



Crossflow Energy

ABP Margam Sands

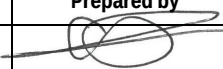
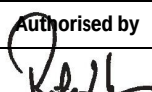
Desk Study



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ABP Margam Sands

Desk Study

ISSUE RECORD					
Report Reference: 2109014.001.01					
Version	Date	Amendments Record	Prepared by	Checked by	Authorised by
-	November 2021	-	 Claire Hooley	 Hannah Jeffery	 Richard Evans

Report Liability Date: November 2021

TEC is ISO 9001:2015 and ISO 14001:2015 certified by Advanced Certification Limited, a UKAS Accredited Certification Body (number 8872) and ISO 45001:2018 certified by QMS International Ltd for the scope of 'Specialist consultancy services across the UK in contaminated land assessment, ground engineering, waste management and construction phase monitoring'.

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1 INTRODUCTION

1.1 Terms of Reference

1.1.1 TEC has been appointed by Dulas Ltd on behalf of Crossflow Energy to undertake a preliminary land contamination assessment of ABP Margham Sands. All works were undertaken in accordance with our proposal letter dated 01 October 2021 and referenced CH.2109014.001.

1.2 Background

1.2.1 The site comprises an irregular shaped parcel of land near the breakwater at Port Talbot Docks, ABP Margam Sands in Neath Port Talbot (Figure 1). The covers an area of approximately 0.22 hectares, with the centre of the site situated at National Grid Reference 275920, 187430.

1.2.2 The proposed development is understood to comprise the construction of a wind turbine and temporary pop-up telecoms mast, alongside its existing older demonstration turbine and associated infrastructure (Crossflow Energy Drawing No. PPP Test Site Layout Drawing dated 05 August 2021).

1.2.3 The aim of these works is to provide information on land contamination risk associated with the site with regard to the proposed development.

1.3 Scope of Works

1.3.1 The scope of work undertaken as part of this report is presented below:

- **Preliminary Risk Assessment:** this phase of assessment involves development of an initial site conceptual model, based on desk study research and a site reconnaissance survey, in order to establish whether or not there are potentially unacceptable risks.

1.3.2 The above scope of work has been undertaken in accordance with current guidance such as LCRM - *Land contamination: risk management* (Environment Agency, 2020), BS10175+A2 (2017), BS5930:2015+A1:2020 and, where appropriate, Eurocode 7 and NHBC/ LABC.

2 PRELIMINARY RISK ASSESSMENT

2.1 Introduction

2.1.1 Information for this preliminary risk assessment (PRA) has been obtained from a site reconnaissance survey and a review of an Envirocheck® report obtained for the site (Appendix B and Appendix C) together with published available information where relevant.

2.2 Site Setting

2.2.1 A site reconnaissance survey was undertaken on 20 October 2021. A summary of the observations is presented in Table 2.1. Photographs taken during the site reconnaissance survey are presented in Appendix A.

Table 2.1: Site Details

Feature	Description
Current Site Use	The site currently comprises a compound situated within the ABP Margam Sands area and is associated with Crossflow Energy. The compound is irregular in shape with its boundary demarked by security fencing. The compound comprises a number of large storage containers, utilised as welfare facilities, and for the storage of materials and tools. Within one of the containers located in the south-eastern corner of the site, a number of small containers, likely storing small amounts of fuel and lubricants were recorded. An electricity sub-station was recorded along the south-eastern boundary of the site, with a number of pallets and an empty IBC stored adjacent to the station. An existing weather data mast, known as a 'MET' mast is location within the central and south-eastern area of the site. Within the north-western area of the site, an existing turbine is located (known as the 'IES'), with associated generator and container. In addition, adjacent to the 'IES', a telephone mast is located, which is understood to be removed shortly. A 1225l plastic bunded above ground fuel storage tank was recorded at the entrance of site (north-eastern boundary), for the storage and dispensing of diesel. No evidence of staining was observed within proximity to the tank.
Site Context	The site is located with an industrial area, associated with the existing Port Talbot Steel Works.
Site Boundary Features	North Port Talbot Steel Works with associated material storage areas, access roads and industrial structures
	East Afan Welsh Water Treatment Plant with Port Talbot Steel Works and associated material storage areas, access roads and structures
	South Open rough grassland with Swansea Bay and associated beach wall beyond
	West Open rough grassland with Swansea Bay and associated beach wall beyond
Site Topography	The site was observed to be relatively flat. Available OS Mapping indicates that the site is situated at approximately 8.2mAOD (Above Ordnance Datum).
Hard and Soft Landscaping	The site is entirely lain to gravel hardstanding with areas of rough grass noted within the hardstanding.
Trees	No trees or hedgerows were noted within the compound itself, however, areas of soft landscaping were recorded to the north, south and west of the site comprising rough grassland.
Fuel, Hazardous Chemicals and Waste Materials Storage	A single, 1225l plastic bunded above ground fuel storage tank was recorded at the entrance of site (north-eastern boundary), for the storage and dispensing of diesel. No evidence of staining was observed within proximity to the tank. No evidence of other above ground or any below ground storage tanks were observed within the compound. Two IBCs were recorded the compound, both of which were noted as empty. In addition, a number of wooden pallets were recorded.

Feature	Description
	A number of small containers, likely storing small amounts of fuel and lubricants were recorded within the large storage container on site.
Asbestos Containing Materials	No evidence of asbestos containing material was observed on the ground surface during the site reconnaissance.
Site Drainage	No formal site drainage was noted within the compound itself. However, areas of standing water were observed at the entrance to the compound. Formalised drainage was recorded along the access road to the north of the compound.
Evidence of Potential Contamination	No visual or olfactory evidence of potential contamination was recorded on the surface during the site reconnaissance.
Ground Stability Hazards	No visual evidence of ground subsidence or ground movement was observed.

2.3

Site History

2.3.1

Details of the history of the site and surrounding area, relevant to this preliminary risk assessment, have been obtained through the review of historical Ordnance Survey (OS) mapping. A summary of potentially significant features is recorded in Table 2.2, which should be read in conjunction with the full map extracts contained within Appendix B.

Table 2.2: Historical Features Summary

On Site Features			OS Dates
Earliest available mapping depicts the site as undeveloped, situated within an area of sand / sand dunes, and later sand and shingle. It is noted the development area is situated below the high-water mark of ordinary tides.			1877 – 1964
From 1965, the site is located within an area of rough grass and is depicted above the high-water mark of medium tides from this date.			1965 – 2021
From 1979, a track / road is depicted along the eastern boundary of the site.			1979 – 2021
Surrounding Features	Distance	Direction	OS Dates
Railway	~75m	Northeast	1919 – 1965
Tank	~40m	East	1964
Works with associated tanks	~490m	Northeast	1965 – 2021
Conveyor	~90m	North	1979 – 2021
Sludge Pond	~250m	Northeast	1978 – 2006
Works with associated tank and electrical substation	~250m	Northwest	1978 – 2021
Pumping station with associated tank and outfalls	~50m	Southeast	1993 – 2021
Sewage Works	~95m	East	2001 – 2021

2.4

Geology

2.4.1

A summary of available geological information for the area is provided in Table 2.3.

Table 2.3: Geological Setting

<i>BGS Geological Mapping (Ref. Solid and Drift 1:63,360 map – The Southwestern part of the Glamorgan Coal Field – Neath, Kidwelly, Llanelly, Swansea and Gower, Sheet 37)</i>		
Geological Unit	Thickness	BGS Description
Made Ground	Unknown	Not recorded on geological mapping but may be present on site
Superficial Deposits: Marine Beach Deposits	Unknown	Shingle, sand, silt and clay; may be bedded or chaotic; beach deposits may be in the form of dunes, sheets or banks; in association with the marine environment.

