ENVIRONMENTAL PERMIT APPLICATION-
SUPPORTING STATEMENT

HYDROGEN PRODUCTION FACILITY
LONGLAND LANE
MARGAM
PORT TALBOT
SA13 2NR

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ENVIRONMENTAL PERMIT APPLICATION – SUPPORTING STATEMENT HYDROGEN PRODUCTION FACILITY, LONGLAND LANE, MARGAM, PORT TALBOT, SA13 2NR

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SA13 2NR

ENVIRONMENTAL PERMIT APPLICATION

SUPPORTING STATEMENT

CONTENTS

LIST OF DRAWINGS

PRO1001/08/01	Site Location Plan
PRO1001/08/02	Operational Layout

LIST OF APPENDICES

Appendix 1	HAZID Review
Appendix 2	Evidence of CE Certified hydrogen storage arrangements
Appendix 3	Drainage Strategy

1.0 INTRODUCTION

1.1 Scope & Background

1.1.1 Sirius Environmental Limited (Sirius) has been commissioned by Protium Green Hydrogen Supply Limited (Protium) to prepare an Environmental Permit Application for a Hydrogen Production Facility (abbreviated to HPF and referred to as the Facility) at Longland Lane, Margam, Port Talbot, SA13 2NR.

1.1.2 Protium , 'the operator' proposes to manufacture hydrogen at the site in Margam by use of a polymer electrolyte membrane (PEM) technology. The site will also include associated compression units and hydrogen storage facilities as well as a hydrogen tube-trailer filling station. The electricity utilised for the electrolyser will be sourced from a guaranteed renewable energy generation source, that being the adjacent Biomass Plant, operated by Western Bio Energy Limited (WBE). This will be facilitated by the use of a private wire, providing a connection between the Biomass Plant and the HPF.

1.1.3 WBE currently hold an Environmental Permit (Permit Reference Number: EPR/ZP3939GL) for the operation of the adjacent Biomass Plant. Protium are proposing to utilise a rectangular section (measuring 70m(L) by 24 (W)) of the northern extents of WBE's permitted area to facilitate the operation of the HPF. With this in mind, as part of this application process, WBE are in the process of surrendering this area from their Environmental Permit which will result in an amendment to their Permit boundary to omit the area of land that Protium are proposing to utilise for the HPF operations. It should be noted that the proposed HPF site has only been utilised by WBE for the storage of virgin timber which was utilised as feedstock for the Biomass Plant.

1.1.4 As alluded to above, separate applications (an application to part surrender WBE's Permit and the subsequent submission of an Environmental Permit Application by Protium for the operation of the HPF) will be required to be determined in the aforementioned sequence by Natural Resources Wales (NRW), as per NRW guidance, as a parcel of land cannot be subject to two Environmental Permits.

1.1.5 For avoidance of doubt, the HPF will be situated within the WBE landholding, however it will be an entirely separate permitted activity. There will be no overlap of Environmental Permit boundaries associated with the HPF operations and WBE's Biomass Plant operations, however, Protium do have an agreement with WBE which allows them to utilise WBE's ancillary facilities such as the site access road, office and welfare facilities and car parking to support the HPF operations.

1.1.6 This supporting statement provides a summary of the Environmental Permit Application and contains relevant site drawings, and appendices to support the Environmental Permit Application.

1.2 Proposed Permitting Route

1.2.1 Natural Resources Wales (NRW) offer a number of possible permitting routes for the operation of a Hydrogen Production Facility (HPF), one of which is termed the HPF 'Quick Permit'. In order to qualify for the 'quick permitting' route the operator must comply with the following conditions:

1) *Hydrogen must be produced via Polymer electrolyte membrane, Anion exchange membrane or Alkaline electrolyser using with Potassium Hydroxide or Sodium Hydroxide as the electrolyte solution*

2) *The electricity utilised is sourced from sustainable sources, the national grid or onsite electrical production at a permitted installation*
3) *The operator intends to abstract less than 20m^3 of surface water per day or the operator already has a permission to abstract surface water of a greater volume*
4) *All wastewater is discharged to sewer or collected for disposal off site*
5) *The operator will not produce more than 1 tonne of non-hazardous or 10 kg of hazardous waste a day.*
6) *The operator will not store more than 1 tonne of hydrogen at any one time*

1.2.2 With the above in mind, the operator has confirmed the following and are therefore eligible to submit an application via NRW's 'quick permitting' route. The responses below should be read in conjunction with the corresponding numbered points in Section 1.2.1 above:

1) *Hydrogen will be produced via Polymer Electrolyte Membrane (PEM)*
2) *The electricity due to be utilised from the adjacent biomass power plant operated by Western BioEnergy Limited (WBE), which is considered to be a sustainable source of energy. The electricity will be supplied via private wire.*
3) *The operator will not abstract any surface water for use in the process. It is anticipated that ~15m^3 of water sourced from a mains water connection (from the adjacent WBE Biomass Plant site) will be utilised in the process.*
4) *All wastewater produced as part of the process is discharged to foul sewer on Heol Cae'r Bont, to the southeast of the Biomass Plant.*
5) *The operator will not produce more than 1 tonne of non-hazardous or 10 kg of hazardous waste a day.*
6) *The operator will not store more than 1 tonne of hydrogen at any one time*

1.2.3 Following on from pre-application discussions (pre-application advice reference number PPN-01159) held between Protium and David Poole (Senior Specialist Advisor) at (NRW), it was confirmed by the Regulator that the 'quick permit' option is a suitable route to obtaining an Environmental Permit for the HPF, given that the criteria listed in Section 1.2.1 will be met. NRW have confirmed that the associated application fee for this type of 'quick permit' application is £788.

1.3 Scheduled Activities

1.3.1 The Activity is considered to be classed as an Installation and listed within Schedule 1 of the Environmental Permitting Regulations 2016 (As Amended), namely;

- Schedule 1 Part 2 Section 4.2 (A1)(a) – Producing Inorganic Chemicals Such as – (i) gases **–** hydrogen.

1.4 Site Setting

1.4.1 The proposed site is at Longland Lane, Margam, Port Talbot, SA13 2NR within the northern part of the Western Wood Energy Plant site (the Biomass Plant). The Biomass Plant is operated by WBE under Environmental Permit Number

EPR/ZP3939GL. As aforementioned, as part of this application process WBE will part surrender their Environmental Permit in order to amend their Environmental Permit boundary to accommodate the siting of the operators HPF within the northern extents of their landholding. With this in mind, the HPF will be located at the same site address as the WBE operations, however the HPF will only occupy a rectangular area (measuring ~70m (l) by 24m (W)) of the northern part of WBE's landholding. The National Grid Reference (NGR) for the HPF operations is 279000, 186219. The site location is depicted upon **Drawing Number PRO1001/08/01**.

1.4.2 To accommodate the HPF operations, the existing concrete pad (previously utilised as a storage area by WBE for the storage of virgin timber) will be extended in a northerly direction to the existing fence-line, and the fence-line will be re-positioned in-line with the WBE's existing land ownership boundary. A fire wall will be constructed in front of the new fence line in order to comply with European Industrial Gases Association/British Compressed Gases Association guidelines. That is, the addition of the firewall will separate the site boundary from the HPF activities.

1.4.3 Entrance to and exit from the proposed site will be via WBE's private access road to the east of the site which is accessed by taking a right hand turn off Heol Cae'r Bont, which is situated to the southeast of the site. Both the HPF operations and the adjacent Biomass Plant will share this common access and entrance infrastructure platform. Upon entry to the Biomass Plant, access is gained to the HPF by continuing along the site access road, over the site weighbridge and following the site one-way system around the Biomass Plant building. The HPF site is located to the immediate north of the Biomass Plant building as depicted upon **Drawing Number PRO1001/08/02**. It should be noted that Protium have an agreement with WBE which enables site operatives to utilise the existing Biomass Plant offices, welfare facilities and parking areas as necessary.

1.4.4 The site is bound to the north and west by an established woodland, beyond which lies Margam Green Energy Plant (a wood fired power station). The WBE staff car parking facility (to be utilised by Protium staff/visitors as necessary) is situated to the immediate east of the site, with an external yard area and roadway which serves the Biomass Plant operations located to the immediate south. Further south, beyond the perimeter of the WBE operations, lies a BOC Gas Plant and playing fields. The BOC Facility is ~5.3ha in area and produces/stocks a wide range of gas, gas equipment, trade tools and safety products. Beyond the BOC site is woodland and beyond this is the Eglwys Nunydd Reservoir used by the Tata Steel and Sea Cadet sailing clubs.

1.4.5 The village of Margam is located ~760m to the north of the site, beyond which lies the town of Port Talbot, situated ~4km to the northwest of the site. The M4 Motorway (junction 38 for Margam) is situated ~400m to the east of the site. The M4 runs past the site in a broadly north/south alignment. Beyond the M4, just over 1km away, lies Margam County Park, Margam Cricket Club and St Mary's Abbey Church.

1.4.6 To the West of the site are the Margam Moors, beyond which are the buildings and infrastructure associated with Port Talbot Steelworks (The Works). The Works are spread over an area of approximately 1,005ha. Its two blast furnaces and steel production plant buildings are major landmarks visible from both the M4 and the London to Swansea rail line and dominate the landscape. The Works represent a site of heavy industry which have been present since the 1960's. The site itself remained as an undeveloped rural field until 2008/2009 when the adjacent Biomass Plant was constructed.

1.4.7 Given that site is located within the landholding of the aforementioned WBE operations (but will be outside of WBE's Environmental Permit Boundary), the HPF benefits from the existing security provisions associated with the adjacent Biomass Plant operations. As well as this there is boundary fencing, a CCTV system and floodlighting as appropriate.

1.4.8 The nearest residential properties include a singular property located ~250m to the northwest of the site, Longland House off Heol Cae'r Bont Road approximately 290m from the HPF and properties located along Ten Acre Wood, ~500m to the west/northwest of the site.

1.5 Risk Assessments and Safety Measures

1.5.1 Protium accepts that risk is inherent in all operations and is committed to applying robust risk management processes to ensure risks are reduced to the minimum practicable. Several safety reviews have been incorporated into the engineering design, including a Hazard Identification (HAZID)/Environmental Impact Identification (ENVID) workshop, Hazard and Operability (HAZOP) and Safety Integrity Level (SIL) Assessment.

1.5.2 The HAZID enables the efficient development of Health, Safety, Security and Environment aspects into the design and supporting philosophies and specifications. The HAZID review identifies hazards and defines both preventive techniques and mitigation measures to be incorporated into Facility design. A copy of the HAZID assessment for the HPF is included within **Appendix 1.** The ENVID review will identify environmental aspects and impacts associated with the HPF.

1.5.3 A HAZOP will be carried out for the process and utility systems following the completion of the Process and Instrumentation Diagrams (P&ID) review. The SIL Assessment will define the minimum safety integrity level required of safety related instrument systems in terms of their required availability, expressed as probability of failure on demand.

1.5.4 A Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) has also been carried out and can be provided to the regulator if considered necessary. The DSEAR assessment includes the identification of sources of flammable atmospheres and suggests suitable control measures to be implemented in order to mitigate potential risks. In addition to this it also identifies where flammable atmospheres may be present and where ignition sources need to be controlled.

1.5.5 In addition to the above, the operator will undertake additional safety studies including a fire and explosion risk analysis, a quantitative risk assessment study, escape, evacuation and rescue analysis, a noise and vibration study and a Human Factors Assessment. The operator will also prepare an Accident Prevention and Mitigation Plan, which will be completed prior to the commencement of operation of the HPF.

1.5.6 In summary, Protium will ensure that the site operates within a safe system of work including development of appropriate safety zones for hydrogen and oxygen venting. Intrinsic safety of electrical systems is assured in an ATEX (Atmosphere Explosible) environment through careful system design and site layout, control is maintained through standard operating procedures and permits to work.

2.0 APPLICATION PROPOSALS

2.1 Summary of the Hydrogen Production Facility Operations

2.1.1 The operator proposes to produce green hydrogen via the process of electrolysis using a polymer electrolyte membrane (PEM). That is, electricity (provided via a renewable source) is utilised to split water into its component parts – hydrogen and oxygen. The hydrogen is collected and stored, whilst the oxygen (a by-product of the process) is emitted safely to the atmosphere.

2.1.2 The HPF will produce up to 960 kgs of green hydrogen per day. The hydrogen will be compressed by hydrogen gas boosters and pressurised into hydrogen tube trailers (HTT) to pressures ranging from 300-400 bar (g) (depending on the type of tube trailer). The hydrogen will then be trailered offsite to regional customers to supply fuel for decarbonising the transport, power, industrial heat and aviation sectors across south Wales.

2.1.3 This HPF will mainly be located upon an existing concrete pad at the development site which drains to the existing (appropriately engineered) surface water drainage system, which was installed to accommodate the adjacent Biomass Plant. However, the concrete pad will also be extended to accommodate the HPF proposal. This extension area will drain to two appropriately engineered infiltration trenches. All wastewater produced as part of the HPF process will be directed to the foul water network associated with the adjacent Biomass Plant and will ultimately discharge to a foul sewer.

2.1.4 Further information regarding the HPF process is contained within **Section 3.2.**

2.2 Consideration of Regulatory Legislation and Guidance

2.2.1 As discussed in Section 1.3, the operation of the HPF is captured under Schedule 1 Part 2 Section 4.2 (A1)(a) of the Environmental Permitting Regulations (2016 as amended). Therefore, given the operation is classed as an Installation, usually the operator would be required to utilise 'Best Available Techniques' (BAT) to prevent or minimise emissions and impacts on the environment. However, there are no existing best available techniques (BAT) reference documents (BREFs) or guidance which specifically cover the production of hydrogen from water by electrolysis (although it is understood that these are currently under development).

2.2.2 Notwithstanding the above, the production of hydrogen by the electrolysis of water is considered to represent an emerging technique by the regulator. The Environment Agency have recently produced (31st March 2024) new guidance entitled '*Hydrogen production by electrolysis of water: emerging techniques. Emerging techniques on how to prevent or minimise the environmental impacts of hydrogen production by electrolysis of water*'. This guidance is applicable for use by all environmental regulators in the UK, including NRW. It is understood that the guidance on emerging techniques is not a regulatory requirement but it does identify best practice to address important environmental issues. It is considered that this guidance should be utilised in the interim until an appropriate BAT guidance and standards are developed for the production of hydrogen by electrolysis of water. Therefore, the operator will give due consideration to this guidance during the operation of the HPF.

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM SUMMARY

3.1 Introduction

3.1.1 The operator is currently working towards an effective system of management which will be accredited to ISO9001 certification standards. ISO 9001 is a globally recognised standard for quality management which allows organisations to improve performance and demonstrates their commitment to quality. ISO 9001 is based on the 'plan-do-check-act' methodology and provides a process-oriented approach to documenting and reviewing the structure, responsibilities, and procedures required to achieve effective quality management in an organisation. Specific sections of the standard contain information on a wide variety of topics, such as:

- Requirements for a QMS, including documented information, planning and determining process interactions
- Responsibilities of management
- Management of resources, including human resources and an organisation's work environment
- Product realisation, including the steps from design to delivery
- Measurement, analysis, and improvement of the QMS through activities like internal audits and corrective and preventive action

3.1.2 The standard also puts an emphasis on risk-based thinking to enhance the application of the process approach.

3.1.3 It is expected that the operator will gain ISO9001 accreditation in the third quarter of 2024.

3.1.4 In addition to the above, the operator has an extensive training and development programme which enables the team to undertake continuous professional development in a range of topics including safety, demonstrating competence and compliance with regulations whist applying best practice.

3.1.5 Audits and inspections will be conducted to a suitable standard to meet the requirements of the management system and performance will be reported to NRW as per the requirements of the Environmental Permit.

3.1.6 Environmental issues will be considered when purchasing items of plant and when design changes are being undertaken at the HPF. These considerations will be documented.

3.1.7 Records will be kept of all items required by the Environmental Permit, other legislation and operating procedures.

3.2 Site Operations – Process Description

3.2.1 As previously indicated, the operator proposes to produce green hydrogen via the process of electrolysis by splitting water into its component parts utilising electricity obtained from a sustainable source. The HPF comprises the following items of plant and equipment:

- ISO container containing the electrolyser equipment, control and monitoring equipment, water treatment and hydrogen gas purification units.
- Hydrogen and oxygen vent stacks
- ISO Container housing the electrical switch gear
- Transformer building
- Compressors and associated buffer tank (within containers)

- 2 Air cooled condenser units
- 3 No Tube trailer refilling bays
- Material consumable storage areas.
- A Private Wire connection to the Biomass Plant substation.
- Pipework/Pipe bridge connecting the HPF to the HTT

This process is further defined in the proceeding sections.

Water Treatment

3.2.2 The HPF will be connected to the Biomass Plant mains water supply. Due to mineralisation and impurities, the water supply is treated prior to use in the electrolysis process. To achieve this the water is passed through a rudimentary Reverse Osmosis Plant (RO Plant) which comprises a bank of filters with very fine pores to filter out minerals dissolved in the water (physical and chemical filtering) while simultaneously deionising the water. The reverse osmosis plant filters will be replaced periodically to ensure optimum efficiency is achieved and to guarantee that the water supply specifications for the electrolyser are maintained. The reject water from the reverse osmosis membrane will be routed to foul sewer situated on Heol Cae'r Bont, to the southeast of the adjacent Biomass Plant.

Electrolysis

3.2.3 The demineralised water (also termed 'Demin Water') is introduced into electrolyser via a pipe at a rate of 700l/hr (maximum). The electrolyser consists of a large, sealed tank within which there is an anode (positively charged) and a cathode (negatively charged) that are connected to the green electricity supply via the ISO Power Unit. . The anode and cathode are separated by a membrane referred to as a Proton Exchange Membrane (PEM). The main function of the membrane is to permit the diffusion of hydrogen ions separating them from the oxygen ions.

3.2.4 The electrolyser will be the largest piece of equipment on site. It consists of two shipping container type units, one containing the electrolyser and the balance of plant and the other housing the power switchgear to power the electrolyser.

3.2.5 Electrolysis requires a supply of electricity, therefore, to ensure the hydrogen produced by the electrolysis process has zero carbon emissions (and can be classified as green), the electricity utilised must be obtained from renewable energy sources. The adjacent Biomass Plant generates renewable energy through the process of combustion of virgin wood, miscellaneous woodchips, waste wood and brash bales. The power plant has an export capacity of 14.7MW, 10MW of which is available to off-takers. Protium, in agreement with WBE, will offtake ~3MW of electricity from the power plant. The HPF will be connected directly to the Biomass Plant substation via a single dedicated electrical connection (private wire). In order to qualify for the 'quick permitting' process (as discussed in Section 1.2) the operator must source electricity from a sustainable source. Given that the HPF will utilise electricity sourced from the adjacent Biomass Plant (which is considered to represent a sustainable source of energy), it is considered that the operator will meet the relevant aforementioned requirement of the 'quick permitting' process.

Hydrogen and Oxygen Gas Capture and Compression

3.2.6 The electrolyser unit is connected by two pipes (with a small diameter) either side of the PEM. The pipe on the cathode side allows the hydrogen gas to leave the stack and the pipe on the anode side allows the oxygen gas to leave the electrolyser stack. Under pressure the hydrogen gas passes through this

pipework and exits the electrolyser container before transferring to either the compressor or the compressor buffer tank. The buffer tank, which is also connected to the compressor acts as a hydrogen store so that the compressor can be continually supplied with hydrogen at the appropriate pressure. The hydrogen is compressed within the compressors and discharged into the HTT's or MCPs (multi-cylinder pallets). The Oxygen gas produced in the electrolyser is vented to atmosphere via a vent stack.

Hydrogen Tube Trailers (HTT)

3.2.7 The HPF includes three HTT parking bays and two tube trailer filling interfaces. The interfaces are located downstream of the compressor. Each of the gas trains will be fitted with a flowmeter to record the mass of gas dispensed. The tube trailer interface comprises of a push-fit nozzle that will connect with the storage compartment on the trailers and dispense gas. The system is capable of simultaneously filling two tube trailers. The system will support tube trailers with a maximum fill pressure of 380 bar(g) and a typical mass of 420kgs.

3.3 Site Infrastructure Plan

3.3.1 To accommodate the HPF, it is proposed that the existing concrete pad will be extended to the north and the fence-line on the northern boundary will be re-positioned in-line with WBE's land ownership boundary for the Biomass Plant. In addition to this, a firewall will be constructed in front of the new fence-line to comply with European Industrial Gases Association/ British Compressed Gases Association Regulations. With this in mind, the operational layout is presented in **Drawing Number PRO1001/08/02**. A drainage plan for the HPF site is included within the proposed drainage strategy which is included in **Appendix 3**.

3.4 Storage Capacities

3.4.1 Less than 1 tonne of hydrogen will be stored at the site at any one time. This allows the operator to remain eligible to submit an application for the HPF via the 'quick permitting' route. Hydrogen will be stored in CE certified stainless-steel cylinders (this is further discussed in Section 3.7).

3.5 Storage of Hazardous Materials

3.5.1 As detailed above, the main throughputs of the HPF process are water and electrical energy; there will be no bulk storage of any substance apart from the product (gaseous hydrogen). Notwithstanding this, the operator will store small quantities of the following materials/products at the site:

- Refrigerant– up to 500 litres, stored in tanks as appropriate.
- Ethylene glycol – up to 1,250 litres, stored within a closed loop system.
- R-407C (Difluoromethane, Pentafluoroethane, 1,1,1,2-Tetrafluoroethane) up to 7.1kg stored in a storage tank as appropriate.

3.5.2 Due to the limited volumes of hazardous materials stored onsite, storage tanks with pallet bunds or other appropriate storage arrangements will be utilised to prevent any chemical spillage. Spill response kits will be provided where appropriate.

3.6 Hours of Operation

3.6.1 Once operational, the HPF will run for twenty-four hours, seven days a week, except during shutdown periods. There will be two planned shutdown periods

annually which will coincide with the planned maintenance shutdowns for the Biomass Plant on the wider site.

3.7 Quality Assurance

3.7.1 In line with NRW requirements, Protium will store hydrogen in CE certified stainless-steel cylinders. The cylinders are certified to design specification EN ISO 10961:2012 (which specifies the requirements for the design, construction, testing and initial inspection of a transportable cylinder bundle which is applicable to cylinder bundles containing compressed gas, liquefied gas and mixtures thereof). Evidence of this is included within **Appendix 2**. The proposed cylinder type conforms to the requirements of the relevant Regulations (Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (as amended) and Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)).

3.7.2 In terms of the resultant hydrogen product specification, purity tests will be carried out on a periodic basis to ensure that the product complies with ISO 14687 (Hydrogen fuel quality — Product specification), Grade D (99.97% purity fuel index). This is the specified grade within ISO 14687 designated for use with PEM fuel cells used in on-road vehicles. The hydrogen is purified in a hydrogen purification unit. The treatment process is outlined in Section 3.2.

3.8 In Process Controls

Point Source Emissions to Air

Oxygen

3.8.1 The HPF will vent oxygen to the air via a stack at a maximum rate of 20kg/hr. It is not considered economically viable to process and sell oxygen from the HPF. The release of oxygen is not considered to have a determinantal effect upon the environment.

Nitrogen

3.8.2 Point source emissions of nitrogen will only occur during the purging of the system when routine maintenance works are being performed. During normal operations, nitrogen will not be emitted to the air. Given that the amount of nitrogen emitted to the air will be so low, it is considered that any environmental effects will be negligible.

Hydrogen

3.8.3 In addition to the above, hydrogen is vented during shutdown and maintenance periods, which will occur on a biannual basis, for a limited period of time (approximately 1 hour). A maximum rate of 44kg/hr is expected and only under the aforementioned specific circumstances. The process equipment is designed so that hydrogen is vented at an appropriate height and location to ensure that the process is conducted safely. It is considered that the volume of hydrogen emitted is so small that it will not have any significant effect on local air quality.

3.8.4 As alluded to above, during normal operations, it is considered that the volume of hydrogen emitted by the process will be insignificant. All process equipment will be installed in accordance with maximum foreseeable operating pressures and temperatures. In addition to this, the operator will ensure that material selection is fully compatible with process fluids and operating conditions. The use of potential sources of leaks e.g. joints, valves and flanges will be minimised, whilst taking into account safe operation and maintenance.

3.8.5 In order to mitigate against unplanned emissions of hydrogen, the HPF will be fitted with suitable operating systems, instrumentation and control systems as well as hydrogen detection sensors. Production of hydrogen will cease in the event that a particular concentration of hydrogen is detected as per an agreed shutdown cause and effect chart. If necessary, the operator will be able to isolate the affected component (e.g., valve). As well as this, intrinsically safe electrical equipment will be utilised to reduce probability of spark ignition, should an unplanned release of hydrogen occur.

Other point source emissions to air

3.8.6 The only other point source emissions would be from mobile plant. In this instance, all plant utilised on site will be serviced and maintained in accordance with manufacturers recommendations. This will ensure that the equipment is operated in an optimal condition to ensure emissions are in accordance with quoted specifications.

3.8.7 The point source emissions of oxygen, nitrogen and hydrogen are depicted upon **Drawing Number PRO1001/08/02**. It is considered that given the volume of potentially polluting emissions are so low and occur so infrequently that air quality risk assessment modelling is not required. However, gas dispersion analysis has been completed and can be provided to the regulator if considered necessary.

Point Source Emissions to Groundwater

3.8.8 There will be no point source emissions to groundwater from the HPF and its associated operations.

Point Source Emissions to Surface Water and Sewer

3.8.9 There will be no point source emissions to surface water or sewer from the HPF operations. As previously indicated, the HPF will predominantly occupy an existing area of concrete hardstanding which drains to the existing surface water drainage system which was installed to support the adjacent biomass operations. That is, drainage from the existing area drains towards a Class 2 full retention separator via a series of road gullies and underground carrier pipework. Surface water then drains from the separator into an attenuation pipe for subsequent infiltration into the underlying geological strata. Any surface water overflow is discharged into the local ditch network in the northwestern corner of the Biomass Plant permit boundary. Please note, the external drainage system is fitted with an isolation valve, located at an appropriate juncture (post the full retention separator), which can be closed should a leak or spill occur from the existing concrete pad area.

3.8.10 Notwithstanding the above, in order to accommodate the footprint of the HPF activities, the existing concrete pad will be extended to the north. To accommodate this, two below ground infiltration structures will be constructed to the north of the HPF. They will be of varying sizes, however they will both be filled with type 'B' filter media in accordance with clause 505 of the specification for highway works, to achieve a porosity of 30%. The infiltration trench will be wrapped in a geotextile surround and 300mm of topsoil will be placed above the infiltration structure, above which will be a dense layer of grassed vegetation. This is considered to represent a Sustainable Drainage System (SuDs).

3.8.11 The extension to the concrete pad will not be subject to any vehicle movements and is only occupied by a small proportion of HPF activities. Given this, is it very unlikely that contamination of surface water shall occur. A drainage

strategy has been prepared for the site (which provides further details of the above) and is included in **Appendix 3.**

3.8.12 All wastewater from the HPF operations (demineralised water associated with the reverse osmosis process) will be directed to the foul drainage network associated with the biomass operations to the south. It will then be directed towards a pumping station prior to being is discharged to the existing public foul sewer, situated to the southeast of WBE's landholding, on Heol Cae'r Bont. This discharge is permitted via the use of a Trade Effluent Discharge Consent (TEDC) which is authorised to Western Wood Energy Plant by Dwr Cymru (Welsh Water). This TEDC allows for the discharge of trade effluent comprising (amongst other things) wastewater from demineralisation plant. The maximum quantity of trade effluent discharged on one day is limited to $50m^3$. It is considered that even with the addition of wastewater associated with the HPF, compliance with the conditions of the TEDC can be maintained. Protium have an agreement with WBE for the use of this TEDC. The TEDC will be amended if considered necessary.

3.8.13 The wastewater composition will be similar to that derived from a mains water supply, however it will have a higher concentration of impurities (e.g. soluble carbonate salts of magnesium and calcium). The water demineralisation process will not introduce any further chemical species to the process.

3.8.14 There will be no emissions to sewer from external operational areas associated with the HPF.

Fugitive Emissions to Air

3.8.15 There is no inherent source of process dust, odour or bioaerosols nor use of any bulk materials which could give rise to any. Incidental dust and litter within the site perimeter will be controlled through general housekeeping measures.

Fugitive Emissions to Surface and Groundwater

3.8.16 Fugitive emissions to surface water and groundwater are controlled by the engineered impermeable site surfacing and on-site drainage systems, as discussed in sections 3.8.9-3.8.11 above. That is, ultimately drainage from the existing concrete pad is directed to a retention separator prior to subsequent infiltration into the underlying geological strata. An isolation valve is present post the full retention separator. This can be closed should a leak or spill occur from the existing concrete pad area.

3.8.17 As previously alluded to, surface water from the concrete pad extension area is directed toward two infiltration structures situated to the north of the site. Given that there will no vehicle movements in this area and there is only minimal infrastructure associated with the HPF situated upon the concrete extension area, it is considered that the likelihood of potential surface water contamination is low. The aforementioned infiltration structures will be equipped with a geotextile surround and 300mm of topsoil will be placed above the infiltration structure, above which will be a dense layer of grassed vegetation. This infiltration structure will therefore provide appropriate mitigation techniques for suspended solids, metals and hydrocarbons, however as aforementioned it is considered that the concrete pad extension operations can be assigned with a low pollution hazard level.

3.8.18 Based on the above, it is considered that there is no risk of fugitive emissions to surface or groundwater associated with the site operations.

3.8.19 A spill procedure is in place, to deal quickly with any spillages and leaks of materials during the treatment or storage operations. All necessary measures will be taken to contain any spillage by means of suitable material and equipment. Minor spillages will be contained using spillage kits or any suitable readily available absorbent material. All staff will be made aware of the location of the spill kits, which will be utilised as necessary.

Control of Odours

3.8.20 Hydrogen and oxygen are odourless gases and therefore the process is considered to be inherently non-odorous. The HPF is therefore not considered likely to give rise to any off-site odour nuisance.

Control of Scavengers Insects and Other Pests

3.8.21 Due to the nature of the operations, the potential for scavengers, insects and other pests to be attracted is very low.

Control of Mud and Debris

3.8.22 Due to the nature of the operations, the potential for mud and debris to be generated is considered very low.

3.8.23 In the event that mud or debris arising from the site operations (or tracked from the adjacent Biomass Plant operations) is spread either on to the site or onto public areas outside the site, any available manual or mechanical means shall be employed to remove any deposits and thus maintain the cleanliness of the site, site access road and wider public roads/ highways.

Control of Noise and Vibration

3.8.24 The HPF is not anticipated to cause detriment to the amenity of the locality given its location adjacent to an existing busy Biomass Plant and in an area characterised by existing industrial operations, as well as significant levels of road traffic associated with the A48 and M4 motorway. In addition to this, the nearest residential receptors are located over 250m distant from the HPF. The loudest piece of equipment associated with the Facility is the compressor unit. The compressor unit is containerised and noise levels are expected to be around 85db (measured at 1m from the unit).

3.8.25 Based on BS 5228-1:2009+A1:2014 (Code of Practice for Noise and Vibration Control on Construction and Open Sites), at around 250m from the site, the sound level of the compressor will decrease from 85db to around 23db. This is based on the assumption that the intervening ground is soft in nature and no mitigation is proposed e.g. acoustic fencing. Please note, a firewall will be installed between the HPF and the site boundary which will afford some noise attenuation. Based on this basic screening calculation, the HPF is unlikely to be audible at the nearest residential receptor.

3.8.26 Based on the above, it is considered unlikely that the site operations will intrude above established background noise levels.

3.8.27 Notwithstanding this, operation of the site will follow environmental guidance with regard to noise and vibration and will utilise appropriate control measures and monitoring to ensure that the noise and vibration from the HPF complies with the relevant criteria and does not give rise to cause for annoyance.

3.8.28 Should unacceptable emissions of noise or vibration occur, the incident will be noted and a record made. An attempt will be made to identify the source of the

noise or vibration and ensure it is removed or otherwise ameliorated. A record will be made of such incidents within the Site Diary and the corrective actions taken.

3.9 Monitoring

3.9.1 If necessary, a monitoring plan for the routine operation of the HPF will be produced. This will take into account any monitoring requirements stipulated within the Environmental Permit. An 'Other than Normal Operating Conditions' (OTNOC) plan will be prepared for the site to address potential emissions during abnormal circumstances. This is further described in Section 3.11.

3.9.2 The HPF will be manned during routine operations and the system can be monitored remotely, if considered necessary.

Monitoring Point Source Emissions to Air

3.9.3 Clearly defined operating limits will be developed for individual equipment and operations will observe these limits supported using automated alarms and trips. This would include leak detection, flame detection, online analysers for oxygen in hydrogen product and hydrogen in oxygen produced.

3.9.4 The point source emissions of oxygen, nitrogen and hydrogen are depicted upon **Drawing Number PRO1001/08/02**.

3.9.5 There is no monitoring of hydrogen, oxygen or nitrogen proposed, however but typical volumes and frequencies of emissions can be defined, if considered necessary.

Monitoring Emissions to Water

3.9.6 As previously indicated, wastewater from the reverse osmosis plant will be direct to the foul sewer network (associated with the adjacent Biomass Plant) prior to discharge to foul sewer. The volume of water will be monitored to ensure that the operator remains in compliance with the associated TEDC.

Monitoring Emissions to Ground and Groundwater

3.9.7 An Application Site Condition Report (SCR) (**Document Reference PRO1001/05**) has been prepared and is included with this Environmental Permit Application. The Application SCR describes the condition of the land and groundwater at the point of permit application, which can be utilised as a point of reference should contamination be identified in the future. Notwithstanding this, given that the operations are considered to be low risk and are conducted upon impermeable concrete surfacing with suitable drainage arrangements in place, it is considered that the risk to ground and groundwater is very low. Given this, the operator does not propose to produce a soil and groundwater monitoring plan for the site.

Monitoring Process Performance

3.9.8 The operator will monitor the energy consumption per kg of hydrogen product and water consumption per kg of hydrogen product. All other process performance monitoring will be conducted in line with the conditions listed within the Environmental Pemit.

3.10 Site and Equipment Maintenance Plan

3.10.1 All site plant and equipment will undergo a daily inspection. All plant and equipment will be covered with a regular maintenance and inspection schedule.

3.10.2 The HPF will run twenty-four hours a day, seven days a week, except during shutdown periods. There will be two planned shutdowns annually which will coincide with the planned maintenance shutdowns of the adjacent Biomass Plant.

3.10.3 The mobile plant will be covered by a regular maintenance and inspection schedule. In addition, there are mobile spill kits located around site to clean up any fluids that have leaked from the mobile plant.

3.11 Accident Prevention and Management Plan

3.11.1 An Accident Prevention and Management Plan will be prepared and submitted to NRW in due course. It is likely that the plan will consider potential accidents/incidents such as explosions, gas release, control of fires, spills and leaks, vehicle collision, proximity of other industrial process plants, equipment failure, abnormal operation etc. The operator will ensure that appropriate emergency planning and emergency contact procedures are established. Any accidents or incidents which occur on site will be investigated and reported as appropriate.

3.11.2 All management plans are reviewed on a 6-monthly basis.

3.11.3 All equipment and systems will be subject to stringent operating and maintenance techniques which will be designed, operated and maintained to ensure that they are reliable and available, thus minimising emissions to the environment. In addition to this, instrumentation and control equipment including gas detection and alarm systems will be ATEX rated where required to minimise the risk of ignition in the event of loss of hydrogen.

3.11.4 As discussed previously, spill kits will be made available to address any spillages, so the consequence of the accident is minimised .

3.11.5 In the event of any significant environmental emergency/incident, a representative of Protium will notify NRW by telephone immediately, but first having due regard for the incident at hand and any remediation actions required to ensure the safety of site personnel and the immediate environment.

3.11.6 Details of any environmental incident will be confirmed to NRW in writing by first class post or fax, on the next working day after identification of the incident. This confirmation will include: the time and duration of the incident, the receiving environmental medium or media where there has been any emission as a result of the incident, an initial estimate of the quantity and composition of any emission, the measures taken to prevent or minimise any further emission and a preliminary assessment of the cause of the incident. Environmental incidents will also be recorded in a site diary.

3.11.7 Any incident notified to NRW will be investigated, and a report of the investigation sent to NRW. The report will detail, as a minimum, the circumstances of the incident, an assessment of any harm to the environment and the steps taken to bring the incident to an end. The report will also set out proposals for remediation and for preventing a repetition of the incident.

3.11.8 All HPF operations will be conducted upon impermeable concrete surfacing with an appropriately engineered drainage system to minimise any significant risk from spills and leaks.

Other Than Normal Operating Conditions

3.11.9 In addition to the production of an Accident Prevention and Management Plan, the operator will also undertake an Other Than Normal Operating Conditions (OTNOC) assessment. This will identify potential abnormal scenarios, mitigation measures and potential options for monitoring of the system in abnormal circumstances. The OTNOC will be assessed periodically and will be part of the sites environmental management system. The OTNOC will be issued to the regulator for consideration upon completion.

3.11.10 Please note, as previously alluded to, the HPF is designed to operate on a continual basis. It is suggested that OTNOC would generally be restricted to infrequent start up and shutdown events. It is considered that there will be some release of hydrogen during the nitrogen line purges which would be required for these events. The volume of nitrogen purge gas will be in the order of 1-2 Nm^3, so the volume of residual hydrogen displaced will be no more than 1-2 Nm^3. These levels are considered to be minimal and will not result in any environmental effects.

3.11.11 Testing and emergency operations may see lifting of relief valves or control valves to vent. Emissions resulting from these operations are expected to occur infrequently for short periods of time (seconds). A conservative estimate for emissions associated with testing is in the order of 1-2 kg. For emergency relief it is anticipated that emissions will be in the order of 20-25 kg.

3.11.12 The system will be designed to inherently avoid leaks by good design practice. As well as this, the HPF will be operated and maintained to appropriate industry standards. Should a leak of hydrogen be detected, the system will initiate a safe shut down.

3.11.13 Periodic depressurisation will be required for vessel inspection and general maintenance. The system inventory will be reduced through offloading prior to any system depressurisation. As previously stated, all abnormal circumstances will be identified and mitigation measures will be proposed as part of the OTNOC assessment and will be recorded in the site diary.

3.12 Contingency Plans

3.12.1 With regards to power supply, in the event of an emergency e.g. breakdown or shut down of the Biomass Plant, the operator has a small standalone generator (electrical rating will be approximately 25kVA) situated on site which can be utilised for use as necessary.

3.12.2 It is likely that the OTNOC assessment described in Section 3.10.11 will consider enforced plant shutdowns and any other changes in normal operations such as extreme adverse weather (e.g. high winds or lightning strike). As alluded to above, the OTNOC will be issued to the regulator upon completion.

3.13 Climate Change

3.13.1 UK climate change projections (Met Office, 2023) indicate that the UK in general can expect increased average summer temperatures, changes to winter daily temperatures, increased rainfall, sea level rise, drier summers etc. Relevant climate change adaptation measures of the HPF include, but are not limited to:

- incorporating robust structural envelope design to withstand environmental loads considering climate change projections;
- implementing flood-resistant design;
- using sustainable drainage systems (SuDS)

3.13.2 With the above in mind, the proposed infiltration structure/structures shall be sized to cater for the 1% Annual Exceedance Probability (AEP) event with an additional allowance of 40% for climate change.

3.13.3 The operator will aim to ensure that the HPF is resilient to the potential impacts of climate change, promote long-term sustainability and reduce vulnerability to climate-related risks.

3.14 Energy and Resource Efficiency

3.14.1 The HPF will be operated via the use of PEM technology. It is considered that this is an appropriate choice of technology based on the following:

Energy demand and Efficiency

3.14.2 The energy utilised to power the HPF is sourced from the adjacent Biomass Plant which is considered to represent a sustainable source of energy. An energy efficient design is utilised as part of the HPF process which includes passive design strategies to optimise natural lighting, ventilation and insulation. This will reduce energy consumption and improve energy performance. It is anticipated that the HPF offtake ~3MW of electricity from the adjacent Biomass Plant.

3.14.3 The major consumers of electrical energy at the HPF will be the electrolyser and compression systems. PEM electrolysers have been selected for their flexibility in generating gases at a high percentage of energy efficiency (in terms of electrical energy in and useful hydrogen out) over most of their operating load range. The efficiency of the electrolyser supplier is quoted as between 75% - 85%, subject to capacity factor and the type of heating values.

3.14.4 Energy efficiency will be a consideration when purchasing balance of plant items, particularly gas heaters and compressors.

3.14.5 All equipment will be maintained to ensure efficient operation. Staff will be trained to ensure unnecessary energy losses are minimised by switching off equipment (where appropriate) when not in use.

3.14.6 The operator will design, operate and maintain the HPF to ensure both energy and process efficiency. That is the energy and raw materials needed to produced each tonne of hydrogen will be minimised as far as practical.

3.14.7 It is proposed to monitor and record energy consumption, which can be made available to NRW should it be considered necessary.

Water demand and efficiency

3.14.8 The water utilised in the process will be sourced from an offtake from the main water supply to the Biomass Plant. It is anticipated that ~15m^3 of water will be utilised per day by the hydrogen production process.

3.14.9 The operator will implement the following strategies to ensure efficient water use:

- Minimise as far as practical the water utilised in the process,
- If possible, the operator will give consideration to the segregation, treatment and reuse of water,
- Identify how much contaminant requires removal to maintain the water quality necessary for effective operation,
- Eliminate, treat or minimise (where possible) any wastes which result from the reverse osmosis treatment process.

3.14.10 It is proposed to monitor and record water consumption, which can be made available to NRW should it be considered necessary.

Waste Management

3.14.11 The operator will conserve natural resources by adopting strategies such as recycling, material reuse (where possible) and will promote a circular economy. The HPF will be designed for durability and adaptability in order to extend the lifespan of the products utilised and ultimately minimise the amount of waste produced at the site.

3.14.12 During operations, waste will be minimised as much as possible. Any waste generated will be stored, transported and recovered/ disposed of at a suitably permitted facility.

3.14.13 Please note, as previously indicated the Facility will not produce more than 1 tonne of non-hazardous or 10 kg of hazardous waste a day. This allows the operator to remain eligible to submit an application for the HPF via the 'quick permitting' route.

3.15 Managing Staff Competence and Training Records

3.15.1 Staff competency and training procedures will be implemented and will be reviewed and updated as part of the sites approved Environmental Management System.

3.15.2 It should be noted that all site staff will have had at least a year's experience of running a HPF, prior to operating the facility.

3.16 Keeping Records

3.16.1 The operator will keep records in line with the requirements of the site's Environmental Permit. This will include keeping records of the following:

- Permits issued to the site
- Any other legal requirements as considered appropriate
- Relevant risk assessments including any updates
- All management system plans
- All operating procedures
- Staff competence and any relevant training
- Emissions and any other monitoring undertaken
- Records of compliance checks including findings of any investigation undertaken and actions taken
- Complaints made regarding the site activities including of any investigation undertaken and actions taken
- Audits of management system, findings (reports) and actions taken
- Management reviews and changes made to the management system
- Certification audit reports and any actions carried out (where necessary)
- Maintenance works undertaken
- Breakdowns
- Emergencies etc

3.16.2 The Site Manager or nominated person will maintain a record of all the above information in the site log or on inspection forms, as appropriate. Records relating to significant events will be kept for up to 6 years, or where involving off site environmental effects or pollution of land or groundwater until permit surrender.

3.16.3 All records and copies of inspection forms will be kept at the Facility at all times and will be available for inspection at all reasonable times by any authorised officer of NRW.

3.16.4 The Facility records may be kept either as:

- Hand generated log;
- Computer generated hard copies; or
- Computer permanent storage media.

3.16.5 To ensure the security of records they will be kept in offices that shall be locked when not attended.

3.16.6 Records will be disposed of in accordance with company policy, which shall ensure an appropriately secure method e.g., shredding and recycling, where feasible.

3.17 Availability of the Environmental Management System

3.17.1 Copies of the site Permit and associated written management systems will be available in the Biomass Plant site offices and are accessible to all site staff and NRW representatives. All staff are provided with full training in the key management practices relating to the operations in which they are involved. Refresher training is undertaken periodically and when there are any significant changes to the management systems.

4.0 REPORT CLOSURE

4.1.1 Following a request by Protium Green Hydrogen Supply Limited (Protium), this application seeks an Environmental Permit for the operation of a Hydrogen Production Facility (HPF) at an existing Biomass Plant in in Margam. The operations meet the criteria (as stated in Section 1.2.1) listed by NRW , to qualify for a 'quick permitting' route. Given this, the operator is proposing to utilise the 'quick permitting' route to facilitate this request.

4.1.2 As previously alluded to, the HPF will be situated within the WBE landholding, however it will be an entirely separate permitted activity. There will be no overlap of Environmental Permit boundaries associated with the HPF operations and WBE's Biomass Plant operations. In order to accommodate this, separate applications (an application to part surrender WBE's Permit and the subsequent submission of an Environmental Permit Application by Protium for the operation of the HPF) will be required to be determined in the aforementioned sequence by Natural Resources Wales (NRW). This is due to the fact that, in accordance with NRW guidance, a parcel of land cannot be subject to two Environmental Permits.

4.1.3 This supporting statement and its associated drawings and appendices provide the required level of information to enable determination of the application.

APPENDIX 1
HAZID Review

Project HEART - Site HAZID Report

Thornton Tomasetti MA23068

Prepared For
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17th November 2023

Executive Summary

This report presents the record of a HAZID on 14th November 2023 for Protium Green Solutions (Protium).

The HAZID objective was to ensure that all hazards associated with the development and operation of the two proposed sites were identified, to enable appropriate hazard management and mitigation measures to be put in place.

There are a number of vendor packages that make up the overall installation and these were excluded from the HAZID as they will be supplied as complete packages. These are:

- The electrolyser
- The compressor and buffer storage
- The bulk storage, where applicable.

The HAZID considered the equipment and connections between the different vendor packages and considered the following nodes for the proposed installations:

1. Site layout and to the outlet of the electrolyser.
2. Between electrolyser and compressor.
3. Outlet of compressor to Hydrogen export.

Two sites were considered:

- Site A the Baglan site.
- Site B the Margam Site

The HAZID raised 29 actions for the Baglan site and 30 actions for the Margam site. These are tabulated in Section 3.1 of this report.

The Protium team shall take responsibility for ensuring that the HAZID actions are addressed and closed out in a timely manner.

Table of Contents

Appendices

Revision History

Revision	Date	Document Ref.	Comments
DRAFT	17/11/2023	MA23068-R-01	First issue for Protium review Append B and Appendix C not currently included

Prepared By:	Reviewed By:	Approved By:
		
Euan Williamson Engineer	John Evans Principal	John Evans Principal

1.0 Introduction

The HAZID for the Project HEART proposed sites took place on 14th November 2023 from 09:00 to 14:45. The HAZID was conducted as a hybrid in person and remote meeting, using Microsoft Teams software, hosted by Protium Green Solutions (Protium).

The HAZID objective was to ensure that all hazards associated with the development and operation of the two proposed sites were identified, to enable appropriate hazard management and mitigation measures to be put in place.

1.1 HAZID Team

The following personnel took part in the HAZID.

Table 1: HAZID Team

Name	Company	Role
John Evans	Thornton Tomasetti	Chair
Euan Williamson	Thornton Tomasetti	Scribe
Sundeep Reddy	Protium Green Solutions	Project Manager
Mathew Seccombe	Protium Green Solutions	Senior Engineer
Finn Doyle[1]	Protium Green Solutions	Applications Engineer
Osian Rees[1]	Protium Green Solutions	Engineer
Tony Byrne[1]	Protium Green Solutions	EPC & Construction Manager

1.2 Objectives

The main objectives of the HAZID were:

- To systematically identify the hazards associated with operations on site, hydrogen production, storage and offtakes.
- To ensure that appropriate management and mitigation measures are in place, or will be put in place to address the identified hazards.

Analysing and assessing the risks associated with the identified hazards is outside the scope of this HAZID. Where identified, the HAZID has recorded actions to ensure that risks are understood and managed. Addressing these actions was outside the scope of the HAZID.

1.3 HAZID Scope

There are a number of vendor packages that make up the overall installation and these were excluded from the HAZID as they will be supplied as complete packages. These are:

- The electrolyser
- The compressor and buffer storage
- The bulk storage, where applicable.

[1] Attended online.

The HAZID considered the equipment and connections between the different vendor packages and considered the following nodes for the proposed installations:

4. Site layout and to the outlet of the electrolyser.
5. Between electrolyser and compressor.
6. Outlet of compressor to Hydrogen export.

Two sites were considered:

- Site A the Baglan site.
- Site B the Margam Site

The equipment for the two sites was the same with the exception that the Margam site included bulk hydrogen storage, up to 480 kg at up to 430 barg, and the Baglan site did not have bulk storage.

The HAZID initially considered the Margam site, before reviewing the Baglan site by difference. The scope does not include tracking and close out of any actions raised during the HAZID. The HAZID terms of reference (ToR), including guidewords to support the session, were distributed prior to the workshop [1].

2.0 HAZID Methodology

2.1 Approach

The HAZID followed a structured brainstorming approach and included:

1. Introduction of team members.
2. Presentation of the HAZID methodology by the chair.
3. Overview of the project and sites at Baglan and Margam by the Protium project manager, included in Appendix B.
4. Overview of the Hydrogen production process, storage and offloading by the Protium senior engineer, included in Appendix C.
5. Conduct of the HAZID.

The HAZID ran as a hybrid in person and virtual meeting via Microsoft Teams. During the HAZID the recording sheets were displayed to the participants as information was entered. Appendix A presents the completed recording sheets.

3.0 HAZID Records

Appendix A contains the completed worksheets from the HAZID.

As the HAZID was conduced for two sites, to make the worksheets for each site clear, the text in the worksheet for the Baglan site is coloured blue and the text in the worksheet for the Margam site is coloured black.

3.1 HAZID Actions

The actions from the HAZID are listed below. Table 2 provides actions recorded for the Baglan site with the numbers suffixed with an 'A' and Table 3 provides actions recorded for the Margam site with the numbers suffixed with a 'B'.

Table 2: HAZID Actions - Baglan Site

No.	Recommendations / Actions	Resp. Person	Due Date
1A	Procedures to be developed for personnel working arrangements on site specific to standalone site.	Sundeep Reddy	August 2024
2A	Develop vehicle management plan; to include offtake vehicles and parking arrangements for operational personnel.	Sundeep Reddy	30th Nov 2023
3A	Consider hazard from public vehicles and the need for vehicle protection outside the entrance.	Sundeep Reddy	30th Nov 2023
4A	Develop plan based on traffic planning guidelines.	Sundeep Reddy	End Jan 2024
5A	Consider CCTV cameras and locked gated access. Review security assessment for SNZ and implement learnings.	Sundeep Reddy	30th Nov 2023
6A	Confirm automated shutdown procedure	Mathew Seccombe	30th Nov 2023
7A	Routine inspection to be included when site is manned.	Sundeep Reddy	30th Nov 2023
8A	Consider suitable disposal route for wastewater.	Sundeep Reddy	30th Nov 2023
9A	Review the vendor assessment of the hazard from a gas release (hydrogen and nitrogen) from electrolyser package with respect to hazard ranges and personnel impact.	Osian Rees	Mid Dec 2023
10A	Confirm low pressure in this section of pipe will trigger system shutdown.	Mathew Seccombe	30th Nov 2023
11A	Determine extent of hazard range in event of full bore failure.	Mathew Seccombe	End Jan 2024
12A	Review gas volumes, isolation and venting of systems downstream of compressor package to ensure safe venting arrangements in emergency conditions.	Mathew Seccombe	End Jan 2024
13A	Review requirement for gas detection downstream of compressor package including filling point.	Osian Rees / Sundeep Reddy	End Jan 2024
14A	Determine extent of hazard range in event of full bore failure.	Mathew Seccombe	End Jan 2024
15A	Determine extent of hazard range in event of full bore failure.	Mathew Seccombe	End Jan 2024
16A	Confirm installation of stops / bollards.	Sundeep Reddy	End March 2024
17A	Confirm earth point at offloading location. Confirm procedure includes earthing of tanker vehicle prior to offloading.	Sundeep Reddy	End March 2024
18A	Ensure system is designed to provide overpressure protection for breakaway coupling at tube trailer.	Mathew Seccombe	End Jan 2024
19A	Ensure system is designed to provide overpressure protection for connection at MCP (multi cylinder pack).	Mathew Seccombe	End Jan 2024

No.	Recommendations / Actions	Resp. Person	Due Date
20A	Review connection for MCP to ensure control is in place to prevent air ingress.	Mathew Seccombe	End Jan 2024
21A	Consider sampling arrangement of gas after compressor.	Sundeep Reddy	End March 2024
22A	Include sampling point at compressor exit.	Mathew Seccombe	30th Nov 2023
23A	Consider security arrangements around tube trailer filling bay.	Sundeep Reddy	End Jan 2024
24A	Offloading procedure to include management of ignition sources e.g. vehicle engine.	Sundeep Reddy	End Jan 2024
25A	Review SNZ operating procedures with regards to manning levels, controls and emergency response. Develop procedures for this site as appropriate.	Sundeep Reddy	End March 2024
26A	Consider traffic barriers and operational procedures including site layout for manoeuvring.	Sundeep Reddy	End March 2024
27A	Consider chocking of vehicle while offloading.	Sundeep Reddy	End March 2024
28A	Develop site procedures for frozen conditions and implement controls where necessary.	Sundeep Reddy	End March 2024
29A	Procedure to be developed, personnel trained, etc.	Sundeep Reddy	End March 2024

Table 3: HAZID Actions - Margam Site

No.	Recommendations / Actions	Resp. Person	Due Date
1B	Level inspection on containers to be included in inspection routine.	Sundeep Reddy	End Jan 2024
2B	Consider vehicle impact protection.	Sundeep Reddy	30th Nov 2023
3B	Review security assessment for SNZ and implement learnings.	Sundeep Reddy	30th Nov 2023
4B	Consider inspection of blocks and/ or separation of blocks from site	Mathew Seccombe	30th Nov 2023
5B	Confirm automated shutdown procedure.	Mathew Seccombe	30th Nov 2023
6B	Routine inspection to be included when site is manned.	Sundeep Reddy	30th Nov 2023
7B	Consider suitable disposal route.	Sundeep Reddy	30th Nov 2023
8B	Required to understand biomass site hazard ranges, mitigations, and potential for escalation into site, should include evacuation and escape of personnel. Consideration of venting philosophy to be included for this event.	Sundeep Reddy	Mid Dec 2023
9B	Review the vendor assessment of the hazard from a gas release (hydrogen and nitrogen) from electrolyser package with respect to hazard ranges and personnel impact.	Osian Rees	Mid Dec 2023
10B	Understand the hazard from the BOC site and whether this can be mitigated.	Sundeep Reddy	30th Nov 2024
11B	Confirm low pressure in this section of pipe will trigger system shutdown.	Mathew Seccombe	30th Nov 2023
12B	Determine extent of hazard range in event of full bore failure.	Mathew Seccombe	End Jan 2024
13B	Review gas volumes, isolation and venting of systems downstream of compressor package to ensure safe venting arrangements in emergency conditions.	Mathew Seccombe	End Jan 2024
14B	Review requirement for gas detection downstream of compressor package including filling point.	Osian Rees / Sundeep Reddy	End Jan 2024
15B	Determine extent of hazard range in event of full bore failure.	Mathew Seccombe	End Jan 2024
16B	Determine extent of hazard range in event of full bore failure.	Mathew Seccombe	End Jan 2024
17B	Confirm installation of stops / bollards.	Sundeep Reddy	End March 2024
18B	Confirm earth point at offloading location. Confirm procedure includes earthing of tanker vehicle prior to offloading.	Sundeep Reddy	End March 2024
19B	Ensure system is designed to provide overpressure protection for breakaway coupling at tube trailer.	Mathew Seccombe	End Jan 2024
20B	Ensure system is designed to provide overpressure protection for connection at MCP (multi cylinder pack).	Matthew Seccombe	End Jan 2024
21B	Review connection for MCP to ensure control is in place to prevent air ingress.	Mathew Seccombe	End Jan 2024
22B	Consider sampling arrangement of gas after compressor.	Sundeep Reddy	End March 2024
23B	Include sampling point at compressor exit.	Mathew Seccombe	30th Nov 2023
24B	Consider security arrangements around tube trailer filling bay.	Sundeep Reddy	End Jan 2024
25B	Offloading procedure to include management of ignition sources e.g. vehicle engine.	Sundeep Reddy	End Jan 2024

No.	Recommendations / Actions	Resp. Person	Due Date
26B	Review SNZ operating procedures with regards to manning levels, controls and emergency response. Develop procedures for this site as appropriate.	Sundeep Reddy	End March 2024
27B	Consider traffic barriers and operational procedures including site layout for manoeuvring.	Sundeep Reddy	End March 2024
28B	Consider chocking of vehicle while offloading.	Sundeep Reddy	End March 2024
29B	Review current site procedures for frozen conditions and implement controls where necessary.	Sundeep Reddy	End March 2024
30B	Procedure to be developed, personnel trained, etc.	Sundeep Reddy	End March 2024

4.0 References

[1] Thornton Tomasetti, "Project Heart HAZID - Terms of Reference," MA23068-R-01 Rev 1, 7th November 2023.

