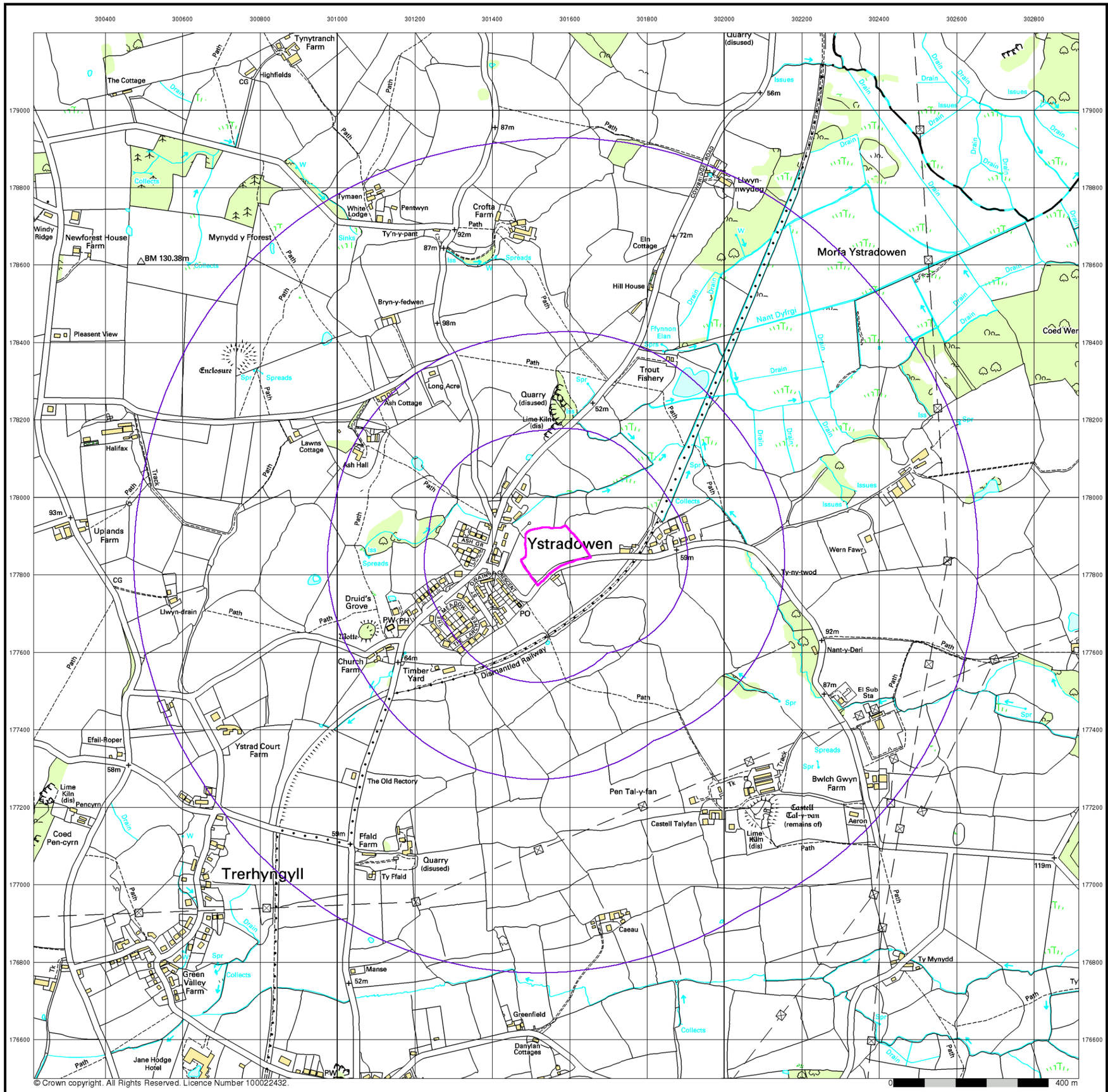


Intégral Géotechnique

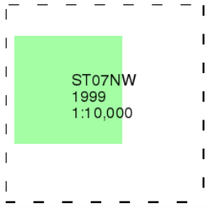
10k Raster Mapping

Published 1999

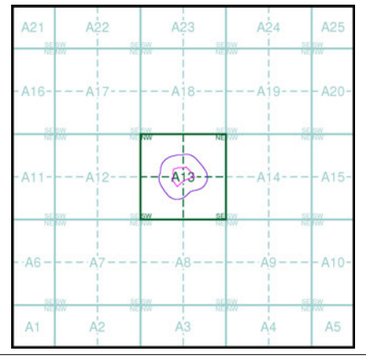
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	231826780_1_1
Customer Ref:	12604/LP
National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	1000

Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW

Landmark INFORMATION GROUP

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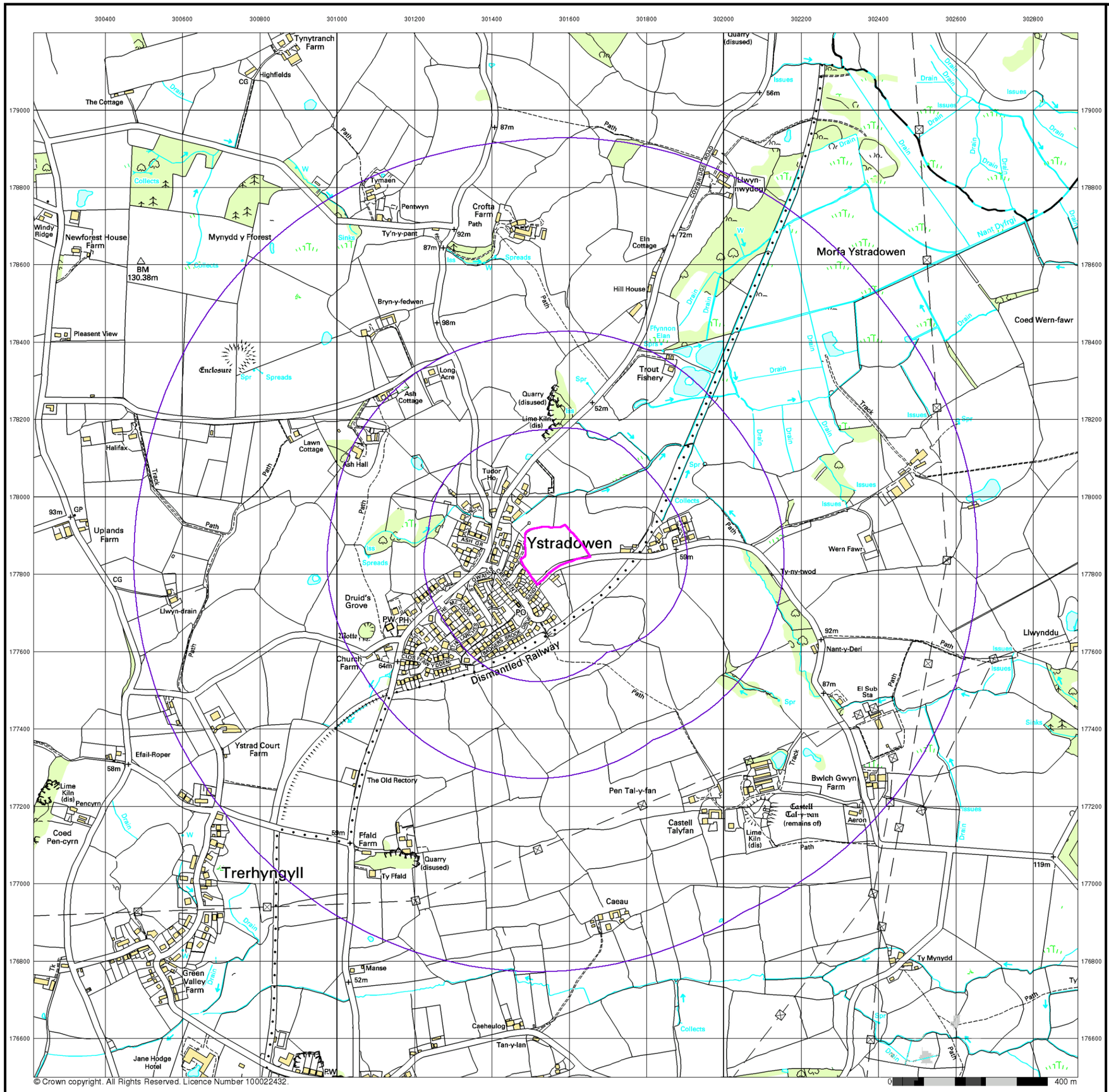


Intégral Géotechnique

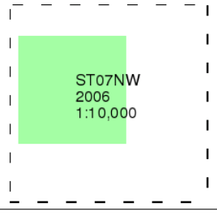
10k Raster Mapping

Published 2006

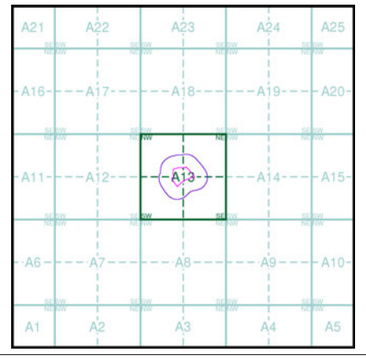
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)



Historical Map - Slice A



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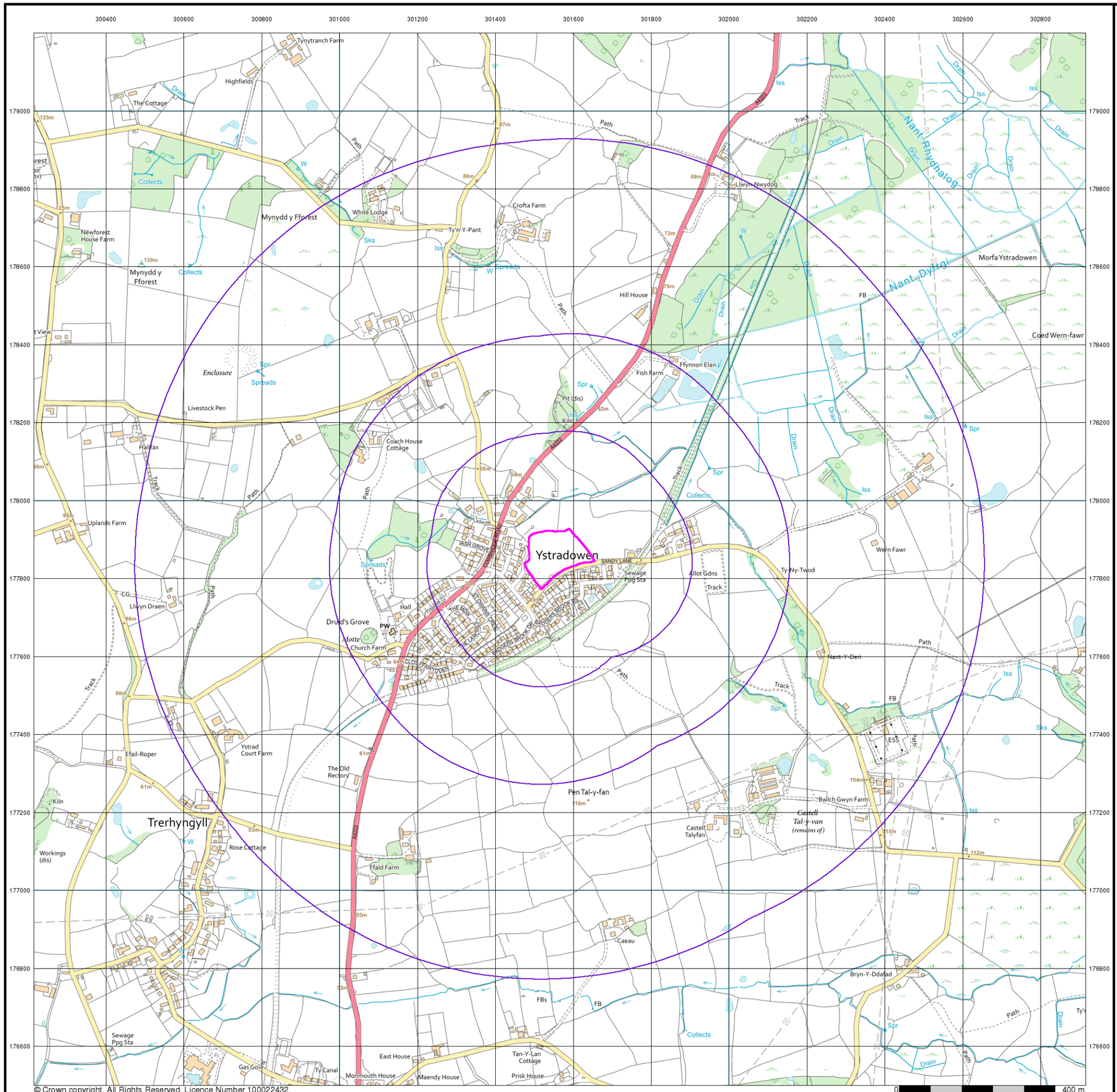


Intégral Géotechnique

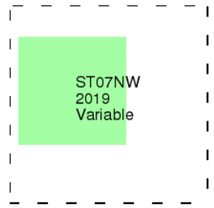
VectorMap Local

Published 2019

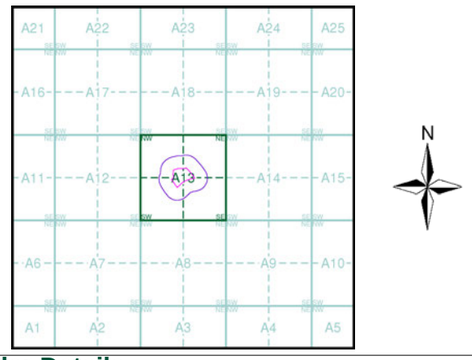
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)



Historical Map - Slice A



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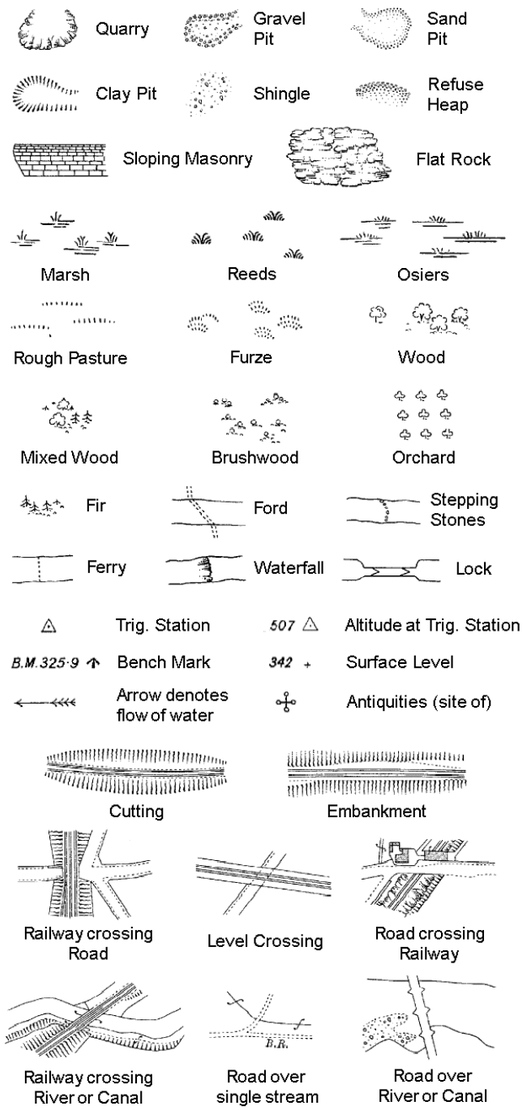
Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



County Boundary (Geographical)

County & Civil Parish Boundary

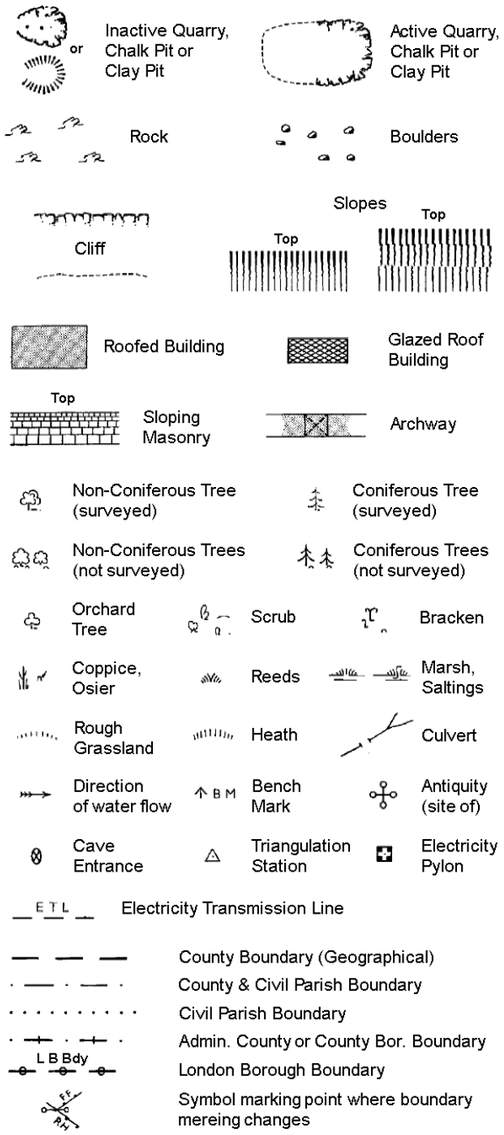
Administrative County & Civil Parish Boundary

Co. Boro. Bdy. County Borough Boundary (England)

Co. Burgh Bdy. County Burgh Boundary (Scotland)

B P B S	Boundary Post or Stone	*P.C.B*	Police Call Box
B.R.	Bridle Road	*P*	Pump
E.P	Electricity Pylon	*S.P*	Signal Post
F.B.	Foot Bridge	*Sl.*	Sluice
F.P.	Foot Path	*Sp.*	Spring
G.P	Guide Post or Board	*T.C.B*	Telephone Call Box
M.S	Mile Stone	*Tr.*	Trough
M.P M.R	Mooring Post or Ring	*W*	Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



County Boundary (Geographical)

County & Civil Parish Boundary

Civil Parish Boundary

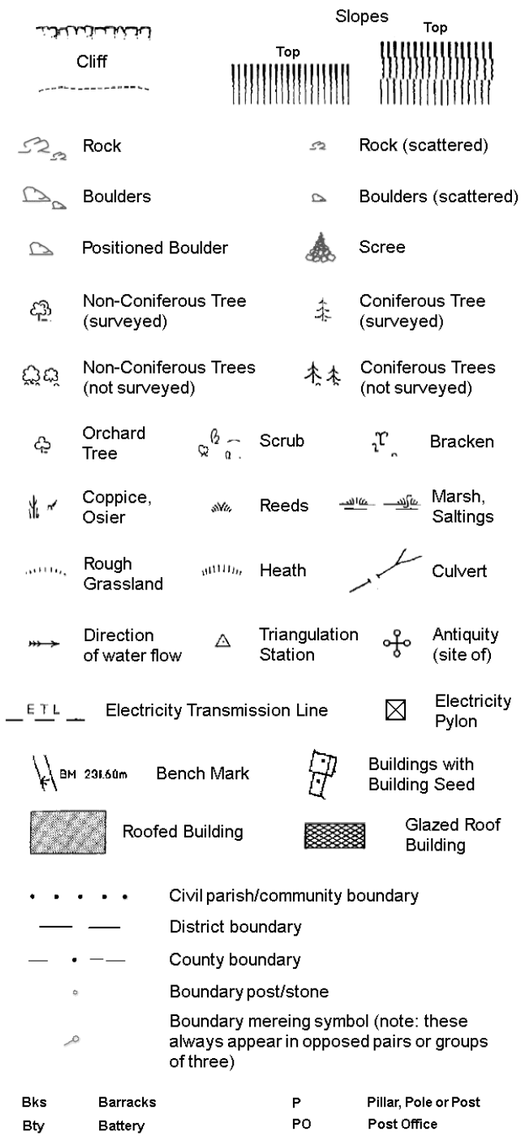
Admin. County or County Bor. Boundary

L B Bdy London Borough Boundary

Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250



Civil parish/community boundary

District boundary

County boundary

Boundary post/stone

Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

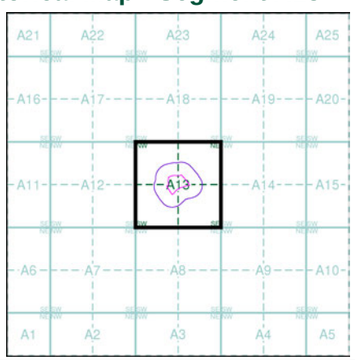
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

Intégral Géotechnique

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Glamorganshire	1:2,500	1877	2
Glamorganshire	1:2,500	1899	3
Glamorganshire	1:2,500	1919	4
Ordnance Survey Plan	1:2,500	1972	5
Additional SIMs	1:2,500	1987	6
Additional SIMs	1:2,500	1989	7
Large-Scale National Grid Data	1:2,500	1993	8
Historical Aerial Photography	1:2,500	2000	9

Historical Map - Segment A13



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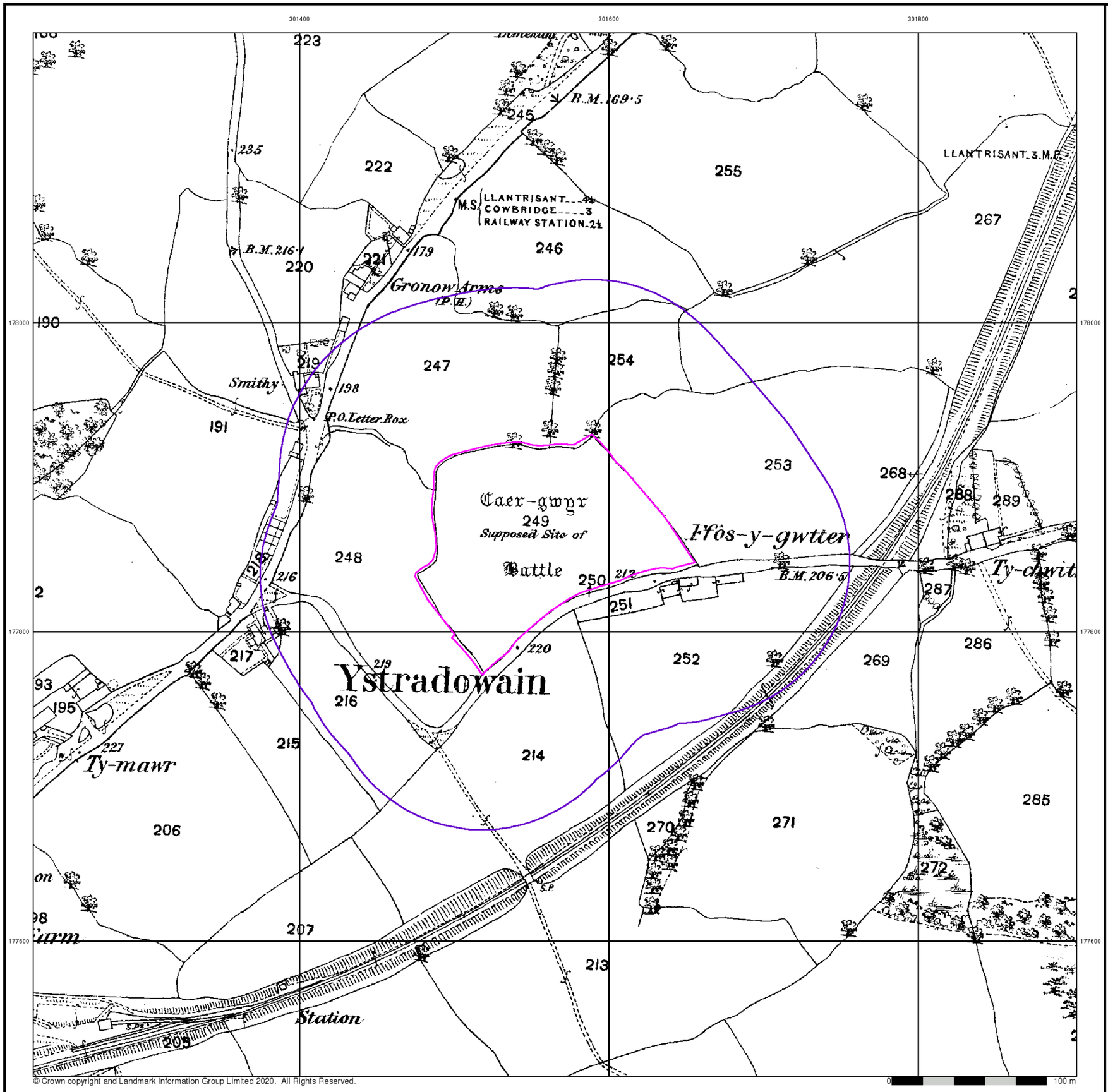
Order Number: 231826780_1_1
Customer Ref: 12604/LP
National Grid Reference: 301560, 177850
Slice: A
Site Area (Ha): 1.59
Search Buffer (m): 100

Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Intégral Géotechnique

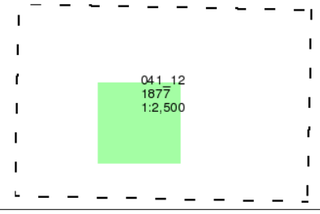
Glamorganshire

Published 1877

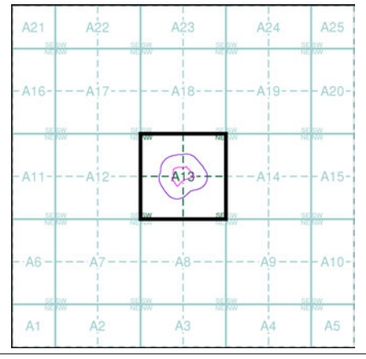
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

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Customer Ref:	12604/LP
National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	100

Site Details

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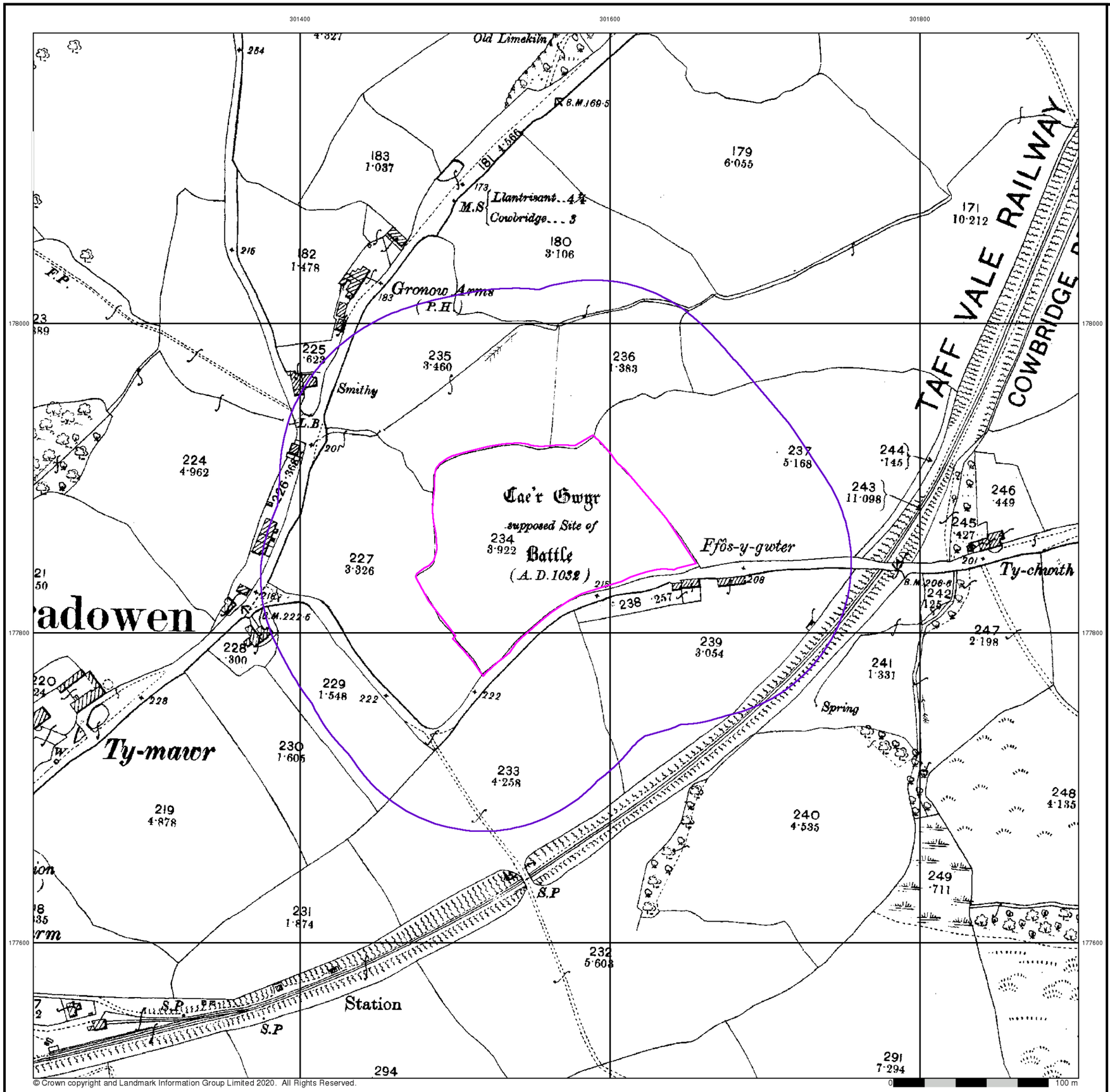


Intégral Géotechnique

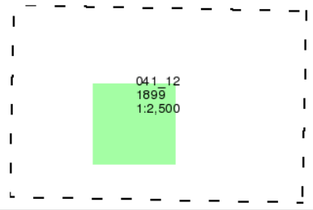
Glamorganshire

Published 1899

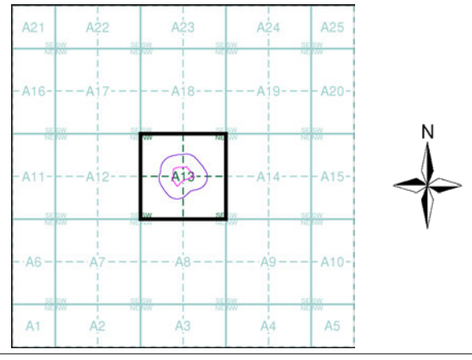
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	231826780_1_1
Customer Ref:	12604/LP
National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	100

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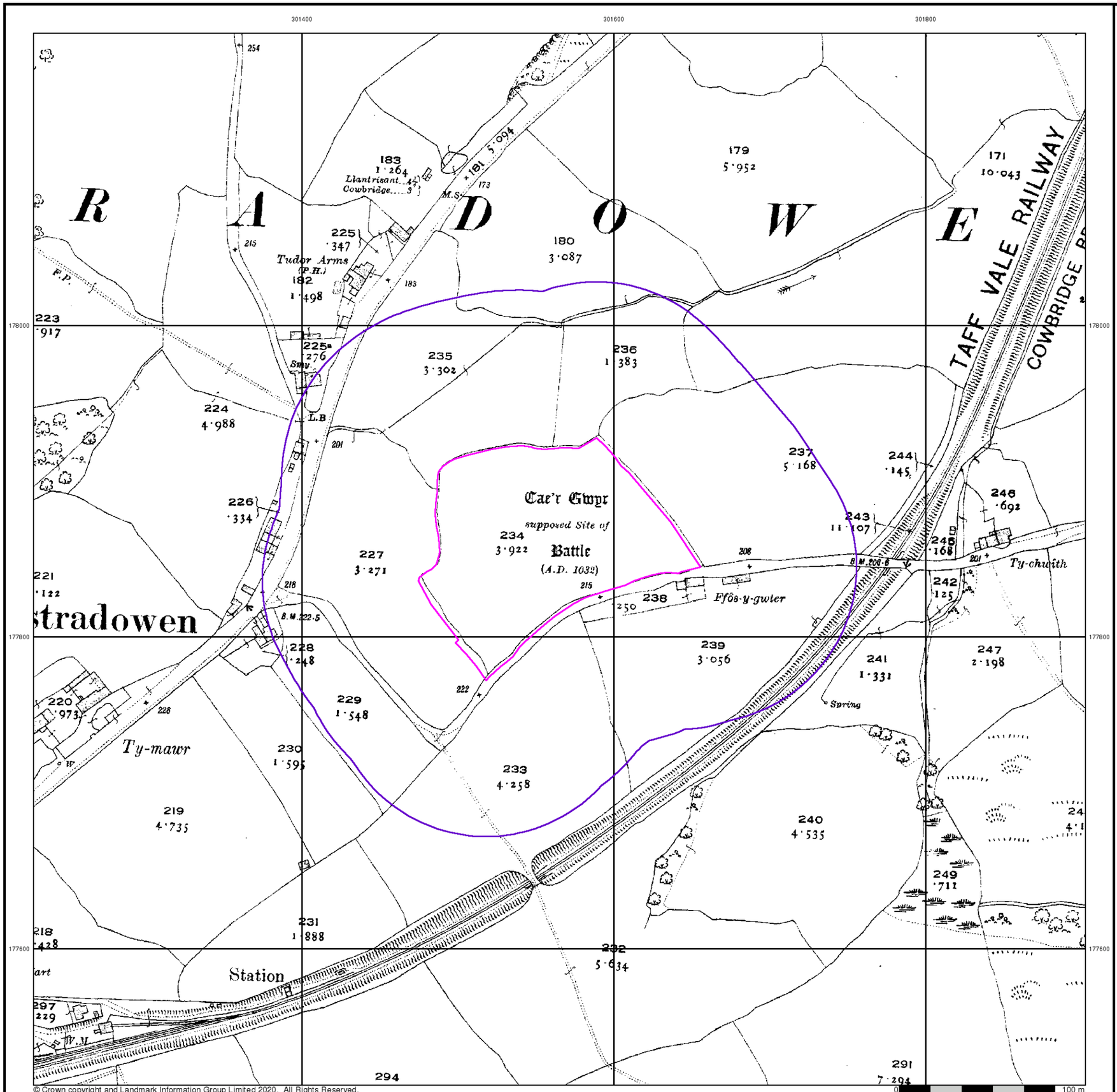


Intégral Géotechnique

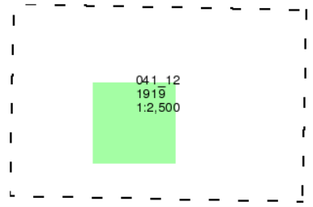
Glamorganshire

Published 1919

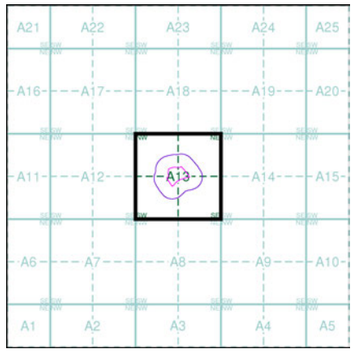
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

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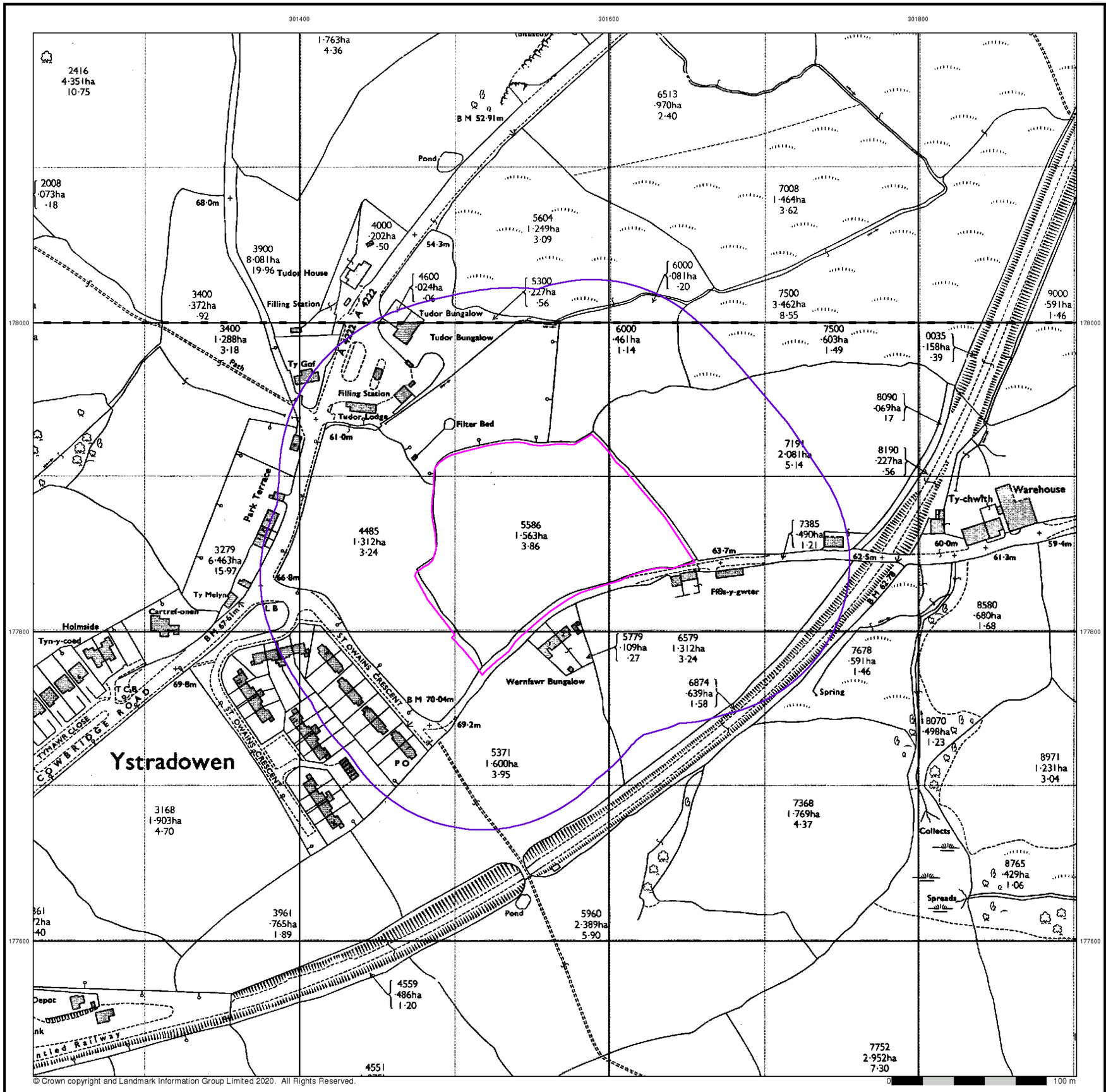
Customer Ref:	12604/LP
National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	100

Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW



Intégral Géotechnique

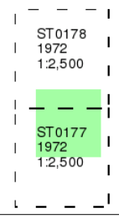
Ordnance Survey Plan

Published 1972

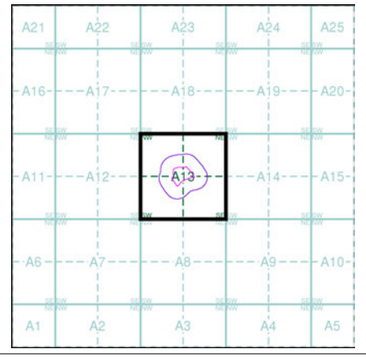
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	231826780_1_1
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National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
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Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW

Landmark INFORMATION GROUP
Tel: 0844 844 9952
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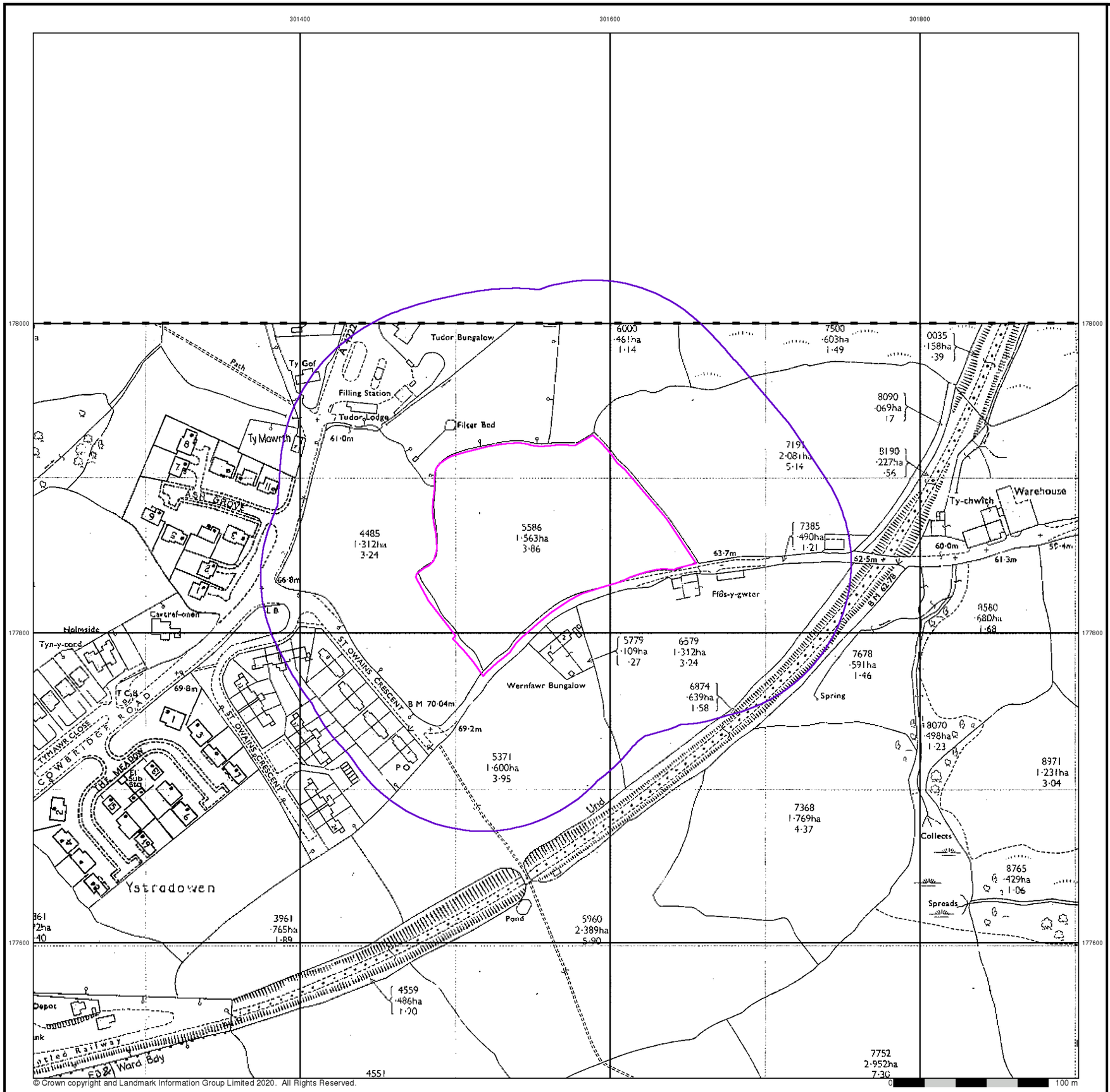


Intégral Géotechnique

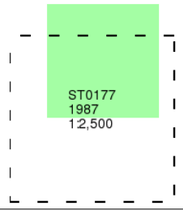
Additional SIMs

Published 1987

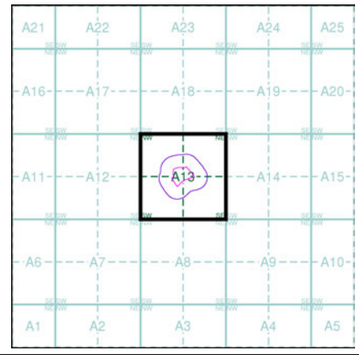
Source map scale - 1:2,500

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

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Customer Ref:	12604/LP
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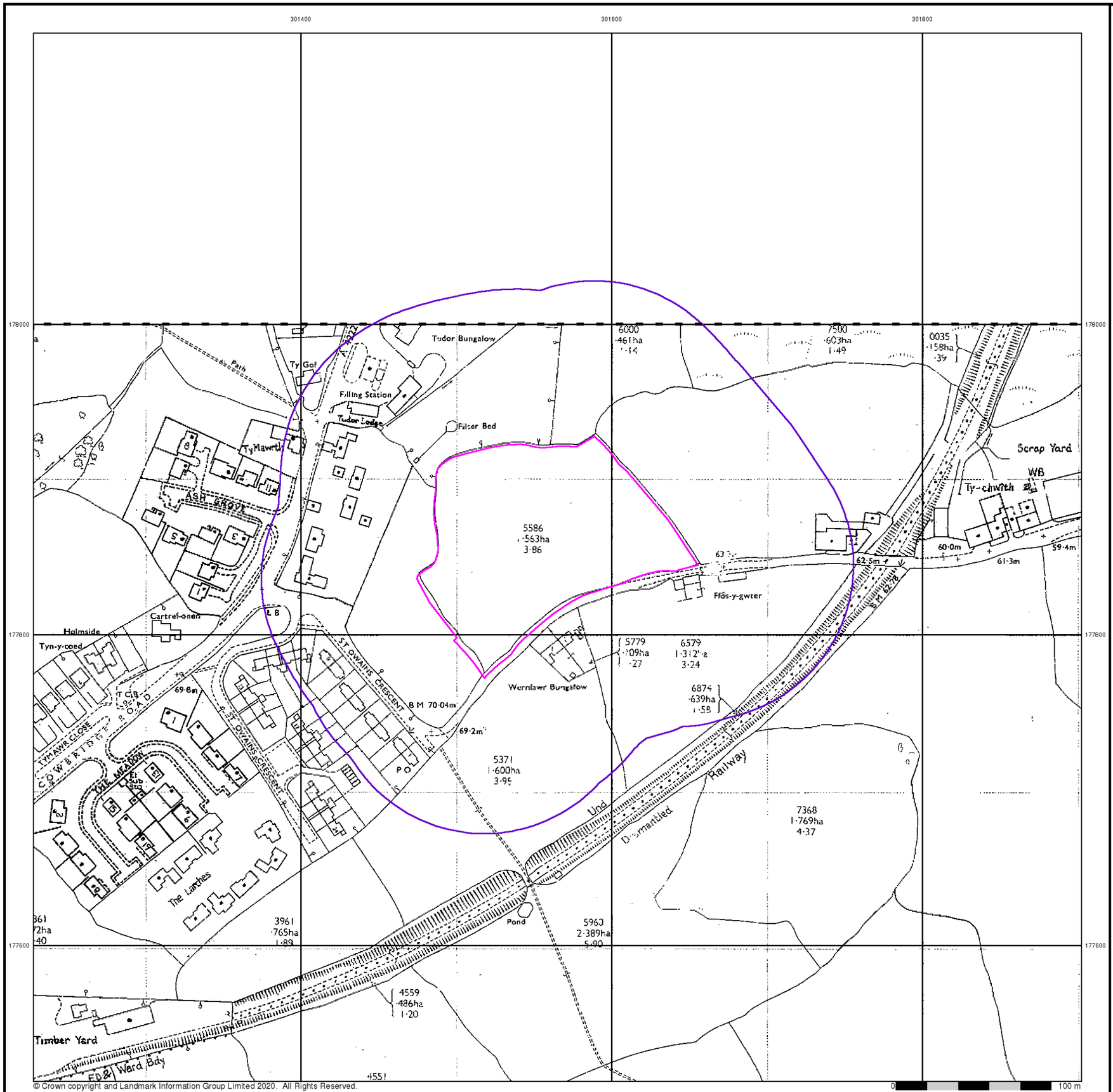
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	100

Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW



Intégral Géotechnique

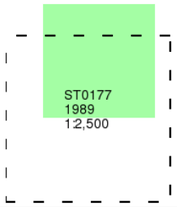
Additional SIMs

Published 1989

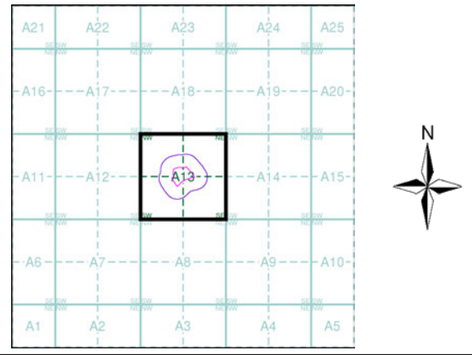
Source map scale - 1:2,500

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	231826780_1_1
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National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	100

Site Details

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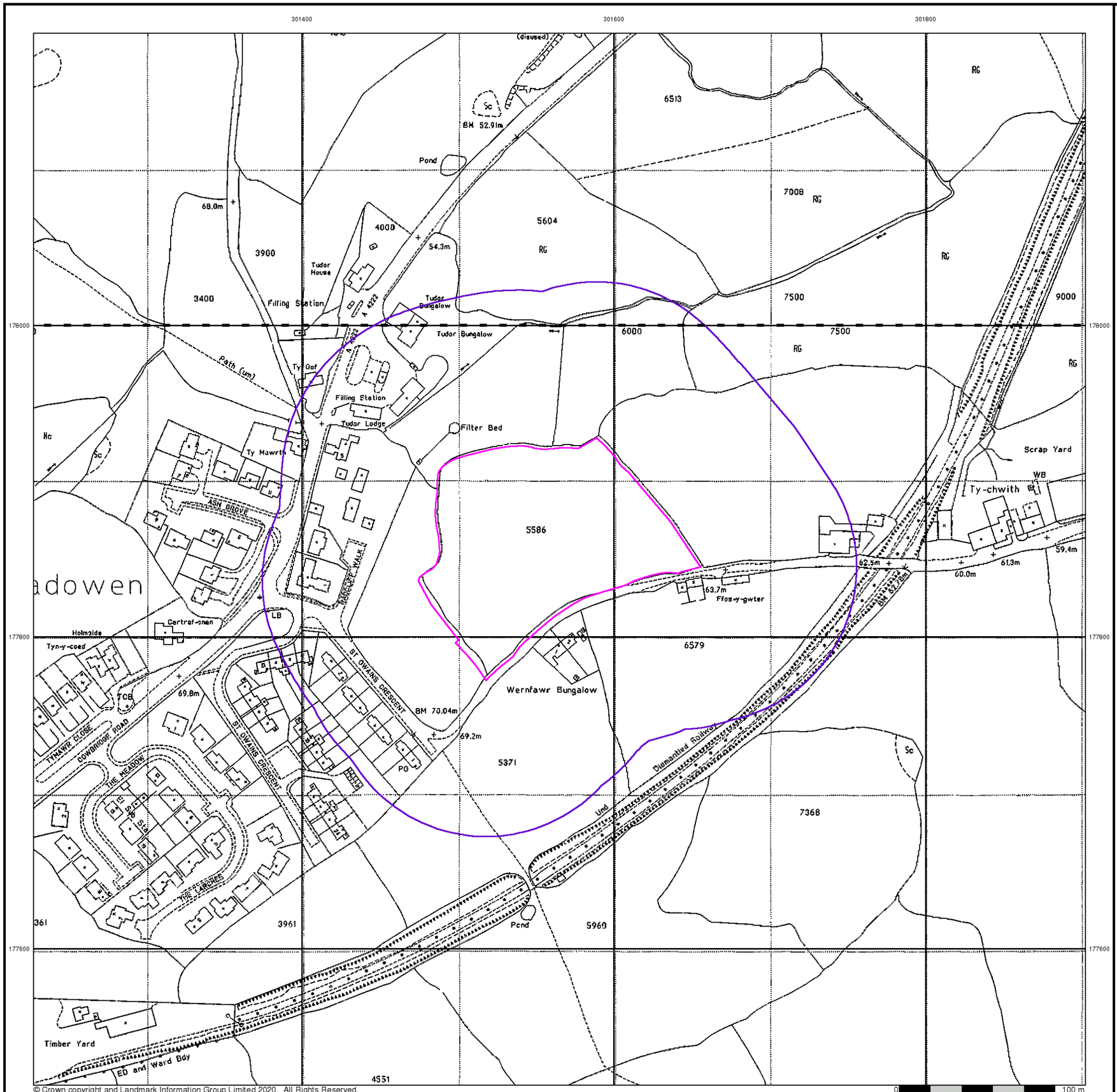
Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Intégral Géotechnique

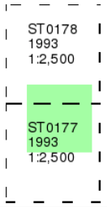
Large-Scale National Grid Data

Published 1993

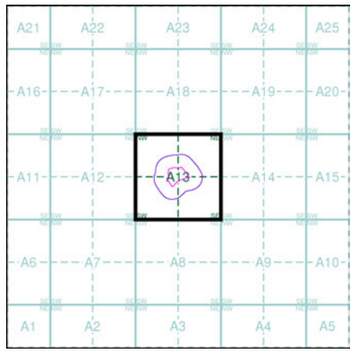
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	231826780_1_1
Customer Ref:	12604/LP
National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	100

Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW

Landmark INFORMATION GROUP

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Fax: 0844 844 9951
Web: www.envirocheck.co.uk

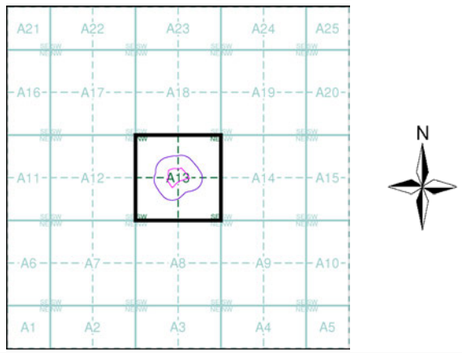
Intégral Géotechnique

Historical Aerial Photography

Published 2000

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A13



Order Details

Order Number:	231826780_1_1
Customer Ref:	12604/LP
National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	100

Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW

Landmark INFORMATION GROUP

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Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Intégral
Géotechnique

Envirocheck® Report:

Mining and Ground Stability Datasheet

Order Details:

Order Number:
231826780_1_1

Customer Reference:
12604/LP

National Grid Reference:
301560, 177850

Slice:
A

Site Area (Ha):
1.59

Search Buffer (m):
1000

Site Details:

Sandy Lane
Ystradowen
Cowbridge
CF71 7TW

Client Details:

MR H Pritchard
Integral Geotechnique
Integral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX

Intégral Géotechnique

Contents

Report Version v53.0

Intégral Géotechnique

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Man Made Mining Cavities					
Mining Instability			n/a	n/a	n/a
Natural Cavities					
Non Coal Mining Areas of Great Britain	pg 1		Yes	n/a	n/a
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Historical Land Use Information (1:2,500)					
Extractive Industries or Potential Excavations from 1855-1909 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1893-1915 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1906-1937 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1924-1949 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1950-1980 (100m)	pg 2		2	n/a	n/a
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Mineral Railway					
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Mining of coal & lignite					
Quarrying of sand & clay, operation of sand & gravel pits	pg 3				1
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Potentially Infilled Land (Non-Water)	pg 3				1
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Brine Subsidence Solution Area					
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Potential for Compressible Ground Stability Hazards	pg 4	Yes	Yes	n/a	n/a
Potential for Ground Dissolution Stability Hazards	pg 4	Yes	Yes	n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 4	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 4	Yes	Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 4	Yes	Yes	n/a	n/a
Salt Mining Related Features					

Intégral Géotechnique

Summary

Report Version v53.0

Intégral Géotechnique

Mining and Natural Cavities Data

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**BGS Recorded Mineral Sites** Site Name: Ffynnon Elan Location: Cowbridge, South Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 160976 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Brofiscin Oolite Formation Commodity: Limestone Positional Accuracy: Located by supplier to within 10m	A18SE (N)	305	1	301569 178232
2	**BGS Recorded Mineral Sites** Site Name: Fflad Location: Cowbridge, South Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 160979 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Jurassic Geology: Blue Lias Formation (Marginal Facies) Commodity: Limestone Positional Accuracy: Located by supplier to within 10m	A7SE (SW)	804	1	301143 177061
3	**BGS Recorded Mineral Sites** Site Name: Ty'N-Y-Pant Sand Pit Location: Cowbridge, South Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 160986 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Quaternary, Devensian Geology: Till, Devensian Commodity: Sand Positional Accuracy: Located by supplier to within 10m	A17NE (NW)	897	1	301051 178692
	Coal Mining Affected Areas In an area which may not be affected by coal mining				
	Non Coal Mining Areas of Great Britain Risk: Highly Unlikely Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	59	1	301532 177982

Intégral Géotechnique

Historical Land Use Information (1:2,500)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	**Extractive Industries or Potential Excavations from 1950-1980** Use: Filter Bed First Map Published Date: 1972 Last Map Published Date: N/A	A13NW (NW)	21	-	301497 177935
5	**Extractive Industries or Potential Excavations from 1950-1980** Use: Railway Cutting First Map Published Date: 1972 Last Map Published Date: N/A	A13SE (SE)	85	-	301654 177730

Intégral Géotechnique

Historical Land Use Information (1:10,000)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
6	**General Quarrying** Use: Not Supplied Date of Mapping: 1885 - 1964	A13NW (N)	234	-	301556 178159
7	**General Quarrying** Use: Not Supplied Date of Mapping: 1885	A7SE (SW)	776	-	301185 177072
8	**Quarrying of sand & clay, operation of sand & gravel pits** Use: Not Supplied Date of Mapping: 1885	A17NE (NW)	891	-	301048 178684
9	**Potentially Infilled Land (Non-Water)** Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1974	A17NE (NW)	891	-	301048 178684
10	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1964	A13SW (W)	223	-	301270 177748
11	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1947	A9SW (SE)	800	-	302078 177167
12	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1964	A14NE (E)	873	-	302491 178098
13	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1964	A17NE (NW)	975	-	301053 178782

Ground Stability Data (1:50,000)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	CBSCB Compensation District The site does not fall within the brine compensation area.				
	Brine Subsidence Solution Area The site does not fall within the brine subsidence solution area.				
14	**Potential for Collapsible Ground Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	1	301557 177854
15	**Potential for Compressible Ground Stability Hazards** Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	13	1	301544 177936
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	1	301557 177854
16	**Potential for Ground Dissolution Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	1	301557 177854
17	**Potential for Ground Dissolution Stability Hazards** Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	301498 177916
18	**Potential for Ground Dissolution Stability Hazards** Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	60	1	301489 177973
19	**Potential for Ground Dissolution Stability Hazards** Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	239	1	301637 178162
20	**Potential for Landslide Ground Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	1	301557 177854
21	**Potential for Landslide Ground Stability Hazards** Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	104	1	301466 178014
22	**Potential for Landslide Ground Stability Hazards** Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	189	1	301458 178099
23	**Potential for Landslide Ground Stability Hazards** Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	199	1	301290 177931
24	**Potential for Landslide Ground Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	231	1	301368 178105
25	**Potential for Running Sand Ground Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	1	301557 177854
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	13	1	301544 177936
26	**Potential for Shrinking or Swelling Clay Ground Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SW)	0	1	301557 177854
27	**Potential for Shrinking or Swelling Clay Ground Stability Hazards** Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	13	1	301544 177936

Historical Map List

The following mapping has been analysed for Historical Land Use Information (1:2,500):

1:2,500	Mapsheet	Published Date
Ordnance Survey Plan	ST0177	1972
Ordnance Survey Plan	ST0178	1972

The following mapping has been analysed for Historical Land Use Information (1:10,000):

1:10,560	Mapsheet	Published Date
Glamorganshire	041_00	1885
Glamorganshire	041_NE	1900
Glamorganshire	041_SE	1900
Glamorganshire	041_NE	1921
Glamorganshire	041_SE	1921
Glamorganshire	041_SE	1947
Glamorganshire	041_NE	1952
Ordnance Survey Plan	ST07NW	1964
1:10,000	**Mapsheet**	**Published Date**
Ordnance Survey Plan	ST07NW	1974

Data Currency

Mining and Cavities Data	Version	Update Cycle
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	October 2019	Bi-Annually
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	Annual Rolling Update
Man Made Mining Cavities Peter Brett Associates	December 2019	Bi-Annually
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Natural Cavities Peter Brett Associates	December 2019	Bi-Annually
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Historical Land Use Information (1:2,500)	**Version**	**Update Cycle**
Subterranean Features Landmark Information Group Limited	March 2019	Bi-Annually
Ground Stability Data (1:50,000)	**Version**	**Update Cycle**
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Brine Subsidence Solution Area Johnson Poole & Bloomer	January 2015	Annual Rolling Update

Data Suppliers

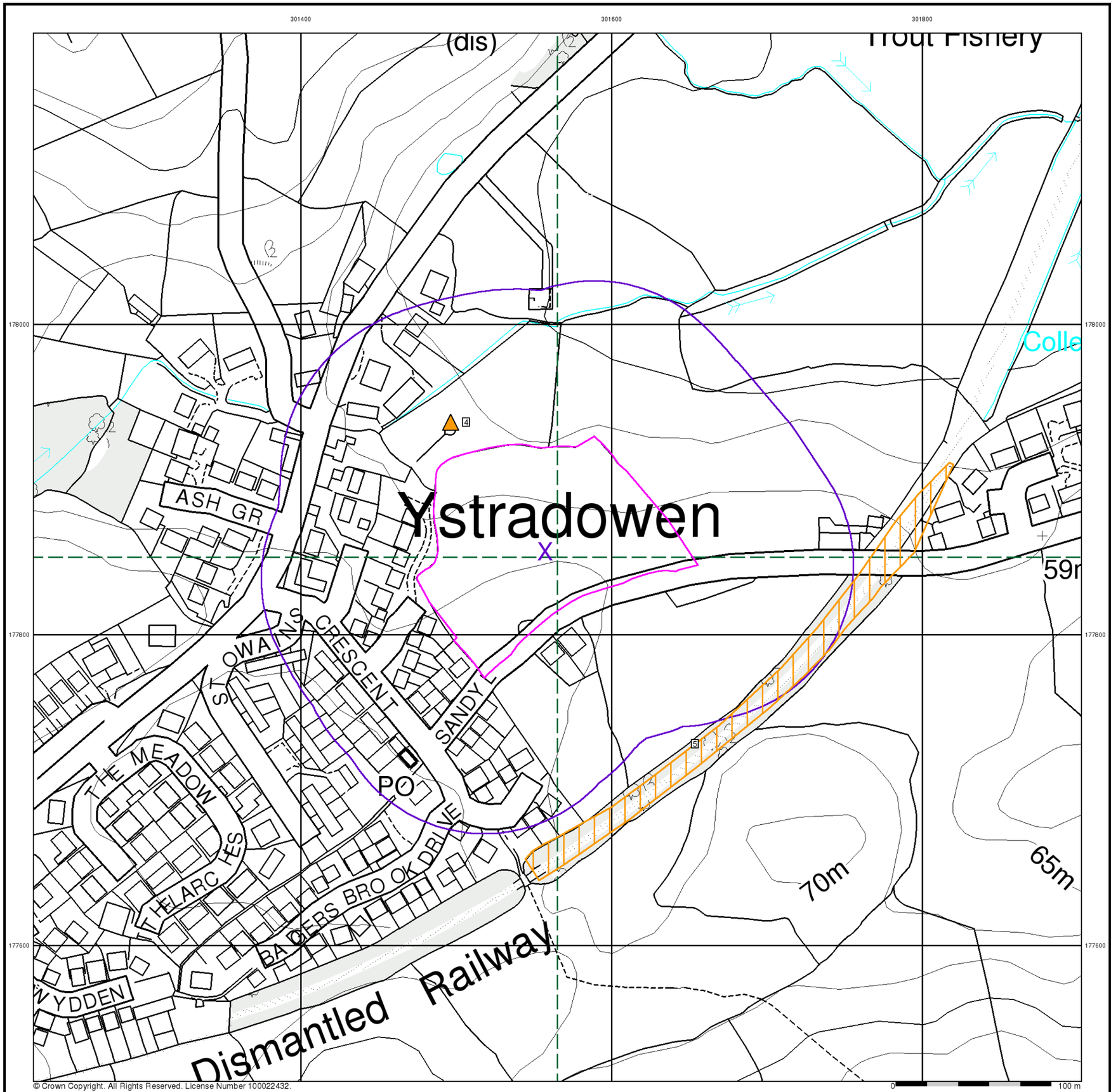
A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	Map data
British Geological Survey	British Geological Survey, Natural Environment Research Council
The Coal Authority	The Coal Authority
Ove Arup	ARUP
Peter Brett Associates	pba peterbrett
Wardell Armstrong	wardell armstrong, your earth our world
Johnson Poole & Bloomer	JPB

Intégral Géotechnique

Useful Contacts

Contact	Name and Address	Contact Details
1	**British Geological Survey - Enquiry Service** British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk



Intégral Géotechnique

Historical Land Use Information (1:2,500)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID | Several of Type at Location

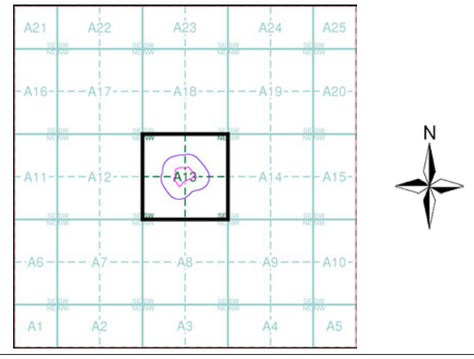
Potentially Contaminative Industrial Uses (Extractive Industries Activity)

	Point	Line	Polygon
Extractive Industries Activity from 1855 - 1909	▲	—	▭
Extractive Industries Activity from 1893 - 1915	▲	—	▭
Extractive Industries Activity from 1906 - 1937	▲	—	▭
Extractive Industries Activity from 1924 - 1949	▲	—	▭
Extractive Industries Activity from 1950 - 1980	▲	—	▭

Subterranean Features

	Point	Line	Polygon
Subterranean Features	▼	- - -	▭

Mining and Ground Stability - Segment A13



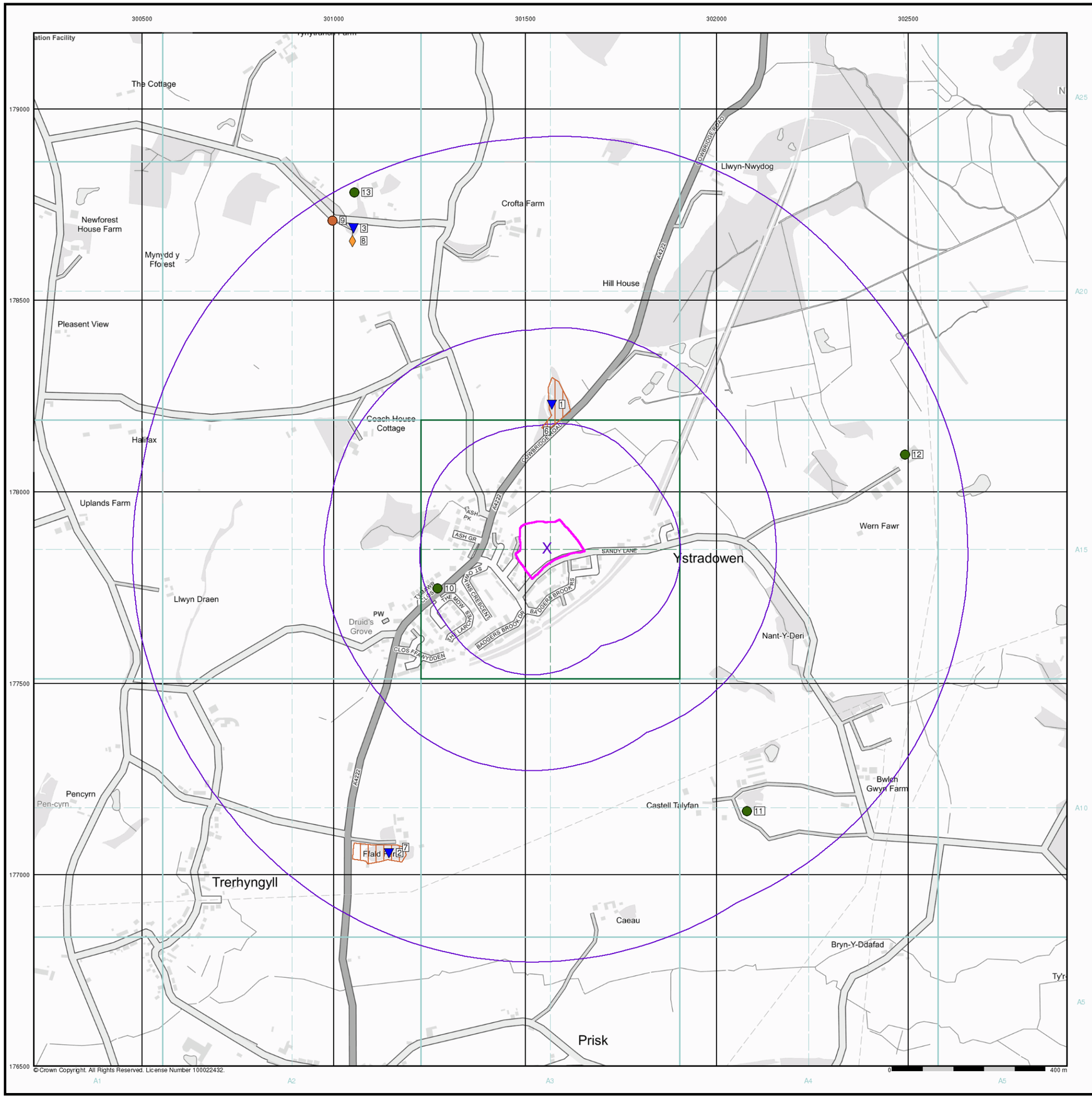
Order Details

Order Number:	231826780_1_1
Customer Ref:	12604/LP
National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Plot Buffer (m):	100

Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Intégral Géotechnique

Historical Land Use Information (1:10,000)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

Potentially Contaminative Industrial Uses (Past Land Uses - Mining)

	Point	Line	Polygon
Air Shafts	◆		
Disturbed Ground	◆		
General Quarrying	◆		
Heap, unknown constituents	◆		
Mineral Railway	◆		
Mining and Quarrying General	◆		
Mining of Coal & Lignite	◆		
Quarrying of Sand and Clay, Operation of Sand and Gravel Pits	◆		

Historical Land Use

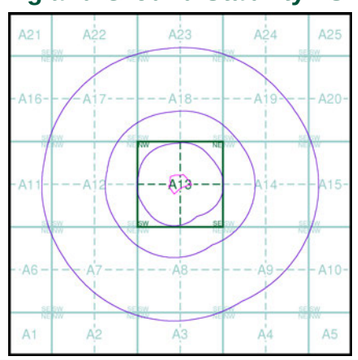
	Point	Line	Polygon
Potentially Infilled Land (Non-Water)	●		
Potentially Infilled Land (Water)	●		
Former Marsh	✠		

Mining Data

Potential Mining Area

BGS Recorded Mineral Site

Mining and Ground Stability - Slice A



Order Details

Order Number:	231826780_1_1
Customer Ref:	12604/LP
National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	1000

Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW

Landmark INFORMATION GROUP

Tel: 0844 844 9952
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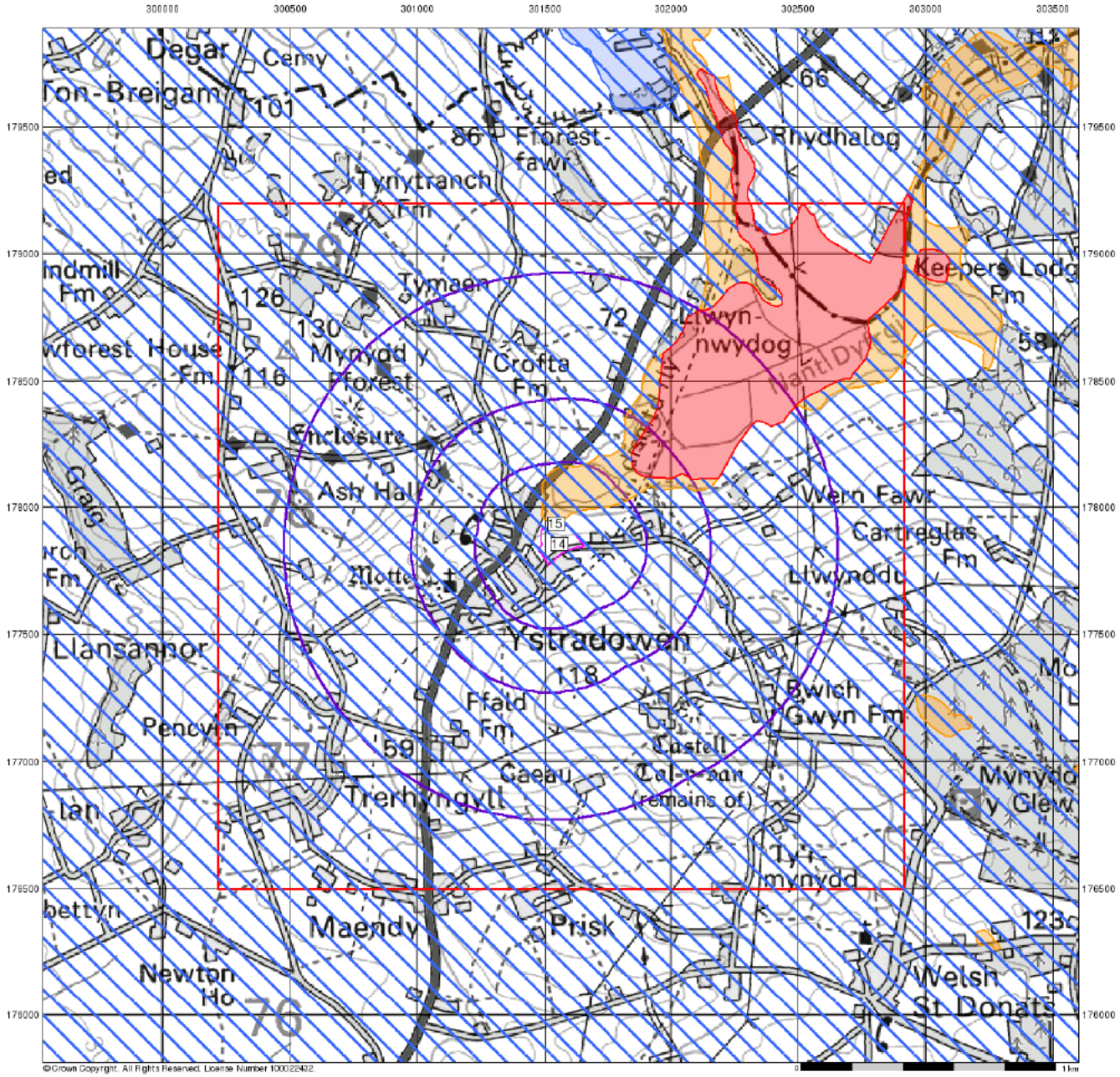


Intégral Géotechnique

Ground Stability Data (1:50,000)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Potential for Compressible Ground Stability Hazards

High | Low | Moderate | Very Low

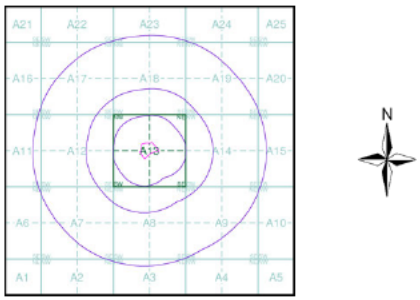
Potential for Collapsible Ground Stability Hazards

High | Low | Moderate | Very Low

Brine Pumping and Salt Mining

	Point	Polygon
Brine Pumping Related Feature	▲	▨
Salt Mining Related Feature	▲	▨

Mining and Ground Stability - Slice A



Order Details

Order Number:	231826780_1_1
Customer Ref:	12604/LP
National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	1000

Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW

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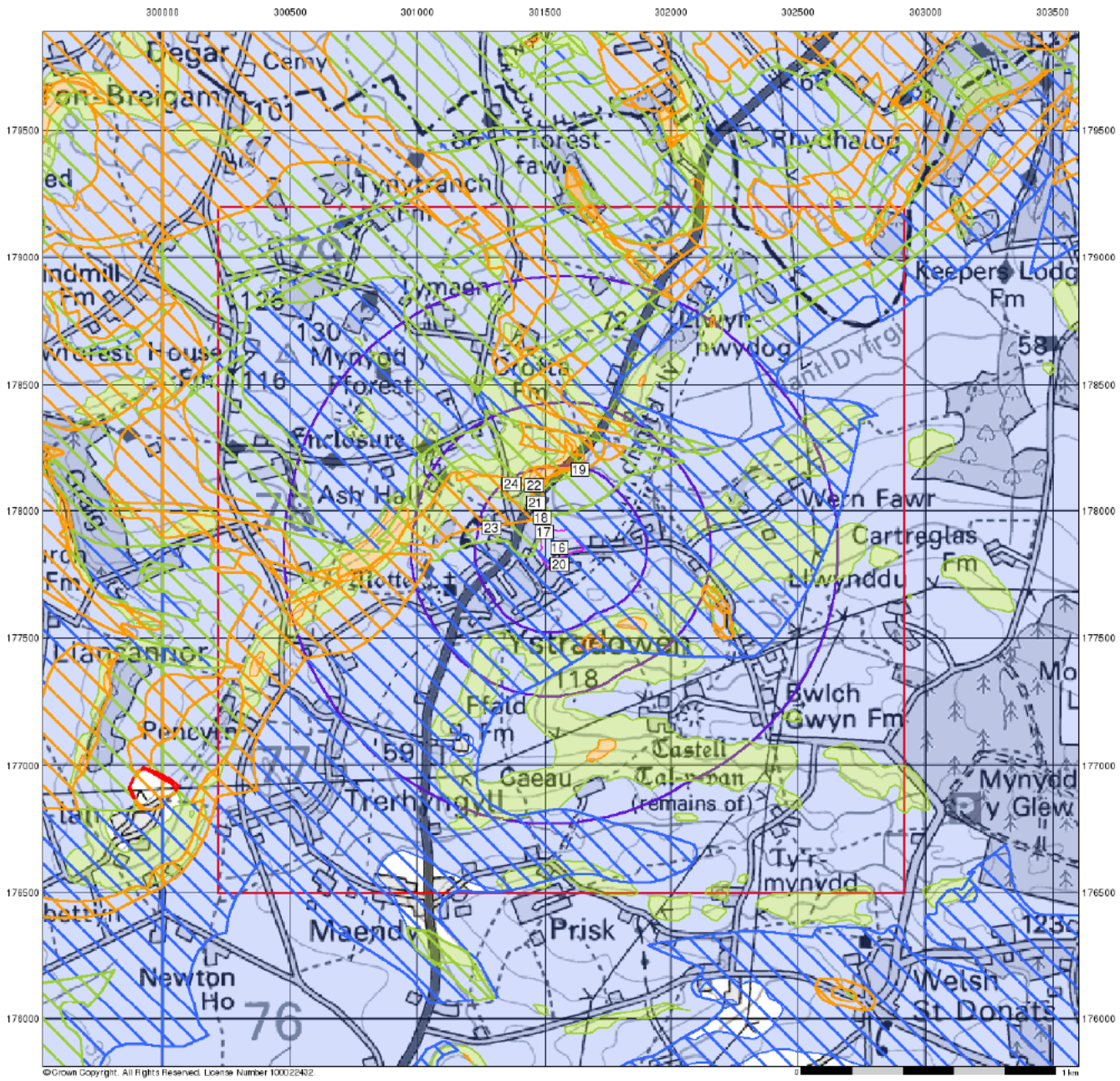


Intégral Géotechnique

Ground Stability Data (1:50,000)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

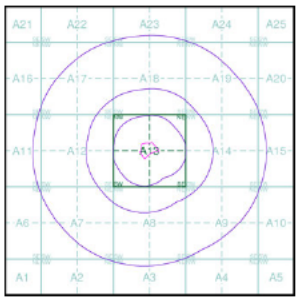
Potential for Landslide Ground Stability Hazards

High | Low
Moderate | Very Low

Potential for Ground Dissolution Stability Hazards

High | Low
Moderate | Very Low

Mining and Ground Stability - Slice A



Order Details

Order Number:	231826780_1_1
Customer Ref:	12604/LP
National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	1000

Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW

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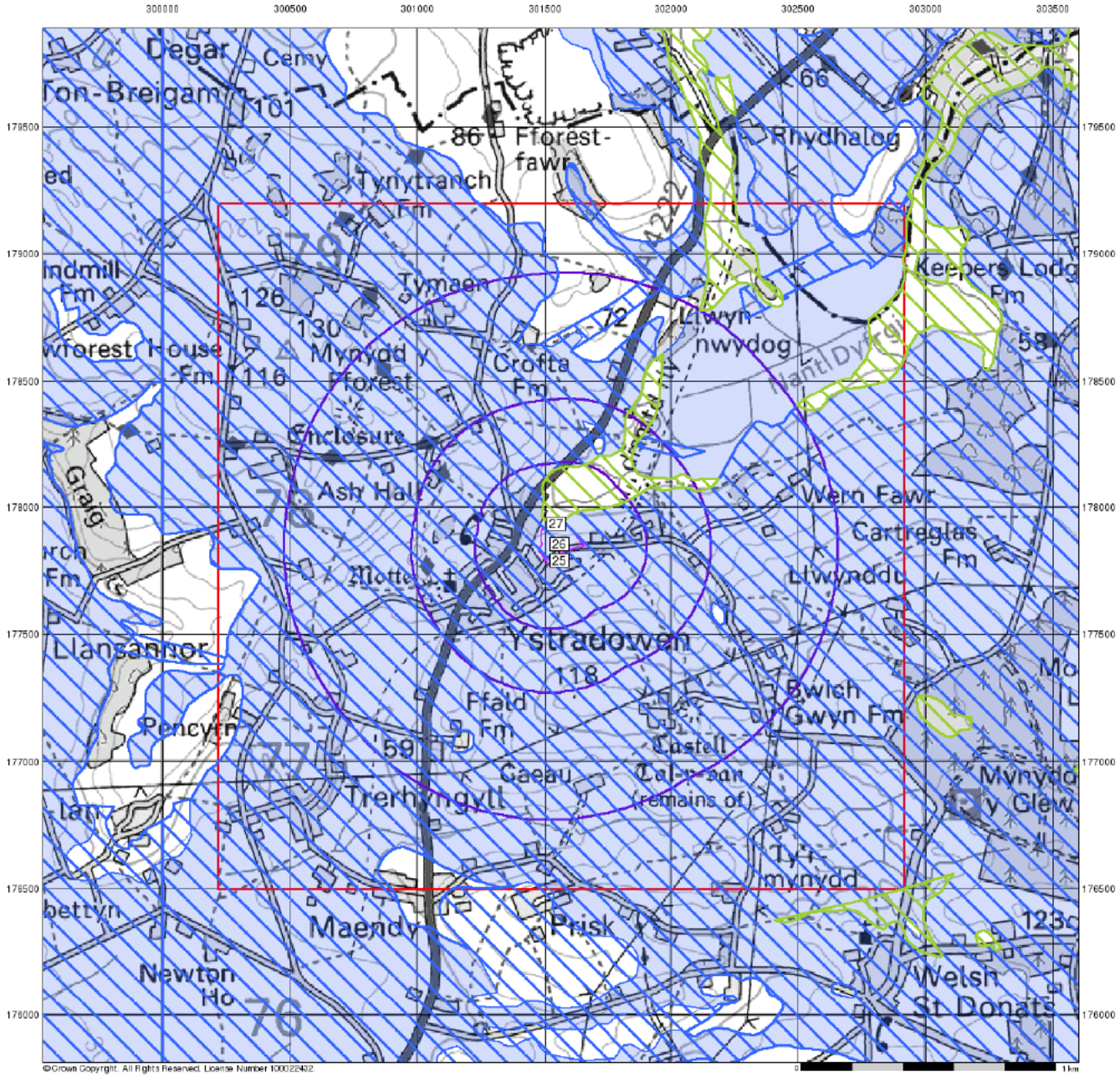
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Intégral Géotechnique

Ground Stability Data (1:50,000)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

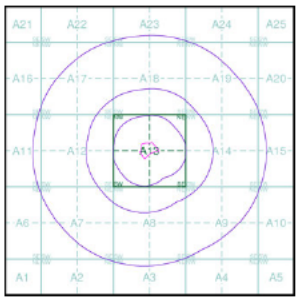
Potential for Running Sand Ground Stability Hazards

High | Low
Moderate | Very Low

Potential for Shrinking or Swelling Clay Ground Stability Hazards

High | Low
Moderate | Very Low

Mining and Ground Stability - Slice A



Order Details

Order Number:	231826780_1_1
Customer Ref:	12604/LP
National Grid Reference:	301560, 177850
Slice:	A
Site Area (Ha):	1.59
Search Buffer (m):	1000

Site Details

Sandy Lane, Ystradowen, Cowbridge, CF71 7TW

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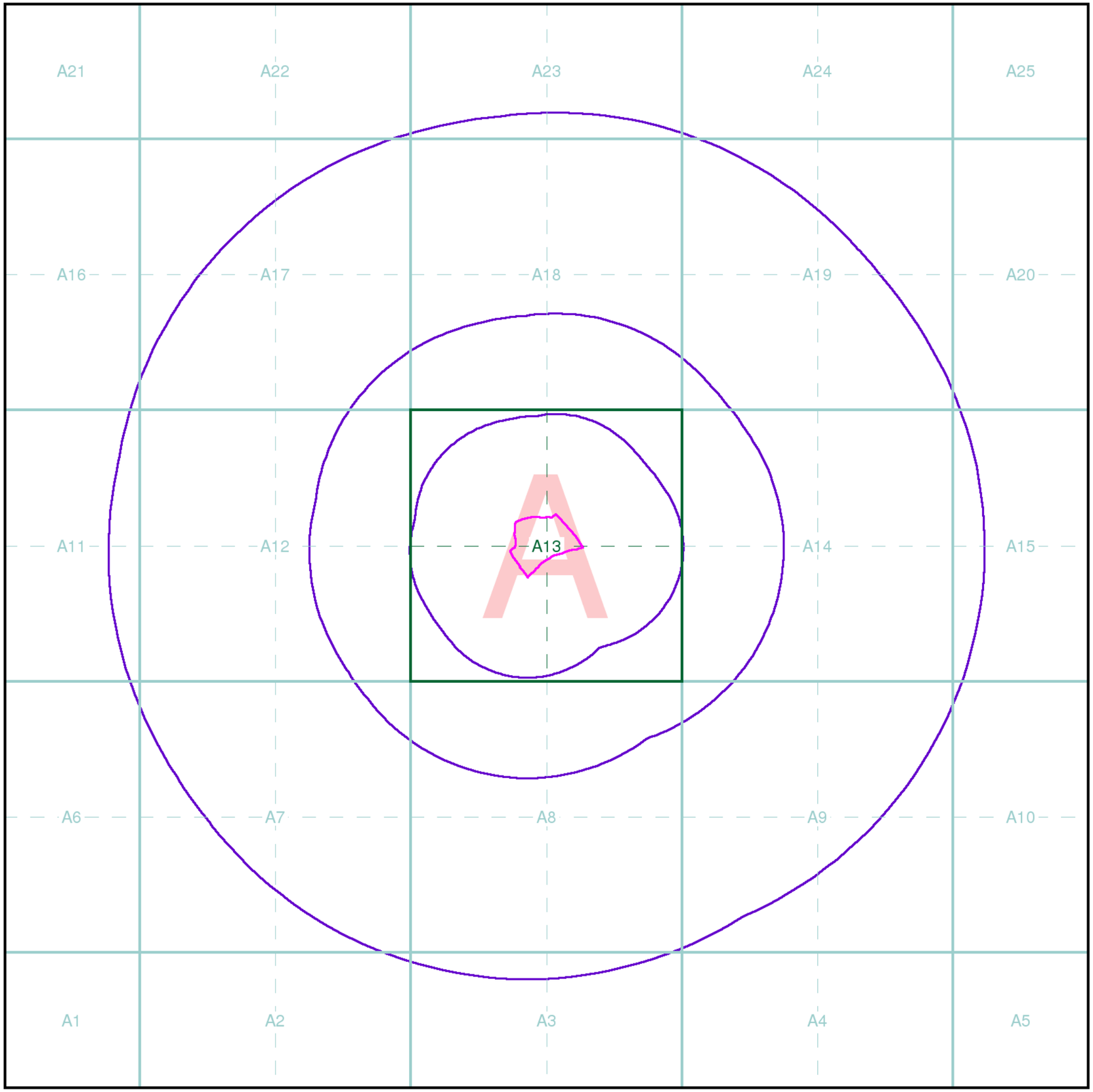
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Intégral Géotechnique

Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:

Map data

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Cyfoeth Naturiol Cymru
Natural Resources Wales

Envirocheck reports are compiled from 136 different sources of data.

Client Details

MR H Pritchard, Integral Geotechnique, Integral House, 7 Beddau Way, Castlegate Business Park, Caerphilly, CF83 2AX

Order Details

Order Number:	231826780_1_1
Customer Ref:	12604/LP
National Grid Reference:	301550, 177860
Site Area (Ha):	1.59
Search Buffer (m):	1000

Site Details

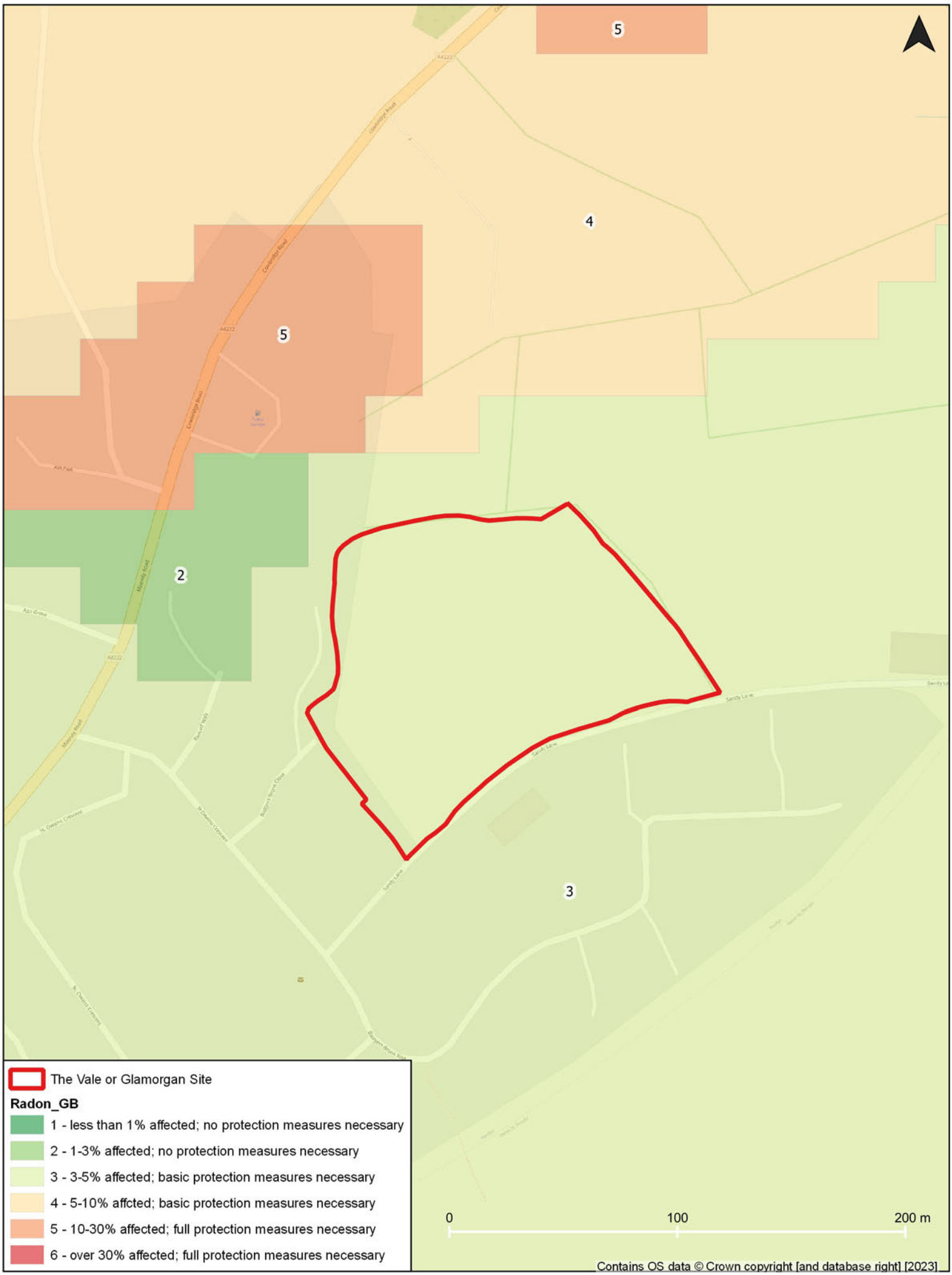
Sandy Lane, Ystradowen, Cowbridge, CF71 7TW

Full Terms and Conditions can be found on the following link:
http://www.landmarkinfo.co.uk/Terms/Show/515

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

APPENDIX B

LANDMARK RADON INFORMATION MAP



Map Scale: 1:2,074
Page Size: 210 x 297 mm
Drawn By: Landmark Geodata
Commercial In Confidence

Radon Information Map

Order Number: 308639778
Date:16/03/2023

Landmark Geodata

APPENDIX C

TRIAL PIT LOGS

Intégral Géotechnique
Intégral House, 7 Beddau Way
Castlegate Business Park
Caerphilly CF83 2AX
Tel. 029 20807991
Fax. 029 20862176
mail@integralgeotec.com

Project Name:	Project No.:	Trial Pit No.:
Land at Sandy Lane	**12604**	**TP01** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Ystradowen	Lewis Homes (South Wales) Limited	LW	1:25

Equipment:	Coordinates:	**Dimensions**
JCB 3CX		2.80m
Date Excavated: 05/02/2020	Level:	Depth : 2.80m, 0.70m

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.15			TOPSOIL: Grass over soft brown silty CLAY with rootlets.
						(Loose and loose to medium dense) brown to slightly orange brown very clayey silty slightly gravelly to gravelly SAND. Gravel is fine to coarse sub-angular to sub-rounded of mixed lithologies.
			1.80			(Loose to medium dense) brown to red brown very clayey silty gravelly fine to medium SAND with lenses of soft, soft to firm silty sandy CLAY. Gravel is fine to coarse rounded to sub-angular of mixed lithologies.
			2.00			(Loose to medium dense) brown silty slightly clayey to clayey gravelly SAND to SAND and GRAVEL. Gravel is fine to coarse sub-angular to sub-rounded of mixed lithologies.
			2.80			End of Trialpit at 2.80 m

Remarks:
1. Trial pit terminated at 2.8m bgl.