Superficial Deposits: Storm Beach Deposits (immediately north of the development site)		Unknown	Storm beach deposits comprise a low rounded ridge of coarse materials (gravels, cobbles and boulders) piled up by very powerful storm waves at the inland margin of a beach, above the level reached by normal spring tides.
Solid Geology: South Wales Middle Coal Measures Formation		Up to 240m	Grey, (productive) coal-bearing mudstones/siltstones, with seatearths and minor sandstones.
BGS Borehole Records			
BGS Reference	Distance/ Direction	Depth	Recorded Strata
SS78NE/100	~100m Southeast	1.2m	Coarse brown sand and medium coarse gravel with large boulders
		>9.75m	Medium dense brown medium sand with shell fragments
SS78NE/223	~105m Southeast	2.95m	Made Ground
		11.5m	Very dense predominantly medium sand with a little gravel, cobbles and numerous shells.
		12.5m	Medium dense brown silty medium sand with pockets of blue-grey silty clay and occasional gravel and shells.
		>15.0m	Loose to medium dense grey-brown slightly silty medium sand, shells and gravel.
SS78NE/222	~110m Southeast	1.0m	Brown sand and gravel with some shell and shell fragments
		2.75m	Rounded gravel and brown sand
		11.5m	Brown predominantly medium sand with shell fragments
		13.5m	Grey silty to very silty clay with pockets and bands of sandy silt and firm grey very sandy silty clay with pockets of partially decomposed roots and small pockets of carbonaceous material
		14.2m	Grey fine sandy silt with pockets of find sand and occasional partially decomposed roots
		15.02m	Grey fine sand becoming silty at depth
		16.5m	Firm grey very silty clay with bands of peaty clay and fine sand
		22.0m	Grey sandy silt with pockets of peat with strong odour and bands of fine sand and silty clay
		23.5m	Grey very silty fine sand grading to sandy silt then silty clay with peaty zones
		23.75m 25.575m	Stiff dark brown peat Grey sandy silty clay grading to rounded and subrounded gravel and very clayey silty sand.
BGS Estimated Soil Chemistry			
Element		Estimated Concentration	
Arsenic		15-25 mg/kg	
Cadmium		<1.8 mg/kg	
Chromium		60 - 90 mg/kg	
Lead		<100 mg/kg	
Nickel		30-45 mg/kg	

Radon	
Radon Potential	Radon Protection Requirement
Intermediate Probability Radon Area (Between 1% and 3% of homes are estimated to be at or above the Action Level)	None reported to be required

2.5

Hydrogeology

2.5.1

The Envirocheck® report and Environment Agency information records the following hydrogeological setting of the site.

Table 2.4: Hydrogeological Setting

Aquifer Status			
Geological Unit	Groundwater Vulnerability/ Aquifer Designation	Environment Agency Aquifer Classification	Potential Hydraulic Gradient Direction
South Wales Middle Coal Measures Formation	High Vulnerability / Secondary A Aquifer	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.	-
Marine Beach Deposits and Storm Beach Deposits	High Vulnerability / Secondary (Undifferentiated) Aquifer	Assigned in cases where it has not been possible to attribute either Category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.	Tidally influenced
Source Protection Zones			
None recorded within 1km			
Groundwater Abstractions			
None recorded within 1km			
Discharge Consents to Groundwater			
3No. recorded within 1km			
Receiving Water	Effluent Type	Distance/ Direction from Site	
Soakaway	Sewage discharges – final/treated effluent	~830m East (3No. records)	
BGS Groundwater Flooding Susceptibility			
~45m East - Potential for groundwater flooding to occur at the surface; and groundwater flooding of property situated below ground level.			

2.6

Hydrology

2.6.1

The hydrological setting of the site is summarised in Table 2.5:

Table 2.5: Hydrological Setting

Nearest Surface Water Features		
Feature	River Quality (GQA Grade)	Distance/ Direction from Site
Swansea Bay	-	~75m South
Surface Water Abstractions		
None recorded within 500m		

Licensed Discharge Consents		
11No. records within 500m		
Receiving Water	Effluent Type	Distance/ Direction from Site
Swansea Bay	Sewage discharges – final/treated effluent	~110m Southeast (3No. records)
	Sewage discharges – storm overflow / storm tank	~310m South (5No. records)
	Sewage system discharge	~370m Southwest (3No. records)
Pollution Incidents		
1No. recorded within 500m		
Receiving Water	Pollutant/ Incident	Distance/ Direction from Site
Unknown	Chemicals – paints / dyes – Category 3 (Minor) incident from a deliberate act	~115m Southeast
Flooding from Rivers or Seas		
On Site Designation	Off Site Areas of Flooding	
Flood Zone 1	~80m west: Extent of flooding and extreme flooding from rivers or seas without defences	

2.7

Environmental Data

2.7.1

Additional relevant environmental data from the Envirocheck® report for the site is summarised in Table 2.6.

Table 2.6: Additional Environmental Data Summary

Landfill Site			
None recorded within 500m			
Licenced Waste Management Facilities			
2No. recorded within 500m			
Name/ Location	Category	Input Dates	Distance/ Direction from Site
Afan Wastewater Treatment Works	Landfill gas engine	2013 – unknown	~160m East
Afan Combined Heat and Power Facility		2018 – unknown	~180m Southeast
Potentially Infilled Land (Water)			
4No. recorded within 500m			
Type	Distance/ Direction from Site		Date on Mapping
Unknown filled ground (pond, marsh, river, stream, dock etc)	On site		1965
	~425m Northeast		1951
	~455m Northeast		1921
	~475m Southwest		1965
Potentially Infilled Land (Non-Water)			
None recorded within 500m			
Commercial/ Industrial Land Use (Active Contemporary Trade Directories)			
No significant land uses identified within 500m			

Points of Interest		
8No. points of interest recorded within 250m of the site		
Type	Distance / Direction	
Tank	~55m southeast ~100m southeast	
Outfall	~65m south ~110m southeast ~110m south	
Sewage Works	~140m east ~150m southeast ~175m east	
Hazardous Substances (Authorisations, Consents, Incidents)		
2No. recorded within 500m		
Category	Details	Distance/ Direction from Site
Integrated Pollution Prevention and Control (IPPC)	Afan Wastewater Treatment Works	~160m East (2No. records)
Sensitive Land Uses		
None recorded within 500m		

2.8 Engineering Considerations

2.8.1 Engineering considerations identified from the Envirocheck® report for the site are summarised in Table 2.7:

Table 2.7: Engineering Considerations

Ground Stability Hazards						
Hazard	Hazard Potential					
	No Hazard	Negligible	Very Low	Low	Moderate	High
Collapsible ground	X					
Compressible ground	X					
Ground dissolution	X					
Landslide			X			
Running sand	X					
Shrink/swell clays	X					
Non-coal mining	X					
BGS Recorded Mineral Sites						
None recorded within 1km						

2.9 Coal Mining

2.9.1 The site is underlain by the South Wales Middle Coal Measures Formation. A review of available Coal Authority mapping indicates the site is situated within a Coal Mining Reporting Area and an area designated as a surface coal resource area.

2.10 Regulatory Consultations

2.10.1 Regulatory consultations were undertaken with the relevant departments at Neath Port Talbot Council with respect to possible environmental issues on-site and in the surrounding area. At the time of issue, no response had been received. Any pertinent information received in due course will be forwarded under separate cover.

2.11 Outline Conceptual Model

- 2.11.1 In accordance with the Environment Agency Land contamination: risk management guidance, potential source-pathway-receptor pollutant linkages identified from the desk study phase are summarised in the following sections.

2.12 Potential Sources

- 2.12.1 Potential sources of contamination identified on and within the vicinity of the site are summarised below:

On Site Sources

- Potentially infilled land / localised areas of made ground of unknown chemical composition; and
- Potentially contaminative uses including above ground fuel tank and electrical substation;

Off Site Sources

- A number of potentially contaminative land uses have been identified in proximity to the site including railways, works and tanks; and
 - In an area of potential historic coal mining
- 2.12.2 No landfills are identified within 250m of the site.

2.13 Potential Receptor Pathways

- 2.13.1 Potential receptors identified as part of this preliminary risk assessment are:

- Current/future site users;
- Construction workers;
- Controlled waters (Secondary Aquifer and Swansea Bay);
- Proposed development/ structures.

2.14 Potential Pathways

- 2.14.1 Potential contaminant pathways relating to the identified receptors and contaminants of concern include:

- Dermal contact – contact with soil, dust or water;
- Ingestion - ingestion of soil, dust or water;
- Inhalation – inhalation of soil, dust or vapours;
- Vertical migration – e.g. seepage of contaminants at the ground surface (i.e. leakage/spillage of hydrocarbons) through cracks in hardstanding and/or leaching of contaminants within the unsaturated zone resulting in vertical contaminant migration; and
- Horizontal migration – e.g. lateral migration of contaminants within the saturated zone and along preferential pathways such as drainage pipe bedding.

2.15 Hazard Assessment and Risk Estimation

- 2.15.1 Potential pollutant linkages identified as part of this preliminary risk assessment are summarised in the Outline Site Conceptual Model presented in Table 2.8. References to risk estimations are made in accordance with the methodology presented in CIRIA publication C552 (2001) titled 'Contaminated Land Risk Assessment: A Guide to Good Practice' and summarised in Appendix D.