Appendix A: Completed HAZID Record Sheets

Table A1: Record Sheet for the Baglan Site

GUIDEWORD	HAZARD/ CAUSE	CONSEQUENCE	EXISTING PREVENTION / SAFEGUARDS / EVALUATION	No.	RECOMMENDATIONS / ACTIONS	RESP. PERSON	ACTION DUE DATE
NODE 1 – Site layout and system to outlet of electrolyser							
Ground movement	Ground movement causing instability	Toppling of equipment resulting in damage or injury to personnel.	Ground will have to be developed specifically for the site.				
Personnel welfare	Injury to personnel	Personnel injury	Procedures for personnel accessing site, lone working, emergency arrangements not in place as greenfield site.	1A	Procedures to be developed for personnel working arrangements on site specific to standalone site.	Sundeep Reddy	August 2024
Collision	Vehicle impact for site vehicles	Accidental release of hydrogen.	No current use for the site, therefore no hazard from other site operations – all vehicle movements related to Protium activities.	2A	Develop vehicle management plan; to include offtake vehicles and parking arrangements for operational personnel.	Sundeep Reddy	30th Nov 2023
Collision	Vehicle impact – external vehicles	Public vehicles entering site.	For excursion from motorway, cannot be mitigated. This site is not a secure site, and is in proximity to public access roads.	3A	Consider hazard from public vehicles and the need for vehicle protection outside the entrance.	Sundeep Reddy	30th Nov 2023
Collision	Vehicle impact with public.	Injury or fatality to public.	Pedestrian walkway and cycleway adjacent to site, hazard is Protium vehicles impacting public.	4A	Develop plan based on traffic planning guidelines.	Sundeep Reddy	End Jan 2024
Site security	Third party trespassers.	Damage to equipment and vehicles on site.	Site fenced off.	5A	Consider CCTV cameras and locked gated access. Review security assessment for SNZ and implement learnings.	Sundeep Reddy	30th Nov 2023
Adverse weather	Flooding	Damage to equipment.	Groundworks will consider drainage requirements.				

GUIDEWORD	HAZARD/ CAUSE	CONSEQUENCE	EXISTING PREVENTION / SAFEGUARDS / EVALUATION	No.	RECOMMENDATIONS / ACTIONS	RESP. PERSON	ACTION DUE DATE
Adverse weather	High winds	Damage to equipment.	Captured as part of vendor package.				
Adverse weather	Lightning strike	Ignition of flammable atmosphere resulting in damage to equipment or adjacent site.	Identified as a hazard as part of engineering scope. Procedures will prevent venting during lightning.				
Utilities	High voltage	Electrocution	Grid connection required; transformer will be required on site – installed by third party.				
Utilities	High voltage	Contamination	275 kV cables on site and across entrance. Hazard during construction and any excavation work, these will be completed by third party contractor. Potential commercial impact if National Grid are required to access cables on site.				
Utilities	Glycol	High pressure release, operational control issue	As part of vendor package				
Utilities	Nitrogen	Equipment damage or failure.	Bulk storage external cylinder packs, standard fittings, etc. Loss of nitrogen, system will automatically shut down	6A	Confirm automated shutdown procedure	Mathew Seccombe	30th Nov 2023
Utilities	Release from water supply impacting electric supply	Breach of regulations	Rating of electrical equipment, cables, etc., will be assessed as part of the procurement scope.	7A	Routine inspection to be included when site is manned.	Sundeep Reddy	30th Nov 2023
Wastewater	Contamination	Electrocution	Water not contaminated, not considered hazard to environment or humans, however cannot be directly released into watercourse.	8A	Consider suitable disposal route for wastewater.	Sundeep Reddy	30th Nov 2023
Electrolyser package	Flammable gas from vent	Ignition of vented gas	Self-contained vendor package, zone 1 area around vent, no equipment planned to be within this area.				

GUIDEWORD	HAZARD/ CAUSE	CONSEQUENCE	EXISTING PREVENTION / SAFEGUARDS / EVALUATION	No.	RECOMMENDATIONS / ACTIONS	RESP. PERSON	ACTION DUE DATE
Dropped Object	Lifting operations	Injury to personnel, damage to equipment.	No elevated platforms or working areas, maintenance to be conducted under shutdown conditions, under specific procedures.				
Gas release	Gas release	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.		9A	Review the vendor assessment of the hazard from a gas release (hydrogen and nitrogen) from electrolyser package with respect to hazard ranges and personnel impact.	Osian Rees	Mid Dec 2023
Node 2 – Between electrolyser and compressor							
Corrosion	Loss of containment	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	Stainless steel pipework.				
Vibration	Loss of containment	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	Pipe support and anti-vibration captured as part of the integrated engineering scope.				
Instrumentation	Potential for leak points	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	No instrumentation on section of pipework. Outlet pressure sensor on electrolyser and inlet pressure sensor on compressor package. Isolation valve at inlet to compressor package. Low pressure sensor on compressor system interfaced to control system to control shutdown.	10A	Confirm low pressure in this section of pipe will trigger system shutdown.	Mathew Seccombe	30th Nov 2023
Gas release	Gas release	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	DSEAR assessment as part of integrated engineering package.	11A	Determine extent of hazard range in event of full bore failure.	Mathew Seccombe	End Jan 2024

GUIDEWORD	HAZARD/ CAUSE	CONSEQUENCE	EXISTING PREVENTION / SAFEGUARDS / EVALUATION	No.	RECOMMENDATIONS / ACTIONS	RESP. PERSON	ACTION DUE DATE
Gas release	Gas release	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	Minimise flanges and connections. Low pressure detection to detect large leaks, any small leaks detected via inspection.				
Back flow	Low pressure in electrolyser	Damage to equipment	Check valve on outlet of electrolyser as part of vendor package.				
Cyber security	System not able to be controlled	Malicious damage by third party.	Included as part of digital infrastructure risk assessment and engineering package.				
Explosion	Gas release, delayed ignition	Explosion overpressure damage to site and adjacent sites.	Pipework in open air to minimise explosion overpressure.				
Fire	Ignition sources on site	Damage to equipment, injury to personnel.	Procedures will include management of ignition sources such as temporary equipment, mobile phones, etc. Fire event will be less severe that an ignited release downstream of the compressor which identified as Action 15A.				
Node 3 – Outlet of compressor to hydrogen export							
Corrosion	Loss of containment	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	Stainless steel pipework.				
Gas release	Loss of containment	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	Pipework has pressure protection.				

GUIDEWORD	HAZARD/ CAUSE	CONSEQUENCE	EXISTING PREVENTION / SAFEGUARDS / EVALUATION	No.	RECOMMENDATIONS / ACTIONS	RESP. PERSON	ACTION DUE DATE
Venting	Ignitable gas cloud	Development of flammable atmosphere; damage to equipment, injury of personnel.		12A	Review gas volumes, isolation and venting of systems downstream of compressor package to ensure safe venting arrangements in emergency conditions.	Mathew Seccombe	End Jan 2024
Gas release	Gas release	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	Minimise flanges and connections.	13A	Review requirement for gas detection downstream of compressor package including filling point.	Osian Rees / Sundeep Reddy	End Jan 2024
Gas release	Gas release	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	DSEAR assessment as part of integrated engineering package.	14AA	Determine extent of hazard range in event of full bore failure.	Mathew Seccombe	End Jan 2024
Fire	Ignited gas release	Injury to personnel.		15A	Determine extent of hazard range in event of full bore failure.	Mathew Seccombe	End Jan 2024
Collision	Impact by vehicle	Damage to assets.	Offtake location remote from storage and compressor. Stops / bollards installed to prevent impact by vehicle.	16A	Confirm installation of stops / bollards.	Sundeep Reddy	End March 2024
Explosion	Ignition source from tube trailer sparking	Explosion overpressure damage to site and adjacent sites. Injury to personnel.		17A	Confirm earth point at offloading location. Confirm procedure includes earthing of tanker vehicle prior to offloading.	Sundeep Reddy	End March 2024
Overpressure	Gas release due to overpressure downstream of compressor	Failure of pipework / equipment	Compressor can generate 500 barg. Pipework maximum pressure rating to be determined but connection coupling for offtake can only be rated to 438 barg. However, tube trailer rated up to 380 barg.	18A	Ensure system is designed to provide overpressure protection for breakaway coupling at tube trailer.	Mathew Seccombe	End Jan 2024

GUIDEWORD	HAZARD/ CAUSE	CONSEQUENCE	EXISTING PREVENTION / SAFEGUARDS / EVALUATION	No.	RECOMMENDATIONS / ACTIONS	RESP. PERSON	ACTION DUE DATE
Overpressure	Gas release due to overpressure downstream of compressor	Failure of pipework / equipment	MCP (multi cylinder pack) rated to 300 barg.	19A	Ensure system is designed to provide overpressure protection for connection at MCP (multi cylinder pack).	Mathew Seccombe	End Jan 2024
Air ingress	Flammable mixture in pipework	Flammable mixture within pipework	Design for tube trailer breakaway coupling to include check valve and will remain positively pressurised.	20A	Review connection for MCP to ensure control is in place to prevent air ingress.	Mathew Seccombe	End Jan 2024
Fire	Fire detection	Failure to detect a fire event.	Identified in fire protection philosophy scope of work.				
Gas purity	Commercial	Commercial risk.	Commercial supplying high level purity therefore need to understand any contamination.	21A	Consider sampling arrangement of gas after compressor.	Sundeep Reddy	End March 2024
Gas purity	Commercial	Commercial risk.	Commercial supplying high level purity therefore need to understand any contamination.	22A	Include sampling point at compressor exit.	Mathew Seccombe	30th Nov 2023
Security	Trespass	Malicious damage by third party.		23A	Consider security arrangements around tube trailer filling bay.	Sundeep Reddy	End Jan 2024
Fire	Ignition during offloading	Injury to personnel and equipment damage.		24A	Offloading procedure to include management of ignition sources e.g. vehicle engine.	Sundeep Reddy	End Jan 2024
Procedures	-	Injury to personnel, plant operation issues, security, etc		25A	Review SNZ operating procedures with regards to manning levels, controls and emergency response. Develop procedures for this site as appropriate.	Sundeep Reddy	End March 2024

GUIDEWORD	HAZARD/ CAUSE	CONSEQUENCE	EXISTING PREVENTION / SAFEGUARDS / EVALUATION	No.	RECOMMENDATIONS / ACTIONS	RESP. PERSON	ACTION DUE DATE
Vehicle collision	Vehicle collision	Damage to equipment on site, accidental release of hydrogen.	Two tube trailers could be parked adjacent to each other.	26A	Consider traffic barriers and operational procedures including site layout for manoeuvring.	Sundeep Reddy	End March 2024
Vehicle collision	Vehicle collision	Damage to equipment on site, accidental release of hydrogen. Injury to site personnel and public.	Potential for vehicle brake failure while at offloading site.	27A	Consider chocking of vehicle while offloading.	Sundeep Reddy	End March 2024
Adverse weather	Vehicle impact due to frozen conditions	Loss of control of vehicle.		28A	Develop site procedures for frozen conditions and implement controls where necessary.	Sundeep Reddy	End March 2024
Handling	Damage to equipment and loss of containment	Development of fire or flammable atmosphere. Injury or impairment of personnel.	For MCP handling forklift will be required for lifting onto vehicle and manoeuvring to filling location.	29A	Procedure to be developed, personnel trained, etc.	Sundeep Reddy	End March 2024

Table A2: Record Sheet for the Margam Site

GUIDEWORD	HAZARD/ CAUSE	CONSEQUENCE	EXISTING PREVENTION / SAFEGUARDS / EVALUATION	No.	RECOMMENDATIONS / ACTIONS	RESP. PERSON	ACTION DUE DATE
NODE 1 – Site layout and system to outlet of electrolyser							
Ground movement	Ground movement causing instability	Toppling of equipment resulting in damage, injury to personnel.	Hard standing available but slopes. Packages need to be levelled when installed.	1B	Level inspection on containers to be included in inspection routine.	Sundeep Reddy	End Jan 2024
Collision	Vehicle impact	Accidental release of hydrogen.	All vehicle movement around site subject to existing vehicle management plan.	2B	Consider vehicle impact protection.	Sundeep Reddy	30th Nov 2023
Site security	Third party trespassers	Damage to equipment and vehicles on site.	Site fenced off and 24/7 security for main access.	3B	Review security assessment for SNZ and implement learnings.	Sundeep Reddy	30th Nov 2023
Site separation	Concrete blocks between biomass store and site	Movement / toppling of concrete blocks resulting in damage equipment.	Concrete blocks planned to be in place between biomass store and site. Ground slopes, so will be stabilised when installed.	4B	Consider inspection of blocks and/ or separation of blocks from site	Mathew Seccombe	30th Nov 2023
Adverse weather	Flooding	Damage to equipment.	Site elevated above natural vegetation and concreted area has drainage and slopes away from proposed site				
Adverse Weather	High winds	Damage to equipment.	2.5km from coast, subject to high wind. Captured as part of vendor package.				
Adverse weather	Lightning strike	Ignition of flammable atmosphere resulting in damage to equipment or adjacent biomass site.	Identified as a hazard as part of engineering scope. Procedures will prevent venting during lightning.				
Utilities	High voltage	Electrocution	Supplied by current site operator.				

GUIDEWORD	HAZARD/ CAUSE	CONSEQUENCE	EXISTING PREVENTION / SAFEGUARDS / EVALUATION	No.	RECOMMENDATIONS / ACTIONS	RESP. PERSON	ACTION DUE DATE
Utilities	Glycol	Contamination	As part of vendor package				
Utilities	Nitrogen	High pressure release, operational control issue	Bulk storage external cylinder packs, standard fittings, etc. Loss of nitrogen, system will automatically shut down	5B	Confirm automated shutdown procedure.	Mathew Seccombe	30th Nov 2023
Utilities	Accidental release from water supply impacting electric supply	Equipment damage or failure.	Rating of electrical equipment, cables, etc., will be assessed as part of the procurement scope.	6B	Routine inspection to be included when site is manned.	Sundeep Reddy	30th Nov 2023
Wastewater	Contamination	Breach of regulations	Water not contaminated, not considered hazard to environment or humans, however cannot be released directly into watercourse.	7B	Consider suitable disposal route.	Sundeep Reddy	30th Nov 2023
Electrolyser package	Flammable gas from vent	Ignition of vented gas	Self-contained vendor package, zone 1 area around vent, no equipment planned to be within this area.				
Dropped Object	Lifting operations	Injury to personnel, damage to equipment.	No elevated platforms or working areas, maintenance to be conducted under shutdown conditions, under specific procedures.				
Fire	Fire at biomass site	Fire reaching site causing escalation. Injury or impairment of personnel.		8B	Required to understand biomass site hazard ranges, mitigations, and potential for escalation into site, should include evacuation and escape of personnel. Consideration of venting philosophy to be included for this event.	Sundeep Reddy	Mid Dec 2023

GUIDEWORD	HAZARD/ CAUSE	CONSEQUENCE	EXISTING PREVENTION / SAFEGUARDS / EVALUATION	No.	RECOMMENDATIONS / ACTIONS	RESP. PERSON	ACTION DUE DATE
Gas release	Gas release	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.		9B	Review the vendor assessment of the hazard from a gas release (hydrogen and nitrogen) from electrolyser package with respect to hazard ranges and personnel impact.	Osian Rees	Mid Dec 2023
Local Hazards	Hazards from BOC site	-	Not known at present but HSE advise this site is in a consultation zone 1.	10B	Understand the hazard from the BOC site and whether this can be mitigated.	Sundeep Reddy	30th Nov 2024
Node 2 – Between electrolyser and compressor							
Corrosion	Loss of containment	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	Stainless steel pipework.				
Vibration	Loss of containment	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	Pipe support and anti-vibration captured as part of the integrated engineering scope.				
Instrumentation	Potential for leak points	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	No instrumentation on section of pipework. Outlet pressure sensor on electrolyser and inlet pressure sensor on compressor package. Isolation valve at inlet to compressor package. Low pressure sensor on compressor system interfaced to control system to control shutdown.	11B	Confirm low pressure in this section of pipe will trigger system shutdown.	Mathew Seccombe	30th Nov 2023
Gas release	Gas release	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	DSEAR assessment as part of integrated engineering package.	12B	Determine extent of hazard range in event of full bore failure.	Mathew Seccombe	End Jan 2024

GUIDEWORD	HAZARD/ CAUSE	CONSEQUENCE	EXISTING PREVENTION / SAFEGUARDS / EVALUATION	No.	RECOMMENDATIONS / ACTIONS	RESP. PERSON	ACTION DUE DATE
Gas release	Gas release	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	Minimise flanges and connections. Low pressure detection to detect large leaks, any small leaks detected via inspection.				
Back flow	Low pressure in electrolyser	Damage to equipment	Check valve on outlet of electrolyser as part of vendor package.				
Cyber security	System not able to be controlled	Malicious damage by third party.	Included as part of digital infrastructure risk assessment and engineering package.				
Explosion	Gas release, delayed ignition	Explosion overpressure damage to site and adjacent biomass site. Injury to personnel.	Pipework in open air to minimise explosion overpressure.				
Fire	Ignition sources on site	Damage to equipment, injury to personnel.	Procedures will include management of ignition sources such as temporary equipment, mobile phones, etc. Fire event will be less severe that an ignited release downstream of the compressor which identified as Action 16B.				
Node 3 – Outlet of compressor to hydrogen export							
Corrosion	Loss of containment	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	Stainless steel pipework.				
Gas release	Loss of containment	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	Pipework has pressure protection and vent system.				

GUIDEWORD	HAZARD/ CAUSE	CONSEQUENCE	EXISTING PREVENTION / SAFEGUARDS / EVALUATION	No.	RECOMMENDATIONS / ACTIONS	RESP. PERSON	ACTION DUE DATE
Venting	Ignitable gas cloud	Development flammable atmosphere; damage to equipment, injury of personnel.		13B	Review gas volumes, isolation and venting of systems downstream of compressor package to ensure safe venting arrangements in emergency conditions.	Mathew Seccombe	End Jan 2024
Gas release	Gas release	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	Minimise flanges and connections.	14B	Review requirement for gas detection downstream of compressor package including filling point.	Osian Rees / Sundeep Reddy	End Jan 2024
Gas release	Gas release	Development of fire or flammable atmosphere; damage to equipment, injury of personnel.	DSEAR assessment as part of integrated engineering package.	15B	Determine extent of hazard range in event of full bore failure.	Mathew Seccombe	End Jan 2024
Fire	Ignited gas release	Injury to personnel.		16B	Determine extent of hazard range in event of full bore failure.	Mathew Seccombe	End Jan 2024
Collision	Impact by vehicle	Damage to assets.	Offtake location remote from storage and compressor. Stops / bollards installed to prevent impact by vehicle.	17B	Confirm installation of stops / bollards.	Sundeep Reddy	End March 2024
Explosion	Ignition source from trailer sparking	Explosion overpressure damage to site and adjacent biomass site. Injury to personnel.		18B	Confirm earth point at offloading location. Confirm procedure includes earthing of tanker vehicle prior to offloading.	Sundeep Reddy	End March 2024
Overpressure	Gas release due to overpressure downstream of compressor	Failure of pipework / equipment	Compressor can generate 500 barg. Pipework maximum pressure rating to be determined but connection coupling for offtake can only be rated to 438 barg. However, tube trailer rate up to 380 barg.	19B	Ensure system is designed to provide overpressure protection for breakaway coupling at tube trailer.	Mathew Seccombe	End Jan 2024

GUIDEWORD	HAZARD/ CAUSE	CONSEQUENCE	EXISTING PREVENTION / SAFEGUARDS / EVALUATION	No.	RECOMMENDATIONS / ACTIONS	RESP. PERSON	ACTION DUE DATE
Overpressure	Gas release due to overpressure downstream of compressor	Failure of pipework / equipment	MCP (multi cylinder pack) rated to 300 barg.	20B	Ensure system is designed to provide overpressure protection for connection at MCP (multi cylinder pack).	Matthew Seccombe	End Jan 2024
Air ingress	Flammable mixture in pipework	Flammable mixture within pipework	Design for tube trailer breakaway coupling to include check valve and will remain positively pressurised.	21B	Review connection for MCP to ensure control is in place to prevent air ingress.	Mathew Seccombe	End Jan 2024
Fire	Fire detection	Failure to detect a fire event.	Identified in fire protection philosophy scope of work.				
Gas purity	Commercial	Commercial risk.	Commercial requirement is to supply high level purity therefore need to understand any contamination.	22B	Consider sampling arrangement of gas after compressor.	Sundeep Reddy	End March 2024
Gas purity	Commercial	Commercial risk.	Commercial requirement is to supply high level purity therefore need to understand any contamination.	23B	Include sampling point at compressor exit.	Mathew Seccombe	30th Nov 2023
Security	Trespass	Malicious damage by third party.		24B	Consider security arrangements around tube trailer filling bay.	Sundeep Reddy	End Jan 2024
Fire	Ignition during offloading	Injury to personnel, equipment damage.		5B	Offloading procedure to include management of ignition sources e.g. vehicle engine.	Sundeep Reddy	End Jan 2024
Procedures	-	Injury to personnel, plant operation issues, security, etc		26B	Review SNZ operating procedures with regards to manning levels, controls and emergency response. Develop procedures for this site as appropriate.	Sundeep Reddy	End March 2024

GUIDEWORD	HAZARD/ CAUSE	CONSEQUENCE	EXISTING PREVENTION / SAFEGUARDS / EVALUATION	No.	RECOMMENDATIONS / ACTIONS	RESP. PERSON	ACTION DUE DATE
Vehicle collision	Vehicle collision	Damage to equipment on site, accidental release of hydrogen.	Two tube trailers could be parked adjacent to each other.	27B	Consider traffic barriers and operational procedures including site layout for manoeuvring.	Sundeep Reddy	End March 2024
Vehicle collision	Vehicle collision	Damage to equipment on site, accidental release of hydrogen. Injury to site personnel and public.	Potential for vehicle brake failure while at offloading site.	28B	Consider chocking of vehicle while offloading.	Sundeep Reddy	End March 2024
Adverse weather	Vehicle impact due to frozen conditions	Loss of control of vehicle.		29B	Review current site procedures for frozen conditions and implement controls where necessary.	Sundeep Reddy	End March 2024
Handling	Damage to equipment and loss of containment	Development of fire or flammable atmosphere. Injury or impairment of personnel.	For MCP handling forklift will be required for lifting onto vehicle and manoeuvring to filling location.	30B	Procedure to be developed, personnel trained, etc.	Sundeep Reddy	End March 2024

Appendix B: Project HEART Overview Slides

Appendix C: Hydrogen Production Process Overview Slides

APPENDIX 2
Hydrogen Storage
(CE Certified)

Type Approval Certificate

Certificate № TAC-1266-389-2301

Valid From: 10th August 2023

Valid Until: 16th October 2027

Manufacturer Koyuncu Ticaret A.ş.

Address Dudullu OSB Hoca Nasreddin Cad. No:11
Umraniye, İstanbul

Country Turkey

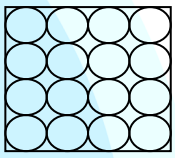
Manufacturer's Mark

Regulation[s]: CDG TPE Regulations 2009 (As amended); ADR 2023

Conformity Assessment: Clause 1.8.7.2; 1.8.7.7 ADR 2023

Design Specification: EN ISO 10961:2012

Pressure Equipment: 16 Cylinder Bundle Assembly

Drawing Number:	**Bundle/Frame**	**Manifold**	**Cylinder Layout**
	KY16X50PRO.TD.000 Rev 0	KYC-17-023 Rev 0	

Marking Drawing: LFRM.216

Bundle Test Pressure:	450	**bar**	**Maximum Working Pressure**	300	**bar**
Maximum Gross Mass:	1653.75	**Kg**	**Manifold Max Rated Pressure**	675	**bar**

Contents: 16 x 50 litre seamless steel cylinders with P mark of conformity and containing pressurised compressed and liquefied gases and mixtures in accordance with P200 of ADR. Excluding groups T, TC and acetylene.

Additional Information: UK counterpart of CONTROLTEST type approval '2010/35/EU – 3253/20.10.2017'

The data plate of each bundle will be marked with the test/working pressures of the intended constituent cylinders in order to avoid over pressurization of intended cylinders; maximum test/working pressures as above

Care shall be taken to ensure embrittling gases are not used with incompatible cylinders

Revision №	Revision History

Details of the results of the examination of the cylinder for type approval and the main features of the type are attached.

The undersigned certifies that the cylinder type described above conforms to the requirements of the Regulation[s] specified above.

Simon Davies

Certifying Inspector

Arrowhead Industrial Services Limited

Orion House, Barn Hill, Stamford, Lincolnshire, PE9 2AE UK

UK Appointed Identification Number: 1266

Signature

Inspector's Mark

UKAS PRODUCT CERTIFICATION 4542

List of Technical Documents For Type Approval

Type Approval Number TAC-1266-389-2301– Supporting Technical Documents

№	Documents	References
1	Application for Type Approval	Dated 14th March 2023
2	16 Cylinder Bundle Assembly Drawings	KY16X50PRO.TD.000 Rev 0 (Model: KY300-16x50)
3	Frame Drawing	KY16X50PRO.TD.000 Rev 0
4	Manifold Drawing	KYC-17-023 Rev 0
5	Stamp Mark Drawing	LFRM.216
6	Design Review	N/A for counterpart – prototype tests recorded below
7	Material Certificate	Doc A - Material Certificates Doc B - Filler Wire
8	Inspection Reports for Prototype - drop test - load test - pressure/leak test	Turkey Report 3-8-23 Koyuncu pg 11-14 Turkey Report 3-8-23 Koyuncu pg 4-8 Manifold Test and Control Report 20.10.2017 Manifold Test and Control Report 31.1.2023
9	Stability Test	Turkey Report 3-8-23 Koyuncu pg 10
10	NDT	Doc C - NDT Certificate
11	Welder's Certificate	Doc G - Weld Procedure Doc H - Welder Qualification Certificate
12	Manifold Certificate of Compliance	Manifold Test and Control Report 31.1.2023
13	Manifold Test Certificate	Manifold Test and Control Report 20.10.2017

APPENDIX 3
Drainage Strategy

WESTERN BIO ENERGY LIMITED
PROTIUM GREEN HYDROGEN SUPPLY LIMITED

DRAINAGE STRATEGY FOR HYDROGEN PRODUCTION FACILITY AT WESTERN WOOD BIOMASS PLANT

Document Reference: PRO1002/DS/01
April 2024

Sirius Environmental

Project Quality Assurance

Report Reference	:	PRO1002/DS/01
Report Date	:	April 2024
Prepared for	:	Protium Green Hydrogen Supply Limited Unit 110 164 – 180 Union Street London SE1 0LH
Issued by	:	Sirius Environmental Limited 4245 Park Approach Thorpe Park Leeds LS15 8GB

Rev	Date Issued	Amendment Details	Author	Reviewer
1	15/04/2024	Amendments following Client review	JD	AK

Purpose

This document was prepared as a Drainage Strategy for Western Bio Energy (WBE) as the applicant and Protium Green Hydrogen Supply Limited (Protium) as the agent, to support a planning application for a Hydrogen Production Facility (HPF) on land at the existing Western Wood Biomass Plant in Margam, Port Talbot.

Sirius Environmental Limited (Sirius) accepts no responsibility or liability for any use, that is made of this document, other than by the Client for the purposes for which it was originally commissioned and prepared.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

LIST OF FIGURES

1 INTRODUCTION

1.1 General

Sirius Environmental Limited (Sirius) were commissioned by Sirius Planning Limited (SPL) on behalf of, Western Bio Energy Limited (WBE) as the applicant and Protium Green Hydrogen Supply Limited (Protium) as the agent, to produce a drainage strategy to support the planning application for a Hydrogen Production Facility (the proposed development).

The proposed development is located within the boundary of the existing Western Wood Biomass Plant. Western Wood Biomass Plant is situated approximately 4.5km south west of the town of Port Talbot in South Wales.

The proposed development is located off Longland Lane, Margam, Port Talbot, SA13 2NR. The site entrance is at Ordnance Survey (OS) grid reference **SS 791 862**.

This drainage strategy shall detail the proposed methods for dealing with any surface water generated as a result of the Hydrogen Production Facility (HPF).

Figure 1 below shows the site location along with the planning boundary in red and the concrete slab extension area in black.

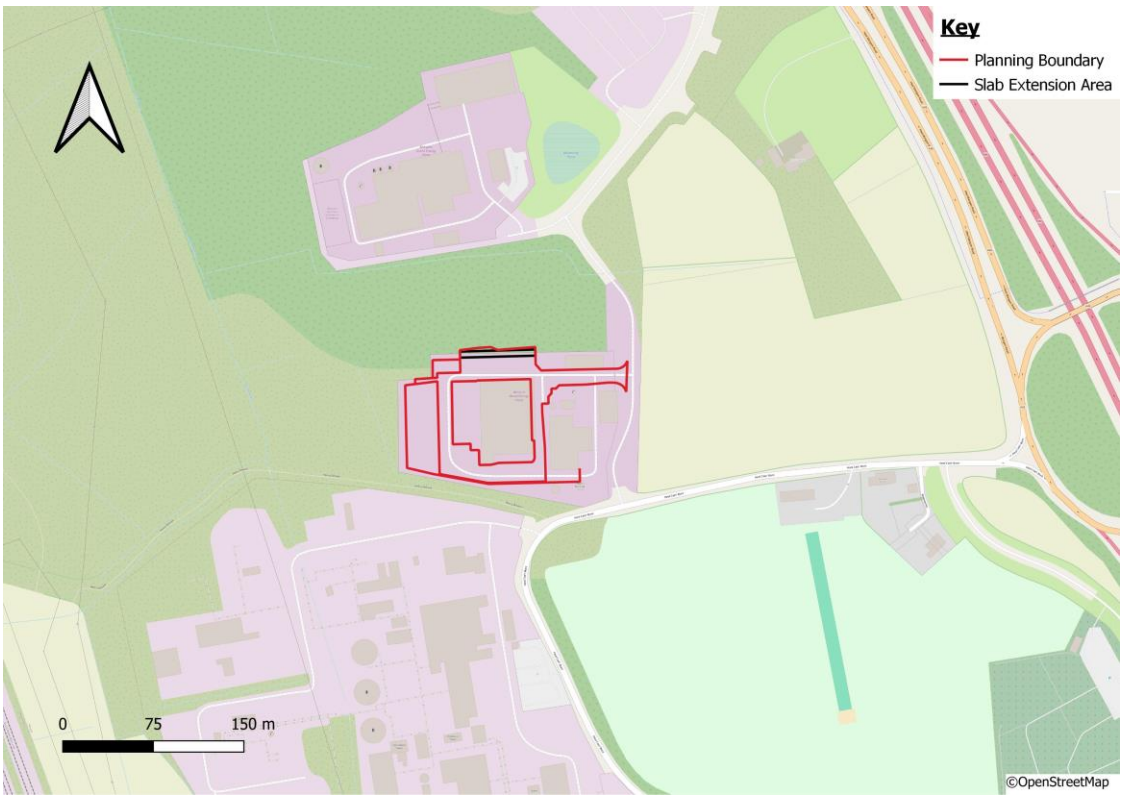


Figure 1 – Site Location Plan

1.2 Current Surface Water Drainage Guidance

In Wales the flood and water management Act 2010, known as Schedule 3, came into force on the 7th January 2019 and requires all new developments to include Sustainable Drainage Systems (SuDS) features to manage any surface water generated. As a result of Schedule 3 being implemented, a set of statutory standards were development which must be followed when undertaking drainage design within Wales.

The six standards are as follows;

1. Standard S1 – Surface Water Runoff Destination;
2. Standard S2 – Surface Water Hydraulic Control;
3. Standard S3 – Surface Water Quality;
4. Standard S4 – Amenity;
5. Standard S5 – Biodiversity; and
6. Standard S6 - Design of drainage for Construction, Operation and Maintenance and Structural Integrity.

These statutory standards must be followed where the proposed development area equals or exceeds 100m^2.

As part of the Schedule 3 implementation, the introduction of SuDS Approval Body (SAB) was created. Prior to commencement of construction, approval on the drainage scheme shall be required from the SAB.

2 DEVELOPMENT PROPOSALS

Planning permission is being sought by Protium to install a Hydrogen Production Facility comprising of the following:

- An Electrolytic Hydrogen Production Facility (HPF) and associated compression and storage;
- A Hydrogen Tube-Trailer Filling Station (HTTFS); and
- Renewable electricity provision from a co-located biomass plant via private wire.

This HPF shall mainly be located on the existing concrete hardstanding at the site which drains to the existing surface water drainage system installed at Western Wood Biomass Plant. However, there shall be an additional area of concrete slab constructed to the north of the existing concrete hardstanding to accommodate the HPF proposal. The proposed concrete pad extension area measures 342m^2 including fire wall.

The proposed development layout is shown on Figure 2 below.

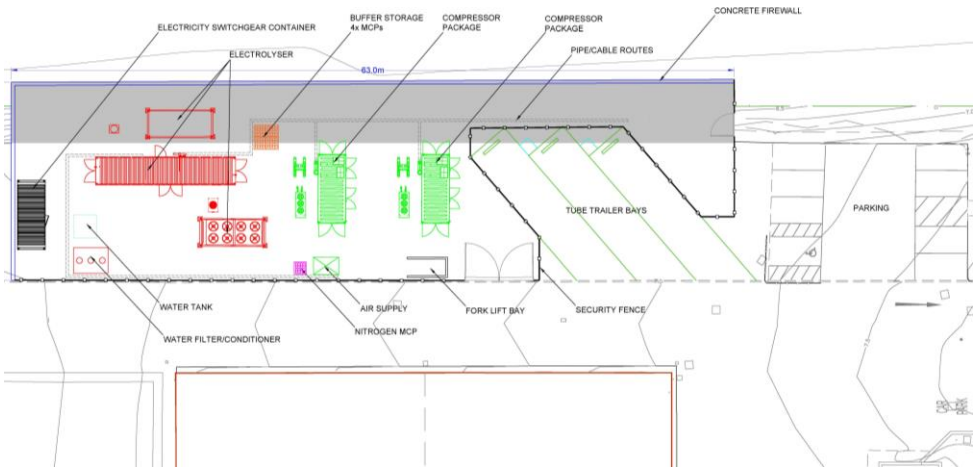


Figure 2 – Proposed Development Layout

3 TOPOGRAPHY

A topographic survey of the site was conducted in October 2023. Generally the site falls from east to west. The eastern boundary of the site has the highest elevation with a level of approximately 9.50mAOD, with the lowest elevation occurring on the western boundary with an elevation of approximately 4.50mAOD.

4 GEOLOGY

As part of this drainage strategy, the British Geology Survey (BGS) maps have been studied to determine the underlying geology for the proposed development area. The BGS maps show that the superficial deposits, varies across the development area. The superficial deposits are either Devensian Glaciofluvial Ice Contact Deposits comprising sand and gravels or Tidal Flat Deposits comprising either clay, silt and sand. The bedrock geology is formed from the South Wales Middle Coal Measures formation which comprises mudstones, siltstones and sandstones.

It is therefore anticipated that the ground shall be receptive and suitable for infiltration/soakaway methods to deal with any surface water runoff generated from the proposed additional area of concrete slab.

5 EXISITNG SITE SURFACE WATER DRAINAGE

The as-built drawings for the currently installed surface water drainage network at the Western Wood Biomass Plant have been reviewed.

The existing site access road and concrete hardstanding areas drain via a series of road gullies, which subsequently fall into underground carrier pipework of varying diameters. The carrier pipework for the external hardstanding areas then generally falls in a westerly direction where all surface water passes through a full retention separator, before draining into the attenuation pipe for subsequent infiltration into the underlying geological strata and any overflow discharged into the local ditch network in the north western corner of the site.

The drainage from the roofs of the existing structures present at the site, collect runoff via rainwater gullies. This water is then subsequently transferred into a separate set of underground carrier pipework, as this does not need to be directed through the retention separator, due to risk of contamination being low. These carrier pipes then fall in a westerly direction were they eventually connect into the attenuation pipework, where this is then infiltrated into the underlying geological strata and any overflow discharged into the local ditch network in the north western corner of the site.

The as-built surface water drainage drawings are presented in Appendix 1.

Part of the proposed HPF is located on the existing slab where the existing surface water drainage is currently installed. Where the HPF is located on existing hardstanding, this area will not increase the amount of hardstanding/impermeable area draining to the existing surface water drainage network on the site and therefore shall not increase the flood risk. As a result of this, the existing drainage network and areas of HPF located on the existing slab have not been assessed further in this drainage strategy.

6 PROPOSED SURFACE WATER DRAINAGE FOR CONCRETE SLAB EXTENSION AREA

6.1 General

As stated in previous sections of this drainage strategy, in 2019 Schedule 3 was implemented in Wales meaning that SuDS drainage systems have to be included within all new development.

Therefore the surface water drainage design associated with the proposed concrete pad extension area is based on the principles stated within the "Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems".

This section shall document the proposed strategy for dealing with any surface water runoff generated as a result of the proposed development associated with the concrete slab extension, as well as detailing how the six standards shall be achieved.

No formal SAB pre-app consultation has been undertaken. However, the design has been made with suitable consideration to ensure compliance with the guidance requirements.

6.2 SuDS Standards Compliance

6.2.1 Standard S1 – Surface Water Runoff Destination

This standard looks at where the generated surface water is discharged too. Within the guidance the locations available for surface water discharge are split into 5 levels, with level 1 being the preferred option and level 5 being the least preferred option which should only be used in exceptional circumstances.

Level 1 is collecting surface water for reuse. As there are no water supply concerns it is deemed that to install a rainwater harvesting system would not be cost effective for the development. Also the area that is being drained shall be an external area which is deemed to not be suitable for rainwater harvesting systems. Therefore, a level 2 or greater disposal method shall be considered.

Level 2 is infiltrating surface water runoff into the ground. A review of the British Geological Survey maps show that there are sand and gravel deposits present within the vicinity of the proposed development. These deposits are considered to have a high enough infiltration rate to mean that infiltration into the ground is a suitable method for dealing with surface water from the additional concrete slab area.

As part of the SAB application infiltration tests shall be undertaken in accordance with Building Research Establishment (BRE) Digest 365 document to confirm the infiltration rate.

Any changes to infiltration structure sizing resulting from the infiltration testing shall be undertaken as part of the SAB application.

6.2.2 Standard S2 – Surface Water Hydraulic Control

This standard looks at ensuring that the discharge rate from any proposed development does not exceed the greenfield runoff rate for the site, pre development, or does not exceed the current brownfield rate if the site is already developed.

The greenfield runoff rate for the additional concrete slab extension area has been calculated. The calculated runoff rates are presented in Table 1 below.

Table 1 – Calculated Greenfield Runoff Rates

	Runoff Rate (l/s)
Q_{Bar}	0.14
Q_{1}	0.13
Q_{30}	0.26
Q_{100}	0.32

As the geology is indicated to be suitable for infiltration no formal attenuation storage is required as would be the case if the proposed development was draining to a water course or sewer.

The proposed infiltration structure/structures shall be sized to cater for the 1% Annual Exceedance Probability (AEP) event with an additional allowance of 40% for climate change. Where possible the infiltration structures shall meet the half drain time requirements for all events up to and including the 1% AEP event with an additional allowance of 40% for climate change. However if the infiltration rate is equal to or lower than K=1 x 10^{-6}m/s it is likely that it will not be possible to achieve the half drain time for the 1% AEP event without making the structures excessively large. Therefore, in accordance with Ciria C753 the half drain time for a lower infiltration rate would be achieved for the 3.3% AEP event. For the purpose of this drainage strategy and to allow initial sizing of the infiltration structure to be undertaken, it has been assumed based on previous experience and also taking a conservative approach that the infiltration rate of the sand and gravel shall be K = 5x10^{-6}m/s.

Urban creep is not considered appropriate for this drainage strategy as any future extensions shall be regulated through the planning process.

6.2.3 Standard S3 – Surface Water Quality

The surface water quality can be assessed using the Simple Index Approach (SIA) which is set out in the SuDS manual. The SIA uses a pollution hazard index which varies for each pollution hazard level and then mitigation indices for each component within the treatment train or the characteristics of material overlying infiltration structure. To ensure that the surface water quality is maintained for any proposed development the mitigation indices must exceed the pollution hazard index for the pollution hazard level within which the proposed development falls.

The proposed extension to the concrete slab shall not be subject to any vehicle movements and only minimal parts of the HPPF are located on it, so it is very unlikely any contamination of surface water shall occur. Therefore the proposed extension to the concrete slab shall be assigned a low pollution hazard level and is more likely to have a pollution hazard index linked to an industrial roof (0.3 for Total Suspended Solids, 0.2 for metal and 0.05 for hydrocarbons) rather than a low pollution hazard level linked to vehicle movements.

Above the infiltration structure there shall be a dense layer of grassed vegetation and this shall overlie a 300mm thick layer of top soil. This shall provide the following mitigation indices; for Total Suspended Solids (TSS) 0.6, for metals 0.5 and for hydrocarbons 0.6.

The total mitigation indices shall exceed the pollution hazard index and ensure that the surface water quality is maintained.

6.2.4 Standard S4 – Amenity

Although an infiltration structure generally does not have any inherent amenity value, the use of the infiltration structure/structures as a surface water control for the proposed development shall allow for the drainage to be installed sub surface. This shall allow for a grassed finish to be achieved on top of the structure resulting in this blending into the existing landscape.

6.2.5 Standard S5 – Biodiversity

As the infiltration structure is proposed to be subsurface, this shall allow a permeable top soil layer to be placed above the structure to allow for this to be grassed following completion. By grassing the top of the structure this shall link into the local natural species and habitats that are already present within the area especially the wetland areas to the north of the site.

The area where the proposed structure is to be located is currently grassed so this will ensure continuate of biodiversity once the construction works are completed.

6.2.6 Standard S6 – Design of Drainage for Construction, Operation and Maintenance and Structural Integrity

All SuDS features have been designed in accordance with the requirements set out in the SuDS manual CIRIA C753 and shall be constructed in accordance with the requirements stated in Ciria C768.

To minimise the risk to personnel, the surface water drainage system for the proposed concrete slab extension has been designed to operate with minimal human interaction. The location of infiltration structures has been considered as part of this drainage strategy and has been located to the north of the proposed additional concrete slab area to allow for easy access for any maintenance works that maybe required in the future. The infiltration structures shall remain in private ownership and any maintenance/remedial requirements shall be the responsibility of the clients.

The surface water system associated with the proposed concrete slab extension shall require maintenance from time to time to ensure the surface water drainage system remains effective at dealing with the surface water runoff generated. As the proposed surface water system only comprises an infiltration structure this is the only component that shall require maintenance. Table 2 below shows the maintenance requirements for the infiltration structures.

Table 2 – Maintenance Requirements for Infiltration Structure		
Maintenance Schedule	**Required Actions**	**Typical Frequency**
Regular Maintenance	Cut grass above infiltration structure	Half yearly minimum or as required during spring and summer months
	Inspect infiltration structure for sediment and debris accumulations on the top surface of the infiltration structure	Once a year minimum
	Trimming any roots that maybe causing blockages within the infiltration structure	Once a year (or as required)
	Remove any litter or debris that may have collected on top of the infiltration structure	Monthly
Occasional Maintenance	Remove sediment from top surface of the infiltration structure if required based on inspections	As required based on inspections
Remedial Actions	Reconstruct infiltration structure and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of infiltration structure)	As required
Monitoring	Check infiltration structure to ensure that the structure is emptying correctly	Once a year

*Table recreated from SuDS manual (Ciria C753) for infiltration structures.

All maintenance on the proposed surface water drainage system shall be undertaken by the client for whom this drainage strategy has been prepared for.

6.3 Overview of Infiltration Structure Sizing

To ensure the infiltration structure is of sufficient size to deal with the proposed additional concrete slab area, drainage calculations were undertaken in Microdrainage 2020.1. The drainage calculations were analysed for events up to and include the 1% Annual Exceedance Probability (AEP) with an additional allowance of 40% for climate change. Within the Microdrainage calculations a runoff coefficient (Cv) of 1 has been used, in accordance with latest guidance, to ensure that all runoff generated from the additional concrete slab shall enter the drainage system.

The infiltration rate of the surrounding strata has been assumed, for the purpose of this drainage strategy, to be 5 x 10^{-6}m/s. This value used is deemed to be conservative for sand and gravel deposits which make up the geology in the location where the infiltration structure is proposed. The SuDS manual recommends typical infiltration rates for sand and gravel of between 3 x 10^{-2}m/s for gravel and 1 x 10^{-5}m/s for sand. Full infiltration testing shall be undertaken as part of the SAB application.

Due to land ownership boundary constraints the infiltration structure shall need to be spilt into a smaller and larger structure. The larger structure shall drain an area of approximately 230m^2 with the smaller structure draining an area of 90m^2. These areas are slightly less than the total slab area as approximately 20m^2 around the perimeter shall have a fire wall constructed on it. Based on an infiltration rate of 5 x 10^{-6}m/s the larger infiltration structure shall need to cover an area of approximately 52m^2 and be 1.2m deep, with the smaller structure covering an area of 21m^2 and again being 1.2m deep. A porosity of 30% has been assumed based on the use of Type B filter media in accordance with the specification for highway works. The Microdrainage calculations show that there is no flooding recorded for either of the infiltration structures, for any events analysed, up to and including the 1% AEP event with an additional allowance of 40% for climate change. Therefore indicating that the infiltration structures are of sufficient size. The Microdrainage calculations are presented in Appendix 3.

To allow for surface water runoff from the concrete slab extension to reach the infiltration structures there shall be 150mm diameter pipes installed at the base of the firewall at a maximum of 5m centres.

As the infiltration structures shall be to the north of the existing Western Wood Biomass Plant and the proposed hydrogen production facility, along with the ground naturally sloping away to the north, the consequences of failure of the infiltration system would be deemed to cause no inconvenience nor cause any damage. Therefore in accordance with Table 25.2 of the SuDS manual a factor of safety of 1.5 has within the calculations.

The half drain time recorded from the Microdrainage calculations, for the 1% AEP event with an additional allowance of 40% for climate change, is 581 minutes for the larger structure and 497 minutes for the smaller structure. Therefore, this meets the requirement to be half full in less than the 1440 minute (24hrs).

The details of the proposed surface water scheme and infiltration structures are shown on Drawing PRO1002/01/01 presented in Appendix 2.

6.4 Electrical Substation Area

The area where the electrical substation is to be installed shall have a gravelled surface. By installing a gravelled surface this shall ensure that the amount of impermeable surfacing is not increased leading to no increase in the amount of surface water runoff generated. This shall ensure that the surface water post installation mimics what currently happens on site in this area.

As a result of this the surface water drainage for the electrical substation area has not been assessed further in this report as it will not increase the flood risk on or off site.

7 CONCLUSIONS

This drainage strategy has assessed the proposals for dealing with the surface water runoff that shall be generated by the additional concrete slab area as part of the proposed Hydrogen Production Facility. The geology in the area, from the geological maps, show that it is likely to be suitable for infiltration into the surrounding strata.

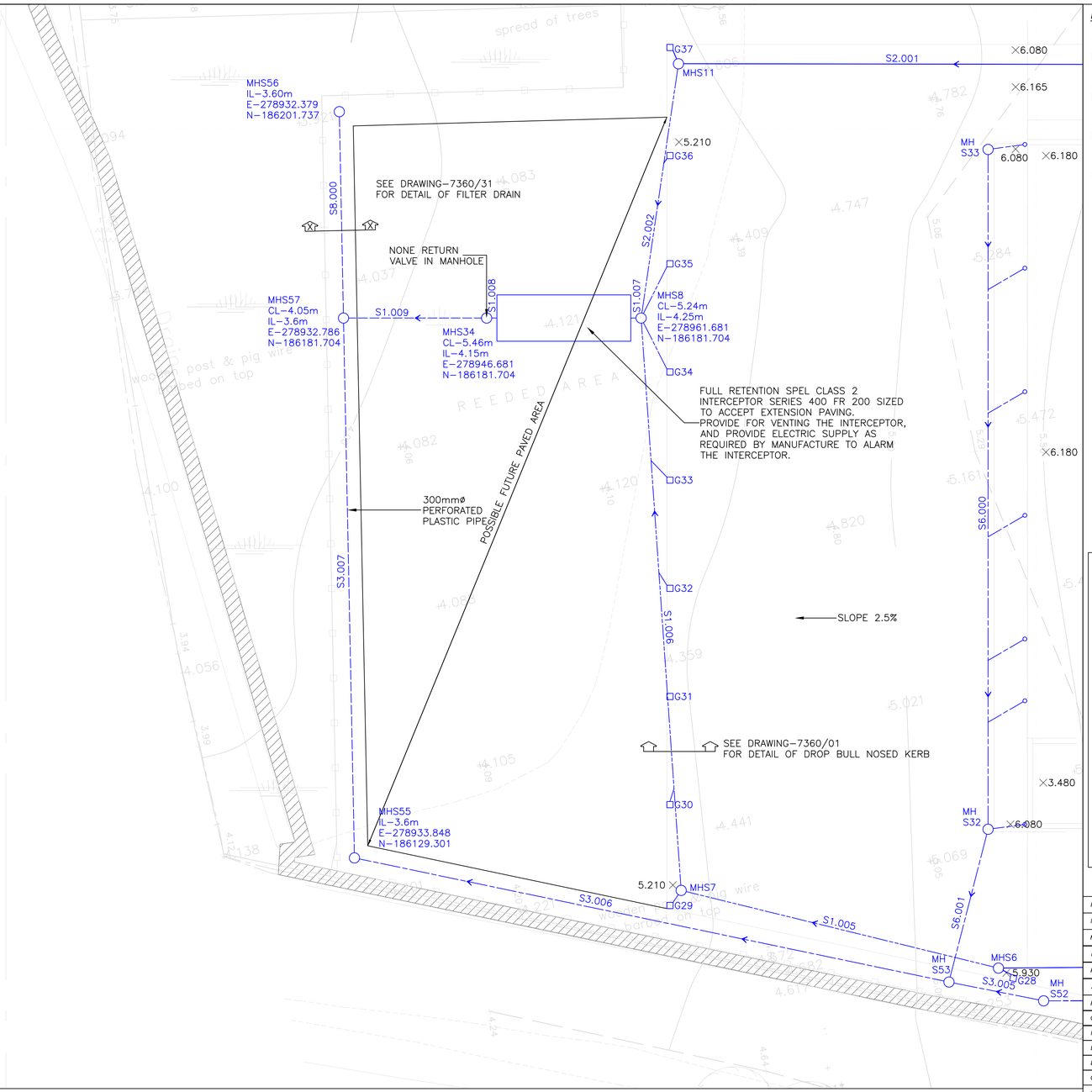
The surface water drainage system shall comprise a larger and a smaller infiltration structure to the north of the hydrogen production facility, which shall have dimensions similar to 52m^2 for the larger structure and 21m^2 for the smaller structure with both being 1.2m deep. The Microdrainage calculations show that the infiltration structures can appropriately deal with the 1% Annual Exceedance Probability event with an additional allowance of 40% for climate change.

The existing surface water drainage system shall continue to be used for the existing hardstanding areas as the proposals do not increase the amount of impermeable area draining to the existing drainage system.

Whilst the drainage system remains subject to SAB approval, this drainage strategy has shown that surface water can be effectively managed and follows the principles of a SAB compliant surface water drainage system with sufficient detail to support the planning application for the proposed Hydrogen Production Facility.

APPENDIX 1

AS-BUILT DRAINAGE DRAWING FOR WESTERN WOOD BIOMASS PLANT



NOTES

1.FOR DRAINAGE DETAILS SEE DRAWING No.7360/30–31

2.FOR ROAD AND KERB DETAILS SEE DRAWING No.7360/01

3.LAND DRAINS SHOWN ARE PROVISIONAL.