Groundwater: Groundwater encountered at 2.6m bgl.

Stability: Spalling and overbreak of excavation sides.

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

Intégral Géotechnique
Intégral House, 7 Beddau Way
Castlegate Business Park
Caerphilly CF83 2AX
Tel. 029 20807991
Fax. 029 20862176
mail@integralgeotec.com

Project Name:	Project No.:	Trial Pit No.:
Land at Sandy Lane	**12604**	**TP02** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Ystradowen	Lewis Homes (South Wales) Limited	LW	1:25

Equipment:	Coordinates:	**Dimensions**
JCB 3CX		2.80m
Date Excavated: 05/02/2020	Level:	Depth : 2.30m, 0.70m

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over soft brown silty CLAY with rootlets.
			0.20			(Loose to medium dense) brown silty clayey gravelly fine to medium SAND. Gravel is fine to coarse angular to sub-rounded of mixed lithologies.
			0.90			(Loose to medium dense) brown to locally red brown silty clayey gravelly cobbly SAND and GRAVEL. Gravel is fine to coarse angular to sub-rounded and tabular of mixed lithologies.
			2.30			End of Trialpit at 2.30 m

1 2 3 4 5

Remarks:
1. Trial pit terminated at 2.3m due to collapse of pit side.

Groundwater: Groundwater not encountered.

Stability: Unstable. Collapse of excavation sides to ground level.

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

Intégral Géotechnique
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Caerphilly CF83 2AX
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Fax. 029 20862176
mail@integralgeotec.com

Project Name:	Project No.:	Trial Pit No.:
Land at Sandy Lane	**12604**	**TP03** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Ystradowen	Lewis Homes (South Wales) Limited	LW	1:25

Equipment: JCB 3CX

Coordinates:

Dimensions 2.80m

Depth : 2.60m

0.70m

Date Excavated: 05/02/2020

Level:

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES					TOPSOIL: Grass over soft brown silty CLAY with rootlets.
			0.20			
0.40	ES					(Loose) brown to orange red brown silty clayey gravelly SAND. Gravel is fine to coarse angular to sub-angular of mixed lithologies.
1.20	D		1.20			(Loose to medium dense) brown to red brown silty clayey sandy fine to coarse GRAVEL with low cobble content. Gravel and cobbles are angular to sub-rounded of mixed lithologies.
			2.60			End of Trialpit at 2.60 m

1
2
3
4
5

Remarks:

1. Trial pit terminated at 2.6m bgl.
2. Soakaway test undertaken.

Groundwater: Groundwater not encountered.

Stability: Spalling and overbreak of excavation sides.

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

Intégral Géotechnique	Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com	Project Name: **Land at Sandy Lane**	Project No.: **12604**	Trial Pit No.: **TP04** Sheet 1 of 1
Location: Ystradowen		Client: Lewis Homes (South Wales) Limited	Logged By: LW	Scale 1:25
Equipment: JCB 3CX		Coordinates:	**Dimensions** 2.80m Depth : 2.30m 0.70m	
Date Excavated: 05/02/2020		Level:		

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.15			TOPSOIL: Grass over soft brown silty CLAY with rootlets.
0.40	ES					(Loose to medium dense) brown to orange brown silty clayey gravelly fine to medium SAND. Gravel is fine to coarse angular to sub-rounded and tabular of mixed lithologies.
1.50	D		1.40			(Loose to medium dense) brown to locally red brown silty clayey gravelly fine to medium SAND with lenses of soft to firm, firm silty sandy CLAY.
			2.30			End of Trialpit at 2.30 m

1
2
3
4
5

Remarks:

1. Trial pit terminated at 2.3m bgl due to instability of excavation sides.

Groundwater: Groundwater encountered at 2.1m bgl.

Stability: Spalling and overbreak of excavation sides.

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

Intégral Géotechnique
Intégral House, 7 Beddau Way
Castlegate Business Park
Caerphilly CF83 2AX
Tel. 029 20807991
Fax. 029 20862176
mail@integralgeotec.com

Project Name: **Land at Sandy Lane**		Project No.: **12604**	Trial Pit No.: **TP05** Sheet 1 of 1
Location: Ystradowen	Client: Lewis Homes (South Wales) Limited	Logged By: LW	Scale 1:25
Equipment: JCB 3CX	Coordinates:	**Dimensions** 2.60m; Depth : 1.60m; 0.70m	
Date Excavated: 05/02/2020	Level:		

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.15			TOPSOIL: Grass over dark brown silty CLAY with roots and rootlets.
						(Loose to medium dense) brown to orange grey brown clayey silty SAND and GRAVEL with low cobble content. Gravel is fine to coarse angular to subrounded of mixed lithologies. Cobbles are sub-rounded of sandstone.
			1.60			End of Trialpit at 1.60 m

Remarks:
1. Trial pit terminated at 1.6m due to shallow groundwater and collapse of pit sides.

Groundwater: Groundwater encountered at 1.6m bgl.

Stability: Unstable. Collapse of excavation sides to ground level.

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

Intégral Géotechnique
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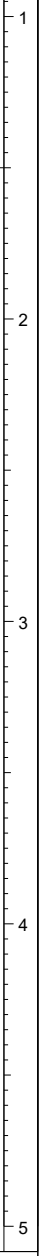
Castlegate Business Park
Caerphilly CF83 2AX
Tel. 029 20807991
Fax. 029 20862176
mail@integralgeotec.com

Project Name: **Land at Sandy Lane**		Project No.: **12604**	Trial Pit No.: **TP05A** Sheet 1 of 1
Location: Ystradowen	Client: Lewis Homes (South Wales) Limited	Logged By: LW	Scale 1:25
Equipment: JCB 3CX	Coordinates:	**Dimensions** 2.50m; Depth : 1.50m; 0.70m	
Date Excavated: 05/02/2020	Level:		

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.15			TOPSOIL: Grass over dark brown silty CLAY with roots and rootlets.
0.40	ES					(Loose to medium dense) brown to orange grey brown clayey silty SAND and GRAVEL with low cobble content. Gravel is fine to coarse angular to subrounded of mixed lithologies. Cobbles are sub-rounded of sandstone.
1.20	D		1.50			End of Trialpit at 1.50 m



Remarks:
1. Trial pit terminated at 1.5m bgl.
2. Soakaway test undertaken.

Groundwater: Groundwater encountered at 1.5m bgl.

Stability: Spalling and overbreak of excavation sides.

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

Intégral Géotechnique
Intégral House, 7 Beddau Way
Castlegate Business Park
Caerphilly CF83 2AX
Tel. 029 20807991
Fax. 029 20862176
mail@integralgeotec.com

Project Name:	Project No.:	Trial Pit No.:
Land at Sandy Lane	**12604**	**TP06** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Ystradowen	Lewis Homes (South Wales) Limited	LW	1:25

Equipment: JCB 3CX

Coordinates:

Date Excavated: 05/02/2020

Level:

Dimensions

2.60m

Depth : 2.10m

0.70m

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over soft brown silty CLAY with rootlets.
			0.20			(Loose to medium dense) brown to orange red brown clayey silty sandy fine to coarse GRAVEL of angular to sub-rounded sandstone.
			1.60			(Loose to medium dense) red grey brown silty very clayey very gravelly fine to coarse SAND with bands of firm, locally soft to firm silty sandy CLAY. Gravel is fine to coarse sub-angular to sub-rounded of mixed lithologies.
			2.10			End of Trialpit at 2.10 m

Remarks:

1. Trial pit terminated at 2.1m bgl.
2. Soakaway test undertaken.

Groundwater: Strata damp below 1.3m bgl.

Stability: Sides stable.

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

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Tel. 029 20807991
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mail@integralgeotec.com

Project Name:	Project No.:	Trial Pit No.:
Land at Sandy Lane	**12604**	**TP07** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Ystradowen	Lewis Homes (South Wales) Limited	JJ	1:25

Equipment:	Coordinates:	**Dimensions**
8 tonne tracked excavator.		1.90m; Depth : 1.70m; 0.70m
Date Excavated: 21/02/2020	Level:	

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over soft brown silty CLAY with rootlets.
			0.20			(Loose) orange brown slightly clayey slightly silty fine to medium SAND.
			0.80			(Loose to medium dense) brown slightly clayey slightly gravelly fine to medium SAND. Gravel is fine to coarse rounded to sub-rounded of mixed lithologies.
						...becoming gravelly with boulder sized lenses of soft sandy CLAY below 1.0m bgl.
			1.70			End of Trialpit at 1.70 m

1
2
3
4
5

Remarks:
1. Trial pit terminated at 1.7m bgl.
2. Soakaway test undertaken.

Groundwater: Groundwater not encountered.

Stability: Slight overbreak of excavation sides.

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

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Project Name:	Project No.:	Trial Pit No.:
Land at Sandy Lane	**12604**	**TP08** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Ystradowen	Lewis Homes (South Wales) Limited	JJ	1:25

Equipment: 8 tonne tracked excavator.

Coordinates:

Date Excavated: 21/02/2020

Level:

Dimensions

1.80m

Depth : 1.40m

0.65m

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.20			TOPSOIL: Soft brown silty CLAY with rootlets.
						Soft orange brown silty sandy CLAY.
			0.80			(Loose to medium dense) brown slightly clayey very gravelly fine to medium SAND with low to medium cobble content. Gravel is fine to coarse rounded to sub-rounded of sandstone. Cobbles are rounded of sandstone.
			1.40			End of Trialpit at 1.40 m

Remarks:

1. Trial pit terminated at 1.4m bgl.
2. Soakaway test undertaken.

Groundwater: Strata damp below 1.0m bgl.

Stability: Overbreak and spalling of excavation sides.

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Project Name:	Project No.:	Trial Pit No.:
Land at Sandy Lane	**12604**	**TP09** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Ystradowen	Lewis Homes (South Wales) Limited	JJ	1:25

Equipment:	Coordinates:	**Dimensions**
8 tonne tracked excavator.		2.00m; Depth : 2.30m; 0.80m
Date Excavated: 21/02/2020	Level:	

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over soft brown silty CLAY with rootlets.
			0.20			Soft orange brown sandy CLAY.
			1.00			Firm brown and red brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse rounded to sub-angular of sandstone. Cobbles are sub-rounded to sandstone. *...with frequent lenses of (loose) brown silty SAND below 1.0m bgl.*
			2.30			End of Trialpit at 2.30 m

Remarks:
1. Trial pit terminated at 2.3m bgl due to instability of excavation sides.

Groundwater: Groundwater encountered at 1.0m bgl.

Stability: Unstable. Running sand conditions encountered below 1.0m bgl.

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Project Name:	Project No.:	Trial Pit No.:
Land at Sandy Lane	**12604**	**TP10** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Ystradowen	Lewis Homes (South Wales) Limited	JJ	1:25

Equipment:	Coordinates:	**Dimensions**
8 tonne tracked excavator.		2.00m; Depth : 2.50m; 0.80m
Date Excavated: 21/02/2020	Level:	

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over soft brown silty CLAY with rootlets.
			0.20			Soft to firm orange brown slightly sandy silty CLAY.
			0.70			(Loose to medium dense) brown clayey slightly gravelly fine to medium SAND with low cobble and low boulder content. Gravel is fine to coarse rounded to sub-angular of mixed lithologies. Cobbles and boulders are rounded and sub-rounded of sandstone.
			1.80			Soft to firm brown sandy CLAY with frequent lenses of (loose) silty SAND.
			2.50			End of Trialpit at 2.50 m

1
2
3
4
5

Remarks:
1. Trial pit terminated at 2.5m bgl.

Groundwater: Groundwater encountered at 0.9m bgl.

Stability: Unstable. Running sand conditions encountered below 0.9m bgl.

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Project Name:	Project No.:	Trial Pit No.:
Land at Sandy Lane	**12604**	**TP11** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Ystradowen	Lewis Homes (South Wales) Limited	JJ	1:25

Equipment:	Coordinates:	**Dimensions**
8 tonne tracked excavator.		2.00m
Date Excavated: 21/02/2020	Level:	Depth : 2.60m, 0.80m

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.20			TOPSOIL: Grass over soft brown silty CLAY with roots and rootlets.
						(Loose to medium dense) brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse sub-rounded to angular of sandstone.
			1.50			Firm dark red brown slightly gravelly CLAY with low cobble content. Gravel is fine to coarse rounded to sub-angular of mixed lithologies. Cobbles are sub-rounded of sandstone.
			2.60			End of Trialpit at 2.60 m

Remarks:
1. Trial pit terminated at 2.6m bgl.

Groundwater: Groundwater encountered at 0.9m bgl.

Stability: Unstable. Running sand conditions encountered below 0.9m bgl.

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Location: Ystradowen		Client: Lewis Homes (South Wales) Limited	Logged By: JJ	Scale 1:25
Equipment: 8 tonne tracked excavator.		Coordinates:	**Dimensions** 2.00m Depth : 2.00m 0.65m	
Date Excavated: 21/02/2020		Level:		

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.20			TOPSOIL: Grass over soft brown silty CLAY with rootlets.
						Soft to firm, locally soft, orange brown slightly sandy silty CLAY.
			1.10			(Loose to medium dense) brown slightly silty gravelly fine to coarse SAND with low cobble content. Gravel is fine to coarse rounded to angular of mixed lithologies. Cobbles are sub-angular of sandstone.
			2.00			End of Trialpit at 2.00 m

1
2
3
4
5

Remarks:

1. Trial pit terminated at 2.0m bgl.
2. Soakaway test undertaken.

Groundwater: Groundwater not encountered.

Stability: Sides stable.

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Project Name:	Project No.:	Trial Pit No.:
Land at Sandy Lane	**12604**	**TP13** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Ystradowen	Lewis Homes (South Wales) Limited	JJ	1:25

Equipment:	Coordinates:	**Dimensions**
8 tonne tracked excavator.		2.00m; Depth : 2.50m; 0.70m
Date Excavated: 21/02/2020	Level:	

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over soft brown silty CLAY with rootlets.
			0.20			Soft to firm, locally soft, orange brown slightly sandy silty CLAY.
			0.80			Firm brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-rounded to sub-angular of sandstone.
						...becoming very sandy and gravelly below 2.0m bgl.
			2.50			End of Trialpit at 2.50 m

1
2
3
4
5

Remarks:
1. Trial pit terminated at 2.5m bgl.

Groundwater: Groundwater not encountered.

Stability: Sides stable.

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Project Name:	Project No.:	Trial Pit No.:
Land at Sandy Lane	**12604**	**TP14** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Ystradowen	Lewis Homes (South Wales) Limited	JJ	1:25

Equipment:	Coordinates:	**Dimensions**
8 tonne tracked excavator.		2.00m
Date Excavated: 21/02/2020	Level:	Depth : 2.80m, 0.70m

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.20			TOPSOIL: Grass over soft brown silty CLAY with rootlets.
						Soft to firm orange brown sandy CLAY.
			0.80			(Loose to medium dense) brown clayey gravelly fine to coarse SAND. Gravel is fine to coarse rounded to sub-angular of mixed lithologies.
			1.60			Firm brown mottled red brown and orange gravelly CLAY with low cobble content. Gravel is fine to coarse rounded to sub-angular of mixed lithologies. Cobbles are sub-rounded of sandstone.
			2.40			(Loose) brown clayey fine to coarse SAND.
			2.80			End of Trialpit at 2.80 m

1 2 3 4 5

Remarks:
1. Trial pit terminated at 2.8m bgl.

Groundwater: Groundwater encountered at 2.4m bgl.

Stability: Running sand conditions encountered below 2.4m bgl.

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Project Name:	Project No.:	Trial Pit No.:
Land at Sandy Lane	**12604**	**TP15** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Ystradowen	Lewis Homes (South Wales) Limited	JJ	1:25

Equipment: 8 tonne tracked excavator.

Coordinates:

Dimensions

Depth : 2.20m

2.00m

1.00m

Date Excavated: 21/02/2020

Level:

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over soft brown silty CLAY with rootlets.
			0.20			Soft to firm, locally soft, orange brown sandy CLAY.
			0.90			(Loose to medium dense) brown slightly silty gravelly fine to coarse SAND with low cobble content. Gravel is fine to coarse rounded to sub-angular of mixed lithologies. Cobbles are sub-rounded of sandstone.
			2.20			End of Trialpit at 2.20 m

1 2 3 4 5

Remarks:

1. Trial pit terminated at 2.2m bgl due to instability of excavation sides.

Groundwater: Groundwater not encountered.

Stability: Unstable. Collapse of excavation sides to ground level.

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Project Name:	Project No.:	Trial Pit No.:
Land at Sandy Lane	**12604**	**TP16** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Ystradowen	Lewis Homes (South Wales) Limited	JJ	1:25

Equipment: 8 tonne tracked excavator.

Coordinates:

Dimensions 2.00m

Depth : 2.80m

0.90m

Date Excavated: 21/02/2020

Level:

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.20			TOPSOIL: Grass over soft brown silty CLAY with rootlets.
			0.50			Soft orange brown sandy CLAY.
			1.10			(Loose to medium dense) brown clayey sandy fine to coarse GRAVEL with medium cobble content. Gravel and cobbles are rounded to sub-angular of mixed lithologies.
			1.60			Soft to firm, locally soft, brown mottled red brown very gravelly slightly sandy CLAY with medium cobble content. Gravel is fine to coarse rounded to sub-angular of mixed lithologies. Cobbles are sub-rounded of sandstone.
			2.80			Soft to firm brown SILT/CLAY with frequent lenses of (loose) brown fine to coarse SAND.
						End of Trialpit at 2.80 m

1 2 3 4 5

Remarks:
1. Trial pit terminated at 2.8m bgl.

Groundwater: Groundwater encountered at 1.4m bgl.

Stability: Unstable. Collapse of excavation sides. Running sand conditions encountered below 1.4m bgl.

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Project Name:	Project No.:	Trial Pit No.:
Land at Sandy Lane	**12604**	**TP17** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Ystradowen	Lewis Homes (South Wales) Limited	JJ	1:25

Equipment: 8 tonne tracked excavator.

Coordinates:

Date Excavated: 21/02/2020

Level:

Dimensions

Depth : 2.50m

2.00m

1.00m

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Grass over soft brown silty CLAY with rootlets.
			0.20			Soft to firm orange brown sandy CLAY.
			1.00			(Loose to medium dense) brown clayey slightly gravelly fine to medium SAND with medium cobble content. Gravel is fine to coarse rounded to sub-angular of mixed lithologies. Cobbles are sub-rounded of sandstone.
						...becoming very clayey below 1.7m bgl.
			2.20			(Loose) brown clayey fine SAND/SILT
			2.50			End of Trialpit at 2.50 m

Remarks:

1. Trial pit terminated at 2.5m bgl.

Groundwater: Groundwater encountered at 1.7m bgl.

Stability: Unstable. Collapse of excavation sides to ground level. Running sand conditions encountered below 1.0m bgl.

