

Hydrogeological Risk Assessment
Banana Field
Cornets End Lane
Meriden Quarry
Meriden
Solihull

Final Report – Revision A

on behalf of
NRS Meriden Aggregates Ltd.

Report fc37351
July 2026

REPORT ISSUE RECORD

Report Title:	Hydrogeological Risk Assessment Banana Field Cornets End Lane Meriden Quarry Meriden Solihull
Addressees of the Report:	NRS Meriden Aggregates Ltd.
Report Status:	Revision A
Project Reference:	fc37351
Date of Issue:	20 July 2026
Prepared & Edited by: 	Lynda Keeys BSc (Hons) MSc Environmental Consultant For and on behalf of Firth Consultants Ltd
Approved by: 	Simon Firth BSc MSc FGS CGeol ASoBRA Director For and on behalf of Firth Consultants Ltd

REVISION RECORD

Date	Issue/Revision	Description	Approved
11 March 2026	Final	Final report	SF
07 July 2026	Revision A	Updated to address EA comments	SF

The contents of this Report may only be relied upon by:

1. Addressees of the Report; or
2. Parties who have received prior written consent from Firth Consultants Ltd in the form of a reliance letter.

Firth Consultants Ltd accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from Firth Consultants Ltd and from the party which commissioned it.

EXECUTIVE SUMMARY

Upon the instructions of the Mineral Planning Group Ltd. (MPG), acting on behalf of their client, NRS Meriden Aggregates Ltd., Firth Consultants Ltd has been commissioned to conduct a Hydrogeological Risk Assessment (HRA) for “Banana Field”, Cornets End Lane, Meriden Quarry, Meriden, Solihull (hereafter referred to as “the site”).

The site is an active sand and gravel quarry and is part of the Meriden Quarry complex which has been extracting sand and gravel from the area since the later 1950s. The site has planning permission for mineral phased extraction of approximately 400,000 tonnes of sand and gravel as a south western extension to Meriden Quarry including the temporary diversion of Cornets End Brook. The planning permission requires the site to be restored back to its approximate original alignment which will require import of materials. It is proposed to use inert waste for the imported material which will require a waste recovery permit. This HRA is intended to support the application for the environmental permit for the deposit of material as a recovery option.

The geology at the site principally comprises approximately 5 to 10m thickness of Glaciofluvial deposits (sands and gravels) overlying Mercia Mudstone bedrock described as stiff clay to at least 25m depth. Quarrying activities have removed the sands and gravels and uppermost 5 to 6m of Mercia Mudstone across the majority of the site and to the area to the north of the site. A clay sidewall liner has been constructed using site won Mercia Mudstone on the eastern, southern and western boundaries, keyed into the underlying Mercia Mudstone. The liner is at least 3.8 m thick and has a measured permeability (from triaxial testing) of 1.6×10^{-9} to $5.1 \times 10^{-9} \text{ m.s}^{-1}$. This sidewall liner will be continued around the entire quarry void off-site to the north in the future. The quarry is underlain by low permeability Mercia Mudstone clay marl which acts as a natural basal barrier.

The nearest surface water body to the site is Horn Brook which is located 30m north-west of the site. This joins Blythe Brook 760m north-west of the site. Cornets End Brook had flowed along the north of the site joining Horn Brook. This has been temporarily diverted to enable quarrying but will be re-instated as part of the restoration.

The Glaciofluvial deposits (and nearby Alluvium deposits) are classed as a Secondary A aquifer. The Mercia Mudstone is classed as a Secondary B aquifer but given its low permeability this is not considered to be a viable water resource in the vicinity of the site.

Baseline groundwater monitoring (prior to de-watering to facilitate quarrying) showed that groundwater was present in the Glaciofluvial deposits with groundwater flowing to the west/north-west and with an average saturated thickness of approximately 6m. Groundwater levels have decreased due to dewatering but are expected to revert to approximately baseline conditions following restoration.

Groundwater sampling and analysis has shown some evidence of impact to groundwater quality of the Glaciofluvial deposits (from ammoniacal nitrogen, sulphate, and some metals) possibly associated with historic landfilling to the east (up-hydraulic gradient of the site).

A Conceptual Site Model (CSM) was developed and this identified the following plausible source-pathway-receptor (SPR) linkages that required further assessment:

- Risk to the Glaciofluvial deposits and Alluvium aquifers from leaching of contaminants from inert waste followed by lateral migration through the clay sidewall liners and dilution within groundwater in the adjacent Glaciofluvial deposits;
- Risk to Horn Brook and River Blythe from leaching of contaminants from inert waste followed by lateral migration through the clay sidewall liners and dilution and migration within groundwater in the adjacent Glaciofluvial deposits.
- Risk to the Glaciofluvial deposits and Alluvium aquifers from leaching of contaminants from non-compliant waste (rogue loads) followed by lateral migration through the clay sidewall liner and dilution within groundwater in the adjacent Glaciofluvial deposits; and
- Risk to Horn Brook and River Blythe from leaching of contaminants from non-compliant waste (rogue loads) followed by lateral migration through the clay sidewall liner and dilution and migration within groundwater in the adjacent Glaciofluvial deposits.

The risk from these SPR linkages was assessed further using Detailed Quantitative Risk Assessment. Two scenarios were modelled: scenario 1, all waste meeting the inert landfill waste acceptance criteria (WAC) and scenario 2: 5% of the waste comprising rogue loads with 95% compliant waste. The Environment Agency's Remedial Targets Methodology Level 3 Groundwater worksheet was used to predict the migration of contaminants through the clay sidewall liners and then dilution calculations were made to estimate the concentrations in groundwater immediately down-hydraulic gradient of the site. The estimated concentrations in groundwater were below Environmental Assessment Levels for all the modelled contaminants for both scenarios.

Sensitivity analysis was undertaken to assess the effects of uncertainty on model input parameter values. This analysis showed that a generally conservative approach had been taken. The assumptions of the entire waste mass having leachate concentrations equal to the waste acceptance criteria (WAC) for inert landfills with an allowance of 5% rogue loads and that these source concentrations did not decrease with time added to the level of conservatism. As such the actual concentrations in groundwater are likely to be lower than those predicted and it can be concluded that the use of inert waste material to infill the site will not present an unacceptable risk to Controlled Waters receptors.

It is recommended that the generic WAC for inert landfills are used as the waste acceptance criteria for the site.

TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	Background	1
1.2	Objectives	1
1.3	Scope of Work	2
1.4	Available Information	2
1.5	Guidance	3
1.6	Report Format.....	3
2	SITE SETTING AND GROUND CONDITIONS	5
2.1	Geography	5
2.2	Site History	5
2.3	Proposed Restoration	6
2.4	Hydrology	7
2.5	Geology	8
2.6	Hydrogeology.....	9
2.6.1	Aquifer classifications.....	9
2.6.2	Source protection zones and licensed abstractions	9
2.6.3	Aquifer Properties	10
2.6.4	Groundwater levels and Piezometry	11
2.6.5	Licensed discharge consents to ground	12
2.7	Groundwater Quality	12
3	CONCEPTUAL SITE MODEL	14
3.1	Sources	14
3.1.1	On-site.....	14
3.1.2	Off-site sources	14
3.2	Receptors	15
3.3	Pathways	16
3.4	Qualitative Risk Assessment	17
4	DETAILED QUANTITATIVE ASSESSMENT OF RISK	19
4.1	Methodology	19
4.2	Modelled Scenarios	19
4.3	Modelled Contaminants and Environmental Assessment Levels	20
4.3.1	Rogue Loads.....	24
4.4	Model Input Parameters	24
4.5	Results.....	27
4.5.1	Scenario 1	27

4.5.2	Scenario 2	30
4.6	Sensitivity Analysis	31
4.7	Risk Evaluation	35
5	CONCLUSIONS AND RECOMMENDATIONS.....	36
5.1	Conclusions	36
5.2	Recommendations.....	37
6	REFERENCES	38

LIST OF TABLES IN TEXT

Table A: Groundwater abstractions within 2km of the site

Table B: Assessment of SPR linkages

Table C: Worst Case Leachate Concentrations

Table D: Selected Environmental Assessment Limits (EALs)

Table E: Comparison of worst case leachate concentration with EAL

Table F: Non-contaminant specific parameter values

Table G: Contaminant specific parameter values

Table H: Scenario 2, rogue load source concentrations

Table I: Predicted concentrations at outer edge of clay liner for Scenario 1

Table J: Predicted concentrations in groundwater for Scenario 1

Table K: Predicted concentrations at outer edge of clay liner for Scenario 2

Table L: Predicted concentrations in groundwater for Scenario 2

Table M: Parameter values tested in the sensitivity analysis

LIST OF FIGURES IN TEXT

Figure A: Hydrograph of groundwater levels in Glaciofluvial deposits in wells near site

Figure B: Results of sensitivity analysis for arsenic

Figure C: Results of sensitivity analysis for benzo(a)pyrene

LIST OF FIGURES OUTSIDE TEXT

Figure 1: Site Location

Figure 2: Location of Groundwater Monitoring Wells

Figure 3: Geology Prior to Quarrying

Figure 4: Site Baseline Piezometry

Figure 5: Conceptual Site Model

LIST OF APPENDICES

- Appendix 1: Envirocheck Report
- Appendix 2: Topographical Survey and Cross Sections
- Appendix 3: Restoration Plan
- Appendix 4: BGS Borehole Records
- Appendix 5: Meriden Quarry Borehole Logs
- Appendix 6: Laboratory Permeability Test Certificates
- Appendix 7: RTM Outputs for Scenario 1
- Appendix 8: RTM Outputs for Scenario 2

1 INTRODUCTION

Upon the instructions of the Mineral Planning Group Ltd. (MPG), acting on behalf of their client, NRS Meriden Aggregates Ltd., Firth Consultants Ltd has been commissioned to conduct a Hydrogeological Risk Assessment (HRA) for “Banana Field”, Cornets End Lane, Meriden Quarry, Meriden, Solihull (hereafter referred to as “the site”) to support an application for a waste recovery permit.

1.1 Background

The site is an active sand and gravel quarry and is part of the Meriden Quarry complex which has been extracting sand and gravel from the area since the later 1950s. Planning permission (Application Number: PL/2018/02524/MWMAJ) for mineral phased extraction of approximately 400,000 tonnes of sand and gravel as a south western extension to Meriden Quarry including the temporary diversion of Cornets End Brook was granted in December 2018.

The application included *“the phased restoration of the extraction area to recreate approximate original ground levels via the importation and placement of inert fill; the reestablishment of Cornets End Brook on its approximate original alignment within an enhanced landscape and ecological corridor; and the reestablishment of an arable agricultural after use on the remainder of the restored extraction area”*. An extension of four additional years to complete the restoration work was granted in July 2025 (Application number: PL/2025/01085/NONMC).

It is proposed to restore the site with the importation of inert waste as a waste recovery operation and as such an HRA is required to support the recovery permit application.

1.2 Objectives

The objectives of the HRA are to:

- Assess the risk to Controlled Waters receptors from the imported waste material;
- Determine site specific waste acceptance criteria; and
- Determine whether mitigation measures are required to protect Controlled Waters receptors and what the specifications of these should be.

1.3 Scope of Work

In order to meet the objectives outlined above the following work was undertaken as part of this HRA:

1. Review available data. This included review of topographic, geological and hydrogeological maps, borehole logs, groundwater elevation data and restoration proposals. A Landmark “Envirocheck” report was also purchased (included as Appendix 1) and reviewed.
2. Development of a Conceptual Site Model (CSM) for Controlled Waters receptors. This identifies possible pathways linking the restoration infill material source with groundwater and related receptors. A qualitative assessment identifies plausible linkages that required further assessment by risk quantification.
3. Risk quantification. This has been conducted using the Environment Agency’s Remedial Targets Methodology (RTM) spreadsheet. The Level 3 Groundwater worksheet has been used to predict the migration of contaminants through the clay liner. Dilution calculations were also made to calculate the concentrations of contaminants in groundwater immediately down hydraulic gradient of the site. These have been compared with appropriate water quality standards to characterise risk. A sensitivity analysis was undertaken to assess the effects of uncertainty and the results of the modelling used with the sensitivity analysis to evaluate the risks. The results of the modelling have been used to determine waste acceptance criteria for the site and assess whether risk mitigation measures are required to reduce risk.
4. Preparation of a report that describes the work conducted.

1.4 Available Information

The following reports relating to the site have been used to prepare this HRA:

- SLR Consulting Limited. Environmental Statement Volume 1. Meriden Quarry, South West Extension. Final. Job no. 407.05731.00003. Dated 28 August 2018.
- MPG Ltd. Waste Recovery Plan. Meriden Quarry. Document Reference: 415/2—R1.3 – WRP. Version 1.3. Dated 20 August 2025.
- Novo Geo Consulting Ltd. Clay Liner CQA Report, Meriden Quarry. Report No: 25-273-R-001. Dated March 2026.
- CE Geochem Ltd. Meriden Quarry Area G Inert Landfill. Hydrogeological Risk Assessment. Report A140501. Dated February 2015.

In addition, the client has provided further information on monitored groundwater levels and a recent topographic survey for the site (from March 2025).

1.5 Guidance

The HRA has been conducted in accordance with relevant Environment Agency (EA) guidance, in particular:

- Environment Agency (EA), 2025a. Land contamination risk management (LCRM) - How to assess and manage the risks from land contamination. Published on 8 October 2020 and updated in 12 June 2025. Accessed from <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>
- EA, 2025b. Landfill operators: environmental permits Landfills for inert waste. Published on 30 January 2020 and updated on 14 May 2025. Accessed from <https://www.gov.uk/guidance/landfill-operators-environmental-permits/landfills-for-inert-waste>
- EA, 2025c. Protect groundwater and prevent groundwater pollution. Available at <https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution/protect-groundwater-and-prevent-groundwater-pollution> Last updated 17 July 2025.
- EA, 2024. Permit Application – New bespoke deposit for recovery permit. National Permitting Service Geoscience Operations Team (GOT) guidance notes. Reference GOTnewDfREnhPreAppAdvice – Version 4.0 – 12/02/2024
- EA and Defra, 2018. Environmental management – guidance. Groundwater risk assessment for your environmental permit. Published on 1 February 2016 and updated in April 2018. Available from <https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit>
- EA, 2017a. Groundwater protection technical guidance. Available at <https://www.gov.uk/government/publications/groundwater-protection-technical-guidance/groundwater-protection-technical-guidance> Last updated 14 March 2017

1.6 Report Format

This report provides a HRA based on the use of imported waste as restoration materials. Section 2 describes the site setting including geography, site history, the proposed development plan, hydrology, geology and hydrogeology. Section 3 presents the

conceptual site model (CSM) of risk, Section 4 describes the risk quantification and Section 5 provides conclusions and recommendations.

2 SITE SETTING AND GROUND CONDITIONS

2.1 Geography

The site is located in a rural area approximately 5 km south-east of Birmingham Airport, equidistant (1.5 km) from the villages of Hampton in Arden to the south-west and Meriden to the north-east in the Metropolitan Borough of Solihull (Figure 1). It is centred on National Grid Reference (NGR) 422675,281189 and occupies a total area of 5.9 ha.

The site is part of the Meriden Quarry complex which includes mineral extraction areas to the north and processing facilities and quarry infrastructure to the east. Cornets End Lane forms the western and southern site boundaries with Hornbrook Farm and arable fields beyond the west and further mineral extraction areas further south.

Prior to quarrying ground levels at the site sloped gently downwards to the north/north-east towards Cornets End Brook which flowed from east to west along the northern part of the site. Ground levels ranged from approximately 96 m above Ordnance Datum (mAOD) in the south west of the site to 89 mAOD at Cornets End Brook in the north east. The extraction of mineral has resulted in a void at the site and in the area to the north of the site. A topographic survey from March 2025 (see Appendix 2) shows that the base of the quarry at that time was approximately 80 to 81 mAOD.

There are no special areas of conservation (SAC), special protection areas (SPA), Ramsar sites or local nature reserves (LNR) within 3km of the site, however there are two sites of special scientific interest (SSSIs) in the local vicinity (Defra, 2025). The River Blythe SSSI is located approximately 1km west of the site and Berkswell Marsh SSSI is located approximately 1.2km to the south of the site.

2.2 Site History

The site history has been determined from historical Ordnance Survey (OS) maps included in the Envirocheck report (included as Appendix 1).

The first available historical OS map dated 1886 shows that the site is part of an undeveloped field with a track crossing it which is part of Packington Race Course which extends offsite to the north-east. Cornets End Lane is present along the southern site boundary and Hornbrook Farm is located to the west beyond the road. Horn Brook is located close to the northern site boundary. A Gravel Pit is located in a corner of the field approximately 200m south west of the site.

The race course is no longer evident by 1904 and the site and surrounding area remain undeveloped fields. By 1937 there are no changes on site however a Sand Pit is now

located approximately 100m to the east of the site and the Gravel Pit to the south has expanded further to the east. The Sand Pit has expanded further east by 1955 and expanded again to the north including several ponds by 1962. Numerous tanks and hoppers are also marked to the east of the site associated with the offsite sand pits.

By 1970 the western part of the sand pit to the east (closest to the site) appears to have been infilled and two marsh / pond areas are located adjacent to excavated sands pits. Between 1986 and 1999 Sand and Gravel extraction in the area has increased considerably with two large Sand and Gravel Pits with ponds to the south of Cornets End Lane and the Sand Pit to the east has expanded to the east and north with many ponds and some areas are now marked as Landfill Sites (presumably the former gravel pits are being infilled with waste). The area immediately to the east of the site (where the first Sand Pit started) is now infilled with “works” located to the north. The site remains unchanged at this time.

By 2025 part of the sand and gravel pit adjacent to the road to the south of the site and part of the sand pit to the north-east have been infilled and an additional sand pit is located approximately 300m north of the site at Heathfield.

Google Earth imagery indicates that between 2013 and 2016 the land immediately to the north of the site has started to be excavated with a pond in the south-east adjacent to Cornets End Brook. By 2019 and until early 2020 almost the whole field to the north is a pond and there is no change on site. Further excavation is evident to the north by 2021 and excavation works have commenced on site with Cornets End Brook presumably having been diverted to the north to join Horn Brook. By 2023 the excavations to the north and on site have become one large sand pit. The more recent imagery dated March 2025 indicates progressive excavation on site and expansion of the sand pit south of Cornets End Lane.

2.3 Proposed Restoration

It is proposed to restore the site to recreate approximate original ground levels via the importation and placement of inert fill, re-establish Cornets End Brook on its approximate original alignment within an enhanced landscape and ecological corridor and re-establish an arable agricultural after use on the remainder of the site. The agreed restoration plan is shown in Appendix 3.

A clay liner has been constructed on the western, southern and eastern sides of the quarry void at the site in preparation for infill. The northern boundary of the site will still be void but will eventually also be infilled with waste with clay sidewall liners. The clay marl at the quarry floor has been excavated to form the sidewall liners and the liner has been subject to

CQA testing (Novo Geo Consulting, 2026). This has confirmed that the clay liner is at least 3.8 m thick and has a permeability ranging from 1.6×10^{-9} to $5.1 \times 10^{-9} \text{ m.s}^{-1}$.

The agricultural land will be restored with a full soil profile consisting of a minimum of 300mm thickness of topsoil, 300mm thickness of subsoil over 600mm thickness of overburden material (previously stripped and used to form an earthen screening bund along the southern site boundary). This 1.2m soil profile is designed to ensure the agricultural land is restored to Best and Most Versatile quality (grades 2/3a). The restoration will include native grass and wildflower strip margins at least 6 metres in width to all boundaries from the restored arable farmland (SRL, 2018).

In addition to the re-establishment of Cornets End Brook it is proposed to create several small ponds along the Brook corridor. These water bodies would all be integrated within the wildlife enhanced corridor post restoration. The stream and nearby ponds would be clay lined and would have sufficient capacity to ensure that they held water all year round with the ponds having a hydrological connection to the stream (SLR, 2018). As the inert waste will have a lower soakaway capacity than pre-development a network of land drains will be installed leading to a storm-balancing pond in the north western area which will discharge to the re-instated Cornets End Brook.

2.4 Hydrology

The nearest surface water body to the site is Horn Brook which is located 30m to the north-west of the site. Cornets End Brook, which previously crossed the site, has been diverted north to join Horn Brook. Following restoration this will be re-instated at the site joining Horn Brook 30m north-west of the site. Horn Brook joins the River Blythe 760m north west of the site.

Neither Horn Brook nor Cornets End Brook are classified water bodies. The River Blythe (from Patrick Bridge to the River Tame) has a current (2022) ecological classification of “Poor” and a “Fail” for chemical quality in 2019 (EA, 2025d). Previous ecological and chemical quality classifications between 2013 and 2016 were rated “poor” and “good”, respectively. The reason for ongoing “poor” ecological classifications is due to diffuse sources of phosphate and other sources effecting macrophytes and phytobenthos. The reason for a “fail” in chemical quality in 2019 is due to detections of benzo(g-h-i)perylene, mercury, perfluorooctane sulphonate (PFOS) and polybrominated diphenyl ethers (PBDE) (EA, 2025d). It is noted that PFOS and PBDE were not previously monitored in UK rivers (and are a common cause of chemical failures in UK rivers).

There are twelve active discharge consents to surface water within 1km of the site (see Envirocheck report in Appendix 1). Four relate to the discharge of trade effluent (site

drainage, process water or mineral workings), seven relate to the discharge of final / treated sewage effluent (three of which are from a water company) and one relates to the discharge of crude sewage effluent. All relate to either a tributary of Horn Brook or the River Blythe.

There are two surface water abstractions within 2km of the site (see Appendix 1). Both are located upstream of the site (as shown on Figure 1) and used for spray irrigation.

Data from the nearest weather station (Coleshill, approximately 7 km north-north-west of the site) indicates that the average annual rainfall for the area for the period 1991 to 2020 was 708.22 mm (Met Office, 2025).

2.5 Geology

The 1:50,000 solid and drift sheet 168 for Birmingham (BGS, 1996) and the British Geological Survey (BGS) online mapper (BGS, 2025) indicate that the site is underlain by the Sidmouth Mudstone Formation of the Mercia Mudstone Group which is described as dominantly red-brown mudstone and siltstone with common grey-green reduction patches and spots where the mudstones are mostly structureless, with a blocky weathering habit (BGS, 2025). The BGS map shows a north-south trending fault line located approximately 100m east of the site with downthrow on the western side. A second fault trending north-west to south-east is shown 220m north east of the site with downthrow on the northern side.

The Sidmouth Mudstone Formation is overlain by Glaciofluvial deposits described as sand and gravel (BGS, 1996). In the north of the site these are overlain by Alluvium (unconsolidated clay, silt, sand and gravel) associated with Cornets End Brook and Horn Brook. Logs for boreholes located approximately 140m north-east and 100m east of the site shown on the BGS website (BGS, 2025) (SP28SW350, SP28SW351 and SP28SW334 – see Appendix 4) indicate that the base of the Glaciofluvial deposits is between 84.1 and 85.5 mAOD (equating to 4.5 to 11.9 m thickness of sands and gravels overlying the mudstone).

Quarrying activities have removed the alluvium and sand gravel deposits across the majority of the site with limited amounts remaining within the batter slopes at the west, east and southern site boundaries of the excavation.

The site geology is indicated by boreholes BH3, BH4, BH4D and BH5 drilled around the periphery of the site at locations shown on Figure 2, the logs of which are provided in Appendix 5. These indicate that red / orange clay with gravels is present to between 4.8 m below ground level (mbgl) in the west to 10 mbgl in the east overlying 0.3 to 3.7 m

thickness of red stiff sandy clay (interpreted to be weathered bedrock) overlying red / orange mudstone. The mudstone has been proven to at least 25 m depth (≈ 71 mAOD and 17m below the base of the Glaciofluvial Deposits) at BH4D and is described (from cores) as firm to very stiff red/brown clay with green/grey clay marbling. A geological cross-section of the site is shown in Figure 3 and the location of the cross-section is shown in Figure 2.

Borehole logs provided by the client for the Birmingham Road inert landfill (licensed landfill shown on Figure 1) located approximately 1km north east of the site show a similar geology, with clay marl of the Sidmouth Mudstone underlying the Glaciofluvial deposits proven to a depth of at least 32.5 mbgl (in BH7D) (approximately 75 mAOD).

BGS borehole record SP28SW181 (BGS, 2025 – see Appendix 4) for a borehole located 1.1km north west of the site records the Mercia Mudstone to a depth of 165 m (base unproven).

2.6 Hydrogeology

2.6.1 Aquifer classifications

The underlying Sidmouth Mudstone Formation is classified by the Environment Agency as a Secondary B Aquifer (Defra, 2025). These aquifers are mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks (called fissures) and openings or eroded layers.

The overlying Glaciofluvial deposits and Alluvium are classified as Secondary A Aquifers (formerly classified as minor aquifers) where permeable layers are 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.

2.6.2 Source protection zones and licensed abstractions

The site is not located within a Source Protection Zone (SPZ) (Defra, 2025). The nearest SPZ (outer protection zone) is located approximately 1.1 km to the east of the site associated with an outcrop of the Allesley and Keresley Members which are both dominated by sandstones and an abstraction at Eaves Green (approximately 4 km north-east of the site).

The Envirocheck report (Appendix 1) indicates that there are eight licensed groundwater abstractions within 2km of the site and SLR report one private groundwater abstraction within 2km of the site (SLR, 2018), the details of which are provided in Table A below and locations are shown on Figure 1.

Table A: Groundwater abstractions within 2km of the site

Licence No.	Name		Distance & direction from site (m)	Use
03/28/11/0132	Cemex Uk Materials Ltd.	Berkswell Quarry - Lagoon	257 SW	Mineral Washing
		Berkswell Quarry - Lagoon	311 SW	Mineral Washing
03/28/11/0133	Cemex Uk Materials Ltd.	Berkswell Quarry - Lagoon	257 SW	Process Water
Md/028/0011/011	Cemex Uk Materials Ltd.	Berkswell Quarry - Phase 2	296 W	Dewatering
		Phase 1	307 W	
		Phase 3	1076 SE	
Md/028/0011/010	Cemex Uk Materials Ltd.	Berkswell Quarry - Lagoon	311 SW	Mineral Washing
		Berkswell Quarry - Area A	801 S	Dewatering
Md/028/0011/013	NRS Aggregates Ltd.	Cornets End Quarry – Lagoon	454 NE	Mineral Washing
Md/028/0011/012	Tarmac Trading Ltd.	Cornets End Quarry – Lagoon	454 NE	Process water and general use
03/28/11/0123				Mineral Washing & General use
03/28/11/0139	Barber	Berryfields Farm, Meriden	1750 E	General Farming & Domestic
-	-	Silver Birches	1750 S	Private supply

2.6.3 Aquifer Properties

SLR (2018) report on estimates of hydraulic conductivity of the Glaciofluvial deposits in the wider Meriden Quarry area. Based on the results of falling head tests the hydraulic conductivity of the Glaciofluvial deposits is estimated to range from 0.02 to 3.5 m.d⁻¹.

Hazen's analysis based on particle size distribution data resulted in hydraulic conductivity estimates of <0.5 to 230 m.d⁻¹. However, as discussed in SLR (2018) following dewatering operations on the adjacent quarry sites it was concluded that the most representative value for the bulk hydraulic conductivity of the Glaciofluvial deposits is the maximum in-situ testing result of 3.5 m.d⁻¹.

The Sidmouth Mudstone which underlies the site and wider area comprises interbedded effectively impermeable mudstones with occasional thin impersistent siltstones and sandstones (skerries). Groundwater flow is predominantly through the thin well cemented fractured sandstone and siltstone horizons (BGS & EA, 2000).

As discussed in Section 2.5 the Sidmouth Mudstone beneath the site is described as firm to very stiff red/brown clay to a depth of at least 25 mbgl (≈71 mAOD). There is no evidence of skerries being present to the depth drilled and the described lithology is representative of an aquitard rather than a groundwater bearing aquifer.

Faulting in the west Midlands can affect the hydrogeology with low permeability faults preventing groundwater flow and causing springs and different groundwater elevations and conversely high permeability faults increase the transmissivity (BGS & EA, 1997).

2.6.4 Groundwater levels and Piezometry

A hydrograph showing groundwater level monitoring data for wells screened within the Glaciofluvial deposits in the vicinity of the site is shown in Figure A below. The locations of these wells are shown in Figure 2.

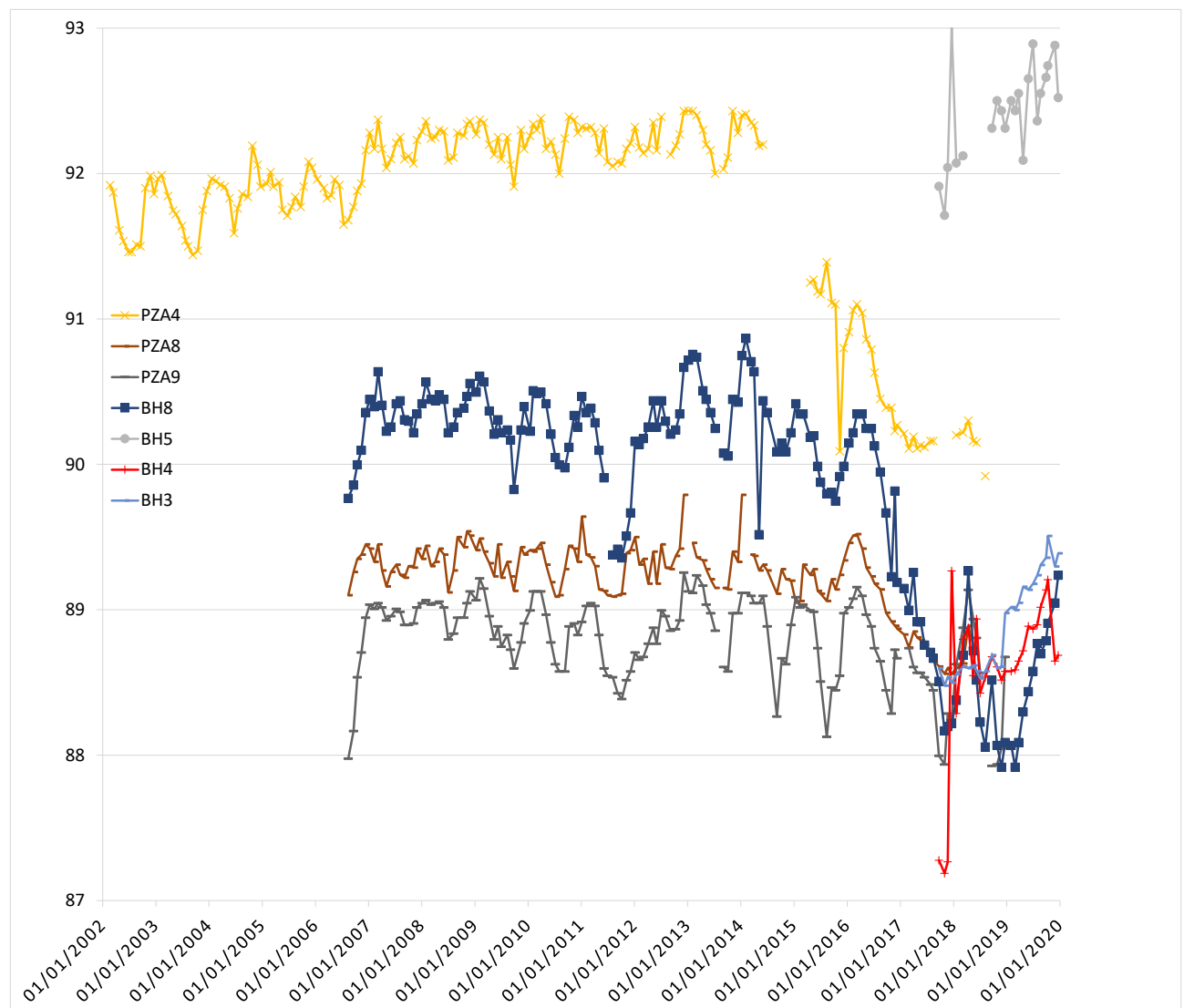


Figure A: Hydrograph of groundwater levels in Glaciofluvial deposits in wells near site

Groundwater levels up to 2015 show what can be considered as baseline groundwater conditions. Dewatering of the quarry to the immediate north of the site commenced in 2015 and this resulted in a decrease in groundwater levels. Based on pre 2015 data baseline groundwater flow direction was to the west/north-west (see Figure 4) and had a hydraulic

gradient of approximately 0.01. It is assumed that groundwater flow direction and gradient will revert to approximately baseline conditions once the site has been restored.

2.6.5 Licensed discharge consents to ground

The Envirocheck report (see Appendix 1) indicates that there are two active discharge consents to groundwater or land/ soakaway within 1 km of the site. Both relate to sewage discharges to the north east of the site (721m and 936m from the site).

2.7 Groundwater Quality

Quarterly groundwater sampling was undertaken from monitoring wells BH1 to BH8 in 2024 and the analytical data for this sampling are provided in Table 1. This table also includes UK drinking water standards (DWS) and Environmental Quality Standards (EQS) for comparison. Note that site specific EQS have been derived for various metals using the Environment Agency's "mBAT" tool and using river quality data for the Horn Brook and the River Blythe from the Environment Agency's water quality archive (EA, 2025e&f).

The analytical data are summarised as follows:

- pH ranged from 5.7 to 7.9 with the lowest values (pH 5.7 and 5.9) recorded at BH3 in September and December 2024.
- Conductivity is between 177 and 813 $\mu\text{S.cm}^{-1}$, with the exception of BH7 where concentrations of 1430 to 1590 $\mu\text{S.cm}^{-1}$ were recorded.
- Concentrations of ammoniacal nitrogen and sulphate were recorded significantly below DWS and EQS at all locations with the exception of BH7 which recorded concentrations of ammoniacal nitrogen between 0.36 to 0.46 mg.L^{-1} (compared with the DWS and EQS of 0.389 and 0.2 mg.L^{-1} , respectively) and sulphate concentrations between 315 and 348 mg.L^{-1} (compared to the DWS of 250 mg.L^{-1}).
- All phenol concentrations were recorded below method detection limits (MDLs).
- Concentrations of Total Petroleum Hydrocarbons (TPH) and Polycyclic Aromatic Hydrocarbons (PAHs) were largely recorded below method detections with occasional detections close to the MDL.
- Samples were analysed for total metals concentrations rather than dissolved. Comparing the results against DWS and EQS (which refer to dissolved concentrations) indicate that the majority of the samples recorded concentrations of iron and manganese above guideline values. Cadmium, chromium and mercury were recorded consistently above guideline values at BH4 and BH8. These

locations also recorded consistently elevated concentrations of nickel and copper. Nickel was also consistently elevated above guideline values at BH5 and BH7 and zinc was consistently elevated at BH7 and BH8. It is uncertain whether samples were filtered in the field. A lack of filtering would result in the analytical results including metals sorbed to suspended sediment which could explain the elevated concentrations detected.

It is noted that several historical landfill sites are located to the east and north-east of the site (see Section 3.1.2 below) which may be affecting the groundwater quality at the site.

3 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) of risk has been developed for the restoration of the quarry void using inert waste soil. The CSM identifies potential sources, pathways and Controlled Waters receptors and determines which combination of these are plausible source-pathway-receptor (SPR) linkages. Plausible SPR linkages are then qualitatively assessed to determine whether or not further risk assessment is required.

3.1 Sources

3.1.1 On-site

It is proposed to restore the sand and gravel quarry void with imported inert waste soil (MPG, 2025). Inert waste is defined under the Landfill Directive as “*waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater*”.