4.FOR SECTION X–X SEE DRAWING No.7360/31

FOR CONSTRUCTION UNLESS NOTED OTHERWISE

DRAINAGE KEY

- SURFACE WATER DRAINAGE
- ROOF WATER DRAINAGE
- LAND DRAIN
- CONC. BED & SURROUND
- FOUL DRAINAGE
- PUMPED FOUL
- DRAINAGE BY BWSC
- MHSXX STORM MANHOLE
- MHFXX FOUL MANHOLE
- G GULLY
- RP RODDING POINT STORM
- RP RODDING POINT FOUL
- IC INSPECTION CHAMBER FOUL
- IC INSPECTION CHAMBER STORM
- SOIL VENT PIPE

GULLY SCHEDULE

NO.	EASTING	NORTHING
G1	279103.514	186098.105
G2	279124.544	186103.085
G3	279106.165	186108.604
G4	279115.946	186111.354
G5	279125.690	186160.616
G6	279118.553	186162.928
G7	279122.573	186217.817
G8	279130.059	186217.354
G9	279111.030	186196.256
G10	279099.088	186208.272
G11	279089.596	186188.232
G12	279096.504	186188.232
G13	279089.799	186161.571
G14	279096.301	186161.571
G15	279096.301	186138.796
G16	279088.403	186127.885
G17	279056.587	186122.467
G18	279056.587	186115.978
G19	279039.776	186198.741
G20	279039.777	186188.493
G21	279039.777	186176.741
G22	279039.777	186165.741
G23	279039.777	186154.741
G24	279039.777	186143.741
G25	279039.778	186132.741
G26	279036.740	186115.978
G27	279016.752	186115.978
G28	278997.759	186117.340
G29	278964.180	186124.682
G30	278964.180	186134.472
G31	278964.180	186144.972
G32	278964.180	186155.472
G33	278964.180	186165.972
G34	278964.180	186176.472
G35	278964.180	186186.972
G36	278964.180	186197.772
G37	278964.180	186207.972
G38	279019.781	186200.929
G39	279019.781	186208.272
G40	279049.598	186219.472
G41	279066.898	186208.272
G42	279061.834	186195.231
G43	279089.799	186175.052

SURFACE WATER SCHEDULE

MH	COVER LEVEL	INVERT LEVEL	SIZE	COVER TYPE	COVER TO SOFFIT	MH TYPE	EASTING	NORTHING	MH	PIPE REF.	DIAMETER	MATERIAL	CLASS*	LENGTH
S1	8.150	6.900	1200	D400	1.100	C	279099.088	186200.979	S1–S2	S1.000	150mm	PLASTIC	B	15.07
S2	7.120	5.870	1200	D400	1.025	C	279093.051	186187.172	S2–S3	S1.001	225mm	PLASTIC	B	41.94
S3	7.120	5.500	1200	D400	1.395	C	279093.051	186145.232	S3–S4	S1.002	225mm	PLASTIC	B	27.07
S4	7.250	5.320	1200	D400	1.630	B	279090.193	186118.311	S4–S5	S1.003	300mm	PLASTIC	B	46.53
S5	7.015	5.000	1200	D400	1.715	B	279043.618	186118.991	S5–S6	S1.004	300mm	PLASTIC	B	47.24
S6	5.930	4.750	1200	D400	0.880	D	278996.377	186118.603	S6–S7	S1.005	300mm	PLASTIC	CONC	31.72
S7	5.210	4.550	1200	D400	0.360	D	278965.570	186126.148	S7–S8	S1.006	375mm	PLASTIC	CONC	55.69
S8	5.240	4.250	1200	D400	0.615	D	278961.681	186181.704	S8–INT	S1.007	375mm	PLASTIC	CONC	1.00
INTERCEPTOR	–	–	–	–	–	–	–	–	INT–S34	S1.008	375mm	PLASTIC	CONC	1.00
S34	5.460	4.150	1200	D400	0.935	D	278946.681	186181.704	S34–S57	S1.009	375mm	PLASTIC	CONC	13.90
S9	7.100	5.775	1200	D400	1.175	C	279044.645	186205.748	S9–S10	S2.000	150mm	PLASTIC	B	27.83
S10	6.170	4.840	1200	D400	1.105	C	279016.818	186206.326	S10–S11	S2.001	225mm	PLASTIC	CONC	51.51
S11	5.210	4.400	1200	D400	0.585	D	278965.309	186206.386	S11–S8	S2.002	225mm	PLASTIC	CONC	24.95
S8	5.240	4.250	1200	D400	0.615	D	278961.681	186181.704						

FOUL SEWER SCHEDULE

MH	COVER LEVEL	INVERT LEVEL	SIZE	COVER TYPE	COVER TO SOFFIT	MH TYPE	EASTING	NORTHING	MH	PIPE REF.	DIAMETER	MATERIAL	CLASS*	LENGTH
F1	7.800	6.300	1200	B125	1.390	C	279072.139	186209.350	F1–F2	F1.000	110mm	PLASTIC	B	32.49
F2	7.085	5.800	1200	D400	1.175	C	279048.997	186186.542	F2–F3	F1.001	110mm	PLASTIC	B	68.61
F3	7.020	5.125	1200	D400	1.785	B	279049.577	186117.939	F3–F5	F1.002	110mm	PLASTIC	B	16.71
F5	6.630	4.850	1200	D400	1.670	B	279055.958	186102.475	F4–F3	F2.000	110mm	PLASTIC	B	10.18
F4	7.150	6.450/5.700	1200	B125	0.590	D	279059.113	186121.493						

ROOF WATER SCHEDULE

MH	COVER LEVEL	INVERT LEVEL	SIZE	COVER TYPE	COVER TO SOFFIT	MH TYPE	EASTING	NORTHING	MH	PIPE REF.	DIAMETER	MATERIAL	CLASS*	LENGTH
S20	7.800	6.700	1200	B125	0.950	D	279069.634	186222.359	S20–S21	S3.000	150mm	PLASTIC	B	13.59
S21	7.800	6.600	1200	B125	0.975	D	279069.634	186208.772	S21–S30	S3.001	225mm	PLASTIC	B	28.34
S30	7.015	6.380	1200	D400	0.410	D	279042.509	186200.566	S30–S29	S3.002	225mm	PLASTIC	B	20.88
S29	6.080	5.325	1200	D400	0.455	D	279042.505	186179.733	S29–S28	S3.003	300mm	PLASTIC	B	64.31
S28	7.140	4.700	1200	D400	2.140	B	279042.490	186115.426	S28–S52	S3.004	375mm	PLASTIC	B	41.72
S52	6.055	4.500	1200	B125	1.180	C	279000.766	186115.426	S52–S53	S3.005	375mm	PLASTIC	B	9.37
S53	6.020	4.410	1200	B125	1.235	C	278991.572	186117.253	S53–S55	S3.006	375mm	PLASTIC	B	58.97
S55	4.050	3.700	1200	B125	0.150	D	278933.848	186129.301	S55–S57	S3.007	300mm	PLASTIC	B	52.41
S57	4.050	3.600	1200	B125	0.450	D	278932.786	186181.704						
S51	7.200	5.950	1200	B125	1.025	C	279110.325	186161.204						
S22	7.150	5.850	1200	D400	1.075	C	279089.214	186159.542	S51–S22	S4.000	225mm	PLASTIC	B	21.18
S54	7.025	5.400	1200	D400	1.400	C	279089.213	186123.470	S22–S54	S4.001	225mm	PLASTIC	B	36.07
S25	7.025	5.050	1200	D400	1.750	B	279054.353	186123.485	S54–S25	S4.002	225mm	PLASTIC	B	34.91
S28	7.015	4.700	1200	D400	2.090	B	279042.490	186115.426	S25–S28	S4.003	225mm	PLASTIC	B	14.34
S23	7.150	5.720	1200	D400	1.205	C	279076.228	186185.870						
S24	7.085	5.500	1200	D400	1.360	C	279050.478	186185.870	S23–S24	S5.000	225mm	PLASTIC	B	25.75
S29	7.020	5.400	1200	D400	1.395	C	279042.505	186179.733	S24–S29	S5.001	225mm	PLASTIC	B	10.06
S33	6.005	4.830	1200	B125	0.950	D	278995.370	186198.070						
S32	6.005	4.530	1200	B125	1.250	C	278995.370	186132.084	S33–S32	S6.000	225mm	PLASTIC	B	65.99
S53	6.020	4.410	1200	B125	1.385	C	278991.572	186117.253	S32–S53	S6.001	225mm	PLASTIC	B	15.31
S50	7.800	7.050	1200	B125	0.600	D	279104.171	186208.772						
S21	7.800	6.600	1200	B125	1.050	C	279070.531	186208.990	S50–S21	S7.000	150mm	PLASTIC	B	34.54
S56	4.050	3.600	1200	B125	0.450	D	278932.380	186201.738						
S57	4.050	3.600	1200	B125	0.450	D	278932.786	186181.704	S56–S57	S8.000	300mm	PLASTIC	B	20.04

1. ALL PIPES 150mm HDPE UNLESS NOTED OTHERWISE WITH A MINIMUM OF 900mm COVER TO THE CROWN.(OTHERWISE PROVIDE CONCRETE BED AND SURROUND)

2.BWSC HAS ADVISED THE FOLLOWING FLOWS:– SERVICE BUILDING–0.06L/S SEDIMENTATION TANK –1.4L/S TO MAXIMUM OF 50,000L IN ANY SINGLE DISCHARGE.

3. CONCRETE BED & SURROUND *CLASS TO BSEN 124

4.GULLY COORDINATES TAKEN FROM FRONT FACE OF KERB AT GULLY CENTER LINE LOCATION

REV	REVISION	BY	DATE
P	ADMIN BUILDING DRAINAGE AMENDED	ACV	09.08.07
N	MHF2 & F1.000-F1.001 AMENDED	ACV	24.07.07
M	MHF2 & F1.000-F1.001 AMENDED	ACV	20.07.07
L	DRAINAGE LAYOUT & SCHEDULE AMENDED	ACV	30.04.07
K	DRAINAGE AMENDED	ACV	25.04.07
J	MHF5 MOVED, F1.002 REVISED	ACV	23.04.07
H	GULLY 43 ADDED ON RUN S1.001	ACV	16.03.07
G	INTERCEPTOR REFERENCE AMENDED	ACV	12.03.07
F	MHS55-57 ADDED TO MANHOLE SCHEDULE	ACV	08.03.07
E	DRAINAGE AMENDED	ACV	05.03.07
D	MH SCHEDULE REVISED & GULLY SCHEDULE ADDED	ACV	06.02.07
C	MH SCHEDULE REVISED	ACV	24.01.07
B	DRAINAGE AND MH SCHEDULE REVISED	ACV	22.01.07
A	DRAINAGE AND MH SCHEDULE REVISED	ACV	17.01.07

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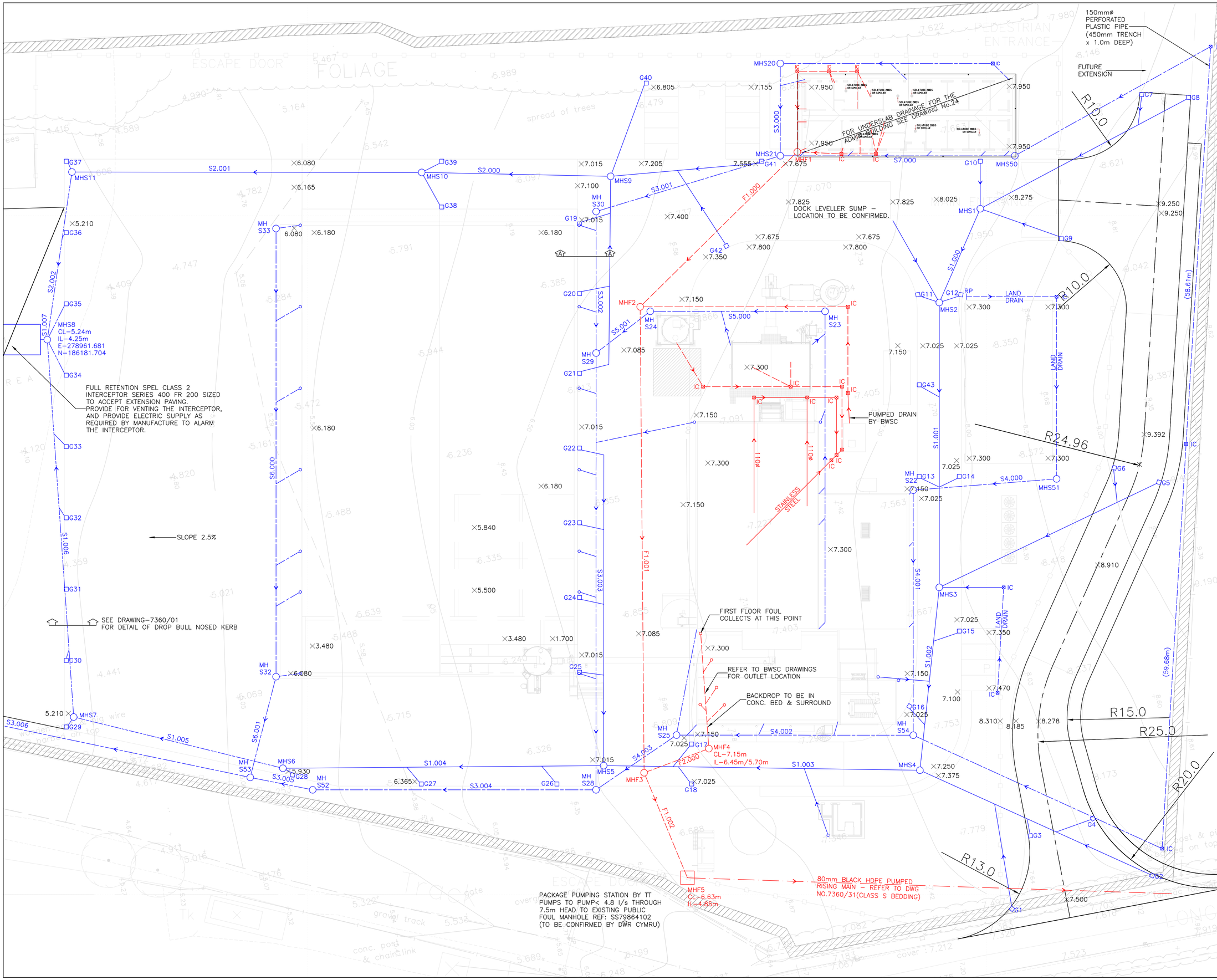
CLIENT
ALUN GRIFFITHS CONTRACTORS LTD

PROJECT
BIOMASS POWER STATION PORT TALBOT

DRAWING TITLE
GENERAL ARRANGEMENT SITE DRAINAGE (2 OF 2)

SCALE		BY	CHECK	DATE
1:250	DESIGNED			
@ A1	DRAWN	ACV	CU	NOV. 2006

PROJECT NO. 7360
DRAWING NO. 21 P



NOTES

1. FOR DRAINAGE DETAILS SEE DRAWING No.7360/30–31
2. FOR ROAD AND KERB DETAILS SEE DRAWING No.7360/01
3. LAND DRAINS SHOWN ARE PROVISIONAL.
4. FOR MANHOLE & GULLY SCHEDULE REFER TO DRAWING No.7360/21
5. FOR SECTION A–A REFER TO DRAWING No.7360/30

POSITION OF ASH SILO AS GIVEN BY ALUN GRIFFITHS CONTRACTORS.

6. A MANHOLE TO BE ADDED ON F1.001 IF RUN EXCEEDS A LENGTH OF 60m.
7. FOR ADMINISTRATION BUILDING INTERNAL DRAINAGE REFER TO DRAWING 7360/105.

FOR CONSTRUCTION UNLESS NOTED OTHERWISE

DRAINAGE KEY

- SURFACE WATER DRAINAGE
- ROOF WATER DRAINAGE
- LAND DRAIN
- CONC. BED & SURROUND
- FOUL DRAINAGE
- PUMPED FOUL
- DRAINAGE BY BWSC
- MHSXX STORM MANHOLE
- MHFXX FOUL MANHOLE
- G GULLY
- RP RODDING POINT STORM
- RP RODDING POINT FOUL
- IC INSPECTION CHAMBER FOUL
- IC INSPECTION CHAMBER STORM
- SOIL VENT PIPE

REV	REVISION	BY	DATE
S	ADMIN BUILDING DRAINAGE AMENDED (NOTE 7 ADDED)	ACV	09.08.07
R	MHF2 & F1.000-F1.001 AMENDED (NOTE 6 ADDED)	ACV	24.07.07
Q	MHF2 & F1.000-F1.001 AMENDED	ACV	20.07.07
P	AS SHOWN IN REVISION CLOUD	ACV	26.06.07
N	DRAINAGE AMENDED	ACV	10.05.07
M	DRAINAGE AMENDED	ACV	30.04.07
L	DRAINAGE AMENDED	ACV	25.04.07
K	DRAINAGE AMENDED AS SHOWN	ACV	23.04.07
J	PROVISIONAL CLOUD OMITTED & DRAIN FROM ASH SILO ADDED	ACV	02.04.07
H	DRAIN FROM TRANSFORMER BAYS ADDED (AS SHOWN) AND GULLY 43 ADDED ON RUN S1.001 (AS SHOWN)	ACV	16.03.07
G	INTERCEPTOR REFERENCE AMENDED	ACV	12.03.07
F	DRAINAGE AMENDED & LAND DRAIN OMITTED	ACV	05.03.07
E	DRAINAGE AMENDED	ACV	02.03.07
D	NOTES AMENDED	ACV	06.02.07
C	PROVISIONAL CLOUD ADDED	ACV	24.01.07
B	DRAINAGE AND MH SCHEDULE REVISED	ACV	22.01.07
A	DRAINAGE AND MH SCHEDULE REVISED	ACV	17.01.07

C.D.GRAY & ASSOCIATES LTD.
Consulting Civil and Structural Engineers
5-6 DERYN COURT, WHARFEDALE ROAD
PENTWYN, CARDIFF, CF23 7HB
TEL NO. 029 20733181 FAX NO. 029 20734445
EMAIL: design@cdgray.co.uk

CLIENT
ALUN GRIFFITHS CONTRACTORS LTD

PROJECT
BIOMASS POWER STATION
PORT TALBOT

DRAWING TITLE
GENERAL ARRANGEMENT
SITE DRAINAGE (1 OF 2)

SCALE		BY	CHECK	DATE
1:250 @ A1	DESIGNED			
	DRAWN	ACV	CU	NOV. 2006

PROJECT NO.	DRAWING NO.	
7360	20	S

APPENDIX 2

PROPOSED SURFACE WATER DRAINAGE DRAWING

PROPOSED LARGER BELOW GROUND INFILTRATION STRUCTURE. INFILTRATION STRUCTURE TO HAVE AN AREA OF APPROXIMATELY 52m² IN ORDER TO DRAIN AN AREA OF 230m². INFILTRATION STRUCTURE TO BE FILLED WITH TYPE B FILTER MEDIA IN ACCORDANCE WITH CLAUSE 505 OF SPECIFICATION FOR HIGHWAY WORKS TO ACHIEVE A POROSITY OF 30%. INFILTRATION TRENCH TO BE WRAPPED IN GEOTEXTILE SURROUND. 300mm OF TOP SOIL SHALL BE PLACED ABOVE THE INFILTRATION STRUCTURE FOR SURFACE WATER QUALITY MEASURES WHICH SHALL ALLOW FOR WELL ESTABLISHED VEGETATION TO FORM.

PROPOSED HYDROGEN PRODUCTION FACILITY

PROPOSED SMALLER BELOW GROUND INFILTRATION STRUCTURE. INFILTRATION STRUCTURE TO HAVE AN AREA OF APPROXIMATELY 21m² IN ORDER TO DRAIN AN AREA OF 90m². INFILTRATION STRUCTURE TO BE FILLED WITH TYPE B FILTER MEDIA IN ACCORDANCE WITH CLAUSE 505 OF SPECIFICATION FOR HIGHWAY WORKS TO ACHIEVE A POROSITY OF 30%. INFILTRATION TRENCH TO BE WRAPPED IN GEOTEXTILE SURROUND. 300mm OF TOP SOIL SHALL BE PLACED ABOVE THE INFILTRATION STRUCTURE FOR SURFACE WATER QUALITY MEASURES WHICH SHALL ALLOW FOR WELL ESTABLISHED VEGETATION TO FORM.

150mm DIAMETER PIPES TO BE INSTALLED AT THE BASE OF THE FIRE WALL AT A MAXIMUM OF 5m CENTRES TO ALLOW SURFACE WATER RUNOFF TO DRAIN THROUGH THE WALL AND INTO THE INFILTRATION STRUCTURES.

WHERE THE PIPEWORK THROUGH THE WALL IS INSTALLED THE LEVELS ON THE CONCRETE SLAB SHALL ADJUSTED SO THAT A FALL IS ENGINEERED TOWARDS THE PIPEWORK SO THAT NO PONDING WATER OCCURS ON THE SURFACE AND THERE IS NO RESTRICTION TO THE FLOW.

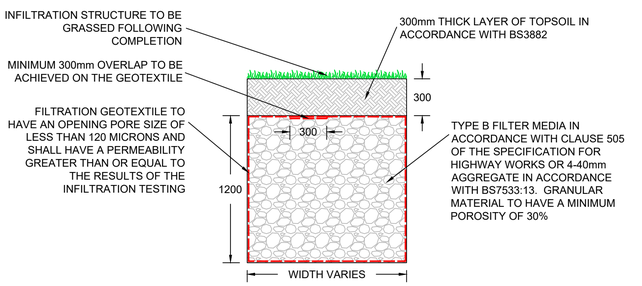
PARKING

OFFICES

WEIGHBRIDGE

CAR PARK

CARS



INFILTRATION STRUCTURE CONSTRUCTION DETAIL
SCALE 1:25

NOTES

1. ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM.
2. DO NOT SCALE FROM THIS DRAWING.
3. ANY ANOMALIES IDENTIFIED WITH THE DETAILS SHOWN ON THIS DRAWING ARE TO BE BROUGHT TO THE ATTENTION OF SIRIUS ENVIRONMENTAL PRIOR TO CONSTRUCTION WORKS COMMENCING.
4. THE EXISTING CONCRETE HARDSTANDING AREAS SHALL CONTINUE TO DRAIN TO THE EXISTING SURFACE WATER DRAINAGE SYSTEM AS CURRENTLY DOES ON SITE.
5. ONLY THE PROPOSED CONCRETE SLAB EXTENSION SHALL DRAIN TO THE INFILTRATION STRUCTURES.

KEY

- 150mm PIPEWORK
- FILTRATION GEOTEXTILE
- PROPOSED CONCRETE EXTENSION
- EXISTING CONCRETE HARDSTANDING
- INFILTRATION STRUCTURE
- TYPE B FILTER MEDIA
- TOP SOIL

REV	DESCRIPTION	DATE	BY
1	LAYOUT OF HYDROGEN PLANT AMENDED	15/04/24	JD

CLIENT

PROTIUM

sirius Environmental
4245 Park Approach, Thorpe Park, Leeds. LS15 8GB. 0113 264 9960

JOB TITLE

MARGRAM HYDROGEN PRODUCTION FACILITY

DRAWING TITLE

SURFACE WATER GENERAL ARRANGEMENT

DRAWN	DATE	APPROVED	DATE
J.D	04/04/2024	A.K	04/04/2024

SCALE	SHEET	DRAWING NUMBER	REVISION
1:250	A1L	PRO1002/01/01	0

APPENDIX 3

SURFACE WATER DRAINAGE CALCULATIONS

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 581 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.368	0.368	0.2	5.7	O K
30 min Summer	0.510	0.510	0.2	8.0	O K
60 min Summer	0.672	0.672	0.2	10.5	O K
120 min Summer	0.840	0.840	0.2	13.1	O K
180 min Summer	0.927	0.927	0.3	14.5	O K
240 min Summer	0.973	0.973	0.3	15.2	O K
360 min Summer	1.026	1.026	0.3	16.0	O K
480 min Summer	1.044	1.044	0.3	16.3	O K
600 min Summer	1.050	1.050	0.3	16.4	O K
720 min Summer	1.051	1.051	0.3	16.4	O K
960 min Summer	1.042	1.042	0.3	16.3	O K
1440 min Summer	1.008	1.008	0.3	15.7	O K
2160 min Summer	0.947	0.947	0.3	14.8	O K
2880 min Summer	0.883	0.883	0.2	13.8	O K
4320 min Summer	0.758	0.758	0.2	11.8	O K
5760 min Summer	0.646	0.646	0.2	10.1	O K
7200 min Summer	0.547	0.547	0.2	8.5	O K
8640 min Summer	0.459	0.459	0.2	7.2	O K
10080 min Summer	0.384	0.384	0.2	6.0	O K
15 min Winter	0.368	0.368	0.2	5.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	107.385	0.0	19
30 min Summer	75.433	0.0	33
60 min Summer	50.812	0.0	64
120 min Summer	33.028	0.0	122
180 min Summer	25.207	0.0	182
240 min Summer	20.598	0.0	242
360 min Summer	15.515	0.0	360
480 min Summer	12.662	0.0	466
600 min Summer	10.802	0.0	516
720 min Summer	9.480	0.0	578
960 min Summer	7.705	0.0	710
1440 min Summer	5.736	0.0	982
2160 min Summer	4.256	0.0	1404
2880 min Summer	3.437	0.0	1816
4320 min Summer	2.543	0.0	2596
5760 min Summer	2.057	0.0	3400
7200 min Summer	1.745	0.0	4176
8640 min Summer	1.526	0.0	4920
10080 min Summer	1.364	0.0	5640
15 min Winter	107.385	0.0	18

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.511	0.511	0.2	8.0	O K
60 min Winter	0.674	0.674	0.2	10.5	O K
120 min Winter	0.843	0.843	0.2	13.1	O K
180 min Winter	0.930	0.930	0.3	14.5	O K
240 min Winter	0.979	0.979	0.3	15.3	O K
360 min Winter	1.035	1.035	0.3	16.1	O K
480 min Winter	1.057	1.057	0.3	16.5	O K
600 min Winter	1.061	1.061	0.3	16.6	O K
720 min Winter	1.056	1.056	0.3	16.5	O K
960 min Winter	1.042	1.042	0.3	16.3	O K
1440 min Winter	0.990	0.990	0.3	15.4	O K
2160 min Winter	0.893	0.893	0.2	13.9	O K
2880 min Winter	0.793	0.793	0.2	12.4	O K
4320 min Winter	0.610	0.610	0.2	9.5	O K
5760 min Winter	0.455	0.455	0.2	7.1	O K
7200 min Winter	0.326	0.326	0.2	5.1	O K
8640 min Winter	0.220	0.220	0.2	3.4	O K
10080 min Winter	0.137	0.137	0.2	2.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	75.433	0.0	33
60 min Winter	50.812	0.0	62
120 min Winter	33.028	0.0	120
180 min Winter	25.207	0.0	178
240 min Winter	20.598	0.0	236
360 min Winter	15.515	0.0	348
480 min Winter	12.662	0.0	458
600 min Winter	10.802	0.0	560
720 min Winter	9.480	0.0	594
960 min Winter	7.705	0.0	740
1440 min Winter	5.736	0.0	1052
2160 min Winter	4.256	0.0	1496
2880 min Winter	3.437	0.0	1932
4320 min Winter	2.543	0.0	2764
5760 min Winter	2.057	0.0	3528
7200 min Winter	1.745	0.0	4256
8640 min Winter	1.526	0.0	5008
10080 min Winter	1.364	0.0	5648

Model Details

Storage is Online Cover Level (m) 1.200

Infiltration Basin Structure

Invert Level (m) 0.000 Safety Factor 1.5
Infiltration Coefficient Base (m/hr) 0.01800 Porosity 0.30
Infiltration Coefficient Side (m/hr) 0.01800

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	52.0	1.200	52.0

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 497 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.372	0.372	0.1	2.3	O K
30 min Summer	0.516	0.516	0.1	3.2	O K
60 min Summer	0.677	0.677	0.1	4.3	O K
120 min Summer	0.842	0.842	0.1	5.3	O K
180 min Summer	0.924	0.924	0.1	5.8	O K
240 min Summer	0.966	0.966	0.1	6.1	O K
360 min Summer	1.007	1.007	0.1	6.3	O K
480 min Summer	1.022	1.022	0.1	6.4	O K
600 min Summer	1.027	1.027	0.1	6.5	O K
720 min Summer	1.027	1.027	0.1	6.5	O K
960 min Summer	1.016	1.016	0.1	6.4	O K
1440 min Summer	0.976	0.976	0.1	6.2	O K
2160 min Summer	0.909	0.909	0.1	5.7	O K
2880 min Summer	0.840	0.840	0.1	5.3	O K
4320 min Summer	0.712	0.712	0.1	4.5	O K
5760 min Summer	0.602	0.602	0.1	3.8	O K
7200 min Summer	0.507	0.507	0.1	3.2	O K
8640 min Summer	0.426	0.426	0.1	2.7	O K
10080 min Summer	0.356	0.356	0.1	2.2	O K
15 min Winter	0.372	0.372	0.1	2.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	107.385	0.0	19
30 min Summer	75.433	0.0	33
60 min Summer	50.812	0.0	62
120 min Summer	33.028	0.0	122
180 min Summer	25.207	0.0	182
240 min Summer	20.598	0.0	242
360 min Summer	15.515	0.0	360
480 min Summer	12.662	0.0	414
600 min Summer	10.802	0.0	476
720 min Summer	9.480	0.0	542
960 min Summer	7.705	0.0	676
1440 min Summer	5.736	0.0	954
2160 min Summer	4.256	0.0	1364
2880 min Summer	3.437	0.0	1784
4320 min Summer	2.543	0.0	2556
5760 min Summer	2.057	0.0	3344
7200 min Summer	1.745	0.0	4104
8640 min Summer	1.526	0.0	4840
10080 min Summer	1.364	0.0	5552
15 min Winter	107.385	0.0	18

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.516	0.516	0.1	3.3	O K
60 min Winter	0.679	0.679	0.1	4.3	O K
120 min Winter	0.845	0.845	0.1	5.3	O K
180 min Winter	0.929	0.929	0.1	5.8	O K
240 min Winter	0.972	0.972	0.1	6.1	O K
360 min Winter	1.018	1.018	0.1	6.4	O K
480 min Winter	1.032	1.032	0.1	6.5	O K
600 min Winter	1.031	1.031	0.1	6.5	O K
720 min Winter	1.029	1.029	0.1	6.5	O K
960 min Winter	1.010	1.010	0.1	6.4	O K
1440 min Winter	0.948	0.948	0.1	6.0	O K
2160 min Winter	0.843	0.843	0.1	5.3	O K
2880 min Winter	0.740	0.740	0.1	4.7	O K
4320 min Winter	0.561	0.561	0.1	3.5	O K
5760 min Winter	0.416	0.416	0.1	2.6	O K
7200 min Winter	0.298	0.298	0.1	1.9	O K
8640 min Winter	0.204	0.204	0.1	1.3	O K
10080 min Winter	0.129	0.129	0.1	0.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	75.433	0.0	33
60 min Winter	50.812	0.0	62
120 min Winter	33.028	0.0	120
180 min Winter	25.207	0.0	178
240 min Winter	20.598	0.0	234
360 min Winter	15.515	0.0	346
480 min Winter	12.662	0.0	450
600 min Winter	10.802	0.0	488
720 min Winter	9.480	0.0	562
960 min Winter	7.705	0.0	720
1440 min Winter	5.736	0.0	1024
2160 min Winter	4.256	0.0	1468
2880 min Winter	3.437	0.0	1900
4320 min Winter	2.543	0.0	2720
5760 min Winter	2.057	0.0	3464
7200 min Winter	1.745	0.0	4248
8640 min Winter	1.526	0.0	4928
10080 min Winter	1.364	0.0	5552

Model Details

Storage is Online Cover Level (m) 1.200

Infiltration Basin Structure

Invert Level (m) 0.000 Safety Factor 1.5
Infiltration Coefficient Base (m/hr) 0.01800 Porosity 0.30
Infiltration Coefficient Side (m/hr) 0.01800

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	21.0	1.200	21.0

ENVIRONMENTAL PERMIT APPLICATION – APPLICATION SITE CONDITION REPORT

HYDROGEN PRODUCTION FACILITY
LONGLAND LANE
MARGAM
PORT TALBOT
SA13 2NR

Document Reference: PRO1001/05.R0
April 2024

Project Quality Assurance
Information Sheet

ENVIRONMENTAL PERMIT APPLICATION – APPLICATION SITE CONDITION REPORT HYDROGEN PRODUCTION FACILITY, LONGLAND LANE, MARGAM, PORT TALBOT, SA13 2NR

Report Status : FINAL

Report Reference : PRO1001/05.R0

Report Date : April 2024

Prepared for : Protium Green Hydrogen Supply Limited (PGHS Ltd)

Prepared by : Sirius Environmental Limited
The Beacon Centre for Enterprise
Dafen
Llanelli
SA14 8LQ

Written by :

Lucy J Edds BSc (Hons) MRes MCIWM
Environmental Consultant

Reviewed by :

Dylan Thomas BSc (Hons) PGDip MCIWM
Principal Environmental Consultant

Approved by :

Mark Griffiths BSc (Hons) MSc CEnv MCIWM CGeol
Environmental Director

Revision	Date	Amendment Details	Author	Reviewer

HYDROGEN PRODUCTION FACILITY
LONGLAND LANE
MARGAM
PORT TALBOT
SA13 2NR

APPLICATION SITE CONDITION REPORT

CONTENTS

LIST OF DRAWINGS

PRO1001/08/01	Site Location Plan
PRO1001/08/02	Operational Layout

LIST OF APPENDICES

Appendix SCR1	Envirocheck Report
Appendix SCR2	Site Photos
Appendix SCR3	Environmental Risk Assessment

1.0 APPLICATION SITE CONDITION REPORT CONTEXT:

Sirius Environmental Limited (Sirius) has been commissioned by Protium Green Hydrogen Supply Limited (PGHS), to prepare and submit a Site Condition Report SCR to support an application for an Environment Permit to operate a Hydrogen Production Facility (HPF) (the 'facility') at Longland Lane, Margam, Port Talbot, SA13 2NR. The relevant documentation is submitted in accordance with the Environmental Permitting (England and Wales) Regulations 2016 (referred to hereafter as the EP Regulations).

The Site Condition Report has been compiled in accordance with the EP Regulations and with Horizontal Guidance Note 5, Site Condition Reports - Guidance and Templates. Information has been gathered based on a desk study review of publicly available information, as well as an Envirocheck ® Report by Landmark (Report Reference: 339233484_1_1) produced in March 2024 (included within **Appendix SCR1**). In addition to this, a site walkover was completed on April 9th 2024. Photographs from a walkover survey of the application site are included in **Appendix SCR2**.

The purpose of the initial Site Condition Report (SCR) is to provide a factual statement of the condition of the site at the time of the Environmental Permit Application. The SCR must describe the nature and distribution of potentially polluting substances in the ground and groundwater at the site prior to the commencement of operations under the Environmental Permit, and those handled during the course of activities on the site. The potentially polluting substances of interest are those which are to be handled at the site under the Permit. The production of a Site Condition Report will satisfy the requirements to provide a "baseline report", in accordance with the requirements of IED.

The HPF is considered to represent a low-risk activity with minimal potential to cause pollution. In addition to this, the site is located within an industrial setting (including an adjacent Biomass Plant) and is within close proximity to major infrastructure networks (the A48, M4 Motorway and main railway line). The site was a greenfield site until 2008/2009 when the adjacent biomass plant was constructed. The biomass plant has since been operating under a strict permitting regime, which requires relevant pollution prevention controls to be implemented. The site was previously utilised for the external, open storage of virgin wood and is equipped with impermeable concrete surfacing and a drainage system. With this in mind, it is not considered necessary to undertake an intrusive site investigation at the site given that the likelihood of any pre-existing contamination is minimal. The operator accepts any risk associated with the identification of any contamination during permit surrender.

2.0 SITE DETAILS	
Name of the applicant	Protium Green Hydrogen Supply Limited (PGHS)
Activity address	Longland Lane, Margam, Port Talbot, SA13 2NR
National grid reference	279000, 186219

Document reference and dates for Site Condition Report at permit application and surrender	This Application Site Condition Report (Doc. Ref.: PRO1001/05.R0) has been prepared to support an Environment Permit Application to operate a HPF at Longland Lane, Margam, Port Talbot, SA13 2NR. The format of this report follows the H5 SCR template (v3.0; October 2014). The baseline conditions have been derived from desk study information and a site walkover conducted on 9th April 2024. For the avoidance of doubt, this Application Site Condition Report also encompasses the requirement to prepare a "Baseline Report" in accordance with the Article 22 of the Industrial Emissions Directive.

Document references for site plans (including location and boundaries)	**PRO1001/8/01** – Site Location Plan **PRO1001/8/02** – Indicative Operational Layout

3.0 CONDITION OF THE LAND AT PERMIT ISSUE

Environmental setting including: • **Geology**	**Made Ground:** According to the British Geological Survey (BGS), the site is not underlain by any made ground. However, made ground may have been placed to allow for the construction of the existing concrete pad present at the development site. There are extensive areas of landscaped ground (artificially modified ground) to the south, west and northwest of the site. This is predominantly associated with the development of the BOC Gas and Gear works (to the south) as well as Margam Steelworks (to the west and northwest). **Geology:** The eastern half of the site is reported to be underlain by superficial deposits comprising Glaciofluvial Ice Contact Deposits of Devensian sand and gravel. The western half of the site is reported to be underlain by Tidal Flat Deposits of clay, silt and sand. The BGS Lexicon database indicates that the Glaciofluvial Ice Contact Deposits consist of stratified sand and gravel and interbedded diamicton deposited by meltwater and ice under (subglacial), within (englacial), and at the margins of, glaciers. It is comprised of sand and gravel with the possibility of lenses of silt, clay and organic material. In addition to this, the BGS Lexicon database indicates that the Tidal Flat Deposits, include mud flat and sand flat deposits, form extensive nearly horizontal marshy land in the intertidal zone that is alternately covered and uncovered by the rise and fall of the tide. They consist of unconsolidated sediment, mainly mud and/or sand. They may form the top surface of a deltaic deposit. The bedrock geology at the site is recorded by the BGS as comprising the South Wales Middle Coal Measures Formation, comprising mudstone, siltstone and sandstone. The BGS Lexicon database describes the South Wales Middle Coal Measures Formation as Grey, (productive) coal-bearing mudstones/siltstones, with seatearths and minor sandstones. The Envirocheck Report (included within **Appendix SCR1**) indicates that the site occupies an area which may be affected by coal mining activity. However, given the historic nature of this mining, any potential ground subsidence should have long since ceased. The 1:50,000 scale geological maps included with the Envirocheck Report (Appendix SCR1) indicate that the surrounding geology is intersected by numerous faults and “rock segments”. The nearest fault to the site is situated

	~85m to the north/northeast, in a broadly southeast-northwest. It is described by the BGS as a "reverse or thrust fault, inferred, barbs on hanging wall side, throw in metres". The depiction of the "rock segments" upon the geological maps included with the Envirocheck Report (**Appendix SCR1**) are associated with the inferred identification of various coal seams within the area. This is to be expected as (as previously mentioned) the site is located within the South Wales Coalfield. The closest inferred coal seam to the site is located ~95m to the northeast, just beyond the aforementioned fault. According to Landis Soilscapes map resource, the soils within the vicinity of the site are freely draining slightly acid loamy soils. All relevant ground stability hazards at the site are considered to either represent no hazard or very low hazard, that is with the exception of compressible ground and potential for running sand ground stability hazard which are both afforded a moderate hazard potential at the site. Only 1 out of 2 recordings of both compressible ground and potential for running sand give a 'moderate' hazard rating at the site. BGS state that "ground is compressible if an applied load, such as a house, causes the fluid in the pore space between its solid components to be squeezed out causing it to decrease rapidly in thickness (compress). Peat, alluvium and laminated clays are common types of deposits associated with various degrees of compressibility". Similarly, the BGS indicate that with regards to the potential for running sand; "Some rocks can contain loosely packed, sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage". The recording of compressible ground and the potential for running sand are both located at the same position at the site (at NGR 279006,186217) and can probably be attributed to the nature of the superficial deposits at the site which include clays and sands. The site is in a lower probability radon area, as less than 1% of homes are above action level. No radon protective measures are necessary in the construction of new dwellings or extensions.
• **Hydrogeology**	**Hydrogeology:** According to Natural Resources Wales (NRW) interactive map viewer, both the underlying bedrock (South Wales Middle Coal Measures Formation) and the superficial deposits underlying the eastern half of the site (Glaciofluvial Ice Contact Deposits) are classified as 'Secondary A' aquifers. NRW define 'Secondary A' aquifers as "permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers". In addition to this, the superficial Tidal Flat Deposits underlying the western half of the site are classified as a 'Secondary Undifferentiated' aquifer. NRW define a

	'Secondary Undifferentiated' aquifer as "aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor value". The site is not situated within a groundwater source protection zone. There is one record of an active (presumed as the Permit end date is not supplied) groundwater abstraction licence within 500m of the site. The record is associated with BOC Limited, Longland Lane, Port Talbot SA13 2NS, situated 465m to the south of the site. The abstraction is classed as 'other industrial/commercial/public services: Evaporative Cooling' and is attributed with Licence Number 21/58/34/0003. The site and the surrounding area are not situated within a groundwater Nitrate Vulnerable Zone (NVZ) or a groundwater or surface water Drinking Water Safeguard Zone. The Envirocheck Report (included within **Appendix SCR1**) indicates that the site is located in high groundwater vulnerability area given that both the underlying bedrock and the eastern half of the superficial geology represent productive strata. The Envirocheck Report indicates that, in terms of BGS Groundwater Flood Susceptibility, the site occupies an area where there is a potential for groundwater flooding to occur at the surface.
• **Surface waters**	**Surface Waters:** The nearest surface water feature is a drain located ~80m to the west of the site, with another located ~80m to the north. These drains are part of a much larger network of drains and ditches in the area which transect much of the landscape to the northwest, west and south of the site. The "Middle Mother Ditch" is located ~470m to the west, with the "Lower Mother" pond located ~1km to the west. Based on the historical maps contained within the Envirocheck Report (**Appendix SCR1**), the "Upper Mother Ditch" is located ~180m to the west of the site. These ditches extend to the south to Margam Moors (~1km to the southwest of the site), a Site of Scientific Interest (SSSI) which is specifically designated due to the fact that the agriculturally-managed freshwater habitat hosts many species of plant on the edge of their geographical range, and nationally important invertebrates. In addition to this, Eglwys Nunydd Reservoir (also designated as SSSI owing to the presence of wintering wildfowl and passage migrants) is located ~620m to the southeast/south of the site. The coast is located ~2km to the west of the site, beyond Margam Steelworks. Please note, the Envirocheck Report indicates that there is a surface water feature located on site, however this was not observed upon the site walkover.

	In terms of Flood Risk, NRW data has been reviewed and found that the majority of the site sits within an area where the flood risk from rivers, the sea and small watercourses is designated as being "very low", with a chance of flooding of less than 1 in 1000 (0.1%). A small area of the northwestern extents of the site is designated as an area which has "low" risk of flooding from rivers. That is, these areas have a chance of flooding of between 1 in 1000 (0.1%) and 1 in 100 (1%). The site is surfaced with impermeable concrete and will be equipped with an appropriate drainage system (some upgrades are required, which are discussed below). That is, drainage from the existing concrete pad area will drain towards a Class 2 full retention separator via a series of road gullies and underground carrier pipework. Surface water then drains from the separator into an attenuation pipe for subsequent infiltration into the underlying geological strata. Any surface water overflow is discharged into the local ditch network in the northwestern corner of the biomass plant permitted boundary. Surface water from the concrete pad extension area will be directed to two infiltrations trenches to the north of the site. They will be equipped with type 'B' filter media in accordance with clause 505 of the specification for highway works, to achieve a porosity of 30%. The infiltration trench will be wrapped in a geotextile surround and 300mm of topsoil will be placed above the infiltration structure, above which will be a dense layer of grassed vegetation. This is considered to represent a Sustainable Drainage System (SuDs). Waste water from the reverse osmosis process associated with the HPF is directed to the foul drainage network associated with the adjacent biomass plant, prior to discharge to public sewer on Heolcae'r bont Road, to the southeast of the site. No surface water or potable water abstraction licences are noted to be within 500m of the site. In addition to this there are no active licenced discharge consents noted within 500m of the site.
Pollution history including: • **pollution incidents that may have affected land**	There is one record of a pollution incident having occurred at the site or within 500m of the site, which is noted as a pollution incident to controlled waters. This relates to an incident which occurred in July 1995, approximately 305m to the south of the site at Afan Pumping Station. A leakage of crude sewage (the receiving water is not given) is provided as the reasoning for the inclusion upon the register. The incident is reported as a Category 3 Minor Incident. This incident is will not have impacted the baseline condition of the application site.
• **historical land-uses and associated contaminants**	A review of historical maps for the site and surrounding areas, included within the Landmark Envirocheck Report (**Appendix SCR1**), indicate that the site itself remained as an undeveloped rural field between 1885 and 1993. A drain is clearly denoted within the western extents of the site on

	the 1:1,250 scale map dated 1952, however it is possible that it had been present for many years previous to this. Utilising aerial imagery available from Google Earth, it is understood that the site remained to be undeveloped through the 1990's and into the 2000's. Between 2006 and 2008 a biomass power plant was constructed immediately to the south of the site. The site was then developed into a concreted storage area, which was utilised for the storage virgin timber materials which were utilised as a fuel supply for the adjacent biomass power plant. The 1:10,560 scale map dated 1885 indicates that the area surrounding the site was largely rural in nature, with much of the land dominated by fields, woodland and a network of ditches/drains. The closest named ditch to the site was the "Upper Mother Ditch" which was located ~180m to the southwest of the site. A limited number of minor roads were present within 1km of the site, the closest being Heol Deiliad which was located ~125m to the south of the site. The Great Western Railway (South Wales Division) which ran in a broadly north to south alignment, was located ~400m to the west of the site. In general, the area was sparsely populated with only a small number of residential properties denoted within 1km of the site. The closest residential property to the site was Ty'n-y-caeau, which was located ~250m to the north west. There was limited development within the surrounding area throughout the first half of the twentieth century, except for the construction of a number of residential properties and some updates to the local infrastructure. The 1:10,000 scale map dated 1964-1965 denotes a dramatic change in the use of the surrounding land, with the construction of a steel works as well as associated supporting infrastructure. The steelworks then dominated the landscape between 500m and 1km to the west/north west/southwest of the site. A coal dump is illustrated ~600m to the southwest and a smaller "works" is denoted ~110m to the south of the site. There was rapid urban expansion of the village of Margam, located ~750m to the north, which can probably be attributed to the housing of the workforce associated with the nearby steelworks. In addition to this, during the 1960's, Eglwys Nunydd Reservoir was first depicted ~620m to the south of the site. By the 1980's Margam Crematorium is denoted, adjacent to the aforementioned reservoir, ~700m to the southeast of the site. The 1:10,000 scale map denotes a major upgrade to the road network, ~400m to the east of the site. A motorway (the M4) was constructed as well as an associated motorway junction. Further research suggests the motorway was built between 1970 and 1980, however, due to an unavailability of maps within the Envirocheck Report from 1965-1982 this is not identified upon the historical maps package included within **Appendix SCR1.** During the 1990's, there were some minor updates to the building layouts and removal/additional of some minor infrastructure associated with the steel works operation, however, it is considered that these changes were insignificant, with the operation remaining to be the dominant presence in the landscape to the west of the site.

	Google Earth images of the site dating back to 2015/2016 illustrate the presence of an additional green energy plant, located ~95m to the north of the site. Based on the historical development of the site (greenfield until 2006-2008) it is considered that likelihood of the identification of existing contamination at the site is low. The timber (associated with the adjacent biomass plant) which was previously stored upon the site would have been uncontaminated, virgin timber and did not contain halogenated organic compounds or heavy metals which may have been present as a result of treatment with wood preservatives or coating. Therefore, it is considered that the site's previous use does not present a potential source of contamination. Notwithstanding this, it is possible that some trace hydrocarbons, metals etc associated with mobile plant or heavy goods vehicles and equipment use may be present, but (if present at all) it would be in limited amounts due to the pollution control measures that have been implemented by the biomass operator at the site. With regards to the surrounding area, potential sources of contamination (e.g. heavy industry, significant infrastructure etc) were (and still are) generally located more than 500m from the sites boundary. Whilst it is understood that there are key contaminants associated with the presence of, for example, a steelworks (e.g. metals, inorganic compounds, acids/alkalis, asbestos and organic compounds) it is considered that the risk presented by these operations is limited given the aforementioned intervening distance from the site and the likelihood of a pollution pathway being established. Notwithstanding this, it is recognised that the "works" depicted ~110m to the south of the site comprises a gas manufacturer and supplier. This manufacturer (BOC Gases) remains to be located to the south of the site to the present day. Potential sources of contamination from this site may include; fuels, organics, inorganics, metals and asbestos. With the above in mind, it is considered that there is unlikely to be an existing source of contamination at the site and therefore an intrusive investigation is not proposed.
• **any visual/olfactory evidence of existing contamination**	A site walkover was carried out on 9th April 2024. No visual or olfactory evidence of contamination was identified at the site. The area was predominantly clear, apart from a very small volume of residual virgin woodchip.
• **evidence of damage to pollution prevention measures**	As aforementioned, the site has previously been utilised by Western Bio Energy Limited (WBE) as a storage area for the storage of virgin timber. Given this the site is engineered with impermeable surfaces and appropriately engineered drainage scheme, it is considered that this is unlikely to represent a likely contamination source. Photographs depicting the current condition of the site infrastructure are included in **Appendix SCR**2. From review of these photographs, all aspects of the site are

	deemed to be in good condition and in working order. Notwithstanding this, the operator is proposing an upgrade to the site drainage in the concrete pad extension area to direct drainage to two infiltration trenches which are equipped with a geomembrane and appropriate type 'B' filter media. The walkover survey did not identify any evidence of ground contamination at the site, or potential ground contamination sources at the site. Please note, WBE currently hold an Environmental Permit (EPR/ZP3939GL) for the operation of the adjacent biomass plant. The permit boundary associated biomass plant encompasses the parcel of land which is to be utilised by Protium for the operation of the HPF. WBE are currently seeking to part Surrender their current Environmental Permit in order to amend their Permit boundary to account for the Applicants proposals.
Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)	Following a desktop study, it is concluded that there has been no historic contamination at the site and no investigations or remediation measures have been considered as required. In addition to the above, there are no Contaminated Land Register Entries and Notices or Local Authority Pollution Prevention and Control Enforcements within 2km of the site centre as recorded by the Envirocheck Report (**Appendix SCR1**). In addition to the above, there are no historical landfill sites within 500m of the site.
Baseline soil and groundwater reference data	No site specific intrusive baseline reference data was considered necessary for review at the application stage to determine the current ground conditions of the site.

Summary	The areas surrounding the site have a long and established industrial history dating back to the mid 1960's. The site itself remained as an undeveloped rural field until 2008/2009 when the adjacent biomass plant was constructed. The site currently comprises impermeable concrete pavement, which was constructed to support the operation of the adjacent biomass plant. The underlying superficial deposits comprise Glaciofluvial Ice Contact Deposits (within the eastern area of the site) and Tidal Flat Deposits (within the western areas of the site). The underlying bedrock comprises South Wales Middle Coal Measures. Given the intervening distance between the site and the heavy industry and infrastructure which has historically (and to the present day) dominated the local landscape (e.g. the presence of Margam steelworks to the west and the M4 Motorway to the east), it is considered that there is no historical risk of any contamination being present at the site. As previously indicated, the site was previously utilised as a storage area for virgin timber. The storage area comprises impermeable concrete surfacing with an appropriate drainage design which remains present to the current day. Given this, the potential for contamination of the site from previous operations is considered to be highly unlikely. The operator of the site will ensure that appropriate engineered containment infrastructure will be maintained or upgraded as appropriate to provide adequate protection of the land from potential contamination associated with the permitted activities. These containment systems will be appropriately maintained throughout the operational life of the facility, with details of any maintenance requirements logged to support future surrender of the site permit. Given the nature of the information already available, the collection of Site Investigation reference data is not considered necessary at the permit application/issue phase of the H P F. The land has been appropriately characterised on a desk study basis, and it is felt that intrusive works are not considered essential. Going forward, records of all environmental incidents on and off site which are likely to have an impact on the condition of the land will be maintained for the life of the Permit, with appropriate investigations implemented to determine the extent of any such incidents.

4.0 PERMITTED ACTIVITIES	
Permitted activities	An application has been made to Natural Resources Wales (NRW) under the Environmental Permitting (England and Wales) Regulations 2016 (as amended) for the operation of a HPF (the 'facility') at Longland Lane, Margam, Port Talbot, SA13 2NR. The operations at the HPF will include the production of hydrogen utilising a 2.5MW Polymer Electrolyte Membrane (PEM) Electrolyser. Demineralised water (prepared via the use of reverse osmosis) is introduced into the electrolyser via a pipe at a rate of 700l/hr (maximum). The electrolyser consists of a large, sealed tank within which there is an anode (positively charged) and a cathode (negatively charged) that are connected to the electricity supply via the ISO Power Unit which is situated at the site. The anode and cathode are separated by a membrane referred to as a PEM. The main function of the membrane is to permit the diffusion of Hydrogen ions and to prevent the diffusion of oxygen ions. The operator will source the electricity (~3MW) to operate the HPF via a single private wire from the adjacent biomass plant. The electrolyser unit is connected by two pipes (with a small diameter) either side of the PEM. The pipe on the cathode side allows the hydrogen gas to leave the stack and the pipe on the anode side allows the oxygen gas to leave the electrolyser stack. Under pressure the hydrogen gas passes through this pipework and exits the electrolyser container before transferring to either the compressor or the compressor buffer tank. The buffer tank, which is also connected to the compressor acts as a hydrogen store so that the compressor can be continually supplied with hydrogen at the right pressure. The hydrogen is compressed within the compressors and discharged into the tube trailers or MCPs (multi-cylinder pallets). The oxygen gas produced in the electrolyser is vented to atmosphere via a vent stack. The HPF also comprises three hydrogen tube trailer parking bays and two tube trailer filling interfaces. The interfaces are located downstream of the compressor. Each of the gas trains will be fitted with a flowmeter to record the mass of gas dispensed. The tube trailer interface comprises of a push-fit nozzle that will connect with the storage compartment on the trailers and dispense gas. The system is capable of simultaneously filling two tube trailers. The system will support tube trailers with a maximum fill pressure of 380 bar(g) and a typical mass of 420kgs. The HPF will be located externally, upon an area of impermeable concrete surface which appropriate drainage controls in place.
Non-permitted activities undertaken	Ancillary operations to support the daily running of the HPF, including: • The operator will utilise the existing of WBE site offices, car parking and welfare facilities associated with the biomass plant activities. These facilities sit outside of the permit boundary. • Wastewater (produced as a result of the reverse osmosis process) is discharged from the site via the foul water drainage network on the adjacent biomass plant site to the foul water sewer situated on Heol Cae'r Bont.
Document references for:	**PRO1001/8/02** – Operational Layout

• **plan showing activity layout; and** • **environmental risk assessment.**	An Environmental Risk Assessment is included within **Appendix SCR3**.