Table 2.8: Outline Conceptual Model

Potential Hazard/ Source	Potential Receptor	Potential Pathway to Receptors	Potential Consequence of Source-Receptor Linkage	Potential Likelihood for Significant Source-Receptor Linkage	Risk Classification
Made ground and potentially contaminative processes (storage tank and electrical substation) – on site	Current and future site users and construction workers	Exposure to potential contaminants through ingestion, inhalation and dermal contact.	Medium	Likely: Given the observations made during the site reconnaissance and given that the site and surrounding area are reported to be located on 'potentially infilled land', the presence of made ground of unknown thickness and chemical composition, or shallow contaminants of concern on site associated with potentially contaminative uses cannot be discounted at this stage.	Low to Moderate Risk
	Controlled waters (Secondary Aquifers and Swansea Bay)	Leaching of potential contaminants from made ground and vertical and lateral migration through the saturated zone to controlled waters.	Medium	Low Likelihood: Given the potential presence of made ground of unknown chemical composition or shallow contaminants of concern, the recorded aquifer status of the underlying strata (Secondary A Aquifer) and close proximity of Swansea Bay, a potential risk to controlled waters, whilst likely to be low, cannot be fully discounted.	Low Risk
	Current and future site users, construction workers and proposed development	Migration, ingress and accumulation of ground gasses.	Severe	Low Likelihood: Made ground, if present, may act as a potential source of ground gas, subject to thickness and chemical composition.	Low to Moderate Risk
Potentially contaminative land uses – off site	Current and future site users, construction workers, controlled waters and proposed development.	Potential on-site contaminant / ground gas migration from off-site sources. Exposure to potential contaminants through ingestion, inhalation and dermal contact.	Medium to Severe	Low Likelihood: Potentially contaminative current and historic processes have been identified in proximity to the site and therefore, the potential for significant contaminant migration cannot be discounted at this stage.	Low to Moderate Risk
Historic coal mining activities – off site	Current and future site users, construction workers, controlled waters and proposed development.	Potential on-site contaminant / ground gas migration	Medium to Severe	Unlikely to Low Likelihood: The site is situated within a Coal Authority Coal Mining Reporting Area and an area designated as a surface coal resource area. Therefore, the potential for onsite contamination and ground gas migration from off-site sources cannot be discounted at this stage.	Low to Moderate Risk

3 RECOMMENDED FURTHER WORKS

3.1.1 Based upon our current conceptual understanding of the site and the proposed end use, the main potential Significant Pollutant Linkages identified are considered to be as follows:

- Human Health (current and future site users and construction workers) – exposure to contaminants associated with potential made ground and potentially contaminative uses on and in proximity of the site through the ingestion, inhalation and dermal contact pathways;
- Controlled Waters – risk to controlled waters from on-site contaminants of potential concern (CoPC) and subsequent migration to identified groundwater receptors; and
- Human health (Future site end users and onsite structures) – migration, ingress and inhalation of potential gases that may be associated with made ground and former coal mining activities within the area.

3.2 Geoenvironmental Risk Management Recommendations

3.2.1 While the site is likely to be of low risk due to the limited nature of the proposed development, given the assessment presented within this report, additional works would be recommended to fully define the geoenvironmental issues associated with the site in relation to the proposed development.

3.3 Geotechnical Risk Management Recommendations

3.3.1 Given the scale of the proposed development, presence of potentially significant made ground and the site being located within a Coal Authority Coal Mining Reporting Area and an area designated as a surface coal resource area, a suitable geotechnical investigation is recommended to confirm the engineering conditions and constraints associated with the site.

TEC

Figures and Drawings



Approximate Site Location:



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Site Name:

APB Margam Sands

Drawing Name:

Site Location Plan

Client Name:

Crossflow Energy

Project No:

2109014.001

Figure No:

1

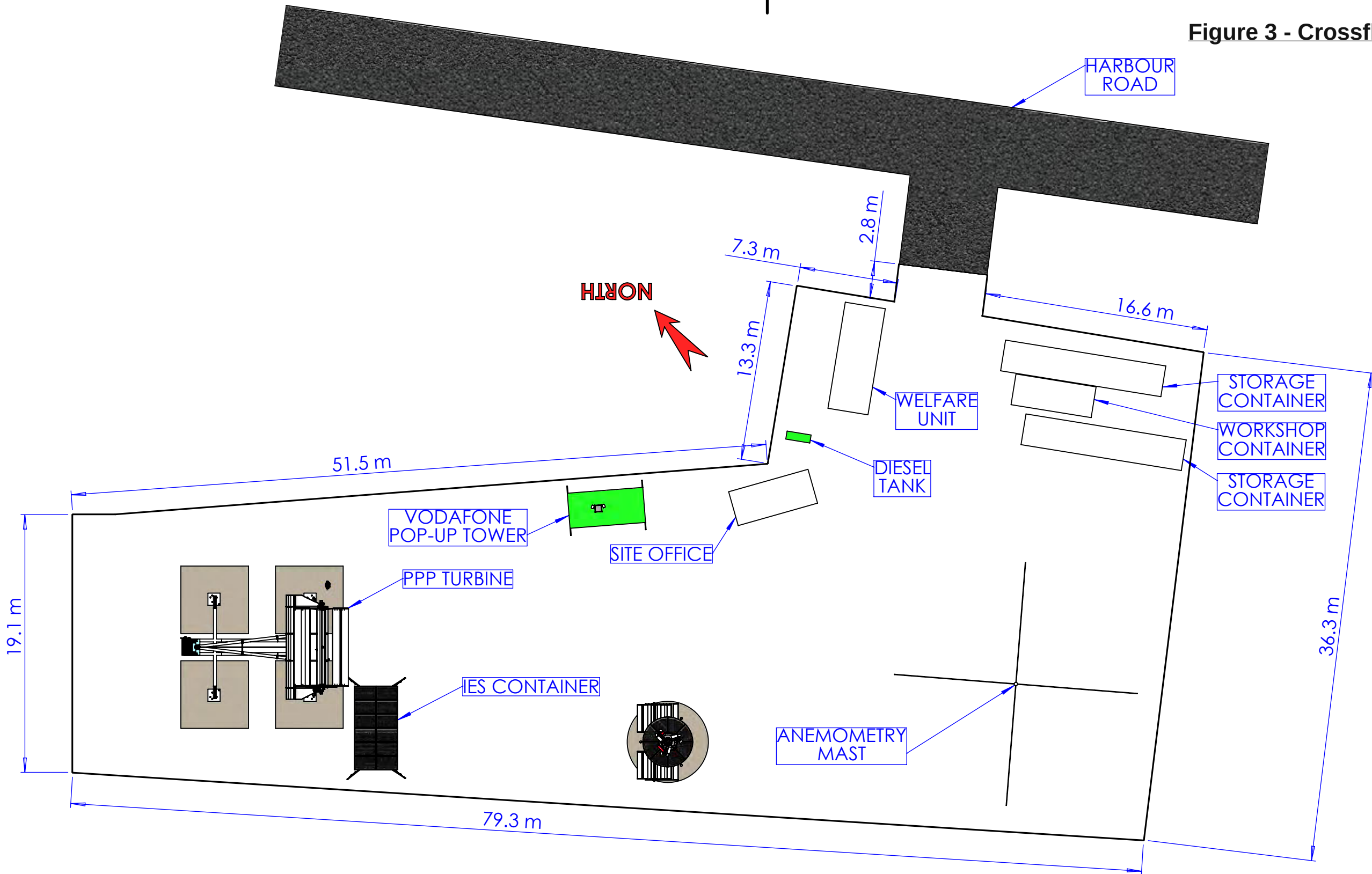
Date:

November 2021

Scale:

NTS

Figure 3 - Crossflow Block Plan



NOTES:-
1. ALL DIMENSIONS ARE APPROXIMATE.
2. SITE AREA 2,300 m² APPROX.