The Environment Agency’s guidance on inert waste (EA, 2009) suggests using a source term based on waste acceptance criteria (WAC) values for inert landfills to assess how likely the waste is to cause pollution. Therefore a potential worst case source is assumed to be material with leachate concentrations equal to the inert WAC.

Environment Agency guidance (EA, 2025g) states that the HRA for a waste recovery application must also consider the risk posed by the accidental acceptance of non-compliant wastes (rogue loads). Waste acceptance procedures are intended to prevent such loads coming onto site, however the possibility of a small amount of material that does not comply with the site waste acceptance criteria cannot be discounted. For this reason a rogue load of non-compliant material has been considered as a potential source.

3.1.2 Off-site sources

As detailed in the Envirocheck report (Appendix 1) there are several historic landfills in the vicinity of the site:

- Tiling Construction Services Limited infilled Meriden Quarry. This large 44ha historic landfill is located just east of the site and was infilled between 1962 and 1992 with inert, industrial, commercial, household and special waste, and liquid sludge.

- Caires and Packison Limited operated a landfill site (6.7ha) at Somer Lane located approximately 527m north of the site. This was infilled between 1984 and 1993 with inert and household waste.
- Packington Estate Enterprises Limited deposited inert waste at The Somers landfill site (7.2 ha) between 1983 and 1993, which is located approximately 826m north of the site. The local authority also record that sewage sludge was deposited at the site.

These historic landfills are shown on Figure 1. The Meriden Quarry historic landfill is located immediately up-hydraulic gradient of the site and could be a source of groundwater and surface water contamination in the local vicinity of the site. As discussed in Section 2.7 this landfill could be the reason for elevated concentrations of some substances (such as ammoniacal nitrogen) in groundwater in the vicinity of the site.

The other two sites are located north (down/cross-hydraulic gradient) of the site and are considered unlikely to be a source of groundwater or surface water contamination in the local vicinity of the site.

The risk from these off-site sources is not assessed further but the potential impact to groundwater quality at the site from these historic landfills should be considered when assessing groundwater quality data for the site.

3.2 Receptors

Potential receptors considered for this assessment are water resources and users of those resources. These are discussed below:

- **Groundwater.** The Sidmouth Mudstone Formation that underlies the site is classified as a Secondary B Aquifer whereas the Glaciofluvial Deposits and Alluvium are classified as Secondary A Aquifers. Given that the Sidmouth Mudstone is composed of stiff clay (to a depth of at least 25 mbgl, 71 mAOD) the bedrock in the vicinity of the site is unlikely to be a viable groundwater resource, therefore the Glaciofluvial Deposits and Alluvium are considered to be the primary groundwater receptor.
- **Groundwater Abstractions / users of Abstractions.** The site is not located within a Source Protection Zone (SPZ) however there are nine licensed groundwater abstractions within 2km of the site (Section 2.6.2). Seven of these abstractions are licensed for mineral washing, process water and dewatering on adjacent quarry sites and are not considered sensitive receptors. There are two potable abstractions which are located approximately 1750 m east and south of the site. These are both

located up-hydraulic gradient of the site and are not considered plausible receptors. Groundwater abstractions and their users are therefore not considered to be plausible receptors and are not considered further in this assessment.

- **Surface Water.** The nearest surface water body to the site is currently Horn Brook which is located 30m to the north west of the site and which flows into the River Blythe. Once re-instated Cornets End Brook will flow across the northern part of the site (to join Horn Brook) but this will be hydraulically separated from the underlying waste material by a clay liner. Horn Brook and the River Blythe are considered as plausible receptors.
- **Surface Water Abstractions / users of Abstractions.** There are two surface water abstractions within 2km of the site both licensed for spray irrigation. These are located upstream of the site and are therefore not considered plausible receptors and are not considered further.

3.3 Pathways

Possible pathways linking the potential on-site sources to the identified receptors are:

- **Leaching of contaminants and migration to groundwater.** Potential contamination in the proposed inert waste infill could partition to the dissolved phase in infiltrating pore water. The restoration plan includes construction of a 1.2m thick capping layer over the inert waste comprising site-won topsoil, subsoil and overburden material. This will be profiled and incorporate land drains which will limit infiltration and generation of leachate in the waste mass (see Section 2.3). The quarry is underlain by a significant thickness of low permeability clay and therefore migration of pore water through the base of the infilled quarry is assumed to be negligible. A low permeability clay liner has been constructed on the sidewalls which will limit the lateral migration of pore water from the waste mass to groundwater in the remnant Glaciofluvial deposits. Dilution within the receiving groundwater within the Glaciofluvial deposits will reduce concentrations.
- **Dissolved phase migration in groundwater.** Groundwater in the Glaciofluvial deposits adjacent to the site flows to the west/north-west and likely discharges to Horn Brook and the River Blythe beyond. Migration of dissolved phase contamination via groundwater is considered a potential pathway although it is noted that a significant proportion of the superficial aquifer in the local area has been removed by multiple quarrying activities (past and present). Attenuation processes (sorption, dispersion, dilution and degradation) will reduce concentrations along the groundwater flow path.

3.4 Qualitative Risk Assessment

Table B lists the possible SPR combinations and makes a qualitative assessment of the risk from each. SPR linkages rated with a risk of “low” are considered highly unlikely to create an unacceptable risk and do not require further consideration. SPR linkages rated with a risk of “medium” or “high” require further assessment.

Table B: Assessment of SPR linkages

Source	Pathway	Receptor	Risk	Justification
Future inert waste	Leaching and dissolved-phase migration	Glaciofluvial Deposits and Alluvium Aquifers	Low to Mod	The inert waste has a low hazard potential and is unlikely to cause a significant impact to groundwater quality. Natural attenuation within the clay liner and dilution within the receiving groundwater will reduce risk. Natural attenuation along the groundwater flow path will further reduce the risk.
		Horn Brook & River Blythe	Low to Mod	Natural attenuation along the groundwater flow path and dilution within surface water will reduce the risk.
Non-compliant waste (rogue load)	Leaching and dissolved-phase migration	Glaciofluvial Deposits and Alluvium Aquifer	Low to Mod	Waste acceptance procedures mean that deposit of rogue load at site is unlikely. Even if a rogue load was to be inadvertently deposited at the site the volume of material deposited would be minimal relative to the overall volume of material imported. Natural attenuation within the clay liner and dilution within the receiving groundwater will reduce risk. Natural attenuation along the groundwater flow path will further reduce the risk.
		Horn Brook	Low to Mod	In addition to the above, natural attenuation along the groundwater flow path and dilution within the Brook will further reduce risk.

The following SPR linkages have been identified with a risk potentially greater than low:

- Risk to the Glaciofluvial deposits and Alluvium aquifers from leaching of contaminants from inert waste followed by lateral migration through the clay sidewall liner and dilution within groundwater in the adjacent Glaciofluvial deposits;
- Risk to Horn Brook and River Blythe from leaching of contaminants from inert waste followed by lateral migration through the clay sidewall liner and dilution and migration within groundwater in the adjacent Glaciofluvial deposits.
- Risk to the Glaciofluvial deposits and Alluvium aquifers from leaching of contaminants from non-compliant waste (rogue loads) followed by lateral migration through the clay sidewall liner and dilution within groundwater in the adjacent Glaciofluvial deposits; and

- Risk to Horn Brook and River Blythe from leaching of contaminants from non-compliant waste (rogue loads) followed by lateral migration through the clay sidewall liner and dilution and migration within groundwater in the adjacent Glaciofluvial deposits.

A schematic cross-section depicting the main elements of the CSM is shown in Figure 5.

The risk from the proposed future inert waste is considered further in Section 4.

4 DETAILED QUANTITATIVE ASSESSMENT OF RISK

The potential risk to the identified groundwater receptors (Glaciofluvial deposits and Alluvium aquifers) and surface water receptors (Horn Brook and River Blythe) from the proposed future inert waste and non-compliant waste (rogue loads) has been quantitatively assessed using Detailed Quantitative Risk Assessment (DQRA).

4.1 Methodology

A DQRA methodology has been selected to best represent the CSM. Neither ConSim nor LandSim are suitable models in this instance as both assume that the aquifer is located below the waste and that there is an unsaturated zone between the waste and groundwater. For this site the aquifer is located adjacent to the waste mass and the pathway is assumed to be lateral migration of leached contaminants through the clay sidewalls into the saturated zone of the aquifer (downwards migration to deeper aquifers is not considered a plausible SPR linkage). For this reason the Environment Agency's Remedial Targets Methodology (RTM) (EA, 2006) and spreadsheet model (EA, 2013) has been used for the assessment as described below.

The Level 3 Groundwater worksheet has been used to model the advective lateral flow of pore water with dissolved phase contaminants through the clay sidewall. The 'aquifer' pathway is modelled as the clay liner and the point of compliance is taken as the outside edge of the liner. The model has been used to predict concentrations in pore water immediately before dilution with groundwater. The Ogata Banks equation has been used to estimate the maximum concentrations at the compliance point that are predicted to occur within 20,000 years of the waste being emplaced (which is the length of time modelled by LandSim [Golder Associates, 2003]). These concentrations are compared with suitable water quality standards or background concentrations (environmental assessment levels – EALs) in order to characterise risk.

4.2 Modelled Scenarios

Two model scenarios have been modelled using the RTM model:

1. Infill material comprises inert waste that is compliant with the inert Waste Acceptance Criteria (WAC) for inert landfills;
2. Infill material includes some non-compliant waste (i.e. rogue loads).

4.3 Modelled Contaminants and Environmental Assessment Levels

The potential source of contamination for the proposed operation is imported inert waste. Environment Agency guidance on inert waste (EA, 2009) suggests using a source term based on Waste Acceptance Criteria (WAC) values to assess how likely the waste is to cause pollution. Where the source term concentration is less than the EAL there will be no significant risk to the groundwater or surface water and therefore these contaminants are not modelled further.

Table D below presents the potential constituents of concern (COPC) together with the selected worst case leachate concentrations. The worst case leachate concentrations have been calculated from the WAC using the following methodologies:

- Leachate test criteria (reported in mg.kg^{-1}) for 10:1 liquid to solid ratio have been used to back calculate leachate concentrations in mg.L^{-1} by dividing by a factor of ten. For example, for arsenic the criteria of 0.5 mg.kg^{-1} gives an equivalent leachate concentration of 0.05 mg.L^{-1} .
- The leachate concentration for benzene has been calculated from the soil test criteria for total benzene, toluene, ethylbenzene and xylenes (BTEX) of 6 mg.kg^{-1} (and assuming that benzene forms 25% of this, i.e. 1.5 mg.kg^{-1}) using the following partitioning equation:

$$C_L = \frac{C_S}{K_{oc} \cdot foc}$$

Where,

C_L = leachate concentration (mg.L^{-1})

C_S = soil concentration (mg.kg^{-1})

K_{oc} = organic carbon partition coefficient (67 L.kg^{-1} from Nathanail *et al*, 2015)

foc = fraction of organic carbon (assumed to be 1% - low end of typical values)

- Naphthalene and benzo(a)pyrene have been used as indicator compounds to represent the risk from PAHs, naphthalene being the most mobile and benzo(a)pyrene one of the most toxic. The leachate concentrations for naphthalene and benzo(a)pyrene have been calculated using the same approach as benzene but making the reasonable worst case assumption that the concentrations of individual PAH constituents are unlikely to exceed 10 mg.kg^{-1} , i.e. 10% of the inert WAC of 100 mg.kg^{-1} for total PAHs. The calculated equilibrium concentration of benzo(a)pyrene exceeds its maximum aqueous solubility of 0.0038 mg.L^{-1}

(Nathanail *et al*, 2015) and therefore the worst case leachate concentration of benzo(a)pyrene has been limited to this solubility.

- Ammoniacal nitrogen is not included in the WAC suite for inert landfills but may be present in inert waste at low concentrations. The minimum suggested concentration for ammoniacal nitrogen in a rogue load of 0.3 mg.L⁻¹ given in EA (2025g) has been assumed as a reasonable maximum value for compliant inert waste.

Note that the use of WAC as source term concentrations is highly conservative as it assumes that all waste in the landfill is at the limit of acceptance for all contaminants in the WAC suite. In reality, the average leachate concentrations will likely be significantly lower than those shown in Table C. Also, the RTM model assumes a constant source term, i.e. it does not account for a declining source. The assumption of a constant source term is conservative.

Table C: Worst Case Leachate Concentrations

Substance	Waste Acceptance Criteria (mg.kg ⁻¹)	Worst Case Leachate Concentration (mg.L ⁻¹)
Arsenic	0.5	0.05 ¹
Barium	20	2 ¹
Cadmium	0.04	0.004 ¹
Chromium	0.5	0.05 ¹
Copper	2	0.2 ¹
Mercury	0.01	0.001 ¹
Nickel	0.4	0.04 ¹
Lead	0.5	0.05 ¹
Antimony	0.06	0.006 ¹
Selenium	0.1	0.01 ¹
Zinc	4	0.4 ¹
Chloride	800	80 ¹
Fluoride	10	1 ¹
Sulphate	1000	100 ¹
PAHs	100	
- Naphthalene		1.5 ²
- Benzo(a)pyrene		0.0038 ²
BTEX	6	
- Benzene		2.2 ²
Ammoniacal Nitrogen	-	0.3 ³

- Based on WAC in mg/kg for inert landfills (Table 5.3 in EA, 2013) converted to mg/L assuming a 10:1 liquid to solid ratio
- Worst case leachate concentrations calculated assuming equilibrium partitioning between waste containing 1.5 mg.kg⁻¹ benzene and 10 mg.kg⁻¹ each of naphthalene and benzo(a)pyrene (reasonable worst case based on WAC limit of 100 mg.kg⁻¹ for total PAHs) and 1% fraction of organic carbon. Assumes organic carbon partition coefficients of 67 L.kg⁻¹ for benzene, 646 L.kg⁻¹ for naphthalene and 128825 L.kg⁻¹ for benzo(a)pyrene (Nathanail *et al*, 2015). Benzo(a)pyrene concentration then limited to maximum aqueous solubility of 0.0038 mg.L⁻¹.
- Minimum value given for rogue load given in EA (2025g)

EALs have been selected in accordance with Environment Agency guidance (EA 2006 and 2025c) and are presented in Table D.

When assessing the risk to groundwater the hazardous nature of the contaminant affects the choice of EAL. For the hazardous substances minimum reporting values (MRVs) (or equivalent) or background concentrations (whichever are greater) are taken as the EALs in order to account for discernibility. For non-hazardous substances, the EALs selected are the lowest of DWS and EQS or background concentration.

The classifications given by the Joint Agencies Groundwater Directive Advisory Group (JAGDAG, 2025) have been used to determine whether substances are hazardous or non-hazardous. According to the JAGDAG classification arsenic, benzene, benzo(a)pyrene, lead and mercury are hazardous substances. Hexavalent chromium is classified as hazardous and trivalent chromium is classified as non-hazardous. The imported waste is not anticipated to contain hexavalent chromium and so chromium has been considered as non-hazardous for this assessment.

Table D: Selected Environmental Assessment Limits (EALs)

Substance	Class ¹	DWS ² (mg.L ⁻¹)	EQS ⁵ (mg.L ⁻¹)	MRV (mg.L ⁻¹)	Background conc. ⁸ (mg.L ⁻¹)	EAL (mg.L ⁻¹)
Antimony	NH	0.005	-	-	No data	0.005
Arsenic	H	0.01	0.05	0.005 ⁷	No data	0.005
Barium	NH	1.3 ³	-	-	No data	1.3
Cadmium	NH	0.005	0.15	-	<0.006	0.005
Chromium	NH	0.05	0.0047	-	0.005	0.0047 ⁹
Copper	NH	2	0.0347	-	<0.09	0.0347
Lead	H	0.01	0.00996	0.0002 ⁷	<0.006	0.0002
Mercury	H	0.001	0.00007	0.00001 ⁶	0.00002	0.00001 ⁹
Nickel	NH	0.02	0.0163	-	0.041	0.0163 ⁹
Selenium	NH	0.01	-	-	No data	0.01
Zinc	NH	3 ⁴	0.04	-	0.03	0.03
Chloride	NH	250	250	-	21.6	21.6
Fluoride	NH	1.5	-	-	No data	1.5
Sulphate	NH	250	400	-	43.7	43.7
Ammoniacal nitrogen as N	NH	0.389	0.2	-	<0.06	0.06
Benzo(a) pyrene	H	0.00001	1.7 x 10 ⁻⁷	5 x 10 ⁻⁸ ⁷	<0.00001	5 x 10 ⁻⁸
Naphthalene	NH	-	0.002	-	0.00002	0.00002
Benzene	H	0.001	0.01	0.001 ⁶	No data	0.001

Notes

1. H = Hazardous. NH = Non-hazardous
2. UK Drinking Water Standard (DWS). Statutory Instruments 2016 No. 614. Water, England and Wales. The Water Supply (Water Quality) Regulations 2016 unless otherwise stated.
3. No UK DWS for barium therefore WHO guideline for Drinking Water Quality has been used (WHO, 2022).
4. No UK DWS for Zinc. WHO report that there are no health concerns for zinc however concentrations above 3 mg/l may not be acceptable to consumers (WHO, 2022) so this has been used.

5. The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015. See Table 1 for details.
6. Hazardous substances to groundwater: minimum reporting values (EA, 2017b).
7. No MRV listed in EA (2017b). MRV based on limit of quantification given in UKTAG (2016)
8. Maximum concentration detected in four sampling rounds from 2024 in up-hydraulic gradient well BH5 (see Table 1)
9. Background concentrations discounted due to uncertainty in measured concentrations (samples may not have been filtered)

Table E compares the worst case leachate concentration for each chemical with the selected EAL.

Table E: Comparison of worst case leachate concentration with EAL

Substance	Worst Case Leachate Concentration (mg.L ⁻¹)	EAL (mg.L ⁻¹)
Antimony	0.006	0.005
Arsenic	0.05	0.005
Barium	2	1.3
Cadmium	0.004	0.005
Chromium	0.05	0.0047
Copper	0.2	0.0347
Lead	0.05	0.0002
Mercury	0.001	0.00001
Nickel	0.04	0.0163
Selenium	0.01	0.01
Zinc	0.4	0.03
Chloride	80	21.6
Fluoride	1	1.5
Sulphate	100	43.7
Ammoniacal nitrogen	0.3¹	0.06
Benzo(a)pyrene	0.0038	5 x 10 ⁻⁸
Naphthalene	1.5	0.00002
Benzene	2.2	0.001

Note: Worst case leachate concentrations in **bold** exceeds EAL

The following contaminants have worst case leachate concentrations that exceed their EAL and will be assessed further using risk quantification:

- Antimony
- Arsenic
- Barium
- Chromium
- Copper
- Lead
- Zinc
- Chloride
- Sulphate
- Ammoniacal nitrogen
- Benzo(a)pyrene
- Naphthalene
- Benzene

- Mercury
- Nickel

4.3.1 Rogue Loads

EA (2025g) suggests modelling arsenic, lead, ammoniacal nitrogen, chloride, sulphate and nickel when assessing the risks from rogue loads. These contaminants have therefore been chosen for modelling Scenario 2.

4.4 Model Input Parameters

The parameter values required for the RTM model can be divided into two types, contaminant specific and non-contaminant specific. The non-contaminant specific parameter values (and justification) required for modelling the clay liner pathway are provided in Table F.

Table F: Non-contaminant specific parameter values

Parameter	Units	Value	Justification
Width of plume perpendicular to groundwater flow	m	620	The width of plume is assumed to be the total length of the top of the clay liner along the eastern, southern and western boundaries as it is assumed that leached contaminants could migrate across this entire length to the aquifer.
Saturated thickness	m	6	Baseline groundwater levels at the site range from approximately 89/89.5 mAOD in the west of the site (PZA8) to 92/92.5 mAOD in the east (PZA4) (see Figure A in Section 2.6.4). The base of the Glaciofluvial deposits is approximately 85 mAOD and therefore the average saturated thickness of the Glaciofluvial deposits (when dewatering ends) is likely to be approximately 6m. It is reasonable to assume that the saturated thickness of the clay liner (in contact with the aquifer) will be similar.
Plume thickness at source	m	6	Assumed equal to saturated aquifer thickness.
Dry bulk density	g.cm ⁻³	1.78	Average of two site specific values from permeability testing of the clay material provided by the client (1.75 and 1.81 – see Appendix 6).
Effective porosity	Fraction	0.30	RTM porosity estimates total porosity of the clay liner to be 0.36 using bulk density of 1.78 g.cm ⁻³ . Effective porosity will be lower than total porosity.
Hydraulic gradient	Fraction	0.59	Hydraulic gradient across the liner calculated from difference between “leachate” level in the waste and groundwater level in the Glaciofluvial deposits divided by thickness of liner (minimum of 3.8 m). Assuming groundwater levels return to approximately baseline (pre 2015) conditions the groundwater levels will range from approximately 89/89.5 mAOD in the west of the site (PZA8) to 92/92.5 mAOD in the east (PZA4) (see Figure A). Theoretically, with a low permeability liner the “leachate” level could be greater than groundwater level if infiltration into the waste exceeds leakage from the waste. The “leachate” level adjacent to the clay sidewall cannot exceed ground elevation

Parameter	Units	Value	Justification
			which, for the restored site, ranges from approximately 90 to 96 mAOD. Assuming an average ground elevation of 93 mAOD and average groundwater level of 90.75 mAOD, the worst-case (maximum) hydraulic gradient is estimated to be 0.59 $[(93 - 90.75)/3.8]$
Hydraulic conductivity	m.d ⁻¹	2.23E-04	Geomean of permeability test results of the clay liner from the CQA report (1.6E-9 and 5.1E-09 m.s ⁻¹ – see Appendix 6)
Distance to compliance point	m	3.8	Minimum thickness of clay sidewall liner
Fraction of organic carbon	Fraction	0.003	Value given for Mercia Mudstone clay liner in Simoes <i>et al</i> (2011)
Dispersivity - Longitudinal - Transverse - Vertical	m	0.223 0.0223 1E-99	Longitudinal and transverse calculated using Xu & Eckstein option. Vertical assumed to be negligible
Degradation option	-	Single phase	Biodegradation assumed to occur in dissolved phase only (conservative assumption).

The contaminant specific parameters required for the assessment are the EAL, the soil-water partition coefficient (Kd) (or in the case of organic contaminants, the organic carbon partition coefficient [Koc]) and the biodegradation half-life. These are presented (along with justification) in Table G below.

Note that, where possible, site specific values of Kd for inorganic contaminants have been used. Site specific values are taken from batch testing (broadly in accordance with EA, 2000) of the Mercia Mudstone clay liner material undertaken for the nearby Birmingham Road inert landfill as reported in CE Geochem (2015). Where site-specific Kd values are not available literature values from USEPA (2005) have been used. For the organic contaminants Koc values have been taken from Nathanail *et al* (2015).

Biodegradation is assumed to occur in the clay liner for the organic contaminants. Literature values of biodegradation half-lives have been reviewed and conservative upper end estimates for aerobic biodegradation selected. It is conservatively assumed that biodegradation occurs in the dissolved phase only.

Table G: Contaminant specific parameter values

Contaminant	EAL ¹	Source Conc. ²	Organic Carbon partition coefficient (Koc) ³	Soil-water partition coefficient (Kd) ⁴	Half-life for degradation of contaminant in groundwater
	mg.L ⁻¹	mg.L ⁻¹	L.kg ⁻¹	L.kg ⁻¹	Days
Antimony	0.005	0.006	-	251 ⁵	9.0E+99 ⁶
Arsenic	0.005	0.05	-	49.4	9.0E+99 ⁶
Barium	1.3	2	-	112 ⁵	9.0E+99 ⁶
Chromium	0.0047	0.05	-	7943 ⁵	9.0E+99 ⁶
Copper	0.0347	0.2	-	501 ⁵	9.0E+99 ⁶
Lead	0.0002	0.05	-	13100	9.0E+99 ⁶
Mercury	0.00001	0.001	-	6310 ⁵	9.0E+99 ⁶
Nickel	0.0163	0.04	-	1259 ⁵	9.0E+99 ⁶
Zinc	0.03	0.4	-	7820	9.0E+99 ⁶
Chloride	21.6	80	-	0.15	9.0E+99 ⁶
Sulphate	43.7	100	-	0.962	9.0E+99 ⁶
Ammoniacal nitrogen	0.06	0.3	-	4.75	2190 ⁷
Benzo(a)pyrene	5E-08	0.0038	128825	-	1058 ⁸
Naphthalene	0.002	1.5	646	-	300 ⁹
Benzene	0.001	2.2	67	-	350 ⁹

1. See Table D
2. See Table E
3. Nathanail *et al*, 2015
4. Kd values from sorption isotherms from batch testing of site-won clay liner material for Meriden Quarry (from CE Geochem, 2015) unless stated otherwise
5. No site specific batch testing data available for contaminant – Kd value taken from most likely/mid-point value from USEPA (2005)
6. Metals and inorganics assumed not to degrade therefore large value adopted
7. Upper limit of estimated half life for aerobic degradation given in EA (2003)
8. Upper limit of estimated half life for aerobic degradation in groundwater given in Howard (1991)
9. Upper limit of estimated half life for aerobic degradation in groundwater given in EA (2002)

For scenario 2 all contaminant specific parameters are the same as in Table G with the exception of the source concentrations. These have been calculated making the conservative assumption that 1 in 20 loads of waste placed at the site are rogue loads that do not meet the inert WAC and that the concentrations in these rogue loads are equal to the maximum concentrations suggested for a rogue load in EA (2025g). The source concentration used for the RTM modelling is then the weighted average concentration in the waste mass assuming that 5% of the waste deposited has the rogue load concentration and the remaining 95% meets the inert WAC, i.e.:

$$C_{source} = 0.05 \times C_{rogue} + 0.95 \times C_{compliant}$$

Where

C_{avg} = overall leachate concentration in the waste mass (mg.L^{-1})

C_{rogue} = leachate concentration in the rogue loads (mg.L^{-1})

$C_{compliant}$ = leachate concentration in the compliant waste (mg.L^{-1})

The source concentrations are provided in Table H below.

Table H: Scenario 2, rogue load source concentrations

Contaminant	EAL ¹	Concentration of compliant waste ²	Maximum concentration in a rogue load. ³	Scenario 2 Source Concentration
	mg.L^{-1}	mg.L^{-1}	mg.L^{-1}	mg.L^{-1}
Ammoniacal nitrogen	0.06	0.3	25	1.54
Arsenic	0.005	0.05	0.06	0.051
Chloride	21.6	80	800	116
Lead	0.0002	0.05	0.15	0.055
Nickel	0.0163	0.04	0.12	0.044
Sulphate	43.7	100	1800	185

1. See Table D
2. See Table E
3. Maximum value for rogue loads given in EA (2025g)

4.5 Results

4.5.1 Scenario 1

The RTM model outputs are presented in Appendix 7. Table I presents the modelled concentrations at the compliance point (outer edge of clay sidewall liner) after 20,000 years. This table also presents the EALs for comparison. The table also shows the “hazard index”, the ratio of the predicted concentration at the compliance point to the EAL. A hazard index of less than 1 indicates that the predicted concentration is less than the EAL, whereas a hazard index greater than 1 indicates that the predicted concentration exceeds the EAL.

Table I: Predicted concentrations at outer edge of clay liner for Scenario 1

Substance	EAL (mg.L ⁻¹)	Predicted concentration at outer edge of clay liner after 20,000 years (mg.L ⁻¹)	Hazard Index
Antimony	0.005	2.7E-04	0.055
Arsenic	0.005	0.050	10
Barium	1.3	1.5	1.2
Chromium	0.0047	0	0
Copper	0.0347	8.4E-06	2.4E-04
Lead	0.0002	0	0
Mercury	0.00001	0	0
Nickel	0.0163	0	0
Zinc	0.03	0	0
Chloride	21.6	80	3.7
Sulphate	43.7	100	2.3
Ammoniacal nitrogen	0.06	0.027	0.45
Benzo(a)pyrene	5E-08	7.3E-07	15
Naphthalene	0.00002	1.1E-05	0.55
Benzene	0.001	5.5E-05	0.055

Values in **bold** exceed EAL

As shown in Table I, use of the WAC limits for inert landfills as the source concentrations results in maximum predicted concentrations at the outer edge of the clay sidewall liner below EALs with the exception of arsenic, barium, chloride, sulphate and benzo(a)pyrene. Arsenic has a maximum predicted concentration ten times the EAL of 0.005 mg.L⁻¹ and barium has a maximum predicted concentration only slightly above the EAL of 1.3 mg.L⁻¹. The predicted maximum concentrations for chloride and sulphate are 3.7 and 2.3 times the EALs, respectively and benzo(a)pyrene has a maximum predicted concentration fifteen times the EAL of 5 x 10⁻⁸ mg.L⁻¹.

The RTM predicted concentrations are the concentrations in the other wall of the clay liner and not in groundwater adjacent the liner. The concentrations in groundwater will be lower due to dilution in the groundwater body. The concentration in groundwater immediately down-hydraulic gradient of the site can be calculated by dividing the predicted concentration at the outer edge of the clay wall liner (i.e. the concentration migrating out of the liner) by a dilution factor. The following equation (adapted from EA, 2006) has been used to calculate the dilution factor:

$$DF = 1 + \frac{Q_{gw}}{Q_L}$$

Where

DF = dilution factor (dimensionless)

Q_{gw} = groundwater flow rate past the site ($m^3.d^{-1}$)

Q_L = leakage rate through the liner ($m^3.d^{-1}$)

Both the groundwater flow rate past the site and the leakage rate through the liner are calculated using Darcy's Law:

$$Q = K . i . W . b$$

Where

K = Hydraulic conductivity ($m.d^{-1}$)

i = hydraulic gradient (dimensionless)

W = width perpendicular to flow (m)

b = saturated thickness (m)

Much of the Glaciofluvial deposits have been removed by quarrying but an approximately 50m wide strip remains along the southern edge of the site and under Cornets End Lane. Assuming a hydraulic conductivity of $3.5 m.d^{-1}$ (see Section 2.6.3), hydraulic gradient of 0.01 (see Section 2.6.4), a width of 50m and saturated aquifer thickness of 6m (see Table F), groundwater flow in the Glaciofluvial deposits past the site is estimated to be $10.5 m^3.d^{-1}$.

The leakage rate through the sidewall liner has been calculated assuming a hydraulic conductivity of the clay liner of $2.23E-04 m.d^{-1}$, hydraulic gradient of 0.59, width of 620m and saturated thickness of 6m (see Table F), giving an estimated flow of $0.49 m^3.d^{-1}$.

Thus, using the equation above, the dilution factor is estimated to be 22 ($1 + 10.5/0.49$). Dividing the predicted concentrations in Table I by this dilution factor gives the predicted concentrations in groundwater immediately down-hydraulic gradient of the site. These are shown in Table J along with the EALs and associated hazard indices.

Table J: Predicted concentrations in groundwater for Scenario 1

Substance	EAL (mg.L ⁻¹)	Predicted concentration in groundwater (mg.L ⁻¹)	Hazard Index
Antimony	0.005	1.2E-05	0.0025
Arsenic	0.005	0.0023	0.45
Barium	1.3	0.069	0.053
Chromium	0.0047	0	0
Copper	0.0347	3.8E-07	1.1E-05
Lead	0.0002	0	0
Mercury	0.00001	0	0
Nickel	0.0163	0	0
Zinc	0.03	0	0
Chloride	21.6	3.6	0.17
Sulphate	43.7	4.5	0.10
Ammoniacal nitrogen	0.06	0.0012	0.020
Benzo(a)pyrene	5E-08	3.3E-8	0.66
Naphthalene	0.00002	5.0E-07	0.025
Benzene	0.001	2.5E-06	0.0025

Values in **bold** exceed EAL

As shown in Table J the predicted concentrations in groundwater are all below the EALs.

4.5.2 Scenario 2

The RTM model outputs are presented in Appendix 8. Table K presents the modelled concentrations at the compliance point (outer edge of clay sidewall liner) after 20,000 years. This table also presents the hazard indices and EALs for comparison.

Table K: Predicted concentrations at outer edge of clay liner for Scenario 2

Substance	EAL (mg.L ⁻¹)	Predicted concentration at outer edge of clay liner after 20,000 years (mg.L ⁻¹)	Hazard Index
Ammoniacal nitrogen	0.06	0.14	2.3
Arsenic	0.005	0.051	10
Chloride	21.6	116	5.4
Lead	0.0002	0	0
Nickel	0.0163	0	0
Sulphate	43.7	185	4.2

Values in **bold** exceed EAL

As shown in Table K, incorporating non-compliant waste (rogue load) at a rate of 1 in 20 loads within the inert waste source concentrations results in maximum predicted concentrations at the outer edge of the clay sidewall liner below EALs with the exception of

ammoniacal nitrogen, arsenic, chloride and sulphate which exceed the EALs by a factor of 2.3 to 10 times.

As with scenario 1 the predicted concentrations at the outer edge of the sidewall liner have been divided by the dilution factor of 22 (as calculated in Section 4.5.1) to calculate the concentrations in groundwater immediately down-hydraulic gradient of the site. These are shown in Table L along with the EALs and associated hazard indices.

Table L: Predicted concentrations in groundwater for Scenario 2

Substance	EAL (mg.L ⁻¹)	Predicted concentration in groundwater (mg.L ⁻¹)	Hazard Index
Ammoniacal nitrogen	0.06	0.0063	0.11
Arsenic	0.005	0.0023	0.46
Chloride	21.6	5.3	0.24
Lead	0.0002	0	0
Nickel	0.0163	0	0
Sulphate	43.7	8.4	0.19

Values in **bold** exceed EAL

As shown in Table L the predicted concentrations in groundwater are all below the EALs.

4.6 Sensitivity Analysis

The influence of uncertainty in the model parameters on the model results has been tested by varying key parameters between realistic limits and observing how this affects the predicted concentrations in groundwater (i.e. accounting for dilution by groundwater) for arsenic and benzo(a)pyrene. These two substances have been chosen to represent the inorganic and organic contaminants, arsenic having the largest hazard index of the inorganic contaminants and benzo(a)pyrene having the largest hazard index of the organic contaminants..

The ranges in parameter values tested are presented in Table M and the results of this sensitivity analysis are presented in Figures B and C below for arsenic and benzo(a)pyrene, respectively. Note that these figures show the relative change in RTV on a log scale for each input parameter (rather than as a percentage). Positive values indicate an increase in RTV whilst negative values indicate a decrease.