APPENDIX SCR1

Envirocheck Report

(March 2024)

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
339233484_1_1

Customer Reference:
PRO1001

National Grid Reference:
279010, 186210

Slice:
A

Site Area (Ha):
0.18

Search Buffer (m):
1000

Site Details:

Site at 279010, 186210

Client Details:

Ms S Howson
Sirius Geotechnical Ltd
4245 Park Approach
Thorpe Park
Leeds
LS15 8GB

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

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 1		4	1	
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls	pg 2		4		
Integrated Pollution Prevention And Control	pg 3		5	1	
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 4		1		1
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 4	Yes			
Pollution Incidents to Controlled Waters	pg 5			1	
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances					
River Quality					
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register	pg 5				2
Water Abstractions	pg 5			2	3 (*16)
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 10	Yes	n/a	n/a	n/a
Bedrock Aquifer Designations	pg 11	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 11	Yes	n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences	pg 11	Yes	Yes	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 12		19	71	157

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 40	1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Registered Landfill Sites					
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)	pg 41		1		1
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)	pg 41		1		1
Planning Hazardous Substance Consents	pg 41		1	4	
Planning Hazardous Substance Enforcements					
Geological					
BGS 1:625,000 Solid Geology	pg 43	Yes	n/a	n/a	n/a
BGS Recorded Mineral Sites					
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas	pg 43	Yes	n/a	n/a	n/a
Mining Instability	pg 43	Yes	n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 43	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 43	Yes		n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 43	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 43	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 43	Yes		n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Industrial Land Use					
Contemporary Trade Directory Entries	pg 44		2		3
Fuel Station Entries					
Gas Pipelines					
Underground Electrical Cables	pg 44			1	
Sensitive Land Use					
Ancient Woodland	pg 45			4	18
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	pg 46				1
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: Potential for Groundwater Flooding to Occur at Surface	A13NE (NE)	0	1	279010 186214
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (SE)	179	1	279200 186100
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NE (NE)	233	1	279250 186350
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14SW (SE)	390	1	279350 185950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (E)	446	1	279500 186250
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (NE)	482	1	279450 186500
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (E)	495	1	279550 186214
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (E)	496	1	279550 186250
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (NE)	500	1	279500 186450
1	**Discharge Consents** Operator: B.O.C Ltd Property Type: Basic Industry, Chemicals Inorganic Location: Longlands Lane Margam Authority: Natural Resources Wales Catchment Area: Not Given Reference: Bb4025701 Permit Version: 1 Effective Date: 19th April 1978 Issued Date: 19th April 1978 Revocation Date: 5th March 1998 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Mother Ditch **Status: Consent expired** Positional Accuracy: Located by supplier to within 100m	A13SW (SW)	177	2	278840 186080
1	**Discharge Consents** Operator: Boc Ltd Property Type: Undefined Or Other Location: Boc Works Margam - Point A - Surfac, Margam - Point A - Surface Wat Authority: Natural Resources Wales Catchment Area: Afon Kenfig Reference: Bp0094101 Permit Version: 1 Effective Date: 11th August 1988 Issued Date: 11th August 1988 Revocation Date: 19th October 1992 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Mother Ditch **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	199	2	278840 186050

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
2	**Discharge Consents** Operator: Boc Ltd Property Type: Basic Industry, Chemicals Inorganic Location: Boc Works Margam - Point B - Surfac, Margam - Point B - Surface Wat Authority: Natural Resources Wales Catchment Area: Afon Kenfig Reference: Bp0094102 Permit Version: 1 Effective Date: 11th August 1988 Issued Date: 11th August 1988 Revocation Date: 19th October 1992 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Mother Ditch **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	213	2	278860 186020
2	**Discharge Consents** Operator: Boc Ltd Property Type: Basic Industry, Chemicals Inorganic Location: Boc Works Margam - Point C Surface, Margam - Point C Surface Water Authority: Natural Resources Wales Catchment Area: Afon Kenfig Reference: Bp0094103 Permit Version: 1 Effective Date: 11th August 1988 Issued Date: 11th August 1988 Revocation Date: 19th October 1992 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Mother Ditch **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	226	2	278870 186000
3	**Discharge Consents** Operator: Boc Ltd Property Type: Basic Industry, Chemicals Inorganic Location: Boc Works Margam - Point D Surface, Margam - Point D Surface Water Authority: Natural Resources Wales Catchment Area: Afon Kenfig Reference: Bp0094104 Permit Version: 1 Effective Date: 11th August 1988 Issued Date: 11th August 1988 Revocation Date: 19th October 1992 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Mother Ditch **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	253	2	278870 185970
4	**Integrated Pollution Controls** Name: Boc Group Plc Location: Longland Lane, PORT TALBOT, West Glamorgan, SA13 2NS Authority: Environment Agency, Welsh Region Permit Reference: BE3421 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.4 A (A) Petroleum processes within the Fuel & Power Industry **Status: Revoked - Now IPPC** Positional Accuracy: Unknown	A13SW (S)	150	3	279000 186055
4	**Integrated Pollution Controls** Name: Boc Group Plc Location: Longland Lane, PORT TALBOT, West Glamorgan, SA13 2NS Authority: Environment Agency, Welsh Region Permit Reference: BA7409 Dated: 17th June 1998 Process Type: IPC major (substantial) variation Description: 1.4 A (A) Petroleum processes within the Fuel & Power Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Unknown	A13SW (S)	155	3	278995 186050

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	**Integrated Pollution Controls** Name: Boc Group Plc Location: Longland Lane, PORT TALBOT, West Glamorgan, SA13 2NS Authority: Environment Agency, Welsh Region Permit Reference: AF9510 Dated: 5th March 1993 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 1.4 A (A) Petroleum processes within the Fuel & Power Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Unknown	A13SW (S)	155	3	278995 186050
4	**Integrated Pollution Controls** Name: Boc Ltd Location: Longland Lane, PORT TALBOT, West Glamorgan, SA13 2NS Authority: Environment Agency, Welsh Region Permit Reference: AT5801 Dated: 22nd September 1995 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.4 A (A) Petroleum processes within the Fuel & Power Industry **Status: Application has met the requirements for authorisation (but not yet authorised)** Positional Accuracy: Unknown	A13SW (S)	160	3	278995 186045
5	**Integrated Pollution Prevention And Control** Name: Western Bio-Energy Limited Location: Western Wood Energy Plant, Longland Lane, Margam, PORT TALBOT, West Glamorgan, SA13 2NR Authority: Natural Resources Wales Permit Reference: DP3831ZX Original Permit Ref: Zp3939gl Effective Date: 4th March 2013 **Status: Effective** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Located by supplier to within 10m Activity Code: 5.1 A(1) (B) Activity Description: THE INCINERATION OF NON-HAZARDOUS WASTE IN AN INCINERATION OR CO-INCINERATION PLANT WITH A CAPACITY EXCEEDING 3 TONNES PER HOUR. Primary Activity: Y	A13SE (E)	22	2	279070 186190
5	**Integrated Pollution Prevention And Control** Name: Western Wood Energy Plant Location: Longland Lane, Margam, PORT TALBOT, West Glamorgan, SA13 2NR Authority: Natural Resources Wales Permit Reference: ZP3939GL Original Permit Ref: Not Supplied Effective Date: 31st October 2023 **Status: Effective** Application Type: Bespoke App. Sub Type: Not Supplied Positional Accuracy: Automatically positioned to the address Activity Code: 5.1 PART A (1) B) Activity Description: Not Supplied Primary Activity: Y	A13SE (SE)	32	2	279033 186173
6	**Integrated Pollution Prevention And Control** Name: Margam Green Energy Plant Location: Margam Green Energy Plant, Margam Green Energy Plant, Land Off Longlands Lane,,, Neath Port Talbot, SA13 2NR Authority: Natural Resources Wales Permit Reference: DP3137EG Original Permit Ref: Not Supplied Effective Date: 19th December 2022 **Status: Effective** Application Type: Bespoke App. Sub Type: Not Supplied Positional Accuracy: Located by supplier to within 100m Activity Code: 5.1 PART A (1) B) Activity Description: Not Supplied Primary Activity: N	A13NW (N)	77	2	279000 186300

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
7	**Integrated Pollution Prevention And Control** Name: Margam Gases Location: Longlands Lane, Port Talbot, PORT TALBOT, West Glamorgan, SA13 2NS Authority: Natural Resources Wales Permit Reference: BV9713IU Original Permit Ref: Not Supplied Effective Date: 25th May 2016 **Status:** **Effective** Application Type: Bespoke App. Sub Type: Not Supplied Positional Accuracy: Located by supplier to within 10m Activity Code: 4.2 PART A (1) A) (I) Activity Description: Not Supplied Primary Activity: Y	A13SW (S)	155	2	278990 186050
7	**Integrated Pollution Prevention And Control** Name: Boc Limited Location: Margam Gases, Longlands Lane, PORT TALBOT, West Glamorgan, SA13 2NS Authority: Natural Resources Wales Permit Reference: QP3531ZZ Original Permit Ref: Bv9713iu Effective Date: 5th March 2013 **Status:** **Effective** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Automatically positioned to the address Activity Code: 4.2 A(1) (A) (I) Activity Description: Inorganic Chemicals; Gases Eg Ammonia, Primary Activity: Y	A13SW (S)	155	2	278995 186050
8	**Integrated Pollution Prevention And Control** Name: Western Bioenergy Ltd Location: Western Wood Energy Plant, Longland Lane, Margam, PORT TALBOT, West Glamorgan, SA13 2NR Authority: Environment Agency, Welsh Region Permit Reference: SP3735UJ Original Permit Ref: Sp3735uj Effective Date: Not Supplied **Status:** **Valid** Application Type: Application App. Sub Type: New Positional Accuracy: Manually positioned to the address or location Activity Code: 1.1 A(1) (B) (III) Activity Description: Combustion; Waste Derived Fuel Greater Or Equal To 3Mw But Less Than 50Mw Primary Activity: Y Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N	A8NW (S)	336	3	278984 185869
9	**Local Authority Pollution Prevention and Controls** Name: Western Bio-Energy Limited Location: Western Wood Energy Plant, Longlands Lane, Margam, Sa13 2nr Authority: Neath Port Talbot County Borough Council, Environmental Health Department Permit Reference: E3/1/129 Dated: 10th January 2008 Process Type: Local Authority Pollution Prevention and Control Description: PG1/3 Boilers and furnaces, 20-50MW net rated thermal input **Status:** **Permitted** Positional Accuracy: Located by supplier to within 10m	A13SE (E)	222	4	279275 186181
10	**Local Authority Pollution Prevention and Controls** Name: Margam Joint Crematorium Committee Location: Longlands Lane, Margam, PORT TALBOT, West Glamorgan, SA13 2NR Authority: Neath Port Talbot County Borough Council, Environmental Health Department Permit Reference: E3/1/5 Dated: 8th September 1992 Process Type: Local Authority Air Pollution Control Description: PG5/2 Crematoria **Status:** **Authorised** Positional Accuracy: Manually positioned to the address or location	A9NW (SE)	791	4	279530 185572
	Nearest Surface Water Feature	A13NW (W)	0	-	278971 186223

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
11	**Pollution Incidents to Controlled Waters** Property Type: Warehouses Location: Afan, Pumping Station Authority: Environment Agency, Welsh Region Pollutant: Crude Sewage Note: Neglect Incident Date: 10th July 1995 Incident Reference: 25078 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Leakage Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A13SW (S)	305	3	279000 185900
12	**Substantiated Pollution Incident Register** Authority: Natural Resources Wales Incident Date: 22nd July 2013 Incident Reference: 1137183 Water Impact: Category 1 - Major Incident Air Impact: Category 4 - No Impact Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: General Biodegradable Materials and WastesAlgae Pollutant: Pollutant Not Identified: Not Identified	A9NW (SE)	639	2	279381 185656
13	**Substantiated Pollution Incident Register** Authority: Natural Resources Wales Incident Date: 9th October 2001 Incident Reference: 35422 Water Impact: Category 2 - Significant Incident Air Impact: Category 4 - No Impact Land Impact: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 10m Pollutant: Oils - Diesel (Including Agricultural)	A7NE (SW)	757	2	278440 185660
14	**Water Abstractions** Operator: Boc Limited Licence Number: 21/58/34/0003 Permit Version: 1 Location: Borehole 2 At Boc Margam Authority: Natural Resources Wales Abstraction: Other Industrial/Commercial/Public Services: Evaporative Cooling 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: 16th January 2009 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8NE (S)	465	2	279040 185740
14	**Water Abstractions** Operator: Boc Limited Licence Number: 21/58/34/0003 Permit Version: Not Supplied Location: Boreholes At Boc Ltd, Longlands Lane, Margam For Evaporative Cooling, B O C Gases, Longland Lane, Port Talbot, Sa13 2ns Authority: Natural Resources Wales Abstraction: Other Industrial/Commercial/Public Services: Evaporative Cooling Abstraction Type: Not Supplied Source: Groundwater Daily Rate (m3): 501.6 Yearly Rate (m3): 0 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	A8NE (S)	465	2	279040 185740

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
15	**Water Abstractions** Operator: Boc Limited Licence Number: 21/58/34/0003 Permit Version: 1 Location: Borehole 1 At Boc Margam Authority: Natural Resources Wales Abstraction: Other Industrial/Commercial/Public Services: Evaporative Cooling 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: 16th January 2009 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8NW (S)	519	2	278900 185690
15	**Water Abstractions** Operator: Boc Limited Licence Number: 21/58/34/0003 Permit Version: Not Supplied Location: Boreholes At Boc Ltd, Longlands Lane, Margam For Evaporative Cooling, B O C Gases, Longland Lane, Port Talbot, Neath Port Talbot, Sa13 2ns Authority: Natural Resources Wales Abstraction: Other Industrial/Commercial/Public Services: Evaporative Cooling Abstraction Type: Water may be abstracted from any point within an area 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: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8NW (S)	519	2	278900 185690
15	**Water Abstractions** Operator: Boc Limited Licence Number: 21/58/34/0003 Permit Version: Not Supplied Location: Boreholes At Boc Ltd, Longlands Lane, Margam For Evaporative Cooling, B O C Gases, Longland Lane, Port Talbot, Sa13 2ns Authority: Natural Resources Wales Abstraction: Other Industrial/Commercial/Public Services: Evaporative Cooling Abstraction Type: Not Supplied Source: Groundwater Daily Rate (m3): 501.6 Yearly Rate (m3): 183960 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	A8NW (S)	519	2	278900 185690
	Water Abstractions Operator: Neath And Port Talbot County Borough Council Licence Number: Wa/058/0051/0002 Permit Version: Not Supplied Location: Fish Pond At Margam, Fish Pond, Nant Cwm Philip, Margam Park, Margam, Sa13 2ta Authority: Natural Resources Wales Abstraction: Production Of Energy: Hydroelectric Power Generation Abstraction Type: Not Supplied Source: Surface Daily Rate (m3): 21600 Yearly Rate (m3): 7884400 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	A15NW (E)	1223	2	280270 186360

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Corus Uk Strip Products Licence Number: 21/58/34/0002 Permit Version: 100 Location: Ditch Passing Through Abbey Works (Mother Ditch Point B) Authority: Environment Agency, Welsh Region Abstraction: Metal: Process Water Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Licenced from 01-Jan to 31-Dec Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2000 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A11NE (W)	1258	3	277730 186455
	Water Abstractions Operator: Tata Steel Uk Limited Licence Number: 21/58/34/0002 Permit Version: 101 Location: Ditch Passing Through Abbey Works (Mother Ditch Point B) Authority: Natural Resources Wales Abstraction: Metal: Evaporative Cooling 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: 12th November 2010 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A11NE (W)	1259	2	277730 186460
	Water Abstractions Operator: Tata Steel Uk Limited Licence Number: 21/58/34/0002 Permit Version: 101 Location: Ditch Passing Through Abbey Works (Mother Ditch Point B) Authority: Natural Resources Wales Abstraction: Metal: Process Water 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: 12th November 2010 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A11NE (W)	1259	2	277730 186460
	Water Abstractions Operator: Corus Uk Strip Products Licence Number: 21/58/34/0002 Permit Version: 100 Location: Ditch Passing Through Abbey Works (Mother Ditch Point B) Authority: Environment Agency, Welsh Region Abstraction: Metal: Evaporative Cooling Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Ditch Passing Through Abbey Wks Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2000 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A11NE (W)	1259	3	277730 186460

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Tata Steel Uk Limited Licence Number: 21/58/34/0002 Permit Version: Not Supplied Location: Land At British Steel At Port Talbot Authority: Natural Resources Wales Abstraction: Metal: Evaporative Cooling Abstraction Type: Not Supplied Source: Surface Daily Rate (m3): 3364.04 Yearly Rate (m3): 1227420 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	A11NE (W)	1259	2	277730 186460
	Water Abstractions Operator: Tata Steel Uk Limited Licence Number: 21/58/34/0002 Permit Version: Not Supplied Location: Land At British Steel At Port Talbot Authority: Natural Resources Wales Abstraction: Metal: Process Water Abstraction Type: Not Supplied Source: Surface Daily Rate (m3): 3364 Yearly Rate (m3): 1227420 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	A11NE (W)	1259	2	277730 186460
	Water Abstractions Operator: Tata Steel Uk Limited Licence Number: 21/58/51/0004 Permit Version: 101 Location: Tydu Brook (Castle Stream) Authority: Natural Resources Wales Abstraction: Metal: Evaporative Cooling 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: 12th November 2010 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A10SE (SE)	1584	2	280400 185370
	Water Abstractions Operator: Tata Steel Uk Limited Licence Number: 21/58/51/0004 Permit Version: 101 Location: Tydu Brook (Castle Stream) Authority: Natural Resources Wales Abstraction: Metal: Process Water 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: 12th November 2010 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A10SE (SE)	1584	2	280400 185370

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Corus Uk Strip Products Licence Number: 21/58/51/0004 Permit Version: 100 Location: Tydu Brook (Castle Stream) Authority: Environment Agency, Welsh Region Abstraction: Metal: Process Water Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Licenced from 01-Jan to 31-Dec Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2000 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A10SE (SE)	1584	3	280400 185370
	Water Abstractions Operator: Tata Steel Uk Limited Licence Number: 21/58/51/0004 Permit Version: Not Supplied Location: Land At British Steel Port Talbot (Kenfig And Castle) Authority: Natural Resources Wales Abstraction: Metal: Evaporative Cooling Abstraction Type: Not Supplied Source: Surface Daily Rate (m3): 60007.2 Yearly Rate (m3): 11819600 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	A10SE (SE)	1584	2	280400 185370
	Water Abstractions Operator: Tata Steel Uk Limited Licence Number: 21/58/51/0004 Permit Version: Not Supplied Location: Land At British Steel Port Talbot (Kenfig And Castle) Authority: Natural Resources Wales Abstraction: Metal: Process Water Abstraction Type: Not Supplied Source: Surface Daily Rate (m3): 60007.2 Yearly Rate (m3): 0 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	A10SE (SE)	1584	2	280400 185370
	Water Abstractions Operator: Corus Uk Strip Products Licence Number: 21/58/51/0004 Permit Version: 100 Location: Tydu Brook (Castle Stream) Authority: Environment Agency, Welsh Region Abstraction: Metal: Evaporative Cooling Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Licenced from 01-Jan to 31-Dec Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2000 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A10SE (SE)	1586	3	280400 185365

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Speed9280 Ltd Licence Number: 21/58/44/0033 Permit Version: 1 Location: Lakeside Golf Club Production Borehole Authority: Natural Resources Wales Abstraction: Golf Courses: Spray Irrigation - Storage 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 March Authorised End: 31 October Permit Start Date: 1st April 2006 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A5SW (SE)	1741	2	280160 184860
	Water Abstractions Operator: Speed9280 Ltd Licence Number: 21/58/44/0033 Permit Version: Not Supplied Location: Borehole Water Supply For Irrigation Authority: Natural Resources Wales Abstraction: Golf Courses: Spray Irrigation - Storage 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: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A5SW (SE)	1741	2	280160 184860
	Water Abstractions Operator: Costain Limited Licence Number: Wa/058/0034/001 Permit Version: 1 Location: Arnallt Culvert-Brook Port Talbot Authority: Environment Agency, Welsh Region Abstraction: Construction: Dust Suppression Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Margam Moors, Port Talbot, West Glamorgan Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 5th August 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A21NE (NW)	1848	3	277820 187673
	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: >10m Superficial Recharge: Medium	A13NW (NW)	0	2	279000 186223

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	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: >10m Superficial Recharge: Medium	A13NW (W)	0	2	279000 186214
	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: No Data	A13NW (NW)	0	2	279000 186223
	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: No Data	A13NE (NE)	0	2	279010 186214
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13NE (NE)	0	2	279010 186214
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13NE (NE)	0	2	279010 186214
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - Undifferentiated	A13NW (NW)	0	2	279000 186223
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A13NE (NE)	0	2	279010 186214
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial/Tidal Models Boundary Accuracy: As Supplied	A13NW (W)	14	2	278953 186228
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial/Tidal Models Boundary Accuracy: As Supplied	A13NE (NE)	161	2	279121 186370
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13NE (NE)	199	2	279154 186396

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
16	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 93.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (W)	58	5	278911 186184
17	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 21.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NE (NE)	72	5	279095 186286
18	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 20.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NE (NE)	75	5	279095 186286
19	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 254.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NW (N)	75	5	279001 186305
20	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 124.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NE (NE)	91	5	279115 186292
21	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 53.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NW (W)	113	5	278853 186227
22	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 91.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NW (NW)	138	5	278862 186313
23	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 63.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NW (NW)	138	5	278862 186313

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
24	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 74.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A13SW (W)	151	5	278822 186160
25	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A13SW (W)	155	5	278824 186142
26	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 16.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (W)	155	5	278824 186142
27	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.9 Watercourse Level: Underground Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A13SW (SW)	158	5	278825 186134
28	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 200.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A13SW (SW)	159	5	278826 186129
29	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 88.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A13SW (W)	164	5	278802 186213
30	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (W)	171	5	278807 186139
31	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 182.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (SW)	174	5	278809 186128
32	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 106.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (W)	174	5	278805 186138

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
33	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 76.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A13NW (W)	207	5	278772 186296
34	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 87.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NW (N)	241	5	278925 186460
35	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 134.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A13NW (NW)	263	5	278746 186368
36	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 16.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NW (NW)	263	5	278746 186368
37	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NW (NW)	267	5	278735 186356
38	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 206.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NW (NW)	269	5	278729 186350
39	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 131.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (SW)	274	5	278850 185957
40	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (SW)	276	5	278720 186079
41	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 41.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (SW)	276	5	278717 186086

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
42	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 48.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (SW)	277	5	278720 186077
43	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 16.6 Watercourse Level: Underground Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A13SW (SW)	280	5	278883 185937
44	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 134.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NW (NW)	282	5	278839 186475
45	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 142.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NW (NW)	282	5	278839 186475
46	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 106.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (W)	293	5	278688 186111
47	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 212.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A13SW (SW)	295	5	278887 185921
48	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 137.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SE (N)	329	5	279033 186553
49	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 134.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NE (NE)	346	5	279196 186541
50	**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: Kenfig Primacy: 1	A12NE (W)	347	5	278622 186264

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
51	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 139.7 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NE (NE)	349	5	279242 186518
52	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 107.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12SE (SW)	353	5	278667 186017
53	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 72.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12SE (SW)	353	5	278667 186017
54	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 123.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12NE (W)	359	5	278616 186297
55	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 107.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12NE (W)	359	5	278616 186297
56	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12SE (W)	361	5	278606 186178
57	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 57.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12SE (W)	362	5	278604 186179
58	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12SE (W)	362	5	278604 186179
59	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 9.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (SW)	364	5	278720 185935

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
60	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (SW)	373	5	278712 185932
61	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 191.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SE (N)	373	5	279056 186597
62	**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: Kenfig Primacy: 1	A13NW (NW)	375	5	278701 186488
63	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 185.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SW (NW)	376	5	278846 186579
64	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NW (NW)	376	5	278695 186484
65	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SW (NW)	376	5	278846 186579
66	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 130.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13NW (NW)	377	5	278690 186481
67	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 121.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A13NW (NW)	377	5	278707 186497
68	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 9.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SW (NW)	377	5	278853 186583

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
69	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A18SE (N)	381	5	279134 186596
70	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 53.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SE (N)	381	5	279134 186596
71	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A18SW (N)	381	5	278865 186590
72	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SW (N)	381	5	278861 186589
73	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 95.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A18SW (N)	381	5	278865 186590
74	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 169.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (SW)	382	5	278716 185915
75	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 26.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (SW)	382	5	278716 185915
76	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 45.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SW (N)	386	5	278863 186595
77	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 185.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A18SE (N)	388	5	279123 186606

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
78	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 195.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A13SW (SW)	400	5	278692 185912
79	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 54.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A13SW (SW)	405	5	278674 185923
80	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A18SW (N)	406	5	278952 186629
81	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 87.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SW (N)	407	5	278952 186630
82	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SW (N)	408	5	278955 186631
83	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SW (N)	408	5	278955 186631
84	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 147.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SW (N)	410	5	278957 186633
85	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 72.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12NE (NW)	418	5	278588 186401
86	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SW (N)	425	5	278875 186639

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
87	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 46.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SW (N)	430	5	278863 186640
88	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 141.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NE (SE)	433	5	279212 185802
89	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 126.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12SE (W)	443	5	278549 186054
90	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12SE (SW)	444	5	278559 186026
91	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 133.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12SE (SW)	445	5	278561 186018
92	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 228.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A14NW (NE)	455	5	279379 186542
93	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 231.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12SE (W)	463	5	278529 186053
94	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 126.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SE (N)	478	5	279183 186684
95	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 100.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NW (SW)	478	5	278780 185764

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
96	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 44.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12SE (SW)	480	5	278561 185946
97	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 18.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NE (S)	484	5	279094 185724
98	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 158.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	485	5	278657 186598
99	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	486	5	278657 186598
100	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 21.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A17SE (NW)	488	5	278668 186610
101	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	488	5	278667 186608
102	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 16.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A8NW (S)	489	5	278921 185718
103	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 511.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12SE (SW)	492	5	278576 185904
104	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 16.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12SE (SW)	492	5	278576 185904

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
105	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 26.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A8NW (S)	498	5	278906 185710
106	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 104.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NE (S)	501	5	279101 185706
107	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 109.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NE (S)	501	5	279101 185706
108	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 215.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	503	5	278633 186600
109	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 25.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	503	5	278645 186611
110	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	506	5	278650 186619
111	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 195.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A17SE (NW)	509	5	278651 186623
112	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 332.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NE (SE)	512	5	279257 185735
113	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 66.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NE (S)	520	5	279025 185685

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
114	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.0 Watercourse Level: Underground Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A8NW (S)	521	5	278918 185686
115	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 32.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NW (S)	522	5	278973 185683
116	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 76.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SE (N)	527	5	279046 186750
117	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 40.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A8NW (S)	532	5	278923 185675
118	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 10.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12NE (NW)	539	5	278478 186451
119	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 153.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A12NE (NW)	539	5	278478 186451
120	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12NE (NW)	543	5	278470 186444
121	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 49.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A9NW (SE)	546	5	279370 185759
122	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 80.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A8NE (SE)	550	5	279287 185706

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
123	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12NE (W)	550	5	278460 186439
124	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 30.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NW (S)	554	5	278968 185651
125	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 77.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NW (S)	557	5	278812 185670
126	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NW (S)	557	5	278812 185670
127	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 101.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NW (S)	558	5	278811 185669
128	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 66.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NE (S)	561	5	279016 185644
129	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 305.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A8NE (SE)	561	5	279271 185688
130	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 27.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NE (SE)	561	5	279271 185688
131	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 116.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A8NW (S)	567	5	278940 185638

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
132	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A8NW (S)	567	5	278940 185638
133	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SE (N)	568	5	279112 186788
134	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 75.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A9NW (SE)	569	5	279408 185759
135	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 30.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A8NW (S)	570	5	278942 185635
136	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SE (N)	573	5	279108 186794
137	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 31.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A18SE (N)	577	5	279105 186798
138	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.7 Watercourse Level: Underground Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A8NE (SE)	578	5	279339 185702
139	**OS Water Network Lines** Watercourse Form: Transfer Watercourse Length: 16.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Eglwys Nunydd Reservoir Catchment Name: Kenfig Primacy: 1	A8NE (SE)	584	5	279343 185698
140	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A8NW (S)	596	5	278960 185609

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
141	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 121.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A8NW (S)	597	5	278961 185608
142	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 13.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NW (S)	597	5	278961 185608
143	**OS Water Network Lines** Watercourse Form: Reservoir Watercourse Length: 1042.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Eglwys Nunydd Reservoir Catchment Name: Kenfig Primacy: 1	A9NW (SE)	600	5	279349 185683
144	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 247.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Middle Mother Ditch Catchment Name: Kenfig Primacy: 1	A12NE (W)	604	5	278399 186427
145	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 141.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8NW (S)	624	5	278834 185595
146	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A17SE (NW)	632	5	278460 186602
147	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A17SE (NW)	644	5	278458 186619
148	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A17SE (NW)	646	5	278458 186622
149	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 18.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	657	5	278447 186625

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
150	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 41.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A17SE (NW)	657	5	278447 186625
151	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.6 Watercourse Level: Underground Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A17SE (NW)	690	5	278405 186625
152	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 86.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A17SE (NW)	695	5	278399 186623
153	**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: Kenfig Primacy: 2	A8SE (S)	698	5	279030 185508
154	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A8SE (S)	698	5	279030 185508
155	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 156.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A8SE (S)	698	5	279027 185508
156	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.0 Watercourse Level: Underground Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A8SE (S)	699	5	279031 185506
157	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A8SE (S)	702	5	279033 185503
158	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 24.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A8SE (S)	706	5	279036 185499

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
159	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 55.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	720	5	278550 186811
160	**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: Kenfig Primacy: 2	A8SE (S)	725	5	279052 185480
161	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 104.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	725	5	278543 186812
162	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 76.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	748	5	278880 185462
163	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 59.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	752	5	278560 186856
164	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 62.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	753	5	278979 185452
165	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A17SE (NW)	768	5	278361 186697
166	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 78.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	768	5	278361 186697
167	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 45.0 Watercourse Level: Underground Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A17SE (NW)	770	5	278359 186696

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
168	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 106.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	781	5	278923 185425
169	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 24.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A8SW (S)	781	5	278923 185425
170	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 26.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	784	5	278809 185437
171	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Middle Mother Ditch Catchment Name: Kenfig Primacy: 1	A17SW (NW)	784	5	278315 186660
172	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.3 Watercourse Level: Underground Permanent: True Watercourse Name: Middle Mother Ditch Catchment Name: Kenfig Primacy: 1	A17SW (NW)	789	5	278312 186663
173	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Middle Mother Ditch Catchment Name: Kenfig Primacy: 1	A17SW (NW)	792	5	278308 186663
174	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 22.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A17SW (NW)	795	5	278317 186683
175	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	797	5	278784 185428
176	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 18.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	797	5	278783 185429

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
177	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	797	5	278783 185429
178	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A17SW (NW)	797	5	278304 186665
179	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 117.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A8SW (S)	798	5	278938 185407
180	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 600.8 Watercourse Level: Underground Permanent: True Watercourse Name: Upper Mother Ditch Catchment Name: Kenfig Primacy: 1	A17SW (NW)	802	5	278297 186664
181	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 36.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	804	5	278393 186788
182	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 52.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	805	5	278766 185425
183	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 58.7 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	805	5	278400 186795
184	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 42.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	807	5	278788 185418
185	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	810	5	278439 186838

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
186	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	810	5	278444 186842
187	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	811	5	278442 186842
188	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 99.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17SE (NW)	812	5	278439 186840
189	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 135.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	817	5	278822 185400
190	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 57.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (SW)	821	5	278335 185678
191	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NE (SW)	821	5	278337 185677
192	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 118.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NE (SW)	821	5	278365 185645
193	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A7NE (SW)	822	5	278335 185677
194	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (SW)	827	5	278296 185720

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
195	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 102.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (SW)	827	5	278296 185720
196	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 23.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (SW)	828	5	278297 185717
197	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 37.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NE (SW)	828	5	278423 185579
198	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 34.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	829	5	278714 185414
199	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 85.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	829	5	278585 185468
200	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A7NW (SW)	833	5	278326 185671
201	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A7NE (SW)	833	5	278448 185552
202	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 54.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NE (SW)	833	5	278448 185552
203	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 18.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A7NW (SW)	836	5	278323 185670

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
204	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 31.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A7NE (SW)	836	5	278448 185549
205	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A7SE (SW)	842	5	278485 185513
206	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 20.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	842	5	278485 185513
207	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 34.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	846	5	278681 185409
208	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 109.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (SW)	847	5	278239 185771
209	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 110.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NE (SW)	851	5	278344 185625
210	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 114.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	851	5	278514 185483
211	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 15.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (SW)	852	5	278318 185652
212	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.9 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (SW)	853	5	278307 185663

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
213	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 84.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (SW)	854	5	278301 185669
214	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 67.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	858	5	278939 185348
215	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 19.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	864	5	278647 185402
216	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	877	5	278628 185396
217	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 89.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	882	5	278447 185492
218	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 45.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	882	5	278622 185393
219	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 43.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	892	5	278880 185317
220	**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: Kenfig Primacy: 1	A7SE (SW)	903	5	278555 185400
221	**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: Kenfig Primacy: 1	A7SE (SW)	903	5	278565 185395

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
222	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	903	5	278568 185394
223	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	903	5	278568 185394
224	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 58.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	904	5	278558 185398
225	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	905	5	278574 185389
226	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17NE (NW)	906	5	278404 186933
227	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 107.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A17NE (NW)	913	5	278401 186940
228	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 78.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	915	5	278344 185533
229	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 42.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	915	5	278495 185419
230	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	915	5	278495 185419

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
231	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 148.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (SW)	917	5	278134 185820
232	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 25.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	919	5	278506 185409
233	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 92.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A9SW (SE)	921	5	279684 185533
234	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 32.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	934	5	278426 185442
235	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 67.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	935	5	278870 185274
236	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 68.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	937	5	278511 185385
237	**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: Kenfig Primacy: 1	A7SE (SW)	938	5	278453 185419
238	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 126.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	938	5	278453 185419
239	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 68.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (SW)	949	5	278106 185803

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
240	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 48.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Lower Mother Ditch Catchment Name: Kenfig Primacy: 1	A7NW (SW)	949	5	278190 185658
241	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 175.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Lower Mother Ditch Catchment Name: Kenfig Primacy: 1	A7NW (SW)	949	5	278190 185658
242	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 68.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	959	5	278954 185246
243	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 138.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SE (SW)	962	5	278403 185424
244	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 21.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12SW (W)	962	5	278037 185953
245	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 177.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Lower Mother Ditch Catchment Name: Kenfig Primacy: 1	A7NW (SW)	976	5	278145 185676
246	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 26.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (W)	976	5	278057 185849
247	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 13.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (SW)	976	5	278145 185676
248	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 79.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Lower Mother Ditch Catchment Name: Kenfig Primacy: 1	A12SW (W)	979	5	278017 185961

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
249	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 43.1 Watercourse Level: Underground Permanent: True Watercourse Name: Lower Mother Ditch Catchment Name: Kenfig Primacy: 1	A12SW (W)	979	5	278017 185961
250	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (SW)	980	5	278151 185660
251	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A12SW (W)	982	5	278027 185917
252	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 47.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Lower Mother Ditch Catchment Name: Kenfig Primacy: 1	A12SW (W)	983	5	278025 185919
253	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Lower Mother Ditch Catchment Name: Kenfig Primacy: 1	A7SW (SW)	986	5	278273 185503
254	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 148.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A7SE (SW)	986	5	278568 185303
255	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 204.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7SW (SW)	987	5	278274 185501
256	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 22.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Lower Mother Ditch Catchment Name: Kenfig Primacy: 1	A7SW (SW)	987	5	278274 185501
257	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (W)	987	5	278038 185868

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
258	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 65.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Lower Mother Ditch Catchment Name: Kenfig Primacy: 1	A7NW (W)	988	5	278035 185873
259	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 125.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A7NW (SW)	988	5	278139 185664
260	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 197.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 2	A7SE (SW)	988	5	278554 185306
261	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 47.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Kenfig Primacy: 1	A8SW (S)	995	5	278895 185212
262	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 121.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Afan Primacy: 1	A19NW (N)	997	5	279353 187175

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Local Authority Landfill Coverage Name: Neath Port Talbot County Borough Council - Has supplied landfill data		0	4	279010 186214

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
263	**Control of Major Accident Hazards Sites (COMAH)** Name: Boc Limited Location: Longland Lane, Port Talbot, West Glamorgan, SA13 2NS Reference: Not Supplied Type: Upper Tier **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (S)	155	6	278995 186050
264	**Control of Major Accident Hazards Sites (COMAH)** Name: British Steel Strip Products Location: Port Talbot Works, PORT TALBOT, West Glamorgan, SA13 2NG Reference: Not Supplied Type: Lower Tier **Status: Record Ceased To Be Supplied Under COMAH Regulations** Positional Accuracy: Manually positioned to the address or location	A18SW (N)	577	6	279000 186800
265	**Notification of Installations Handling Hazardous Substances (NIHHS)** Name: British Oxygen Company (BOC) Limited Location: Longlands Lane, Margam, PORT TALBOT, West Glamorgan, SA13 2NS **Status: Not Active** Positional Accuracy: Automatically positioned to the address	A13SW (S)	150	6	278990 186055
266	**Notification of Installations Handling Hazardous Substances (NIHHS)** Name: British Steel Strip Mill Products Location: Port Talbot Works, PORT TALBOT, West Glamorgan, SA13 2NG **Status: Not Active** Positional Accuracy: Manually positioned to the address or location	A18SW (N)	572	6	279005 186795
267	**Planning Hazardous Substance Consents** Name: Boc Ltd Location: Longlands Lane, Margam, PORT TALBOT, West Glamorgan, SA13 2NS Authority: Neath Port Talbot County Borough Council, Planning Department Application Ref: P/97/1386 Hazardous Substance: Part C, Flammable Substance (Not in Parts A&B), Gas or gases flammable in air, when held as a gas, where amount held is >= 15tonnes Maximum Quantity: 23 Application date: 17th November 1997 **Decision: Unknown at time of reportUnknown** Positional Accuracy: Located by supplier to within 10m	A13SW (S)	250	7	278955 185955
267	**Planning Hazardous Substance Consents** Name: BOC Ltd Location: Longlands Lane, Margam, PORT TALBOT, West Glamorgan, SA13 2NS Authority: Neath Port Talbot County Borough Council, Planning Department Application Ref: P/97/1386 Hazardous Substance: Part B, Highly Reactive and Explosive Substance, Hydrogen, where amount held is greater than or equal to 2 tonnes Maximum Quantity: 4 Application date: 17th November 1997 **Decision: Unknown at time of reportUnknown** Positional Accuracy: Located by supplier to within 10m	A13SW (S)	255	7	278955 185950
267	**Planning Hazardous Substance Consents** Name: BOC Ltd Location: Longlands Lane, Margam, PORT TALBOT, West Glamorgan, SA13 2NS Authority: Neath Port Talbot County Borough Council, Planning Department Application Ref: 92/8936 Hazardous Substance: Part C, Flammable Substance (Not in Parts A&B), Liquefied petroleum gas held at >1.4 bar where amount held is greater than or equal to 25 tonnes Maximum Quantity: 199 Application date: 2nd October 1992 **Decision: Deemed consent granted between June 1992 and November 1992Granted** Positional Accuracy: Located by supplier to within 10m	A13SW (S)	255	7	278950 185950
267	**Planning Hazardous Substance Consents** Name: Boc Ltd Location: Longlands Lane, Margam, PORT TALBOT, West Glamorgan, SA13 2NS Authority: Neath Port Talbot County Borough Council, Planning Department Application Ref: 97/1386 Hazardous Substance: Part B, Highly Reactive and Explosive Substance, Liquid Oxygen, where amount held is greater than or equal to 500 tonnes Maximum Quantity: 20112 Application date: 17th November 1997 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Located by supplier to within 10m	A13SW (S)	260	7	278950 185945

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
267	**Planning Hazardous Substance Consents** Name: Boc Ltd Location: Longlands Lane, Margam, PORT TALBOT, West Glamorgan, SA13 2NS Authority: Neath Port Talbot County Borough Council, Planning Department Application Ref: 92/8936 Hazardous Substance: Unknown at time of report Maximum Quantity: 20000 Application date: 2nd October 1992 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Located by supplier to within 10m	A13SW (S)	260	7	278955 185945

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Pennine Middle Coal Measures Formation And South Wales Middle Coal Measures Formation (Undifferentiated)	A13NE (NE)	0	1	279010 186214
	Coal Mining Affected Areas Description: In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report.	A13NE (NE)	0	8	279010 186214
	Mining Instability Mining Evidence: Inconclusive Coal Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	A13NE (NE)	0	-	279010 186214
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	279006 186217
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	279010 186214
	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	279006 186217
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	279010 186214
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	279010 186214
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	279010 186214
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	279010 186214
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	279006 186217
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	92	1	278988 186106
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	279010 186214
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	279006 186217
	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	A13NE (NE)	0	1	279010 186214
	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	A13NE (NE)	0	1	279010 186214

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
268	**Contemporary Trade Directory Entries** Name: B O C Gas & Gear Location: Longland Lane, Port Talbot, West Glamorgan, SA13 2NS Classification: Gas - Industrial & Medical Suppliers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (S)	155	-	278995 186050
268	**Contemporary Trade Directory Entries** Name: B O C Gases Ltd Location: Longland Lane, Port Talbot, SA13 2NS Classification: Gas Suppliers **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (S)	155	-	278995 186050
269	**Contemporary Trade Directory Entries** Name: Margam Crematorium Location: Longland Lane, Port Talbot, West Glamorgan, SA13 2NR Classification: Cemeteries & Crematoria **Status: Active** Positional Accuracy: Automatically positioned to the address	A9NW (SE)	791	-	279530 185572
269	**Contemporary Trade Directory Entries** Name: Margam Crematorium Location: Longland Lane, Port Talbot, West Glamorgan, SA13 2NR Classification: Cemeteries & Crematoria **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NW (SE)	791	-	279530 185572
270	**Contemporary Trade Directory Entries** Name: Tech-Print Ltd Location: E R Building,Unit T14 Cefn Gwrgan Road, Margam, Port Talbot, West Glamorgan, SA13 2BZ Classification: Printers **Status: Active** Positional Accuracy: Manually positioned to the road within the address or location	A17NE (NW)	973	-	278484 187069
271	**Underground Electrical Cables** Unique Feature Identifier: 10007059 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 9th January 2023	A12SE (W)	415	9	278572 186073

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
272	**Ancient Woodland** Name: Not Supplied Reference: 22151 Area(m²): 20020 Type: Restored Ancient Woodland Site	A13NW (NW)	279	2	278845 186475
273	**Ancient Woodland** Name: Not Supplied Reference: 23140 Area(m²): 11383.39 Type: Restored Ancient Woodland Site	A14NW (E)	450	2	279485 186354
274	**Ancient Woodland** Name: Not Supplied Reference: 18226 Area(m²): 358291.78 Type: Ancient and Semi-Natural Woodland	A19SW (NE)	453	2	279352 186565
275	**Ancient Woodland** Name: Not Supplied Reference: 15776 Area(m²): 2890.8 Type: Ancient and Semi-Natural Woodland	A18SE (NE)	496	2	279213 186694
276	**Ancient Woodland** Name: Not Supplied Reference: 15777 Area(m²): 3352.99 Type: Ancient and Semi-Natural Woodland	A18SE (N)	599	2	279160 186813
277	**Ancient Woodland** Name: Not Supplied Reference: 18222 Area(m²): 759.92 Type: Ancient and Semi-Natural Woodland	A8NE (S)	633	2	279136 185577
278	**Ancient Woodland** Name: Not Supplied Reference: 50045 Area(m²): 884.82 Type: Ancient Woodland Site of Unknown Category	A8NE (S)	653	2	279152 185559
279	**Ancient Woodland** Name: Not Supplied Reference: 41896 Area(m²): 14456.6 Type: Plantation on Ancient Woodland	A18SE (N)	681	2	279265 186871
280	**Ancient Woodland** Name: Not Supplied Reference: 23139 Area(m²): 29608.73 Type: Restored Ancient Woodland Site	A14SE (E)	688	2	279740 186144
281	**Ancient Woodland** Name: Not Supplied Reference: 41896 Area(m²): 6334.68 Type: Plantation on Ancient Woodland	A19SW (NE)	770	2	279531 186829
282	**Ancient Woodland** Name: Not Supplied Reference: 8429 Area(m²): 13595.92 Type: Ancient and Semi-Natural Woodland	A19NW (NE)	796	2	279401 186941
283	**Ancient Woodland** Name: Not Supplied Reference: 39703 Area(m²): 63.68 Type: Plantation on Ancient Woodland	A19NW (NE)	805	2	279373 186963
284	**Ancient Woodland** Name: Not Supplied Reference: 39703 Area(m²): 4583.16 Type: Plantation on Ancient Woodland	A19SW (NE)	817	2	279541 186880
285	**Ancient Woodland** Name: Not Supplied Reference: 50291 Area(m²): 24954.78 Type: Ancient Woodland Site of Unknown Category	A19NW (NE)	830	2	279493 186928

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
286	**Ancient Woodland** Name: Not Supplied Reference: 8429 Area(m²): 125.01 Type: Ancient and Semi-Natural Woodland	A19SW (NE)	871	2	279662 186847
287	**Ancient Woodland** Name: Not Supplied Reference: 23135 Area(m²): 3239.8 Type: Restored Ancient Woodland Site	A9SW (SE)	895	2	279635 185524
288	**Ancient Woodland** Name: Not Supplied Reference: 41896 Area(m²): 586.61 Type: Plantation on Ancient Woodland	A18NE (N)	899	2	279238 187104
289	**Ancient Woodland** Name: Not Supplied Reference: 39703 Area(m²): 12105.85 Type: Plantation on Ancient Woodland	A18NE (N)	902	2	279240 187106
290	**Ancient Woodland** Name: Not Supplied Reference: 8785 Area(m²): 78310.66 Type: Ancient and Semi-Natural Woodland	A14NE (E)	916	2	279954 186397
291	**Ancient Woodland** Name: Not Supplied Reference: 41896 Area(m²): 5173.13 Type: Plantation on Ancient Woodland	A18NE (N)	927	2	279099 187150
292	**Ancient Woodland** Name: Not Supplied Reference: 41896 Area(m²): 64731.92 Type: Plantation on Ancient Woodland	A19SE (NE)	934	2	279885 186650
293	**Ancient Woodland** Name: Not Supplied Reference: 8429 Area(m²): 144.45 Type: Ancient and Semi-Natural Woodland	A18NE (N)	944	2	279196 187157
294	**Sites of Special Scientific Interest** Name: Eglwys Nunydd Reservoir Multiple Areas: N Total Area (m2): 1033974.87 Source: Natural Resources Wales Reference: 33133wxy Designation Details: Not Supplied Designation Date: Not Supplied Date Type: Not Supplied	A9NW (SE)	584	2	279359 185707

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices		
Bridgend County Borough Council - Environmental Health Department	January 2020	Annual Rolling Update
Natural Resources Wales	November 2023	Annually
Neath Port Talbot County Borough Council - Environmental Health Department	October 2017	Annual Rolling Update
Discharge Consents		
Environment Agency - Welsh Region	August 2014	Quarterly
Natural Resources Wales	February 2024	Quarterly
Enforcement and Prohibition Notices		
Environment Agency - Welsh Region	March 2013	
Integrated Pollution Controls		
Environment Agency - Welsh Region	January 2009	
Integrated Pollution Prevention And Control		
Natural Resources Wales	December 2023	Quarterly
Environment Agency - Welsh Region	January 2021	Quarterly
Local Authority Integrated Pollution Prevention And Control		
Bridgend County Borough Council - Environmental Health Department	July 2015	Variable
Neath Port Talbot County Borough Council - Environmental Health Department	March 2014	Variable
Local Authority Pollution Prevention and Controls		
Bridgend County Borough Council - Environmental Health Department	July 2015	Not Applicable
Neath Port Talbot County Borough Council - Environmental Health Department	March 2014	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements		
Bridgend County Borough Council - Environmental Health Department	July 2015	Variable
Neath Port Talbot County Borough Council - Environmental Health Department	March 2015	Variable
Nearest Surface Water Feature		
Ordnance Survey	February 2024	
Pollution Incidents to Controlled Waters		
Environment Agency - Welsh Region	December 1998	
Prosecutions Relating to Authorised Processes		
Environment Agency - Welsh Region	July 2015	
Natural Resources Wales	July 2015	
Prosecutions Relating to Controlled Waters		
Environment Agency - Welsh Region	March 2013	
Natural Resources Wales	March 2013	
Registered Radioactive Substances		
Natural Resources Wales	January 2015	
Environment Agency - Welsh Region	June 2016	As notified
Substantiated Pollution Incident Register		
Natural Resources Wales	February 2024	Quarterly
Environment Agency Wales - South West Area	January 2021	Quarterly
Water Abstractions		
Natural Resources Wales	February 2024	Quarterly
Environment Agency - Welsh Region	October 2023	Quarterly
Water Industry Act Referrals		
Environment Agency - Welsh Region	October 2017	
Natural Resources Wales	October 2022	
Groundwater Vulnerability Map		
Natural Resources Wales	June 2018	As notified
Bedrock Aquifer Designations		
Natural Resources Wales	January 2018	As notified
Superficial Aquifer Designations		
Natural Resources Wales	January 2018	As notified

Agency & Hydrological	Version	Update Cycle
Source Protection Zones Natural Resources Wales	July 2022	Annual Rolling Update
Extreme Flooding from Rivers or Sea without Defences Natural Resources Wales	September 2020	
Flooding from Rivers or Sea without Defences Natural Resources Wales	September 2020	
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	January 2024	Quarterly
BGS Groundwater Flooding Susceptibility British Geological Survey - National Geoscience Information Service	May 2013	As notified
Waste	**Version**	**Update Cycle**
BGS Recorded Landfill Sites British Geological Survey - National Geoscience Information Service	November 2002	As notified
Historical Landfill Sites Natural Resources Wales	March 2023	As notified
Integrated Pollution Control Registered Waste Sites Environment Agency - Welsh Region	January 2009	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries) Environment Agency Wales - South West Area Natural Resources Wales	January 2023 October 2021	Quarterly Quarterly
Licensed Waste Management Facilities (Locations) Natural Resources Wales Environment Agency Wales - South West Area	February 2024 July 2021	Quarterly Quarterly
Local Authority Landfill Coverage Bridgend County Borough Council Neath Port Talbot County Borough Council - Environmental Health Department	February 2003 February 2003	Not Applicable Not Applicable
Local Authority Recorded Landfill Sites Bridgend County Borough Council Neath Port Talbot County Borough Council - Environmental Health Department	October 2018 October 2018	
Registered Landfill Sites Environment Agency Wales - South West Area	March 2006	Not Applicable
Registered Waste Transfer Sites Environment Agency Wales - South West Area	April 2018	
Registered Waste Treatment or Disposal Sites Environment Agency Wales - South West Area	June 2015	

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH)		
Health and Safety Executive	January 2024	Bi-Annually
Explosive Sites		
Health and Safety Executive	March 2017	
Notification of Installations Handling Hazardous Substances (NIHHS)		
Health and Safety Executive	August 2001	
Planning Hazardous Substance Enforcements		
Bridgend County Borough Council - Planning Department	March 2023	Variable
Neath Port Talbot County Borough Council - Planning Department	October 2015	Variable
Planning Hazardous Substance Consents		
Bridgend County Borough Council - Planning Department	February 2016	Variable
Neath Port Talbot County Borough Council - Planning Department	October 2015	Variable
Geological	**Version**	**Update Cycle**
BGS 1:625,000 Solid Geology		
British Geological Survey - National Geoscience Information Service	January 2009	As notified
BGS Recorded Mineral Sites		
British Geological Survey - National Geoscience Information Service	January 2024	Bi-Annually
CBSCB Compensation District		
Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011	
Cheshire Brine Subsidence Compensation Board (CBSCB)	November 2020	As notified
Coal Mining Affected Areas		
The Coal Authority - Property Searches	February 2023	Annual Rolling Update
Mining Instability		
Ove Arup & Partners	June 1998	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	April 2020	As notified
Potential for Compressible Ground Stability Hazards		
British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Ground Dissolution Stability Hazards		
British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Landslide Ground Stability Hazards		
British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Running Sand Ground Stability Hazards		
British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Shrinking or Swelling Clay Ground Stability Hazards		
British Geological Survey - National Geoscience Information Service	January 2019	As notified
Radon Potential - Radon Affected Areas		
British Geological Survey - National Geoscience Information Service	October 2023	Annually
Radon Potential - Radon Protection Measures		
British Geological Survey - National Geoscience Information Service	October 2023	Annually

Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries		
Thomson Directories	October 2023	Quarterly
Fuel Station Entries		
Catalist Ltd - Experian	February 2024	Quarterly
Gas Pipelines		
National Grid	October 2021	Bi-Annually
Underground Electrical Cables		
National Grid	February 2023	Bi-Annually
Sensitive Land Use	**Version**	**Update Cycle**
Ancient Woodland		
Natural Resources Wales	October 2023	Bi-Annually
Areas of Adopted Green Belt		
Bridgend County Borough Council	August 2023	Quarterly
Neath Port Talbot County Borough Council - Planning Services	August 2023	Quarterly
Areas of Unadopted Green Belt		
Bridgend County Borough Council	August 2023	Quarterly
Neath Port Talbot County Borough Council - Planning Services	August 2023	Quarterly
Areas of Outstanding Natural Beauty		
Natural Resources Wales	November 2023	Bi-Annually
Environmentally Sensitive Areas		
The National Assembly for Wales - GI Services (Department of Planning & Countryside)	January 2017	
Forest Parks		
Forestry Commission	May 2023	Not Applicable
Local Nature Reserves		
Bridgend County Borough Council	February 2024	Bi-Annually
Neath Port Talbot County Borough Council	February 2024	Bi-Annually
Marine Nature Reserves		
Natural Resources Wales	February 2024	Bi-Annually
National Nature Reserves		
Natural Resources Wales	September 2023	Bi-Annually
National Parks		
Natural Resources Wales	February 2018	Annually
Nitrate Vulnerable Zones		
The National Assembly for Wales - GI Services (Department of Planning & Countryside)	April 2016	
Natural Resources Wales	March 2023	Bi-Annually
Ramsar Sites		
Natural Resources Wales	February 2024	Bi-Annually
Sites of Special Scientific Interest		
Natural Resources Wales	October 2023	Bi-Annually
Special Areas of Conservation		
Natural Resources Wales	October 2023	Bi-Annually
Special Protection Areas		
Natural Resources Wales	October 2023	Bi-Annually

Data Suppliers

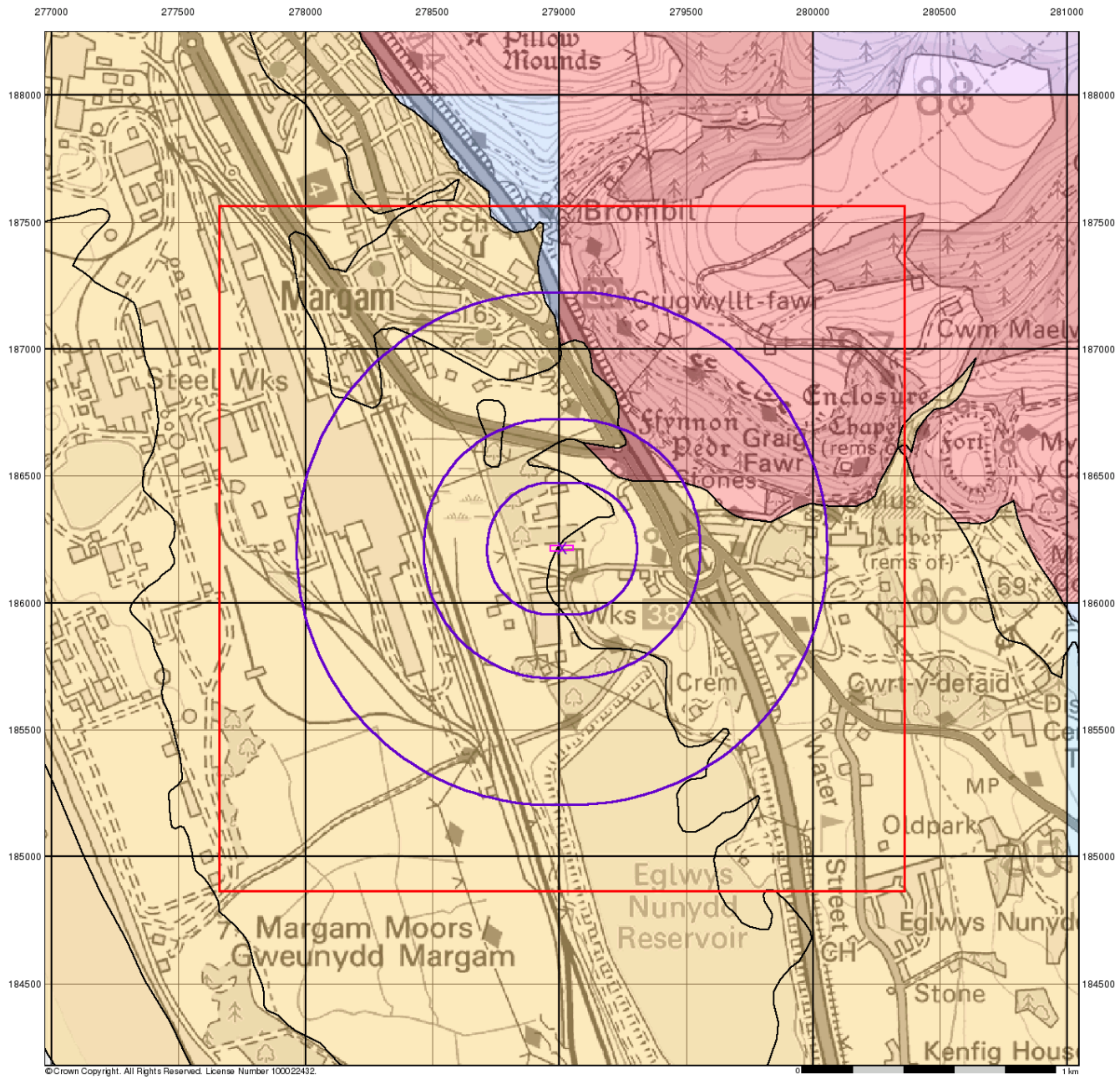
A selection of organisations who provide data within this report

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	
Stantec UK Ltd	

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	**Neath Port Talbot County Borough Council - Environmental Health Department** Room 322, Neath Civic Centre, Neath, West Glamorgan, SA11 3QZ	Telephone: 01639 763333 Fax: 01693 763444 Website: www.neath-porttalbot.gov.uk
5	**Ordnance Survey** Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.gov.uk
6	**Health and Safety Executive** 5S.2 Redgrave Court, Merton Road, Bootle, L20 7HS	Website: www.hse.gov.uk
7	**Neath Port Talbot County Borough Council - Planning Department** Port Talbot Civic Centre, Port Talbot, SA13 1PJ	Telephone: 01639 763333 Fax: 01639 763444 Website: www.neath-porttalbot.gov.uk
8	**The Coal Authority - Property Searches** 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG	Telephone: 0345 762 6848 Fax: 01623 637 338 Email: groundstability@coal.gov.uk Website: www2.groundstability.com
9	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9966 Fax: 0844 844 9951 Email: helpdesk@landmark.co.uk Website: www.landmark.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.