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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APPENDIX D

WINDOWLESS SAMPLE BOREHOLE LOGS

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Location: Ystradowen		Client: Lewis Homes (South Wales) Limited	Coordinates:	Hole Type: WLS
Equipment: GEO 32		Diameter of Casing:	Level:	Scale 1:25
Diameter of Boring: 101mm		Depth of Casing:	Dates 21/02/2020 -	Logged By: JJ

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			TOPSOIL: Grass over soft brown silty CLAY with rootlets.
		1.00	C	N=8 (2,2/2,2,2,2)				Soft to firm orange brown sandy silty CLAY.
					1.20			Soft to firm red brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to coarse rounded to sub-angular of mixed lithologies.
		2.00	C	N=10 (2,2/2,2,3,3)				
								...becoming firm to stiff below 2.5m bgl.
	3.00 ▼	3.00	C	N=16 (4,3/3,4,4,5)				
		4.00	C	N=21 (3,3/4,5,6,6)				
		5.00	C	N=35 (4,5/7,8,9,11)	5.00			End of Borehole at 5.00 m

Remarks:

1. Sampler refusal at 5.0m bgl.

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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Project Name: **Land at Sandy Lane**		Project No.: **12604**	Borehole No.: **WS02** Sheet 1 of 1
Location: Ystradowen	Client: Lewis Homes (South Wales) Limited	Coordinates:	Hole Type: WLS
Equipment: GEO 32	Diameter of Casing:	Level:	Scale 1:25
Diameter of Boring: 101mm	Depth of Casing:	Dates 21/02/2020 -	Logged By: JJ

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15			TOPSOIL: Grass over soft brown silty CLAY with rootlets.
								Soft to firm orange brown slightly sandy silty CLAY.
		1.00	C	N=12 (1,2/3,3,3,3)				
					1.10			Loose to medium dense brown slightly silty gravelly fine to medium SAND. Gravel is fine to coarse rounded to sub-angular of mixed lithologies.
					1.40			Soft to firm orange brown very sandy silty CLAY.
		2.00	C	N=27 (4,3/4,6,7,10)				*...becoming gravelly below 2.0m bgl.*
					2.20			Stiff brown sandy gravelly CLAY. Gravel is fine to coarse sub-angular of sandstone.
		2.90	C	N=50 (4,4/50 for 255mm)	2.90			End of Borehole at 2.90 m

Remarks:

1. Sampler refusal at 2.9m bgl.

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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Project Name: **Land at Sandy Lane**		Project No.: **12604**	Borehole No.: **WS03** Sheet 1 of 1
Location: Ystradowen	Client: Lewis Homes (South Wales) Limited	Coordinates:	Hole Type: WLS
Equipment: GEO 32	Diameter of Casing:	Level:	Scale 1:25
Diameter of Boring: 101mm	Depth of Casing:	Dates 21/02/2020 -	Logged By: JJ

Well	Water Strikes	Samples & In situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
								TOPSOIL: Grass over soft brown silty CLAY with rootlets.
					0.20			Soft to firm orange brown sandy slightly gravelly CLAY. Gravel is fine to coarse rounded to sub-angular of mixed lithologies.
		1.00	C	N=9 (1,3/3,1,2,3)				
					1.40			Loose to medium dense brown very clayey slightly gravelly fine to medium SAND with frequent lenses of soft to firm brown laminated SILT.
		2.00	C	N=12 (2,2/3,3,3,3)				
	3.00 ▼	3.00	C	N=16 (2,3/3,4,4,5)				*...becoming medium dense below 3.0m bgl.*
		4.00	C	N=22 (2,4/4,4,5,9)				
		4.70	C	N=47 (5,7/10,11,13,13)				End of Borehole at 4.70 m
					5.00			

Remarks:

1. Sampler refusal at 4.7m bgl.

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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Project Name: **Land at Sandy Lane**		Project No.: **12604**	Borehole No.: **WS04** Sheet 1 of 1
Location: Ystradowen	Client: Lewis Homes (South Wales) Limited	Coordinates:	Hole Type: WLS
Equipment: GEO 32	Diameter of Casing:	Level:	Scale 1:25
Diameter of Boring: 101mm	Depth of Casing:	Dates 21/02/2020 -	Logged By: JJ

Well	Water Strikes	Samples & In situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
								TOPSOIL: Grass over soft brown silty CLAY with rootlets.
					0.20			Loose orange brown silty fine to medium SAND.
		1.00	C	N=4 (1,1/1,1,1,1)				
		2.00	C	N=11 (1,2/2,2,4,3)				*...becoming loose to medium dense below 2.0m bgl.*
					2.50			Firm brown thinly laminated SILT/CLAY.
	3.00 ▼	3.00	C	N=15 (2,3/3,4,4,4)				
					3.40			Medium dense brown fine to medium slightly silty SAND.
		4.00	C	N=14 (3,3/4,3,3,4)				
		5.00	C	N=23 (4,5/6,6,5,6)	5.00			End of Borehole at 5.00 m

Remarks:
1. Sampler terminated at 5.0m bgl.

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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Project Name: **Land at Sandy Lane**		Project No.: **12604**	Borehole No.: **WS05** Sheet 1 of 1
Location: Ystradowen	Client: Lewis Homes (South Wales) Limited	Coordinates:	Hole Type: WLS
Equipment: GEO 32	Diameter of Casing:	Level:	Scale 1:25
Diameter of Boring: 101mm	Depth of Casing:	Dates 21/02/2020 -	Logged By: JJ

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			TOPSOIL: Grass over soft brown silty CLAY with rootlets.
					0.80			Soft to firm orange brown slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular of sandstone.
		1.00	C	N=6 (2,2/1,1,2,2)				Loose brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse sub-angular of sandstone.
					1.90			Firm red brown slightly sandy gravelly CLAY. Gravel is fine to coarse sub-rounded to angular of sandstone.
		2.00	C	N=19 (6,4/5,6,4,4)				
					2.90			Medium dense brown slightly gravelly fine to coarse SAND. Gravel is fine to coarse sub-angular of sandstone.
		3.00	C	N=13 (4,4/4,3,3,3)				
		4.00	C	N=7 (2,2/1,2,2,2)	4.00			Soft to firm red brown thinly laminated SILT/CLAY with frequent lenses of (loose) brown fine to coarse SAND.
								...becoming firm to stiff below 4.8m bgl.
		5.00	C	N=26 (3,2/6,6,8,6)	5.00			End of Borehole at 5.00 m

Remarks:

1. Sampler terminated at 5.0m bgl.

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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Project Name: **Land at Sandy Lane**		Project No.: **12604**	Borehole No.: **WS06** Sheet 1 of 1
Location: Ystradowen	Client: Lewis Homes (South Wales) Limited	Coordinates:	Hole Type: WLS
Equipment: GEO 32	Diameter of Casing:	Level:	Scale 1:25
Diameter of Boring: 101mm	Depth of Casing:	Dates 21/02/2020 -	Logged By: JJ

Well	Water Strikes	Samples & In situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
					0.20			TOPSOIL: Grass over soft brown silty CLAY with rootlets.
								Soft to firm orange brown slightly sandy silty CLAY.
		1.00	C	N=12 (1,2/3,2,3,4)	1.00			Firm brown and red brown slightly gravelly CLAY. Gravel is fine to coarse sub-angular of sandstone.
	2.10 ▼	2.00	C	N=11 (3,2/2,3,3,3)	1.90			Loose to medium dense, locally loose, brown clayey slightly sandy fine to coarse SAND. Gravel is fine to coarse rounded to sub-angular of mixed lithologies.
		3.00	C	N=12 (2,3/2,3,3,4)				
		4.00	C	N=7 (2,1/1,2,2,2)				
		5.00	C	N=10 (1,1/1,1,3,5)	5.00			End of Borehole at 5.00 m

Remarks:

1. Sampler terminated at 5.0m bgl.

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

AGS

APPENDIX E

SOIL INFILTRATION TEST RESULTS

BRE365 SOIL INFILTRATION RATE TEST - TP03

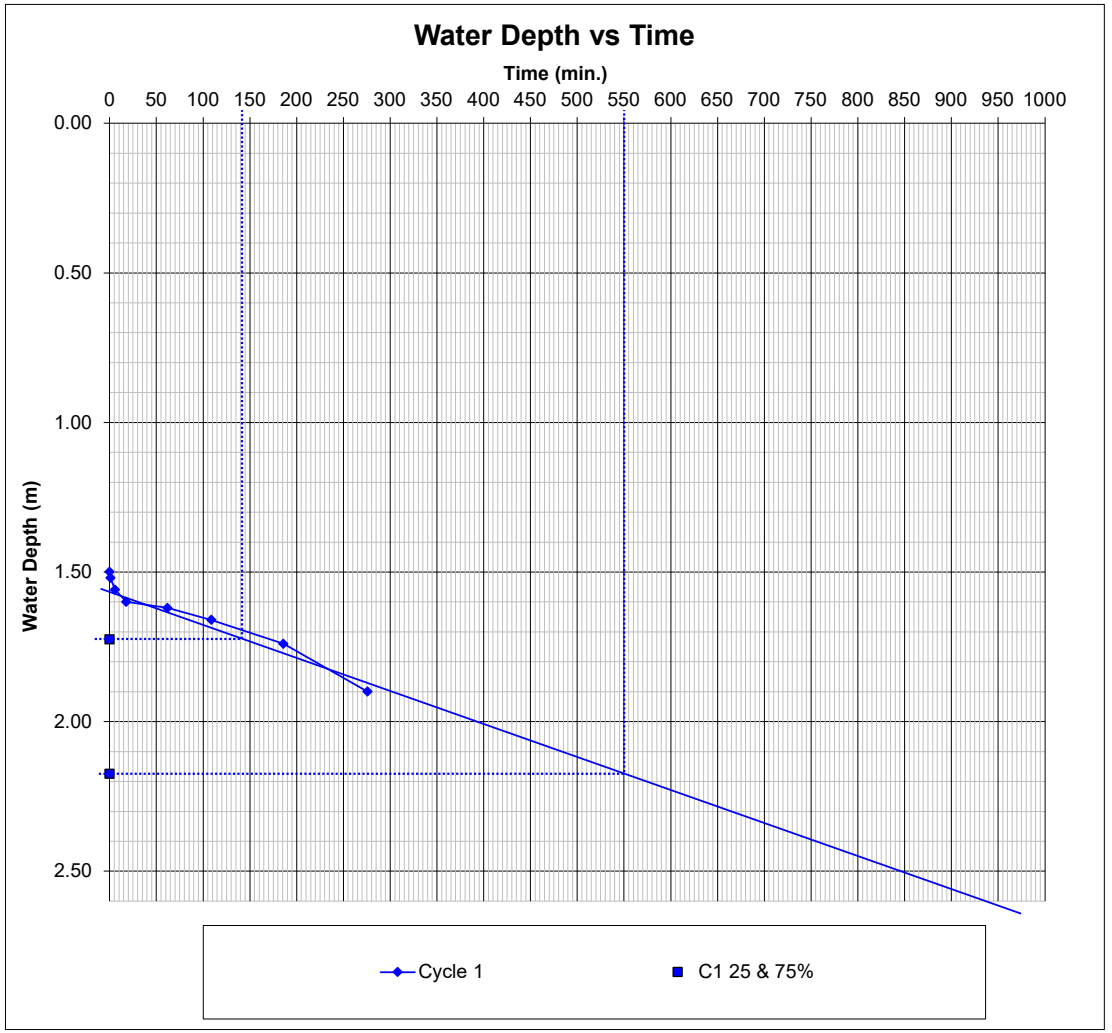
12604 Sandy Lane, Ystradowen

Trial Pit Information	
Length (m)	2.80
Width (m)	0.70
Depth (m)	2.60
Groundwater	Dry
Weather Conditions	Dry
Date	05-Feb-20

Remarks
Spalling of pit sides
Note trendline extrapolated in order to derive soil infiltration rate
Actual infiltration over the same time period may vary
Unable to complete second and third test cycles in the time available

Cycle 1		Cycle 2		Cycle 3	
Time (min)	Depth (m)	Time (min)	Depth (m)	Time (min)	Depth (m)
0	1.50				
1	1.52				
6	1.56				
18	1.60				
62	1.62				
109	1.66				
186	1.74				
276	1.90				

Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	2.40		
Water Depths (m)			
Water depth at start of test	1.50		
Water depth at end of test	1.90		
Effective depth (measured)	0.40		
% Effective storage depth	0.44		
Effective Storage Depths (m)			
Effective storage depth (100%)	0.90		
Effective storage depth (75%)	0.68		
Effective storage depth (50%)	0.45		
Effective storage depth (25%)	0.23		
Outflow Time (min)			
Time for measured outflow	276		
Time for 100% outflow	930		
Time for 75-25% outflow	410		
Volume of Outflow (m^3)			
Over measured effective depth	0.78		
Over 100% effective depth	1.76		
From 75% - 25% effective depth	0.88		
Surface Area (m^2)			
For 100% effective storage	8.26		
For 50% effective storage	5.11		
Over measured depth	4.76		
Soil Infiltration Rate (m/s)	**Cycle 1**	**Cycle 2**	**Cycle 3**
Over 100% effective depth	3.8E-06		
Over measured depth	9.9E-06		
Over 75% - 25% effective depth	**7.0E-06**		



Intégral Géotechnique

BRE365 SOIL INFILTRATION RATE TEST - TP06

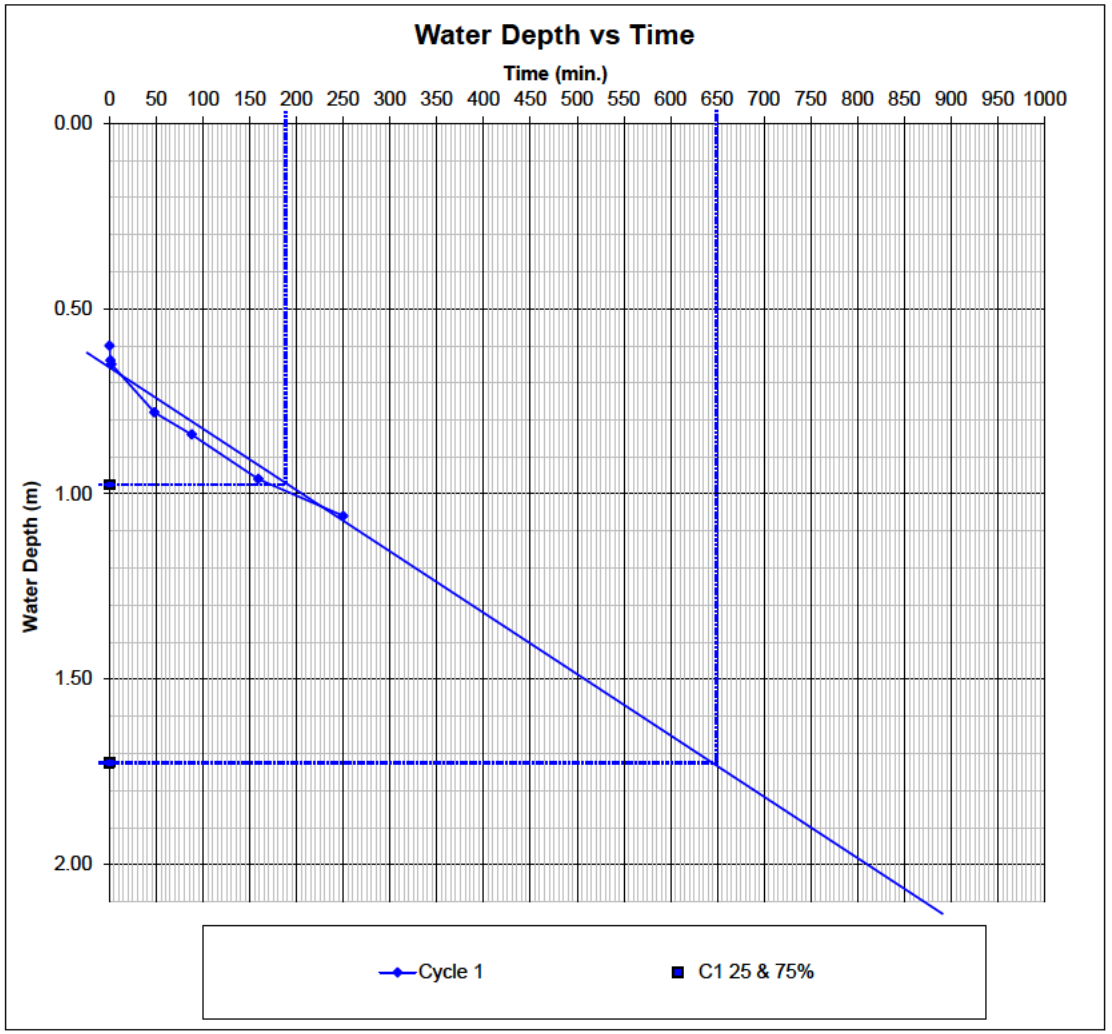
12604 Sandy Lane, Ystradowen

Trial Pit Information	
Length (m)	2.80
Width (m)	0.70
Depth (m)	2.10
Groundwater	Dry
Weather Conditions	Dry
Date	05-Feb-20

Remarks
Note trendline extrapolated in order to derive soil infiltration rate
Actual infiltration over the same time period may vary
Unable to complete second and third test cycles in the time available

Cycle 1		Cycle 2		Cycle 3	
Time (min)	Depth (m)	Time (min)	Depth (m)	Time (min)	Depth (m)
0	0.60				
1	0.64				
2	0.65				
48	0.78				
88	0.84				
159	0.96				
250	1.06				

Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	2.10		
Water Depths (m)			
Water depth at start of test	0.60		
Water depth at end of test	1.06		
Effective depth (measured)	0.46		
% Effective storage depth	0.31		
Effective Storage Depths (m)			
Effective storage depth (100%)	1.50		
Effective storage depth (75%)	1.13		
Effective storage depth (50%)	0.75		
Effective storage depth (25%)	0.38		
Outflow Time (min)			
Time for measured outflow	250		
Time for 100% outflow	870		
Time for 75-25% outflow	460		
Volume of Outflow (m^3)			
Over measured effective depth	0.90		
Over 100% effective depth	2.94		
From 75% - 25% effective depth	1.47		
Surface Area (m^2)			
For 100% effective storage	12.46		
For 50% effective storage	7.21		
Over measured depth	5.18		
Soil Infiltration Rate (m/s)	**Cycle 1**	**Cycle 2**	**Cycle 3**
Over 100% effective depth	4.5E-06		
Over measured depth	1.2E-05		
Over 75% - 25% effective depth	7.4E-06		



Intégral Géotechnique

BRE365 SOIL INFILTRATION RATE TEST - TP05A

12604 Sandy Lane, Ystradowen

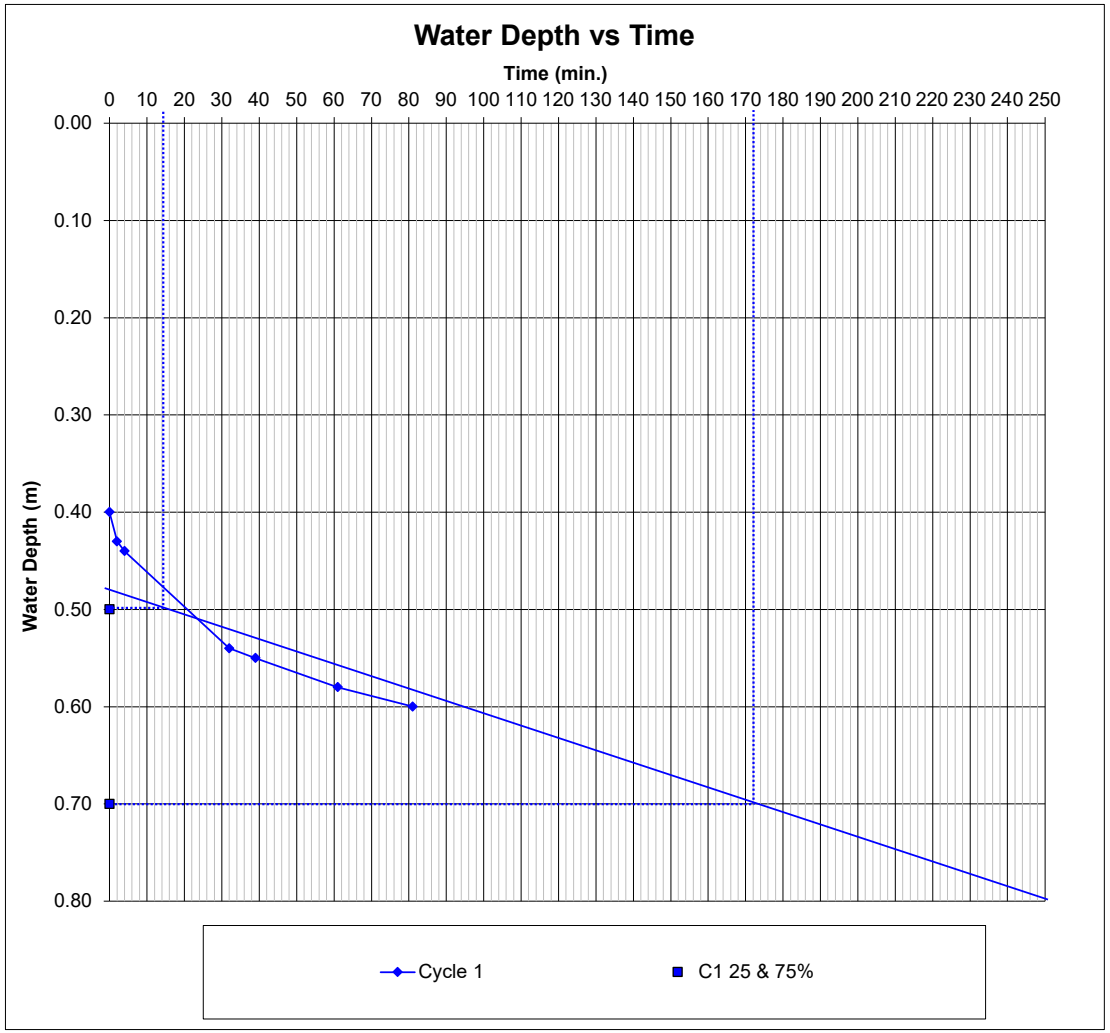
Trial Pit Information	
Length (m)	2.50
Width (m)	0.70
Depth (m)	1.50
Groundwater	1.5
Weather Conditions	Dry
Date	05-Feb-20

Remarks

At end of test, trial pit depth was 0.8m due to spalling of pit sides.