Table M: Parameter values tested in the sensitivity analysis

Parameter	Base case	Min value	Max value	Justification
Width of plume perpendicular to groundwater flow (m)	620	500	750	Min and max approximately $\pm 20\%$ of base case value
Saturated thickness / plume thickness (m)	6	4	8	Reasonable range based on site data
Dry bulk density (g.cm^{-3})	1.78	1.32	1.87	Range of values given for Mercia Mudstone in Worcester/Knowle Basins in BGS (2002)
Effective porosity (fraction)	0.3	0.2	0.35	Reasonable range in values for clay
Hydraulic gradient (m.m^{-1})	0.59	0.295	1.2	0.5x and 2x base case value
Hydraulic conductivity (m.d^{-1})	2.23E-04	1.38E-04	4.41E-04	Range of values from permeability testing (see Appendix 6)
Fraction of organic carbon (fraction)	0.003	0.0015	0.006	0.5x and 2x base case value
Biodegradation half-life - benzo(a)pyrene	1058	114	1058	Base case and max is max value for aerobic degradation in groundwater in Howard (1991). Min is min value for aerobic degradation in groundwater in Howard (1991)
Biodegradation option	Dissolved phase only	Dissolved phase only	Dissolved and sorbed phases	Base case and "min" based on conservative assumption of

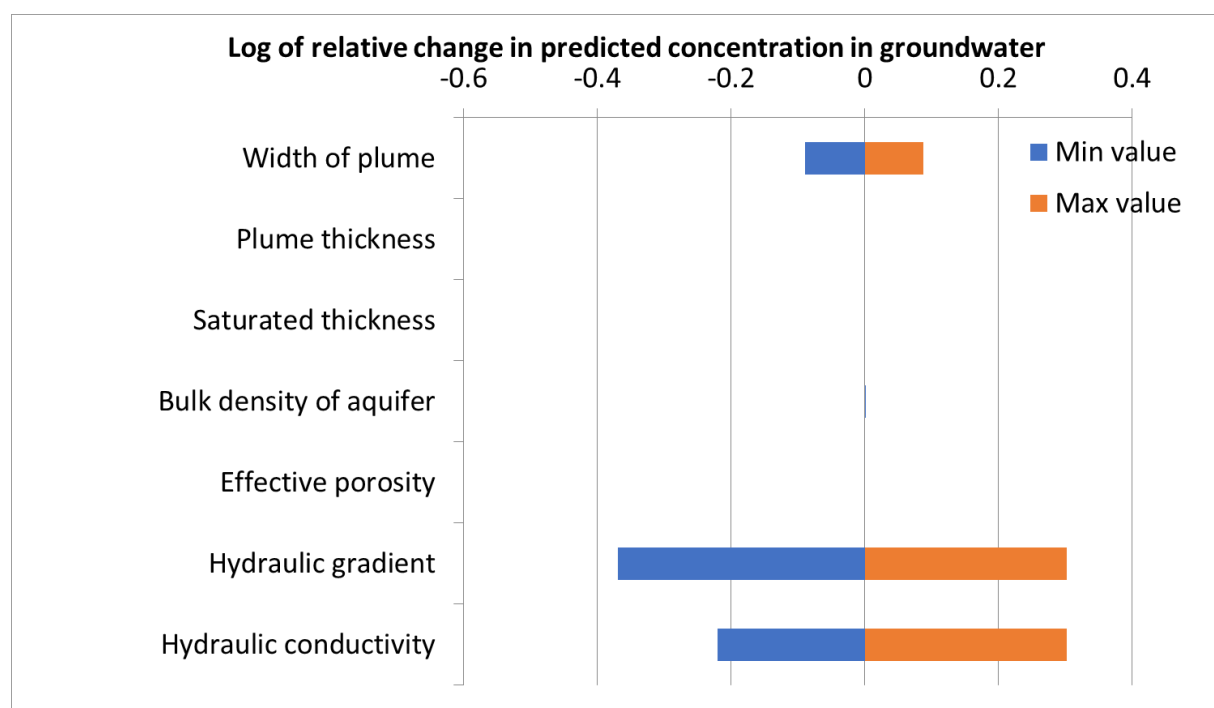
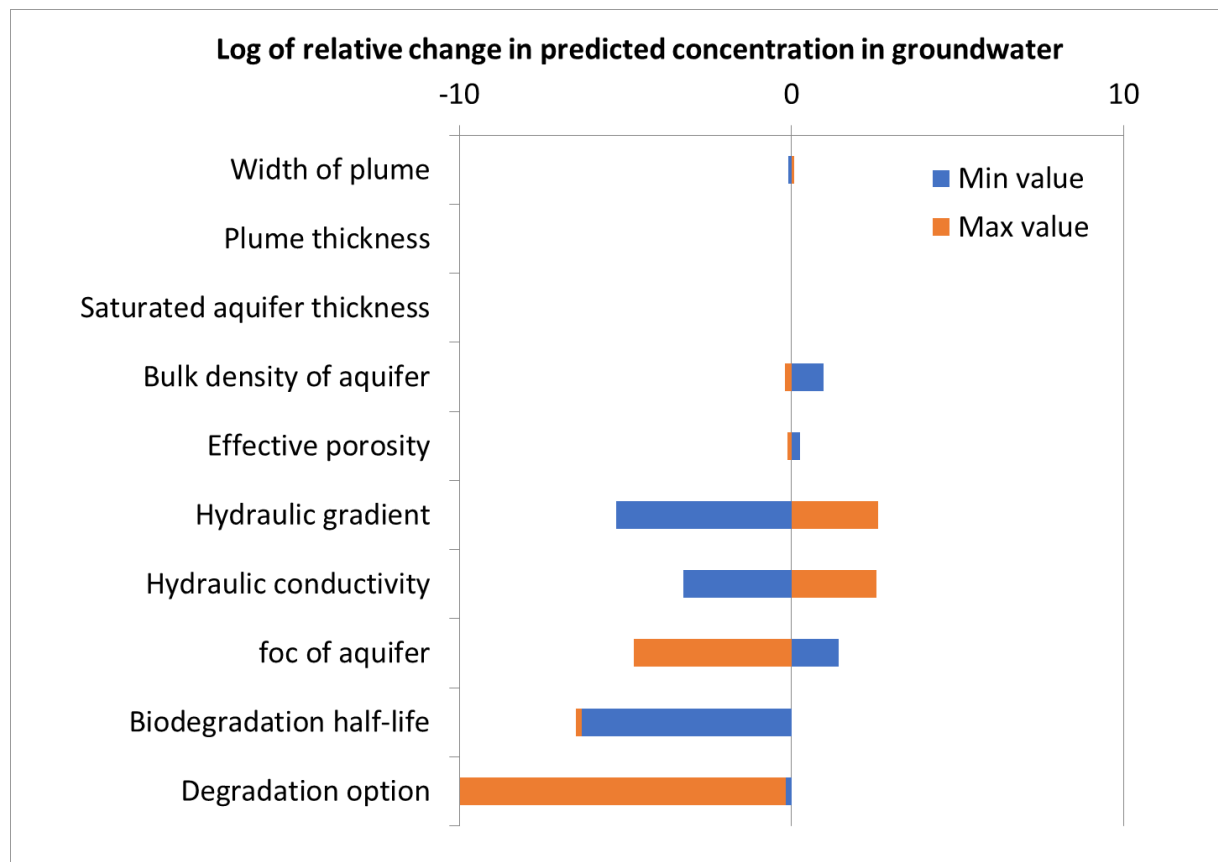
Figure B: Results of sensitivity analysis for arsenic


Figure C: Results of sensitivity analysis for benzo(a)pyrene



The sensitivity analysis shows that there is relatively little sensitivity in the predicted concentrations in groundwater to plausible changes in the majority of parameter values. The parameters causing the greatest change are discussed below:

Arsenic

- Hydraulic gradient.** The base case hydraulic gradient across the liner is calculated from the difference between a worst case “leachate” level in the waste and groundwater level in the Glaciofluvial deposits divided by the thickness of the liner. Halving gradient decreases the predicted concentration in groundwater from $2.3 \mu\text{g.L}^{-1}$ to $0.97 \mu\text{g.L}^{-1}$ whereas doubling the gradient increases the predicted concentration to $4.6 \mu\text{g.L}^{-1}$. The predicted concentrations are still below the EAL of $5 \mu\text{g.L}^{-1}$.
- Hydraulic conductivity.** The geomean of permeability test results from clay on the wider Meriden site has been used for the base case. Using the minimum test result decreases the predicted concentration in groundwater from $2.3 \mu\text{g.L}^{-1}$ to $1.4 \mu\text{g.L}^{-1}$ whereas using the maximum test result increases the predicted concentration to $4.6 \mu\text{g.L}^{-1}$. The predicted concentrations are still below the EAL of $5 \mu\text{g.L}^{-1}$.

Benzo(a)pyrene

- **Hydraulic gradient.** The base case hydraulic gradient across the liner is calculated from the difference between a worst case “leachate” level in the waste and groundwater level in the Glaciofluvial deposits divided by the thickness of the liner. Halving gradient decreases the predicted concentration in groundwater by five orders of magnitude to $1.7\text{E-}10 \mu\text{g.L}^{-1}$ whereas doubling the gradient increases the predicted concentration by three orders of magnitude to $0.014 \mu\text{g.L}^{-1}$ which exceeds the EAL of $5\text{E-}05 \mu\text{g.L}^{-1}$.
- **Hydraulic conductivity.** The geomean of permeability test results from clay on the wider Meriden site has been used for the base case. Using the minimum test result decreases the predicted concentration in groundwater by three orders of magnitude to $1.9\text{E-}08 \mu\text{g.L}^{-1}$ whereas using the maximum test result increases the predicted concentration by approximately three orders of the magnitude to $0.012 \mu\text{g.L}^{-1}$ which exceeds the EAL of $5\text{E-}05 \mu\text{g.L}^{-1}$.
- **Fraction of organic carbon.** The foc used for the base case modelling used a literature value for a Mercia Mudstone clay liner. Halving this value increases the predicted concentration by one order of magnitude to $8.5\text{E-}04 \mu\text{g.L}^{-1}$ which exceeds the EAL of $5\text{E-}05 \mu\text{g.L}^{-1}$, whereas doubling the foc decreases the predicted concentration by five orders of magnitude to $6.0\text{E-}10 \mu\text{g.L}^{-1}$.
- **Biodegradation half-life.** The predicted concentrations are based on upper limit biodegradation half-lives for aerobic biodegradation from literature values. Using the lower limit of biodegradation half-lives from literature values results in the predicted concentrations decreasing by over six orders of magnitude to $1.6\text{E-}11 \mu\text{g.L}^{-1}$.
- **Biodegradation option.** The predicted concentrations in groundwater are based on the highly conservative assumption that biodegradation only occurs in the dissolved phase. Using the more realistic dual phase degradation option (i.e. biodegradation only occurs in both the sorbed and dissolved phases) decreases the predicted concentrations significantly (by more than ten orders of magnitude).

The sensitivity analysis shows that an overall conservative approach has been adopted for the assessment and that the predicted concentrations in groundwater presented in Table I can be considered precautionary.

4.7 Risk Evaluation

The Environment Agency's RTM spreadsheet model has been used to predict concentrations in pore water leaking from the clay sidewall liner to groundwater. Calculations have then been conducted to estimate the diluted concentrations in groundwater immediately down-hydraulic gradient of the site. Sensitivity analysis has shown that the modelling is conservative. In addition, the following conservative assumptions have been made:

- For scenario 1, the entire waste mass is assumed to have leachate concentrations equal to the WAC for inert landfills. This is highly conservative;
- For scenario 2 it is assumed that 5% of the waste mass comprises non-compliant waste with source concentrations equal to the maximum values suggested for rogue loads ion EA (2025g). This is likely to be highly conservative;
- The source concentrations are assumed to not change with time. In reality source concentrations will decrease over time as contaminants are leached from the waste mass and (in the case of organic contaminants) degraded.

As a result the actual concentrations in groundwater are likely to be significantly lower than predicted. Given that the modelled concentrations are below EALs (and for most contaminants well below EALs) it can be concluded that the use of inert waste material (including an allowance for rogue loads) to infill the site will not present an unacceptable risk to Controlled Waters receptors.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The following conclusions are drawn from the risk assessment work conducted:

- The CSM identified the following plausible SPR linkages that required further assessment:
 - Risk to the Glaciofluvial deposits and Alluvium aquifers from leaching of contaminants from inert waste followed by lateral migration through the clay sidewall liners and dilution within groundwater in the adjacent Glaciofluvial deposits;
 - Risk to Horn Brook and River Blythe from leaching of contaminants from inert waste followed by lateral migration through the clay sidewall liners and dilution and migration within groundwater in the adjacent Glaciofluvial deposits.
 - Risk to the Glaciofluvial deposits and Alluvium aquifers from leaching of contaminants from non-compliant waste (rogue loads) followed by lateral migration through the clay sidewall liner and dilution within groundwater in the adjacent Glaciofluvial deposits; and
 - Risk to Horn Brook and River Blythe from leaching of contaminants from non-compliant waste (rogue loads) followed by lateral migration through the clay sidewall liner and dilution and migration within groundwater in the adjacent Glaciofluvial deposits.
- The risk from these SPR linkages was assessed further using DQRA. Two scenarios were modelled: scenario 1, all waste meeting the inert WAC and scenario 2: 5% of the waste comprising rogue loads with 95% compliant waste. The Environment Agency's RTM Level 3 Groundwater worksheet was used to predict the migration of contaminants through the clay sidewall liners and then dilution calculations were made to estimate the concentrations in groundwater immediately down-hydraulic gradient of the site. The estimated concentrations in groundwater were below EALs for all the modelled contaminants for both scenarios.
- Sensitivity analysis was undertaken to assess the effects of uncertainty on model input parameter values. This analysis showed that a generally conservative approach had been taken. The assumptions of the entire waste mass having leachate concentrations equal to the WAC for inert landfills with an allowance of 5% rogue loads and that the source concentrations did not decrease with time added to

the level of conservatism. As such the actual concentrations in groundwater are likely to be lower than those predicted and it can be concluded that the use of inert waste material to infill the site will not present an unacceptable risk to Controlled Waters receptors.

5.2 Recommendations

It is recommended that the generic WAC for inert landfills are used as the waste acceptance criteria for the site.

6 REFERENCES

British Geological Survey (BGS), 1996. 1:50,000 Solid and Drift Geology, Sheet 168, Birmingham.

BGS, 2002. Engineering geology of British rocks and soils. Mudstones of the Mercia Mudstone Group. Research Report RR/01/02

BGS, 2025. BGS GeoIndex Onshore. Available at <https://www.bgs.ac.uk/map-viewers/geoindex-onshore/>

BGS & Environment Agency (EA), 1997. The physical properties of major aquifers in England and Wales. BGS Technical report WD/97/34. Environment Agency R&D Publication 8. BGS, Keyworth.

BGS & EA, 2000. The physical properties of minor aquifers in England and Wales. BGS technical report WD/00/04.

CE Geochem Ltd. Meriden Quarry Area G Inert Landfill. Hydrogeological Risk Assessment. Report A140501. Dated February 2015.

Defra, 2025. Aquifer classifications and Source Protection Zones from the MAGIC website. <https://magic.defra.gov.uk/>

Environment Agency (EA), 2000. CEC & Kd Determination in Landfill Performance Evaluation. A review of methodologies and preparation of standard materials for laboratory analysis. R&D Technical Report P340

EA, 2002. The Effects of Contaminant Concentration on the Potential for Natural Attenuation. R&D Technical Report P2-228/TR

EA, 2003. Review of ammonium attenuation in soil and groundwater. National Groundwater and Contaminated Land Centre. NGWCLC report NC/02/49

EA, 2006. Remedial Targets Methodology. Hydrogeological Risk Assessment for Contaminated Land.

EA, 2009. Environmental Permitting Regulations: Inert Waste Guidance Standards and Measures for the Deposit of Inert Waste on Land.

EA, 2013. Hydrogeological risk assessment for land contamination Remedial Targets Worksheet Version 3.2. January 2013

EA, 2017a. Groundwater protection technical guidance. Available at <https://www.gov.uk/government/publications/groundwater-protection-technical-guidance/groundwater-protection-technical-guidance> Last updated 14 March 2017

EA, 2017b. Hazardous substances to groundwater: minimum reporting values. Available at <https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values> Last updated 13 January 2017

EA, 2018. The Environment Agency's approach to groundwater protection. February 2018. Version 1.2. Available from <https://www.gov.uk/government/publications/groundwater-protection-position-statements>

EA, 2024. Permit Application – New bespoke deposit for recovery permit. National Permitting Service Geoscience Operations Team (GOT) guidance notes. Reference GOTnewDfREnhPreAppAdvice – Version 4.0 – 12/02/2024

EA, 2025a. Land contamination risk management (LCRM) - How to assess and manage the risks from land contamination. Published on 8 October 2020 and updated on 12 June 2025. Accessed from <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

EA, 2025b. Landfill operators: environmental permits Landfills for inert waste. Published on 30 January 2020 and updated on 14 May 2025. Accessed from <https://www.gov.uk/guidance/landfill-operators-environmental-permits/landfills-for-inert-waste>

EA, 2025c. Protect groundwater and prevent groundwater pollution. Available at <https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution/protect-groundwater-and-prevent-groundwater-pollution> Last updated 17 July 2025

EA, 2025d. Catchment Data Explorer. River Blythe from Patrick Bridge to the River Tame Water Body. Available at: <https://environment.data.gov.uk/catchment-planning/WaterBody/GB104028042572>

EA, 2025e. Water Quality Archive. Horn Brook - Hampton Lane Hampton In Arden. Available at <https://environment.data.gov.uk/water-quality/view/sampling-point/MD-62933100>

EA, 2025f. Water Quality Archive. River Blythe - Patrick Bridge B4102. Available at https://environment.data.gov.uk/water-quality/view/sampling-point/MD-61644950?_all=true

EA, 2025g. Environment Agency Advice: Completing Hydrogeological Risk Assessments for inert waste deposit permit applications. 7 July 2025. Available at: <https://www.circularonline.co.uk/guidance/environment-agency-advice-series-completing-hydrogeological-risk-assessments-for-inert-waste-deposit-permit-applications/>

Golder Associates, 2003. LandSim Manual v2.5.

Howard, P.H., 1991. Handbook of Environmental Degradation Rates. ISBN 0-87371-358-3.

JAGDAG, 2025. Substance determinations 15 July 2025. Joint Agencies Groundwater Directive Advisory Group. Available at: <https://www.wfduk.org/resources/groundwater-hazardous-substances-standards>

Met Office, 2025. Average annual rainfall data for Coleshill Station. Available at <https://www.metoffice.gov.uk/research/climate/maps-and-data/location-specific-long-term-averages/gc9f99dn5>

MPG Ltd. Waste Recovery Plan, 2025. Meriden Quarry. Document Reference: 415/2—R1.3 – WRP. Version 1.3. Dated 20 August 2025.

Nathanail, C.P., McCaffrey, C., Gillett, A.G., Ogden, R.C. and Nathanail, J.F. 2015. The LQM/CIEH S4ULs for Human Health Risk Assessment. Land Quality Press, Nottingham. ISBN 978-0-9931084-0-2.

Simoes, A., Stringfellow, A.M., Smallman, D., Beaven, R., Marshall, J., Powrie, W. and Potter, H.A.B., 2011. Sorption of organic contaminants by Oxford Clay and Mercia Mudstone landfill liners. Quarterly Journal of Engineering Geology and Hydrogeology, 44, 345–360

SLR Consulting Limited, 2018. Environmental Statement Volume 1. Meriden Quarry, South West Extension. Final. Job no. 407.05731.00003. Dated 28 August 2018.

UK Technical Advisory Group on the Water Framework Directive (UKTAG), 2016. Technical report on Groundwater Hazardous Substances. September 2016. Available at: https://www.wfduk.org/sites/default/files/Media/UKTAG_Technical%20report_GW_Haz-Subs_ForWebfinal.pdf

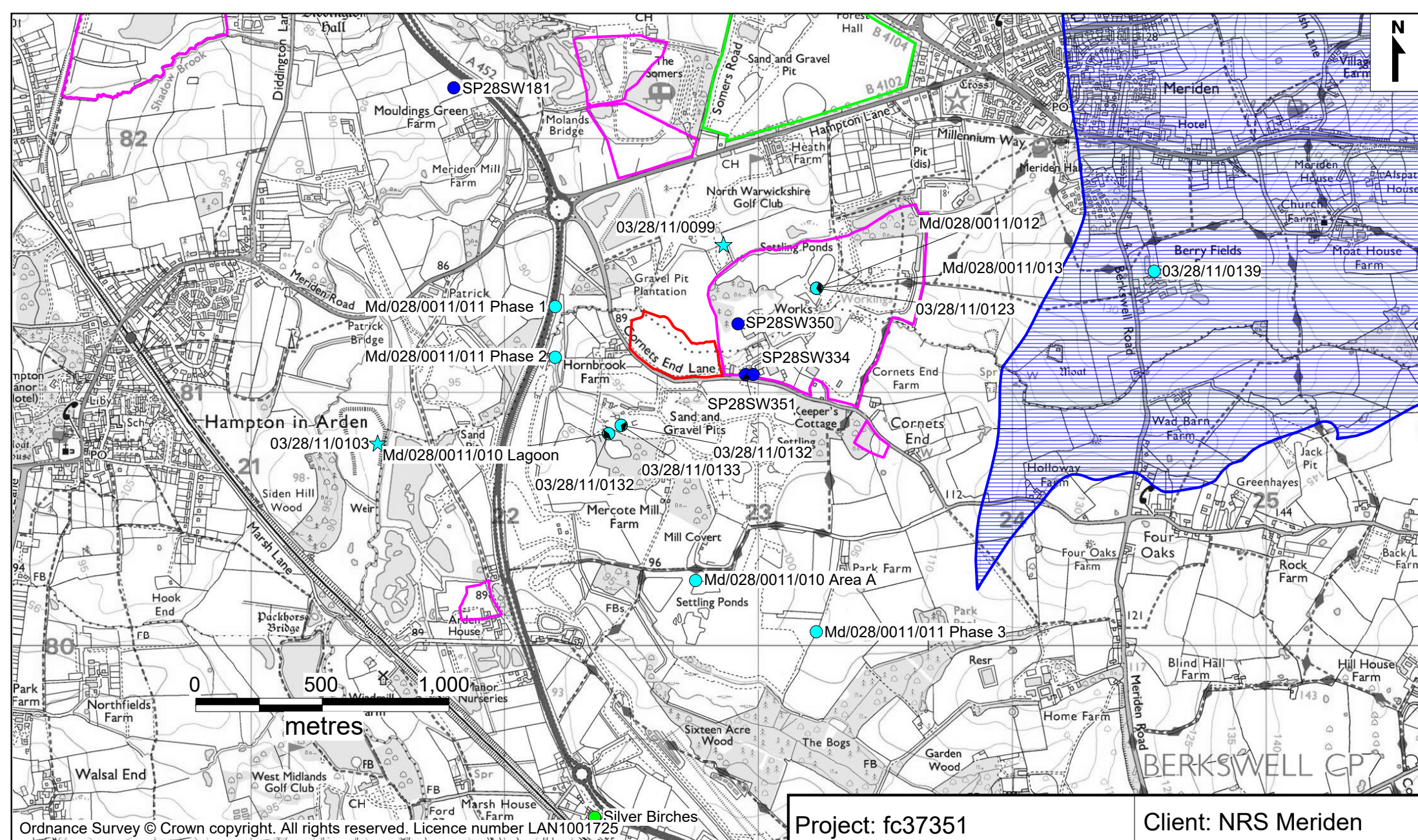
U.S. Environmental Protection Agency (USEPA), 2005. Partition Coefficients for Metals in Surface Water, Soil, and Waste. EPA/600/R-05/074. July 2005.

Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015. For EQS information.

Water Supply (Water Quality) Regulations 2016. Statutory Instrument 2016 No. 614.

WHO, 2022. Guidelines for drinking-water quality: Fourth edition incorporating the first and second addenda. 21 March 2022.

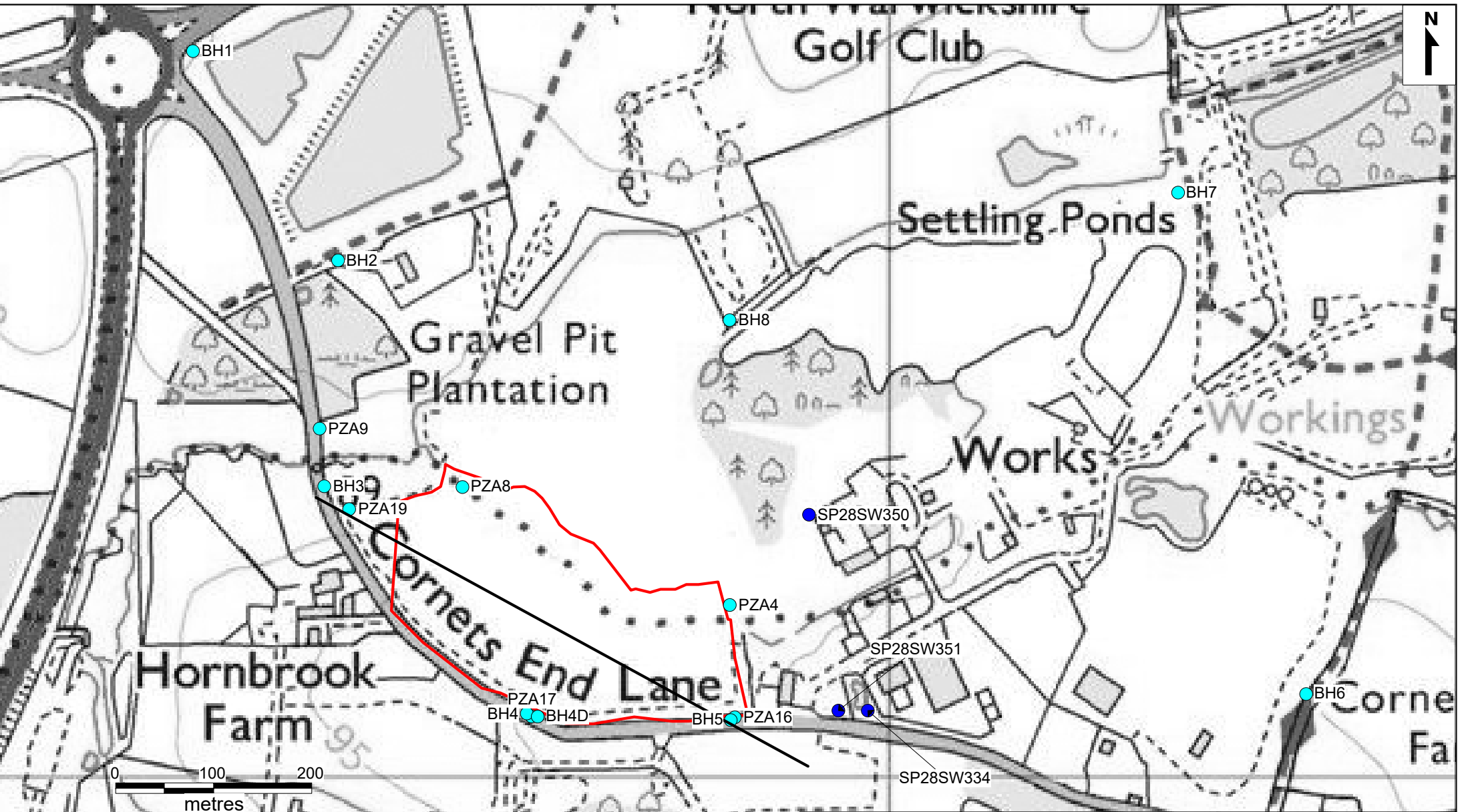
FIGURES



- Site
- SPZ3
- Licensed landfill
- Historic landfill
- Licensed Groundwater Abstraction (approximate location)
- Private Groundwater Abstraction (approximately location)
- ★ Licensed Surface Water Abstraction
- BGS Borehole Log Location

firth consultants
 environmental risk assessment
 Polygon Yard, 39a Islington Rd
 Bristol BS3 1QB
 Tel: 0117 379 0022
 www.firthconsultants.co.uk

Project: fc37351 Banana Field, Meriden Quarry		Client: NRS Meriden Aggregates Ltd.
Figure 1	Site Location	
Scale: as shown		
Date: 22/12/25		



Ordnance Survey © Crown copyright. All rights reserved. Licence number LAN1001725

- Site
- Groundwater Monitoring Well
- BGS Borehole Log Location
- Cross Section Location

firth consultants
environmental risk assessment

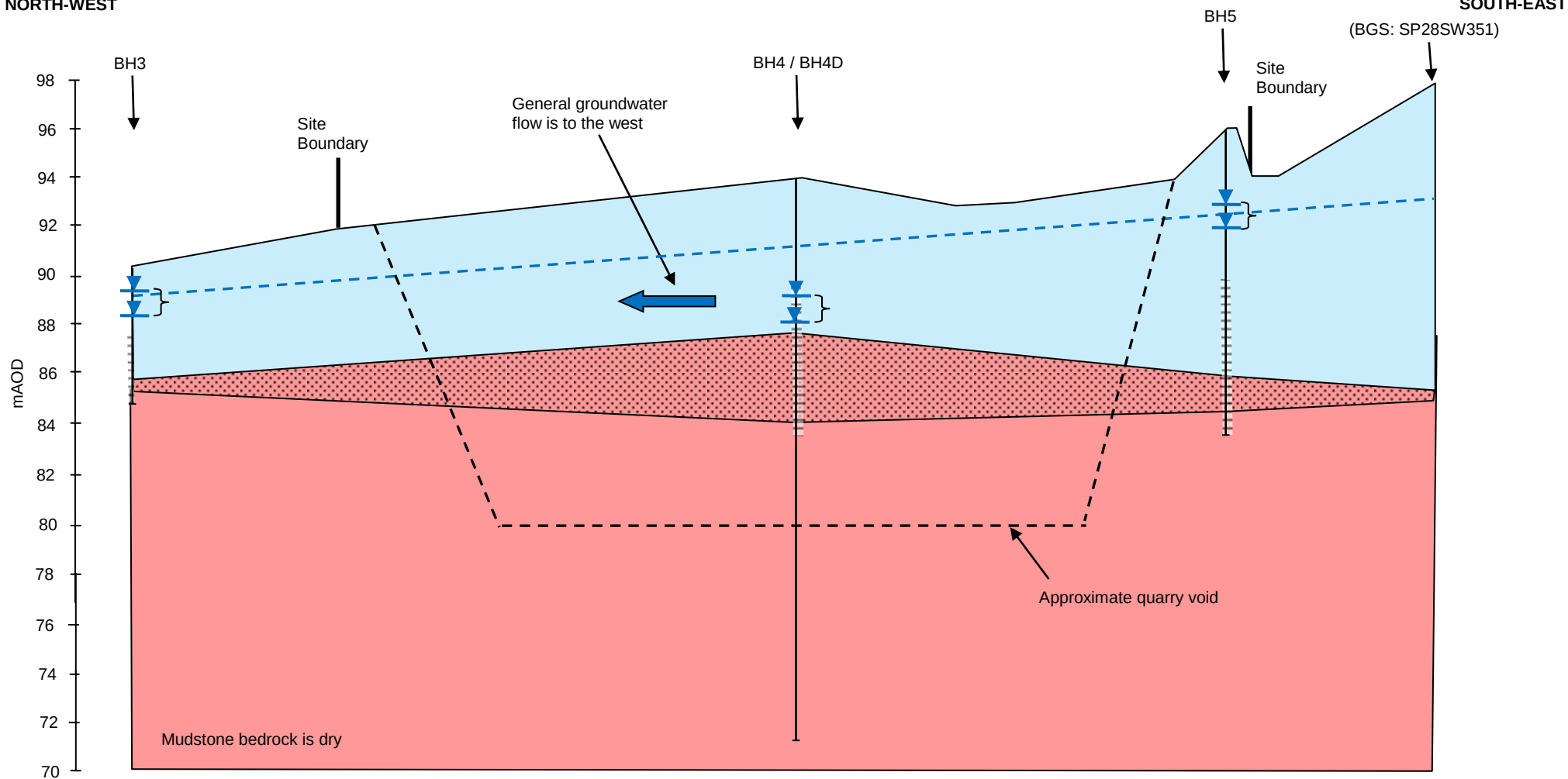
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB

Tel: 0117 379 0022
www.firthconsultants.co.uk

Project: fc37351 Banana Field, Meriden Quarry		Client: NRS Meriden Aggregates Ltd.
Figure 2	Location of Groundwater Monitoring Wells	
Scale: as shown		
Date: 22/12/25		

NORTH-WEST

SOUTH-EAST



Legend

- Glaciofluvial Deposits (Clay with gravels)
- Weathered Mudstone (stiff sandy clay)
- Sidmouth Mudstone Formation – Mudstone
- } Range in groundwater Level in 2018 and 2019
- Average water table in Glaciofluvial Deposits

100m

Project: fc37351
Banana Field, Meriden

Client: NRS Meriden
Aggregates Ltd.