Groundwater Vulnerability

General

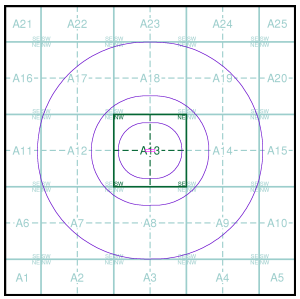
Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

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:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	1000

Site Details

Site at 279010, 186210

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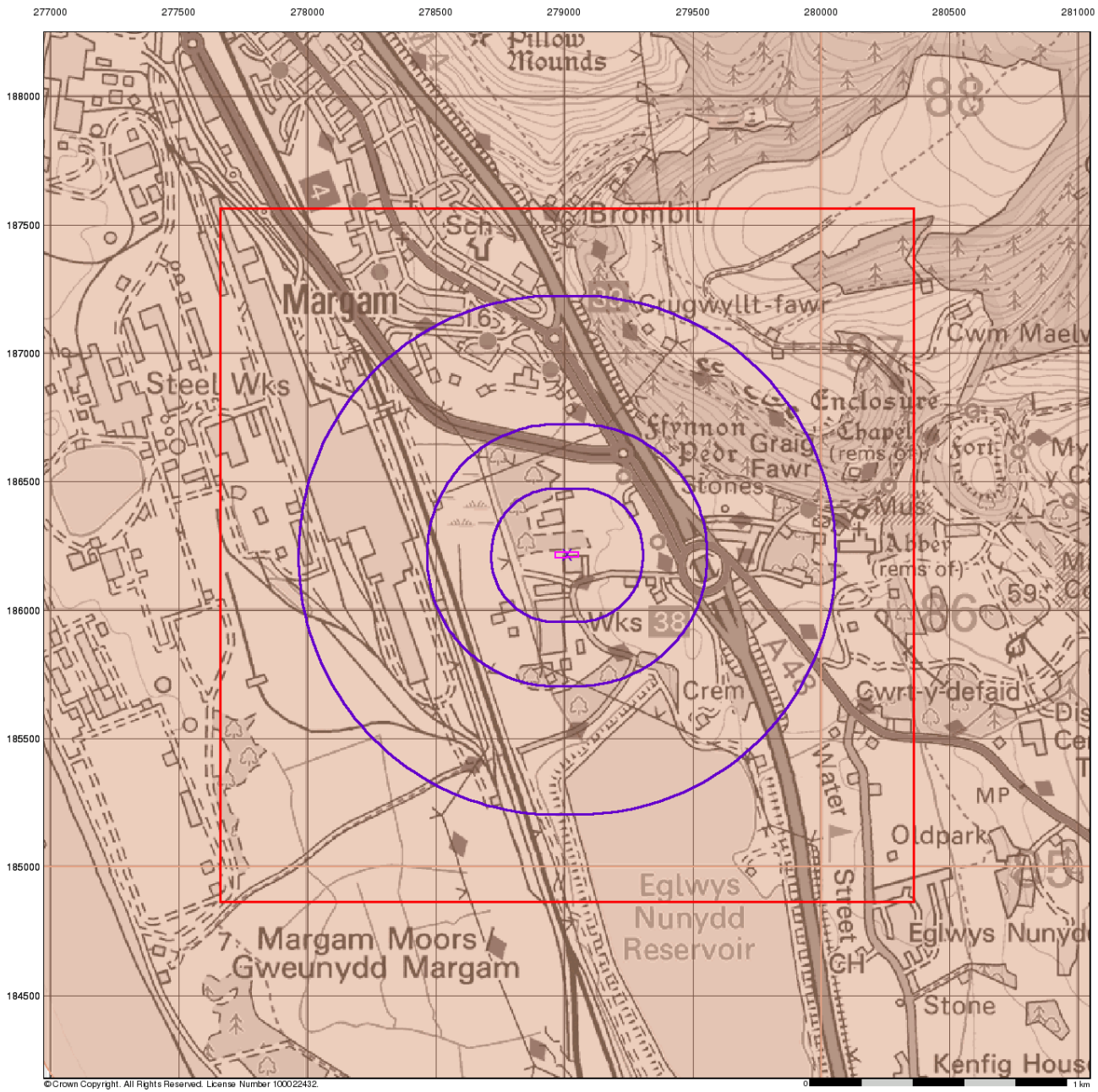


Bedrock Aquifer Designation

General

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

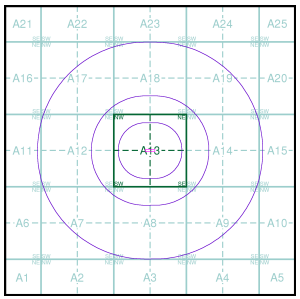
Slice | Map ID

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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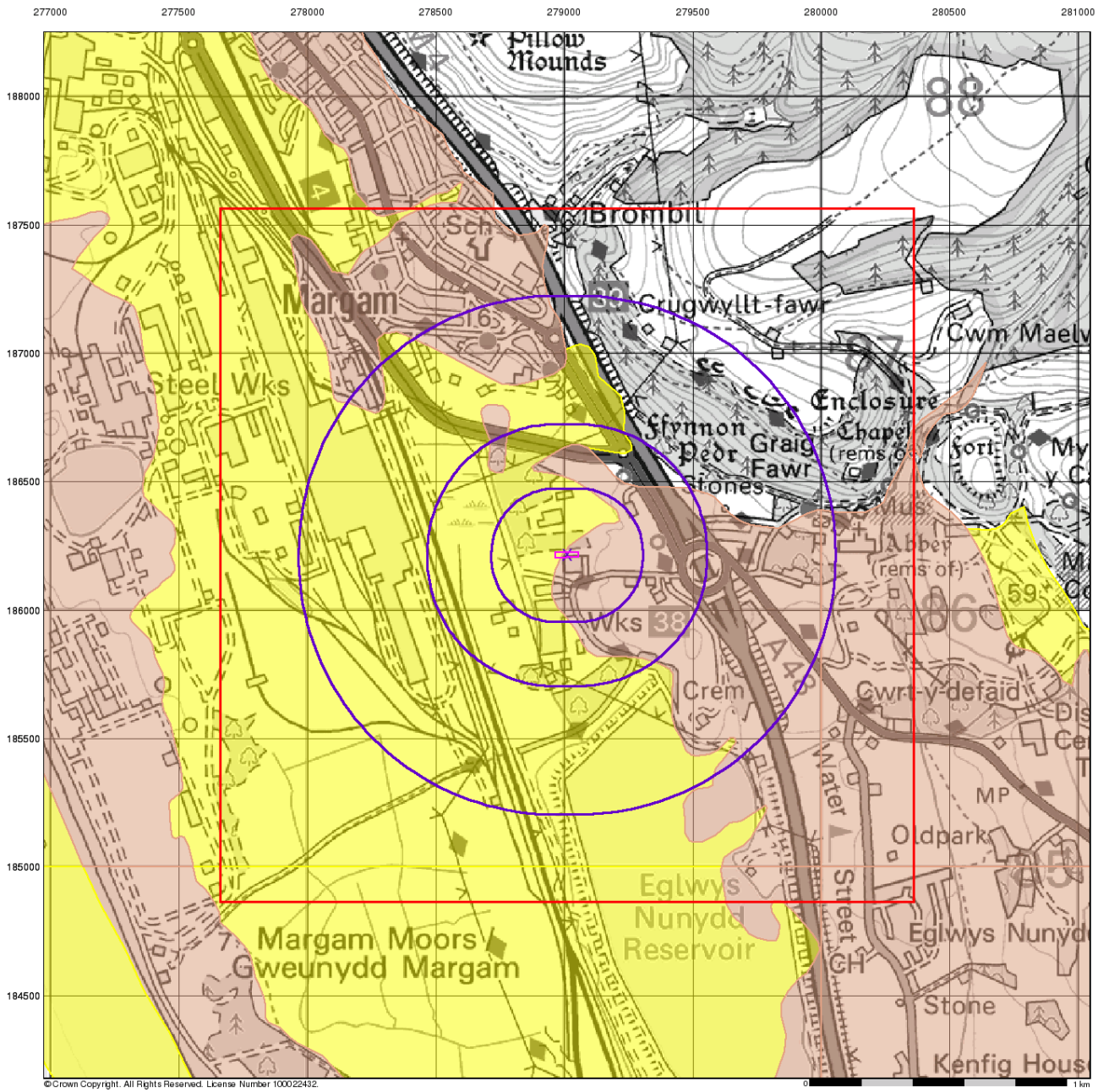


Superficial Aquifer Designation

General

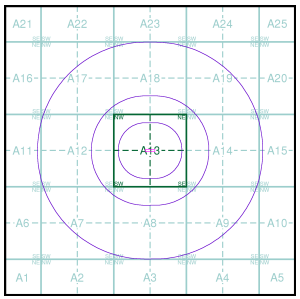
Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

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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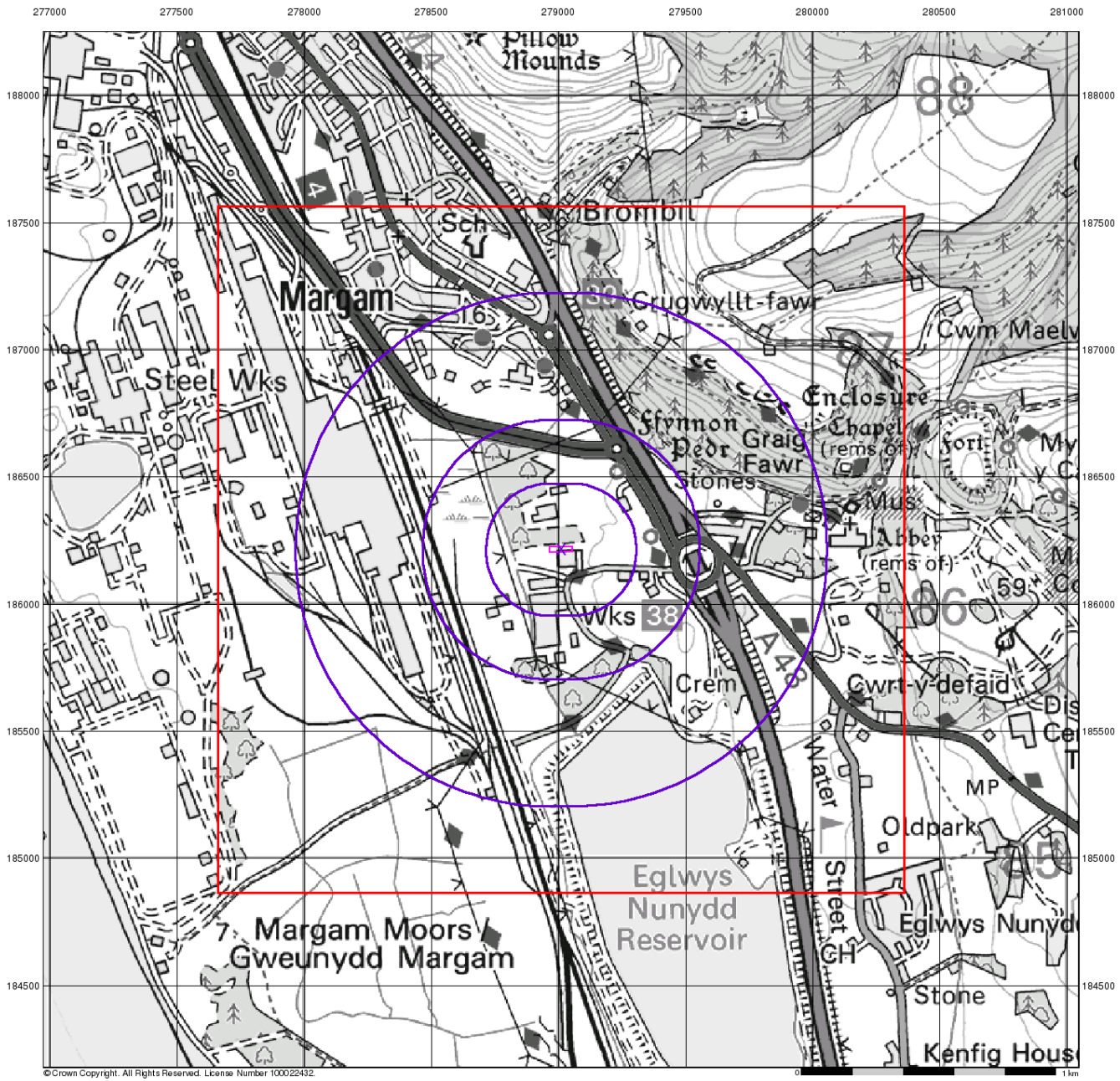


sirius

Source Protection Zones

General

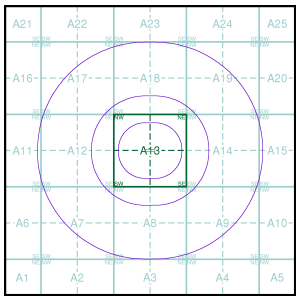
Specified Site | Specified Buffer(s) | Bearing Reference Point

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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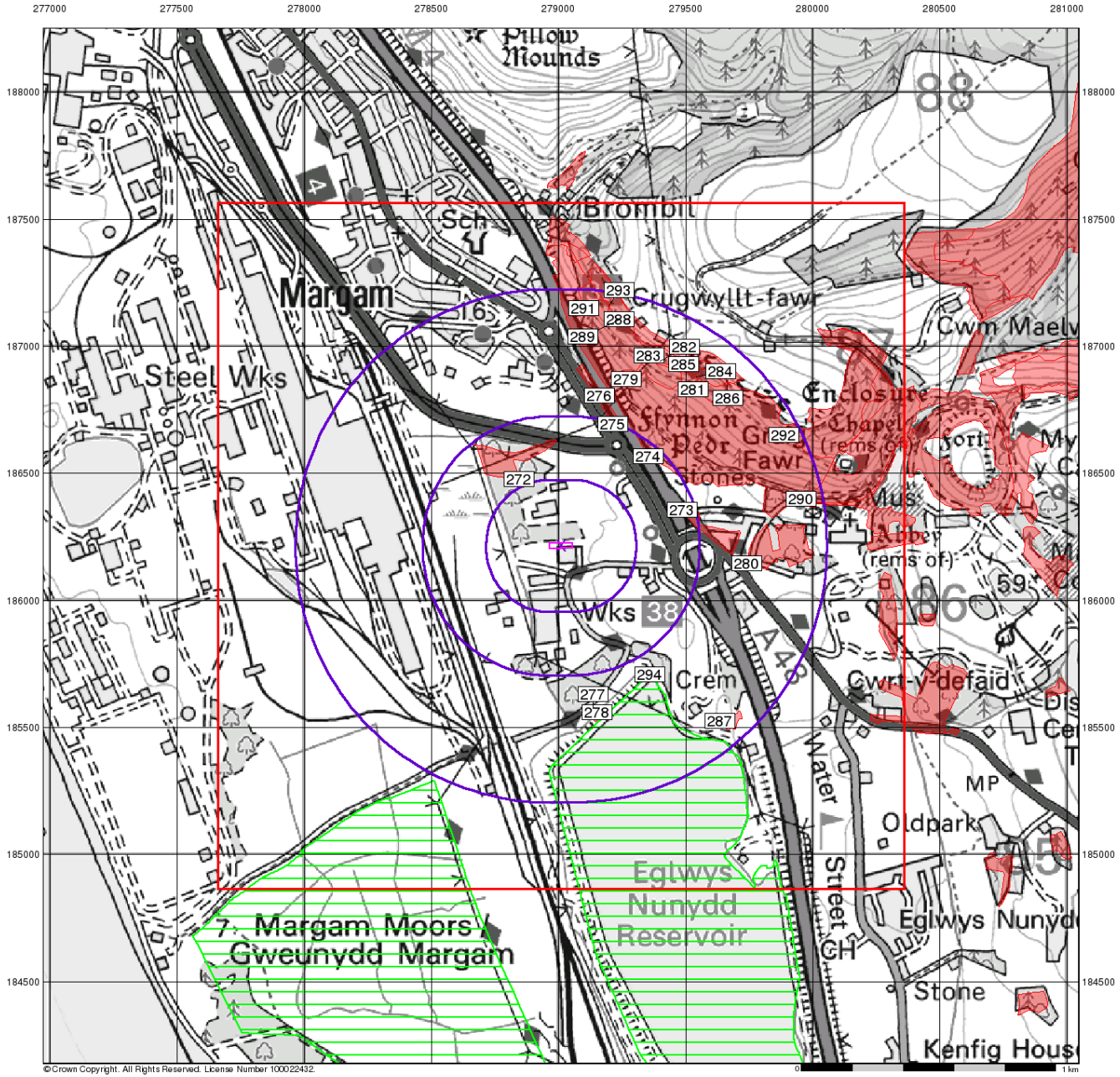


Sensitive Land Uses

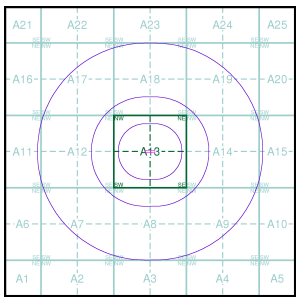
General

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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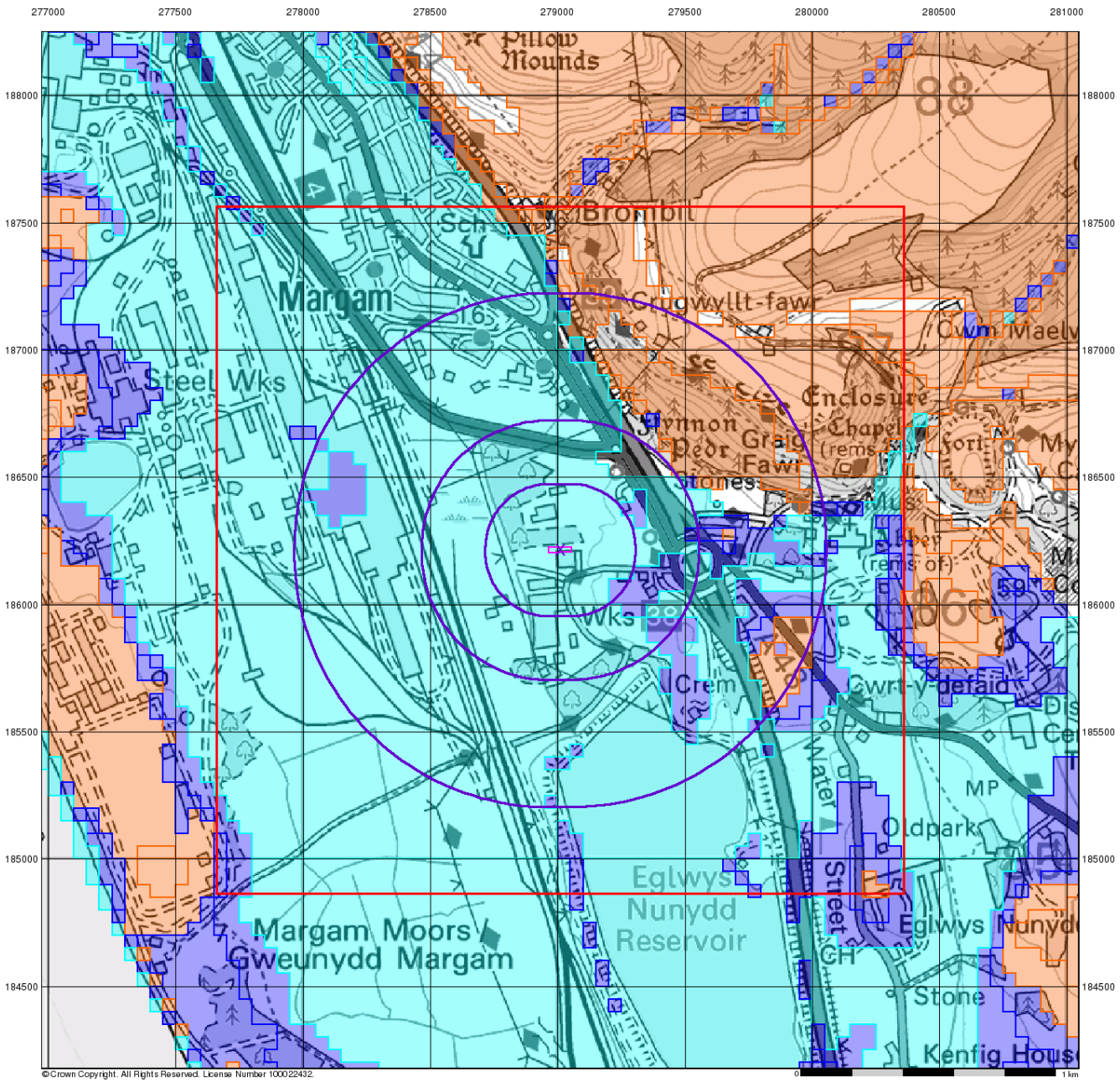


BGS Flood GFS Data

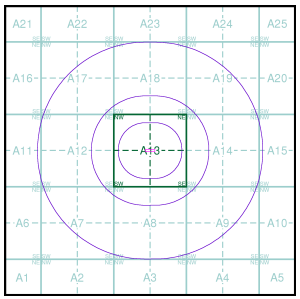
General

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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Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	LSGR	Landscaped Ground (Undivided)	Artificially Modified Ground	Not Supplied - Holocene
	MGR	Made Ground (Undivided)	Artificial Deposit	Not Supplied - Holocene
	SLIP	Landslide Deposit	Unknown/Unclassified Entry	Not Supplied - Quaternary

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	TFD	Tidal Flat Deposits	Clay, Silt and Sand	Not Supplied - Holocene
	ALV	Alluvium	Clay, Silt, Sand and Gravel	Not Supplied - Holocene
	GFICD	Glaciofluvial Ice Contact Deposits, Devensian	Sand and Gravel	Not Supplied - Devensian
	GFDUD	Glaciofluvial Deposits, Devensian	Sand and Gravel	Not Supplied - Devensian
	TILLD	Till, Devensian	Diamicton	Not Supplied - Devensian
	ALF	Alluvial Fan Deposits	Sand and Gravel	Not Supplied - Quaternary
	BSA	Blown Sand	Sand	Not Supplied - Quaternary
	STOB	Storm Beach Deposits	Gravel	Not Supplied - Quaternary
	MBD	Marine Beach Deposits	Sand and Gravel	Not Supplied - Quaternary

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	SWUCM	South Wales Upper Coal Measures Formation	Mudstone, Siltstone and Sandstone	Not Supplied - Westphalian
	LLFB	Llynfi Member	Sandstone	Not Supplied - Westphalian
	LLFB	Llynfi Member	Mudstone, Siltstone and Sandstone	Not Supplied - Westphalian
	RA	Rhondda Member	Sandstone	Not Supplied - Westphalian
	SWUCM	South Wales Upper Coal Measures Formation	Sandstone	Not Supplied - Westphalian
	RA	Rhondda Member	Mudstone, Siltstone and Sandstone	Not Supplied - Westphalian
	SWMCM	South Wales Middle Coal Measures Formation	Mudstone, Siltstone and Sandstone	Not Supplied - Westphalian
	SWLCM	South Wales Lower Coal Measures Formation	Mudstone, Siltstone and Sandstone	Not Supplied - Westphalian
		Faults		
		Rock Segments		

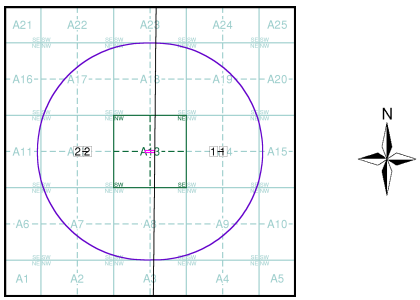
Geology 1:50,000 Maps

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 ID:**	**2**
Map Sheet No:	**248**	**Map Sheet No:**	**247**
Map Name:	**Pontypridd**	**Map Name:**	**Swansea**
Map Date:	**1960**	**Map Date:**	**2011**
Bedrock Geology:	**Available**	**Bedrock Geology:**	**Available**
Superficial Geology:	**Available**	**Superficial Geology:**	**Available**
Artificial Geology:	**Not Available**	**Artificial Geology:**	**Available**
Faults:	**Not Supplied**	**Faults:**	**Not Supplied**
Landslip:	**Available**	**Landslip:**	**Available**
Rock Segments:	**Not Supplied**	**Rock Segments:**	**Not Supplied**

Geology 1:50,000 Maps - Slice A



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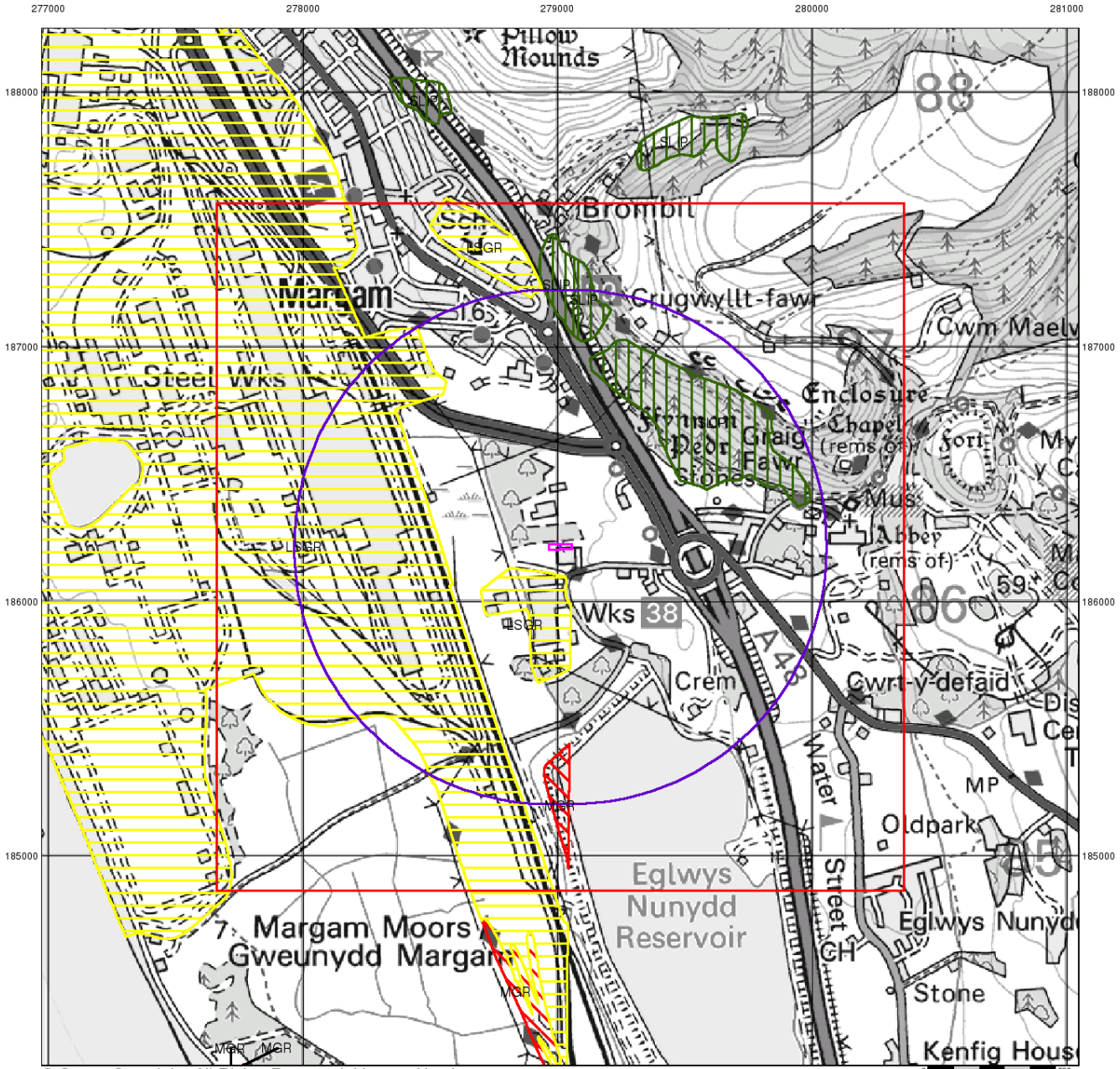


Artificial Ground and Landslip

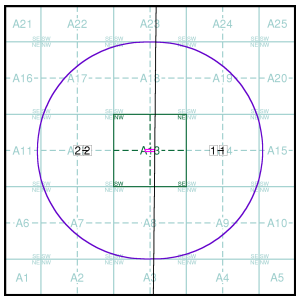
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions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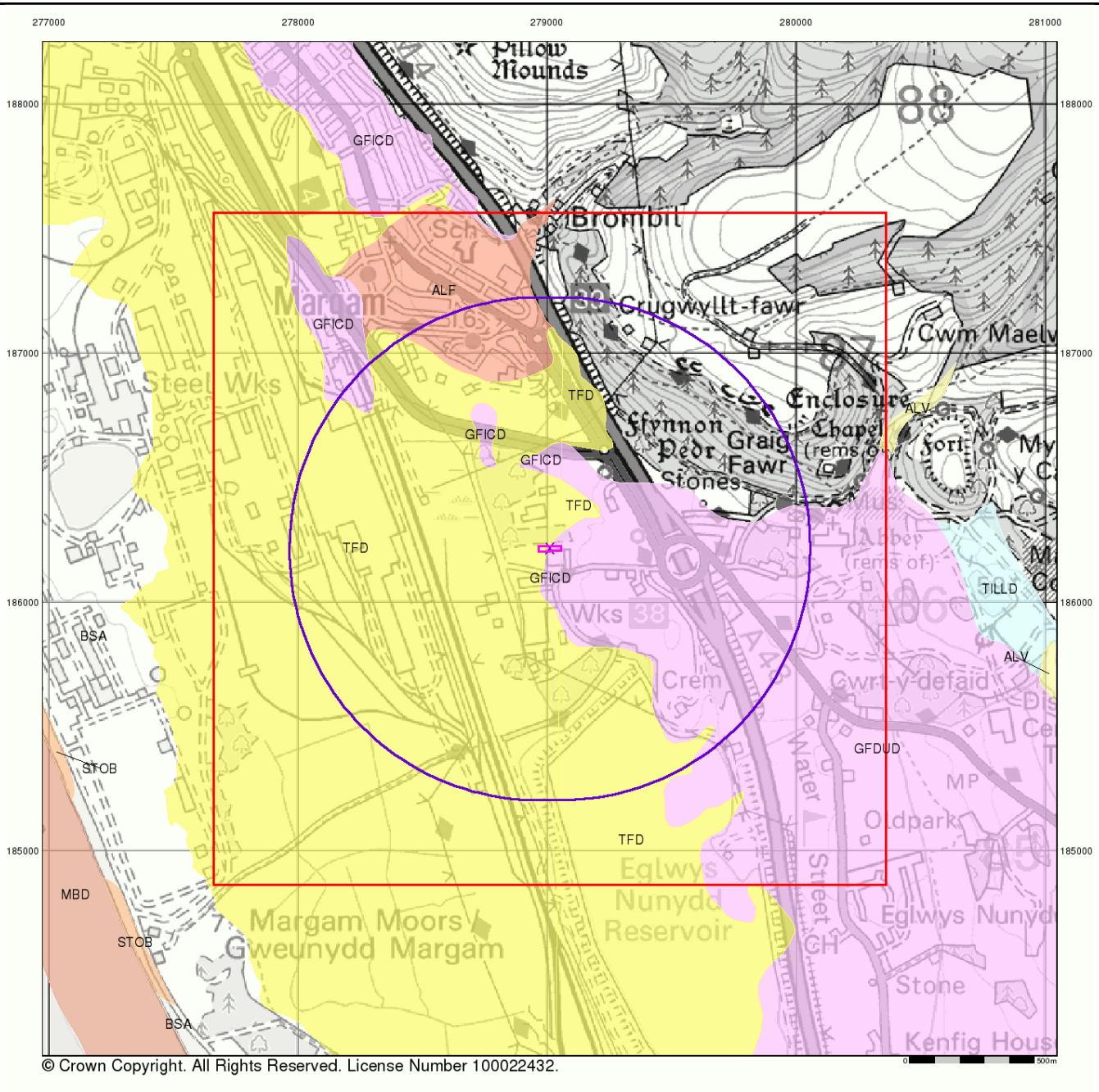


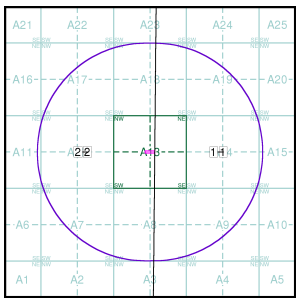
Superficial Geology

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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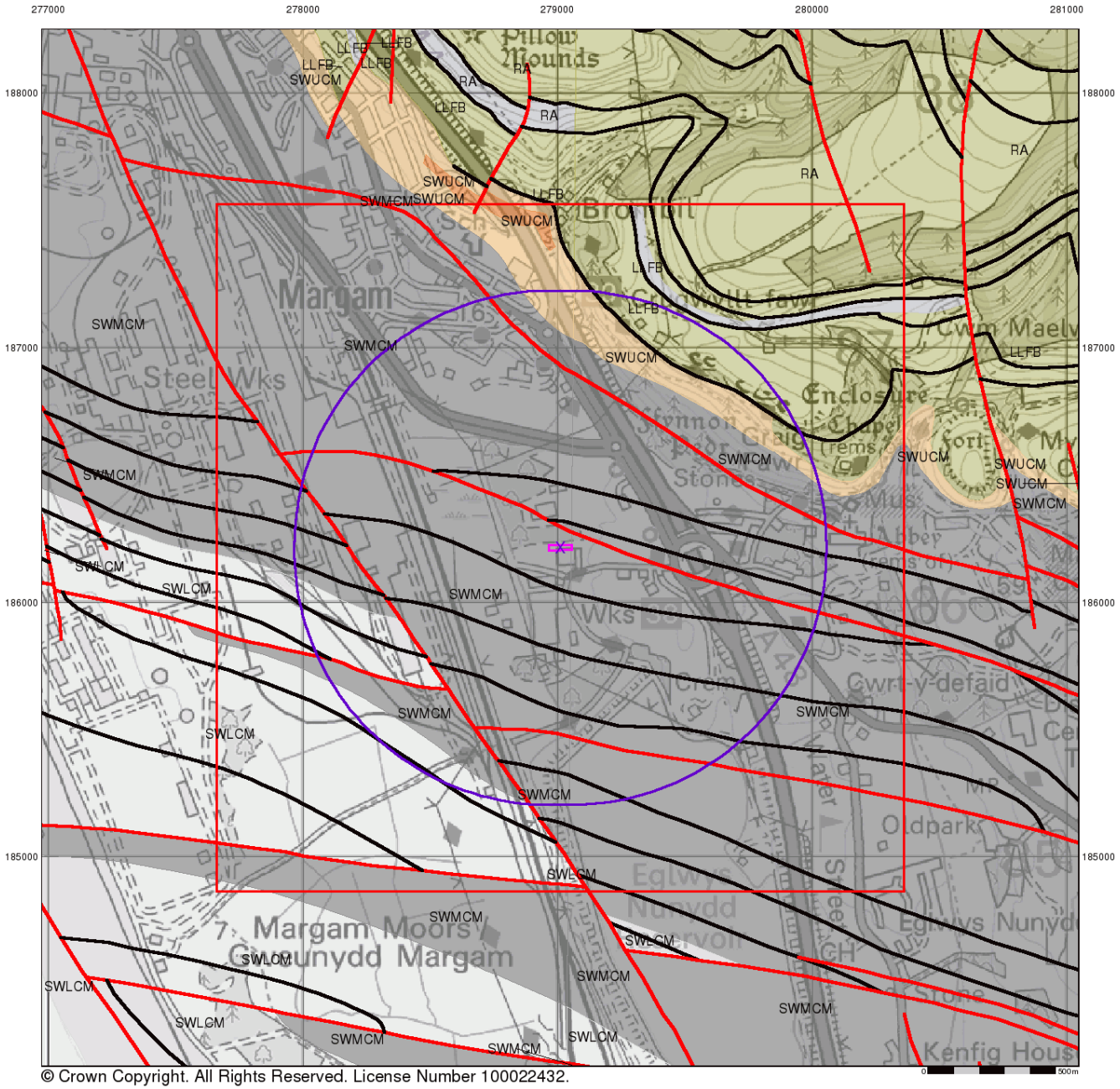


Bedrock and Faults

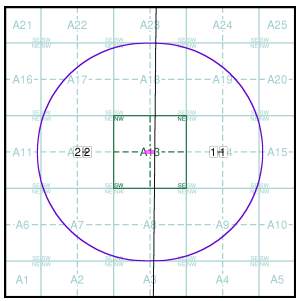
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

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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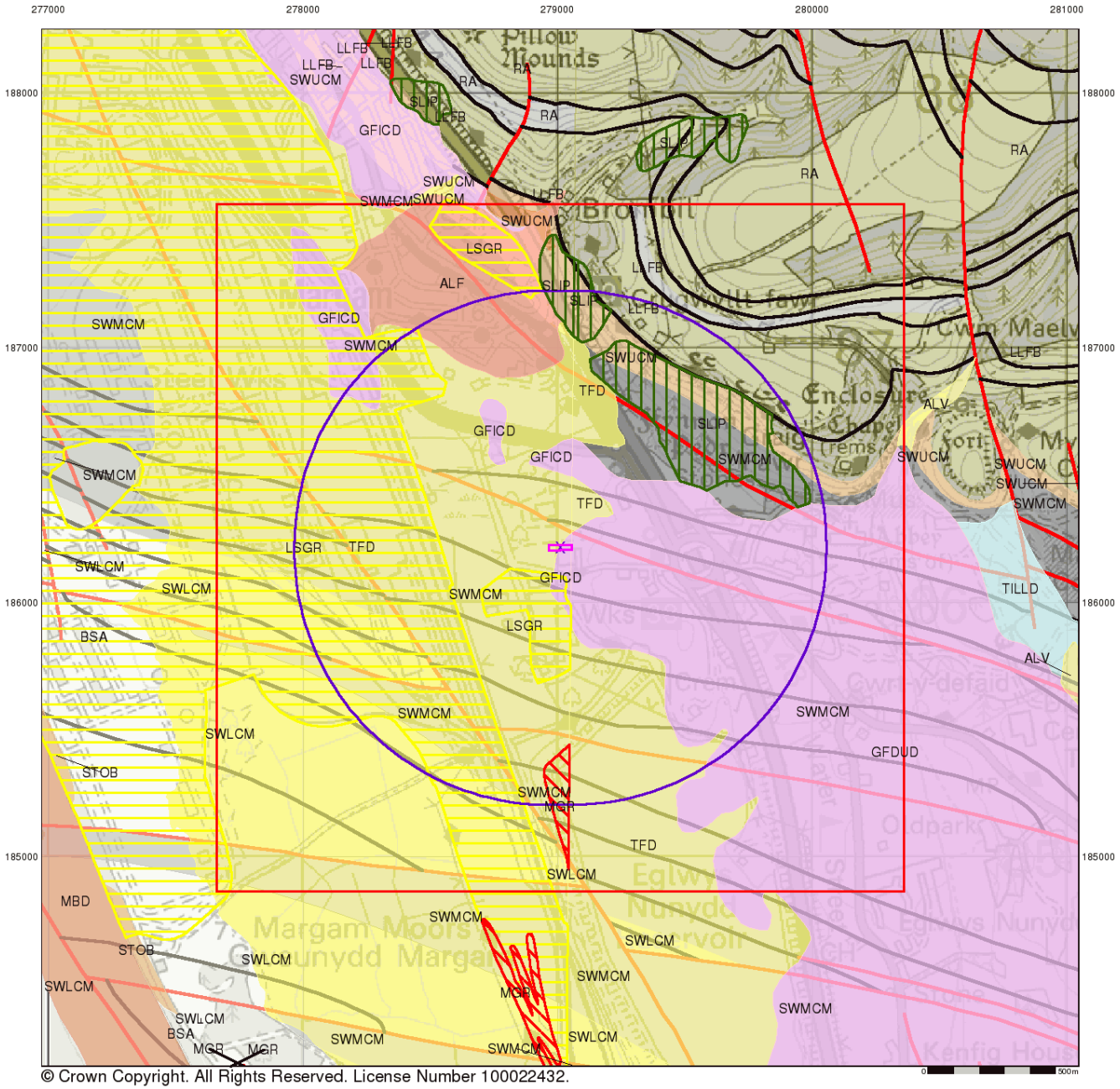


Combined Surface Geology

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.

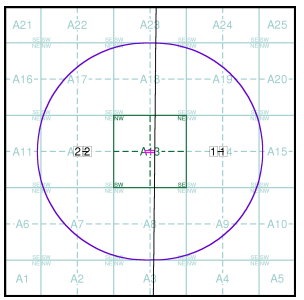
Additional Information

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
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

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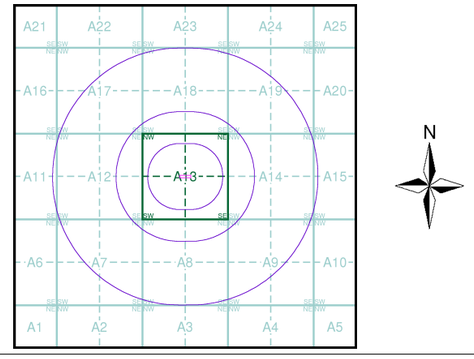
Historical Mapping & Photography included:

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	1938 - 1952	5
Glamorganshire	1:10,560	1951	6
Ordnance Survey Plan	1:10,000	1964 - 1965	7
Ordnance Survey Plan	1:10,000	1969	8
Ordnance Survey Plan	1:10,000	1982 - 1988	9
Ordnance Survey Plan	1:10,000	1990 - 1993	10
10K Raster Mapping	1:10,000	1999	11
Street View	Variable		12

Historical Map - Slice A



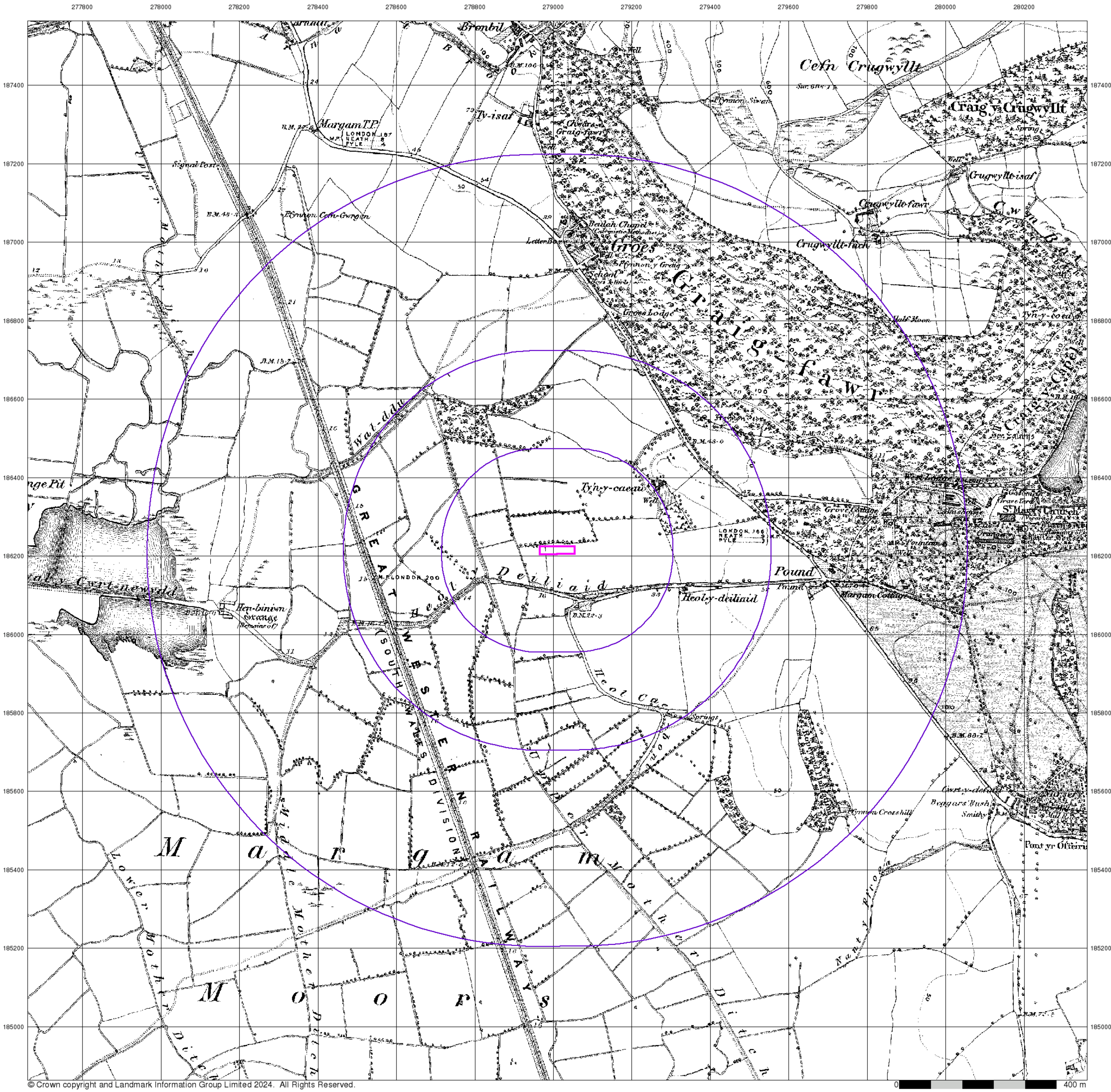
Order Details

Order Number: 339233484_1_1
Customer Ref: PRO1001
National Grid Reference: 279010, 186210
Slice: A
Site Area (Ha): 0.18
Search Buffer (m): 1000

Site Details

Site at 279010, 186210

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



Glamorganshire

Published 1885

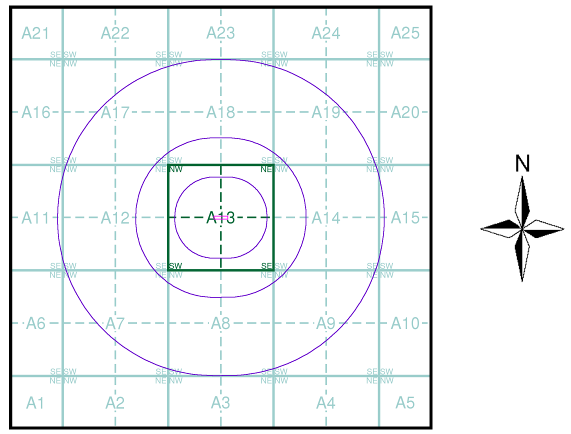
Source map scale - 1:10,560

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)

03300
1885
1:10,560

Historical Map - Slice A



Order Details

Order Number: 339233484_1_1
Customer Ref: PRO1001
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Slice: A
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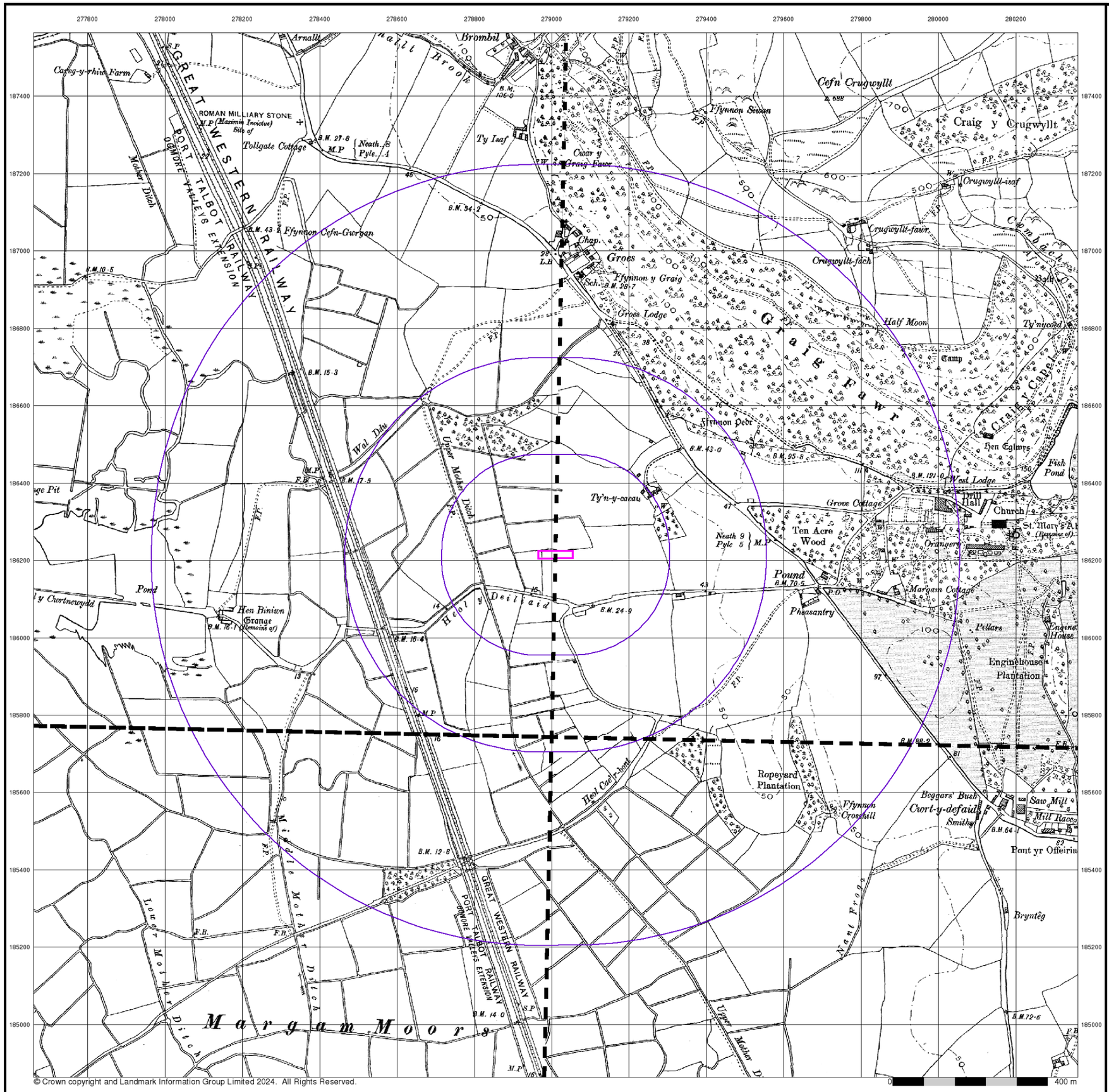


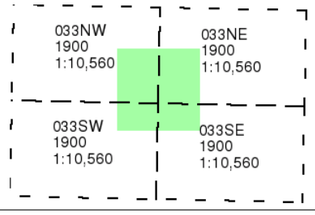
Glamorganshire

Published 1900

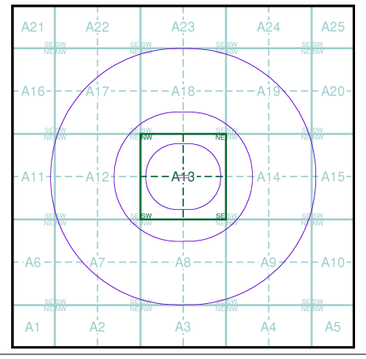
Source map scale - 1:10,560

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



Order Details

Order Number:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
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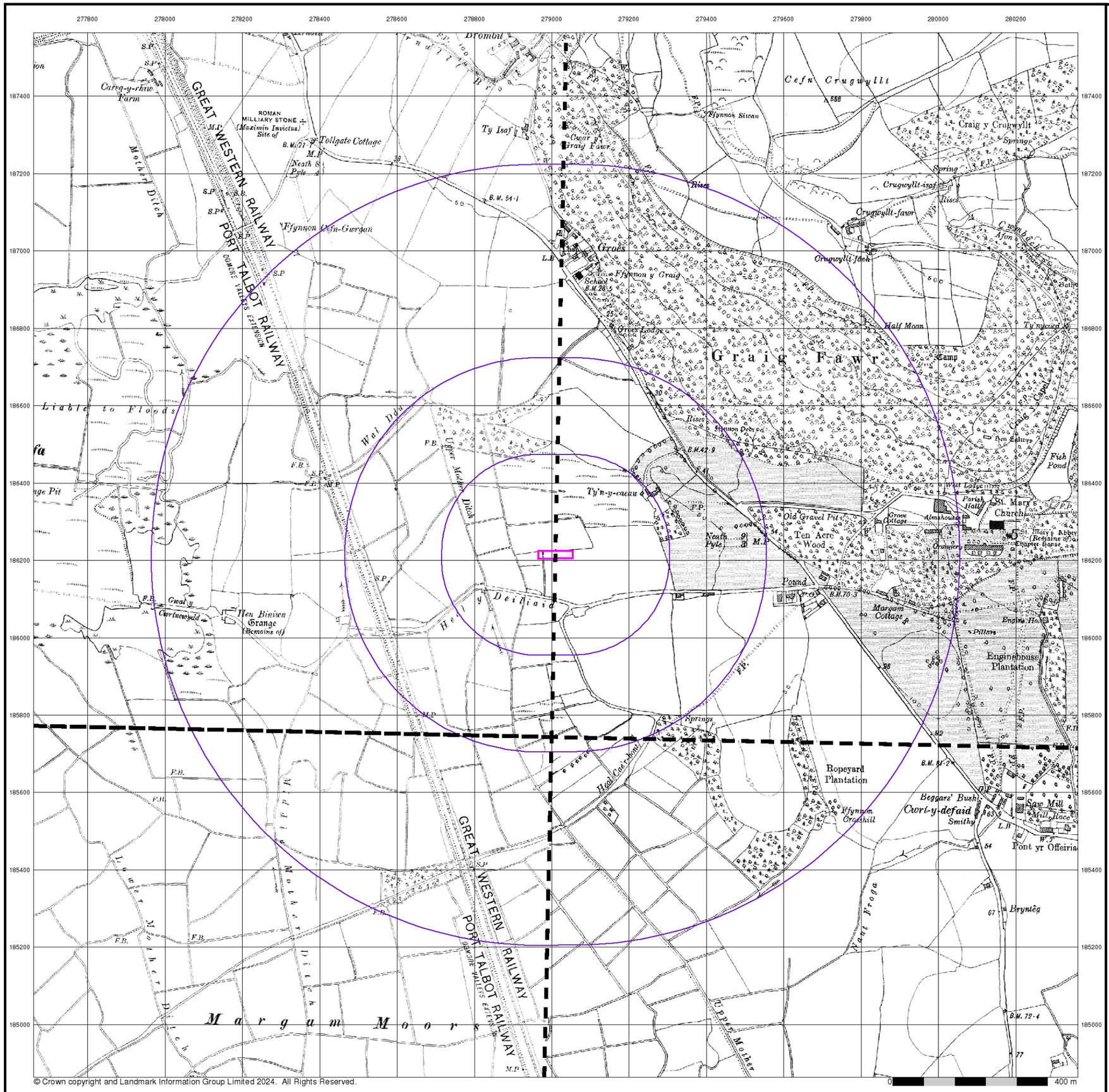


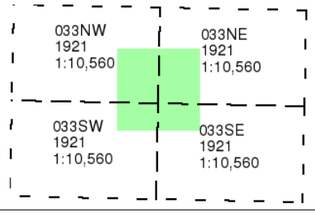
Glamorganshire

Published 1921

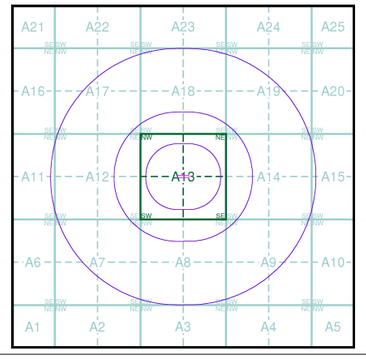
Source map scale - 1:10,560

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)