Material: N/A		This drawing and any information or descriptive material set out on it are the confidential and copyright property of Cross-Flow Energy Co. Ltd. © and MUST NOT BE DISCLOSED, COPIED, LOANED in whole or part or used for any purpose without the written permission of Cross-Flow Energy Co. Ltd.	Description: PPP SITE LAYOUT DRAWING - WITH 3.5kW ECOTOWER			
Finish: N/A			Drawn by: N LONG		Drawn Date: 05/08/2021	
Unless Otherwise Stated: Linear Tol.: ±0.2 , Angular Tol.: 0°15' Surface Finish: 0.32µm All Dimensions: mm			Checked/Approved by:		Checked/Approved Date:	
Drawing Scale: 1:300			Part Number: PPP TEST SITE LAYOUT DRAWING			
Approx Weight: Kg	Drawing Produced In Accordance With: BS8888	Legal Owner:  DRIVING PROGRESS Baglan Bay Innovation Centre, Energy Park Central Avenue, Port Talbot, SA12 7AX, UK +44 1639 816 020 enqr@crossflowenergy.co.uk www.crossflowenergy.co.uk	Drawing Number: PPP TEST SITE LAYOUT DRAWING		Sheet: 1 of 2	Revision: 4
Projection Method: THIRD ANGLE 		Sheet Size: A3				

Appendix A

Site Photographs

ABP Margam Sands



Photograph 1: View of existing compound located along the breakwaters of Port Talbot Docks, ABP Margam Sands, facing south-west with 'MET' mast.



Photograph 2: View of existing containers located at the entrance of the compound, with bunded fuel storage tank, facing north-west.

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Photograph 3: Southern boundary of the site, with empty IBC, wooden pallet storage and electricity substation beyond, facing north-east.



Photograph 4: Existing 'MET' weather data mast located within the central area of the site, facing north.

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Photograph 5: View of existing site, facing south-east



Photograph 6: Existing turbine and generator with 'IES' control container located along the north-western boundary of the site, facing north-west

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Photograph 7: Temporary telephone mast with associated generator located along the northern boundary of the site, facing south-east.



Photograph 8: View of existing storage containers and car parking areas, facing north-east.



Photograph 9: Internal view of large storage container within the south-eastern area of the site, number of small containers (fuel and lubricants) recorded.

Appendix B

Historical Maps

Historical Mapping Legends

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

	Quarry		Gravel Pit		Sand Pit
	Clay Pit		Shingle		Refuse Heap
	Sloping Masonry		Flat Rock		
	Marsh		Reeds		Osiers
	Rough Pasture		Furze		Wood
	Mixed Wood		Brushwood		Orchard
	Fir		Ford		Stepping Stones
	Ferry		Waterfall		Lock
	Trig. Station		Altitude at Trig. Station		
	B.M. 325.9		Bench Mark		Surface Level
	Arrow denotes flow of water		Antiquities (site of)		
	Cutting		Embankment		
	Railway crossing Road		Level Crossing		Road crossing Railway
	Railway crossing River or Canal		Road over single stream		Road over River or Canal
	County Boundary (Geographical)		County & Civil Parish Boundary		Administrative County & Civil Parish Boundary
	County Borough Boundary (England)		County Burgh Boundary (Scotland)		
	B.P. B.S. Boundary Post or Stone		P.C.B. Police Call Box		
	B.R. Bridle Road		P. Pump		
	E.P. Electricity Pylon		S.P. Signal Post		
	F.B. Foot Bridge		S.L. 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

	Inactive Quarry, Chalk Pit or Clay Pit		Active Quarry, Chalk Pit or Clay Pit
	Rock		Boulders
	Cliff		Slopes
	Roofed Building		Glazed Roof Building
	Sloping Masonry		Archway
	Non-Coniferous Tree (surveyed)		Coniferous Tree (surveyed)
	Non-Coniferous Trees (not surveyed)		Coniferous Trees (not surveyed)
	Orchard Tree		Scrub
	Coppice, Osier		Reeds
	Rough Grassland		Heath
	Direction of water flow		Bench Mark
	Cave Entrance		Triangulation Station
	Electricity Transmission Line		Electricity Pylon
	County Boundary (Geographical)		County & Civil Parish Boundary
	County Boundary		Boundary post/stone
	County Borough Boundary (England)		County Burgh Boundary (Scotland)
	Admin. County or County Bor. Boundary		London Borough Boundary
	Symbol marking point where boundary mereing changes		
	BH Beer House		P Pillar, Pole or Post
	BP, BS Boundary Post or Stone		PO Post Office
	Cn, C Capstan, Crane		PC Public Convenience
	Chy Chimney		PH Public House
	D Fn Drinking Fountain		Pp Pump
	EI 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

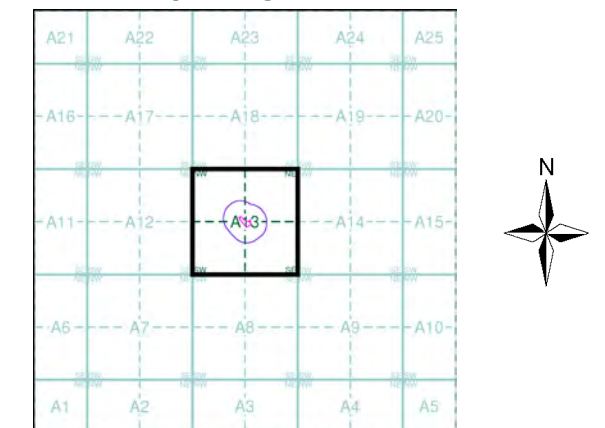
	Cliff		Slopes
	Rock		Rock (scattered)
	Boulders		Boulders (scattered)
	Positioned Boulder		Scree
	Non-Coniferous Tree (surveyed)		Coniferous Tree (surveyed)
	Non-Coniferous Trees (not surveyed)		Coniferous Trees (not surveyed)
	Orchard Tree		Scrub
	Coppice, Osier		Reeds
	Rough Grassland		Heath
	Direction of water flow		Triangulation Station
	Electricity Transmission Line		Electricity Pylon
	Bench Mark		Buildings with Building Seed
	Roofed Building		Glazed Roof Building
	Civil parish/community boundary		District boundary
	County boundary		Boundary post/stone
	Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)		
	Bks Barracks		P Pillar, Pole or Post
	Bty Battery		PO Post Office
	Cem Cemetery		PC Public Convenience
	Chy Chimney		Pp Pump
	Cis Cistern		Ppg Sta Pumping Station
	Disntd Rly Dismantled Railway		PW Place of Worship
	El Gen Sta Electricity Generating Station		Sewage Ppg Sta Sewage Pumping Station
	EI 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 Governor		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



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Glamorganshire	1:2,500	1877	2
Glamorganshire	1:2,500	1899	3
Glamorganshire	1:2,500	1919	4
Glamorganshire	1:2,500	1940	5
Ordnance Survey Plan	1:2,500	1964	6
Ordnance Survey Plan	1:1,250	1978 - 1979	7
Ordnance Survey Plan	1:2,500	1981	8
Large-Scale National Grid Data	1:1,250	1993	9
Historical Aerial Photography	1:2,500	2001	10