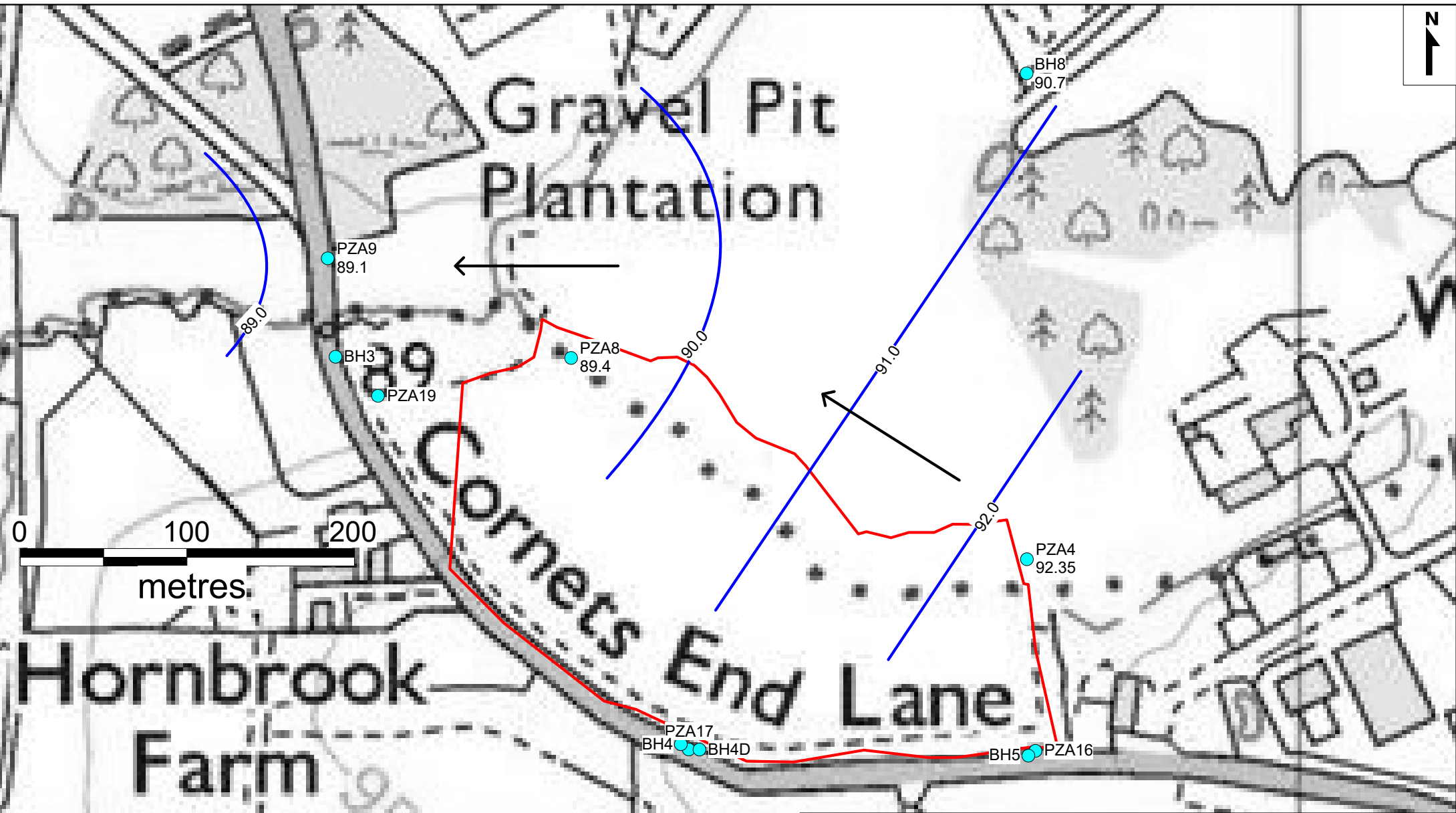
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Road
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure 3

Scale: see key

Date: 18/12/25

Geology prior to quarrying



Ordnance Survey © Crown copyright. All rights reserved. Licence number LAN1001725

- Site
- Groundwater Level Monitoring Well
- 90.7 Groundwater Elevation on 13/04/2014 (mAOD)
- Groundwater contour (13/03/2014)
- ↖ Direction of Groundwater Flow

firth consultants
environmental risk assessment

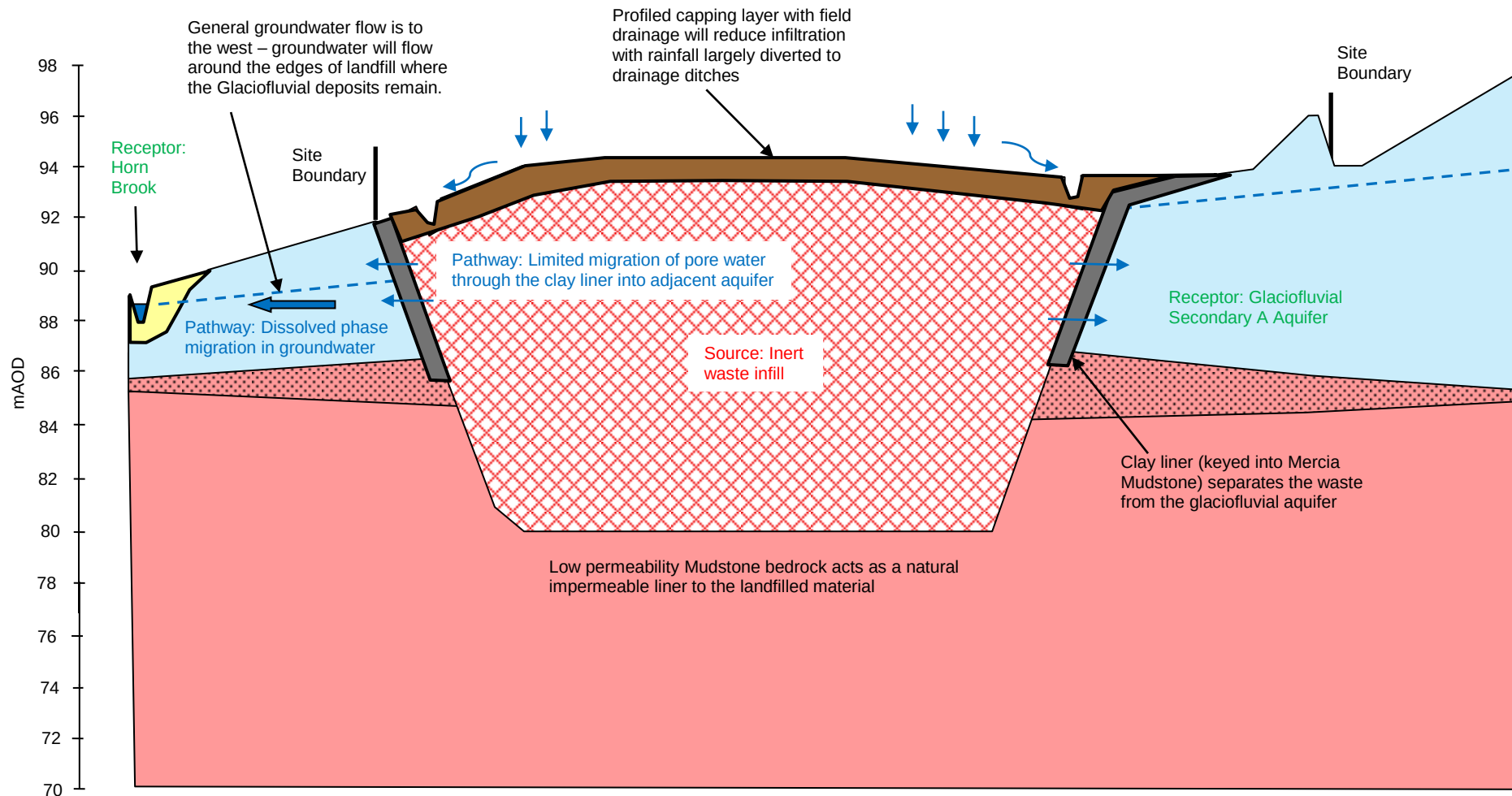
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB

Tel: 0117 379 0022
www.firthconsultants.co.uk

Project: fc37351 Banana Field, Meriden Quarry		Client: NRS Meriden Aggregates Ltd.
Figure 4	Site Baseline Piezometry	
Scale: as shown		
Date: 22/12/25		

NORTH-WEST

SOUTH-EAST

**Legend**

- Alluvium
- Glaciofluvial Deposits (Clay with gravels)
- Weathered Mudstone (stiff sandy clay)
- Sidmouth Mudstone Formation – Mudstone
- Baseline water table in Glaciofluvial Deposits

Project: fc37351
Banana Field, Meriden

Client: NRS Meriden
Aggregates Ltd.

firth consultants
environmental risk assessment

Polygon Yard, 39a Islington Road
Bristol BS3 1QB

Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure 5

Scale: see key

Date: 18/12/25

Conceptual Site Model

TABLES

Table 1: Groundwater Analytical Results



				BH1	BH1	BH1	BH1	BH2	BH2	BH2	BH2	BH3	BH3	BH3	BH3	BH4	BH4	BH4	BH4	BH5	BH5	BH5	BH5	BH6
Analyte	Units	DWS	EQS	15/03/24	25/06/24	05/09/24	05/12/24	15/03/24	25/06/24	05/09/24	05/12/24	15/03/24	25/06/24	05/09/24	05/12/24	15/03/24	25/06/24	05/09/24	05/12/24	15/03/24	25/06/24	05/09/24	05/12/24	15/03/24
pH	pH units	6.5 to 9.5	6 to 9	7.3	6.9	6.8	7	7.4	6.4	6.7	6.5	7.3	6.2	5.7	5.9	7.1	6.9	7.1	6.7	7.3	6.4	6.7	6.9	7.5
Conductivity- Electrical 20C	uS/cm			480	199	177	187	241	261	250	236	220	245	240	235	280	813	740	710	410	436	453	464	488
Alkalinity as CaCO3	mg/l			145	57.2	45.2	48	71	84.2	72.4	77.8	15.1	10.2	8.6	8	14	160	165	172	128	212	220	200	63.7
Ammoniacal Nitrogen as N	mg/l	0.389	0.2	³ <0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.09	<0.06	<0.06	<0.06	0.18	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.11
Chloride as Cl	mg/l	250		37.2	33.7	25.1	28.1	10.3	9.3	9.2	8.1	31.9	35.8	21.9	25.6	38.2	91.2	91.9	89.7	10.2	19.5	21.6	18.7	57.7
Sulphate as SO4	mg/l	250		39.9	20.4	15	16.2	32.5	42.4	32.5	36.5	43.6	47.5	43.6	44.1	46.2	55.6	48.7	54.4	42.8	29.7	43.7	33.1	142
TOC (Filtered)	mg/l			3.6	5	3.5	4.7	6.1	5.1	4.4	4.6	5.3	4.1	4.3	3.8	4.2	8.4	8.3	9.6	4.2	7.7	7.6	8.4	11.6
Phenols Mono (Phenol Index)	mg/l		0.0077	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
EH >C6 - C40	ug/l			<10	<10	<10	<10	<10	<10	<10	<10	83	<10	<10	<10	65	<10	<10	<10	<10	14	24	30	<10
EH >C6 - C8	ug/l			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
EH >C8 - C10	ug/l			<10	<10	<10	<10	<10	<10	<10	<10	21	<10	<10	<10	30	<10	<10	<10	<10	<10	<10	<10	<10
EH >C16 - C24	ug/l			<10	<10	<10	<10	<10	<10	<10	<10	75	<10	<10	<10	30	<10	<10	<10	<10	14	<10	<10	<10
EH >C24 - C40	ug/l			<10	<10	<10	<10	<10	<10	<10	<10	<10	15	14	14	<10	<10	<10	<10	<10	12	15	12	<10
EH >C10 - C16	ug/l			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	15	15	13	<10
Sodium, total as Na	mg/l	200		8.21	9.26	8.75	9.21	<3.00	4.09	3.26	3.13	19.9	11.2	11.2	12	13.1	45.6	45.7	42.1	12.4	13.6	14.6	12.5	<6.00
Magnesium, total as Mg	mg/l			11.8	10.7	7.9	7.3	7.2	7.3	7.1	6.7	52	4.8	2.5	3.7	33	22.3	28.2	25	15	12.7	12.8	13.6	41.3
Potassium, total as K	mg/l			16.4	1.76	2.03	1.41	<1.80	2.07	1.39	1.63	4.3	5.18	5.31	4.78	4.84	16.2	20.1	15.7	5.03	5.02	5.2	4.64	5.84
Calcium, total as Ca	mg/l			58.5	18.4	19.3	17.7	41.6	40.5	36.7	35.3	18.9	27.7	26.4	24.6	27.9	82.7	86.9	83.4	44.8	63.1	66	65.8	71.2
Chromium, total as Cr	mg/l	0.05	0.0034	<0.002	<0.002	<0.002	<0.002	<0.002	<0.020	<0.020	<0.020	<0.002	0.002	<0.002	<0.002	0.003	0.071	0.069	0.067	0.005	<0.002	<0.002	<0.002	0.062
Iron, total as Fe	mg/l	0.2	1	5.28	0.61	0.56	0.45	2.38	4.12	4.09	3.82	<0.23	0.4	0.47	0.3	3.68	40.3	39.7	37.1	0.34	0.71	0.95	0.8	88.8
Manganese, total as Mn	mg/l	0.05	0.217	⁴ 0.21	5.7	7.34	6.6	3.43	<0.070	<0.070	<0.070	0.09	0.13	0.15	0.11	0.12	1.41	1.66	1.81	0.07	0.4	0.47	0.31	5.89
Mercury, Total as Hg	mg/l	0.001	0.00007	⁵ <0.0006	<0.00001	<0.00001	<0.00003	<0.006	<0.0002	0.00013	0.00017	<0.00001	0.00001	0.00002	0.00001	<0.00006	0.00019	0.00028	0.00024	0.00002	<0.006	<0.006	<0.0060	0.0034
Nickel, total as Ni	mg/l	0.02	0.0163	⁴ <0.003	<0.003	<0.003	<0.003	<0.070	<0.030	0.03	<0.030	0.009	0.008	0.009	0.007	0.016	0.066	0.055	0.081	<0.030	0.022	0.041	0.039	0.116
Copper, total as Cu	mg/l	2	0.0347	⁴ <0.009	<0.009	<0.009	<0.009	<0.09	<0.09	<0.09	<0.09	<0.009	<0.009	<0.009	<0.009	0.009	0.305	0.231	0.267	<0.09	<0.09	<0.09	<0.09	<0.18
Zinc, total as Zn	mg/l	3	¹ 0.04	⁴ <0.018	<0.018	<0.018	<0.018	<0.180	<0.180	<0.018	<0.180	<0.018	<0.018	<0.018	<0.018	0.04	<0.36	<0.36	<0.36	0.03	<0.018	<0.018	<0.018	<0.360
Cadmium, total as Cd	mg/l	0.005	0.15	⁶ <0.0006	<0.0006	<0.0006	<0.0006	<0.0060	<0.0060	<0.0060	<0.0060	<0.0006	0.0017	0.0015	0.0012	<0.0006	0.0121	0.013	0.0131	<0.00006	<0.0060	<0.0060	<0.0060	<0.0120
Lead, total as Pb	mg/l	0.01	0.00996	⁴ <0.006	<0.006	<0.006	<0.006	<0.060	<0.060	<0.060	<0.060	<0.006	<0.006	<0.006	<0.006	<0.006	<0.120	0.12	<0.120	<0.060	<0.006	<0.006	<0.006	<0.120
Naphthalene	ug/l		2	<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	<0.010	<0.200	0.015	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	0.02	<1.000
Acenaphthylene	ug/l			<0.010	<0.100	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	<0.010	<0.200	<0.010	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
Acenaphthene	ug/l			<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	<0.010	<0.200	<0.010	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
Fluorene	ug/l			<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	<0.010	<0.200	<0.010	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
Phenanthrene	ug/l			<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	0.016	<0.200	<0.100	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
Anthracene	ug/l		0.1	<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	0.014	<0.200	<0.100	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
Fluoranthene	ug/l		0.0063	<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	<0.010	<0.200	0.021	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
Pyrene	ug/l			<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	<0.010	<0.200	0.016	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
Benzo(a)anthracene	ug/l			<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	<0.010	<0.200	<0.010	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
Chrysene	ug/l			<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	<0.010	<0.200	<0.010	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
Benzo(b)fluoranthene	ug/l			<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	0.02	<0.200	0.018	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
Benzo(k)fluoranthene	ug/l			<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	0.022	<0.200	0.018	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
Benzo(a)pyrene	ug/l	0.01	0.00017	<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	<0.010	<0.200	<0.010	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
Indeno(123cd)pyrene	ug/l			<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	0.013	<0.200	0.021	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
Dibenzo(ah)anthracene	ug/l			<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	<0.010	<0.200	<0.010	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
Benzo(ghi)perylene	ug/l			<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	<0.010	<0.200	0.013	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	<0.010	<1.000
PAH, Total of 16	ug/l			<0.010	<0.010	<0.010	<0.010	<0.100	<0.200	<0.100	<0.100	<0.010	0.085	<0.200	0.122	<0.500	<0.100	<0.200	<0.100	<0.500	<0.010	<0.010	0.02	<1.000
Sum of DWS PAHs	ug/l	0.1	²	0	0	0	0	0	0	0	0	0	0	0.055	0	0.07	0	0	0	0	0	0	0	0

1. No UK DWS for zinc therefore the WHO appearance / taste threshold has been used (WHO, 2022).

2. DWS is sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene & indeno(1,2,3-cd)pyrene.

3. High quality Type 6 water body (altitude over 80mAOD and alkalinity 100 to 200mg/L) for ammonia standard.

4. Freshwater EQS for Cu, Pb, Mn, Ni & Zn are calculated using m-BAT tool based on a pH of 7.7 and Ca of 55 mg/l and DOC of 8.3 mg/l (av. of samples River Blythe taken between Oct 02 to May 04, EA, 2025e). For Zn the Ambient Background Concentration of 1.4 ug/l is added for an unlisted catchment

5. No annual average EQS available for mercury therefore maximum allowable concentration used

6. EQS Class 4 water body for Cd: Alkalinity 100 to 200 mg CaCO3/l. Av. alkalinity from Horn Beck is 138mg.L-1 from 2017 & 18 (EA, 2025)

Table 1: Groundwater Analytical Results



					BH6	BH6	BH6	BH7	BH7	BH7	BH7	BH8	BH8	BH8	BH8
Analyte	Units	DWS		EQS	25/06/24	05/09/24	05/12/24	15/03/24	25/06/24	05/09/24	05/12/24	15/03/24	25/06/24	05/09/24	05/12/24
pH	pH units	6.5 to 9.5		6 to 9	7.6	7.8	7.4	7.9	7.4	7.7	7.5	7.7	6.8	6.7	6.5
Conductivity- Electrical 20C	uS/cm				350	360	338	1510	1480	1590	1430	520	562	540	543
Alkalinity as CaCO3	mg/l				60.4	58.2	66.8	310	278	262	260	57.2	68.1	48.6	55.6
Ammoniacal Nitrogen as N	mg/l	0.389		0.2	³ <0.06	<0.06	<0.06	0.4	0.46	0.42	0.36	<0.06	<0.06	<0.06	<0.06
Chloride as Cl	mg/l	250			49.8	55.1	50	162	184	194	171	46.9	42.8	41.9	49.8
Sulphate as SO4	mg/l	250			22.6	25	24.3	324	348	315	330	137	136	136	143
TOC (Filtered)	mg/l				3	2.5	2.7	6.6	5.2	5.4	6.3	3.3	6.8	7.3	5.9
Phenols Mono (Phenol Index)	mg/l			0.0077	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
EH >C6 - C40	ug/l				<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
EH >C6 - C8	ug/l				<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
EH >C8 - C10	ug/l				<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
EH >C16 - C24	ug/l				<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
EH >C24 - C40	ug/l				<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
EH >C10 - C16	ug/l				<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Sodium, total as Na	mg/l	200			28.7	24.7	25	44.7	35.4	31.3	32.6	20.9	27.2	21.2	25
Magnesium, total as Mg	mg/l				4.7	3.95	4.2	121	125	123	110	22.4	38.6	32.5	36.8
Potassium, total as K	mg/l				3.11	2.83	2.63	7.46	7.79	5.39	6.79	4.12	9.78	9.9	10.9
Calcium, total as Ca	mg/l				65.3	34.3	33.6	251	241	267	234	48.1	66.1	64.9	63.8
Chromium, total as Cr	mg/l	0.05		0.0034	<0.002	<0.002	<0.002	<0.020	<0.020	<0.020	<0.020	0.028	0.051	0.0387	0.0494
Iron, total as Fe	mg/l	0.2		1	<0.23	<0.23	<0.23	20.2	18.8	11.9	15.1	26.1	54.7	61.7	57.6
Manganese, total as Mn	mg/l	0.05		0.217	⁴ <0.007	<0.07	<0.007	4.48	6.87	4.99	5.83	1.38	7.4	6.26	6.93
Mercury, Total as Hg	mg/l	0.001		0.00007	⁵ 0.00001	0.00003	0.00001	<0.006	0.00004	0.00003	0.00004	0.0038	0.0042	0.00515	0.00518
Nickel, total as Ni	mg/l	0.02		0.0163	⁴ <0.003	<0.003	<0.003	<0.030	0.027	0.034	0.031	0.031	0.172	0.124	0.181
Copper, total as Cu	mg/l	2		0.0347	⁴ 0.0061	0.0572	0.05	<0.09	0.0428	0.0042	0.042	<0.09	0.14	0.132	0.134
Zinc, total as Zn	mg/l	3	¹	0.04	⁴ 0.03	0.032	0.03	0.186	0.198	0.162	0.182	<0.180	0.353	0.354	0.361
Cadmium, total as Cd	mg/l	0.005		0.15	⁶ <0.0006	<0.0006	<0.0006	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0115	0.0112	0.0107
Lead, total as Pb	mg/l	0.01		0.00996	⁴ <0.006	<0.006	<0.006	<0.060	<0.060	<0.060	<0.060	<0.060	0.084	<0.100	0.0808
Naphthalene	ug/l			2	<0.010	0.01	<0.01	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Acenaphthylene	ug/l				<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Acenaphthene	ug/l				<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Fluorene	ug/l				<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Phenanthrene	ug/l				<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Anthracene	ug/l			0.1	<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Fluoranthene	ug/l			0.0063	<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Pyrene	ug/l				<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Benzo(a)anthracene	ug/l				<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Chrysene	ug/l				<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Benzo(b)fluoranthene	ug/l				<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Benzo(k)fluoranthene	ug/l				<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Benzo(a)pyrene	ug/l	0.01		0.00017	<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Indeno(123cd)pyrene	ug/l				<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Dibenzo(ah)anthracene	ug/l				<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Benzo(ghi)perylene	ug/l				<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
PAH, Total of 16	ug/l				<0.010	<0.010	<0.010	<0.100	<0.050	<0.100	<0.050	<1.000	<0.100	<0.200	<0.100
Sum of DWS PAHs	ug/l	0.1	²		0	0	0	0	0	0	0	0	0	0	0

1. No UK DWS for zinc therefore the WHO appearance / taste threshold has been used (WHO, 2022).

2. DWS is sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene & indeno(1,2,3-cd)pyrene.

3. High quality Type 6 water body (altitude over 80mAOD and alkalinity 100 to 200mg/L) for ammonia standard.

4. Freshwater EQS for Cu, Pb, Mn, Ni & Zn are calculated using m-BAT tool based on a pH of 7.7 and Ca of 55 mg/l and DOC of 8.3 mg/l (av. of samples River Blythe taken between Oct 02 to May 04, EA, 2025e). For Zn the Ambient Background Concentration of 1.4 ug/l is added for an unlisted catchment

5. No annual average EQS available for mercury therefore maximum allowable concentration used

6. EQS Class 4 water body for Cd: Alkalinity 100 to 200 mg CaCO3/l. Av. alkalinity from Horn Beck is 138mg.L-1 from 2017 & 18 (EA, 2025)

APPENDIX 1

Envirocheck Report

Envirocheck[®] Report:

Datasheet

Order Details:

Order Number:

391714463_1_1

Customer Reference:

fc37351

National Grid Reference:

422670, 281180

Slice:

A

Site Area (Ha):

5.92

Search Buffer (m):

1000

Site Details:

Site at 422676,281189

Client Details:

Mr S Firth
Firth Consultants Ltd
37 Nutgrove Avenue
Bristol
BS3 4QF

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	32
Hazardous Substances	-
Geological	41
Industrial Land Use	54
Sensitive Land Use	59
Data Currency	60
Data Suppliers	66
Useful Contacts	67

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.

Copyright Notice

© Landmark Information Group Limited 2025. The Copyright on the information and data and its format as contained in this Envirocheck® Report ("Report") is the property of Landmark Information Group Limited ("Landmark") and several other Data Providers, including (but not limited to) Ordnance Survey, British Geological Survey, the Environment Agency/Natural Resources Wales and Natural England, and must not be reproduced in whole or in part by photocopying or any other method. The Report is supplied under Landmark's Terms and Conditions accepted by the Customer. A copy of Landmark's Terms and Conditions can be found with the Index Map for this report. Additional copies of the Report may be obtained from Landmark, subject to Landmark's charges in force from time to time. The Copyright, design rights and any other intellectual rights shall remain the exclusive property of Landmark and /or other Data providers, whose Copyright material has been included in this Report. © Environment Agency & United Kingdom Research and Innovation 2025. © Natural Resources Wales & United Kingdom Research and Innovation 2025.

Natural England Copyright Notice

Site of Special Scientific Interest, National Nature Reserve, Ramsar, Special Protection Area, Special Conservation Area, Marine Nature Reserve data (derived from Ordnance Survey 1:10000 raster) is provided by, and used with the permission of, Natural England who retain the copyright and Intellectual Property Rights for the data.

Scottish Natural Heritage Copyright

Contains SNH information licensed under the Open Government Licence v3.0.

Ove Arup Copyright Notice

The Mining Instability data was obtained on licence from Ove Arup & Partners Limited (for further information, contact mining.review@arup.com). No reproduction or further use of such Data is to be made without the prior written consent of Ove Arup & Partners Limited. The supplied Mining Instability data is derived from publicly available records and other third party sources and neither Ove Arup & Partners nor Landmark warrant the accuracy or completeness of such information or data.

Stantec Copyright Notice

The cavity data presented has been extracted from the PBA (now Stantec UK Ltd) enhanced version of the original DEFRA national cavity databases. Stantec UK Ltd retain the copyright & intellectual property rights in the data. Whilst all reasonable efforts are made to check that the information contained in the cavity databases is accurate we do not warrant that the data is complete or error free. The information is based upon our own researches and those collated from a number of external sources and is continually being augmented and updated by Stantec UK Ltd. In no event shall Stantec UK Ltd or Landmark be liable for any loss or damage including, without limitation, indirect or consequential loss or damage arising from the use of this data.

Radon Potential dataset Copyright Notice

Information supplied from a joint dataset compiled by The British Geological Survey and Public Health England. The probability result is only valid for properties above ground. All basement and cellar areas are considered to be at additional risk from high radon levels. If an underground room such as a cellar or basement makes up part of the living or working accommodation, the property should be tested regardless of Radon Affected Area status.

Natural Resources Wales Copyright Notice

Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right. Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Some features of this information are based on digital spatial data licensed from the Centre for Ecology & Hydrology © NERC (CEH). Defra, Met Office and DARD Rivers Agency © Crown copyright. © Cranfield University. © James Hutton Institute. Contains OS data © Crown copyright and database right 2025. Land & Property Services © Crown copyright and database right.

Report Version v53.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 2		2	3	22
Prosecutions					
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control	pg 9		6		2
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 11		3	1	
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 11		Yes		
Pollution Incidents to Controlled Waters	pg 11				4
Historical Prosecutions					
Registered Radioactive Substances					
Substantiated Pollution Incident Register					
Water Abstractions	pg 12			24	2 (*4)
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 20	Yes	n/a	n/a	n/a
Groundwater Vulnerability - Soluble Rock Risk			n/a	n/a	n/a
Groundwater Vulnerability - Local Information			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 20	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 20	Yes	n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences	pg 20	Yes		n/a	n/a
Flooding from Rivers or Sea without Defences	pg 20	Yes		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 20	1	12	27	52
Water Framework Directive - Catchment	pg 30	Yes		Yes	
Water Framework Directive - Groundwater	pg 31	Yes			
Water Framework Directive - Surface Waters	pg 31	Yes			Yes

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	pg 32		1		2
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)	pg 32				1
Licensed Waste Management Facilities (Locations)	pg 32		3	3	10
Local Authority Landfill Coverage		1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites	pg 36				3
Potentially Infilled Land (Non-Water)	pg 37		3	1	1
Potentially Infilled Land (Water)	pg 37				2
Registered Landfill Sites	pg 37			1	3
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites	pg 40			1	
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 41	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 41	Yes	Yes	Yes	Yes
BGS Recorded Mineral Sites	pg 44		12	18	18
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas	pg 52	Yes	n/a	n/a	n/a
Mining Instability	pg 52	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 52	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 52	Yes	Yes	n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 53	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 53	Yes	Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 53	Yes	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
Industrial Land Use					
Contemporary Trade Directory Entries	pg 54		10	8	2
Fuel Station Entries					
Points of Interest - Commercial Services	pg 55		1	1	2
Points of Interest - Education and Health					
Points of Interest - Manufacturing and Production	pg 56		7	4	10
Points of Interest - Public Infrastructure	pg 57		1	1	5
Points of Interest - Recreational and Environmental					
Underground Electrical Cables					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland	pg 59				1
Areas of Adopted Green Belt	pg 59				1
Areas of Unadopted Green Belt	pg 59				1
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	pg 59	1		1	
Ramsar Sites					
Sites of Special Scientific Interest	pg 59				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 of Property Situated Below Ground Level	A13SW (SW)	0	1	422650 281150
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13SW (NW)	0	1	422672 281175
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SW (W)	0	1	422600 281150
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (SE)	0	1	422850 281100
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (SE)	10	1	422800 281050
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (NW)	79	1	422550 281400
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (E)	93	1	422950 281100
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (SE)	94	1	422950 281050
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SE (E)	143	1	423000 281100
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (E)	144	1	423000 281050
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (E)	147	1	423000 281150
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SW (NW)	234	1	422500 281550
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14SW (E)	251	1	423100 281000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SW (SW)	267	1	422400 280900
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14SW (SE)	315	1	423150 280950
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A9NW (SE)	324	1	423100 280850
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14SW (E)	343	1	423200 281100
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A9NW (SE)	370	1	423050 280750
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NW (SW)	391	1	422400 280750
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SW (N)	392	1	422672 281700
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NW (S)	407	1	422672 280650
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14SW (E)	448	1	423300 281000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NE (S)	457	1	422700 280600
1	Discharge Consents Operator: Tarmac Central Limited Property Type: Undefined Or Other Location: The Workshop Meriden Quarry, Cornets End Lane, Meriden, Warwickshire Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: Wq/72/29 Permit Version: 1 Effective Date: 23rd May 1975 Issued Date: 23rd May 1975 Revocation Date: 19th June 2001 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Land/Soakaway Receiving Water: Underground Strata Status: Revoked (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 100m	A13SE (E)	49	2	422900 281100
2	Discharge Consents Operator: Tarmac Central Limited Property Type: Undefined Or Other Location: The Office Meriden Quarry, Cornets End Lane, Meriden, Warwickshire Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: Wq/72/30 Permit Version: 1 Effective Date: 23rd May 1975 Issued Date: 23rd May 1975 Revocation Date: 19th June 2001 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Land/Soakaway Receiving Water: Underground Strata Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989 Positional Accuracy: Located by supplier to within 100m	A13SE (E)	108	2	422950 281150
3	Discharge Consents Operator: Cemex Uk Materials Ltd Property Type: MINERAL/GRAVEL EXTRACTION/QUARRYING Location: Berkswell Quarry Cornets End Lane, Meriden, Coventry, Warwickshire Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/09245/T Permit Version: 1 Effective Date: 9th April 1984 Issued Date: 9th April 1984 Revocation Date: Not Supplied Discharge Type: Trade Effluent Discharge-Site Drainage Discharge Environment: Freshwater Stream/River Receiving Water: Tributary Of The Horn Brook Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989 Positional Accuracy: Located by supplier to within 100m	A8NW (SW)	292	2	422460 280830
4	Discharge Consents Operator: Tarmac Central Limited Property Type: MINERAL/GRAVEL EXTRACTION/QUARRYING Location: Meriden Quarry, Cornets End Lane, Meriden, Warwickshire Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/07079/T Permit Version: 1 Effective Date: 26th July 1983 Issued Date: 26th July 1983 Revocation Date: 11th December 2003 Discharge Type: Trade Effluent Discharge-Site Drainage Discharge Environment: Freshwater Stream/River Receiving Water: Horn Brook Status: Revoked (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 100m	A14NW (E)	316	2	423120 281320

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
5	Discharge Consents Operator: Nrs Saredon Aggregates Limited Property Type: MINERAL/GRAVEL EXTRACTION/QUARRYING Location: Meriden Quarry, Cornets End Lane, Meriden, Warwickshire Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/35904/T Permit Version: 1 Effective Date: 12th December 2003 Issued Date: 12th December 2003 Revocation Date: Not Supplied Discharge Type: Trade Discharge - Process Water Discharge: Freshwater Stream/River Environment: Receiving Water: Horn Brook Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	426	2	423180 281440
6	Discharge Consents Operator: N.R.S. Waste Management Services Limited Property Type: MINERAL/GRAVEL EXTRACTION/QUARRYING Location: Meriden Quarry, Cornets End Lane, Meriden, Warwickshire Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/35387/T Permit Version: 1 Effective Date: 8th September 1999 Issued Date: 8th September 1999 Revocation Date: Not Supplied Discharge Type: Trade Discharge - Mineral Workings Discharge: Freshwater Stream/River Environment: Receiving Water: Trib Of Horn Brook Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A14NW (E)	544	2	423350 281350
7	Discharge Consents Operator: D L Williams Property Type: DOMESTIC PROPERTY (SINGLE) (INCL FARM HOUSE) Location: Mercote Mill Farm, Kenilworth Road, Hampton In Arden, Solihull, O Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/03274/S Permit Version: 1 Effective Date: 12th July 1972 Issued Date: 12th July 1972 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: River Blythe (Trib) Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989 Positional Accuracy: Located by supplier to within 100m	A8SW (S)	562	2	422600 280500
8	Discharge Consents Operator: J Dawson Property Type: DOMESTIC PROPERTY (SINGLE) (INCL FARM HOUSE) Location: Cornets End Farm, Cornets End Lane, Meriden, Warwickshire Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/03275/S Permit Version: 1 Effective Date: 12th July 1972 Issued Date: 12th July 1972 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: River Blythe (Trib) Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989 Positional Accuracy: Located by supplier to within 100m	A14SE (E)	567	2	423400 280900

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	Discharge Consents Operator: Nrs Saredon Aggregates Limited Property Type: MINERAL/GRAVEL EXTRACTION/QUARRYING Location: Meriden Quarry Cornets End Lane, Meriden, Warwickshire, Warwickshire, Cv7 7lg Authority: Environment Agency, Midlands Region Catchment Area: Not Supplied Reference: Epreb3996nt Permit Version: 1 Effective Date: 12th October 2016 Issued Date: 12th October 2016 Revocation Date: Not Supplied Discharge Type: Trade Discharge - Mineral Workings Discharge: Freshwater Stream/River Environment: Receiving Water: Horn Brook Status: New issued under EPR 2010 Positional Accuracy: Located by supplier to within 10m	A19SW (NE)	652	2	423280 281670
10	Discharge Consents Operator: G A Chattaway Property Type: Not Given Location: Meriden Mill Farmhouse, STONEBRIDGE, Warwickshire Authority: Environment Agency, Midlands Region Catchment Area: Not Given Reference: 3/28/11/2458/1 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: 14th November 1973 Revocation Date: Not Supplied Discharge Type: Sewage Effluent Discharge: Groundwater Environment: Receiving Water: Not Supplied Status: Not Given Positional Accuracy: Located by supplier to within 100m	A17SW (NW)	721	2	422000 281800
11	Discharge Consents Operator: E J Seckington Property Type: Not Given Location: Mouldings Green Farm, Kenilworth-Stonebridge Road, HAMPTON IN ARDEN Authority: Environment Agency, Midlands Region Catchment Area: Not Given Reference: T/11/02762/S/1 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: 15th July 1970 Revocation Date: Not Supplied Discharge Type: Sewage Treatment Works - Final Effluent Discharge: Freshwater Stream/River Environment: Receiving Water: River Blythe Status: Not Given Positional Accuracy: Located by supplier to within 100m	A17NW (NW)	873	2	422000 282000
12	Discharge Consents Operator: M T Davies Property Type: Not Given Location: Cornets End Cottage, Cornets End Lane, MERIDEN, Warwickshire Authority: Environment Agency, Midlands Region Catchment Area: Not Given Reference: T/11/03273/S/1 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: 12th July 1972 Revocation Date: Not Supplied Discharge Type: Sewage Treatment Works - Final Effluent Discharge: Freshwater Stream/River Environment: Receiving Water: River Blythe Status: Not Given Positional Accuracy: Located by supplier to within 100m	A9NE (SE)	876	2	423600 280600

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
13	Discharge Consents Operator: W D C Jones Property Type: DOMESTIC PROPERTY (SINGLE) (INCL FARM HOUSE) Location: Mouldings Green Farm Stonebridge, Hampton In Arden, Solihull, Warwickshire Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: 3/28/11/2049 Permit Version: 1 Effective Date: 26th June 1972 Issued Date: 26th June 1972 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Land/Soakaway Environment: Receiving Water: Underground Strata Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989 Positional Accuracy: Located by supplier to within 100m	A17NW (NW)	936	2	421900 282000
14	Discharge Consents Operator: Severn Trent Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Meriden Sewage Treatment Works Hampton Lane, Meriden, Coventry, West Midlands, Cv7 7jr Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/36164/R Permit Version: 7 Effective Date: 31st March 2025 Issued Date: 20th December 2024 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Tributary Of River Blythe Status: Varied under EPR 2010 Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	963	2	423605 281768
14	Discharge Consents Operator: Severn Trent Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Meriden Sewage Treatment Works Hampton Lane, Meriden, Coventry, West Midlands, Cv7 7jr Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/36164/R Permit Version: 6 Effective Date: 22nd December 2022 Issued Date: 19th December 2022 Revocation Date: 30th March 2025 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Tributary Of River Blythe Status: Varied under EPR 2010 Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	963	2	423605 281768
14	Discharge Consents Operator: Severn Trent Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Meriden Sewage Treatment Works Hampton Lane, Meriden, Coventry, West Midlands, Cv7 7jr Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/36164/R Permit Version: 4 Effective Date: 31st March 2010 Issued Date: 24th March 2010 Revocation Date: 9th April 2014 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Horn Brook Status: Modified (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	989	2	423650 281750