Historical Map - Slice A



Order Details

Order Number:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	1000

Site Details

Site at 279010, 186210

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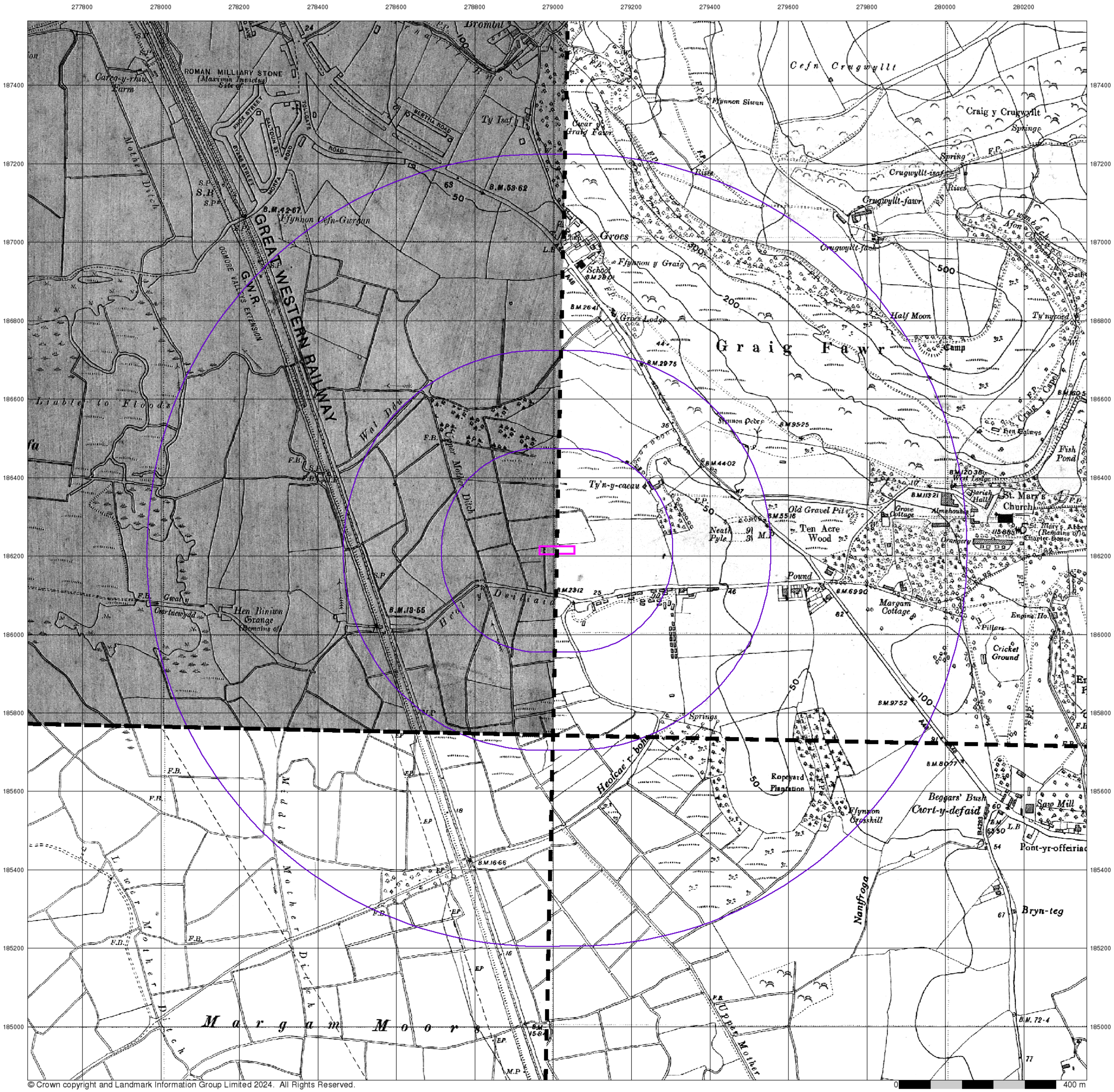


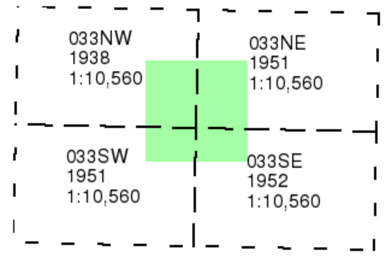
Glamorganshire

Published 1938 - 1952

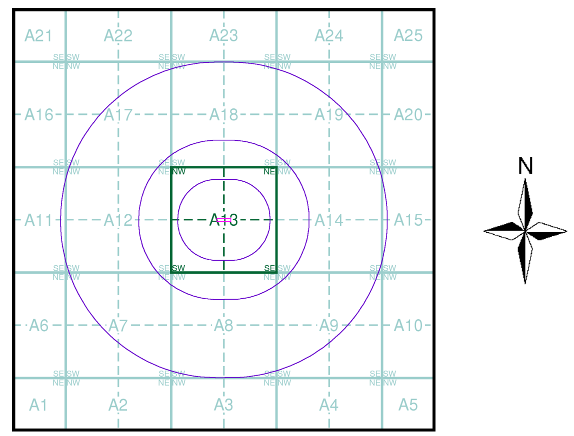
Source map scale - 1:10,560

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)



Historical Map - Slice A



Order Details

Order Number:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	1000

Site Details

Site at 279010, 186210

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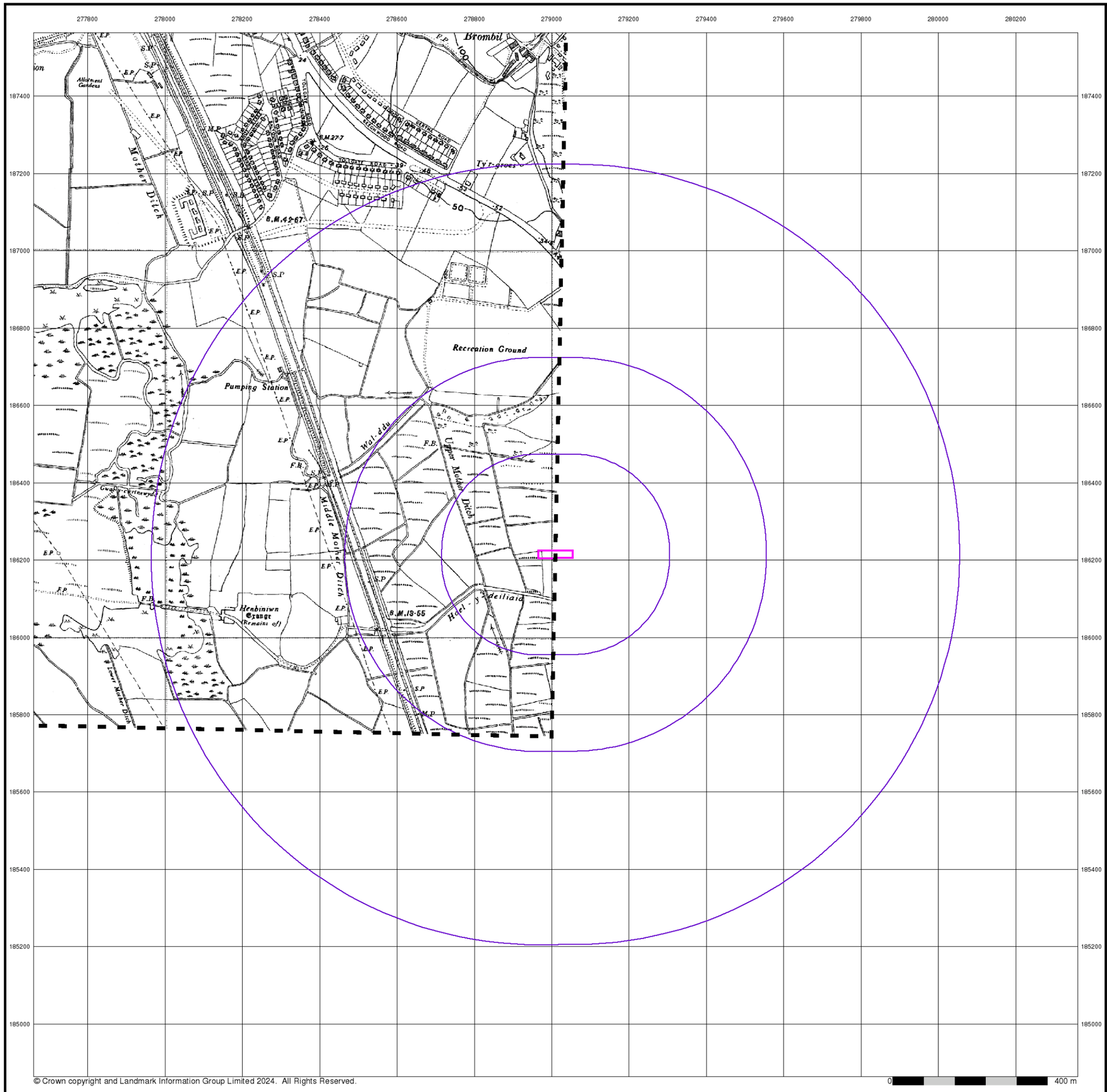


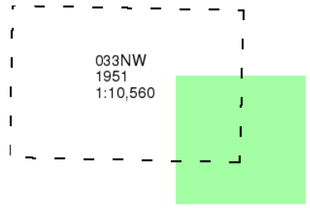
Glamorganshire

Published 1951

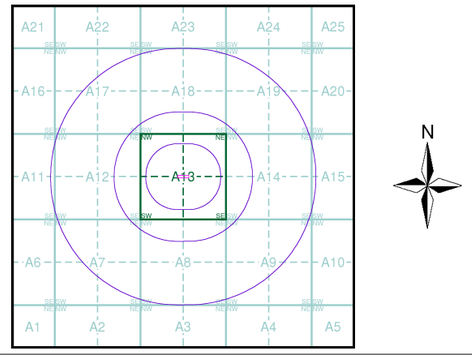
Source map scale - 1:10,560

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



Order Details

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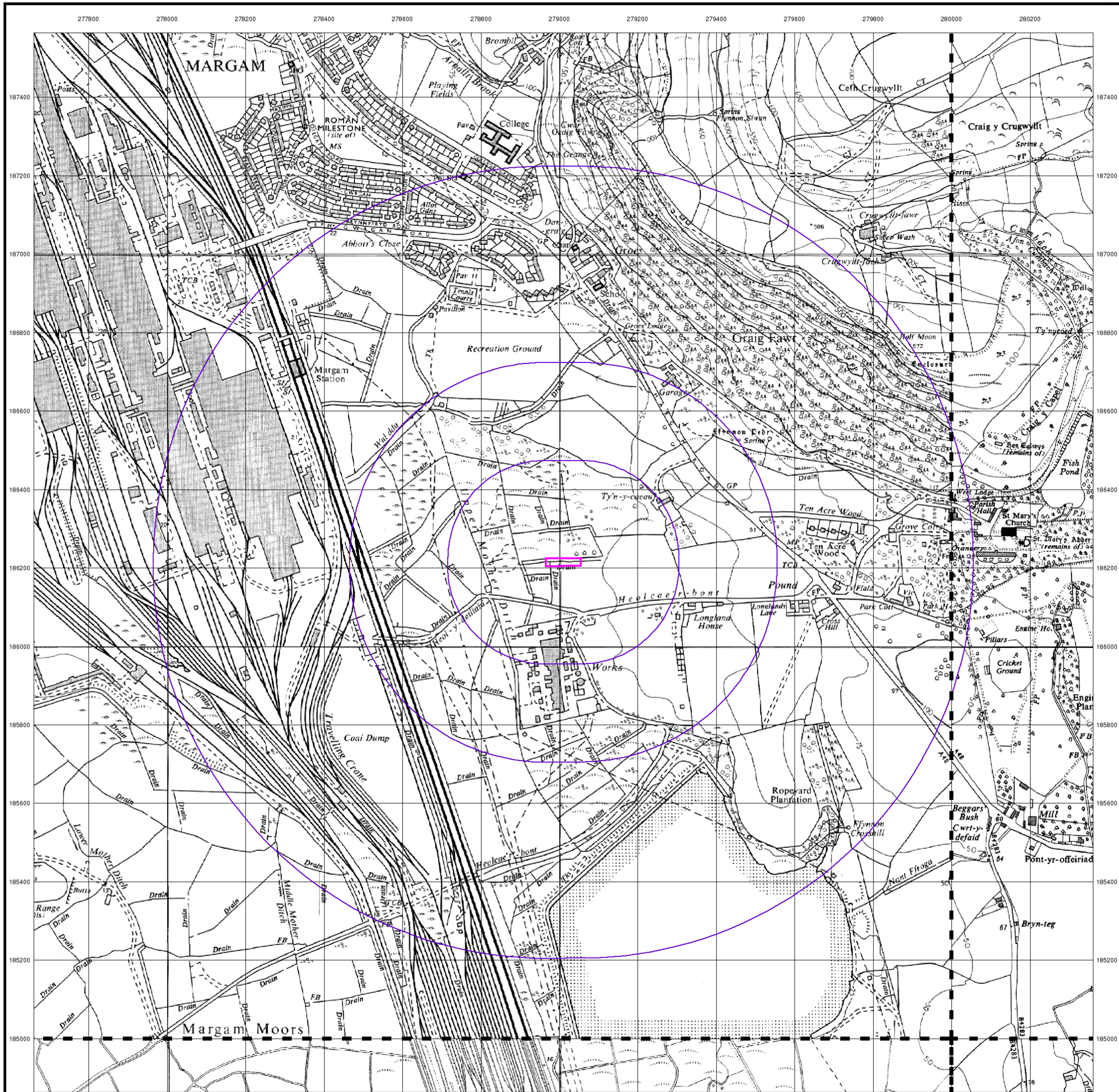


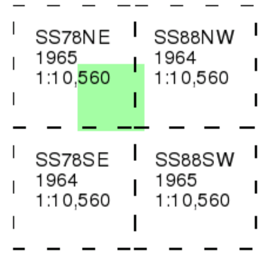
Ordnance Survey Plan

Published 1964 - 1965

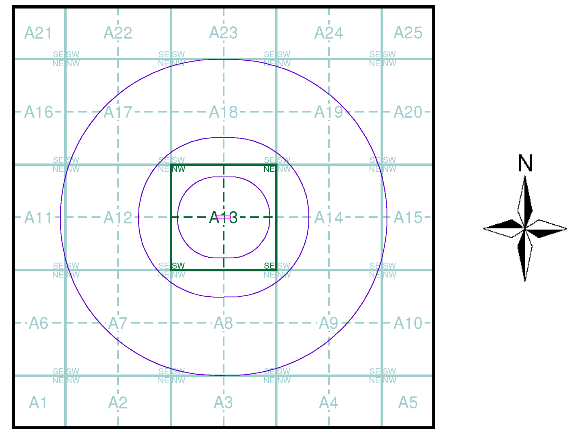
Source map scale - 1:10,000

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



Order Details

Order Number: 339233484_1_1
Customer Ref: PRO1001
National Grid Reference: 279010, 186210
Slice: A
Site Area (Ha): 0.18
Search Buffer (m): 1000

Site Details

Site at 279010, 186210

Landmark INFORMATION GROUP
Tel: 0844 844 9952
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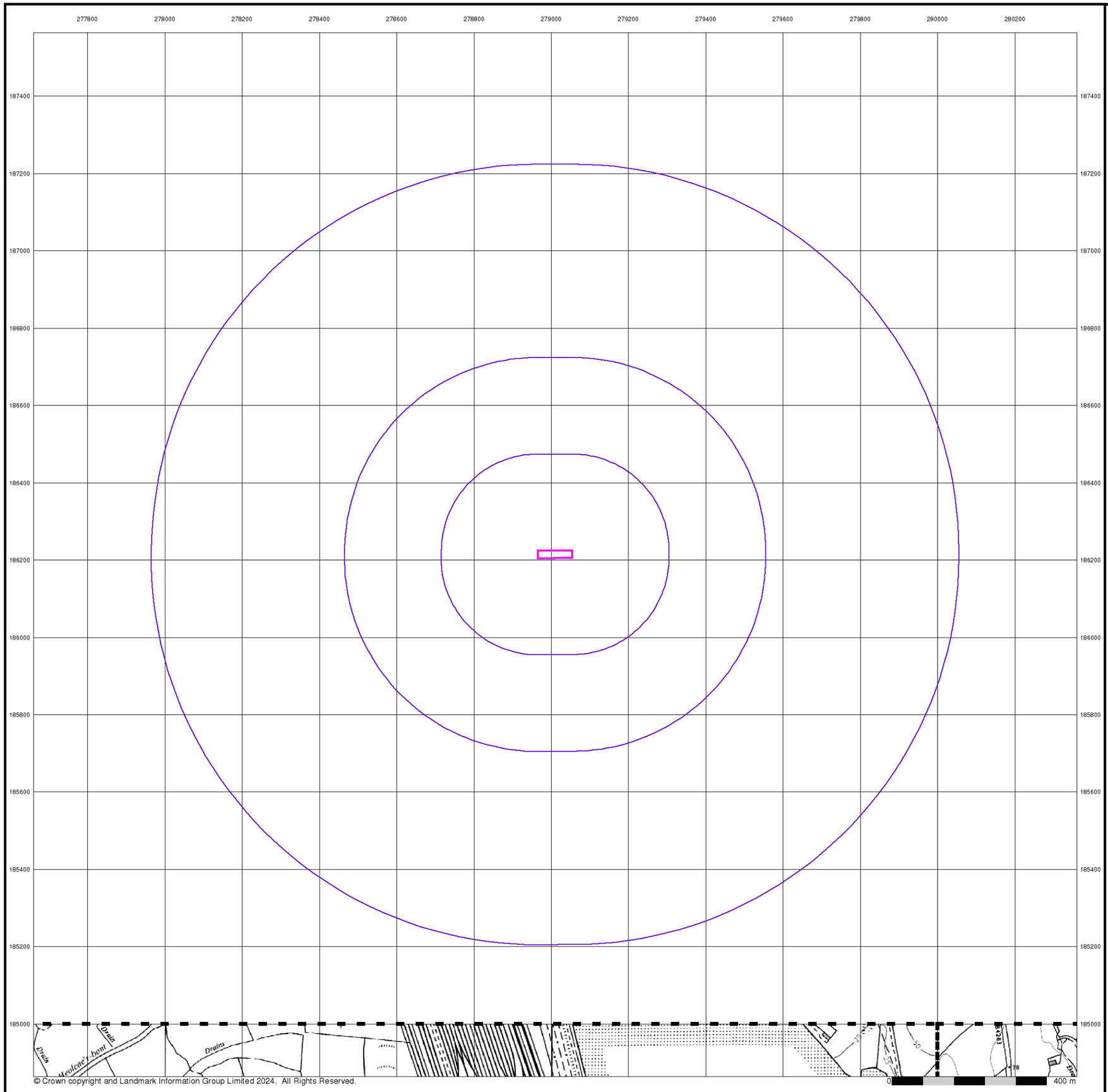


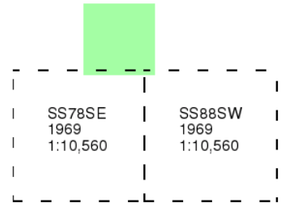
Ordnance Survey Plan

Published 1969

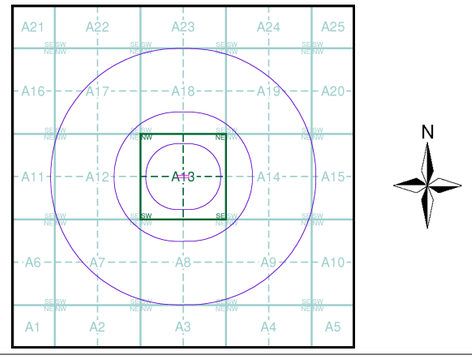
Source map scale - 1:10,000

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



Order Details

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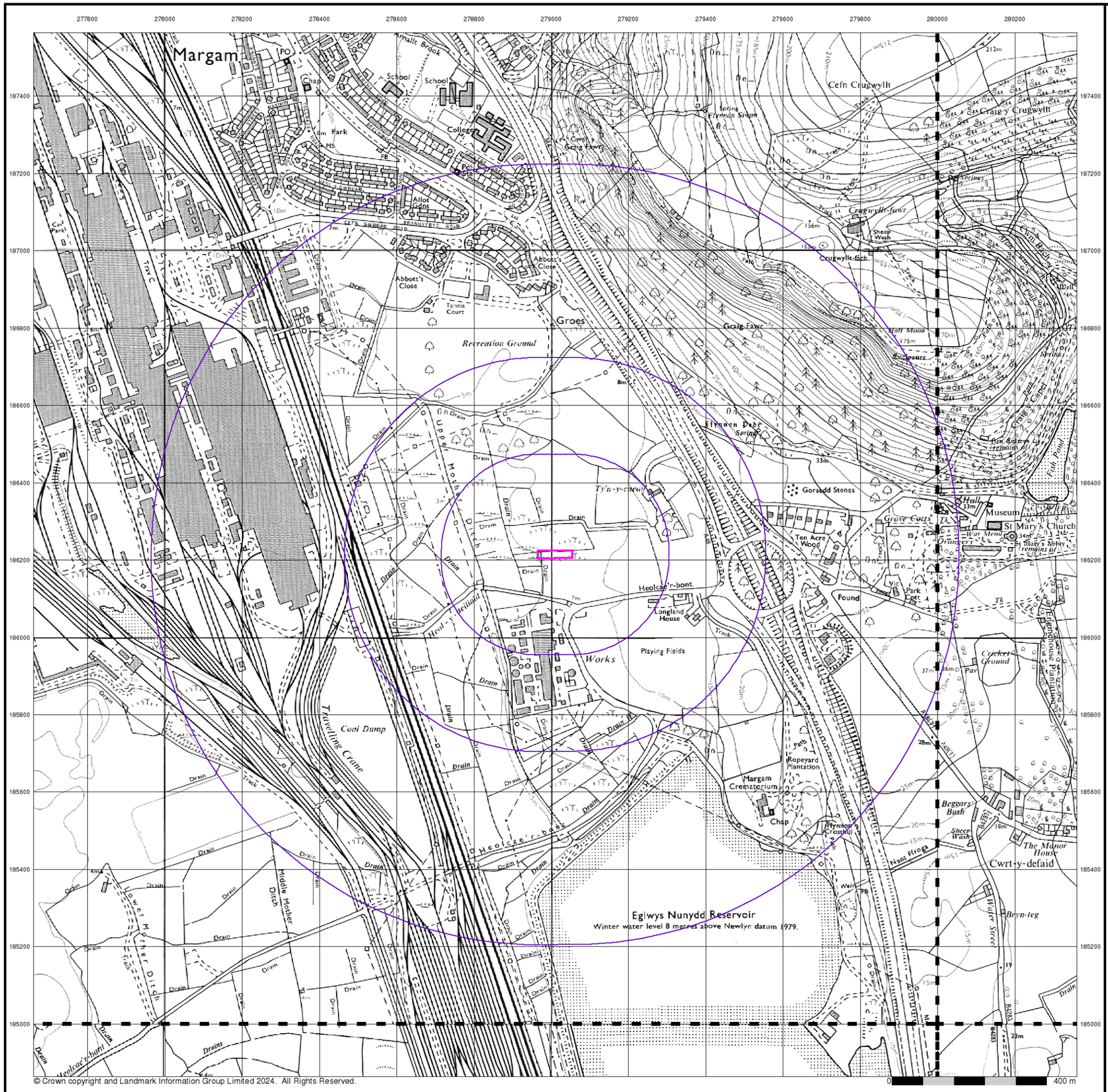


sirius

Ordnance Survey Plan

Published 1982 - 1988

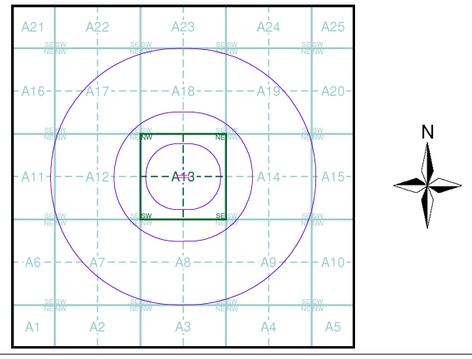
Source map scale - 1:10,000

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)

SS78NE 1982 1:10,000	SS88NW 1988 1:10,000
SS78SE 1988 1:10,000	SS88SW 1987 1:10,000

Historical Map - Slice A



Order Details

Order Number:	339233484_1_1
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Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	1000

Site Details

Site at 279010, 186210

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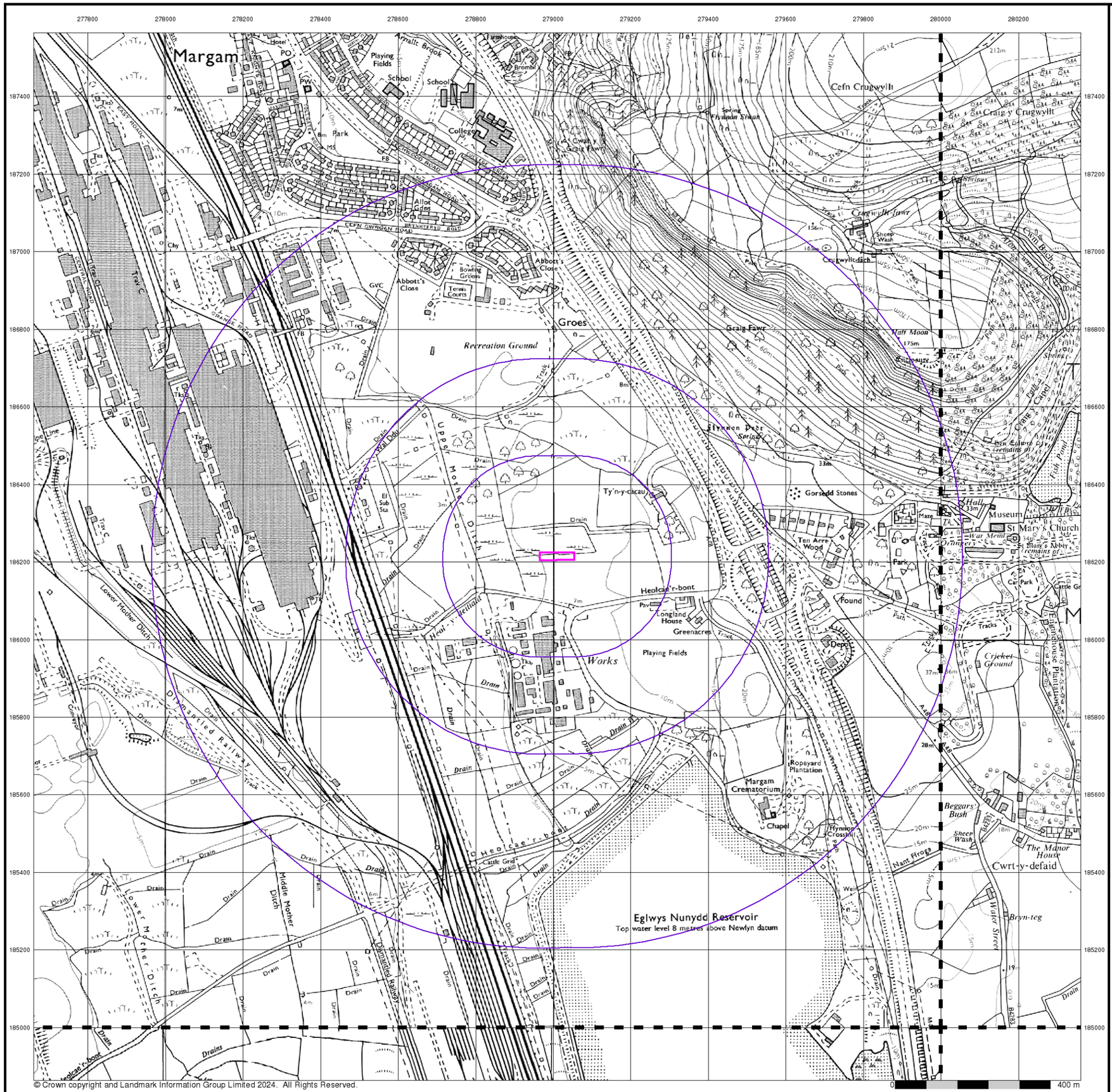

Ordnance Survey Plan

Published 1990 - 1993

Source map scale - 1:10,000

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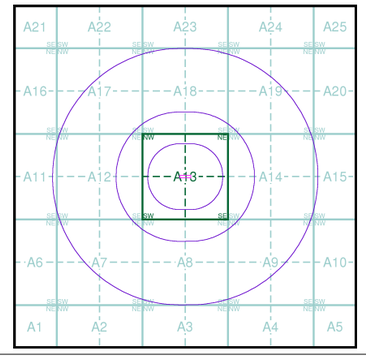
Map Name(s) and Date(s)

SS78NE 1993 1:10,000

SS88NW 1991 1:10,000

SS78SE 1990 1:10,000

Historical Map - Slice A



Order Details

Order Number:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	1000

Site Details

Site at 279010, 186210

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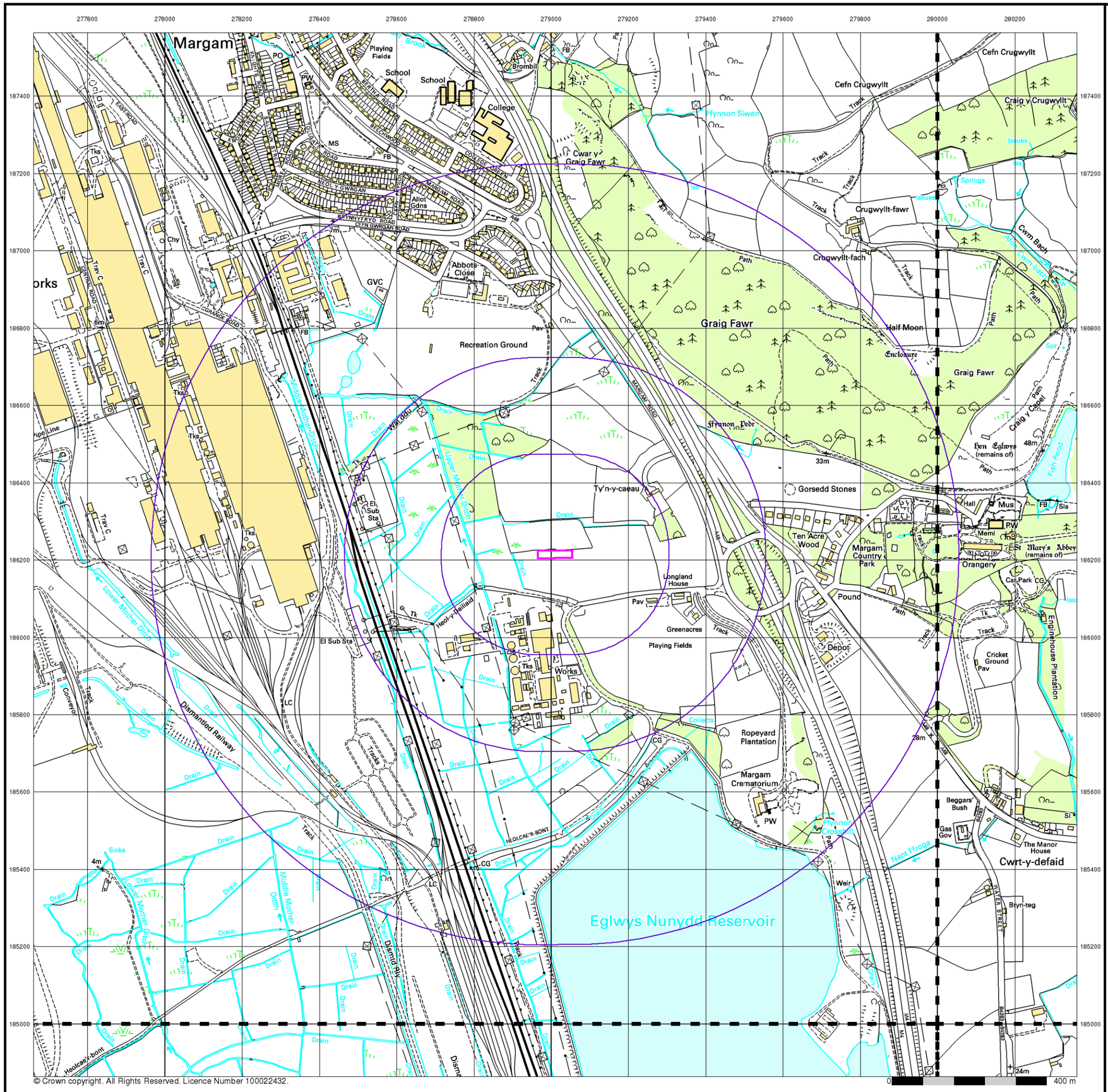


10k Raster Mapping

Published 1999

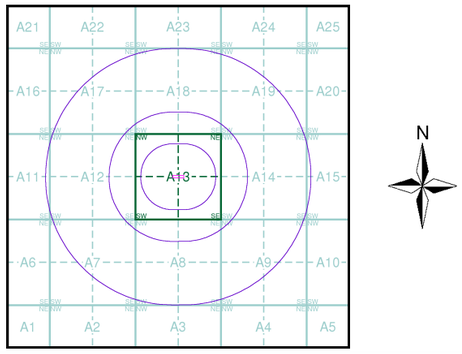
Source map scale - 1:10,000

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)

SS78NE 1999 1:10,000	SS88NW 1999 1:10,000
SS78SE 1999 1:10,000	SS88SW 1999 1:10,000

Historical Map - Slice A



Order Details

Order Number:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
Slice:	A
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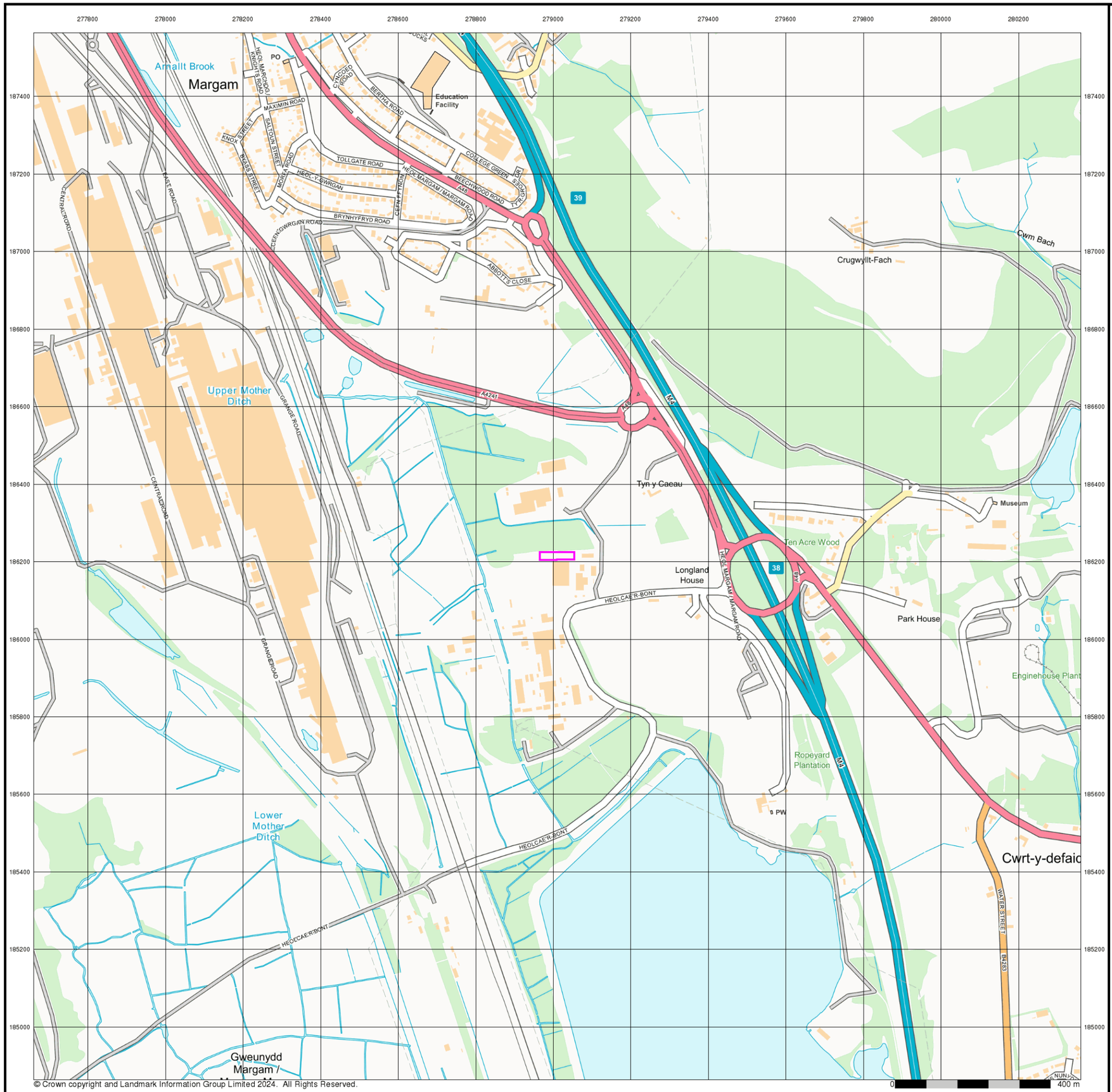


Street View

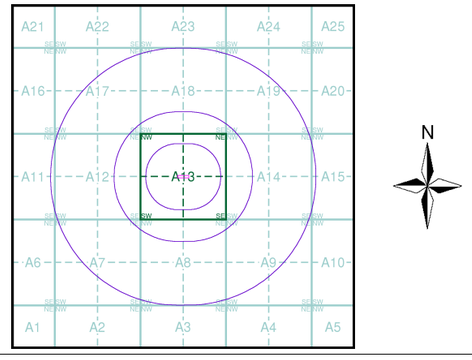
Published 2024

Source map scale - 1:10,000

Street View is a street-level map for the whole of Great Britain produced by the Ordnance Survey. These maps are provided at a nominal scale of 1:10,000

Map Name(s) and Date(s)

Street View Map - Slice A



Order Details

Order Number:	339233484_1_1
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Search Buffer (m):	1000

Site Details

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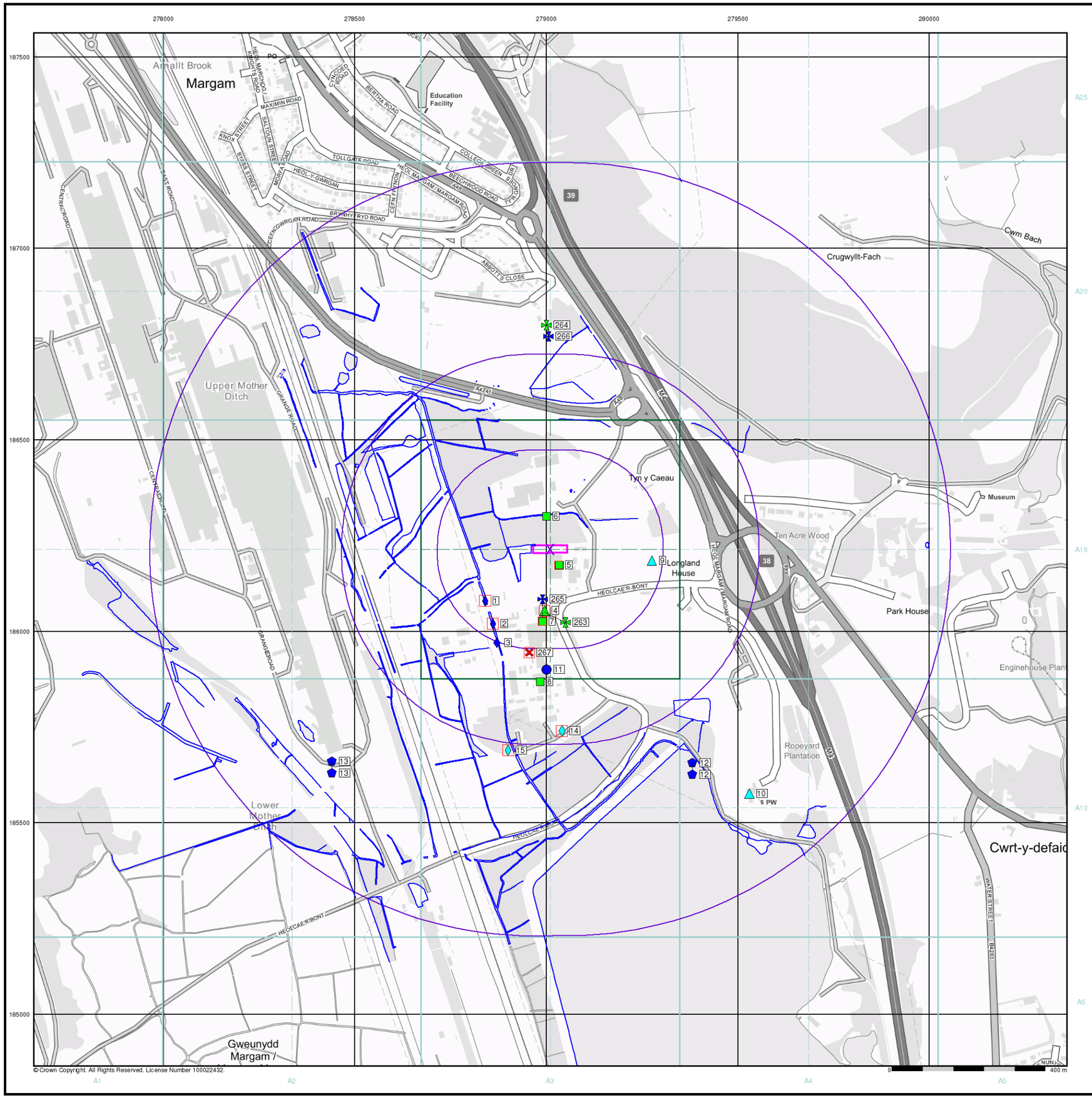


General

- 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

Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

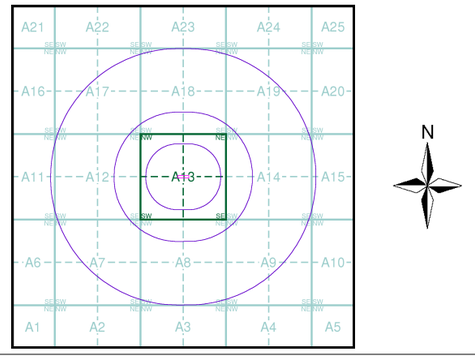
Waste

- 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
- 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

Hazardous Substances

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

Site Sensitivity Map - Slice A



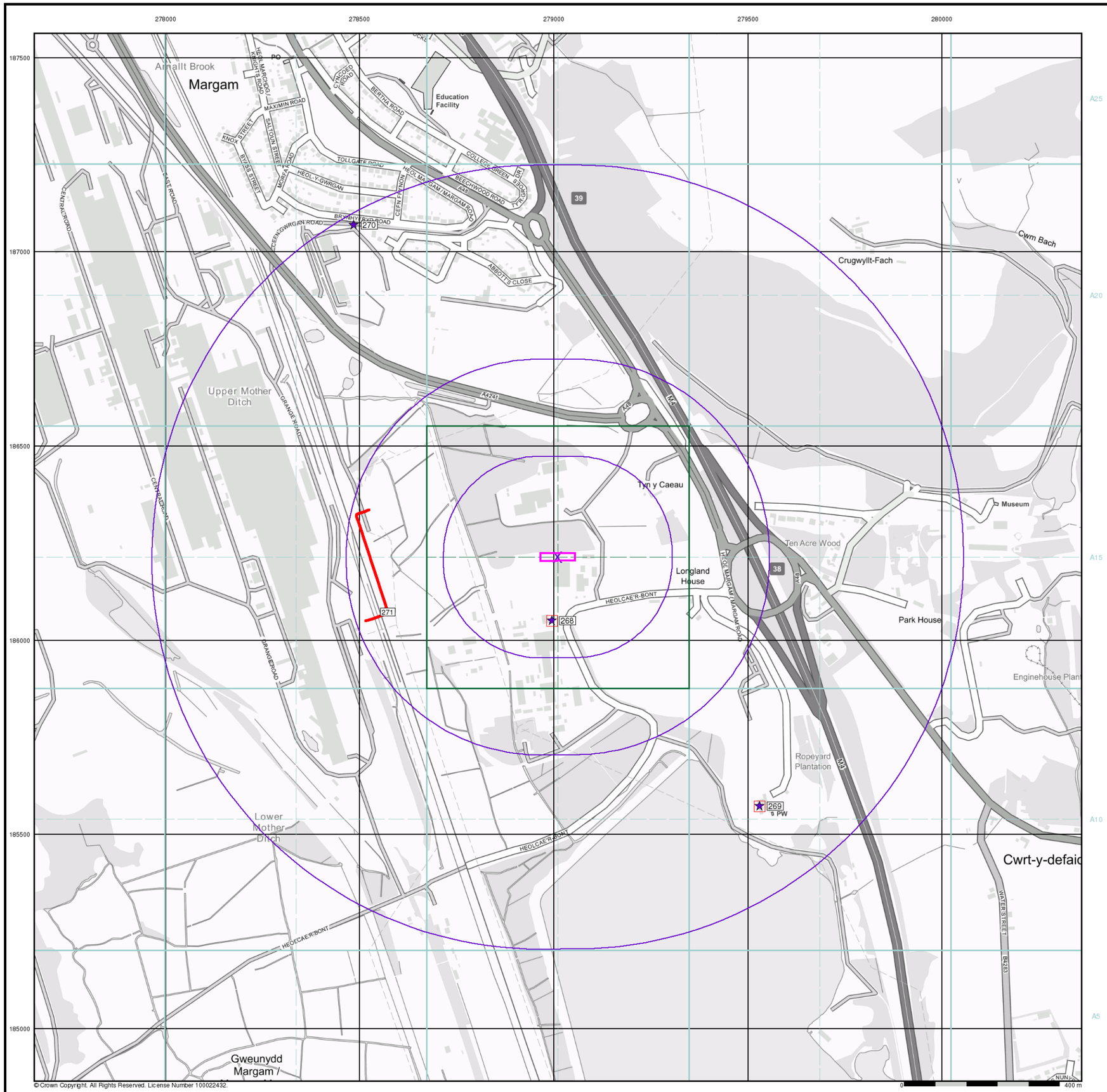
Order Details

Order Number:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	1000

Site Details

Site at 279010, 186210

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



Industrial Land Use Map

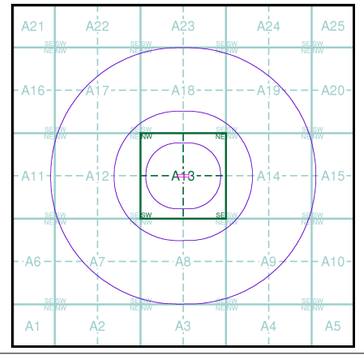
General

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

Industrial Land Use

Contemporary Trade Directory Entry
Fuel Station Entry
Gas Pipeline
Underground Electrical Cables

Industrial Land Use Map - Slice A



Order Details

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Site Area (Ha):	0.18
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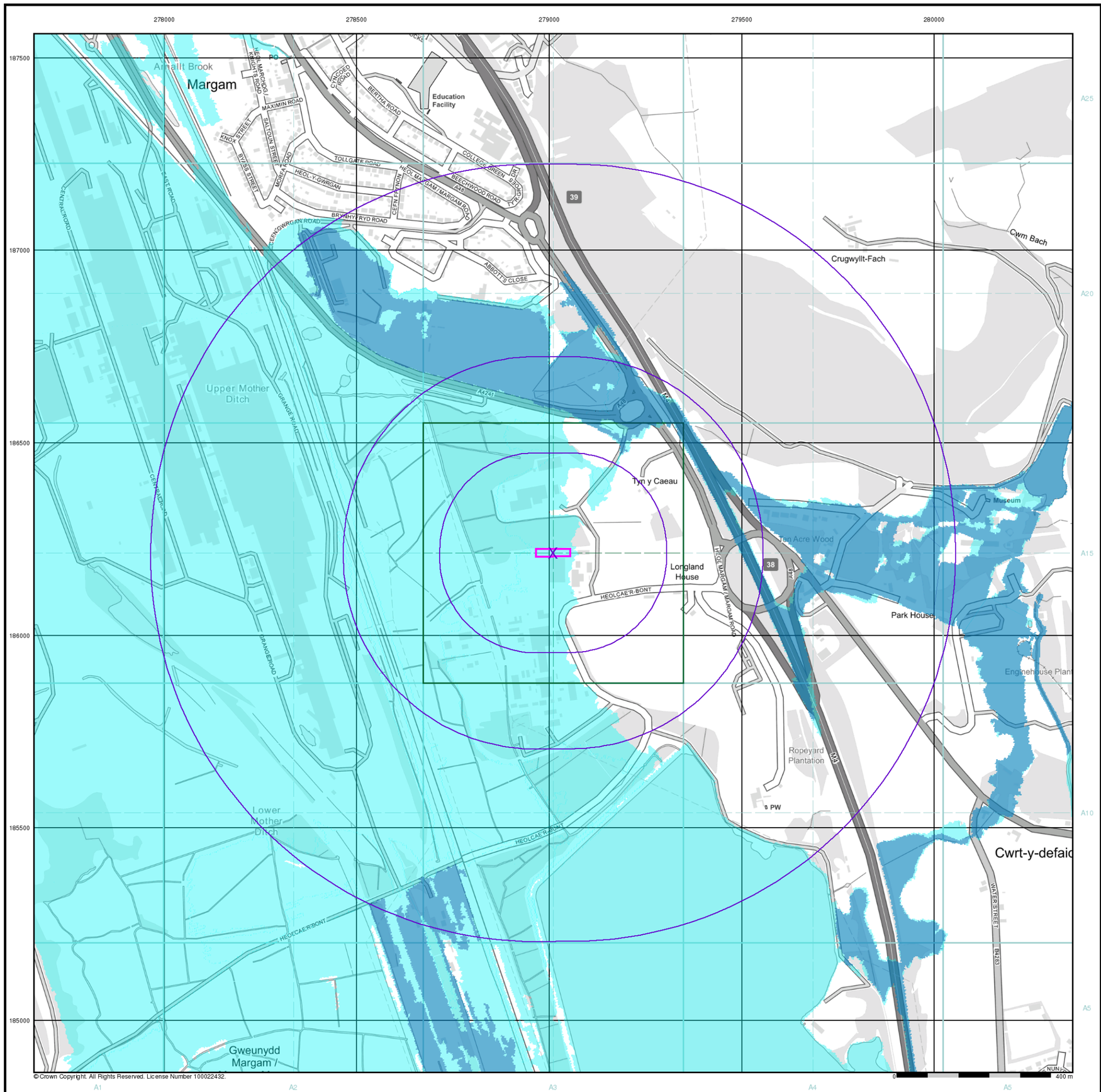


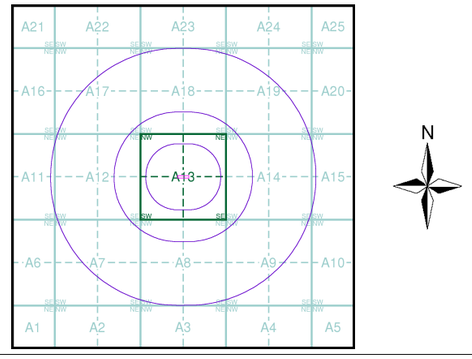
General

- 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



Order Details

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National Grid Reference:	279010, 186210
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	1000

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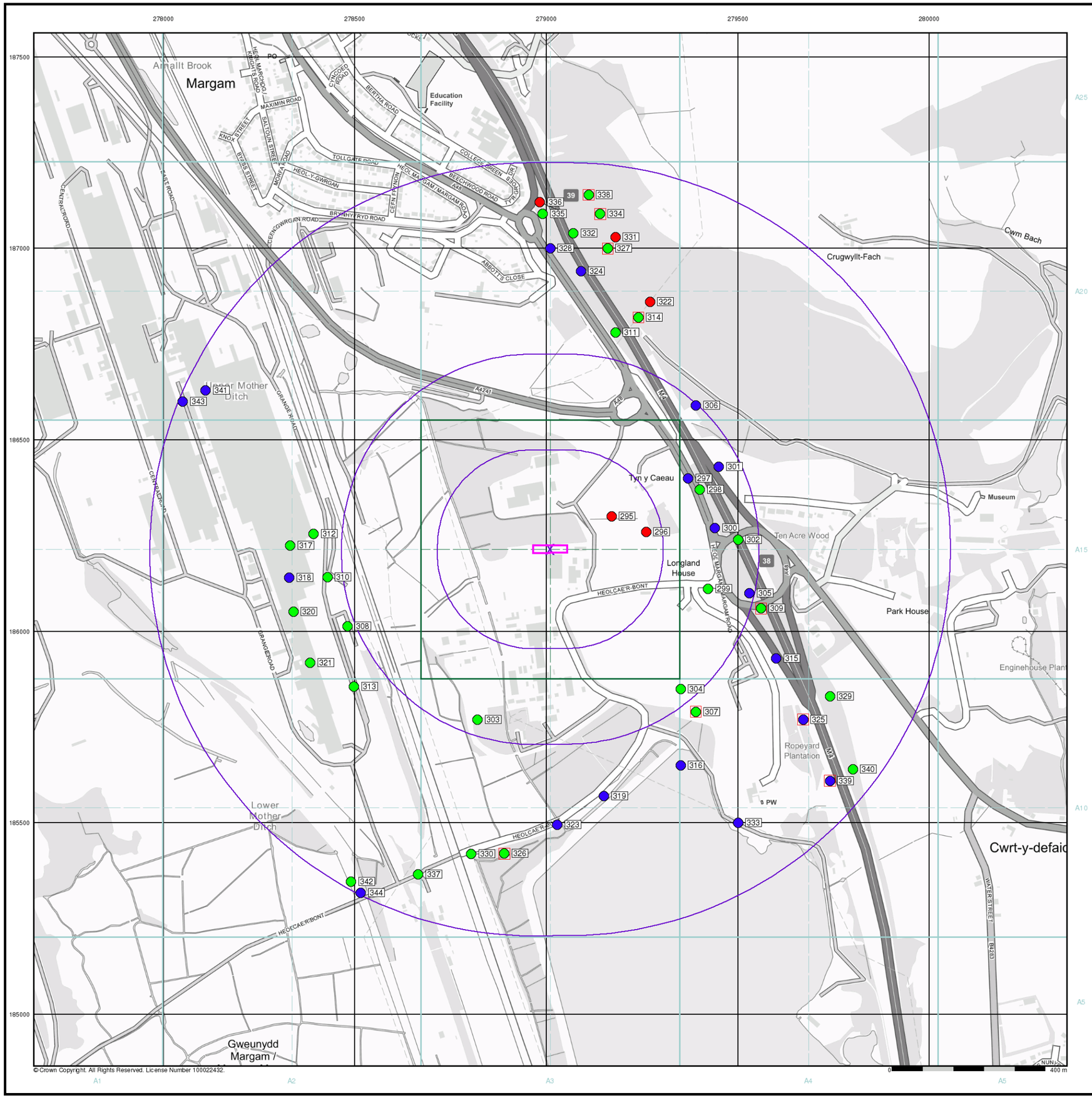


General

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

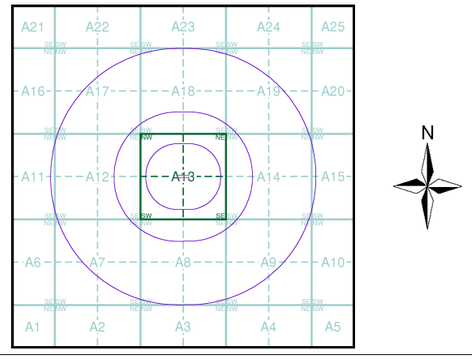
Agency and Hydrological (Boreholes)

- 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



Order Details

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National Grid Reference:	279010, 186210
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	1000