Historical Map - Segment A13



Order Details

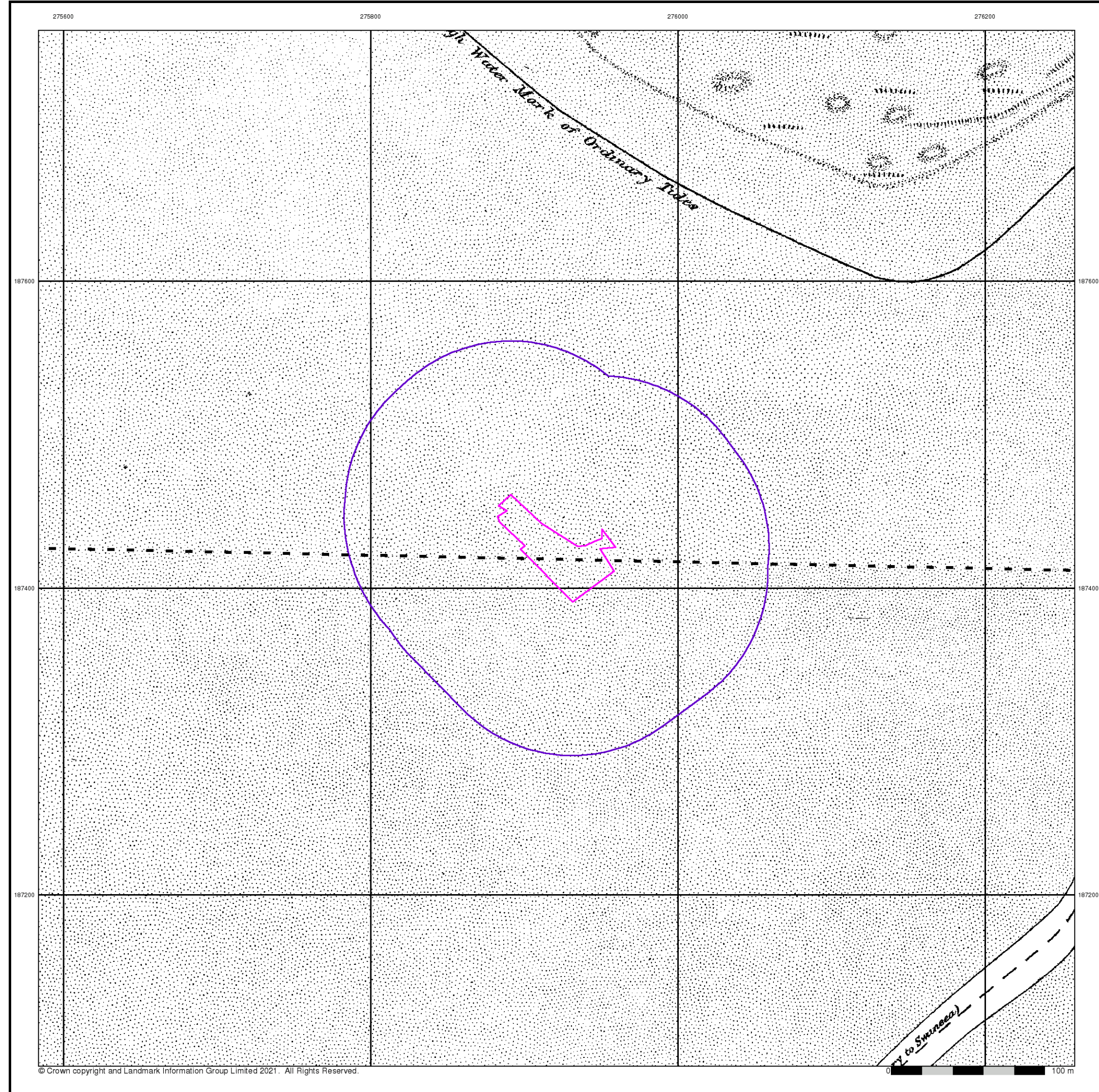
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National Grid Reference: 275920, 187430
Slice: A
Site Area (Ha): 0.22
Search Buffer (m): 100

Site Details

Site at 275910, 187420



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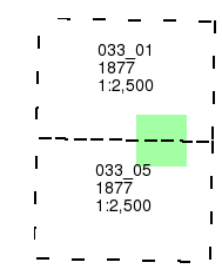
Glamorganshire

Published 1877

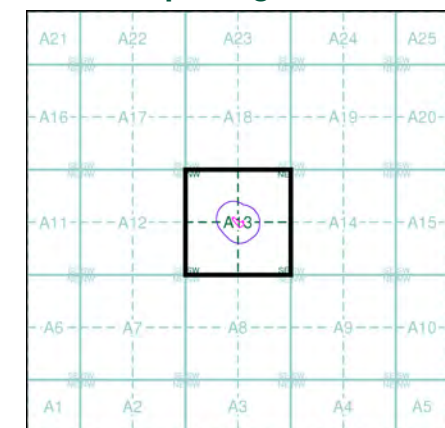
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

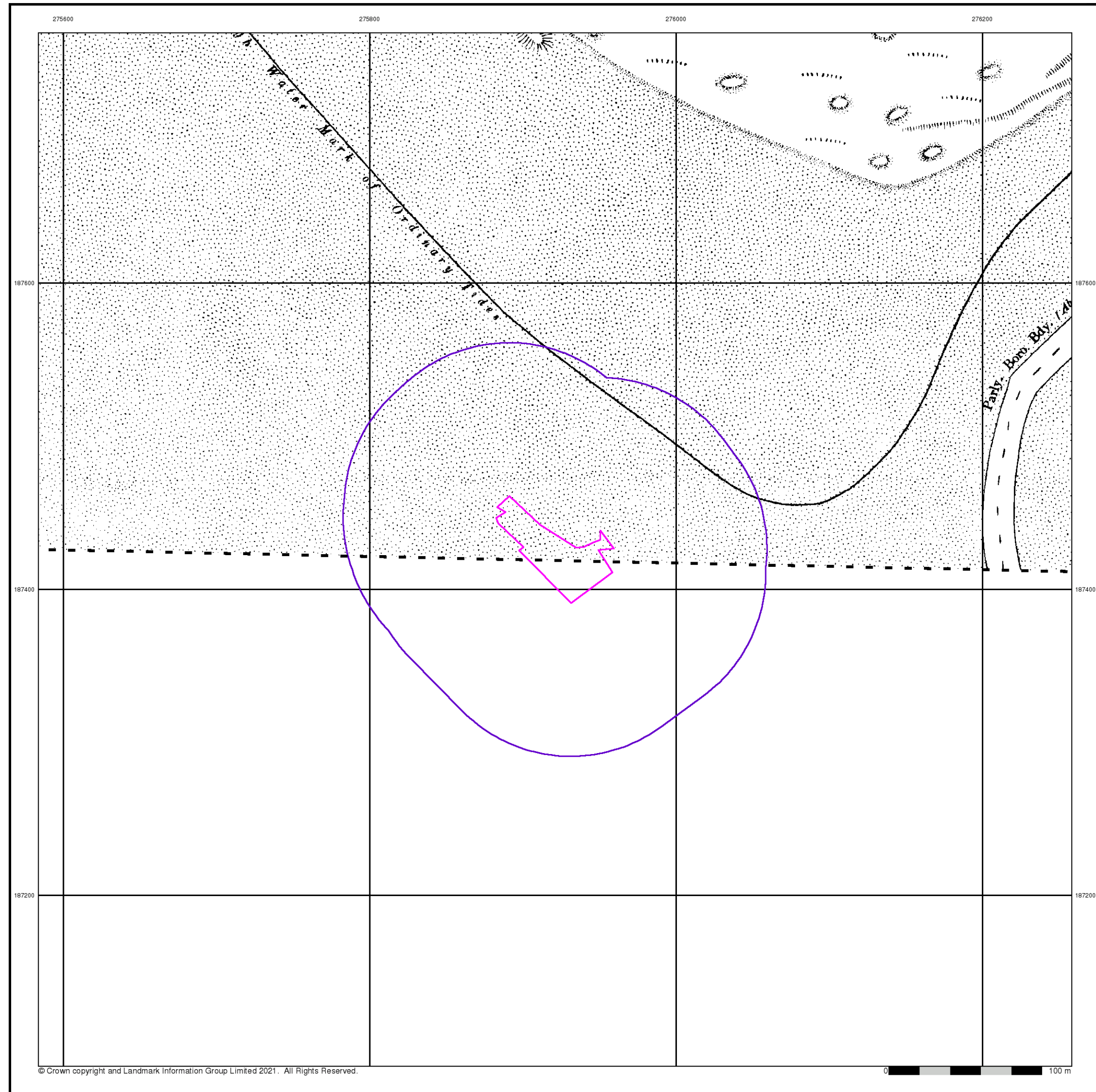
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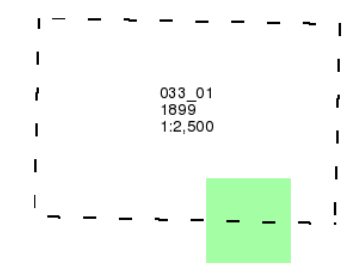
Glamorganshire

Published 1899

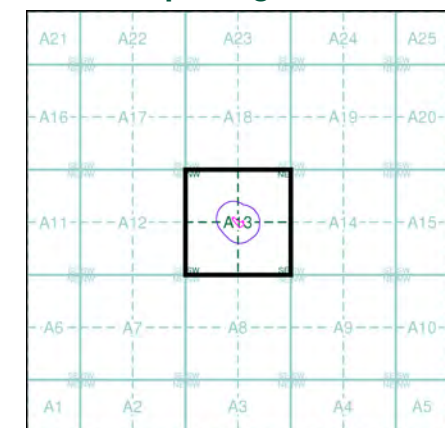
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