Cycle 1		Cycle 2		Cycle 3	
Time (min)	Depth (m)	Time (min)	Depth (m)	Time (min)	Depth (m)
0	0.40				
2	0.43				
4	0.44				
32	0.54				
39	0.55				
61	0.58				
81	0.60				

Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	0.80		
Water Depths (m)			
Water depth at start of test	0.40		
Water depth at end of test	0.60		
Effective depth (measured)	0.20		
% Effective storage depth	0.50		
Effective Storage Depths (m)			
Effective storage depth (100%)	0.40		
Effective storage depth (75%)	0.30		
Effective storage depth (50%)	0.20		
Effective storage depth (25%)	0.10		
Outflow Time (min)			
Time for measured outflow	81		
Time for 100% outflow	250		
Time for 75-25% outflow	158		
Volume of Outflow (m^3)			
Over measured effective depth	0.35		
Over 100% effective depth	0.70		
From 75% - 25% effective depth	0.35		
Surface Area (m^2)			
For 100% effective storage	4.31		
For 50% effective storage	3.03		
Over measured depth	3.03		
Soil Infiltration Rate (m/s)	**Cycle 1**	**Cycle 2**	**Cycle 3**
Over 100% effective depth	1.1E-05		
Over measured depth	2.4E-05		
Over 75% - 25% effective depth	**1.2E-05**		



Intégral Géotechnique

BRE365 SOIL INFILTRATION RATE TEST - TP07

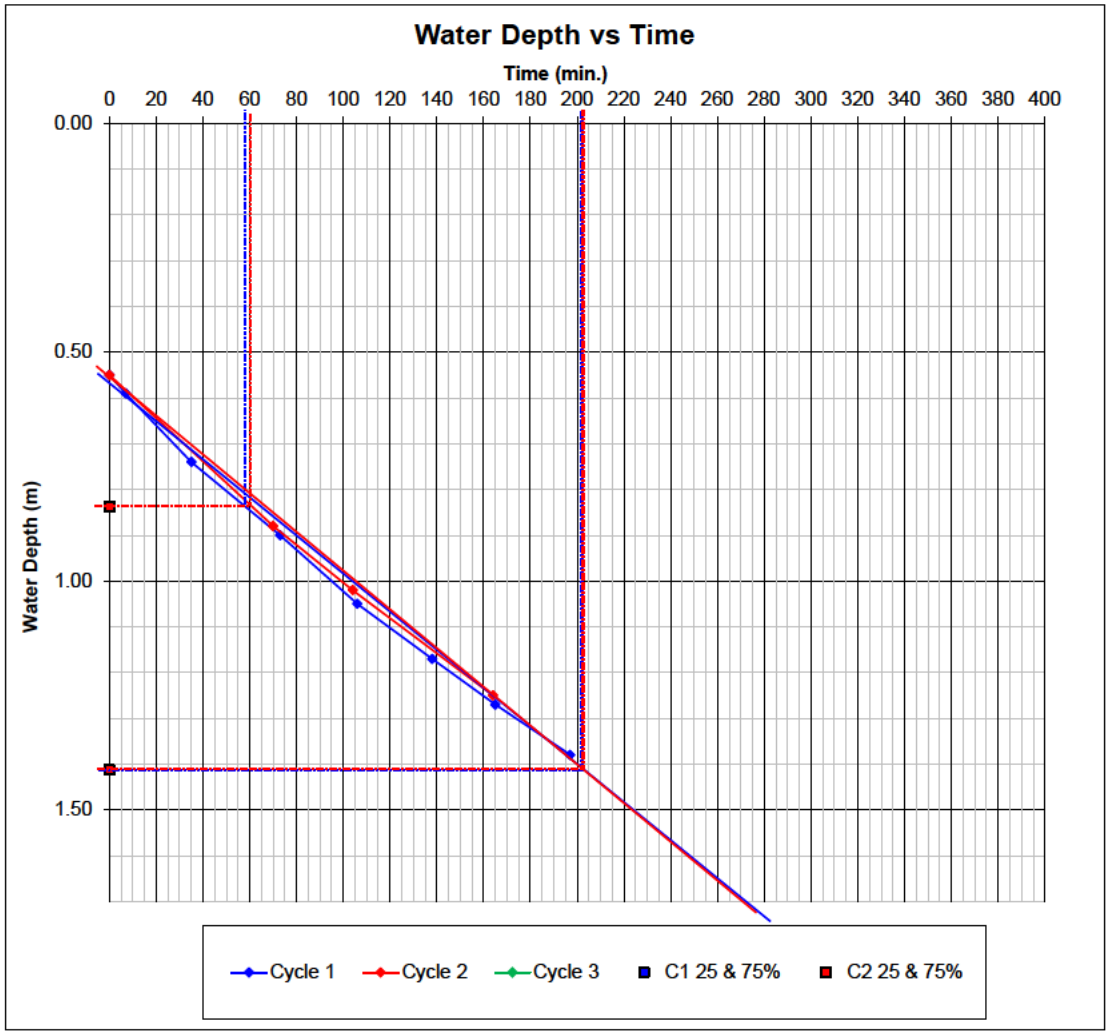
12604 Sandy Lane, Ystradowen

Trial Pit Information	
Length (m)	1.90
Width (m)	0.70
Depth (m)	1.70
Groundwater	Dry
Weather Conditions	
Date	21.02.20

Remarks
Note trendline extrapolated in order to derive soil infiltration rate
Actual infiltration over the same time period may vary
Unable to complete third test cycle in time available

Cycle 1		Cycle 2		Cycle 3	
Time (min)	Depth (m)	Time (min)	Depth (m)	Time (min)	Depth (m)
0	0.55	0	0.55		
7	0.59	70	0.88		
35	0.74	104	1.02		
73	0.90	164	1.25		
106	1.05				
138	1.17				
165	1.27				
197	1.38				

Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	1.70	1.70	
Water Depths (m)			
Water depth at start of test	0.55	0.55	
Water depth at end of test	1.38	1.25	
Effective depth (measured)	0.83	0.70	
% Effective storage depth	0.72	0.61	
Effective Storage Depths (m)			
Effective storage depth (100%)	1.15	1.15	
Effective storage depth (75%)	0.86	0.86	
Effective storage depth (50%)	0.58	0.58	
Effective storage depth (25%)	0.29	0.29	
Outflow Time (min)			
Time for measured outflow	197	164	
Time for 100% outflow	270	270	
Time for 75-25% outflow	140	140	
Volume of Outflow (m^3)			
Over measured effective depth	1.10	0.93	
Over 100% effective depth	1.53	1.53	
From 75% - 25% effective depth	0.76	0.76	
Surface Area (m^2)			
For 100% effective storage	7.31	7.31	
For 50% effective storage	4.32	4.32	
Over measured depth	5.65	4.97	
Soil Infiltration Rate (m/s)	**Cycle 1**	**Cycle 2**	**Cycle 3**
Over 100% effective depth	1.3E-05	1.3E-05	
Over measured depth	1.7E-05	1.9E-05	
Over 75% - 25% effective depth	**2.1E-05**	**2.1E-05**	



Intégral Géotechnique

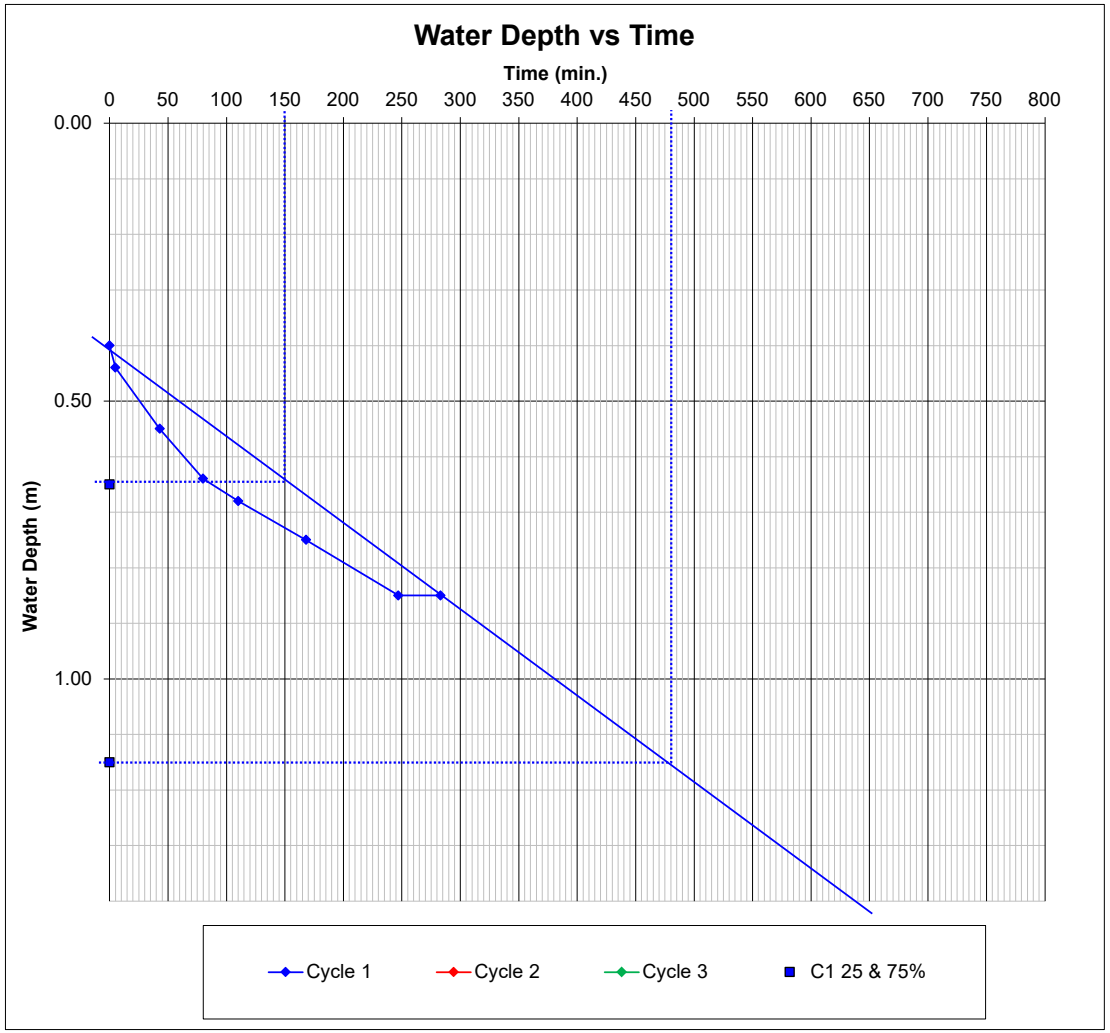
BRE365 SOIL INFILTRATION RATE TEST - TP08

12604 Sandy Lane, Ystradowen

Trial Pit Information	
Length (m)	1.80
Width (m)	0.65
Depth (m)	1.40
Groundwater	1
Weather Conditions	
Date	21.02.20

Remarks
Note trendline extrapolated in order to derive soil infiltration rate
Actual infiltration over the same time period may vary
Unable to complete second and third test cycles in the time available

Cycle 1		Cycle 2		Cycle 3	
Time (min)	Depth (m)	Time (min)	Depth (m)	Time (min)	Depth (m)
0	0.40				
5	0.44				
43	0.55				
80	0.64				
110	0.68				
168	0.75				
247	0.85				
283	0.85				



Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	1.40		
Water Depths (m)			
Water depth at start of test	0.40		
Water depth at end of test	0.85		
Effective depth (measured)	0.45		
% Effective storage depth	0.45		
Effective Storage Depths (m)			
Effective storage depth (100%)	1.00		
Effective storage depth (75%)	0.75		
Effective storage depth (50%)	0.50		
Effective storage depth (25%)	0.25		
Outflow Time (min)			
Time for measured outflow	283		
Time for 100% outflow	640		
Time for 75-25% outflow	330		
Volume of Outflow (m^3)			
Over measured effective depth	0.53		
Over 100% effective depth	1.17		
From 75% - 25% effective depth	0.59		
Surface Area (m^2)			
For 100% effective storage	6.07		
For 50% effective storage	3.62		
Over measured depth	3.38		
Soil Infiltration Rate (m/s)	**Cycle 1**	**Cycle 2**	**Cycle 3**
Over 100% effective depth	5.0E-06		
Over measured depth	9.2E-06		
Over 75% - 25% effective depth	**8.2E-06**		

Intégral Géotechnique

BRE365 SOIL INFILTRATION RATE TEST - TP12

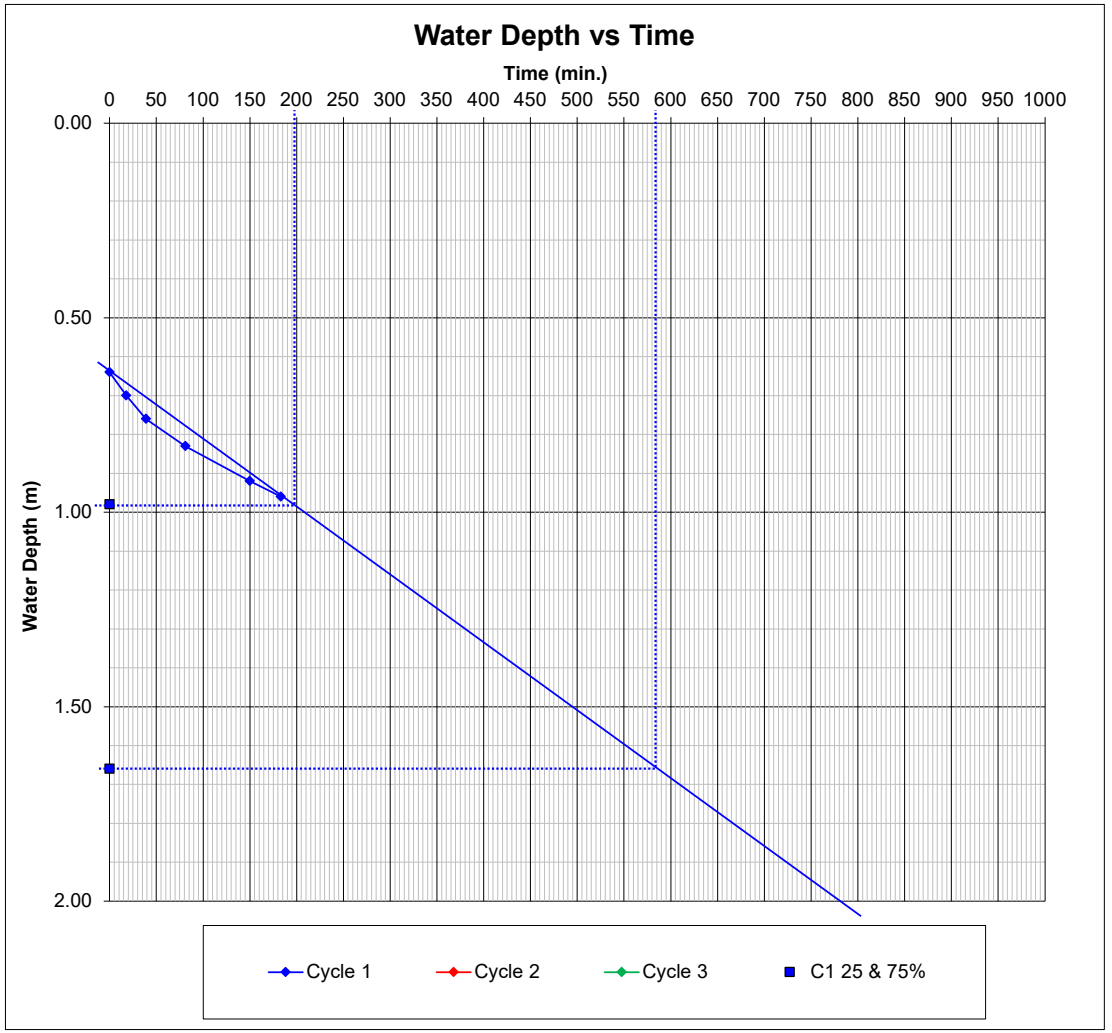
12604 Sandy Lane, Ystradowen

Trial Pit Information	
Length (m)	2.00
Width (m)	0.65
Depth (m)	2.00
Groundwater	Dry
Weather Conditions	
Date	21.02.20

Remarks
Note trendline extrapolated in order to derive soil infiltration rate
Actual infiltration over the same time period may vary
Unable to complete second and third test cycles in the time available

Cycle 1		Cycle 2		Cycle 3	
Time (min)	Depth (m)	Time (min)	Depth (m)	Time (min)	Depth (m)
0	0.64				
18	0.70				
39	0.76				
81	0.83				
150	0.92				
183	0.96				

Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	2.00		
Water Depths (m)			
Water depth at start of test	0.64		
Water depth at end of test	0.96		
Effective depth (measured)	0.32		
% Effective storage depth	0.24		
Effective Storage Depths (m)			
Effective storage depth (100%)	1.36		
Effective storage depth (75%)	1.02		
Effective storage depth (50%)	0.68		
Effective storage depth (25%)	0.34		
Outflow Time (min)			
Time for measured outflow	183		
Time for 100% outflow	780		
Time for 75-25% outflow	380		
Volume of Outflow (m^3)			
Over measured effective depth	0.42		
Over 100% effective depth	1.77		
From 75% - 25% effective depth	0.88		
Surface Area (m^2)			
For 100% effective storage	8.51		
For 50% effective storage	4.90		
Over measured depth	3.00		
Soil Infiltration Rate (m/s)	**Cycle 1**	**Cycle 2**	**Cycle 3**
Over 100% effective depth	4.4E-06		
Over measured depth	1.3E-05		
Over 75% - 25% effective depth	**7.9E-06**		



Intégral Géotechnique

APPENDIX F

LABORATORY CHEMICAL TEST RESULTS

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Analytical Report Number : 20-85651

Project / Site name:	Sandy Lane, Ystradowen	**Samples received on:**	10/02/2020
Your job number:	12604	**Samples instructed on:**	10/02/2020
Your order number:		**Analysis completed by:**	18/02/2020
Report Issue Number:	1	**Report issued on:**	18/02/2020
Samples Analysed:	4 soil samples		

Signed: [redacted]

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 20-85651

Project / Site name: Sandy Lane, Ystradowen

Lab Sample Number				1436143	1436144	1436145	1436146	
Sample Reference				TP03	TP03	TP05	TP05	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.10	0.40	0.10	0.40	
Date Sampled				05/02/2020	05/02/2020	05/02/2020	05/02/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	20	13	23	12	
Total mass of sample received	kg	0.001	NONE	0.50	0.50	0.50	0.40	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	5.7	7.2	6.7	7.5	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Total Sulphate as SO_4	mg/kg	50	MCERTS	460	200	890	130	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.027	0.0099	0.014	0.013	
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	2.2	3.4	
Total Sulphur	mg/kg	50	MCERTS	460	100	510	74	
Total Organic Carbon (TOC)	%	0.1	MCERTS	2.7	0.6	3.2	0.3	
Loss on Ignition @ 450°C	%	0.2	MCERTS	6.7	1.4	7.4	1.1	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.26	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	1.7	0.38	< 0.05	
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.59	0.10	< 0.05	
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	5.0	0.61	< 0.05	
Pyrene	mg/kg	0.05	MCERTS	< 0.05	4.7	0.49	< 0.05	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	2.5	0.38	< 0.05	
Chrysene	mg/kg	0.05	MCERTS	< 0.05	2.5	0.46	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	4.3	0.55	< 0.05	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.1	0.19	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	3.0	0.34	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.5	< 0.05	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.38	< 0.05	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	1.6	< 0.05	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	29.2	3.50	< 0.80	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	8.5	13	11	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.45	0.51	0.37	0.68	
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.2	0.8	0.2	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	20	30	18	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	16	10	11	11	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	54	26	38	24	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	25	11	23	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	41	22	48	20	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	98	89	88	76	

Analytical Report Number : 20-85651

Project / Site name: Sandy Lane, Ystradowen

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1436143	TP03	None Supplied	0.10	Brown loam and clay with gravel and vegetation.
1436144	TP03	None Supplied	0.40	Brown loam and clay with gravel and vegetation.
1436145	TP05	None Supplied	0.10	Brown loam and clay with gravel and vegetation.
1436146	TP05	None Supplied	0.40	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 20-85651

Project / Site name: Sandy Lane, Ystradowen

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 20-89049

Project / Site name:	Sandy lane, Ystradowen	**Samples received on:**	26/02/2020
Your job number:		**Samples instructed on:**	26/02/2020
Your order number:	12604	**Analysis completed by:**	05/03/2020
Report Issue Number:	1	**Report issued on:**	05/03/2020
Samples Analysed:	4 soil samples		

Signed: [redacted]

Zina Abdul Razzak
Senior Quality Specialist

For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 20-89049

Project / Site name: Sandy lane, Ystradowen
Your Order No: 12604

Lab Sample Number				1453568	1453569	1453570	1453571	
Sample Reference				TP3A	TP3B	TP3C	TP3D	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.40	0.40	0.40	0.40	
Date Sampled				21/02/2020	21/02/2020	21/02/2020	21/02/2020	
Time Taken				1500	1505	1510	1515	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	16	15	14	15	
Total mass of sample received	kg	0.001	NONE	0.60	0.60	0.60	0.60	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.44	
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.40	
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.31	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	1.15	

Analytical Report Number : 20-89049

Project / Site name: Sandy lane, Ystradowen

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1453568	TP3A	None Supplied	0.40	Brown clay and sand with gravel.
1453569	TP3B	None Supplied	0.40	Brown clay and sand with gravel and vegetation.
1453570	TP3C	None Supplied	0.40	Brown clay and sand with gravel and vegetation.
1453571	TP3D	None Supplied	0.40	Brown sand with gravel and vegetation.

Analytical Report Number : 20-89049

Project / Site name: Sandy lane, Ystradowen

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

APPENDIX G

LABORATORY GEOTECHNICAL TEST RESULTS

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client:	Integral Geotechnique	Client Reference:	12604
Client Address:	Integral House, 7 Beddau Way, Castlegate Business Park, CF83 2AX	Job Number:	20-85865
		Date Sampled:	05/02/2020
		Date Received:	10/02/2020
Contact:	Lowri Williams	Date Tested:	13/02/2020
Site Address:	Sandy Lane, Ystradowen	Sampled By:	Not Given

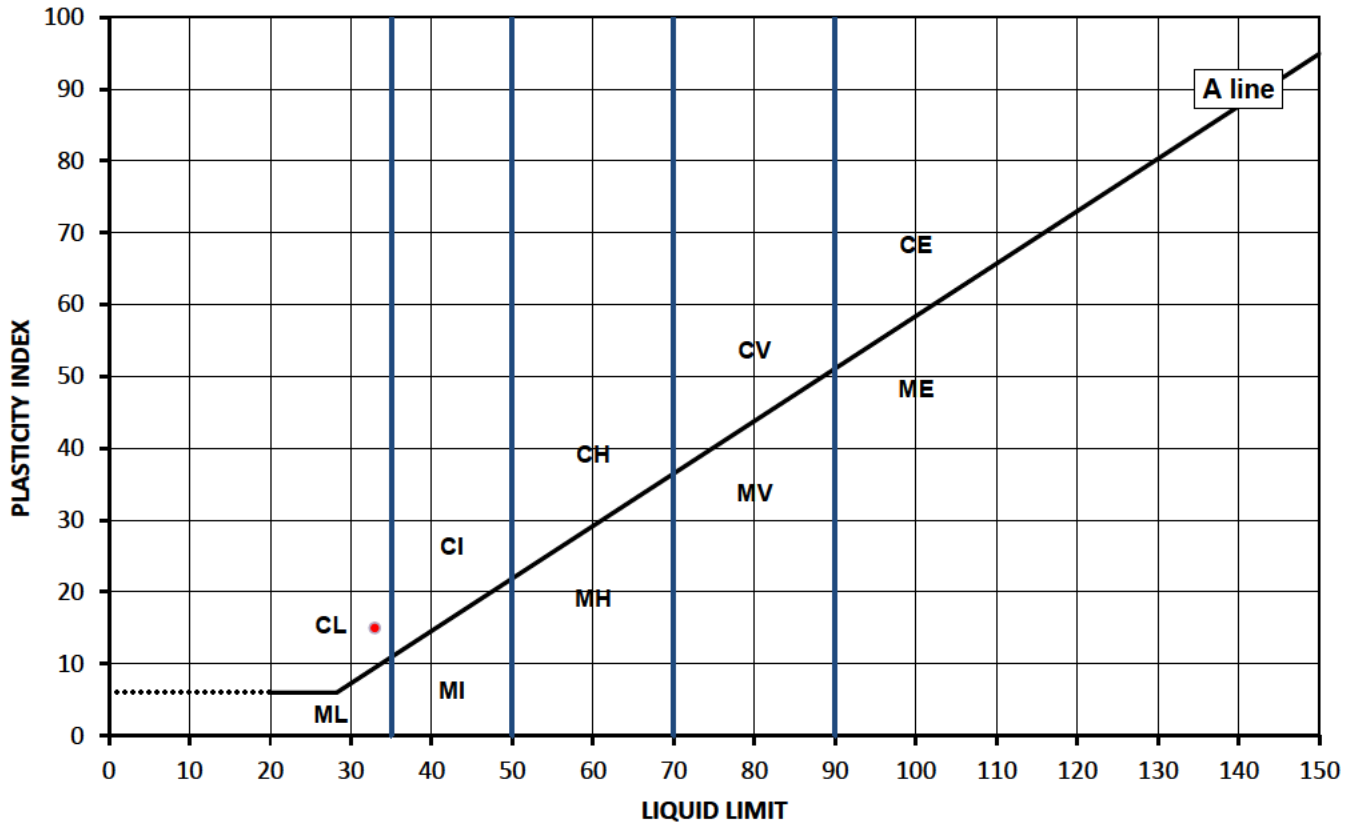
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1437233	Depth Top [m]:	1.20
Hole No.:	TP03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Dark brown gravelly very sandy CLAY		