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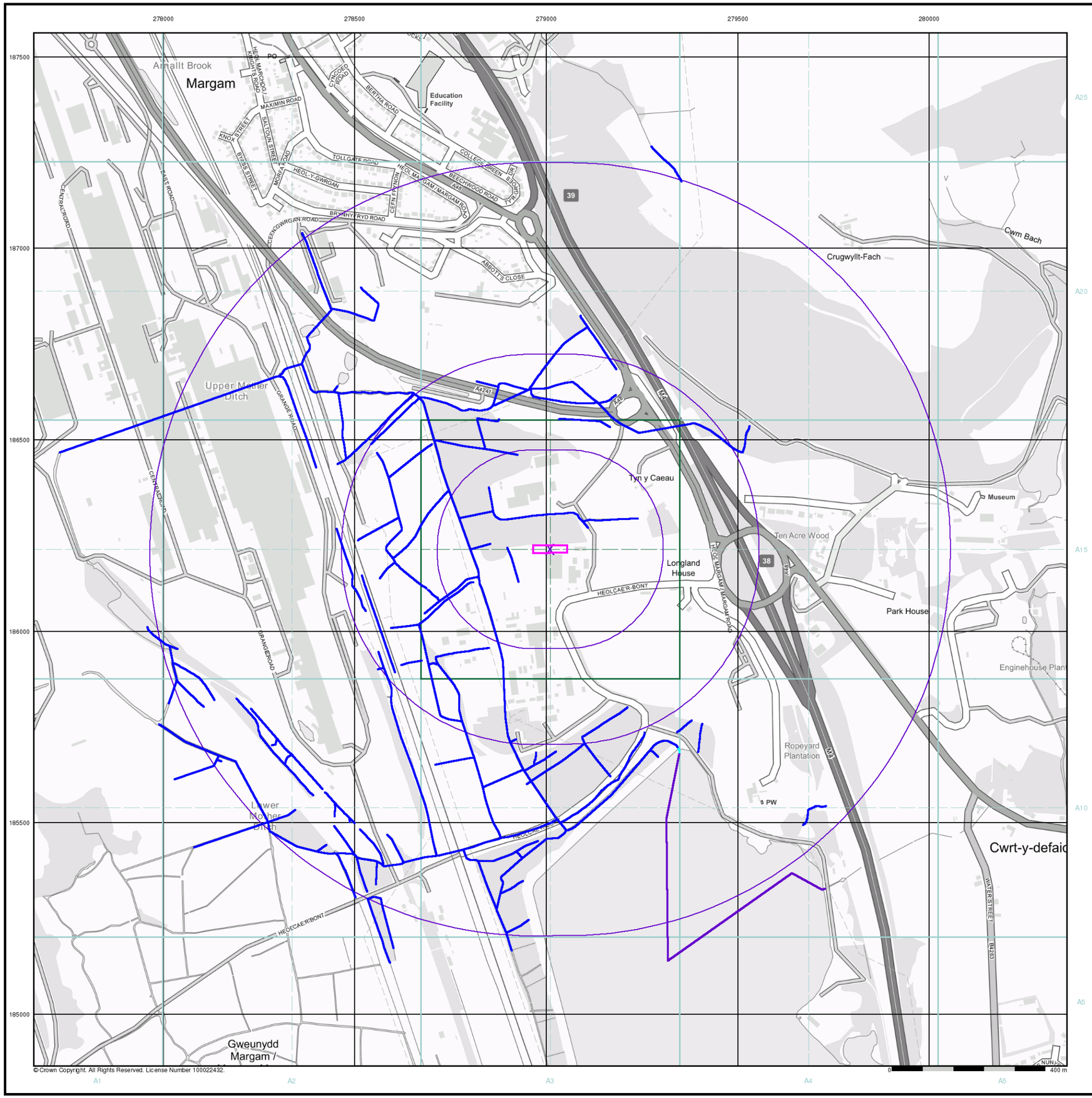


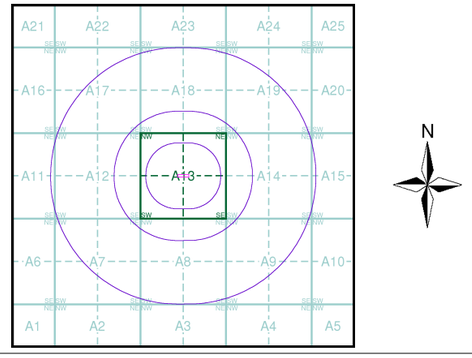
General

- 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

OS Water Network Map - Slice A



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Slice:	A
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Site at 279010, 186210

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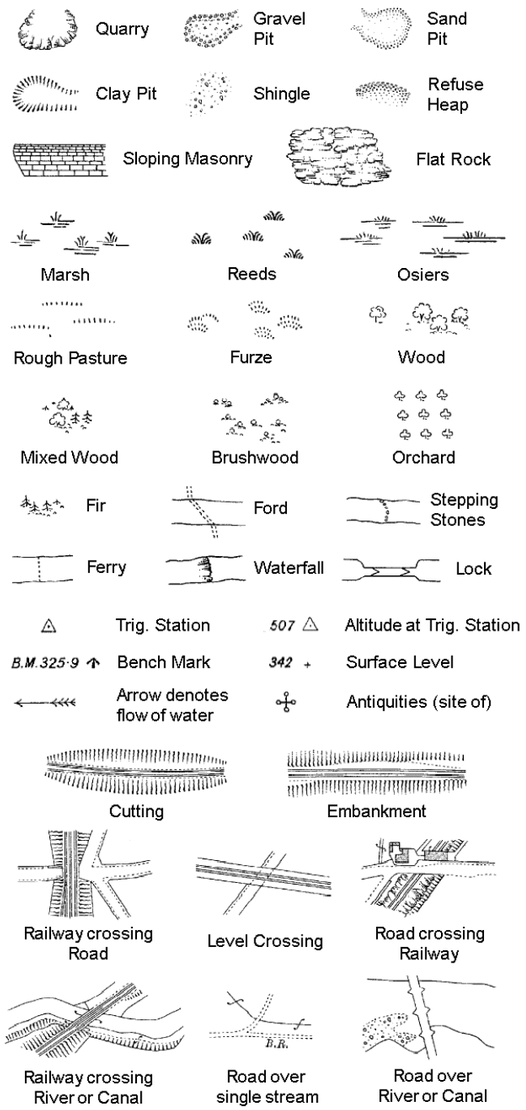
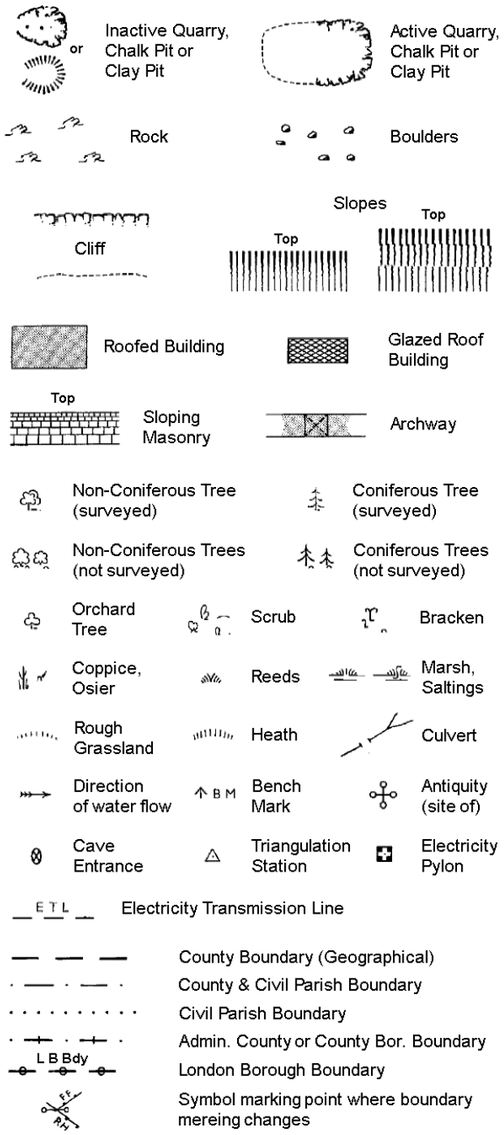
Historical Mapping Legends

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



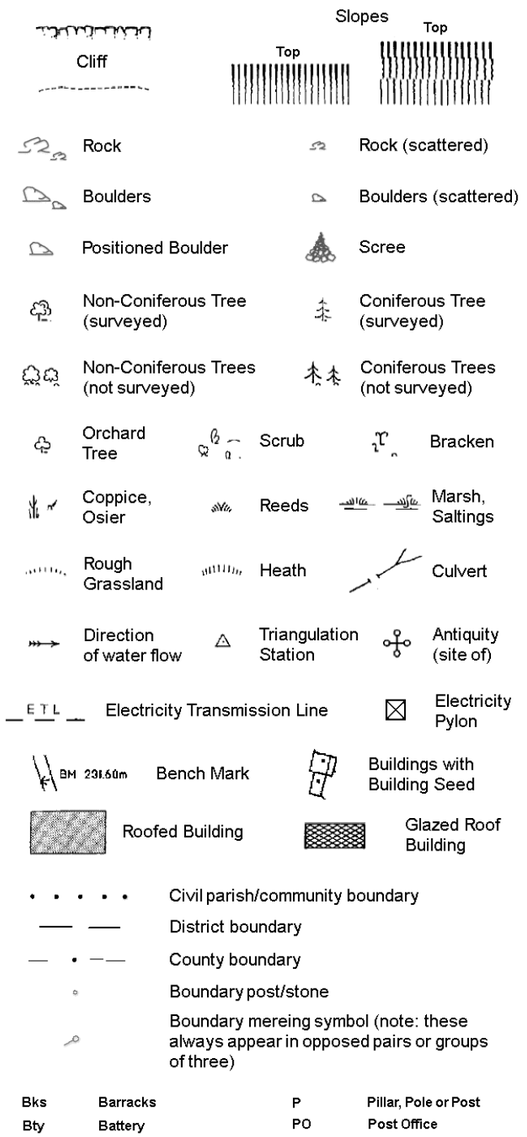
B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

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



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



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

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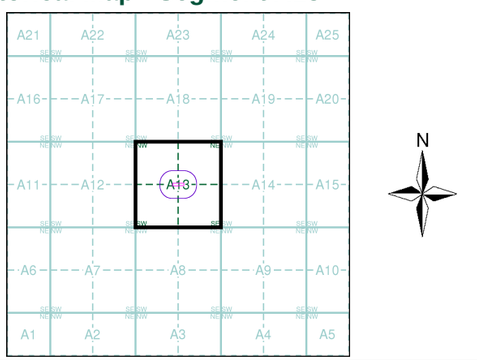
Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Glamorganshire	1:2,500	1877	2
Glamorganshire	1:2,500	1899	3
Glamorganshire	1:2,500	1918	4
Glamorganshire	1:2,500	1940	5
Ordnance Survey Plan	1:1,250	1952	6
Ordnance Survey Plan	1:2,500	1953 - 1964	7
Ordnance Survey Plan	1:2,500	1964	8
Ordnance Survey Plan	1:1,250	1964	9
Additional SIMs	1:1,250	1964 - 1989	10
Ordnance Survey Plan	1:2,500	1970	11
Additional SIMs	1:2,500	1979 - 1980	12
Additional SIMs	1:2,500	1990	13
Ordnance Survey Plan	1:2,500	1991	14
Additional SIMs	1:1,250	1991	15
Additional SIMs	1:2,500	1991	16
Large-Scale National Grid Data	1:1,250	1993	17
Large-Scale National Grid Data	1:2,500	1993	18
Large-Scale National Grid Data	1:1,250	1995	19
Large-Scale National Grid Data	1:2,500	1995	20

Historical Map - Segment A13



Order Details

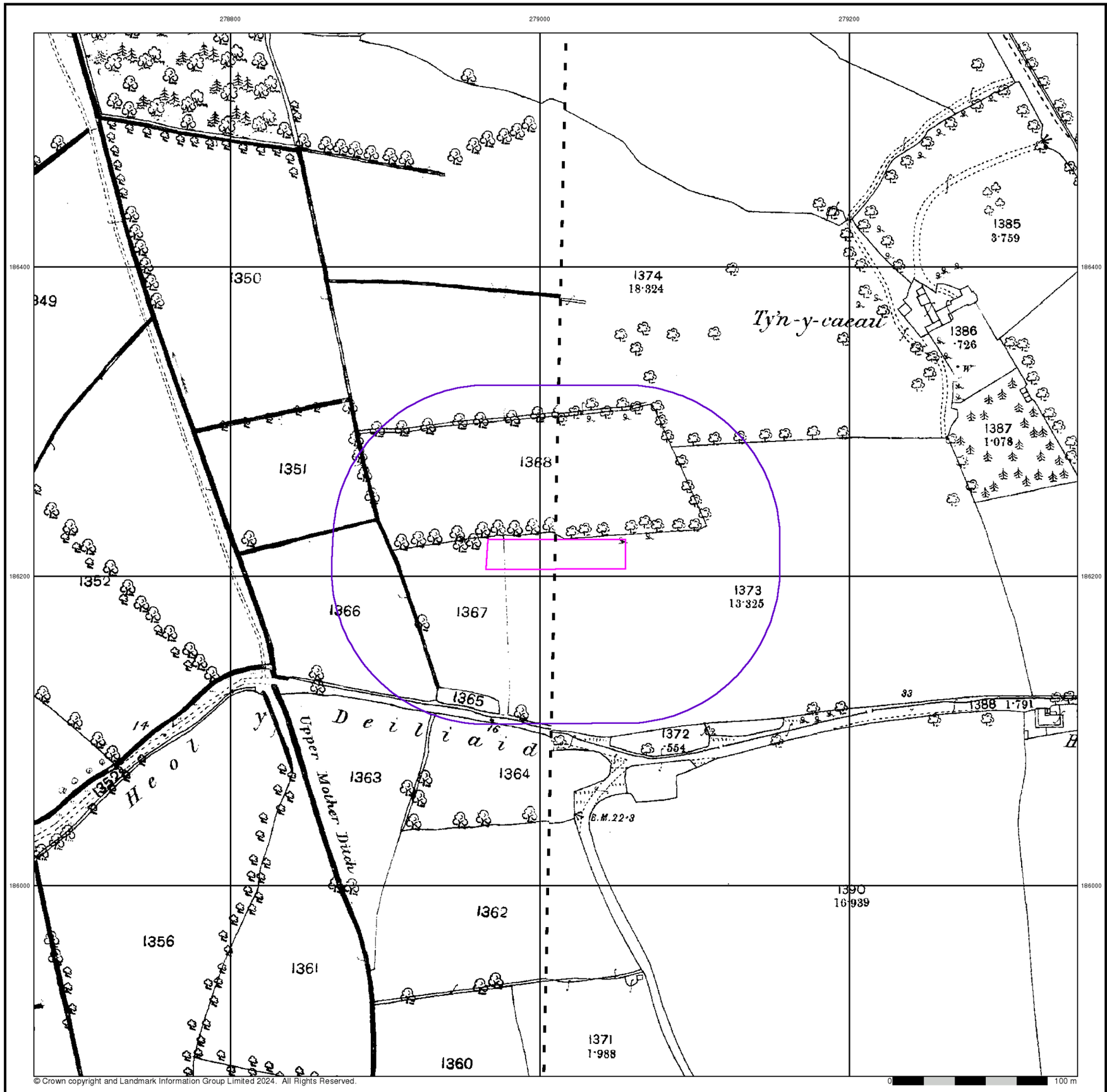
Order Number:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	100

Site Details

Site at 279010, 186210

Landmark INFORMATION GROUP

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



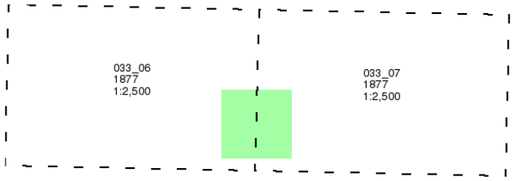
Glamorganshire

Published 1877

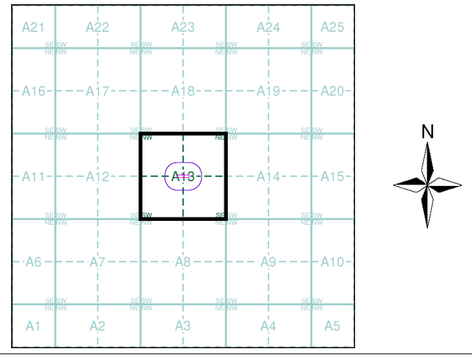
Source map scale - 1:2,500

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

Order Number:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
Slice:	A
Site Area (Ha):	0.18
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Site Details

Site at 279010, 186210

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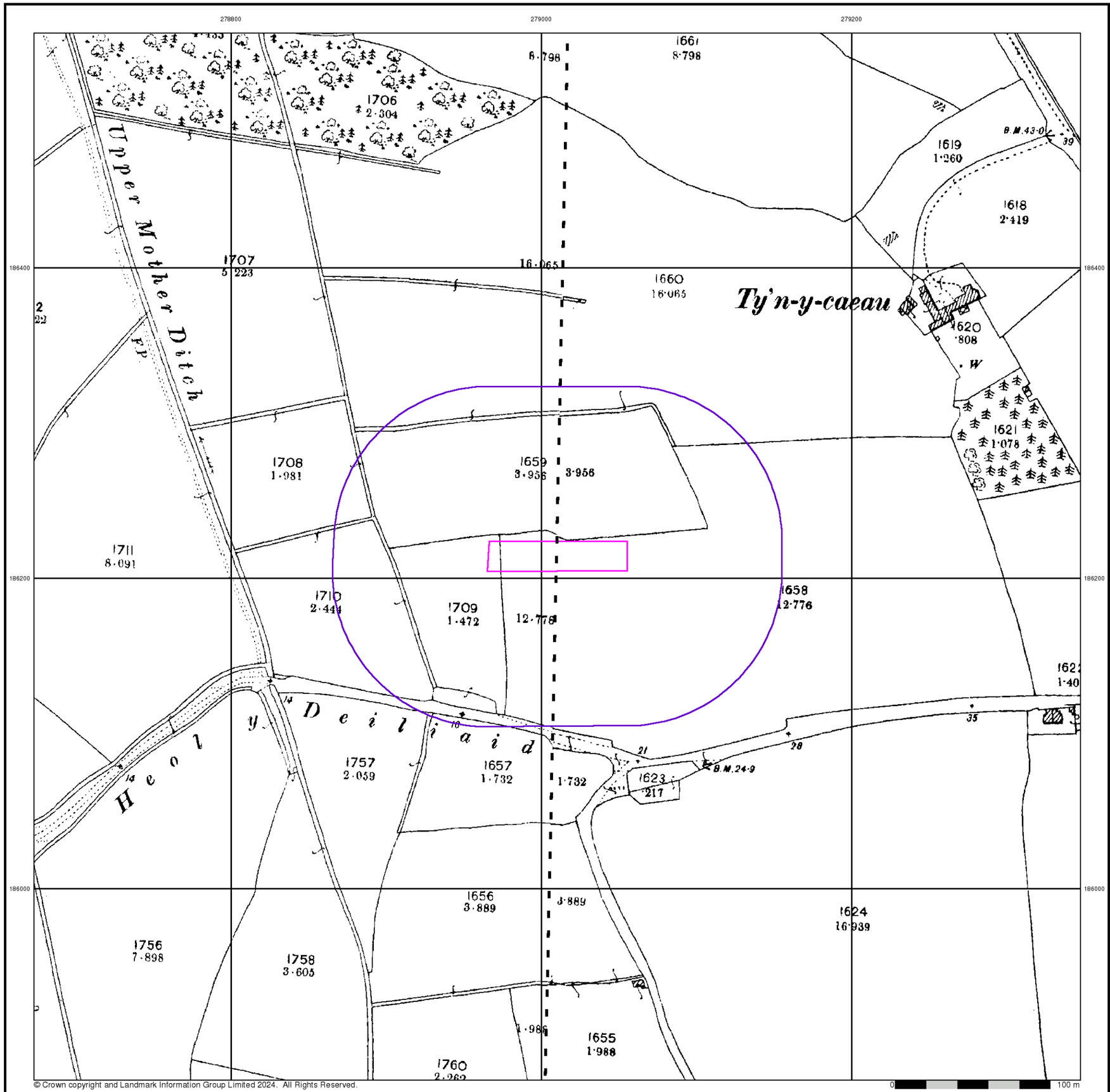
Web: www.envirocheck.co.uk



Glamorganshire

Published 1899

Source map scale - 1:2,500

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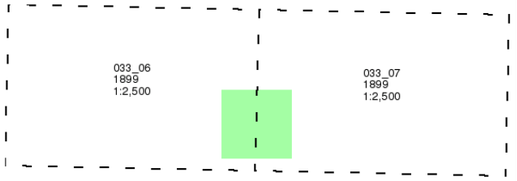
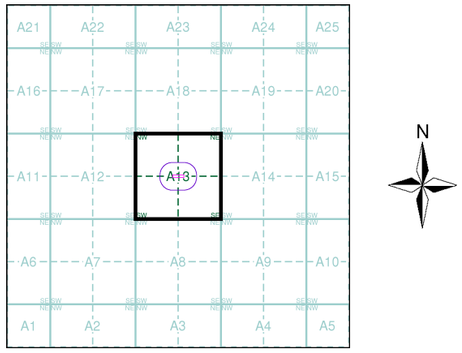
Map Name(s) and Date(s)



Historical Map - Segment A13



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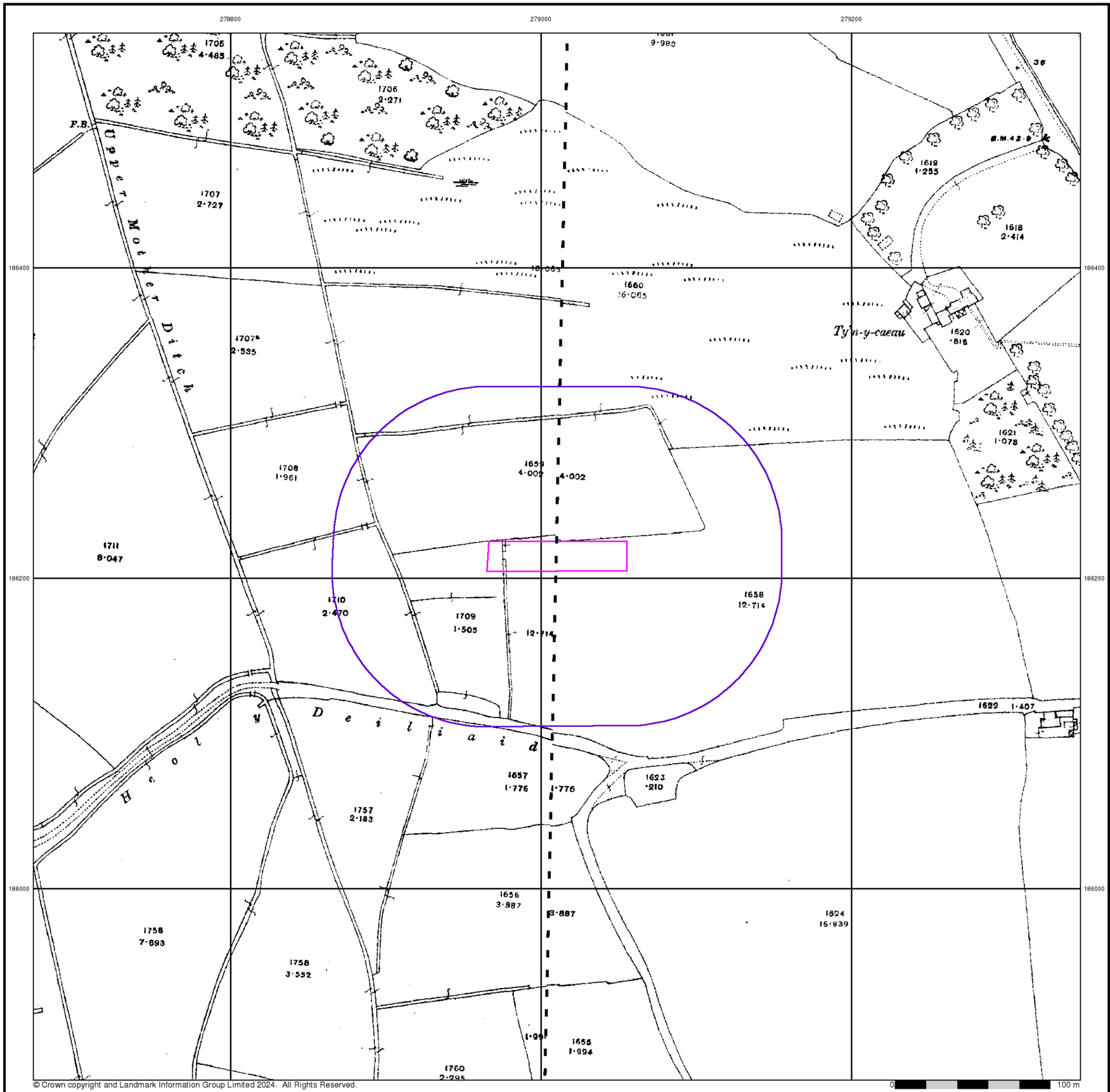


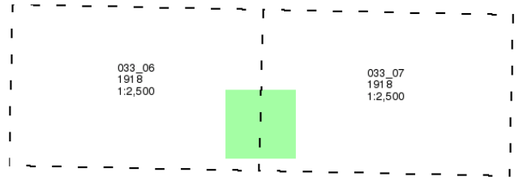
Glamorganshire

Published 1918

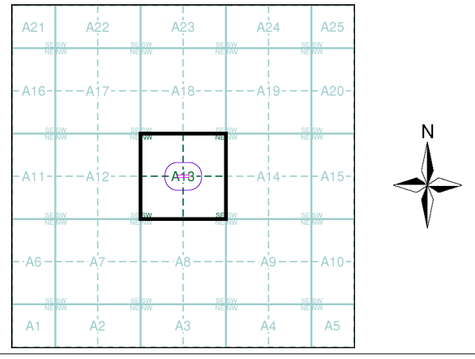
Source map scale - 1:2,500

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



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Site Details

Site at 279010, 186210

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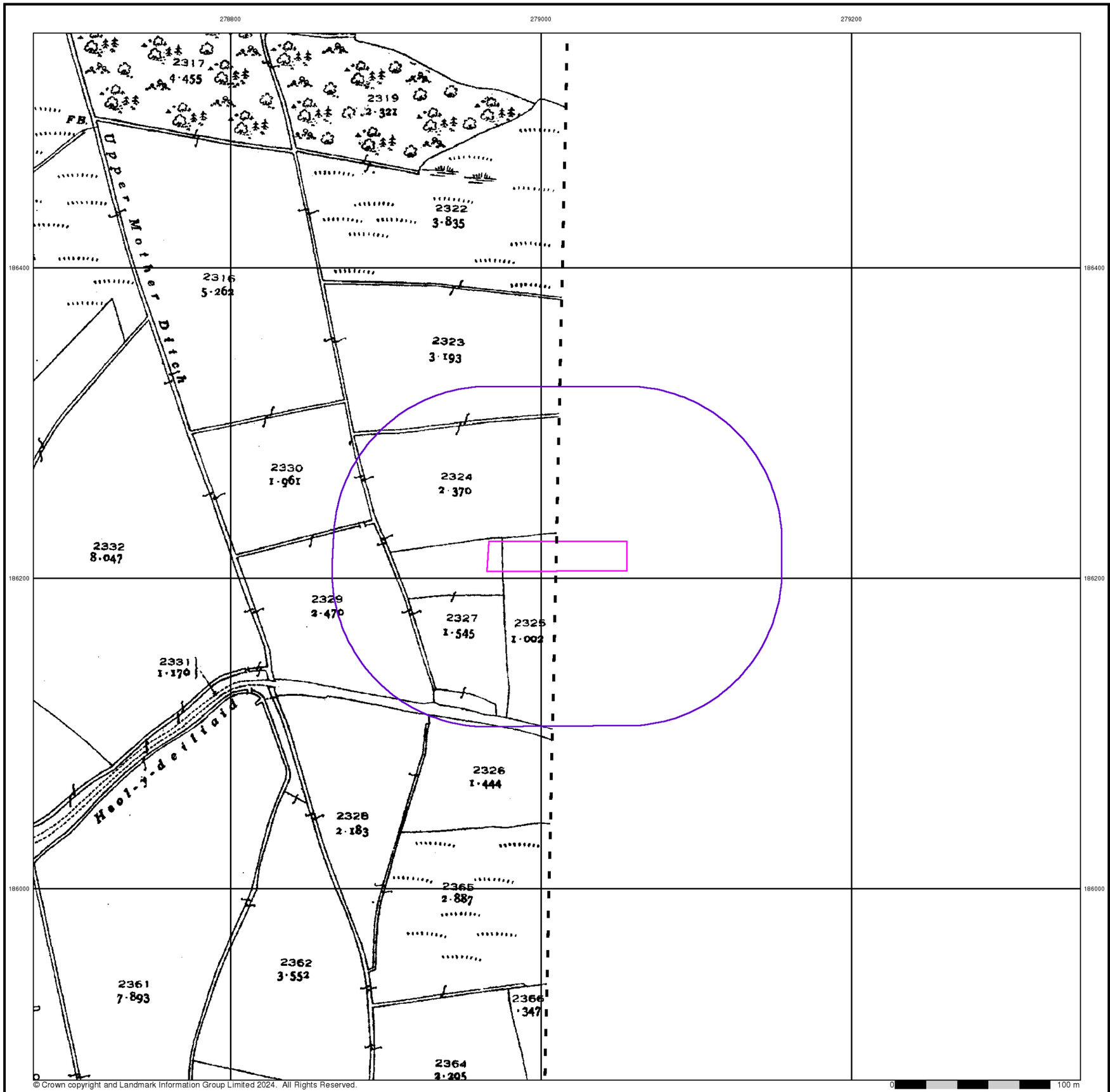

Glamorganshire

Published 1940

Source map scale - 1:2,500

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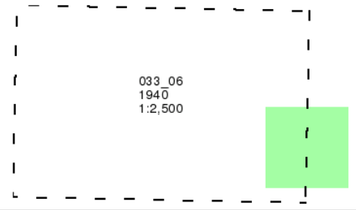
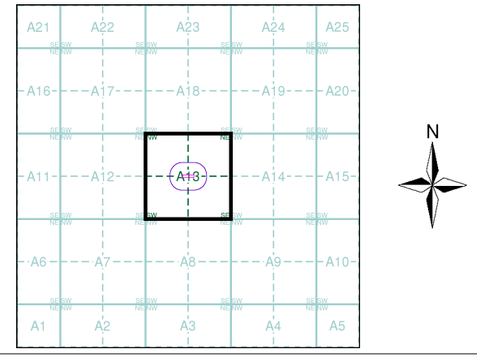
Map Name(s) and Date(s)



Historical Map - Segment A13



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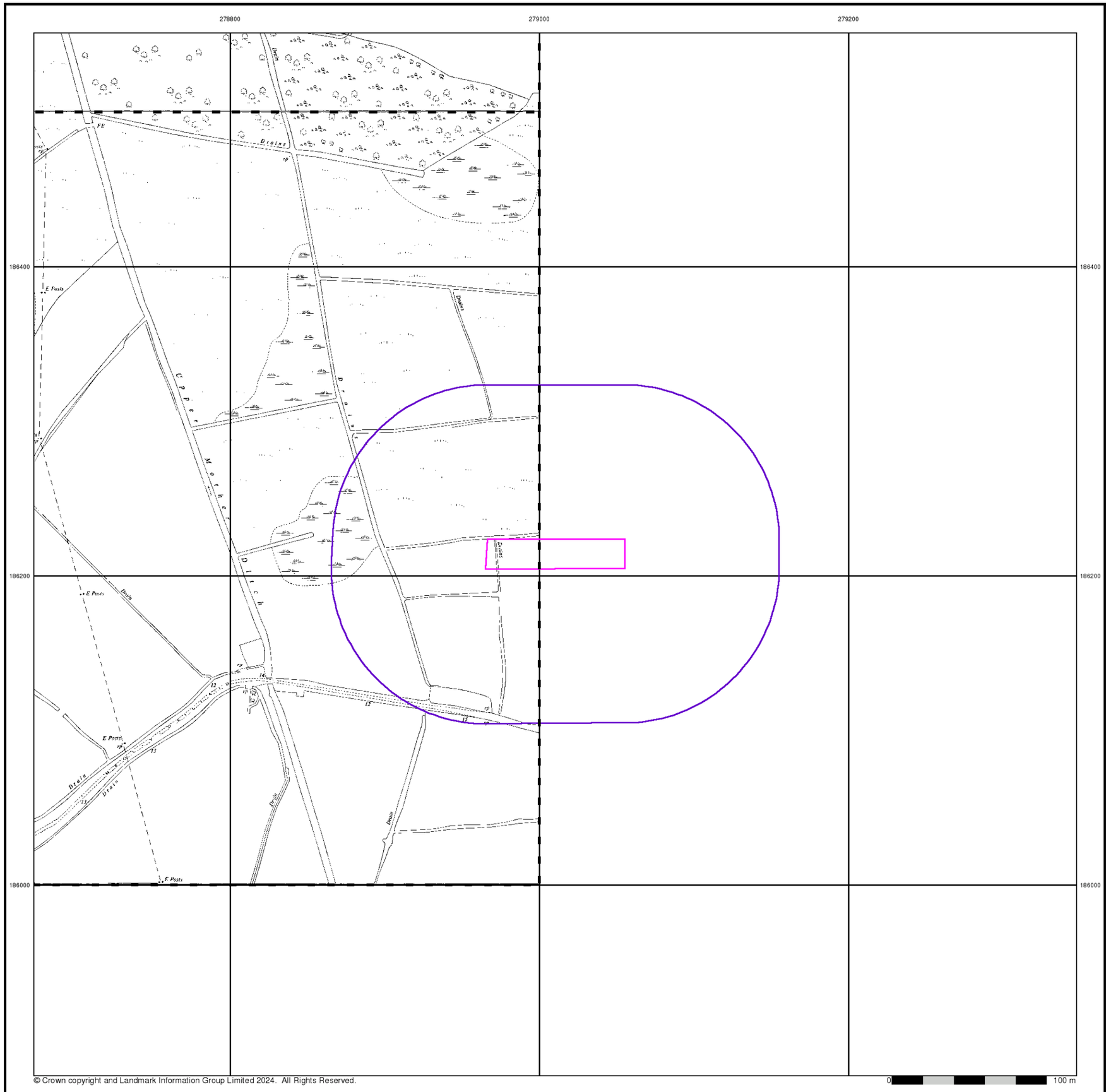


Ordnance Survey Plan

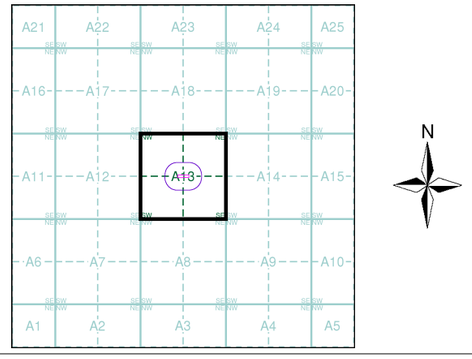
Published 1952

Source map scale - 1:1,250

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



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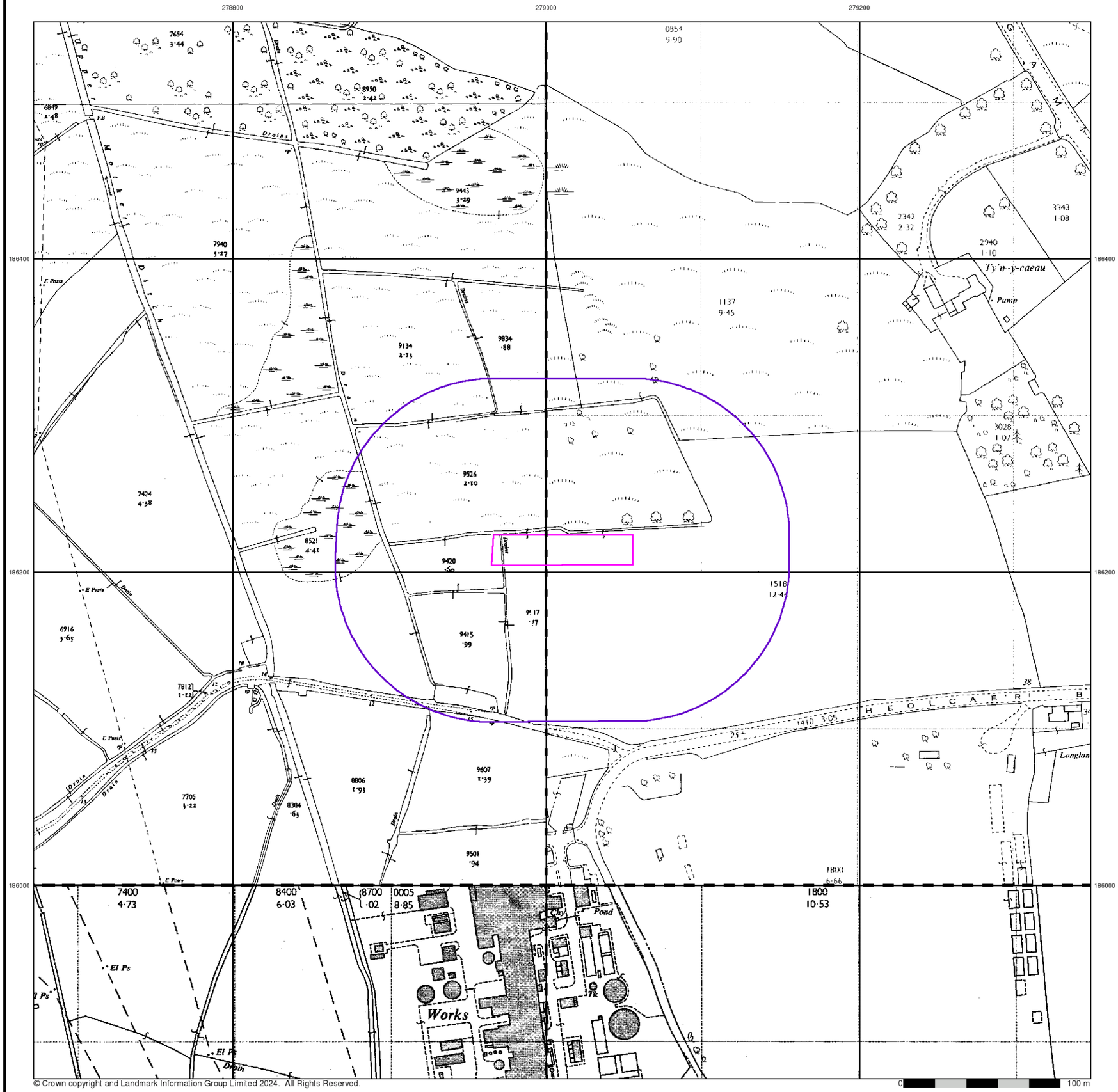

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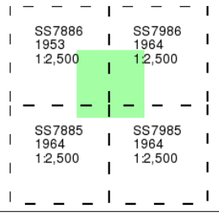
Ordnance Survey Plan

Published 1953 - 1964

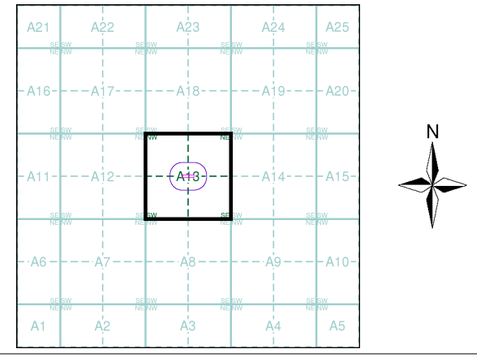
Source map scale - 1:2,500

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



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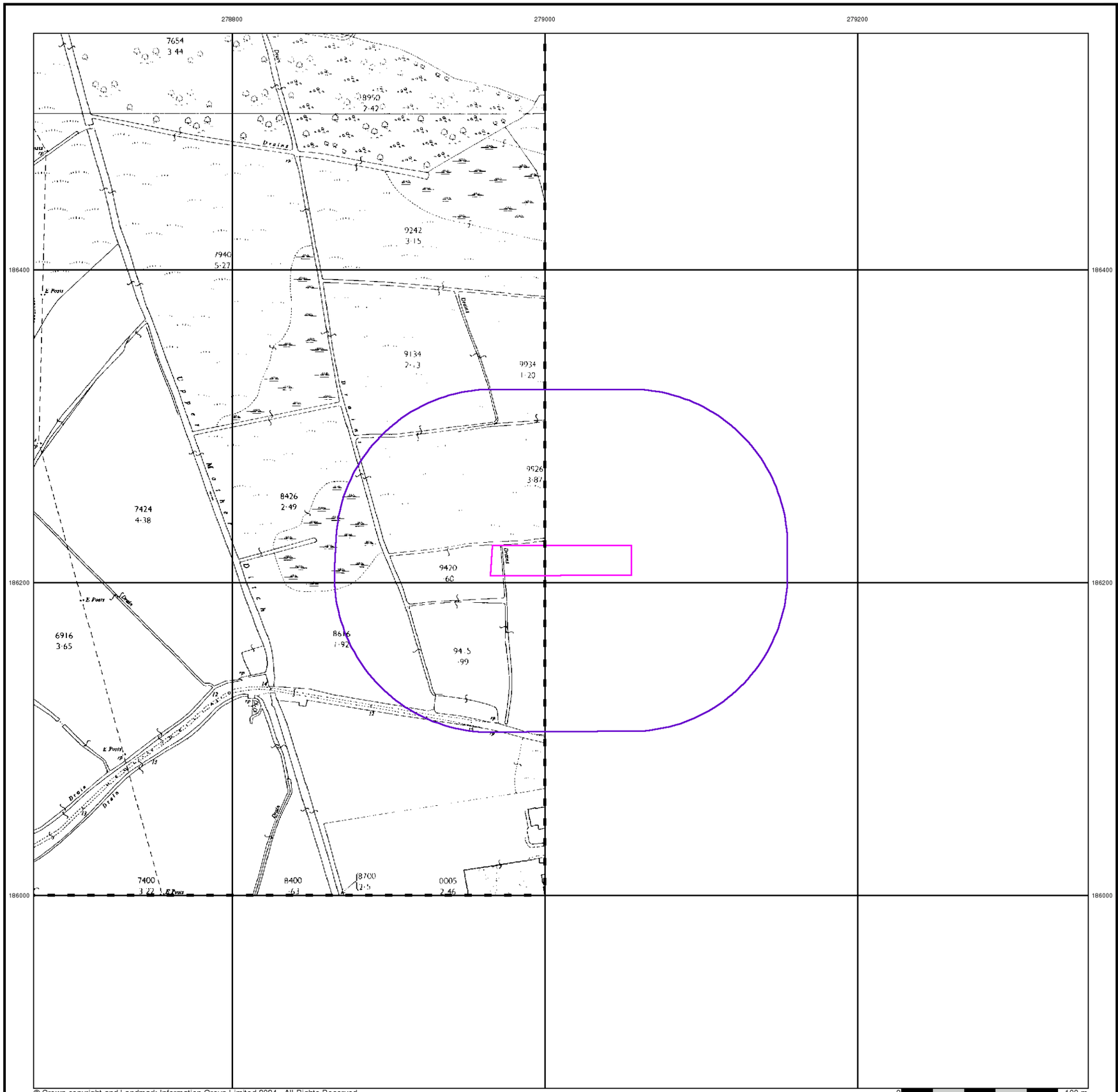
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



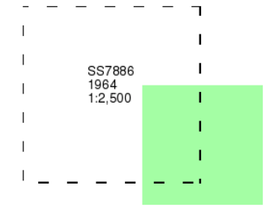
Ordnance Survey Plan

Published 1964

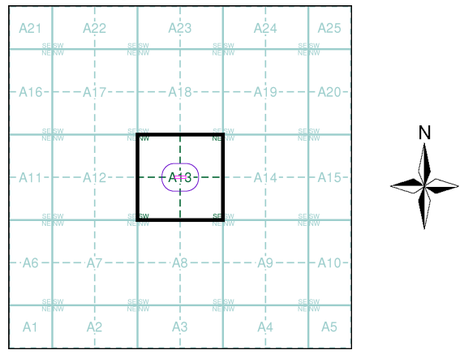
Source map scale - 1:2,500

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



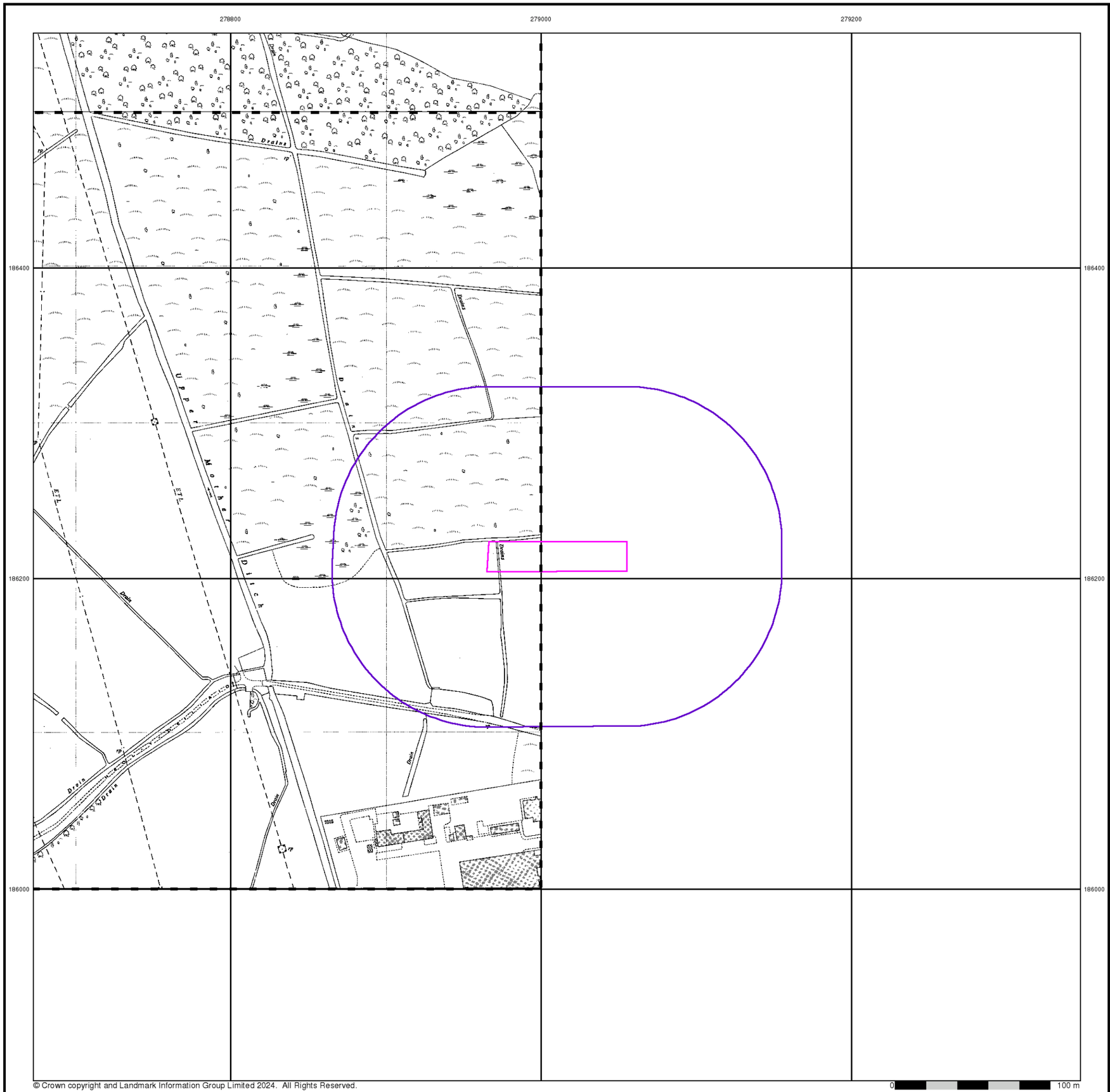
Order Details

Order Number:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	100

Site Details

Site at 279010, 186210

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



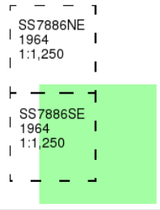
Ordnance Survey Plan

Published 1964

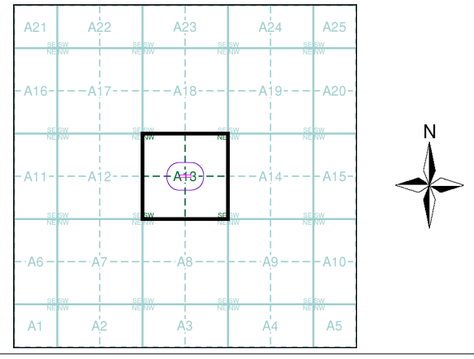
Source map scale - 1:1,250

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:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	100

Site Details

Site at 279010, 186210

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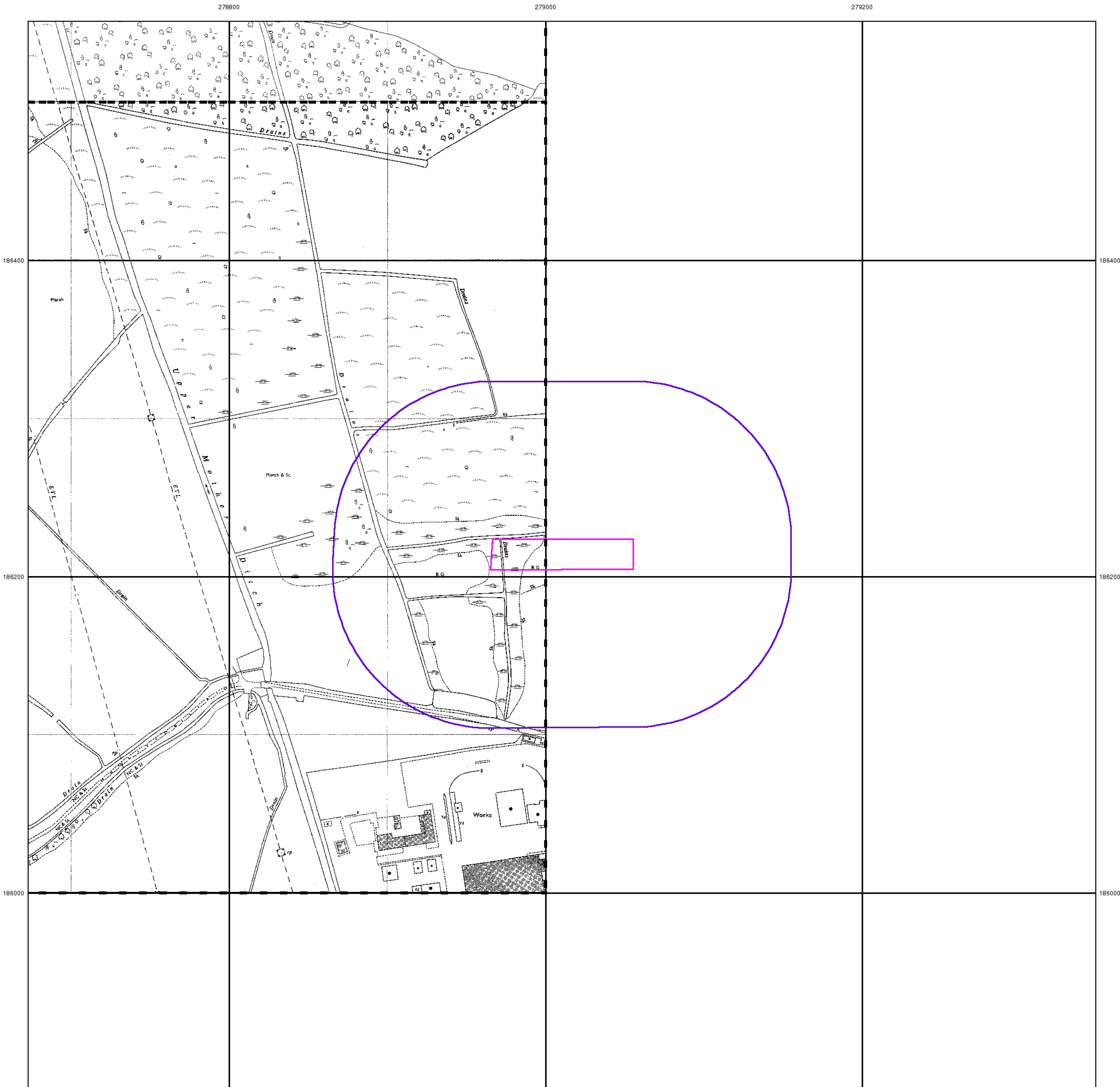


0 100 m

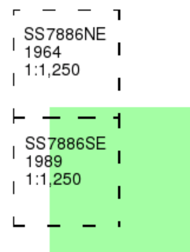
Additional SIMs

Published 1964 - 1989

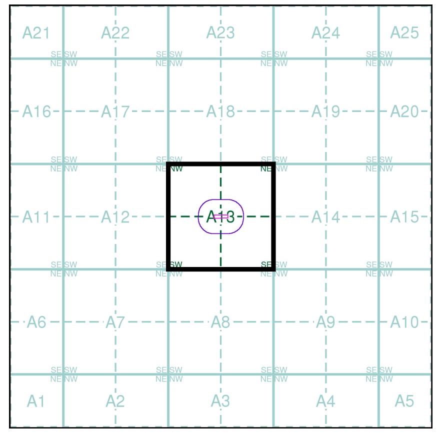
Source map scale - 1:1,250

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

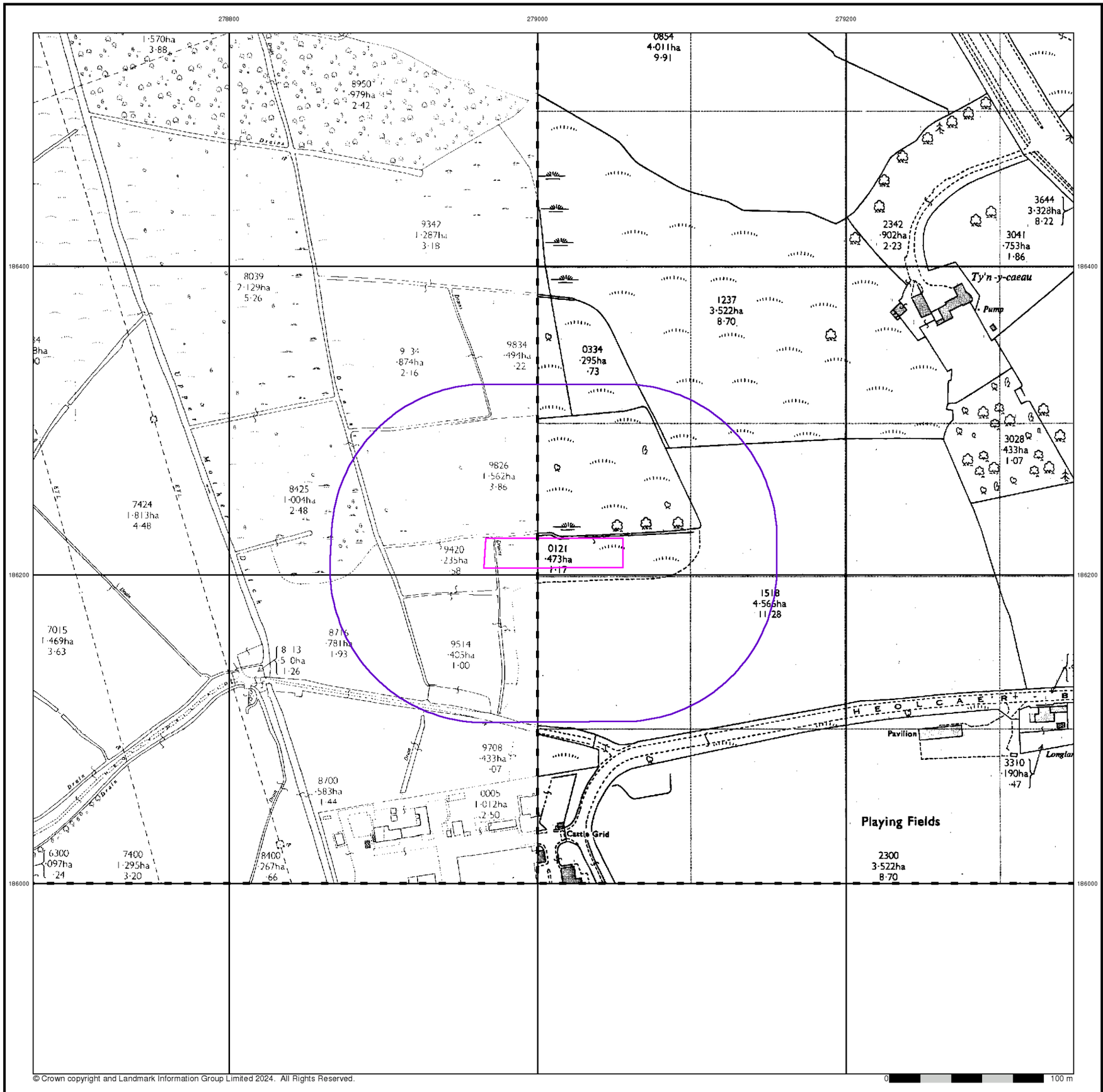


Order Details

Order Number: 339233484_1_1
Customer Ref: PRO1001
National Grid Reference: 279010, 186210
Slice: A
Site Area (Ha): 0.18
Search Buffer (m): 100