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
14	Discharge Consents Operator: Severn Trent Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Meriden Sewage Treatment Works Hampton Lane, Meriden, Coventry, West Midlands, Cv7 7jr Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/36164/R Permit Version: 3 Effective Date: 1st January 2010 Issued Date: 14th October 2008 Revocation Date: 30th March 2010 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Horn Brook Status: Modified (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	989	2	423650 281750
14	Discharge Consents Operator: Severn Trent Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Meriden Sewage Treatment Works Hampton Lane, Meriden, Coventry, West Midlands, Cv7 7jr Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/36164/R Permit Version: 1 Effective Date: 28th October 2005 Issued Date: 28th October 2005 Revocation Date: 30th December 2005 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Horn Brook Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	989	2	423650 281750
14	Discharge Consents Operator: Severn Trent Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Meriden Sewage Treatment Works Hampton Lane, Meriden, Coventry, West Midlands, Cv7 7jr Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/36164/R Permit Version: 2 Effective Date: 31st December 2005 Issued Date: 28th October 2005 Revocation Date: 31st December 2009 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Horn Brook Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	989	2	423650 281750
14	Discharge Consents Operator: Severn Trent Water Limited Property Type: Sewage Disposal Works - Water Company Location: Meriden Sewage Treatment Works Hampton Lane, Hampton Lane, Meriden, Coventry, Cv7 7jr Authority: Environment Agency, Midlands Region Catchment Area: Upper Trent Catchment Reference: T/11/36164/R Permit Version: 2 Effective Date: 31st December 2005 Issued Date: 28th October 2005 Revocation Date: Not Supplied Discharge Type: Discharge Of Other Matter-Crude Effluent Discharge: Freshwater Stream/River Environment: Receiving Water: Horn Brook Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	989	2	423650 281750

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
14	Discharge Consents Operator: Severn Trent Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Meriden Sewage Treatment Works Hampton Lane, Meriden, Coventry, West Midlands, Cv7 7jr Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/35533/R Permit Version: 1 Effective Date: 9th April 2001 Issued Date: 9th April 2001 Revocation Date: 27th October 2005 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Horn Brook Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	989	2	423650 281750
14	Discharge Consents Operator: Severn Trent Water Limited Property Type: Sewage Disposal Works - Water Company Location: Meriden Sewage Treatment Works Hampton Lane, Hampton Lane, Meriden, Coventry, Cv7 7jr Authority: Environment Agency, Midlands Region Catchment Area: Upper Trent Catchment Reference: T/11/35533/R Permit Version: 2 Effective Date: 31st December 2005 Issued Date: 9th April 2001 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Horn Brook Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	989	2	423650 281750
14	Discharge Consents Operator: Severn Trent Water Limited Property Type: Sewage Disposal Works - Water Company Location: Meriden Sewage Treatment Works Hampton Lane, Hampton Lane, Meriden, Coventry, Cv7 7jr Authority: Environment Agency, Midlands Region Catchment Area: Upper Trent Catchment Reference: T/11/35533/R Permit Version: 2 Effective Date: 31st December 2005 Issued Date: 9th April 2001 Revocation Date: Not Supplied Discharge Type: Discharge Of Other Matter-Crude Effluent Discharge: Freshwater Stream/River Environment: Receiving Water: Horn Brook Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	989	2	423650 281750
14	Discharge Consents Operator: Severn Trent Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Meriden Sewage Treatment Works Hampton Lane, Meriden, Coventry, West Midlands, Cv7 7jr Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/35076/R Permit Version: 1 Effective Date: 29th July 1997 Issued Date: 29th July 1997 Revocation Date: 8th April 2001 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Horn Brook Status: Post National Rivers Authority Legislation where issue date > 31/08/1989 Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	989	2	423650 281750

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
14	Discharge Consents Operator: Severn Trent Water Authority Property Type: Not Given Location: Authority: Environment Agency, Midlands Region Catchment Area: Not Given Reference: T/11/08729/R/1 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: 26th September 1981 Revocation Date: Not Supplied Discharge Type: Sewage Effluent Discharge-Treated Effluent Discharge: Freshwater Stream/River Environment: Receiving Water: Meriden Brook(Blythe) Status: Not Given Positional Accuracy: Located by supplier to within 100m	A19SE (NE)	989	2	423650 281750
14	Discharge Consents Operator: Severn Trent Water Limited Property Type: Sewage Disposal Works - Water Company Location: Meriden Sewage Treatment Works Hampton Lane, Hampton Lane, Meriden, Coventry, Cv7 7jr Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/35076/R Permit Version: 1 Effective Date: 29th July 1997 Issued Date: 29th July 1997 Revocation Date: 8th April 2001 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Horn Brook Status: Post National Rivers Authority Legislation where issue date > 31/08/1989 Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	990	2	423650 281751
14	Discharge Consents Operator: Severn Trent Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Meriden Sewage Treatment Works Hampton Lane, Meriden, Coventry, West Midlands, Cv7 7jr Authority: Environment Agency, Midlands Region Catchment Area: Upper Blythe To Confluence With Cole Reference: T/11/36164/R Permit Version: 5 Effective Date: 10th April 2014 Issued Date: 10th April 2014 Revocation Date: 21st December 2022 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Horn Brook Status: Varied under EPR 2010 Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	999	2	423650 281768

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
15	Integrated Pollution Prevention And Control Name: Nrs Environmental Services Ltd Location: Cornets End Recycling Facility Epr/Hb3802hf, Cornets End Recycling Facility, Cornets End Recycling Facility Epr/Hb3802hf, Meriden,,, Coventry, CV7 7LH Authority: Environment Agency, Midlands Region Permit Reference: HB3802HF Original Permit Ref: Hb3802hf Effective Date: 18th October 2024 Status: Effective Application Type: Transfer App. Sub Type: Not Supplied Positional Accuracy: Manually positioned to the address or location Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N Activity Code: 5.3 A(1) a) (vi) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING RECYCLING OR RECLAMATION OF INORGANIC MATERIALS OTHER THAN METALS OR METAL COMPOUNDS Primary Activity: N Activity Code: 5.3 A(1) a) (vi) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING RECYCLING OR RECLAMATION OF INORGANIC MATERIALS OTHER THAN METALS OR METAL COMPOUNDS Primary Activity: Y	A13SE (E)	139	2	422992 281101
16	Integrated Pollution Prevention And Control Name: Tarmac Trading Limited Location: Meriden, Tarmac Meriden Quarry, Meriden, Cornetts End Lane,,, Meriden, CV7 7LG Authority: Environment Agency, Midlands Region Permit Reference: HP3129LY Original Permit Ref: Hp3129ly Effective Date: 13th February 2025 Status: Effective Application Type: New App. Sub Type: Not Supplied Positional Accuracy: Located by supplier to within 100m Activity Code: AR2 Activity Description: MCP Primary Activity: N Activity Code: AR1 Activity Description: MCP Primary Activity: Y	A13SE (E)	163	2	423002 281175
17	Integrated Pollution Prevention And Control Name: Berkswell Recycling Limited Location: Berkswell Quarry Epr/Vp3032wg, Berkswell Quarry, Cornets End Lane, Meriden,, West Midlands, CV7 7LH Authority: Environment Agency, Midlands Region Permit Reference: VP3032WG Original Permit Ref: Vp3032wg Effective Date: 14th June 2016 Status: Superseded By Variation Application Type: Application App. Sub Type: New Positional Accuracy: Automatically positioned to the address Activity Code: 5.4 A(1) (a) (ii) Activity Description: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y	A13SW (SW)	225	2	422435 280926

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
18	Integrated Pollution Prevention And Control Name: Astwood Energy Limited Location: Meridian Waste Water Treatment Facility Epr/Zp3237yl, Meriden Quarry, Meridian Waste Water Treatment Facility Epr/Zp3237yl, Cornets End Lane, Solihull, CV7 7LG Authority: Environment Agency, Midlands Region Permit Reference: ZP3237YL Original Permit Ref: Zp3237yl Effective Date: 18th December 2021 Status: Surrendered Application Type: Surrender App. Sub Type: Not Supplied Positional Accuracy: Located by supplier to within 10m Activity Code: 5.4 A(1) (a) (ii) Activity Description: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y Activity Code: 0.0 Associated Process Activity Description: Directly Associated Activity (Included) Primary Activity: N	A14SW (E)	227	2	423080 281110
18	Integrated Pollution Prevention And Control Name: Astwood Energy Limited Location: Meridian Waste Water Treatment Facility Epr/Zp3237yl, Meriden Quarry, Cornets End Lane,, Solihull, CV7 7LG Authority: Environment Agency, Midlands Region Permit Reference: TP3104SM Original Permit Ref: Zp3237yl Effective Date: 18th December 2021 Status: Surrender Effective Application Type: Surrender App. Sub Type: Whole Positional Accuracy: Located by supplier to within 10m Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 5.4 A(1) (a) (ii) Activity Description: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y	A14SW (E)	227	2	423080 281110
18	Integrated Pollution Prevention And Control Name: Rebellion Biomass Llp Location: Meriden Biomass Energy Facility - Epr/Cp3735rl, Meriden Quarry, Meriden Biomass Energy Facility - Epr/Cp3735rl, Comets End Lane, Coventry, West Northamptonshire, CV7 7LG Authority: Environment Agency, Midlands Region Permit Reference: CP3735RL Original Permit Ref: Cp3735rl Effective Date: 2nd December 2021 Status: Revoked Application Type: New App. Sub Type: Not Supplied Positional Accuracy: Located by supplier to within 10m Activity Code: 5.1 A(1) (B) Activity Description: Any Activity For The Polymerisation Or Co-Polymerisation Of Any Pre-Formulated Resin Or Pre-Formulated Gel Coat Which Contains Any Unsaturated Hydrocarbon, Where The Activity Is Likely To Involve, In Primary Activity: Y	A14SW (E)	227	2	423080 281110
19	Integrated Pollution Prevention And Control Name: Berkswell Recycling Limited Location: Berkswell Quarry Epr/Vp3032wg, Berkswell Quarry, Cornets End Lane, Meriden,, West Midlands, CV7 7LH Authority: Environment Agency, Midlands Region Permit Reference: PP3002LF Original Permit Ref: Vp3032wg Effective Date: 30th November 2021 Status: Effective Application Type: Variation App. Sub Type: Standard Positional Accuracy: Located by supplier to within 10m Activity Code: 5.4 A(1) b) (i) Activity Description: RECOVERY OR A MIX OF RECOVERY AND DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING BIOLOGICAL TREATMENT Primary Activity: Y	A8NE (S)	526	2	422890 280540

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
19	Integrated Pollution Prevention And Control Name: Berkswell Recycling Limited Location: Berkswell Quarry Epr/Db3508ma, Berkswell Quarry, Berkswell Quarry Epr/Db3508ma, Cornets End Lane, Meriden,, Coventry, West Midlands, CV7 7LH Authority: Environment Agency, Midlands Region Permit Reference: DB3508MA Original Permit Ref: Vp3032wg Effective Date: 30th November 2021 Status: Effective Application Type: Variation (Administrative) App. Sub Type: Not Supplied Positional Accuracy: Located by supplier to within 10m Activity Code: 5.4 A(1) b) (i) Activity Description: RECOVERY OR A MIX OF RECOVERY AND DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING BIOLOGICAL TREATMENT Primary Activity: Y	A8NE (S)	526	2	422890 280540
20	Local Authority Pollution Prevention and Controls Name: Tarmac Lafarge Location: Cornets End Lane, Solihull, Coventry, West Midlands, Cv7 7lh Authority: Solihull Metropolitan Borough Council, Environmental Health Department Permit Reference: Not Supplied Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG3/1Blending, packing, loading and use of bulk cement Status: Permitted Positional Accuracy: Manually positioned to the road within the address or location	A13SE (SE)	8	3	422831 281056
20	Local Authority Pollution Prevention and Controls Name: Hope Rmc Ltd Location: Cornets End Lane, Solihull, Coventry, West Midlands, Cv7 7lh Authority: Solihull Metropolitan Borough Council, Environmental Health Department Permit Reference: Not Supplied Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG3/1Blending, packing, loading and use of bulk cement Status: Permitted Positional Accuracy: Manually positioned to the road within the address or location	A13SE (SE)	8	3	422831 281056
21	Local Authority Pollution Prevention and Controls Name: Cemex Uk Operations Ltd Location: Cornets End Lane, Meriden, COVENTRY, West Midlands, CV7 7LH Authority: Solihull Metropolitan Borough Council, Environmental Health Department Permit Reference: ME021/9999/2/000 Dated: 17th September 1993 Process Type: Local Authority Air Pollution Control Description: PG3/1Blending, packing, loading and use of bulk cement Status: Authorised Positional Accuracy: Located by supplier to within 100m	A13SW (SW)	229	3	422450 280910
22	Local Authority Pollution Prevention and Controls Name: Tarmac Building Products Location: Cornets End Lane, Meriden, COVENTRY, West Midlands, CV7 7LG Authority: Solihull Metropolitan Borough Council, Environmental Health Department Permit Reference: Me021/9999/2a Dated: 24th September 1993 Process Type: Local Authority Air Pollution Control Description: PG3/1Blending, packing, loading and use of bulk cement Status: Authorised Positional Accuracy: Manually positioned to the address or location	A14NW (E)	295	3	423123 281244
	Nearest Surface Water Feature	A13NW (NW)	8	-	422541 281317
23	Pollution Incidents to Controlled Waters Property Type: Aggregate (Sand/Gravel) Location: Meriden Mill Farm, HAMPTON IN ARDEN Authority: Environment Agency, Midlands Region Pollutant: Miscellaneous - Inert Suspended Solids Note: Horn Brook; Discharge From Quarry Polluting Stream; Other Adverse Effects Incident Date: 16th August 1997 Incident Reference: 2002485 Catchment Area: Trent Catchment : Upper Blythe To Confluence With Cole Receiving Water: Watercourse Cause of Incident: Poor/Inadequate Maintenance Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A12NW (NW)	640	2	421900 281500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
24	Pollution Incidents to Controlled Waters Property Type: Miscellaneous Premises: Other Location: Meriden Mill Farm Authority: Environment Agency, Midlands Region Pollutant: Miscellaneous - Inert Suspended Solids Note: Horn Brook; High Turbidity Poss Quarry Discharge; SSSI Affected; Amenity Affected Incident Date: 22nd August 1995 Incident Reference: 1700259 Catchment Area: Trent Catchment : Upper Blythe To Confluence With Cole Receiving Water: Watercourse Cause of Incident: Miscellaneous/Other Pollution Type Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A17SW (NW)	688	2	421920 281650
24	Pollution Incidents to Controlled Waters Property Type: Miscellaneous Premises: Unknown Location: Meriden Mill Farm Authority: Environment Agency, Midlands Region Pollutant: Miscellaneous - Inert Suspended Solids Note: Quarry Discharge Bright Red; SSSI Affected; Amenity Affected Incident Date: 22nd January 1996 Incident Reference: 2700424 Catchment Area: Trent Catchment : Upper Blythe To Confluence With Cole Receiving Water: Watercourse Cause of Incident: Other Incident/Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A17SW (NW)	690	2	421900 281620
25	Pollution Incidents to Controlled Waters Property Type: Miscellaneous Premises: Unknown Location: Hill Farm, MERIDEN Authority: Environment Agency, Midlands Region Pollutant: Miscellaneous - Inert Suspended Solids Note: Amenity Affected; Horne Brook; Illegal Discharge To Brook Incident Date: 14th June 1996 Incident Reference: 2000850 Catchment Area: Trent Catchment : Upper Blythe To Confluence With Cole Receiving Water: Watercourse Cause of Incident: Other Incident/Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A17SW (NW)	732	2	421900 281700
26	Water Abstractions Operator: Cemex Uk Materials Limited Licence Number: 03/28/11/0132 Permit Version: 104 Location: Berkswell Quarry, Meriden - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Berkswell Quarry Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 21st December 2018 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	257	2	422460 280870
26	Water Abstractions Operator: Cemex Uk Materials Limited Licence Number: 03/28/11/0133 Permit Version: 103 Location: Berkswell Quarry, Meriden - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Process water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Berkswell Quarry, Solihull Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 21st December 2018 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	257	2	422460 280870

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
26	Water Abstractions Operator: Cemex Uk Materials Limited Licence Number: 03/28/11/0133 Permit Version: 102 Location: Berkswell Quarry, Meriden - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Process water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Berkswell Quarry, Solihull Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 1st April 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	257	2	422460 280870
26	Water Abstractions Operator: Cemex Uk Materials Limited Licence Number: 03/28/11/0132 Permit Version: 103 Location: Berkswell Quarry, Meriden - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Berkswell Quarry Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 1st March 2005 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	257	2	422460 280870
26	Water Abstractions Operator: Rmc Aggregates (Western) Limited Licence Number: 03/28/11/0132 Permit Version: 101 Location: Berkswell Quarry, Meriden - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Berkswell Quarry Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 29th April 1999 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	257	2	422460 280870
26	Water Abstractions Operator: Rmc Aggregates (Western) Limited Licence Number: 03/28/11/0133 Permit Version: 101 Location: Berkswell Quarry, Meriden - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Process water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Berkswell Quarry, Solihull Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 29th April 1999 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	257	2	422460 280870

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
26	Water Abstractions Operator: Western Aggregates Ltd Licence Number: 03/28/11/0133 Permit Version: 100 Location: Berkswell Quarry, Meriden - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Process water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Berkswell Quarry, Solihull Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 16th June 1993 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	257	2	422460 280870
26	Water Abstractions Operator: Western Aggregates Ltd Licence Number: 03/28/11/0132 Permit Version: 100 Location: Berkswell Quarry, Meriden - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Berkswell Quarry Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 16th June 1993 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	257	2	422460 280870
27	Water Abstractions Operator: Cemex Uk Materials Limited Licence Number: Md/028/0011/011 Permit Version: 2 Location: Marked `Phase 2? On The Map. Authority: Environment Agency, Midlands Region Abstraction: Extractive: Dewatering 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 April Authorised End: 31 March Permit Start Date: 28th November 2024 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12SE (W)	296	2	422200 281138
28	Water Abstractions Operator: Cemex Uk Materials Limited Licence Number: Md/028/0011/011 Permit Version: 2 Location: Marked `Phase 1? On Map 1 And 2. Authority: Environment Agency, Midlands Region Abstraction: Extractive: Dewatering 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 April Authorised End: 31 March Permit Start Date: 28th November 2024 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12NE (W)	307	2	422200 281338

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
29	Water Abstractions Operator: Cemex Uk Materials Limited Licence Number: 03/28/11/0132 Permit Version: 105 Location: Berkswell Quarry, Meriden - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Berkswell Quarry Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 29th January 2025 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8NW (SW)	311	2	422410 280837
29	Water Abstractions Operator: Cemex Uk Materials Limited Licence Number: Md/028/0011/010 Permit Version: 1 Location: Lagoon At Berkswell Quarry Authority: Environment Agency, Midlands Region Abstraction: Extractive: Mineral Washing 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 April Authorised End: 31 March Permit Start Date: 28th July 2022 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8NW (SW)	311	2	422410 280837
30	Water Abstractions Operator: North Warwickshire Golf Club Ltd Licence Number: 03/28/11/0099 Permit Version: 100 Location: North Warks Golf Course - Un-Named Trib R Blythe Authority: Environment Agency, Midlands Region Abstraction: Golf Courses: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: North Warks Golf Course - Trib R Blythe Authorised Start: 01 April Authorised End: 30 September Permit Start Date: 2nd May 2006 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A18SE (NE)	355	2	422850 281580
30	Water Abstractions Operator: North Warwickshire Golf Club Ltd Licence Number: 03/28/11/0099 Permit Version: 101 Location: North Warks Golf Course - Un-Named Trib R Blythe Authority: Environment Agency, Midlands Region Abstraction: Golf Courses: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: North Warks Golf Course - Trib R Blythe Authorised Start: 01 April Authorised End: 30 September Permit Start Date: 7th February 2025 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A18SE (NE)	366	2	422863 281583

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
31	Water Abstractions Operator: Nrs Aggregates Ltd Licence Number: Md/028/0011/013 Permit Version: 1 Location: Cornets End Quarry - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Cornets End Quarry - Lagoon Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 1st April 2024 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	454	2	423230 281410
31	Water Abstractions Operator: Tarmac Trading Limited Licence Number: Md/028/0011/012 Permit Version: 2 Location: Cornets End Quarry - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Process water 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 April Authorised End: 31 March Permit Start Date: 26th August 2022 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	454	2	423230 281410
31	Water Abstractions Operator: Tarmac Trading Limited Licence Number: Md/028/0011/012 Permit Version: 1 Location: Cornets End Quarry - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: General Use (Medium Loss) 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 April Authorised End: 31 March Permit Start Date: 27th March 2019 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	454	2	423230 281410
31	Water Abstractions Operator: Tarmac Trading Limited Licence Number: 03/28/11/0123 Permit Version: 106 Location: Cornets End Quarry - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: General Use (Medium Loss) 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 April Authorised End: 31 March Permit Start Date: 4th May 2018 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	454	2	423230 281410

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
31	Water Abstractions Operator: Tarmac Trading Limited Licence Number: 03/28/11/0123 Permit Version: 106 Location: Cornets End Quarry - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Cornets End Quarry - Lagoon Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 4th May 2018 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	454	2	423230 281410
31	Water Abstractions Operator: Tarmac Trading Limited Licence Number: 03/28/11/0123 Permit Version: 105 Location: Cornets End Quarry - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Cornets End Quarry - Lagoon Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 26th October 2015 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	454	2	423230 281410
31	Water Abstractions Operator: Lafarge Tarmac Trading Limited Licence Number: 03/28/11/0123 Permit Version: 104 Location: Cornets End Quarry - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Cornets End Quarry - Lagoon Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 26th September 2013 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	454	2	423230 281410
31	Water Abstractions Operator: Tarmac Limited Licence Number: 03/28/11/0123 Permit Version: 103 Location: Cornets End Quarry - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Cornets End Quarry - Lagoon Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 1st January 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	454	2	423230 281410

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
31	Water Abstractions Operator: Tarmac Central Limited Licence Number: 03/28/11/0123 Permit Version: 102 Location: Cornets End Quarry - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Cornets End Quarry - Lagoon Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 17th February 2004 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	454	2	423230 281410
31	Water Abstractions Operator: Nash Rocks Limited Licence Number: 03/28/11/0123 Permit Version: 101 Location: Cornets End Quarry - Lagoon Authority: Environment Agency, Midlands Region Abstraction: Extractive: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Cornets End Quarry - Lagoon Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 1st July 1999 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A14NW (NE)	454	2	423230 281410
32	Water Abstractions Operator: Cemex Uk Materials Limited Licence Number: Md/028/0011/011 Permit Version: 2 Location: Area Marked 'A' Authority: Environment Agency, Midlands Region Abstraction: Extractive: Dewatering 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 April Authorised End: 31 March Permit Start Date: 28th November 2024 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8SE (S)	801	2	422753 280258
32	Water Abstractions Operator: Cemex Uk Materials Limited Licence Number: Md/028/0011/011 Permit Version: 1 Location: Berkswell Quarry, Warwickshire Authority: Environment Agency, Midlands Region Abstraction: Mineral Products: Dewatering 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 April Authorised End: 31 March Permit Start Date: 28th July 2022 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8SE (S)	801	2	422753 280258

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: R S Beaty & Sons Licence Number: 03/28/11/0103 Permit Version: 100 Location: Patricks Farm, Kenilworth Road - River Blythe Authority: Environment Agency, Midlands Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Patricks Farm Authorised Start: 01 June Authorised End: 31 August Permit Start Date: 7th March 1992 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A6NE (W)	1062	2	421500 280800
	Water Abstractions Operator: Cemex Uk Materials Limited Licence Number: Md/028/0011/011 Permit Version: 2 Location: Marked 'Phase 3? On Map 2. Authority: Environment Agency, Midlands Region Abstraction: Extractive: Dewatering 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 April Authorised End: 31 March Permit Start Date: 28th November 2024 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A4NW (SE)	1076	2	423229 280056
	Water Abstractions Operator: Mr C Barber Licence Number: 03/28/11/0139 Permit Version: 100 Location: Berryfields Farm, Meriden - Borehole Authority: Environment Agency, Midlands Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Berryfields Farm, Meriden Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 22nd December 1989 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(E)	1743	2	424550 281500
	Water Abstractions Operator: Mr C Barber Licence Number: 03/28/11/0139 Permit Version: 101 Location: Berryfields Farm, Meriden - Borehole Authority: Environment Agency, Midlands Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Berryfields Farm, Meriden Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 22nd January 2025 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(E)	1750	2	424561 281477

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: 300-550 mm/year Baseflow Index: >70% Superficial Patchiness: <90% Superficial Thickness: 3-10m Superficial Recharge: High	A13SW (NW)	0	2	422672 281175
	Groundwater Vulnerability - Soluble Rock Risk None				
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - B	A13SW (NW)	0	2	422672 281175
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13SW (NW)	0	2	422672 281175
	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	A13NW (NW)	0	2	422645 281230
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13NW (NW)	0	2	422605 281265
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
33	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 599.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A13NE (NE)	0	4	422695 281192
34	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: Trent Primacy: 1	A13NW (NW)	8	4	422541 281317
35	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 128.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A13NW (NW)	33	4	422510 281322
36	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 146.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A13NW (NW)	34	4	422520 281338

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
37	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 13.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A13NW (NW)	97	4	422413 281323
38	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 332.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A13NW (NW)	108	4	422400 281320
39	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 47.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A13NW (N)	127	4	422598 281439
40	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 60.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A13SW (S)	147	4	422590 280934
41	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 1.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A13SW (SW)	162	4	422530 280941
42	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 161.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A13SW (SW)	163	4	422528 280941
43	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 210.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A13NW (N)	167	4	422636 281466
44	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: Trent Primacy: 1	A14NW (E)	204	4	423035 281220
45	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 433.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A14NW (E)	230	4	423059 281232

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
46	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 139.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12NE (W)	272	4	422225 281223
47	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 5.9 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SE (W)	282	4	422219 281112
48	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 8.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SE (W)	286	4	422214 281115
49	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 33.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A13SW (SW)	289	4	422388 280882
50	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 9.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A13SW (SW)	291	4	422361 280900
51	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 194.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A13SW (SW)	291	4	422354 280905
52	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 6.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SE (W)	291	4	422207 281124
53	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 14.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SE (W)	293	4	422206 281118
54	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 108.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 2	A12SE (W)	302	4	422200 281107

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
55	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 2.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A18SE (N)	306	4	422795 281558
56	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 12.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SE (W)	307	4	422192 281120
57	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 74.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A18SE (N)	308	4	422797 281558
58	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 18.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12NE (W)	309	4	422189 281227
59	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 96.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SE (W)	310	4	422195 281093
60	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 18.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SE (W)	315	4	422182 281127
61	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 32.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SE (W)	317	4	422179 281145
62	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 76.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12NE (W)	321	4	422175 281215
63	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 29.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SE (W)	323	4	422177 281109

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
64	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 6.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SE (W)	332	4	422201 281017
65	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 41.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SE (W)	345	4	422150 281148
66	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 478.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A18SE (NE)	370	4	422867 281585
67	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 30.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SE (W)	374	4	422124 281122
68	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 172.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A8NE (S)	376	4	422768 280684
69	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: Trent Primacy: 1	A12SE (W)	400	4	422096 281134
70	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 244.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 2	A12SE (W)	470	4	422040 281053
71	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: Trent Primacy: 1	A12SE (W)	475	4	422023 281111
72	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 63.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SE (W)	482	4	422017 281109

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
73	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 5.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SW (W)	517	4	421977 281156
74	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 250.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12SW (W)	520	4	421975 281161
75	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 4.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12NW (W)	541	4	421965 281349
76	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 193.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12NW (W)	545	4	421961 281351
77	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 193.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A19SW (NE)	568	4	423090 281704
78	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 77.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 2	A12SW (W)	602	4	421956 280901
79	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 11.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 2	A12SW (W)	602	4	421957 280900
80	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 1.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 2	A12SW (W)	602	4	421956 280901
81	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 22.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 2	A12SW (W)	605	4	421960 280889

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
82	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 6.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 2	A12SW (SW)	616	4	421959 280866
83	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 5.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 2	A12SW (SW)	622	4	421955 280862
84	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 18.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A12NW (NW)	656	4	421892 281526
85	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 297.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A14NE (E)	660	4	423490 281278
86	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 314.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A17SW (NW)	665	4	421890 281544
87	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 76.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 2	A12SW (W)	677	4	421889 280869
88	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: Trent Primacy: 1	A19SW (NE)	702	4	423334 281686
89	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 9.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A19SW (NE)	704	4	423337 281686
90	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 269.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A19SW (NE)	712	4	423347 281688

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
91	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 123.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 2	A12SW (W)	747	4	421814 280863
92	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 143.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: River Blythe Catchment Name: Trent Primacy: 1	A17SW (NW)	749	4	421970 281810
93	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 297.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: River Blythe Catchment Name: Trent Primacy: 1	A17SW (NW)	749	4	421972 281813
94	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 938.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A7SE (SW)	770	4	422162 280451
95	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 34.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A18NW (N)	807	4	422360 282105
96	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 11.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A17SW (NW)	809	4	421843 281752
97	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 155.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: River Blythe Catchment Name: Trent Primacy: 1	A17SW (NW)	811	4	421844 281757
98	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 64.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A17NE (N)	830	4	422330 282122
99	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 5.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A17NE (NW)	836	4	422268 282108

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
100	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 121.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A17NE (NW)	837	4	422263 282107
101	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 862.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A8SW (S)	848	4	422468 280235
102	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 17.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 2	A7NW (W)	861	4	421712 280812
103	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: Trent Primacy: 1	A17SW (NW)	877	4	421745 281726
104	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 740.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: River Blythe Catchment Name: Trent Primacy: 1	A17SW (NW)	877	4	421745 281726
105	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 1.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 2	A7NW (W)	878	4	421696 280807
106	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 32.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A7NW (W)	879	4	421695 280807
107	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 158.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A7NW (W)	879	4	421695 280807
108	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 49.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A17NE (NW)	884	4	422185 282126

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
109	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 87.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A17NE (NW)	889	4	422131 282105
110	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 3.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A17NE (NW)	889	4	422137 282109
111	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 6.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A17NE (NW)	889	4	422137 282109
112	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 250.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A15SW (E)	893	4	423742 281186
113	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 9.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A17NE (NW)	914	4	422052 282089
114	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 25.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: River Blythe Catchment Name: Trent Primacy: 1	A17NE (NW)	923	4	422044 282093
115	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 489.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: River Blythe Catchment Name: Trent Primacy: 1	A11SE (W)	936	4	421559 281143
116	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 156.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 2	A17NE (NW)	941	4	422049 282118
117	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 400.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: River Blythe Catchment Name: Trent Primacy: 1	A17NE (NW)	941	4	422049 282118

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
118	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 1060.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A3NW (S)	946	4	422341 280171
119	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 166.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A16SE (NW)	949	4	421649 281699
120	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 145.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A19SE (NE)	956	4	423630 281720
121	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 6.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A19SE (NE)	958	4	423600 281766
122	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 84.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: River Blythe Catchment Name: Trent Primacy: 1	A11NE (W)	997	4	421506 281326
123	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 295.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: River Blythe Catchment Name: Trent Primacy: 1	A11NE (W)	997	4	421506 281326
124	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 285.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Trent Primacy: 1	A2NE (SW)	1000	4	422203 280170
	Water Framework Directive - Catchment Class Code: River Catchment WaterBody Name: Blythe from Patrick Bridge to R Tame WaterBody ID: GB104028042572 Operational Catchment: Blythe Rivers Management: Tame Anker and Mease Catchment: Tame, Anker & Mease Catchment Name: Tame, Anker & Mease	A13SW (NW)	0	2	422672 281175
	Water Framework Directive - Catchment Class Code: River Catchment WaterBody Name: Blythe from Temple Balsall Brook to Patrick Bridge WaterBody ID: GB104028042571 Operational Catchment: Blythe Rivers Management: Tame Anker and Mease Catchment: Tame, Anker & Mease Catchment Name: Tame, Anker & Mease	A12SE (W)	489	2	422040 280990

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Framework Directive - Groundwater Waterbody Name: Tame Anker Mease - Secondary Combined Waterbody ID: GB40402G990800 URL Address: https://environment.data.gov.uk/catchment-planning/WaterBody/GB40402G990800 Overall Rating: Good Chemical Rating: Good Quantitative Measure: Good Year: 2019	A13SW (NW)	0	2	422672 281175
	Water Framework Directive - Surface Waters Class Code: River Waterbody Name: Blythe From Patrick Bridge To R Tame Waterbody ID: GB104028042572 URL Address: Not Supplied Overall Rating: Not Assessed Chemical Rating: Not Assessed Classification Year: 2022	A13NW (NW)	0	2	422552 281319
	Water Framework Directive - Surface Waters Class Code: River Waterbody Name: Blythe From Temple Balsall Brook To Patrick Bridge Waterbody ID: GB104028042571 URL Address: Not Supplied Overall Rating: Not Assessed Chemical Rating: Not Assessed Classification Year: 2022	A11SE (W)	936	2	421559 281137

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
125	Historical Landfill Sites Licence Holder: Tilling Construction Services Limited Location: Cornets End Lane, Meriden, West Midlands Name: Meriden Quarry Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD23762 First Input Date: 1st January 1962 Last Input Date: 31st July 1992 Specified Waste Type: Deposited Waste included Inert, Industrial, Commercial, Household and Special Waste, and Liquid Sludge EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 4600/0076 BGS Ref: Not Supplied Other Ref: 644/205, SL/286, 4600/0512	A13NE (E)	7	2	422842 281192
126	Historical Landfill Sites Licence Holder: Caires and Packison Limited Location: Somers Lane, Meriden, Solihull, West Midlands Name: Somer Lane Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD23761 First Input Date: 31st December 1984 Last Input Date: 29th June 1993 Specified Waste Type: Deposited Waste included Inert and Household Waste EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 4600/0202 BGS Ref: Not Supplied Other Ref: SL/456, 644/779	A18SW (N)	527	2	422485 281849
127	Historical Landfill Sites Licence Holder: Packington Estate Enterprises Limited Location: Somers Road, Meriden, Warwickshire Name: The Somers Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD23547 First Input Date: 31st December 1983 Last Input Date: 1st June 1993 Specified Waste Type: Deposited Waste included Inert Waste EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 3700/0303 BGS Ref: Not Supplied Other Ref: WDL/303, 644/2104	A18NW (N)	826	2	422458 282145
128	Licensed Waste Management Facilities (Landfill Boundaries) Name: Meriden Quarry Landfill Site Area G Licence Number: 402326 Location: N. R. S. WASTE MANAGEMENT SERVICES LIMITED, Meriden Quarry Landfill Site Area G, Birmingham Road, Meriden, Solihull, West Midlands, CV7 7JT Licence Holder: N. R. S. Waste Management Services Limited Authority: Environment Agency - Midlands Region, Central Area Site Category: Inert LF Max Input Rate: Not Supplied Licence Status: Issued Issued: 24th November 2015 Positional Accuracy: Positioned by the supplier Boundary Accuracy: As Supplied	A18NE (N)	734	2	422873 281991
129	Licensed Waste Management Facilities (Locations) Licence Number: 120088 Location: Berkswell Quarry, Cornets End Lane, Meriden, Coventry, West Midlands, CV7 7LH Operator Name: CEMEX UK MATERIALS LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Not Supplied Licence Status: Issued Issued: 24th March 2025 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13SE (SE)	186	2	422920 280890