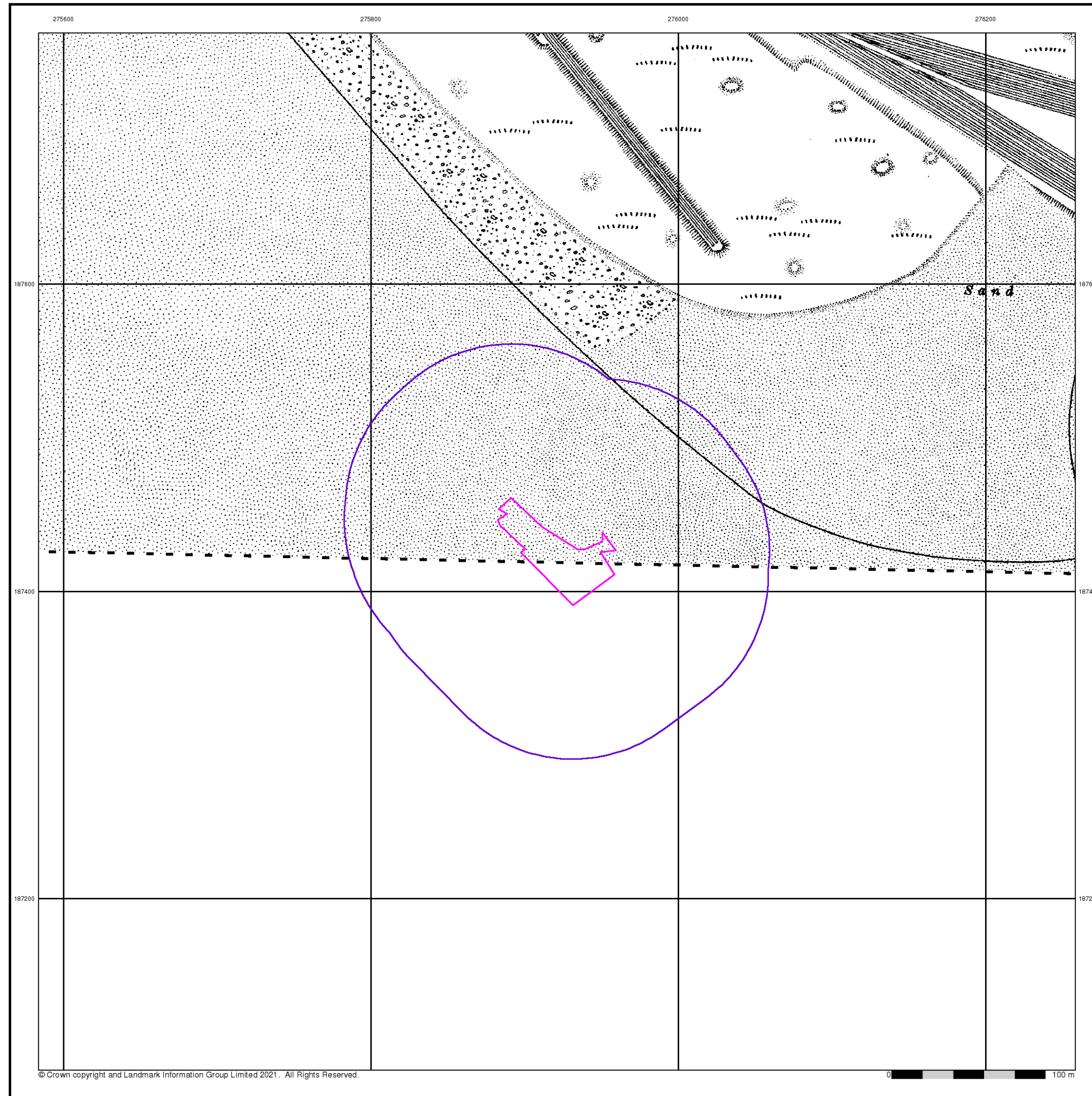
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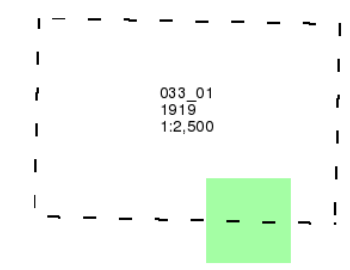
Glamorganshire

Published 1919

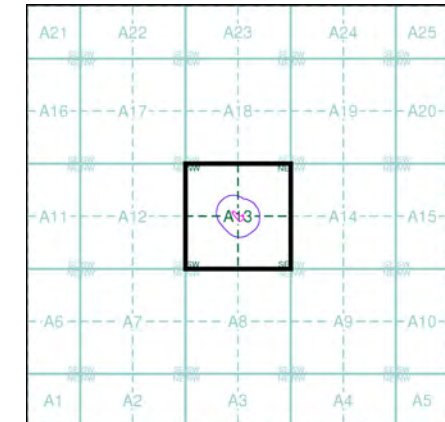
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

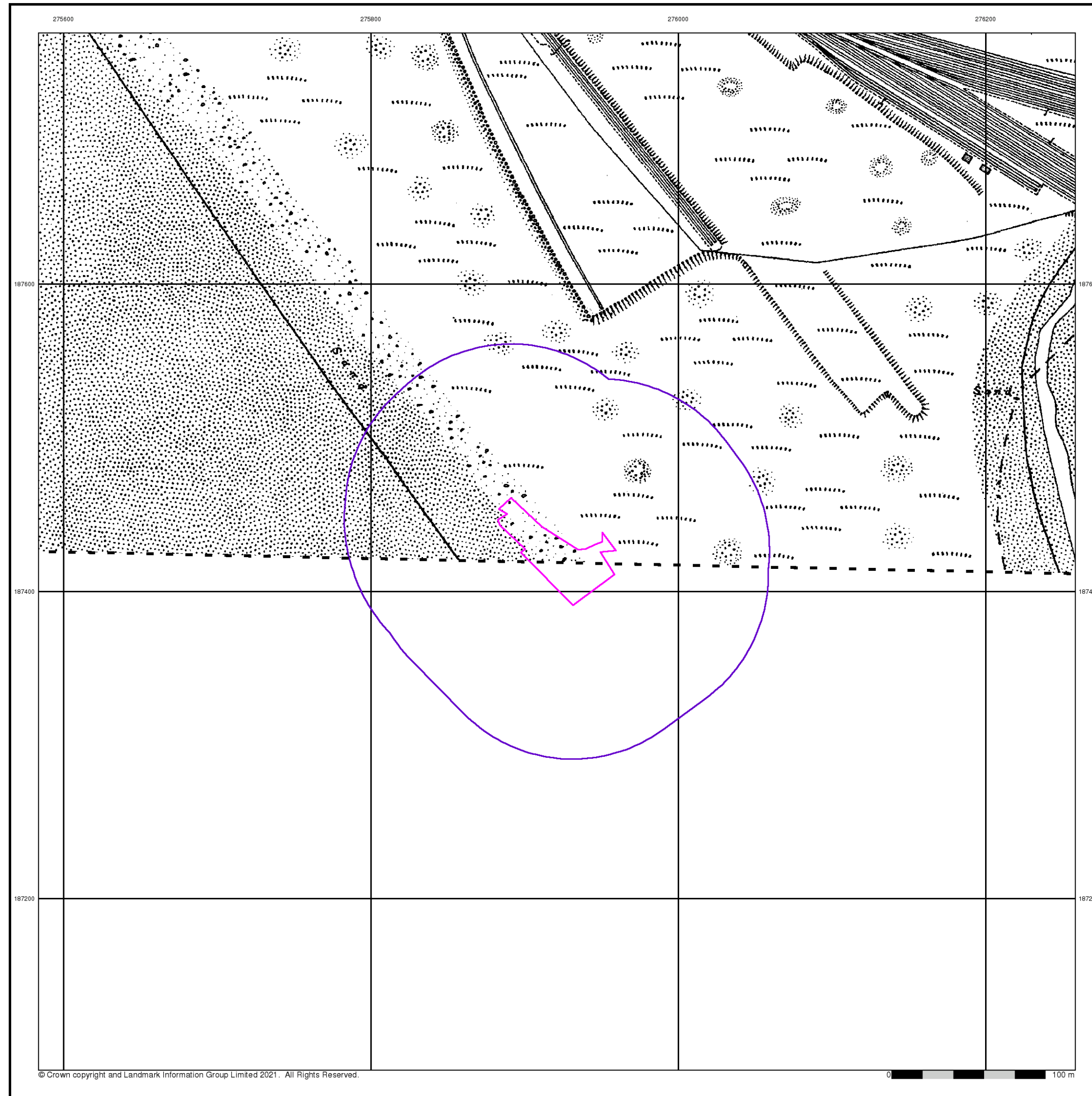
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Customer Ref: 2109014.001
National Grid Reference: 275920, 187430
Slice: A
Site Area (Ha): 0.22
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Site Details