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
16	33	18	15	53



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: [redacted]

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 18/02/2020

GF 236.6

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client:	Integral Geotechnique	Client Reference:	12604
Client Address:	Integral House, 7 Beddau Way, Castlegate Business Park, CF83 2AX	Job Number:	20-85865
		Date Sampled:	05/02/2020
		Date Received:	10/02/2020
Contact:	Lowri Williams	Date Tested:	13/02/2020
Site Address:	Sandy Lane, Ystradowen	Sampled By:	Not Given

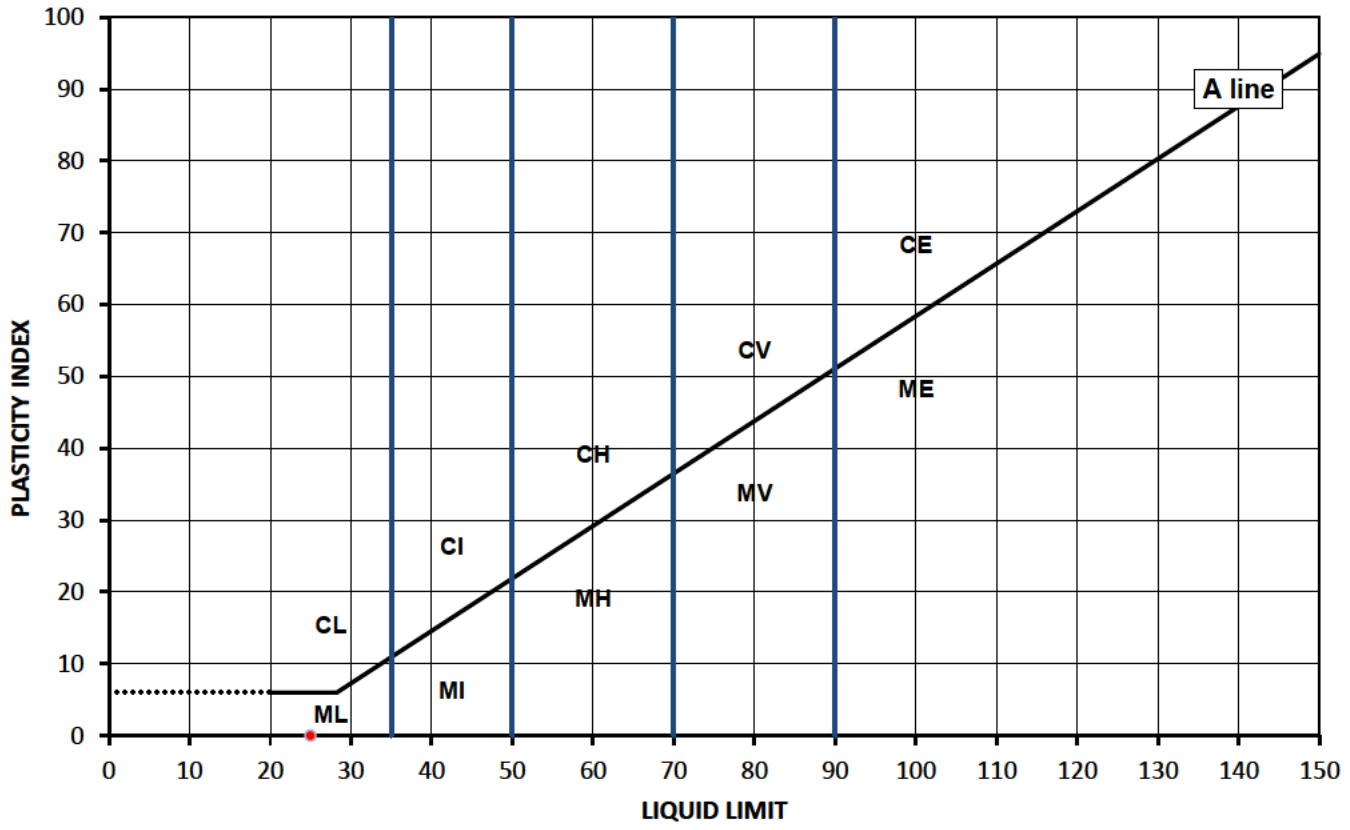
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1437234	Depth Top [m]:	1.20
Hole No.:	TP05	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly slightly clayey SAND		

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
19	25	NP	NP.	72



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks: NP – non plastic

Signed: [redacted]

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 18/02/2020

GF 236.6

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client:	Integral Geotechnique	Client Reference:	12604
Client Address:	Integral House, 7 Beddau Way, Castlegate Business Park, CF83 2AX	Job Number:	20-85865
		Date Sampled:	05/02/2020
		Date Received:	10/02/2020
Contact:	Lowri Williams	Date Tested:	13/02/2020
Site Address:	Sandy Lane, Ystradowen	Sampled By:	Not Given

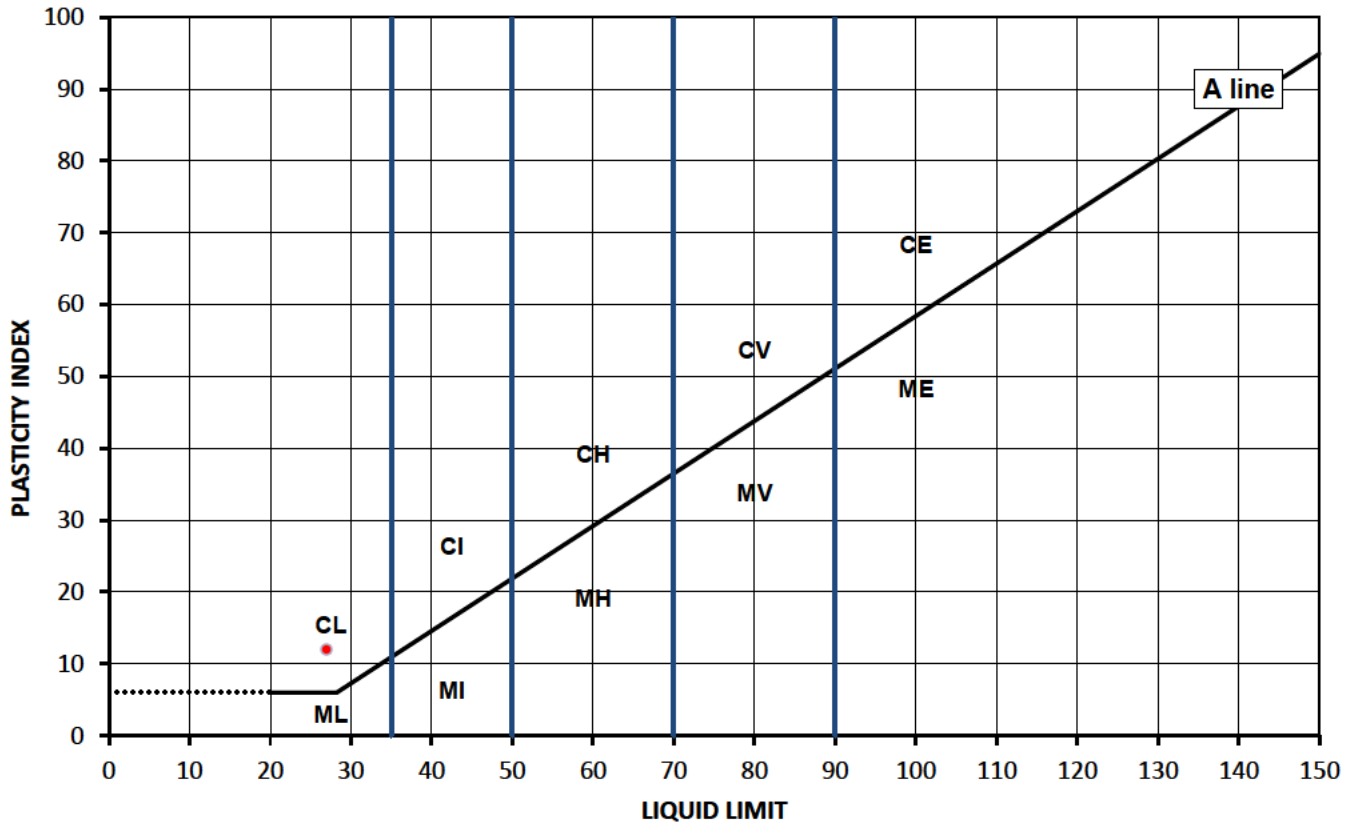
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1437235	Depth Top [m]:	1.50
Hole No.:	TP04	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly very sandy CLAY		

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
11	27	15	12	90



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: [redacted]

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 18/02/2020

GF 236.6

SUMMARY REPORT

Summary of Classification Test Results

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with:

MC by BS 1377-2: 1990: Clause 3.2; WC by BS EN 17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3, Clause 4.4 and 5; PD by BS 1377-2: 1990: Clause 8.2

Client: Integral Geotechnique

Client Address: Integral House, 7 Beddau Way, Castlegate Business Park, CF83 2AX

Contact: Lowri Williams

Site Address: Sandy Lane, Ystradowen

Client Reference: 12604
Job Number: 20-85865
Date Sampled: 05/02/2020
Date Received: 10/02/2020
Date Tested: 13/02/2020
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	MC	WC	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	LL	PL	PI	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
1437233	TP03	Not Given	1.20	Not Given	D	Dark brown gravelly very sandy CLAY	Atterberg 4 Point	16		53	33	18	15						
1437235	TP04	Not Given	1.50	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 4 Point	11		90	27	15	12						
1437234	TP05	Not Given	1.20	Not Given	D	Brown slightly gravelly slightly clayey SAND	Atterberg 4 Point	19		72	25	NP	NP.						

Note: # Non accredited; NP - Non plastic

Comments:

Signed: [redacted]

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 18/02/2020

GF 238.8

Lowri Williams
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Analytical Report Number : 20-85867

Project / Site name:	Sandy Lane, Ystradowen	**Samples received on:**	10/02/2020
Your job number:	12604	**Samples instructed on:**	10/02/2020
Your order number:		**Analysis completed by:**	17/02/2020
Report Issue Number:	1	**Report issued on:**	17/02/2020
Samples Analysed:	3 soil samples		

Signed: [redacted]

Katarzyna Lewicka
Head of Reporting Section

For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 20-85867

Project / Site name: Sandy Lane, Ystradowen

Lab Sample Number				1437240	1437241	1437242		
Sample Reference				TP03	TP05	TP04		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				1.20	1.20	1.50		
Date Sampled				05/02/2020	05/02/2020	05/02/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	15	13	11		
Total mass of sample received	kg	0.001	NONE	0.90	0.80	0.90		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.0	7.8	7.6		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.019	0.017	0.019		

Analytical Report Number : 20-85867

Project / Site name: Sandy Lane, Ystradowen

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1437240	TP03	None Supplied	1.20	Brown clay and sand.
1437241	TP05	None Supplied	1.20	Brown clay and sand.
1437242	TP04	None Supplied	1.50	Brown clay and sand with gravel and vegetation.

The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 20-85867

Project / Site name: Sandy Lane, Ystradowen

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

APPENDIX H

SUMMARY OF LABORATORY CHEMICAL TEST RESULTS

SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12604
Site: Land at Sandy Lane, Ystradowen
Soil Type: Topsoil and Subsoil
Soil Organic Matter: 1%

METALS AND SEMI-METALS

No.	Location	Depth (m)	Arsenic (mg/kg)	Boron (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (VI) (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (Elemental) (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
1	TP03	0.10	15	0.4	0.45	< 0.2	29	< 4.0	16	54	< 0.3	16	< 1.0	41	98
2	TP03	0.40	8.5	0.2	0.51	< 0.2	20	< 4.0	10	26	< 0.3	25	< 1.0	22	89
3	TP05	0.10	13	0.8	0.37	< 0.2	30	< 4.0	11	38	< 0.3	11	< 1.0	48	88
4	TP05	0.40	11	0.2	0.68	< 0.2	18	< 4.0	11	24	< 0.3	23	< 1.0	20	76
	Screening Criteria Value		37.0	290.0	1.7	11.0	-	6.0	2400.0	200.0	1.2	130.0	250.0	410.0	3700.0
	Source of Screening Criteria Value		S4UL	S4UL	S4UL	S4UL	-	S4UL	S4UL	C4SL	S4UL	S4UL	S4UL	S4UL	S4UL

Intégral Géotechnique

SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12604
Site: Land at Sandy Lane, Ystradowen
Soil Type: Topsoil and Subsoil
Soil Organic Matter: 1%

INORGANIC CHEMICALS & OTHERS

No.	Location	Depth (m)	Cyanide (mg/kg)	Loss on ignition, dried solids (%)	Moisture content at 30 C (%)	Phenol (mg/kg)	pH (pH units)	Water Soluble Sulphate (g/l)	Sulphate Total as SO4 (mg/kg)	Sulphide (mg/kg)	Total Sulphur (mg/kg)	TOC by Ignition in O2 (%)	Equivalent SOM (%)	Asbestos in Soil	Asbestos Quantification (%)
1	TP03	0.10	< 1	6.7	20	< 1.0	5.7	0.027	460	< 1.0	460	2.7	4.64	Not-detected	#N/A
2	TP03	0.40	< 1	1.4	13	< 1.0	7.2	0.0099	200	< 1.0	100	0.6	1.03	Not-detected	#N/A
3	TP05	0.10	< 1	7.4	23	< 1.0	6.7	0.014	890	2.2	510	3.2	5.50	Not-detected	#N/A
4	TP05	0.40	< 1	1.1	12	< 1.0	7.5	0.013	130	3.4	74	0.3	0.52	Not-detected	#N/A
	Screening Criteria Value		**34.0**	-	-	**280.0**	-	-	-	-	-	-	-	-	**0.001**
	Source of Screening Criteria Value		ATRISK	-	-	S4UL	-	-	-	-	-	-	-	-	IOM

Intégral Géotechnique

SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12604
Site: Land at Sandy Lane, Ystradowen
Soil Type: Topsoil and Subsoil
Soil Organic Matter: 1%

POLYAROMATIC HYDROCARBONS (PAH)

No.	Location	Depth (m)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(ghi)perylene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(ah)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(123cd)pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
1	TP03	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2	TP03	0.40	< 0.05	0.26	0.59	2.5	3.0	4.3	1.6	1.1	2.5	0.38	5.0	< 0.05	1.5	< 0.05	1.7	4.7
3	TP05	0.10	< 0.05	< 0.05	0.10	0.38	0.34	0.55	< 0.05	0.19	0.46	< 0.05	0.61	< 0.05	< 0.05	< 0.05	0.38	0.49
4	TP05	0.40	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
5	TP3A	0.40	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
6	TP3B	0.40	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
7	TP3C	0.40	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
8	TP3D	0.40	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.40	< 0.05	< 0.05	< 0.05	0.44	0.31
	Screening Criteria Value		210.0	170.0	2400.0	7.2	2.2	2.6	320.0	77.0	15.0	0.2	280.0	170.0	27.0	2.3	95.0	620.0
	Source of Screening Criteria Value		S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL

Intégral Géotechnique

FIGURES

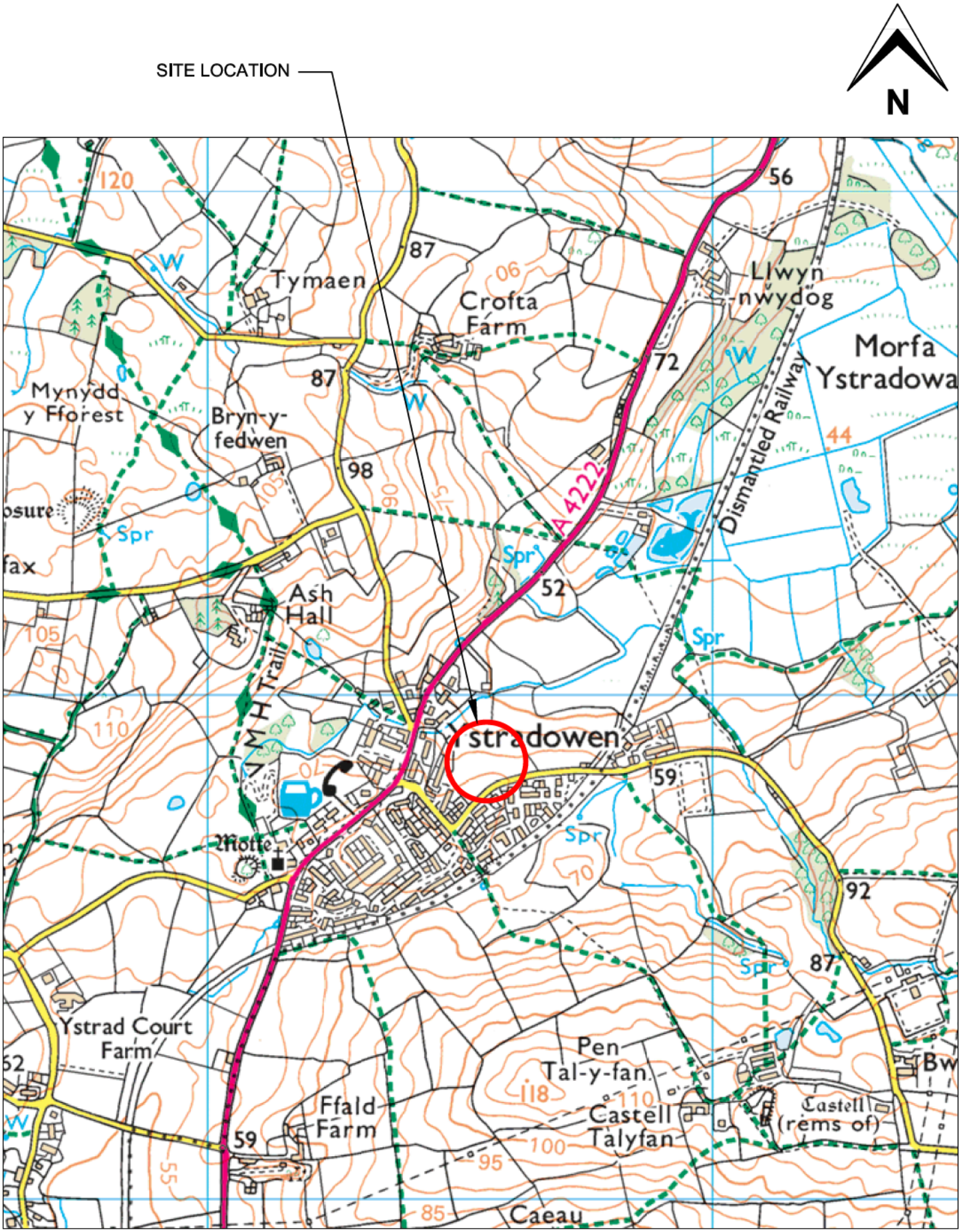

Figure 1: Site Location

Project: Land at Sandy Lane, Ystradowen	Job no.: 12604	Intégral Géotechnique	Integral House, 7 Beddau Way, Castlegate Business Park, Caerphilly, CF83 2AX. Tel: 029 2080 7991
Client: Lewis Homes (South Wales) Limited	Scale: 1:10,000 at A4		

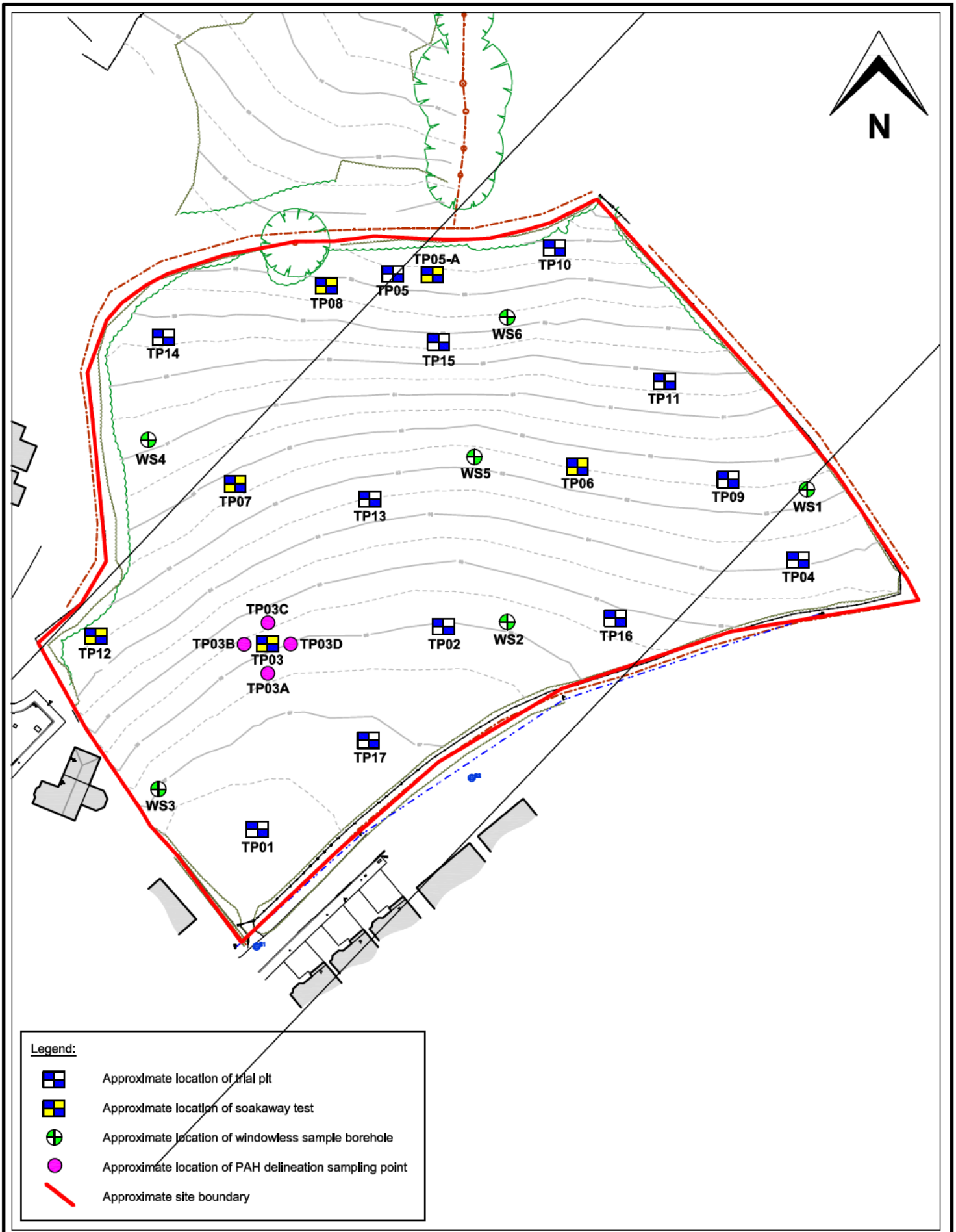

Figure 2: Site Plan

Project: Land at Sandy Lane, Ystradowen	Job no.: 12604	Intégral Géotechnique	Integral House, 7 Beddau Way, Castlegate Business Park, Caerphilly, CF83 2AX. Tel: 029 2080 7991
Client: Lewis Homes (South Wales) Limited	Scale: 1:1000 at A4		