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
130	Licensed Waste Management Facilities (Locations) Licence Number: 408235 Location: Cornets End Lane, Meriden, CV7 7LG Operator Name: BIFFA WASTE SERVICES LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Household, Commercial And Industrial Transfer Stations Licence Status: Issued Issued: 12th July 2023 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14SW (E)	191	2	423044 281103
131	Licensed Waste Management Facilities (Locations) Licence Number: 42811 Location: Cornets End Recycling Facility, Meriden, Coventry, CV7 7LH Operator Name: NRS Environmental Services Ltd Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Metal Recycling Sites (Mixed) Licence Status: Issued Issued: 25th November 2024 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Manually positioned within the geographical locality	A13SW (SW)	216	2	422474 280909
132	Licensed Waste Management Facilities (Locations) Licence Number: 102753 Location: Berkswell Quarry, Cornets Ends Lane, Meriden, Coventry, West Midlands, CV7 7LH Operator Name: CEMEX UK MATERIALS LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Management of inert or extractive waste at mine Licence Status: Issued Issued: 13th July 2011 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	A8NE (S)	257	2	422700 280800
133	Licensed Waste Management Facilities (Locations) Licence Number: 102016 Location: Meriden Quarry, Cornets End Lane, Meriden, Coventry, West Midlands, CV7 7LG Operator Name: N R S WASTE CARE LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Use of waste for reclamation etc <50,000 tps Licence Status: Surrendered Issued: 11th November 2010 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: 11th November 2010 IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14NW (E)	294	2	423121 281247

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
134	Licensed Waste Management Facilities (Locations) Licence Number: 103211 Location: Berkswell Quarry, Cornets End Lane, Meriden, Warwickshire, CV7 7LH Operator Name: CEMEX UK MATERIALS LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Use of waste in a deposit for recovery op Licence Status: Issued Issued: 24th March 2025 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8NE (SE)	312	2	422909 280758
135	Licensed Waste Management Facilities (Locations) Licence Number: 401564 Location: Berkswell Quarry, Cornets End Lane, Meriden, Warwickshire, CV7 7LH Operator Name: BERKSWELL RECYCLING LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Physical Treatment Facilities Licence Status: Issued Issued: 27th May 2015 Last Modified: 27th May 2015 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8NE (S)	520	2	422893 280547
135	Licensed Waste Management Facilities (Locations) Licence Number: 100884 Location: Berkswell Quarry, Cornets End Lane, Meriden, Coventry, West Midlands, CV7 7LH Operator Name: BERKSWELL RECYCLING LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Composting Licence Status: Issued Issued: 14th June 2016 Last Modified: 27th August 2024 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8NE (S)	526	2	422890 280540
136	Licensed Waste Management Facilities (Locations) Licence Number: 400960 Location: Meriden Quarry, Cornets End Lane, Meriden, Warwickshire, CV7 7LG Operator Name: N R S WASTE CARE LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Inert & Excavation Waste TS Licence Status: Surrendered Issued: 6th February 2014 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: 6th February 2014 IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14NE (E)	638	2	423456 281328

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
137	Licensed Waste Management Facilities (Locations) Licence Number: 400769 Location: Meriden Quarry, Cornets End Lane, Meriden, Warwickshire, CV7 7LG Operator Name: A & A RECYCLING SERVICES LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Physical Treatment Facilities Licence Status: Issued Issued: 23rd September 2013 Last Modified: 23rd September 2013 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14NE (E)	677	2	423470 281413
138	Licensed Waste Management Facilities (Locations) Licence Number: 102788 Location: Meriden Quarry, Cornets End Lane, Meriden, Warwickshire, CV7 7LG Operator Name: JUNIPER (NO.3) LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Mining Waste Operations Licence Status: Expired Issued: 17th December 2012 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	A19SE (NE)	838	2	423500 281700
138	Licensed Waste Management Facilities (Locations) Licence Number: 102788 Location: Meriden Quarry, Cornets End Lane, Meriden, Warwickshire, CV7 7LG Operator Name: JUNIPER (NO.3) LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Mining Waste Operations Licence Status: Expired Issued: 17th December 2012 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	A19SE (NE)	838	2	423500 281700
139	Licensed Waste Management Facilities (Locations) Licence Number: 102732 Location: Meriden Quarry, Cornets End Lane, Meriden, Coventry, West Midlands, CV7 7LG Operator Name: N. R. S. WASTE MANAGEMENT SERVICES LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Management of inert or extractive waste at mine Licence Status: Issued Issued: 20th May 2011 Last Modified: 20th May 2011 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A19NW (NE)	845	2	423303 281899

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
140	Licensed Waste Management Facilities (Locations) Licence Number: 104829 Location: Meriden Quarry, Cornets End Lane, Meriden, Warwickshire, CV7 7LG Operator Name: N R S WASTE CARE LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Use of waste in a deposit for recovery op Licence Status: Issued Issued: 10th March 2014 Last Modified: 10th March 2014 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	850	2	423374 281851
141	Licensed Waste Management Facilities (Locations) Licence Number: 103860 Location: Meriden Quarry, Cornets End Lane, Meriden, Warwickshire, CV7 7LG Operator Name: N R S WASTE CARE LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Use of waste in a deposit for recovery op Licence Status: Issued Issued: 11th June 2012 Last Modified: 11th June 2012 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A19NE (NE)	970	2	423439 281953
142	Licensed Waste Management Facilities (Locations) Licence Number: 104725 Location: Meriden Quarry, Cornets End Lane, Meriden, Warwickshire, CV7 7LG Operator Name: N R S WASTE CARE LIMITED Operator Location: Not Supplied Authority: Environment Agency - Midlands Region, Central Area Site Category: Use of waste in a deposit for recovery op Licence Status: Issued Issued: 2nd April 2013 Last Modified: 2nd April 2013 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A19NW (NE)	979	2	423095 282160
	Local Authority Landfill Coverage Name: Solihull Metropolitan District Council - Has supplied landfill data		0	5	422672 281175
	Local Authority Landfill Coverage Name: North Warwickshire Borough Council - Has supplied landfill data		706	6	422764 281997
	Local Authority Landfill Coverage Name: Warwickshire County Council - Had landfill data but passed it to the relevant environment agency		706	7	422764 281997
143	Local Authority Recorded Landfill Sites Location: Meriden Quarry Reference: N Authority: Solihull Metropolitan Borough Council Last Reported Status: Unknown Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate	A19SW (NE)	627	5	423309 281602
144	Local Authority Recorded Landfill Sites Location: Meriden Quarry, Cornets End Lane, Meriden, Solihull Reference: SL286 Authority: Solihull Metropolitan Borough Council Last Reported Status: Unknown Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate	A19SW (NE)	627	5	423309 281602

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
145	Local Authority Recorded Landfill Sites Location: The Somers, Great Packington Reference: Not Supplied Authority: North Warwickshire Borough Council, Environmental Health Department Last Reported Status: Unknown Types of Waste: Sewage Sludge, Contaminated Material Date of Closure: Not Supplied Positional Accuracy: Located by supplier to within 100m Boundary Quality: Not Applicable	A23SW (N)	990	6	422400 282300
146	Potentially Infilled Land (Non-Water) Bearing Ref: E Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1983	A13SE (E)	67	-	422924 281072
147	Potentially Infilled Land (Non-Water) Bearing Ref: SE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1983	A13SE (SE)	88	-	422937 281027
148	Potentially Infilled Land (Non-Water) Bearing Ref: SW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1983	A13SW (SW)	200	-	422424 280963
149	Potentially Infilled Land (Non-Water) Bearing Ref: NW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1983	A12NE (NW)	275	-	422265 281422
150	Potentially Infilled Land (Non-Water) Bearing Ref: S Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1983	A8SW (S)	793	-	422398 280313
151	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1937	A17SW (NW)	663	-	421887 281530
152	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1889	A11SE (W)	910	-	421586 281119
153	Registered Landfill Sites Licence Holder: Ready Mixed Concrete (UK) Ltd Licence Reference: SL 2012 Site Location: Berkswell Quarry, Cornets End Lane, Meriden, COVENTRY, West Midlands, CV7 7LH Licence Easting: 423300 Licence Northing: 281500 Operator Location: RMC House, High Street, FELTHAM, Middlesex, TW13 4HD Authority: Environment Agency - Midlands Region, Upper Trent Area Site Category: Landfill Max Input Rate: Undefined Waste Source: No known restriction on source of waste Restrictions: Status: Licence never issuedUnder Review Dated: Not Supplied Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Approximate location provided by supplier Boundary Accuracy: Not Applicable Authorised Waste: Licenced Wastes Not To Hand	A14NW (NE)	310	2	423079 281383

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
154	Registered Landfill Sites Licence Holder: Packington Estate Enterprises Licence Reference: SL 456 Site Location: The Somers, Somers Road, Meriden, Coventry, West Midlands Licence Easting: 422500 Licence Northing: 282000 Operator Location: Packington Hall, Meriden, COVENTRY, West Midlands, CV7 7HF Authority: Environment Agency - Midlands Region, Upper Trent Area Site Category: Landfill Max Input Rate: Undefined Waste Source: No known restriction on source of waste Restrictions: Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Dated: 1st May 1984 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Sub/Top Soil Prohibited Waste: Asbestos Poisonous, Noxious, Polluting Wastes	A18NW (N)	681	2	422500 282000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
155	Registered Landfill Sites Licence Holder: Tilling Construction Services Licence Reference: SL 286 Site Location: Meriden Quarry, Cornets End Lane, Solihull, West Midlands Licence Easting: 423500 Licence Northing: 281900 Operator Location: Conyngham Hall, KNARESBOROUGH, North Yorkshire, HG5 9AY Authority: Environment Agency - Midlands Region, Upper Trent Area Site Category: Landfill Max Input Rate: Very Large (Equal to or greater than 250,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Dated: 1st June 1980 Preceded By: Not Given Licence: Superseded By: SL 2042 Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Aluminium Asbestos Barium Compounds (Water Soluble) Borates Calcium Hydroxide Calcium Oxide Cellulose Wastes (Natural/Synth.) Construction And Demolition Wastes Contaminated Rubbish/Bags/Sacks Copper Compounds Empty Used Containers Ferrous Metal Scrap House. + Com. Baled Waste House. + Com. Pulverised Waste House. + Com. Untreated Waste Incinerator Residues Ind. Non-Haz. Inert, Non-Flammable Ind. Non-Haz. Potentially Combustible Ion-Exchange Resin Wastes Iron Compounds Mineral Processing Wastes Nickel Compounds Nitrates Nitrites Non-Ferrous Metal Scrap Paint Waste \$ Polymeric Material, Products/Scrap Scrap Rubber (Including Tyres) Sewage Silt And Dredgings Slag, Boiler/Flue Cleanings Sodium/Potassium Oxides/Hydroxides Sodium/Potassium Carbonates Tar, Pitch, Bitumen, Asphalts Used Filter Materials \$ Waste Treated Timber Zinc Compounds Environment Agency Carcinogenic Wastes must give specific authorisation for this waste to be acceptedWaste requires prior approval Controlled Wastes Explosive Waste Medical (Misuse Of Drugs Act) Medical, Surgical, Veterinary Wastes Radioactive Wastes Sludge Wastes Waste Flammable Solvents	A19NE (NE)	970	2	423500 281900

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
156	Registered Landfill Sites Licence Holder: Packington Estate Enterprises Ltd Licence Reference: 303 Site Location: The Somers, Somers Road, Meriden, Coventry, West Midlands Licence Easting: 422500 Licence Northing: 282300 Operator Location: A.B. Consult. Fenthams Road, HAMPTON IN ARDEN, Warwickshire, B92 0BH Authority: Environment Agency - Midlands Region, Upper Trent Area Site Category: Landfill Max Input Rate: Very Large (Equal to or greater than 250,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Dated: 1st June 1987 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Inert Constr'N Ind. Wastes Subsoil, Topsoil Prohibited Waste: Asbestos Biodegradable Waste Paper/Cardboard Waste Plasterboard Poisonous, Noxious, Polluting Wastes Similar Wastes Textiles Wood, Wood Products	A23SW (N)	980	2	422500 282300
157	Registered Waste Treatment or Disposal Sites Licence Holder: Coleman & Co (Plant Hire) Ltd Licence Reference: SL 2042 Site Location: Meriden Quarry, Cornets End Lane, Meriden, Coventry, West Midlands Operator Location: 43 Station Road, Stetchford, BIRMINGHAM, West Midlands, B33 9AX Authority: Environment Agency - Midlands Region, Upper Trent Area Site Category: Transfer - with treatment Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Licence Status: Operational as far as is knownOperational Dated: 16th December 1998 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Excavated Tarmacadam Hardcore Inert Excavation Materials Max.Waste Permitted By Licence Prohibited Waste: Biodegradable Waste Liquid Wastes Sludge Wastes Spec.Waste (Epa'90:S62/1996 Regs) Waste N.O.S.	A14SW (E)	497	2	423350 281000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Triassic Rocks (Undifferentiated)	A13SW (NW)	0	1	422672 281175
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 40 - 60 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: <15 mg/kg	A13SE (NE)	0	1	422681 281188
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 20 - 40 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: <15 mg/kg	A13SW (NW)	0	1	422672 281175
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 20 - 40 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: <15 mg/kg	A13NW (NW)	52	1	422542 281377
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NE (NE)	53	1	422849 281255
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 20 - 40 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: <15 mg/kg	A13NE (NE)	58	1	422791 281298
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 40 - 60 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: <15 mg/kg	A13SE (S)	111	1	422747 280951

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 40 - 60 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel 15 - 30 mg/kg Concentration:	A13SW (SW)	166	1	422534 280936
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel 15 - 30 mg/kg Concentration:	A12NE (NW)	241	1	422269 281346
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 40 - 60 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel 15 - 30 mg/kg Concentration:	A14SW (E)	382	1	423239 281042
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 20 - 40 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel <15 mg/kg Concentration:	A12SE (W)	483	1	422033 281024
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 40 - 60 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel 15 - 30 mg/kg Concentration:	A9NW (SE)	501	1	423112 280634
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel 15 - 30 mg/kg Concentration:	A12SW (W)	516	1	421979 281137

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 20 - 40 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel <15 mg/kg Concentration:	A9NW (SE)	625	1	423260 280587
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 20 - 40 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel <15 mg/kg Concentration:	A12NW (W)	689	1	421838 281468
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 40 - 60 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel <15 mg/kg Concentration:	A19SW (NE)	722	1	423312 281736
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 20 - 40 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel <15 mg/kg Concentration:	A14NE (E)	733	1	423561 281295
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 20 - 40 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel <15 mg/kg Concentration:	A12SW (W)	807	1	421743 280877
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 20 - 40 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel <15 mg/kg Concentration:	A17SW (NW)	877	1	421834 281851

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel 15 - 30 mg/kg Concentration:	A17SW (NW)	925	1	421760 281835
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 40 - 60 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel 15 - 30 mg/kg Concentration:	A17NW (NW)	978	1	421837 282000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 40 - 60 mg/kg Concentration: Lead Concentration: <100 mg/kg Nickel 15 - 30 mg/kg Concentration:	A19SE (NE)	983	1	423601 281807
158	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236587 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	118	1	422486 281022
159	BGS Recorded Mineral Sites Site Name: Cornet'S End Sand Pit Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 221969 Type: Opencast Status: Ceased Operator: Tarmac Trading Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A13NE (E)	131	1	422965 281200
159	BGS Recorded Mineral Sites Site Name: Cornet'S End Sand Pit Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 221969 Type: Opencast Status: Ceased Operator: Tarmac Trading Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Silica Sand Positional Accuracy: Located by supplier to within 10m	A13NE (E)	131	1	422965 281200

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
160	BGS Recorded Mineral Sites Site Name: Berkswell Quarry A Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236592 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A13SE (SE)	137	1	422934 280952
161	BGS Recorded Mineral Sites Site Name: Cornet'S End Sand Pit Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 221968 Type: Opencast Status: Ceased Operator: Tarmac Trading Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Silica Sand Positional Accuracy: Located by supplier to within 10m	A13NE (NE)	143	1	422920 281310
161	BGS Recorded Mineral Sites Site Name: Cornet'S End Sand Pit Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 221968 Type: Opencast Status: Ceased Operator: Tarmac Trading Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A13NE (NE)	143	1	422920 281310
162	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236581 Type: Opencast Status: Ceased Operator: Cemex Uk Materials Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A13SE (S)	151	1	422725 280908
163	BGS Recorded Mineral Sites Site Name: Berkswell Quarry A Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236593 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A14SW (SE)	203	1	423019 280942
164	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236580 Type: Opencast Status: Ceased Operator: Cemex Uk Materials Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A13SW (S)	219	1	422560 280868

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
165	BGS Recorded Mineral Sites Site Name: Cornet'S End Sand Pit Location: Cornet'S End, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 39240 Type: Opencast Status: Ceased Operator: Tilling Construction Services Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand Positional Accuracy: Located by supplier to within 10m	A14SW (E)	237	1	423090 281110
166	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands, Cv7 7lh Source: British Geological Survey, National Geoscience Information Service Reference: 3967 Type: Opencast Status: Dormant Operator: Cemex Uk Materials Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	242	1	422415 280920
167	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236582 Type: Opencast Status: Ceased Operator: Cemex Uk Materials Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A8NE (S)	247	1	422814 280813
168	BGS Recorded Mineral Sites Site Name: Meriden Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands, Cv7 7lg Source: British Geological Survey, National Geoscience Information Service Reference: 221857 Type: Opencast Status: Ceased Operator: Tarmac Trading Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A13NE (N)	251	1	422753 281517
169	BGS Recorded Mineral Sites Site Name: Berkswell Quarry A Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 3968 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: River Blyth Gravel Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A8NE (SE)	267	1	423000 280840
170	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236579 Type: Opencast Status: Ceased Operator: Cemex Uk Materials Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A8NW (SW)	278	1	422477 280838

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
171	BGS Recorded Mineral Sites Site Name: Berkswell Quarry A Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236594 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A14SW (SE)	287	1	423104 280919
172	BGS Recorded Mineral Sites Site Name: Cornet'S End Sand Pit Location: Cornet'S End, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 39807 Type: Opencast Status: Ceased Operator: Tilling Construction Services Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Silica Sand Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	331	1	423020 281470
172	BGS Recorded Mineral Sites Site Name: Cornet'S End Sand Pit Location: Cornet'S End, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 39807 Type: Opencast Status: Ceased Operator: Tilling Construction Services Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	331	1	423020 281470
173	BGS Recorded Mineral Sites Site Name: Coventry Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands, Cv7 7lg Source: British Geological Survey, National Geoscience Information Service Reference: 259463 Type: Recycled Status: Active Operator: Nrs Meriden Aggregates Ltd. Operator Location: Not Supplied Periodic Type: Anthropogene Geology: Mineral Based Waste Commodity: Secondary Positional Accuracy: Located by supplier to within 10m	A14NW (E)	365	1	423150 281370
173	BGS Recorded Mineral Sites Site Name: Coventry Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands, Cv7 7lg Source: British Geological Survey, National Geoscience Information Service Reference: 3971 Type: Opencast Status: Dormant Operator: Nrs Meriden Aggregates Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A14NW (E)	365	1	423150 281370
174	BGS Recorded Mineral Sites Site Name: Coventry Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands, Cv7 7lg Source: British Geological Survey, National Geoscience Information Service Reference: 244674 Type: Opencast Status: Active Operator: Nrs Meriden Aggregates Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A18SW (N)	391	1	422455 281700

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
175	BGS Recorded Mineral Sites Site Name: Berkswell Quarry A Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236599 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A8NE (SE)	393	1	422937 280681
176	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236583 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A8NW (S)	400	1	422486 280703
177	BGS Recorded Mineral Sites Site Name: Berkswell Quarry A Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236598 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A8NE (S)	420	1	422852 280643
178	BGS Recorded Mineral Sites Site Name: Berkswell Quarry A Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236597 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	430	1	423055 280684
179	BGS Recorded Mineral Sites Site Name: Berkswell Quarry A Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236595 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	468	1	423224 280775
180	BGS Recorded Mineral Sites Site Name: Cornet'S End Sand Pit Location: Cornet'S End, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 39808 Type: Opencast Status: Ceased Operator: Lafarge-Tarmac Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Silica Sand Positional Accuracy: Located by supplier to within 10m	A14SW (E)	491	1	423340 281155

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
180	BGS Recorded Mineral Sites Site Name: Cornet'S End Sand Pit Location: Cornet'S End, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 39808 Type: Opencast Status: Ceased Operator: Lafarge-Tarmac Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A14SW (E)	491	1	423340 281155
181	BGS Recorded Mineral Sites Site Name: Meriden Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands, Cv7 7lg Source: British Geological Survey, National Geoscience Information Service Reference: 221858 Type: Opencast Status: Ceased Operator: Tarmac Trading Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A19SW (NE)	497	1	423070 281635
182	BGS Recorded Mineral Sites Site Name: Berkswell Quarry A Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236600 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A8NE (SE)	497	1	422932 280574
183	BGS Recorded Mineral Sites Site Name: Cornet'S End Sand Pit Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 221970 Type: Opencast Status: Ceased Operator: Tarmac Trading Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Silica Sand Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	510	1	423260 281470
183	BGS Recorded Mineral Sites Site Name: Cornet'S End Sand Pit Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 221970 Type: Opencast Status: Ceased Operator: Tarmac Trading Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	510	1	423260 281470
184	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236584 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A8NW (S)	534	1	422486 280557

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
185	BGS Recorded Mineral Sites Site Name: Berkswell Quarry A Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236596 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	581	1	423191 280590
186	BGS Recorded Mineral Sites Site Name: Berkswell Quarry A Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236601 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A8SE (S)	660	1	422854 280402
187	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236585 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A8SW (S)	666	1	422488 280417
188	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236586 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A8SW (S)	671	1	422655 280387
189	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236590 Type: Opencast Status: Ceased Operator: Cemex Uk Materials Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A9SW (SE)	727	1	423091 280377
190	BGS Recorded Mineral Sites Site Name: Cornet'S End Sand Pit Location: Cornet'S End, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 39809 Type: Opencast Status: Ceased Operator: Lafarge-Tarmac Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	743	1	423475 281565

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
190	BGS Recorded Mineral Sites Site Name: Cornet'S End Sand Pit Location: Cornet'S End, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 39809 Type: Opencast Status: Ceased Operator: Lafarge-Tarmac Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Silica Sand Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	743	1	423475 281565
191	BGS Recorded Mineral Sites Site Name: Berkswell Quarry B Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236604 Type: Opencast Status: Ceased Operator: Rmc Aggregates (Western) Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A7NW (SW)	771	1	421858 280736
192	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236588 Type: Opencast Status: Ceased Operator: Cemex Uk Materials Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A8SW (S)	822	1	422598 280239
193	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236589 Type: Opencast Status: Ceased Operator: Cemex Uk Materials Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A8SE (S)	858	1	422941 280212
194	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands, Cv7 7lh Source: British Geological Survey, National Geoscience Information Service Reference: 235998 Type: Opencast Status: Active Operator: Cemex Uk Materials Ltd. Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A8SE (S)	859	1	422755 280200
195	BGS Recorded Mineral Sites Site Name: The Somers Location: Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 39812 Type: Opencast Status: Ceased Operator: Arc - Eastern Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A18NW (N)	869	1	422570 282190

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
196	BGS Recorded Mineral Sites Site Name: Berkswell Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 236591 Type: Opencast Status: Ceased Operator: Cemex Uk Materials Ltd. Operator Location: Not Supplied Periodic Type: Cromerian - Ipswichian Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A9SW (SE)	887	1	423106 280214
197	BGS Recorded Mineral Sites Site Name: Meriden 1 Quarry Location: Cornets End Lane, Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 221966 Type: Opencast Status: Ceased Operator: Nrs Waste Care Ltd Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Terrace Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A19NE (NE)	949	1	423440 281925
198	BGS Recorded Mineral Sites Site Name: The Somers Location: Meriden, Coventry, West Midlands Source: British Geological Survey, National Geoscience Information Service Reference: 39811 Type: Opencast Status: Ceased Operator: Arc - Eastern Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Deposits, Mid Pleistocene Commodity: Sand and Gravel Positional Accuracy: Located by supplier to within 10m	A22SE (N)	976	1	422265 282255
	BGS Measured Urban Soil Chemistry No data available				
	BGS Urban Soil Chemistry Averages No data available				
	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.	A13SW (NW)	0	8	422672 281175
	Mining Instability Mining Evidence: Inconclusive Coal Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	A13SW (NW)	0	-	422672 281175
	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	A13SE (NE)	0	1	422681 281188
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (NW)	0	1	422672 281175
	Potential for Collapsible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (S)	111	1	422747 280951
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (NW)	0	1	422672 281175
	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SE (NE)	0	1	422681 281188

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	19	1	422601 281062
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (NW)	0	1	422672 281175
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (NW)	0	1	422672 281175
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (NW)	0	1	422672 281175
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SE (NE)	0	1	422681 281188
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	52	1	422542 281377
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	58	1	422849 281255
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SE (S)	111	1	422747 280951
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A12NE (NW)	241	1	422269 281346
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	0	1	422666 281169
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (NW)	0	1	422672 281175
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	63	1	422555 281387
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (S)	111	1	422747 280951
	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	A13SW (NW)	0	1	422672 281175
	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	A13SW (NW)	0	1	422672 281175

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
199	Contemporary Trade Directory Entries Name: Berkswell Forgework Location: Cornets End Lane, Meriden, Coventry, CV7 7LH Classification: Wrought Ironwork Status: Inactive Positional Accuracy: Automatically positioned to the address	A13SW (W)	51	-	422444 281176
199	Contemporary Trade Directory Entries Name: Farm & Industrial Cladding Ltd Location: Hornbrook Farm, Cornets End Lane, Meriden, Coventry, CV7 7LH Classification: Cladding Suppliers & Installers Status: Inactive Positional Accuracy: Automatically positioned to the address	A13SW (W)	51	-	422444 281176
200	Contemporary Trade Directory Entries Name: Hitachi Construction Machinery (Uk) Location: Park Cornets End Lane, Meriden, Coventry, West Midlands, CV7 7LG Classification: Machinery - Industrial & Commercial Status: Active Positional Accuracy: Manually positioned to the road within the address or location	A13SE (SE)	53	-	422910 281067
200	Contemporary Trade Directory Entries Name: Cemex Berkswell Concrete Plant Concrete Account Orders Location: Cornets End Lane, Meriden, Coventry, West Midlands, CV7 7LH Classification: Concrete & Mortar Ready Mixed Status: Active Positional Accuracy: Manually positioned within the geographical locality	A13SE (SE)	54	-	422911 281058
201	Contemporary Trade Directory Entries Name: Ready Mixed Concrete (West Midlands) Ltd Location: Cornets End La, Meriden, Coventry, West Midlands, CV7 7LH Classification: Concrete & Mortar Ready Mixed Status: Inactive Positional Accuracy: Manually positioned to the road within the address or location	A13NW (NW)	109	-	422407 281336
202	Contemporary Trade Directory Entries Name: N R S Aggregates Ltd Location: Site 7 N R S House Meridan Park, Cornets End Lane, Meriden, Coventry, West Midlands, CV7 7LG Classification: Sand, Gravel & Other Aggregates Status: Active Positional Accuracy: Manually positioned within the geographical locality	A13SE (E)	165	-	423008 281148
202	Contemporary Trade Directory Entries Name: Cemex Berkswell Concrete Plant Mortar Screed Sales Location: Cornets End Lane, Meriden, Coventry, West Midlands, CV7 7LH Classification: Cement Manufacturers & Distributors Status: Active Positional Accuracy: Manually positioned within the geographical locality	A14SW (E)	211	-	423051 281173
203	Contemporary Trade Directory Entries Name: Cemex Berkswell Concrete Plant Concrete Sales Location: Cornets End Lane, Meriden, Coventry, West Midlands, CV7 7LH Classification: Concrete & Mortar Ready Mixed Status: Active Positional Accuracy: Manually positioned within the geographical locality	A14SW (E)	193	-	423048 281033
204	Contemporary Trade Directory Entries Name: Cemex Berkswell Quarry & Recovery Site Aggregate Asphalt Sales Location: BERKSWELL QUARRY, CORNETS END LANE, MERIDEN, SOLIHULL, CV7 7LH Classification: Cement Manufacturers & Distributors Status: Active Positional Accuracy: Automatically positioned to the address	A13SW (SW)	220	-	422464 280911
205	Contemporary Trade Directory Entries Name: Cemex Uk Location: Berkswell Quarry Landfill Site, Cornets End Lane, Solihull, CV7 7LH Classification: Concrete & Mortar Ready Mixed Status: Inactive Positional Accuracy: Automatically positioned to the address	A8NW (S)	228	-	422671 280829
206	Contemporary Trade Directory Entries Name: Tarmac Location: Meriden Depot, Cornets End Lane, Meriden, Coventry, West Midlands, CV7 7LG Classification: Quarries Status: Active Positional Accuracy: Manually positioned within the geographical locality	A14NW (E)	296	-	423124 281243

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
206	Contemporary Trade Directory Entries Name: A & A Recycling Services Ltd Location: Meriden Quarry, Cornets End Lane, Meriden, Coventry, West Midlands, CV7 7LG Classification: Recycling Services Status: Active Positional Accuracy: Manually positioned within the geographical locality	A14NW (E)	296	-	423124 281243
206	Contemporary Trade Directory Entries Name: Power X Equipment Location: Cornets End Lane, Meriden, Coventry, West Midlands, CV7 7LG Classification: Metals - Mining Status: Inactive Positional Accuracy: Manually positioned within the geographical locality	A14NW (E)	296	-	423124 281243
206	Contemporary Trade Directory Entries Name: Breedon Aggregates Location: MERIDEN QUARRY, CORNETS END LANE, MERIDEN, SOLIHULL, CV7 7LH Classification: Sand, Gravel & Other Aggregates Status: Active Positional Accuracy: Automatically positioned to the address	A14NW (E)	296	-	423124 281243
206	Contemporary Trade Directory Entries Name: Breedon Aggregates Location: Meriden Landfill Site, Cornets End Lane, Solihull, CV7 7LG Classification: Sand, Gravel & Other Aggregates Status: Inactive Positional Accuracy: Manually positioned to the address or location	A14NW (E)	298	-	423126 281245
206	Contemporary Trade Directory Entries Name: A & A Recycling Location: Meriden Quarry, Cornets End Lane, Meriden, Coventry, CV7 7LH Classification: Recycling Services Status: Active Positional Accuracy: Automatically positioned to the address	A14NW (E)	299	-	423128 281242
206	Contemporary Trade Directory Entries Name: Tilcon Ltd Location: Cornets End Lane, Meriden, Coventry, CV7 7LG Classification: Concrete & Mortar Ready Mixed Status: Inactive Positional Accuracy: Automatically positioned in the proximity of the address	A14NW (E)	311	-	423139 281245
206	Contemporary Trade Directory Entries Name: Tarmac Central Location: Cornets End Lane, Meriden, Coventry, CV7 7LG Classification: Sand, Gravel & Other Aggregates Status: Inactive Positional Accuracy: Automatically positioned in the proximity of the address	A14NW (E)	311	-	423139 281245
207	Contemporary Trade Directory Entries Name: Bullseye Distributors Ltd Location: UNIT 3, PATRICK FARM BARNS, MERIDEN ROAD, HAMPTON IN ARDEN, SOLIHULL, B92 0LT Classification: Distribution Services Status: Active Positional Accuracy: Automatically positioned to the address	A12NW (W)	841	-	421667 281388
208	Contemporary Trade Directory Entries Name: Avon Utilities & Generation Location: 1 Mouldings Green, Kenilworth Road, Meriden, Coventry, West Midlands, CV7 7LJ Classification: Electricity Generating & Distributing Equipment Status: Inactive Positional Accuracy: Automatically positioned to the address	A17NW (NW)	970	-	421916 282055
209	Points of Interest - Commercial Services Name: A & A Recycling Services Ltd Location: Meriden Quarry, Cornets End Lane, Meriden, Coventry, CV7 7LH Category: Recycling Services Class Code: Recycling, Reclamation and Disposal Positional Accuracy: Positioned to address or location	A13SE (E)	154	9	422993 281175
210	Points of Interest - Commercial Services Name: A & A Recycling Location: Meriden Quarry, Cornets End Lane, Meriden, Solihull, CV7 7LH Category: Recycling Services Class Code: Recycling, Reclamation and Disposal Positional Accuracy: Positioned to address or location	A14NW (E)	298	9	423127 281242

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
211	Points of Interest - Commercial Services Name: Bullseye Distributors Ltd Location: Unit 3 Patrick Farm Barns, Meriden Road, Hampton-in-Arden, Solihull, B92 0LT Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A12NW (W)	841	9	421667 281388
212	Points of Interest - Commercial Services Name: Armac Environmental Location: Stonebridge House, Kenilworth Road, Balsall Common, Solihull, CV7 7LJ Category: Recycling Services Class Code: Recycling, Reclamation and Disposal Positional Accuracy: Positioned to address or location	A17NW (NW)	1000	9	421901 282083
213	Points of Interest - Manufacturing and Production Name: Sand and Gravel Pit Location: CV7 Category: Extractive Industries Class Code: Sand, Gravel and Clay Extraction and Merchants Positional Accuracy: Positioned to an adjacent address or location	A13SE (SE)	53	9	422841 281012
214	Points of Interest - Manufacturing and Production Name: Tank Location: CV7 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SW (S)	127	9	422590 280955
215	Points of Interest - Manufacturing and Production Name: Sand and Gravel Pit Location: CV7 Category: Extractive Industries Class Code: Sand, Gravel and Clay Extraction and Merchants Positional Accuracy: Positioned to an adjacent address or location	A13SE (S)	179	9	422676 280878
216	Points of Interest - Manufacturing and Production Name: Tarmac Location: Meriden Depot, Cornets End Lane, Meriden, Coventry, CV7 7LG Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to address or location	A14SW (E)	191	9	423041 281120
217	Points of Interest - Manufacturing and Production Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A13SW (SW)	222	9	422440 280926
217	Points of Interest - Manufacturing and Production Name: Works Location: CV7 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A13SW (SW)	226	9	422435 280925
218	Points of Interest - Manufacturing and Production Name: Workings Location: B92 Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to an adjacent address or location	A13SW (S)	225	9	422578 280853
219	Points of Interest - Manufacturing and Production Name: Sand and Gravel Pit Location: CV7 Category: Extractive Industries Class Code: Sand, Gravel and Clay Extraction and Merchants Positional Accuracy: Positioned to an adjacent address or location	A14SW (SE)	263	9	423083 280931
220	Points of Interest - Manufacturing and Production Name: Works Location: CV7 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A14NW (E)	306	9	423120 281288
220	Points of Interest - Manufacturing and Production Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A14NW (E)	316	9	423130 281290