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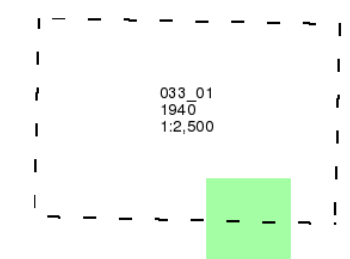
Glamorganshire

Published 1940

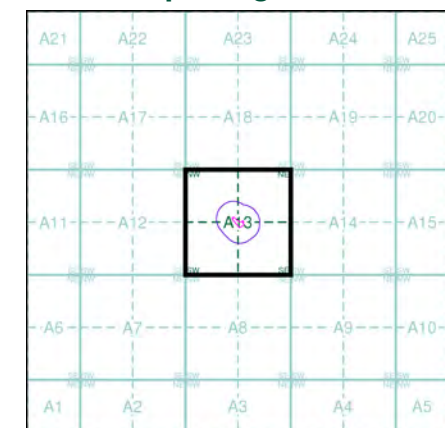
Source map scale - 1:2,500

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

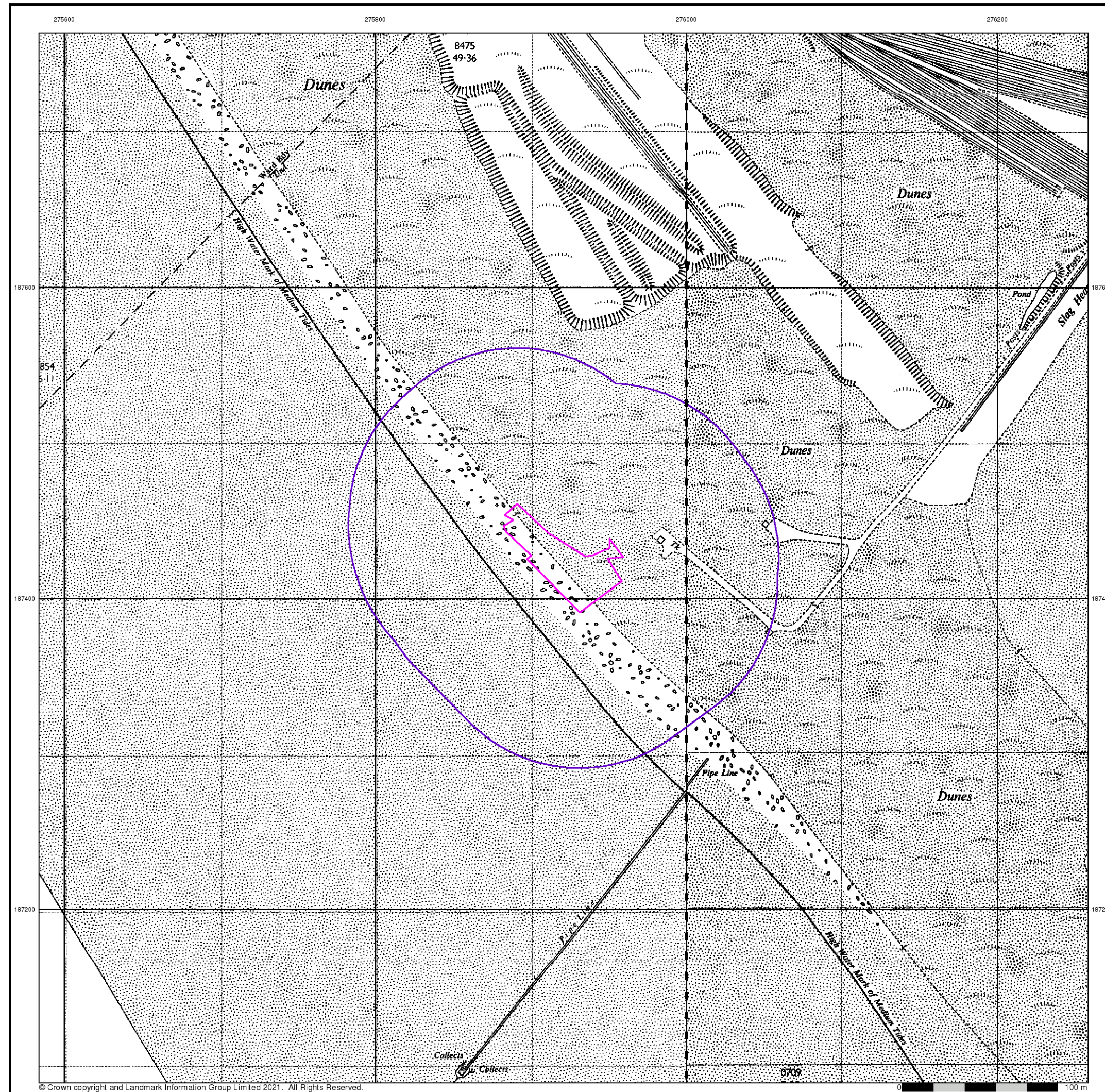
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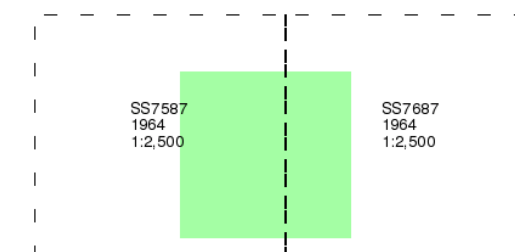
Ordnance Survey Plan

Published 1964

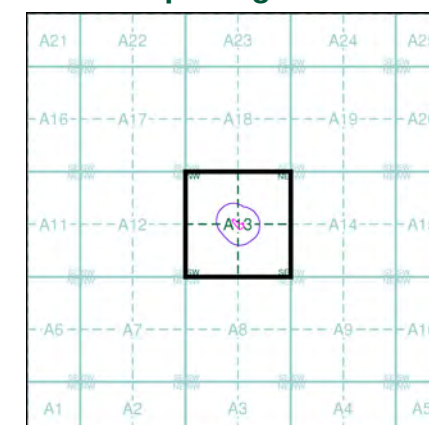
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered 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

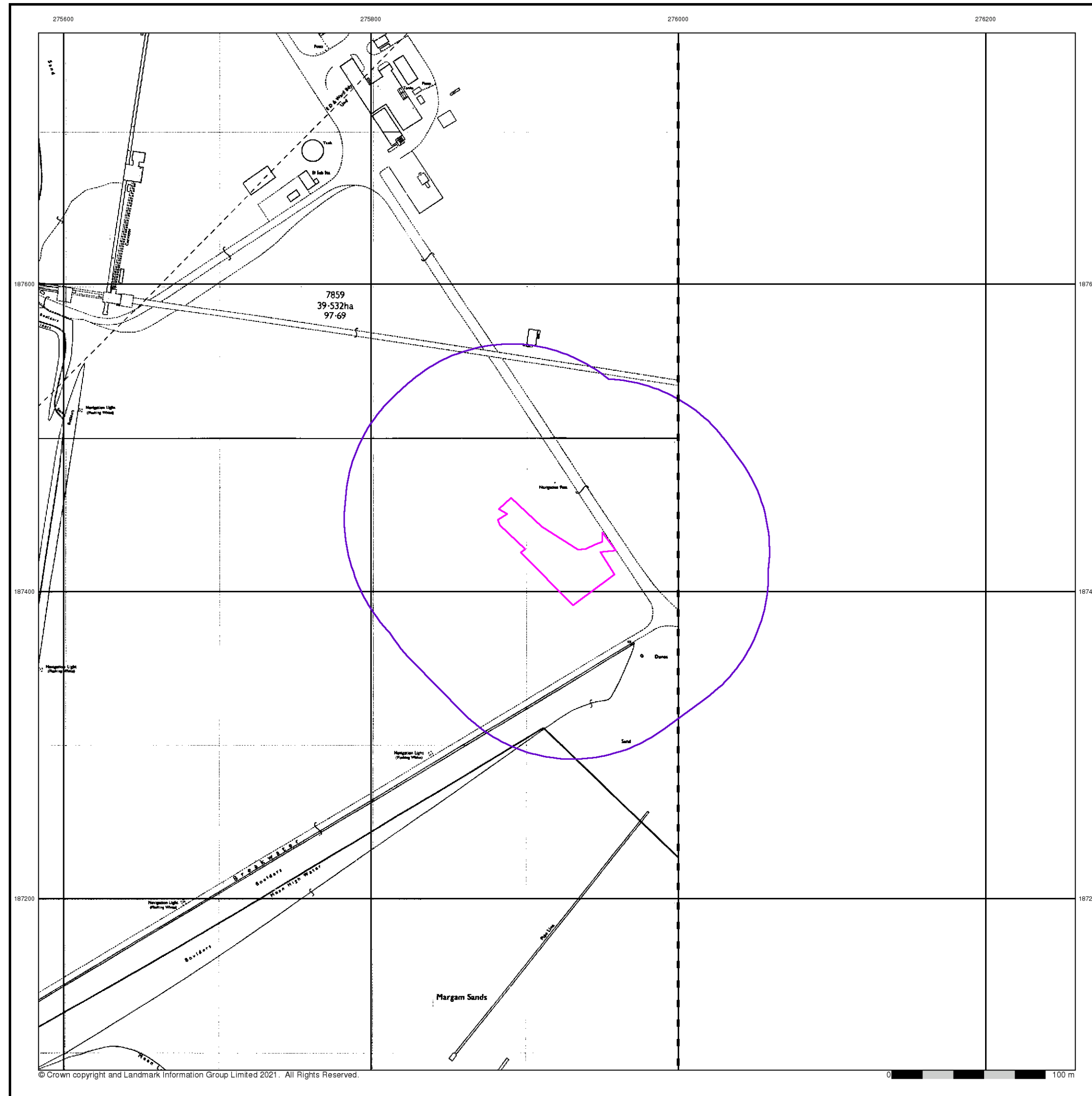
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Slice: A
Site Area (Ha): 0.22
Search Buffer (m): 100