Site Details

Site at 279010, 186210



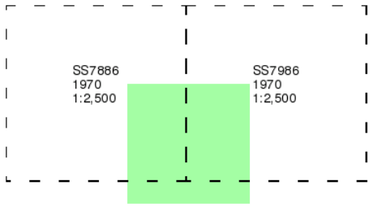
Ordnance Survey Plan

Published 1970

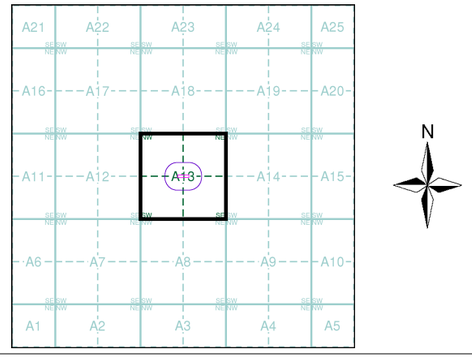
Source map scale - 1:2,500

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:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	100

Site Details

Site at 279010, 186210

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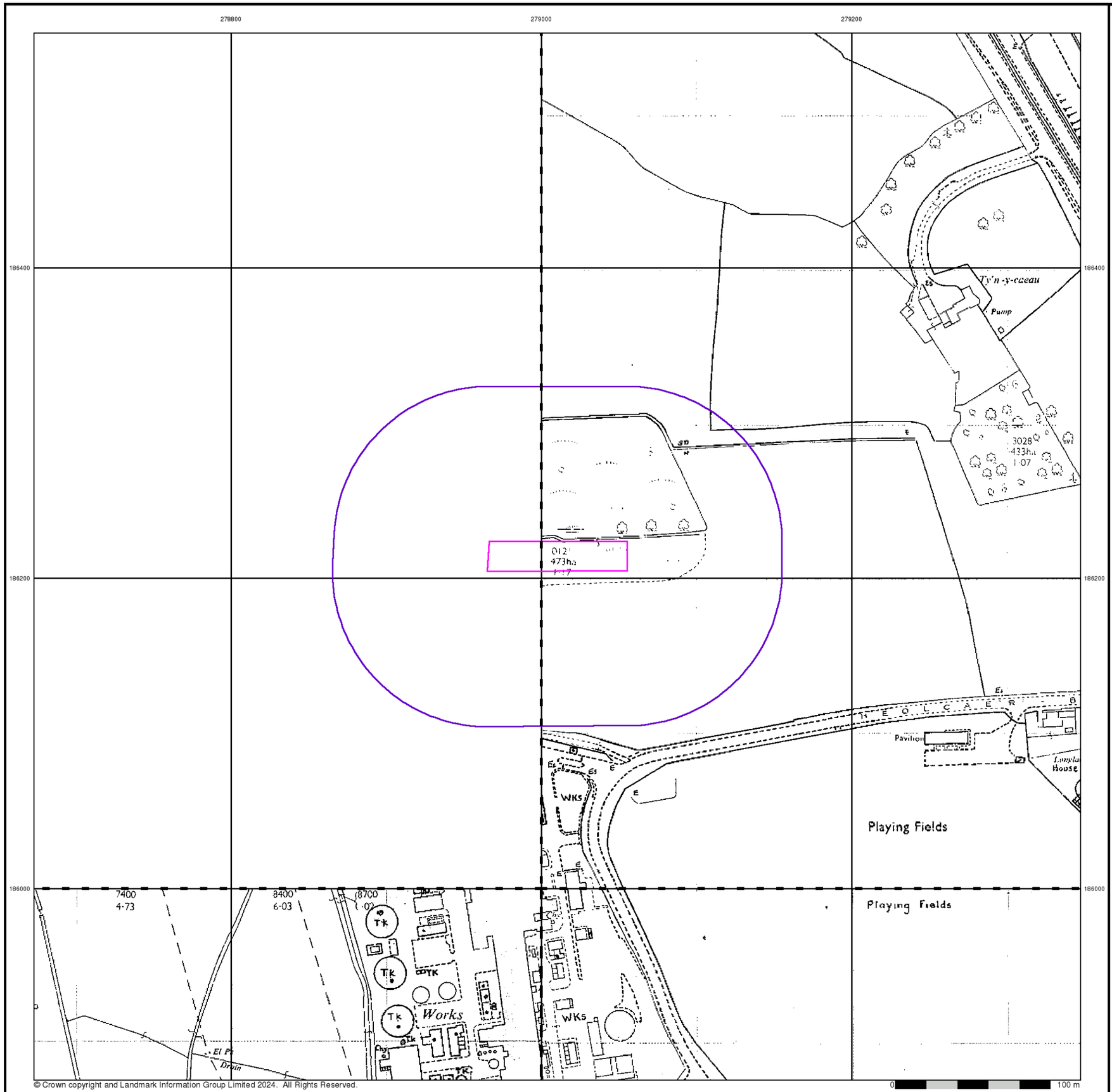


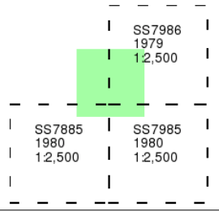
Additional SIMs

Published 1979 - 1980

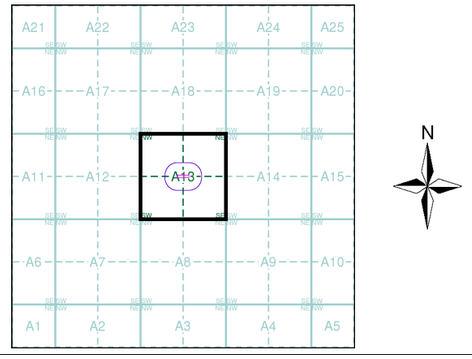
Source map scale - 1:2,500

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:	339233484_1_1
Customer Ref:	PRO1001
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Search Buffer (m):	100

Site Details

Site at 279010, 186210

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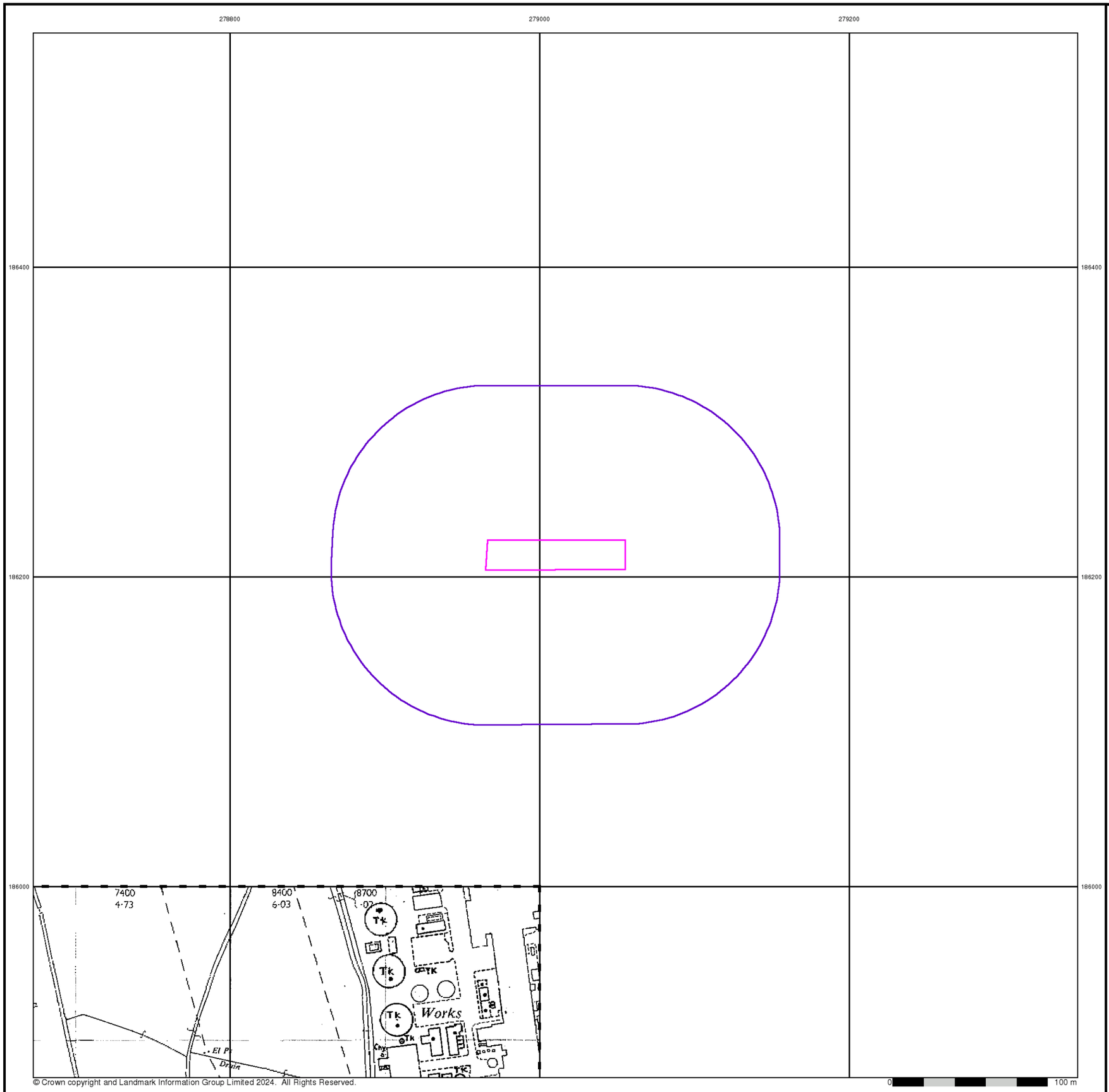


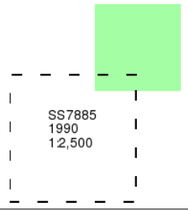
Additional SIMs

Published 1990

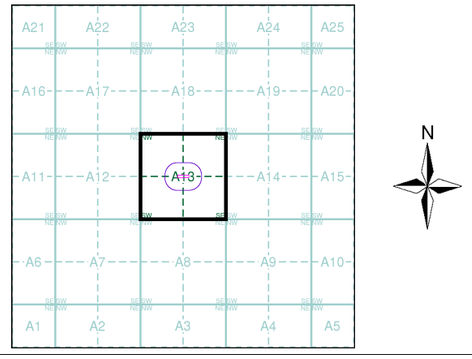
Source map scale - 1:2,500

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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Site Details

Site at 279010, 186210

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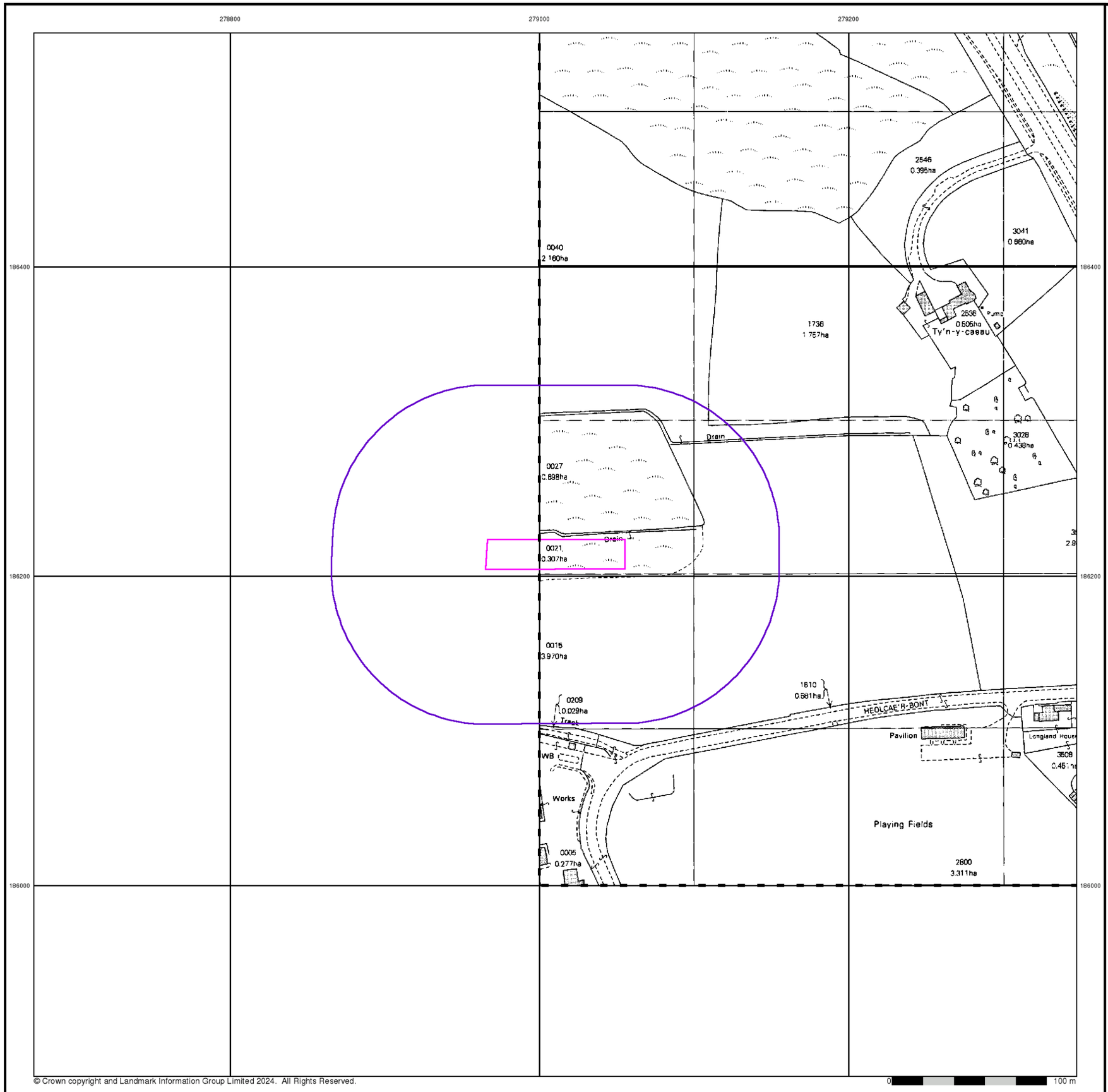


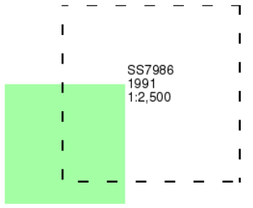
Ordnance Survey Plan

Published 1991

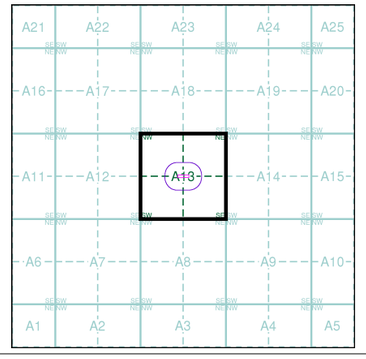
Source map scale - 1:2,500

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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Site Details

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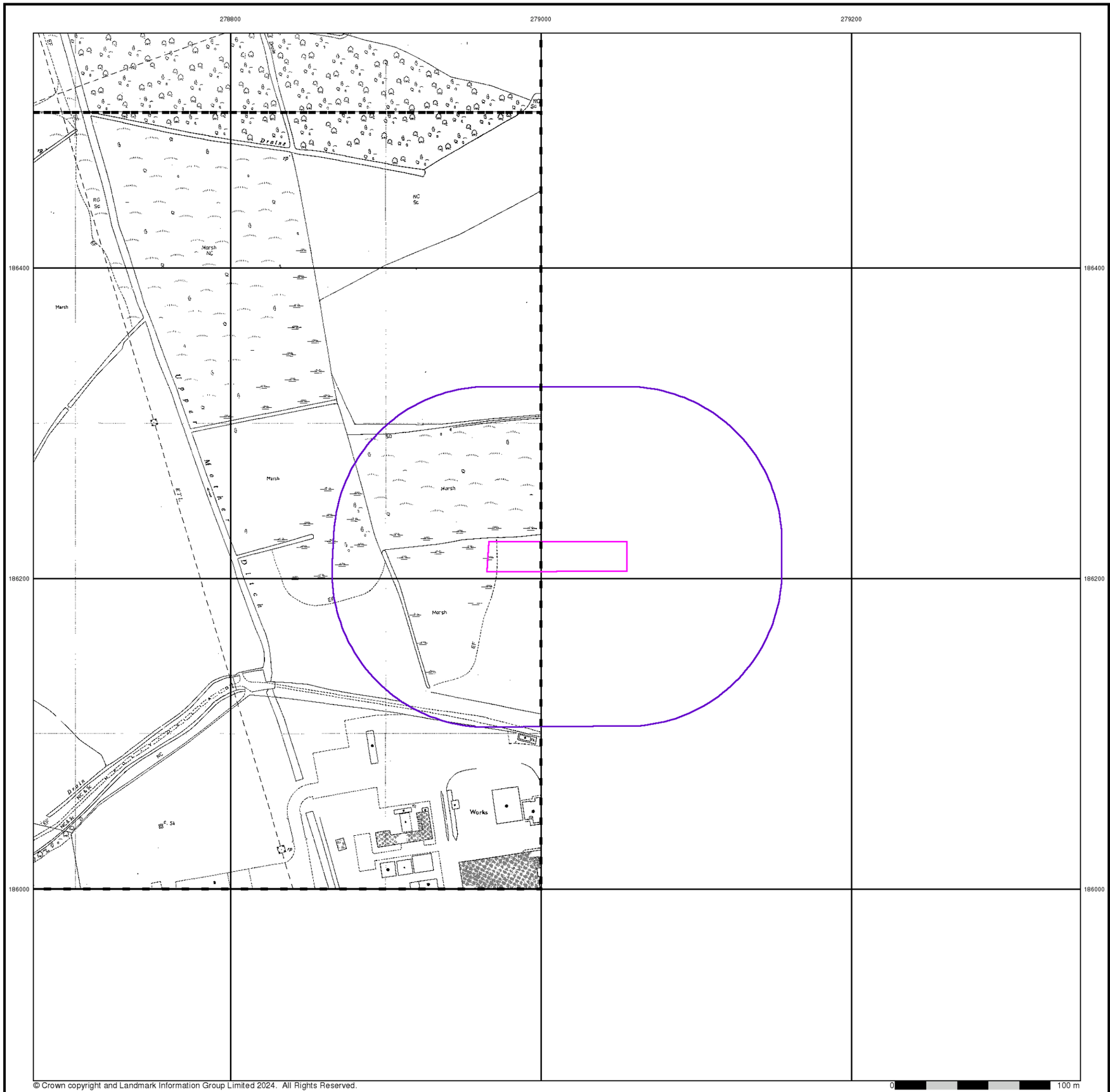


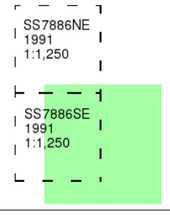
Additional SIMs

Published 1991

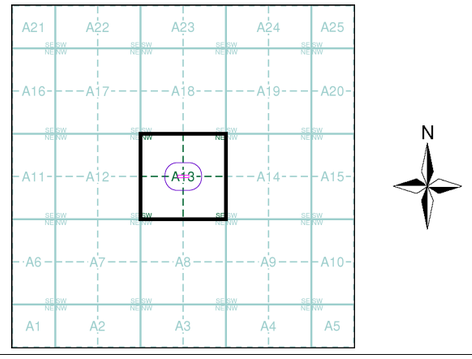
Source map scale - 1:1,250

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:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
Slice:	A
Site Area (Ha):	0.18
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Site Details

Site at 279010, 186210

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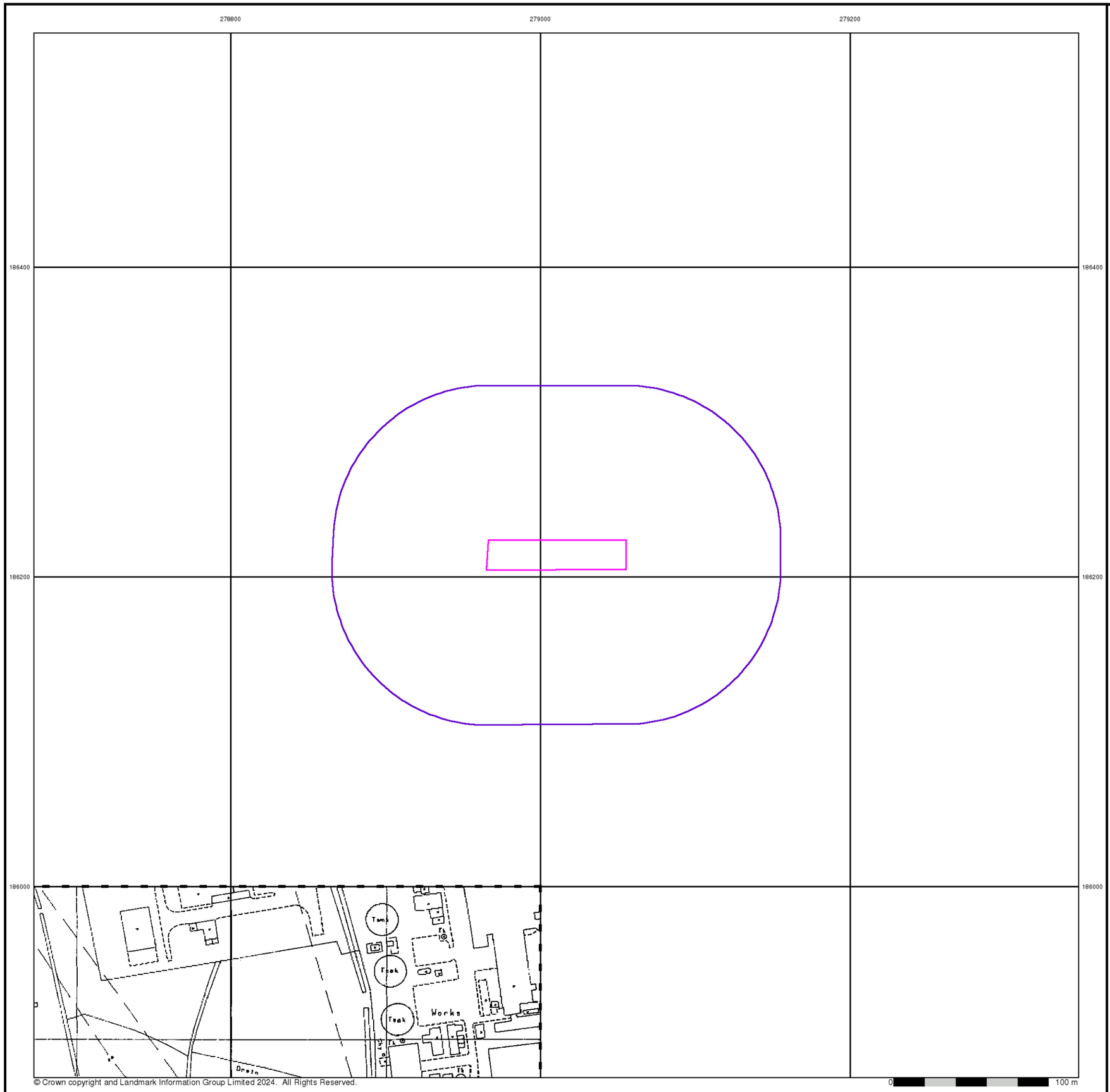


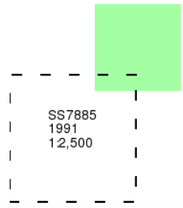
Additional SIMs

Published 1991

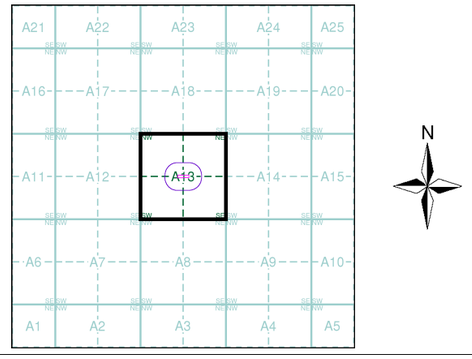
Source map scale - 1:2,500

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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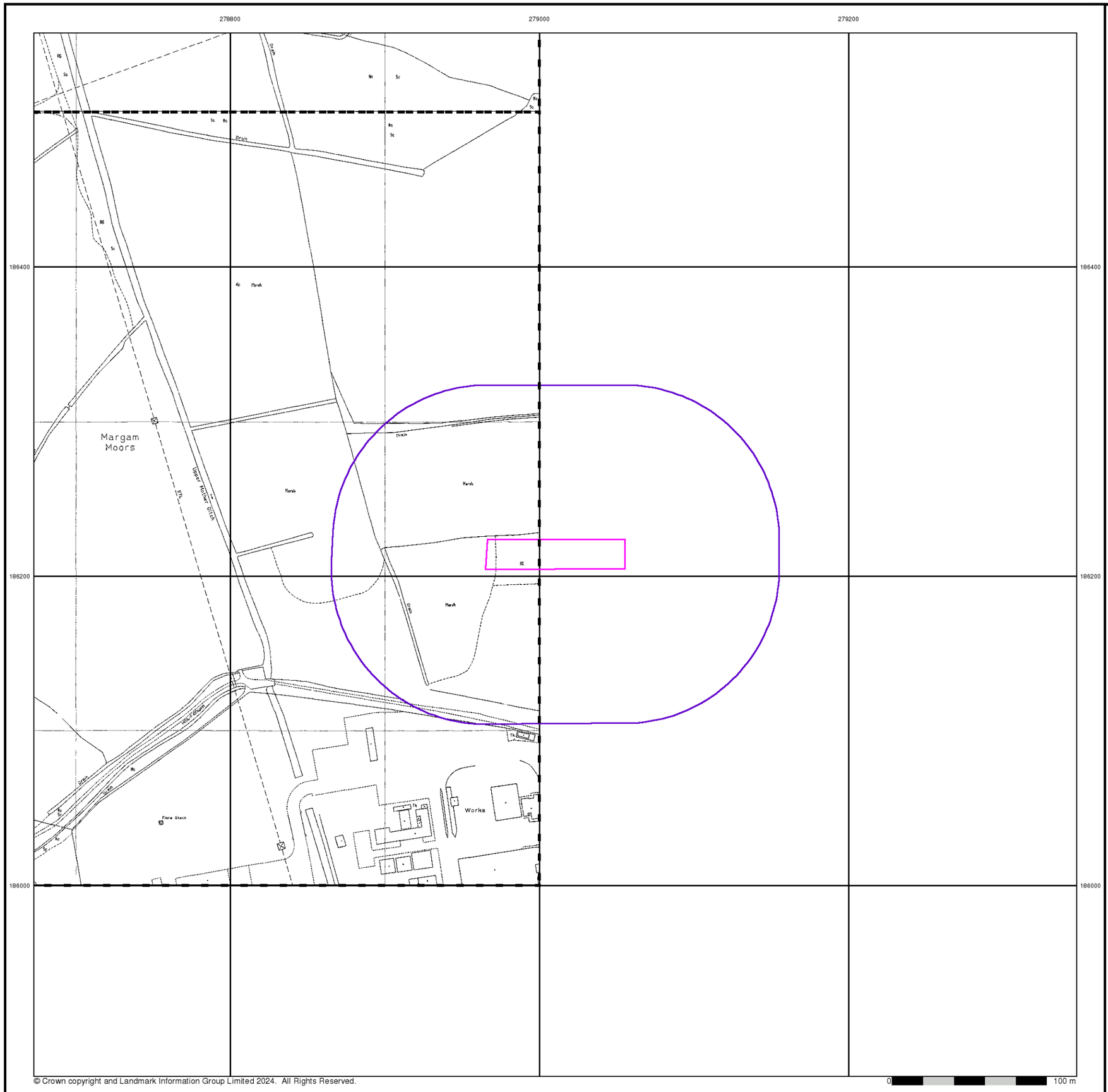


Large-Scale National Grid Data

Published 1993

Source map scale - 1:1,250

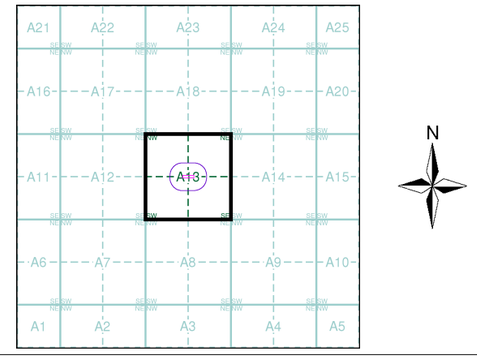
'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic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

Map Name(s) and Date(s)

SS7886NE
1993
1:1,250

SS7886SE
1993
1:1,250

Historical Map - Segment A13



Order Details

Order Number:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
Slice:	A
Site Area (Ha):	0.18
Search Buffer (m):	100

Site Details

Site at 279010, 186210

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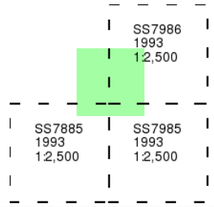
Large-Scale National Grid Data

Published 1993

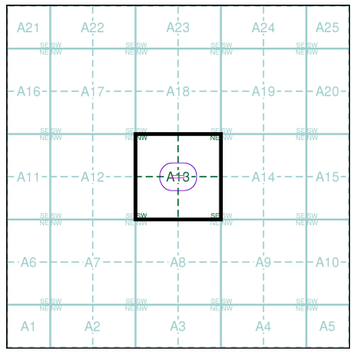
Source map scale - 1:2,500

'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:	339233484_1_1
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Slice:	A
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Search Buffer (m):	100

Site Details

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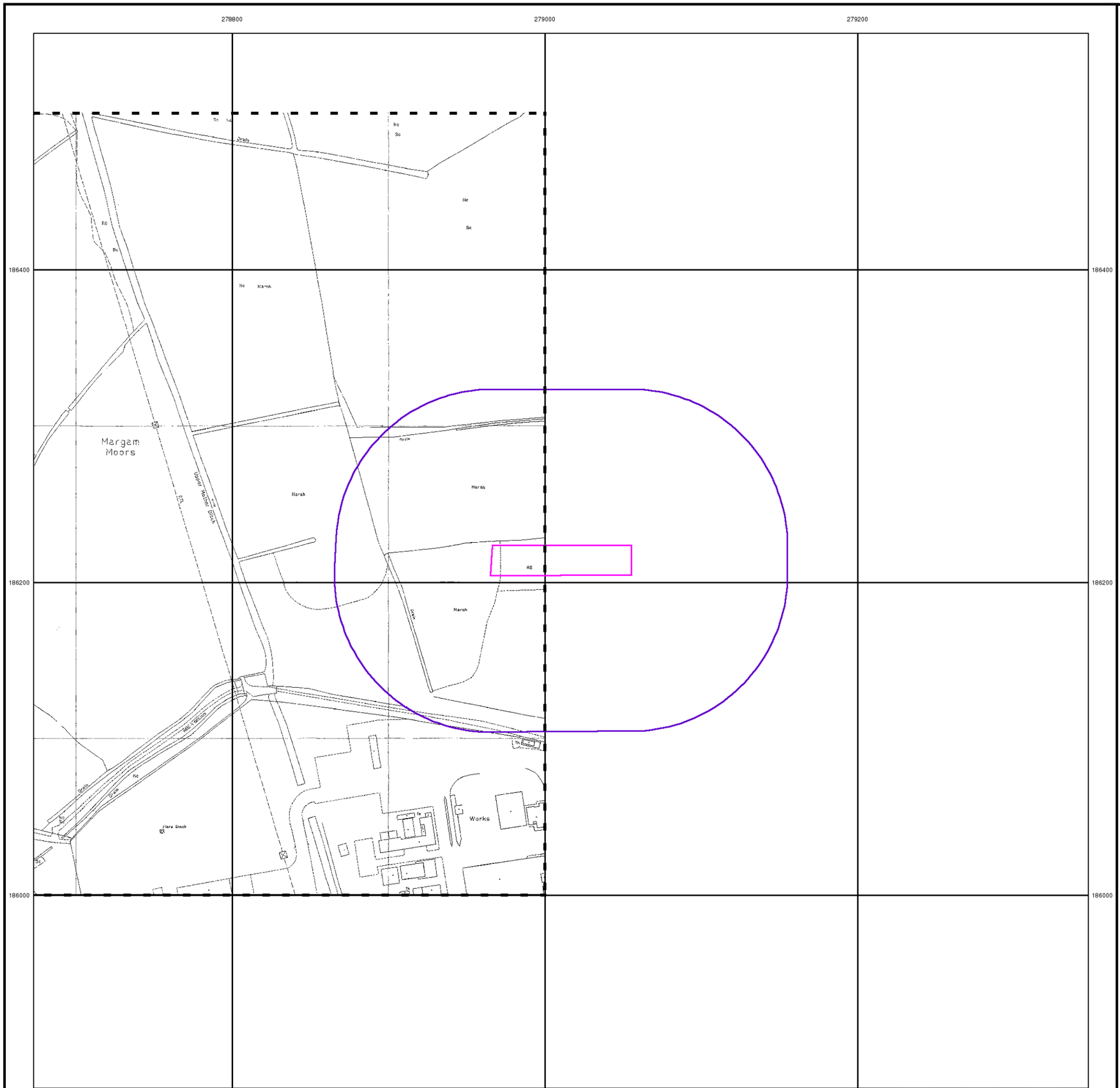


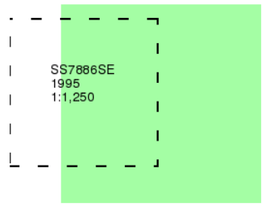
Large-Scale National Grid Data

Published 1995

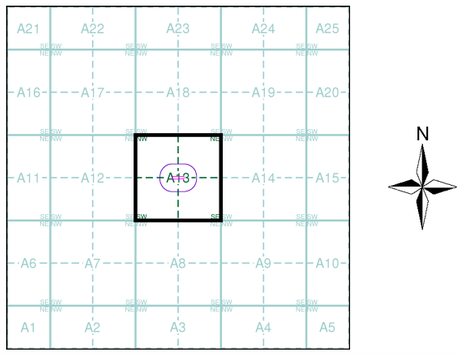
Source map scale - 1:1,250

'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

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Search Buffer (m):	100

Site Details

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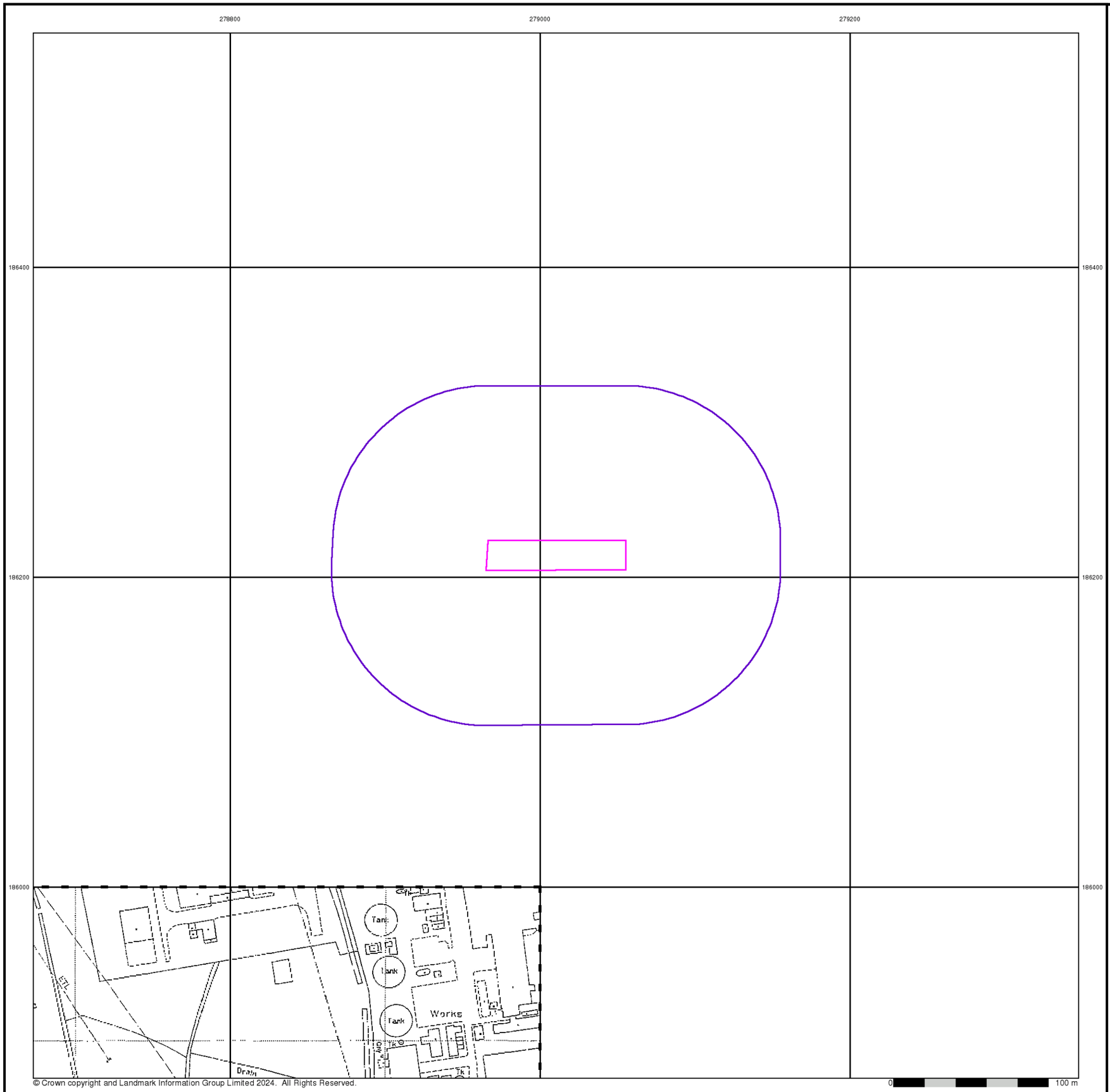


0 100 m

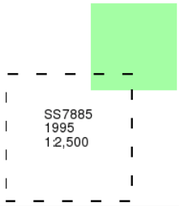
Large-Scale National Grid Data

Published 1995

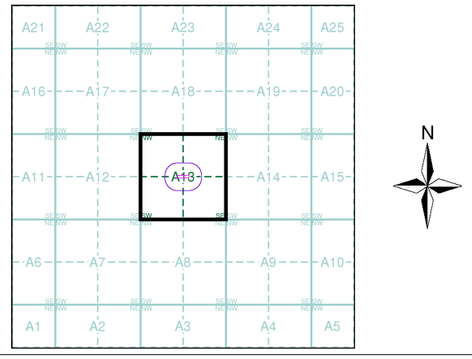
Source map scale - 1:2,500

'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



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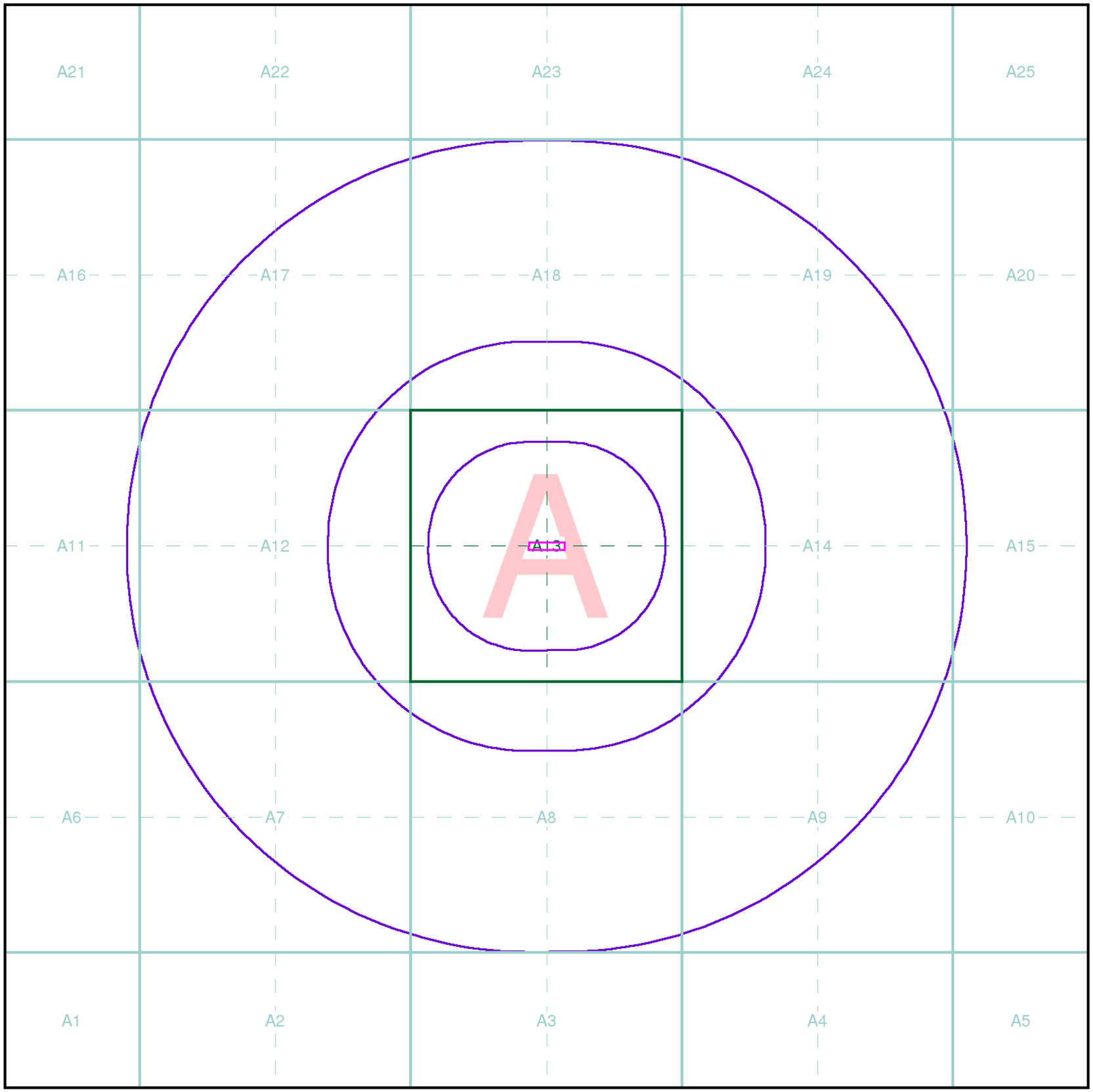
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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:

Envirocheck reports are compiled from 136 different sources of data.

Client Details

Ms S Howson, Sirius Geotechnical Ltd, 4245 Park Approach, Thorpe Park, Leeds, LS15 8GB

Order Details

Order Number:	339233484_1_1
Customer Ref:	PRO1001
National Grid Reference:	279010, 186210
Site Area (Ha):	0.18
Search Buffer (m):	1000

Site Details

Site at 279010, 186210

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 SCR2

Site photos (April 2024)

App. SCR2 – Margam HPF Site Condition Photographs (April 2024)

Figure 1 – Proposed HPF Area (existing concrete pad) facing east.

Figure 2 – Proposed HPF area (existing lighter concrete pad),facing west.

Figure 3 – Condition of existing impermeable concrete slab (eastern end).

Figure 4 – Condition of existing impermeable concrete pad (central and western end).

Figure 5 - Condition of existing impermeable concrete pad (western end).

Figure 6 – Proposed concrete pad extension area to facilitate HPF operations, facing east

Figure 7 –Proposed concrete pad extension area to facilitate HPF operations, facing west.

Figure 8 - Existing concrete slab area (lighter concrete) with proximity to biomass plant and service road

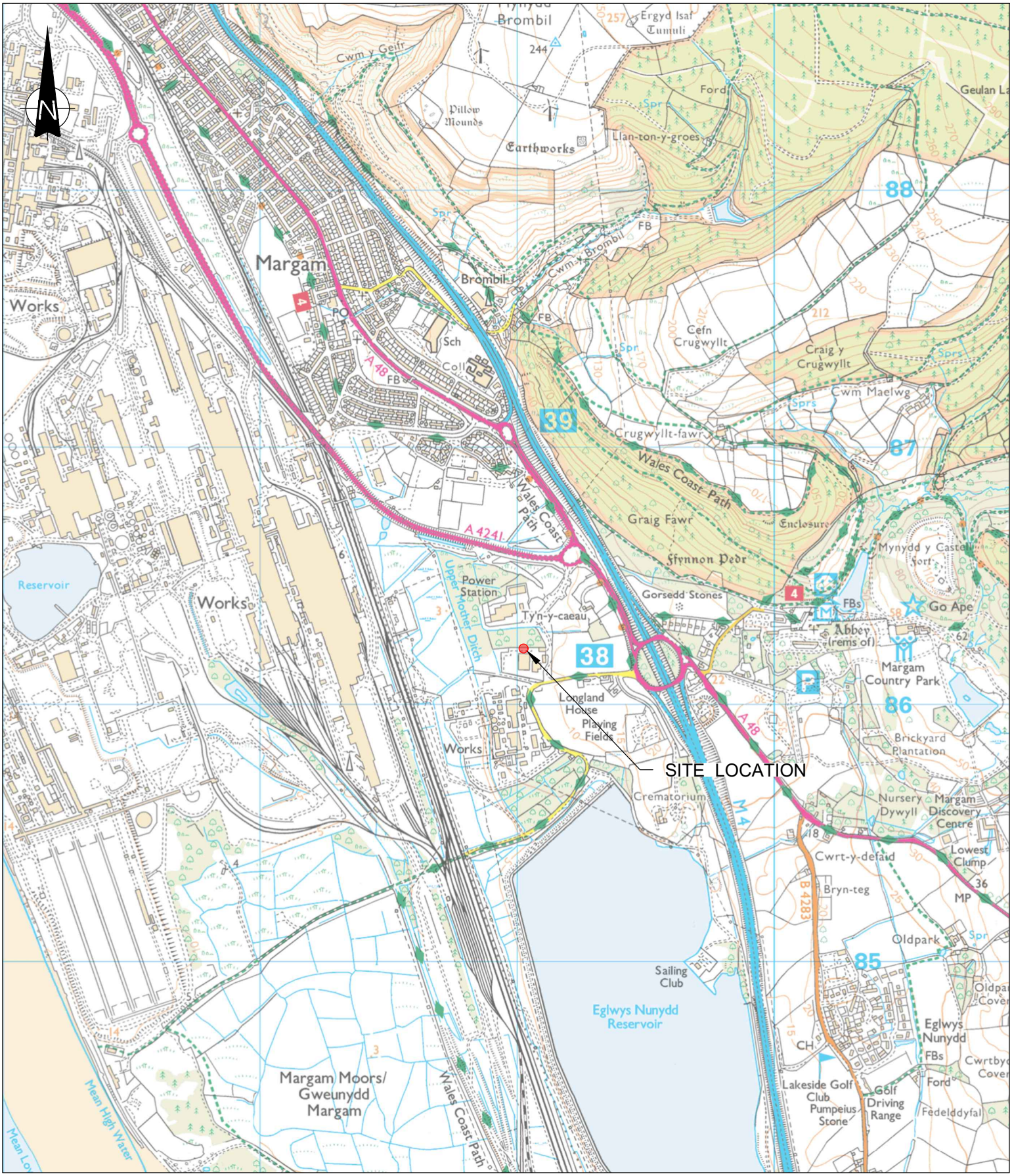
APPENDIX SCR3
Environmental Risk Assessment

App. SCR3 – Margam HPF Environmental Risk Assessment

Table 1 – Assessment of Pollution Potential of Materials Stored and Handled at the Site

Substance	Chemical Composition	Quantity	Environmental Behaviour & Fate	Potential Environmental Impact	Storage Arrangements	Assessment of Alternatives
Refrigerant (R410A)	50% Difluoromethane (R32); 50% Pentafluoroethane (R125)	Up to 500 litres	Fate is ultimately 100% to air	Harm to human health – can cause suffocation or frostbite should rapid evaporation occur. Inhalation of products in decomposition can lead to respiratory difficulty. Contribution to global warming potential if handled and stored incorrectly.	Appropriate storage tank to be utilised. Tank will be stored in cool, dry and well-ventilated area.	No alternatives currently being considered.
Ethylene glycol	Organic compound (CH_2OH)	up to 1,250 litres	Product is water soluble and is highly mobile in soils. Undergoes rapid biodegradation in aerobic and anaerobic environments (approximately100% removal of EG within 24 h to 28 days)	Short-term contamination of land and controlled waters and health risk to end users (i.e. humans, wildlife).	Stored in a closed loop system. Spill kits are located at strategic locations across the site	Potential alternative include the less toxic propylene glycol, but which processes lesser performance efficiencies.
R-407C	Difluoromethane, Pentafluoroethane, 1,1,1,2-Tetrafluoroethane	Up to 7.1kg	Material is gas at room temperature so is unlikely to remain in water. Fate is ultimately 100% to air	Harm to human health – skin irritation, frost bite and in a reduced oxygen environment symptoms of asphyxiation and cardiac arrythmia may occur.	Appropriate storage tank to be utilised. Tank will be stored in cool, dry and well-ventilated area. Spill kits are located at strategic locations across the site	No alternatives currently being considered.

DRAWINGS



CLIENT

PROTIUM

JOB TITLE

MARGAM HYDROGEN PRODUCTION FACILITY - ENVIRONMENTAL PERMIT APPLICATION

Sirius Environmental

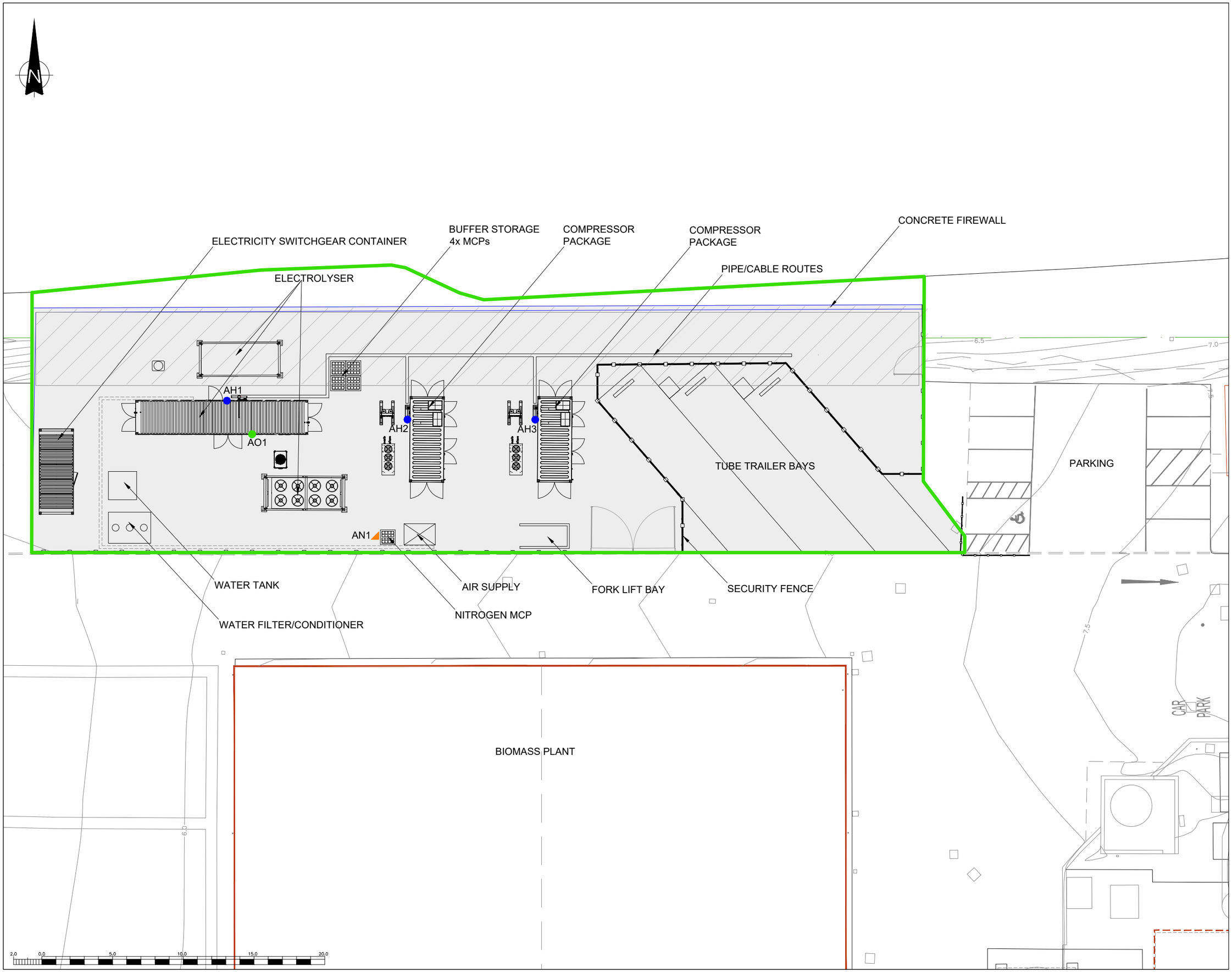
DRAWING TITLE

SITE LOCATION PLAN

REV	DESCRIPTION	DATE	BY

DRAWN	DATE	APPROVED	DATE
L.E.	24/4/2024	D.T.	24/4/2024

SCALE	SHEET	DRAWING NUMBER	REVISION
1:20,000	A4P	PRO1001/08/01	0



KEY

- CONCRETE PAD EXTENSION
- CONCRETE PAVEMENT
- ENVIRONMENTAL PERMIT APPLICATION BOUNDARY
- HYDROGEN VENT - AH1,2,3
- OXYGEN VENT - AO1
- NITROGEN VENT - AN1

NOTES

1) **Vent locations are indicative only and will be refined as the the project design is finalised.**
2) **Continuousand emergency hydrogen vents are located in the same location, but are routed through separate piepwork**
3) **Nitrogen will be vented intermittently following purges of the system. Vent location will be at the hydrogen vents indicated.**

REV	DESCRIPTION	DATE	BY

CLIENT

PROTIUM

Sirius Environmental
The Beacon Centre for Enterprise, Dafen, Llanelli. SA14 8LQ. 01554 780 544

JOB TITLE

MARGAM HYDROGEN PRODUCTION FACILITY

DRAWING TITLE

OPERATIONAL LAYOUT

DRAWN	DATE	APPROVED	DATE
L.E	23/04/2024	D.T.	23/04/2024

SCALE	SHEET	DRAWING NUMBER	REVISION
1:500	A3L	PRO1001/08/2	0