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
221	Points of Interest - Manufacturing and Production Name: Gravel and Sand Workings Location: CV7 Category: Extractive Industries Class Code: Sand, Gravel and Clay Extraction and Merchants Positional Accuracy: Positioned to an adjacent address or location	A13NE (NE)	319	9	422987 281477
222	Points of Interest - Manufacturing and Production Name: Sand and Gravel Pit Location: B92 Category: Extractive Industries Class Code: Sand, Gravel and Clay Extraction and Merchants Positional Accuracy: Positioned to an adjacent address or location	A8SE (S)	642	9	422683 280415
223	Points of Interest - Manufacturing and Production Name: Sand Pit Location: B92 Category: Extractive Industries Class Code: Sand, Gravel and Clay Extraction and Merchants Positional Accuracy: Positioned to an adjacent address or location	A7NW (SW)	829	9	421891 280604
224	Points of Interest - Manufacturing and Production Name: T S Beaty Location: Patricks Farm, Meriden Road, Hampton-in-Arden, Solihull, B92 0LT Category: Farming Class Code: Livestock Farming Positional Accuracy: Positioned to address or location	A11NE (W)	846	9	421658 281341
224	Points of Interest - Manufacturing and Production Name: R S Beaty & Sons Location: Patricks Farm, Meriden Road, Hampton-in-Arden, Solihull, B92 0LT Category: Farming Class Code: Livestock Farming Positional Accuracy: Positioned to address or location	A11NE (W)	847	9	421657 281341
225	Points of Interest - Manufacturing and Production Name: J Webb Location: Cornets End Lane, Meriden, Coventry, CV7 7LF Category: Farming Class Code: Livestock Farming Positional Accuracy: Positioned to address or location	A9SW (SE)	858	9	423327 280347
225	Points of Interest - Manufacturing and Production Name: J Webb Location: Cornets End Lane, Meriden, Coventry, CV7 7LF Category: Farming Class Code: Livestock Farming Positional Accuracy: Positioned to address or location	A9SW (SE)	858	9	423327 280347
226	Points of Interest - Manufacturing and Production Name: Gravel Pit Location: CV7 Category: Extractive Industries Class Code: Sand, Gravel and Clay Extraction and Merchants Positional Accuracy: Positioned to an adjacent address or location	A19NW (NE)	895	9	423322 281947
227	Points of Interest - Manufacturing and Production Name: Gravel and Sand Workings Location: B92 Category: Extractive Industries Class Code: Sand, Gravel and Clay Extraction and Merchants Positional Accuracy: Positioned to an adjacent address or location	A3NE (S)	919	9	422783 280141
228	Points of Interest - Manufacturing and Production Name: Sheep Wash Location: CV7 Category: Farming Class Code: Sheep Dips and Washes Positional Accuracy: Positioned to an adjacent address or location	A9SE (SE)	969	9	423385 280252
229	Points of Interest - Manufacturing and Production Name: Sand and Gravel Pit Location: CV7 Category: Extractive Industries Class Code: Sand, Gravel and Clay Extraction and Merchants Positional Accuracy: Positioned to an adjacent address or location	A19NW (NE)	974	9	423327 282037
230	Points of Interest - Public Infrastructure Name: Waste Processing Facility Location: CV7 Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to an adjacent address or location	A13SE (E)	131	9	422987 281079

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
231	Points of Interest - Public Infrastructure Name: Landfill Site Location: CV7 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location	A14SW (E)	497	9	423348 280985
232	Points of Interest - Public Infrastructure Name: Landfill Site Location: CV7 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location	A14SE (E)	508	9	423354 281170
233	Points of Interest - Public Infrastructure Name: Landfill Site Location: CV7 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location	A14NE (E)	698	9	423465 281483
233	Points of Interest - Public Infrastructure Name: Landfill (Deposit) Location: CV7 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location	A19SE (NE)	724	9	423462 281548
234	Points of Interest - Public Infrastructure Name: Weir Location: CV7 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A17SW (NW)	732	9	421993 281809
234	Points of Interest - Public Infrastructure Name: Weir Location: CV7 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A17SW (NW)	736	9	421986 281808

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
235	Ancient Woodland Name: The Somers Reference: 1107676 Area(m²): 35353.2 Type: Plantation on Ancient Woodland	A18NE (N)	706	10	422761 281996
236	Areas of Adopted Green Belt Authority: North Warwickshire Borough Council, Planning Administration Plan Name: North Warwickshire Local Plan Status: Adopted Plan Date: 4th July 2006	A18NE (N)	700	11	422757 281989
237	Areas of Unadopted Green Belt Authority: North Warwickshire Borough Council, Planning Administration Plan Name: North Warwickshire Local Plan Status: Submission Draft Plan Date: 27th March 2018	A18NE (N)	703	11	422762 281991
238	Nitrate Vulnerable Zones Name: River Trent (Source To Confluence With Derwent) Nvz Description: Surface Water Source: Environment Agency, Head Office	A13SW (NW)	0	2	422672 281175
239	Nitrate Vulnerable Zones Name: Coventry Description: Groundwater Source: Environment Agency, Head Office	A14SW (SE)	343	2	423157 280897
240	Sites of Special Scientific Interest Name: River Blythe Multiple Areas: Y Total Area (m2): 619457.58 Source: Natural England Reference: 1001772 Designation Details: Site Of Special Scientific Interest Designation Date: 15th December 1989 Date Type: Notified Designation Details: Water Framework Directive (WFD) Designation Date: 15th December 1989 Date Type: Notified	A17SW (NW)	728	10	421990 281800

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices Coventry City Council - Environmental Health Department Environment Agency - Head Office Solihull Metropolitan Borough Council - Environmental Health Department North Warwickshire Borough Council - Environmental Health Department	June 2022 November 2023 October 2017 October 2025	Annual Rolling Update Annually Annual Rolling Update Annual Rolling Update
Discharge Consents Environment Agency - Midlands Region	July 2025	Quarterly
Enforcement and Prohibition Notices Environment Agency - Midlands Region	March 2013	
Integrated Pollution Controls Environment Agency - Midlands Region	January 2009	
Integrated Pollution Prevention And Control Environment Agency - Midlands Region	April 2025	Bi-Annually
Local Authority Integrated Pollution Prevention And Control Coventry City Council - Environmental Health Department Solihull Metropolitan Borough Council - Environmental Health Department North Warwickshire Borough Council - Environmental Health Department	August 2014 August 2014 December 2020	Variable Variable Variable
Local Authority Pollution Prevention and Controls Solihull Metropolitan Borough Council - Environmental Health Department Coventry City Council - Environmental Health Department North Warwickshire Borough Council - Environmental Health Department	August 2014 August 2014 December 2020	Annual Rolling Update Not Applicable Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements Coventry City Council - Environmental Health Department Solihull Metropolitan Borough Council - Environmental Health Department North Warwickshire Borough Council - Environmental Health Department	August 2014 August 2014 September 2014	Variable Variable Variable
Nearest Surface Water Feature Ordnance Survey	September 2025	
Pollution Incidents to Controlled Waters Environment Agency - Midlands Region	December 1999	
Historical Prosecutions Environment Agency, Midlands Region	March 2013	Not Applicable
Registered Radioactive Substances Environment Agency - Head Office Environment Agency - Midlands Region	May 2023 May 2023	
Substantiated Pollution Incident Register Environment Agency - Midlands Region - Central Area Environment Agency - Midlands Region - Lower Severn Area Environment Agency - Midlands Region - Upper Trent Area	July 2025 July 2025 July 2025	Quarterly Quarterly Quarterly
Water Abstractions Environment Agency - Midlands Region	July 2025	Quarterly
Water Industry Act Referrals Environment Agency - Midlands Region	October 2017	
Groundwater Vulnerability Map Environment Agency - Head Office	June 2018	As notified
Bedrock Aquifer Designations Environment Agency - Head Office	January 2018	As notified
Superficial Aquifer Designations Environment Agency - Head Office	January 2018	As notified
Source Protection Zones Environment Agency - Head Office	August 2025	Bi-Annually
Extreme Flooding from Rivers or Sea without Defences Environment Agency - Head Office	December 2023	As notified

Agency & Hydrological	Version	Update Cycle
Flooding from Rivers or Sea without Defences Environment Agency - Head Office	December 2023	As notified
Areas Benefiting from Flood Defences Environment Agency - Head Office	February 2023	
Flood Water Storage Areas Environment Agency - Head Office	June 2025	Quarterly
Flood Defences Environment Agency - Head Office	August 2022	
OS Water Network Lines Ordnance Survey	October 2025	Quarterly
Surface Water 1 in 30 year Flood Extent Environment Agency - Head Office	May 2018	Annually
Surface Water 1 in 100 year Flood Extent Environment Agency - Head Office	May 2018	Annually
Surface Water 1 in 1000 year Flood Extent Environment Agency - Head Office	May 2018	Annually
Surface Water Suitability Environment Agency - Head Office	February 2016	Annually
BGS Groundwater Flooding Susceptibility British Geological Survey - National Geoscience Information Service	May 2013	As notified
Water Framework Directive - Catchment Environment Agency - Head Office	July 2025	Annually
Water Framework Directive - Groundwater Environment Agency - Head Office	July 2025	Annually
Water Framework Directive - Surface Waters Environment Agency - Head Office	July 2025	Annually

Waste	Version	Update Cycle
BGS Recorded Landfill Sites British Geological Survey - National Geoscience Information Service	November 2002	As notified
Historical Landfill Sites Environment Agency - Head Office	April 2025	Bi-Annually
Integrated Pollution Control Registered Waste Sites Environment Agency - Midlands Region	January 2009	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries) Environment Agency - Midlands Region - Central Area Environment Agency - Midlands Region - Lower Severn Area Environment Agency - Midlands Region - Upper Trent Area	July 2025 July 2025 July 2025	Quarterly Quarterly Quarterly
Licensed Waste Management Facilities (Locations) Environment Agency - Midlands Region - Central Area Environment Agency - Midlands Region - Lower Severn Area Environment Agency - Midlands Region - Upper Trent Area	April 2025 April 2025 April 2025	Bi-Annually Bi-Annually Bi-Annually
Local Authority Landfill Coverage Coventry City Council - Planning Department North Warwickshire Borough Council - Environmental Health Department Solihull Metropolitan Borough Council Warwickshire County Council	February 2003 February 2003 February 2003 February 2003	Not Applicable Not Applicable Not Applicable Not Applicable
Local Authority Recorded Landfill Sites Coventry City Council - Planning Department North Warwickshire Borough Council - Environmental Health Department Solihull Metropolitan Borough Council Warwickshire County Council	October 2018 October 2018 October 2018 October 2018	
Potentially Infilled Land (Non-Water) Landmark Information Group Limited	December 1999	
Potentially Infilled Land (Water) Landmark Information Group Limited	December 1999	
Registered Landfill Sites Environment Agency - Midlands Region - Central Area Environment Agency - Midlands Region - Lower Severn Area Environment Agency - Midlands Region - Upper Trent Area	March 2006 March 2006 March 2006	Not Applicable Not Applicable Not Applicable
Registered Waste Transfer Sites Environment Agency - Midlands Region - Central Area Environment Agency - Midlands Region - Lower Severn Area Environment Agency - Midlands Region - Upper Trent Area	April 2018 April 2018 April 2018	
Registered Waste Treatment or Disposal Sites Environment Agency - Midlands Region - Central Area Environment Agency - Midlands Region - Lower Severn Area Environment Agency - Midlands Region - Upper Trent Area	June 2015 June 2015 June 2015	

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH) Health and Safety Executive	June 2025	Bi-Annually
Explosive Sites Health and Safety Executive	March 2017	
Notification of Installations Handling Hazardous Substances (NIHS) Health and Safety Executive	August 2001	
Planning Hazardous Substance Enforcements Coventry City Council - Planning Department Solihull Metropolitan Borough Council Warwickshire County Council North Warwickshire Borough Council - Planning Administration	April 2023 February 2016 July 2007 May 2023	Variable Variable Annual Rolling Update Variable
Planning Hazardous Substance Consents Solihull Metropolitan Borough Council North Warwickshire Borough Council - Planning Administration Warwickshire County Council Coventry City Council - Planning Department	February 2016 January 2016 July 2007 July 2022	Variable Variable Annual Rolling Update Variable
Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	As notified
BGS Estimated Soil Chemistry British Geological Survey - National Geoscience Information Service	December 2015	As notified
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	April 2025	Bi-Annually
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB) Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011 November 2020	As notified
Coal Mining Affected Areas The Coal Authority - Property Searches	February 2023	
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	November 2025	Annually
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	November 2025	Annually

Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries Thomson Directories	September 2025	Quarterly
Fuel Station Entries Green Street Advisor (UK) Ltd	August 2025	Quarterly
Points of Interest - Commercial Services PointX	September 2025	Quarterly
Points of Interest - Education and Health PointX	September 2025	Quarterly
Points of Interest - Manufacturing and Production PointX	September 2025	Quarterly
Points of Interest - Public Infrastructure PointX	September 2025	Quarterly
Points of Interest - Recreational and Environmental PointX	September 2025	Quarterly
Underground Electrical Cables National Grid	January 2024	

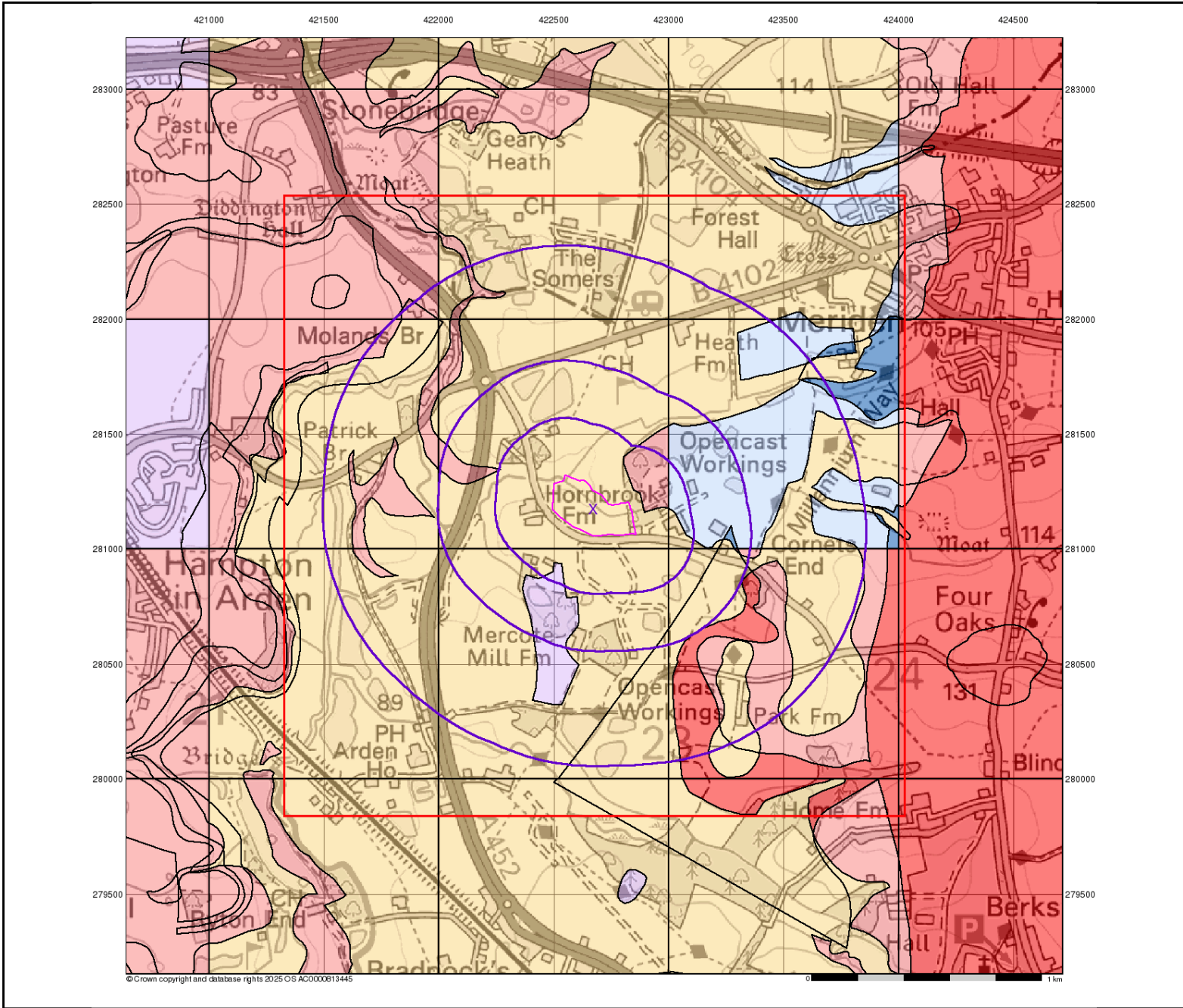
Sensitive Land Use	Version	Update Cycle
Ancient Woodland Natural England	September 2025	Bi-Annually
Areas of Adopted Green Belt Coventry City Council North Warwickshire Borough Council - Planning Administration Solihull Metropolitan Borough Council	July 2025 July 2025 July 2025	Quarterly Quarterly Quarterly
Areas of Unadopted Green Belt Coventry City Council North Warwickshire Borough Council - Planning Administration Solihull Metropolitan Borough Council	July 2025 July 2025 July 2025	Quarterly Quarterly Quarterly
Areas of Outstanding Natural Beauty Natural England	November 2025	Bi-Annually
Environmentally Sensitive Areas Natural England	August 2023	
Forest Parks Forestry Commission	May 2023	Not Applicable
Local Nature Reserves Natural England	August 2025	Bi-Annually
Marine Nature Reserves Natural England	August 2025	Bi-Annually
National Nature Reserves Natural England	July 2025	Bi-Annually
National Parks Natural England	September 2025	Annually
Nitrate Sensitive Areas Natural England	April 2023	Not Applicable
Nitrate Vulnerable Zones Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA) Environment Agency - Head Office	April 2016 November 2025	Annually
Ramsar Sites Natural England	August 2025	Bi-Annually
Sites of Special Scientific Interest Natural England	November 2025	Bi-Annually
Special Areas of Conservation Natural England	July 2025	Bi-Annually
Special Protection Areas Natural England	November 2025	Bi-Annually

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	 British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL
Centre for Ecology and Hydrology	 Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Stantec UK Ltd	

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	Environment Agency - National Customer Contact Centre (NCCC) PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
3	Solihull Metropolitan Borough Council - Environmental Health Department P O Box 24, Council House, Solihull, West Midlands, B91 3QT	Telephone: 0121 704 8086 Fax: 0121 704 6404 Website: www.solihull.gov.uk
4	Ordnance Survey Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.co.uk
5	Solihull Metropolitan Borough Council P O Box 19, Council House, Solihull, West Midlands, B91 3QT	Telephone: 0121 704 6000 Fax: 0121 704 6404 Website: www.solihull.gov.uk
6	North Warwickshire Borough Council - Environmental Health Department P O Box 6, Old Bank House, 129 Long Street, Atherstone, North Warwickshire, CV9 1BG	Telephone: 01827 715341 Fax: 01827 719399 Website: www.northwarks.gov.uk
7	Warwickshire County Council PO Box 43, Shire Hall, Warwick, Warwickshire, CV34 4SX	Telephone: 01926 410410 Website: www.warwickshire.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	PointX 5-6 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY	Website: www.pointx.co.uk
10	Natural England County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
11	North Warwickshire Borough Council - Planning Administration Po Box 6, Council House, South Street, Atherstone, Warwickshire, CV9 1BG	Telephone: 01827 715341 Fax: 01827 719225 Website: www.northwarks.gov.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 Landmark Information Group, Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0330 036 6618 Fax: 0844 844 9951 Email: helpdesk@landmark.co.uk Website: www.landmark.co.uk

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



Envirocheck®

LANDMARK INFORMATION GROUP®

Groundwater Vulnerability

General

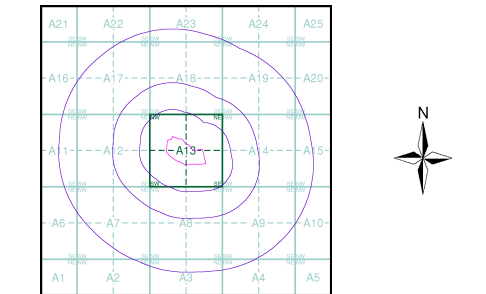
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

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

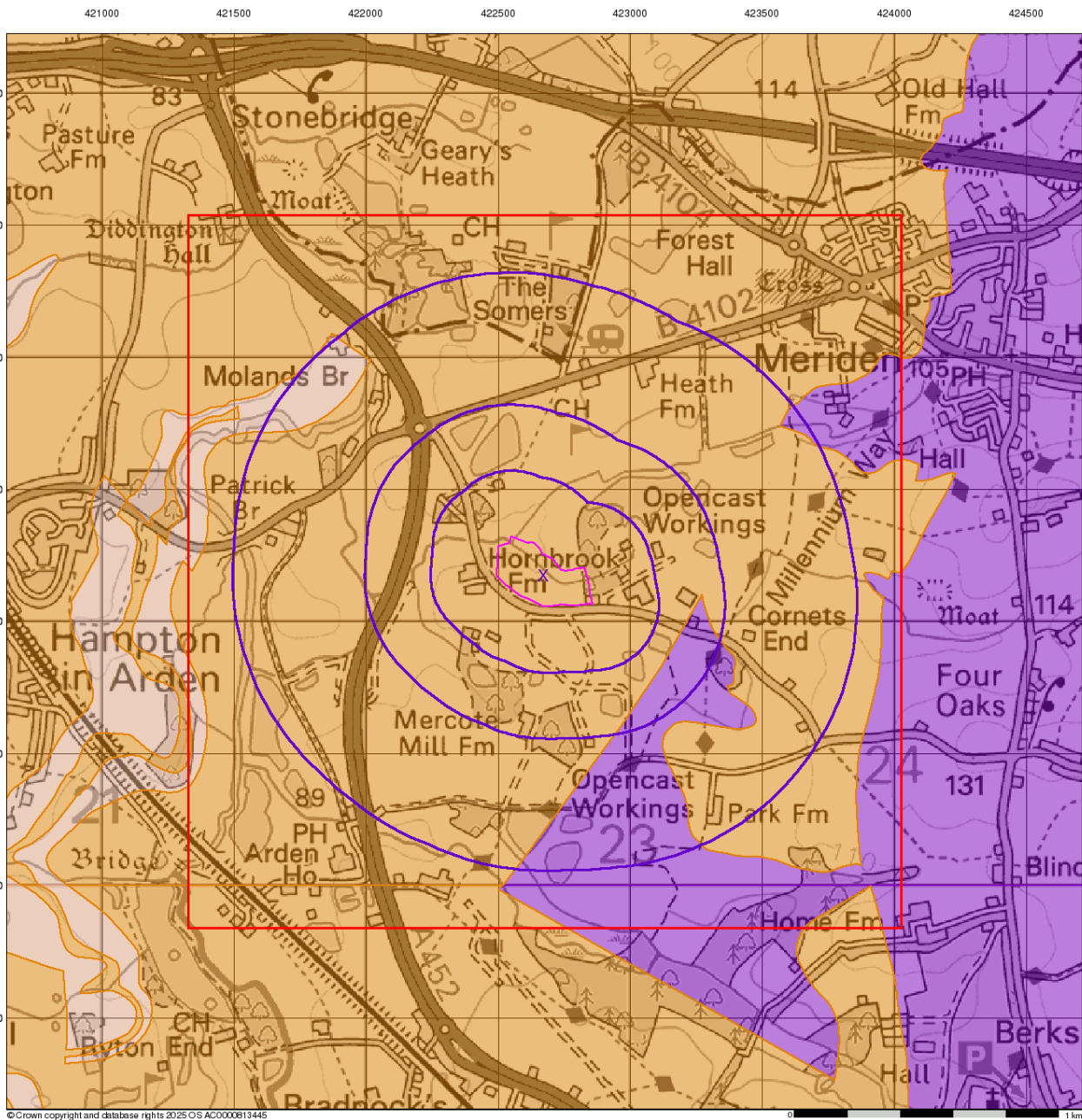
Site Sensitivity Context Map - Slice A



Order Details
Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 1000

Site Details
Site at 422676,281189

Landmark®
INFORMATION GROUP



© Crown copyright and database rights 2025 OS AC0000613445

Envirocheck[®]

LANDMARK INFORMATION GROUP[®]

Bedrock Aquifer Designation

General

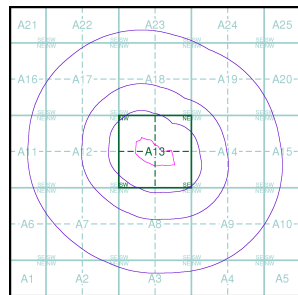
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

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



Order Details

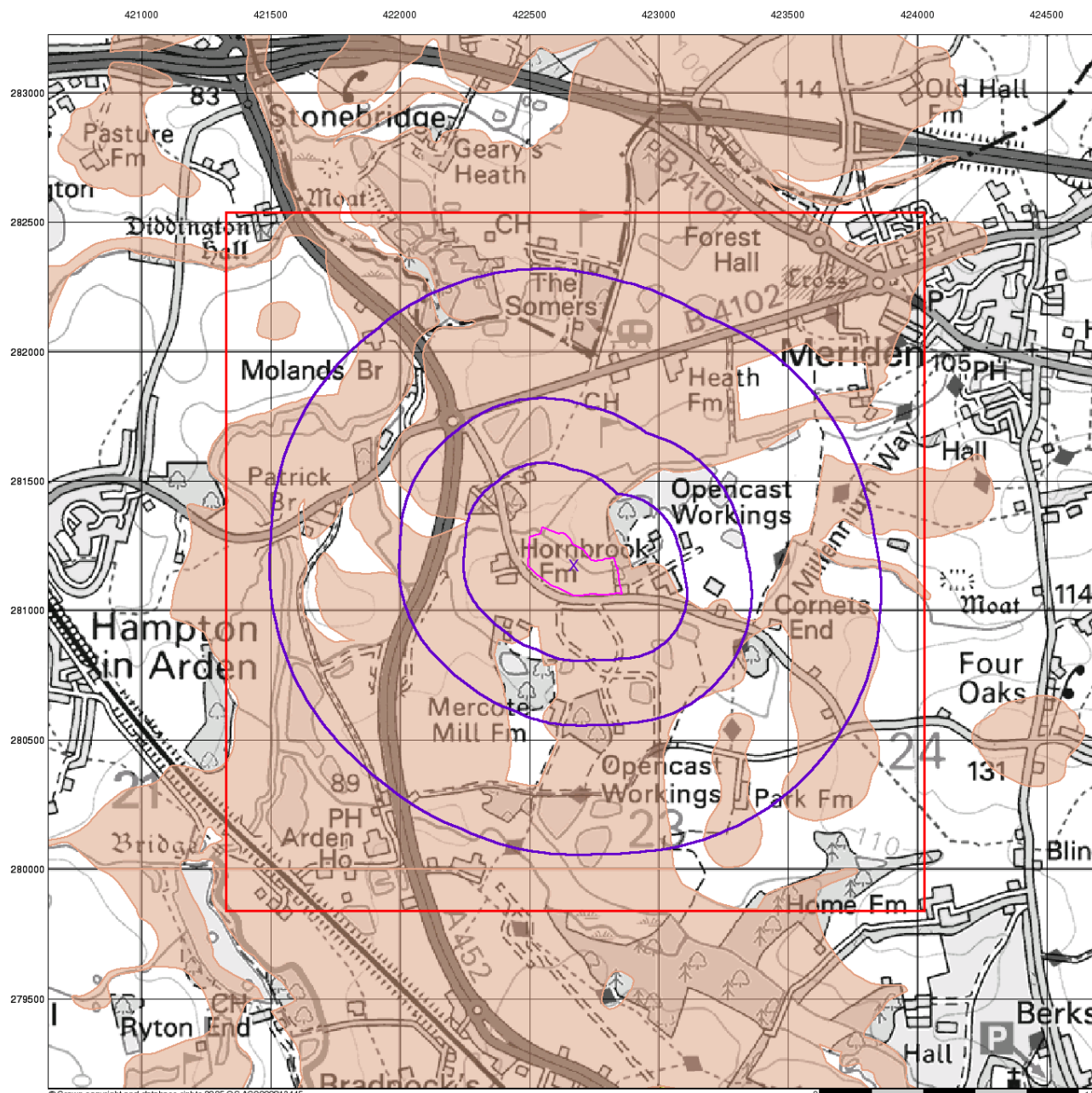
Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 1000

Site Details

Site at 422676,281189

Landmark[®]
LANDMARK INFORMATION GROUP

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



© Crown copyright and database rights 2025 OS AC0000613446

0 1 km

Envirocheck[®]

LANDMARK INFORMATION GROUP[®]

Superficial Aquifer Designation

General

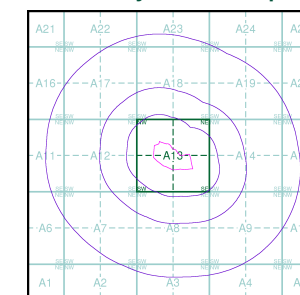
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

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



Order Details

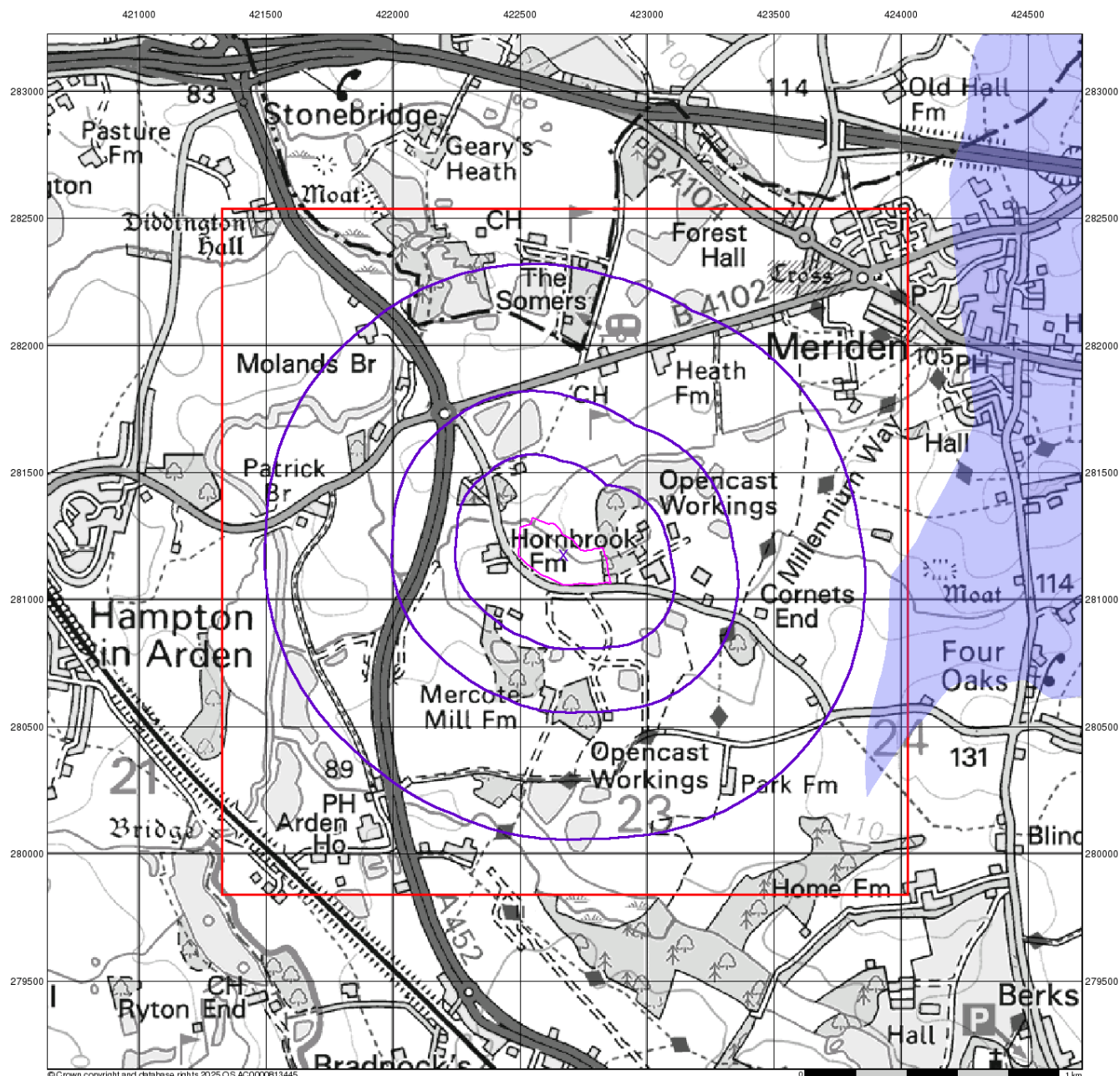
Order Number: 391714463_1_1
 Customer Ref: fc37351
 National Grid Reference: 422670, 281180
 Slice: A
 Site Area (Ha): 5.92
 Search Buffer (m): 1000

Site Details

Site at 422676,281189

Landmark[®]
 LANDMARK INFORMATION GROUP

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



© Crown copyright and database rights 2025 OS AC0000813445

Envirocheck[®]

LANDMARK INFORMATION GROUP[®]

Source Protection Zones

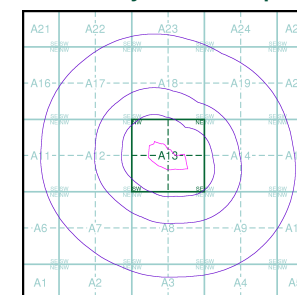
General

- ◊ Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- Slice
- B 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



Order Details

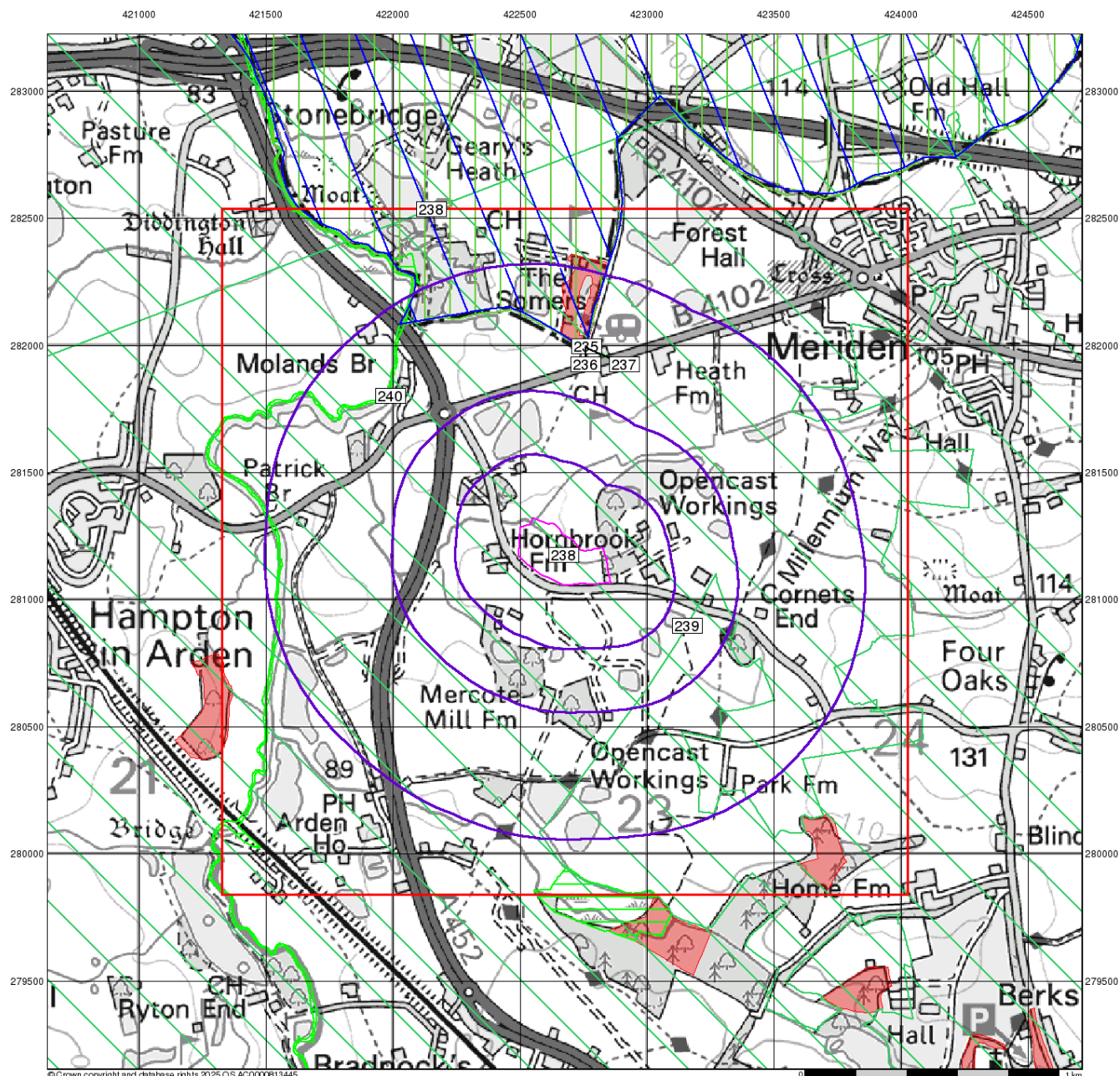
Order Number: 391714463_1_1
 Customer Ref: fc37351
 National Grid Reference: 422670, 281180
 Slice: A
 Site Area (Ha): 5.92
 Search Buffer (m): 1000