Site Details

Site at 275910, 187420



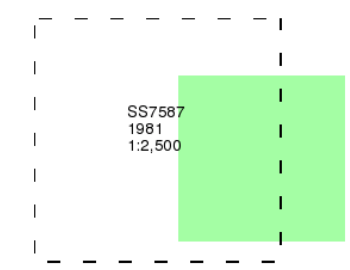
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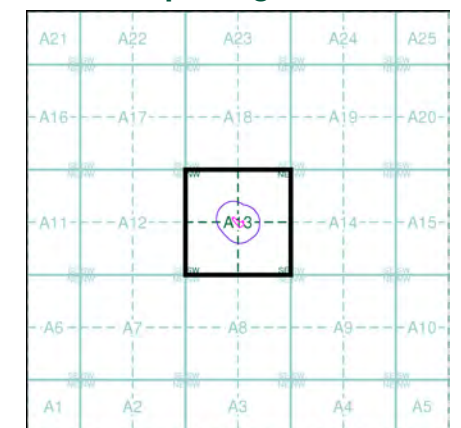
Ordnance Survey Plan
Published 1981
Source map scale - 1:2,500

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

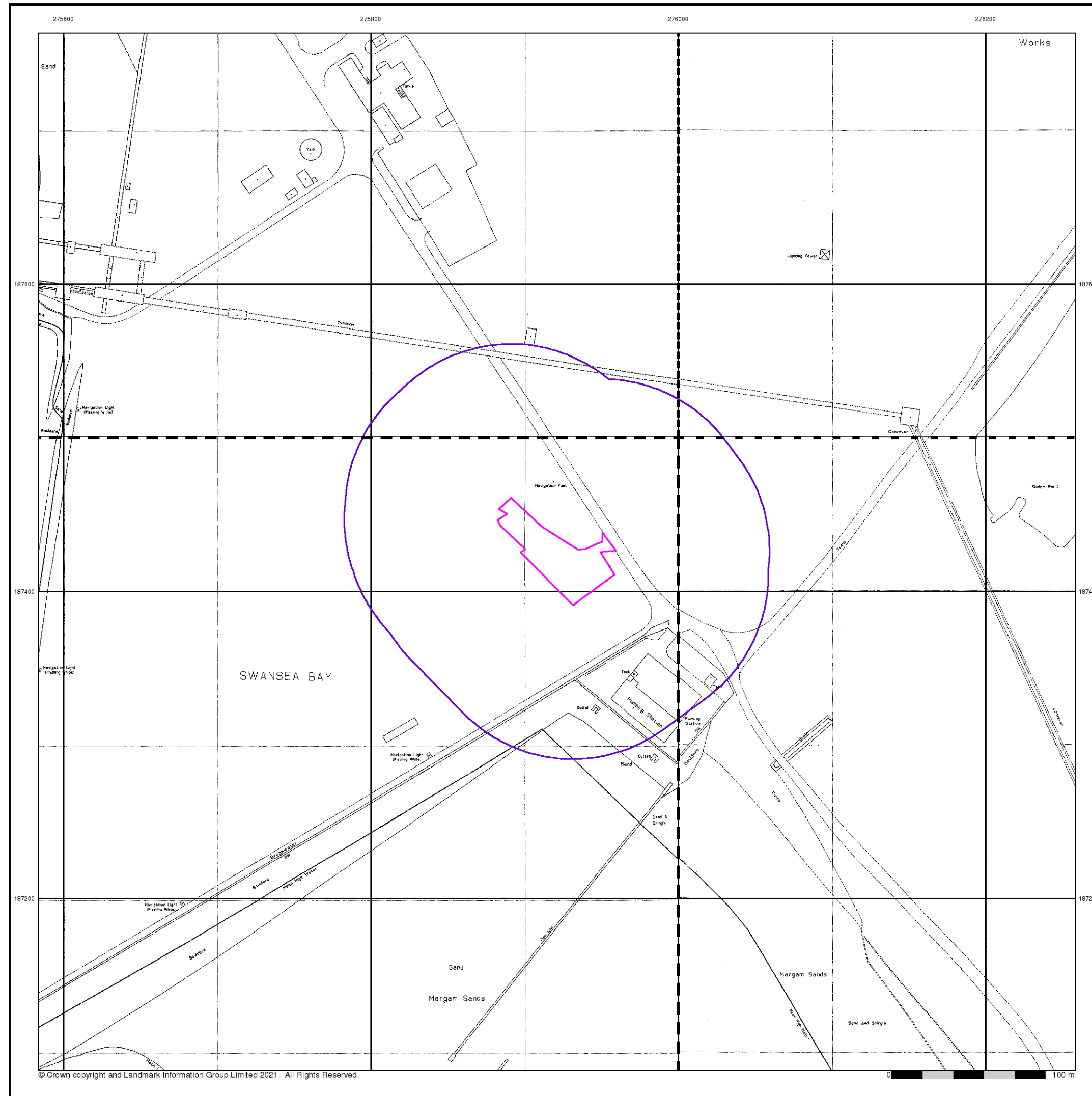
Order Number: 286021094_1_1
Customer Ref: 2109014.001
National Grid Reference: 275920, 187430
Slice: A
Site Area (Ha): 0.22
Search Buffer (m): 100

Site Details

Site at 275910, 187420



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Large-Scale National Grid Data

Published 1993

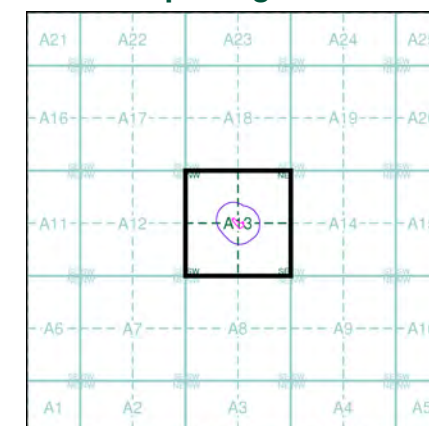
Source map scale - 1:1,250

'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)

SS7587NE 1993 1:1,250	SS7687NW 1993 1:1,250
SS7587SE 1993 1:1,250	SS7687SW 1993 1:1,250

Historical Map - Segment A13



Order Details

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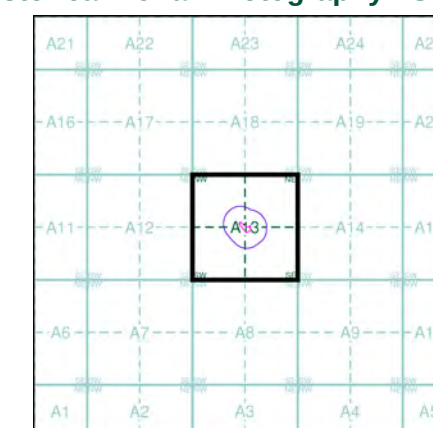


Historical Aerial Photography

Published 2001

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

Historical Aerial Photography - Segment A13



Order Details

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Landmark
INFORMATION GROUP

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