Site Details

Site at 422676, 281189

Landmark[®]
 LANDMARK INFORMATION GROUP

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



© Crown copyright and database rights 2025 OS AC0000813445

Envirocheck®

LANDMARK INFORMATION GROUP®

Sensitive Land Uses

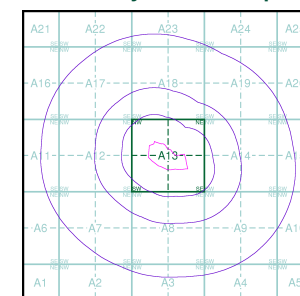
General

- 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



Order Details

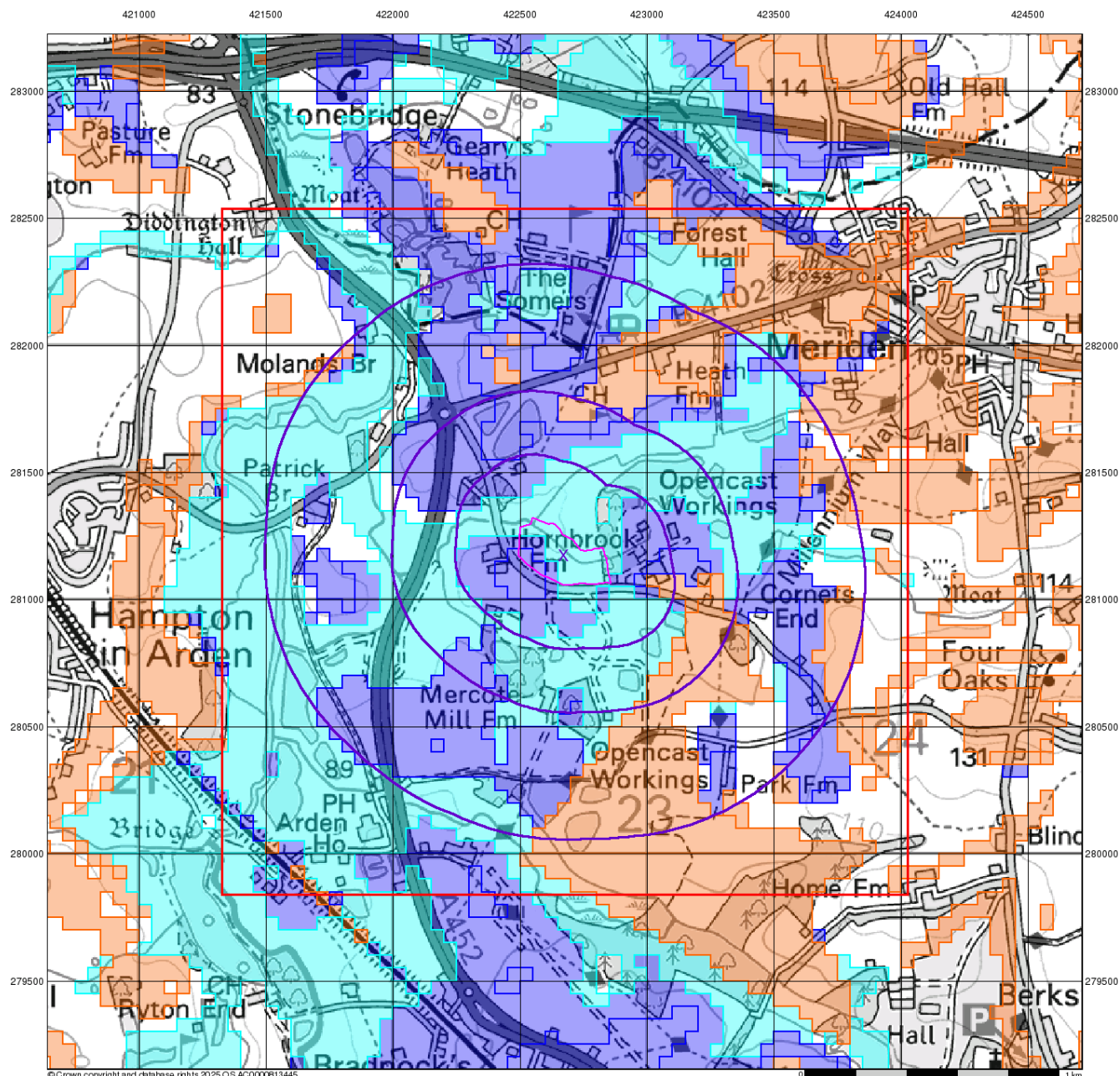
Order Number: 391714463_1_1
 Customer Ref: fc37351
 National Grid Reference: 422670, 281180
 Slice: A
 Site Area (Ha): 5.92
 Search Buffer (m): 1000

Site Details

Site at 422676, 281189

Landmark®
 INFORMATION GROUP

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



Envirocheck[®]

● LANDMARK INFORMATION GROUP[®]

BGS Flood GFS Data

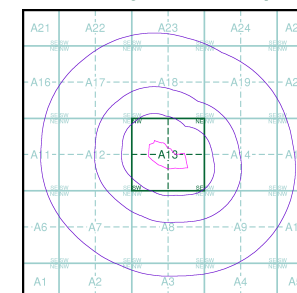
General

- ◆ Specified Site
- ◆ Specified Buffer(s)
- X 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



Order Details

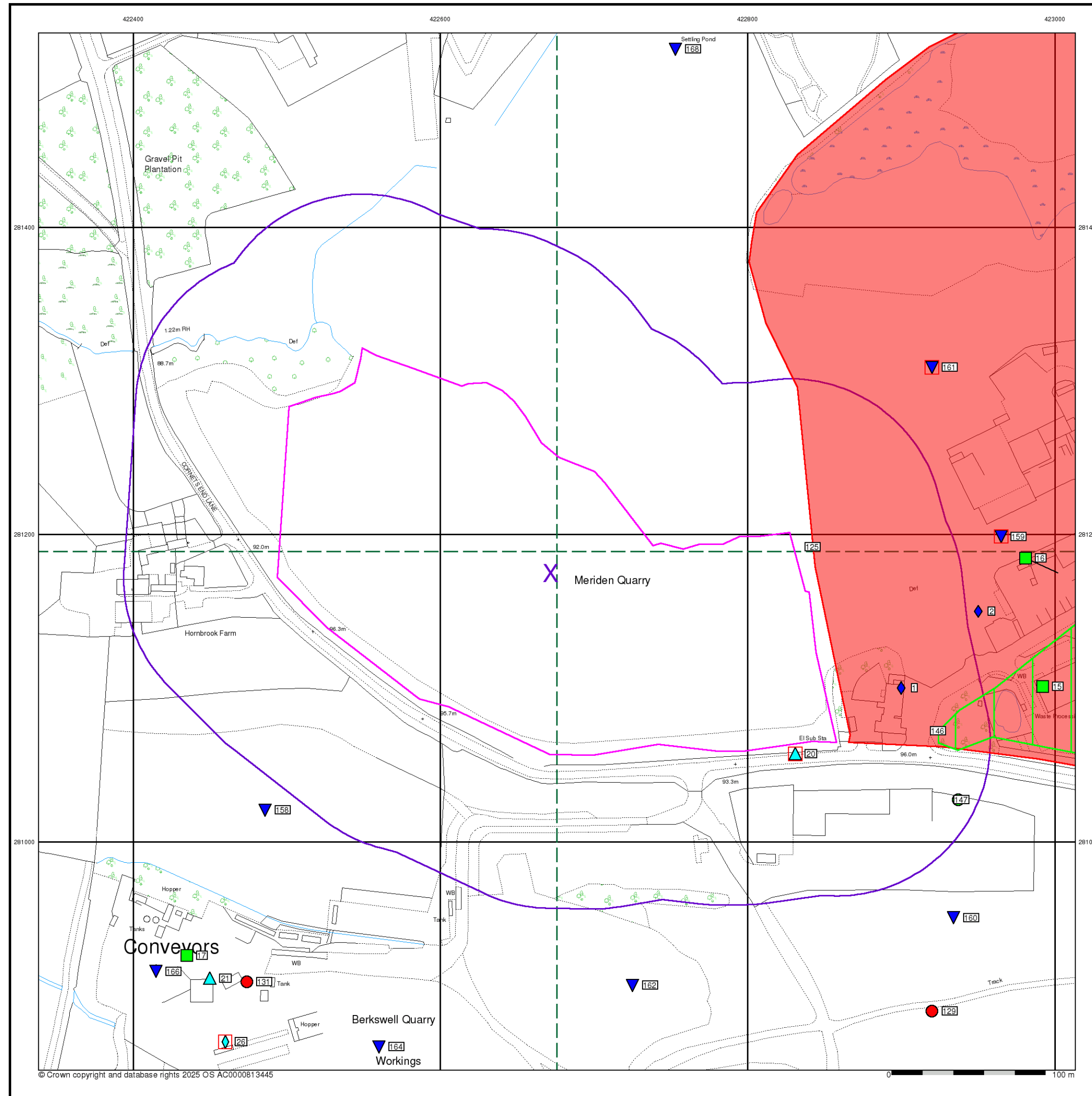
Order Number: 391714463_1_1
 Customer Ref: fc37351
 National Grid Reference: 422670, 281180
 Slice: A
 Site Area (Ha): 5.92
 Search Buffer (m): 1000

Site Details

Site at 422676, 281189

Landmark[®]
 ● LANDMARK INFORMATION GROUP

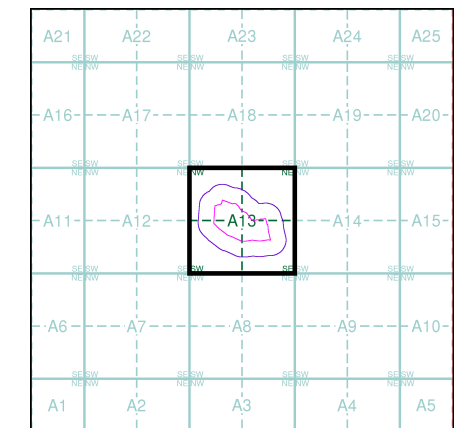
Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk



© Crown copyright and database rights 2025 OS AC0000813445

- ### General
- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Map ID
- ### 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 Enforcement
 - Pollution Incident to Controlled Waters
 - Historical Prosecutions
 - Prosecutions
 - Registered Radioactive Substance
 - River Network or Water Feature
 - Substantiated Pollution Incident Register
 - Water Abstraction
 - Water Industry Act Referral
- ### Waste
- BGS Recorded Landfill Site (Location)
 - BGS Recorded Landfill Site
 - EA Historic Landfill (Buffered Point)
 - EA Historic Landfill (Polygon)
 - Integrated Pollution Control Registered Waste Site
 - Licensed Waste Management Facility (Landfill Boundary)
 - Licensed Waste Management Facility (Location)
 - Local Authority Recorded Landfill Site (Location)
 - Local Authority Recorded Landfill Site
 - Potentially Infilled Land (Non-water)
 - Potentially Infilled Land (Non-water)
 - Potentially Infilled Land (Water)
 - Potentially Infilled Land (Water)
 - Potentially Infilled Land (Water)
 - Registered Landfill Site
 - Registered Landfill Site (Location)
 - Registered Landfill Site (Point Buffered to 100m)
 - Registered Landfill Site (Point Buffered to 250m)
 - Registered Waste Transfer Site (Location)
 - Registered Waste Transfer Site
 - Registered Waste Treatment or Disposal Site (Location)
 - Registered Waste Treatment or Disposal Site
- ### Hazardous Substances
- COMAH Site
 - Explosive Site
 - NIHHS Site
 - Planning Hazardous Substance Consent
 - Planning Hazardous Substance Enforcement
- ### Geological
- BGS Recorded Mineral Site

Site Sensitivity Map - Segment A13

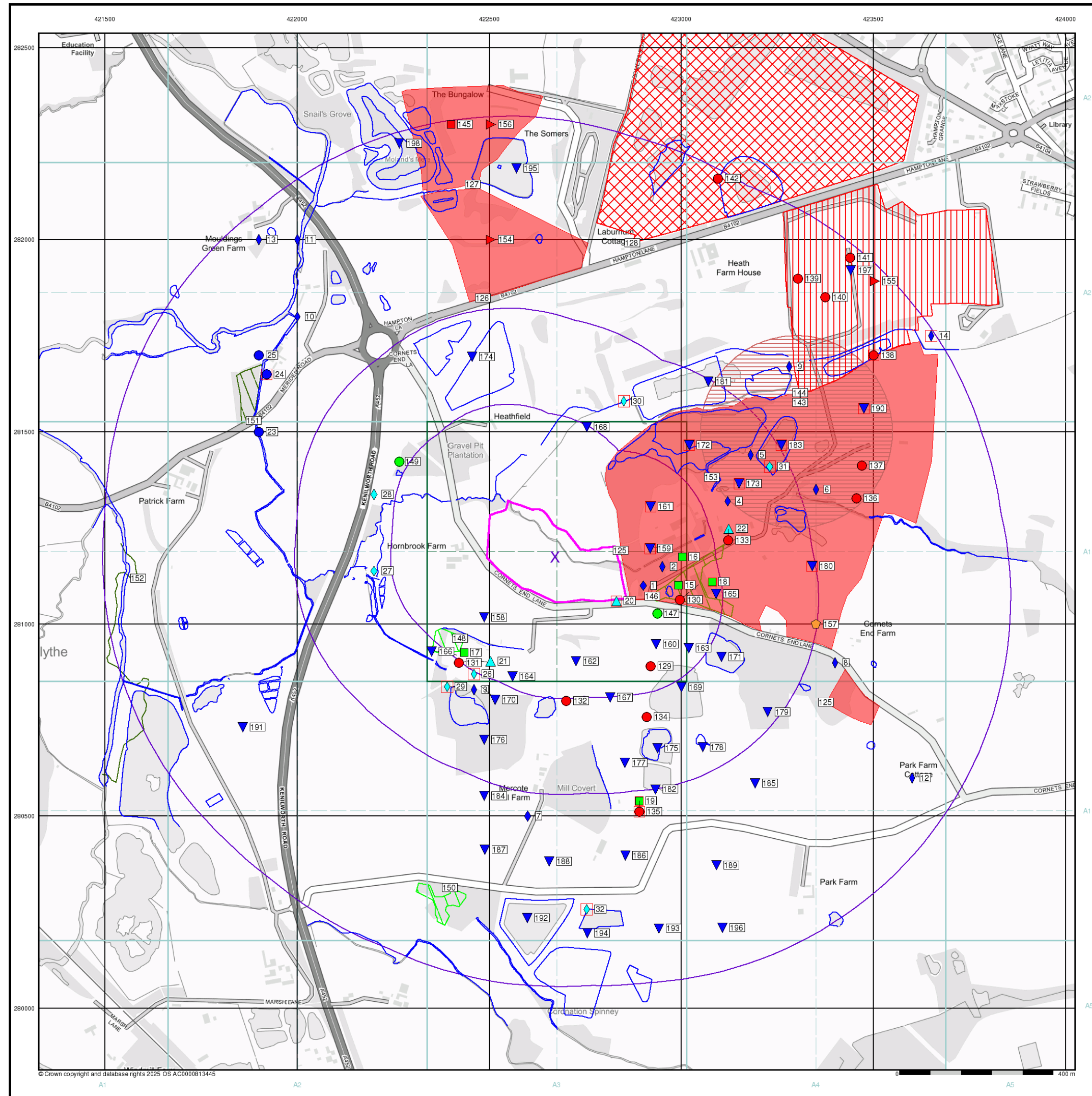


Order Details

Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Plot Buffer (m): 100

Site Details

Site at 422676,281189



© Crown copyright and database rights 2025 OS AC0000813445

Envirocheck®

LANDMARK INFORMATION GROUP®

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
- Historical Prosecutions
- Prosecutions
- Registered Radioactive Substance
- River Network or Water Feature
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Waste

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

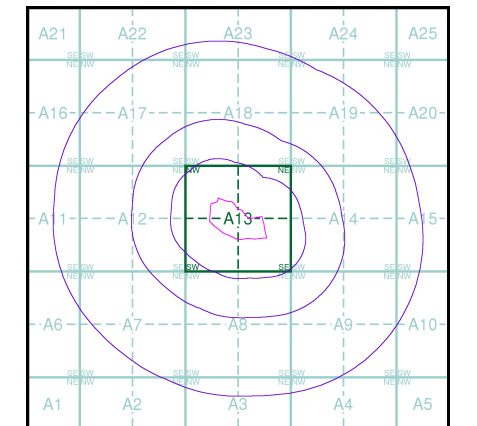
Hazardous Substances

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

Geological

- BGS Recorded Mineral Site

Site Sensitivity Map - Slice A



Order Details

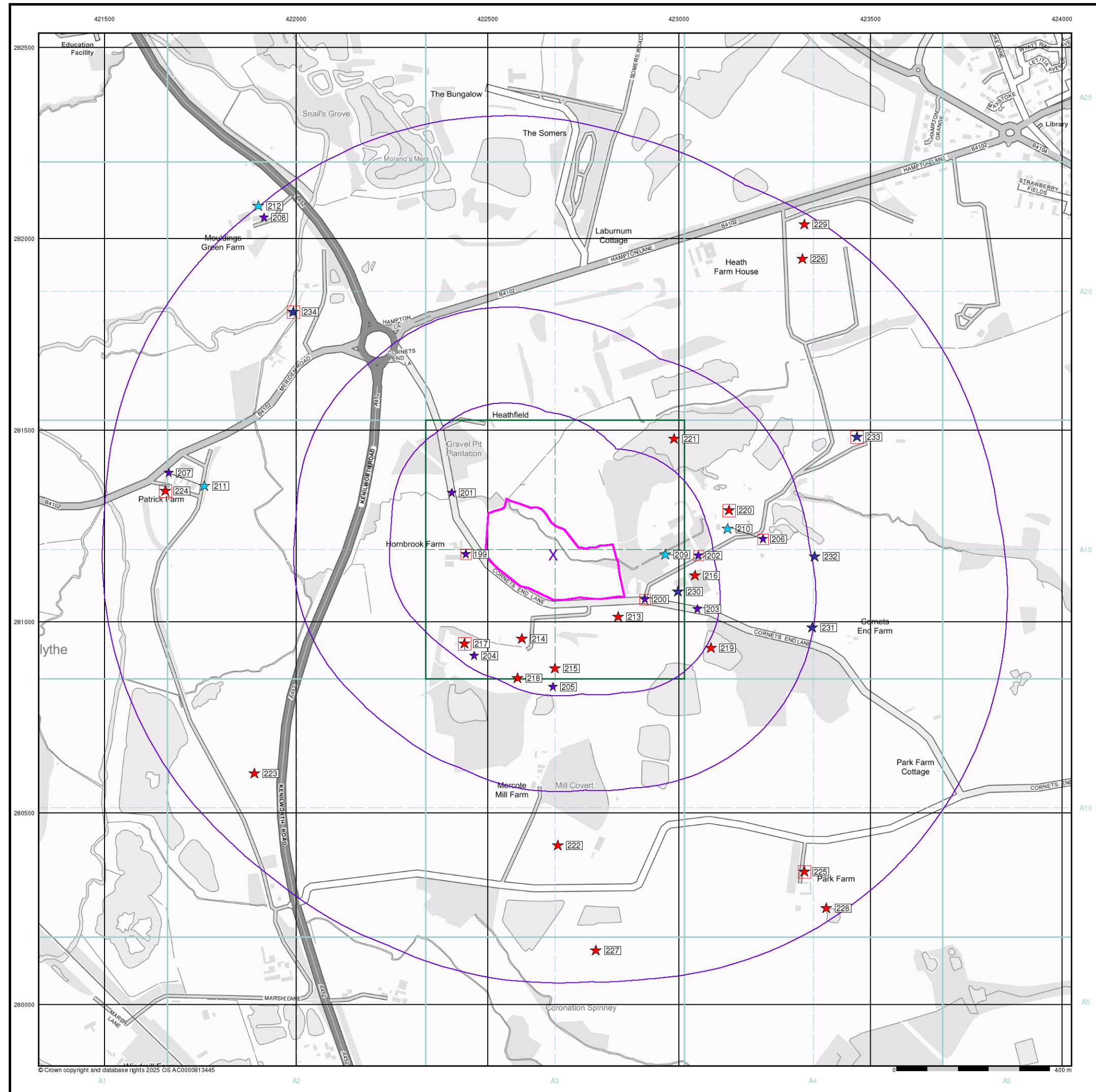
Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 1000

Site Details

Site at 422676,281189

Landmark®
INFORMATION GROUP

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



Envirocheck®

● LANDMARK INFORMATION GROUP®

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
- ★ Points of Interest - Commercial Services
- ★ Points of Interest - Education and Health
- ★ Points of Interest - Manufacturing and Production
- ★ Points of Interest - Public Infrastructure
- ★ Points of Interest - Recreational and Environmental
- Underground Electrical Cables

Industrial Land Use Map - Slice A

Order Details

Order Number:	391714463_1_1
Customer Ref:	fc37351
National Grid Reference:	422670, 281180
Slice:	A
Site Area (Ha):	5.92
Search Buffer (m):	1000

Site Details

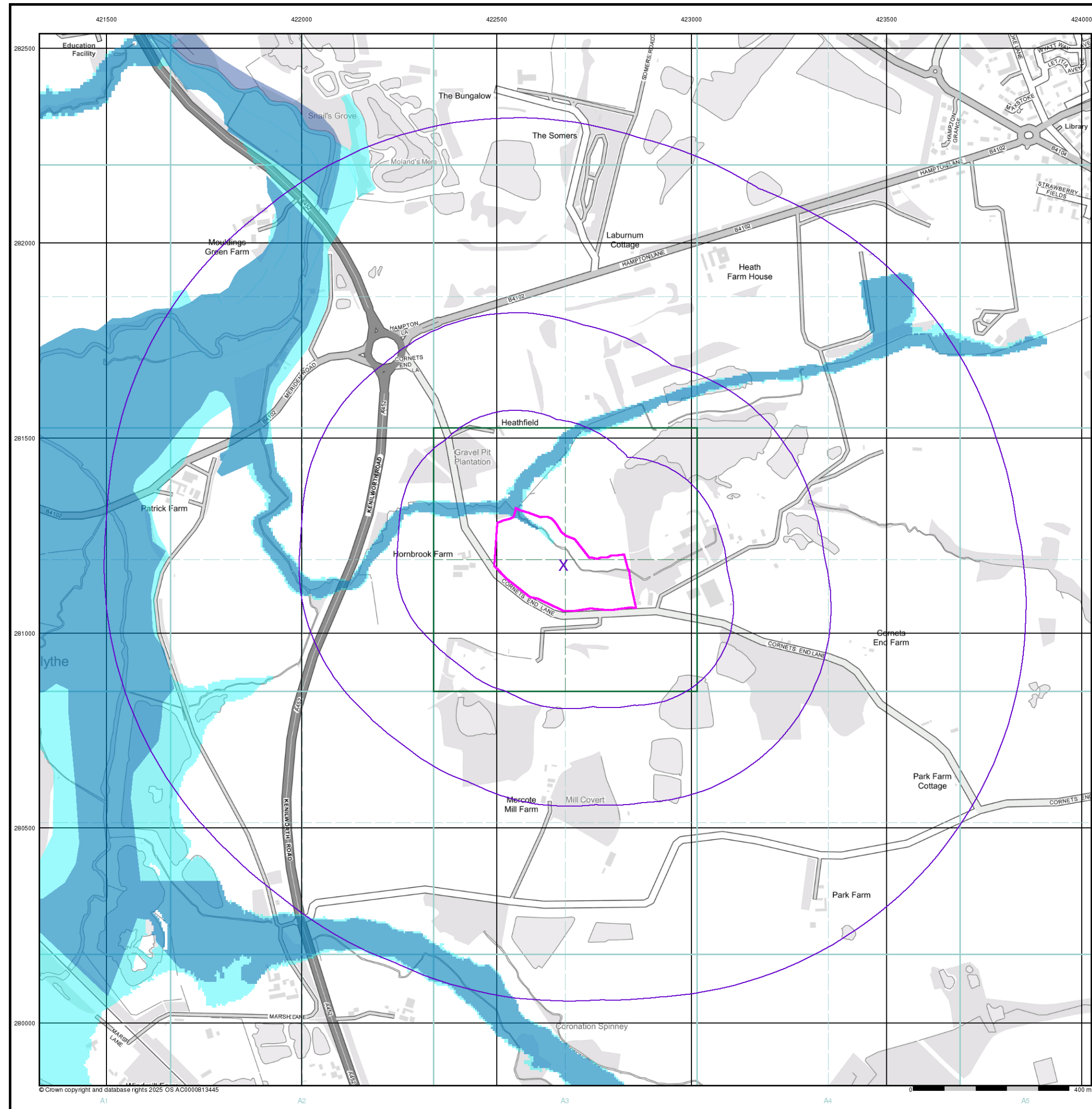
Site at 422676,281189

Landmark®

● INFORMATION GROUP

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

A Landmark Information Group Service v50.0 08-Dec-2025 Page 2 of 7



© Crown copyright and database rights 2025 OS AC0000813445

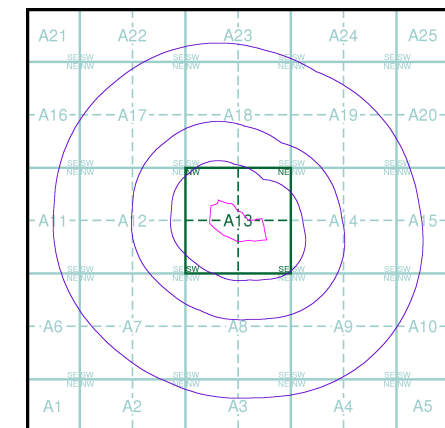
General

- 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

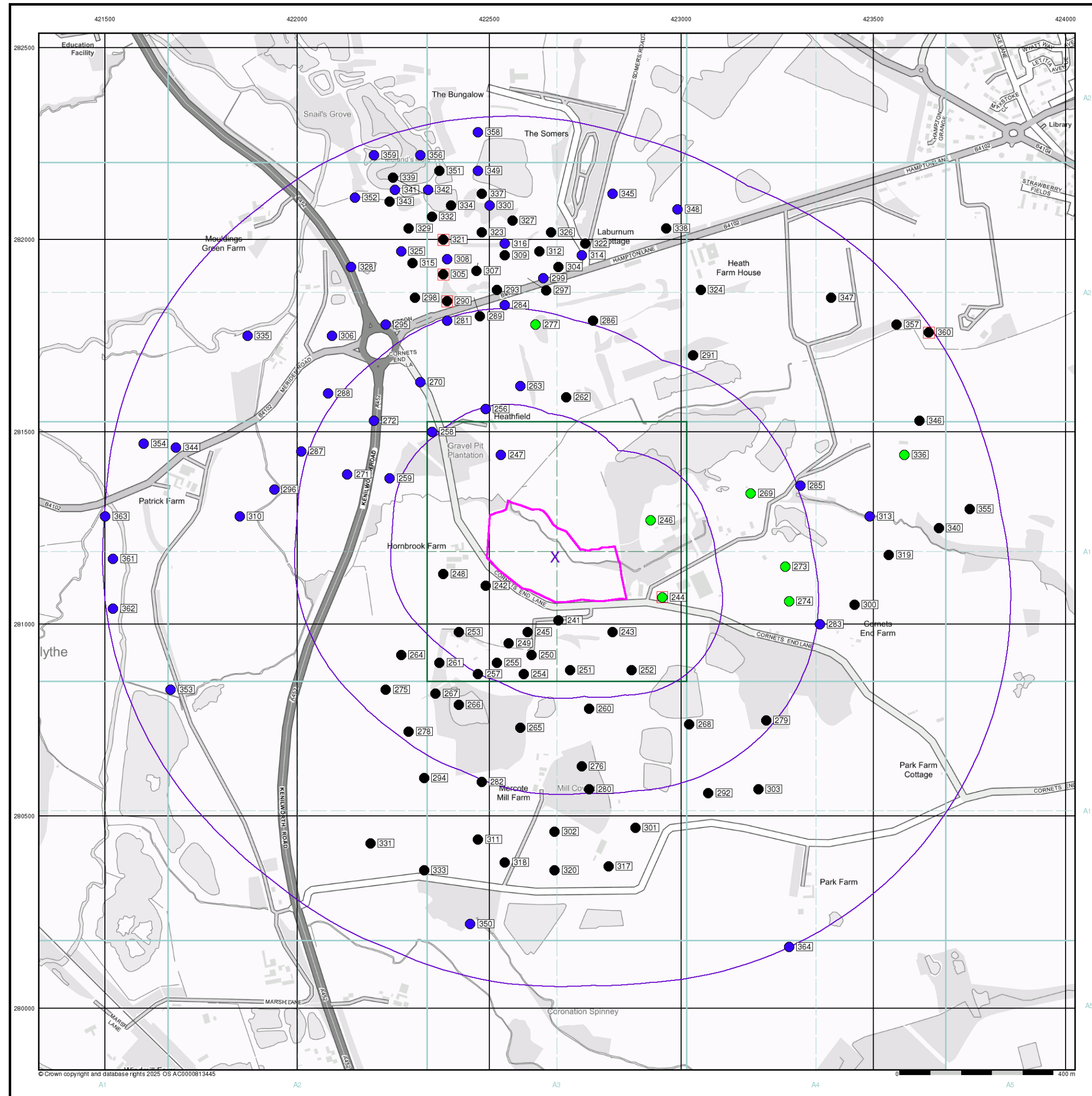


Order Details

Order Number: 391714463_1_1
 Customer Ref: fc37351
 National Grid Reference: 422670, 281180
 Slice: A
 Site Area (Ha): 5.92
 Search Buffer (m): 1000

Site Details

Site at 422676,281189



© Crown copyright and database rights 2025 OS AC0000813445

General

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

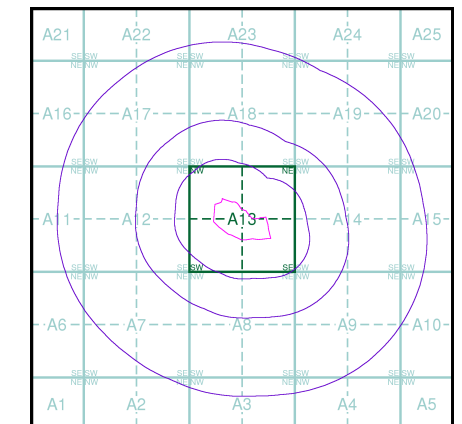
Agency and Hydrological (Boreholes)

- 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

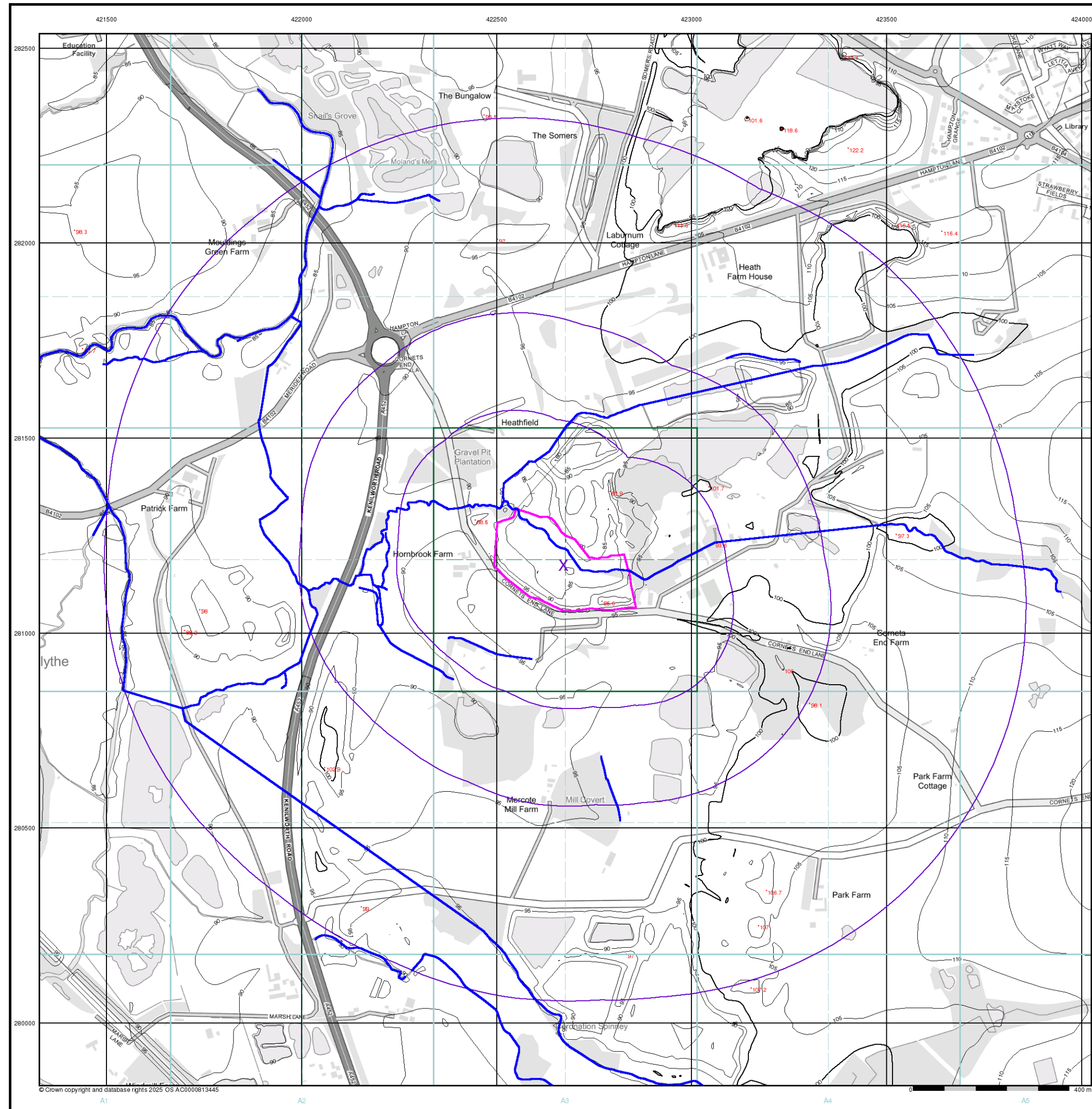


Order Details

Order Number: 391714463_1_1
 Customer Ref: fc37351
 National Grid Reference: 422670, 281180
 Slice: A
 Site Area (Ha): 5.92
 Search Buffer (m): 1000

Site Details

Site at 422676,281189



© Crown copyright and database rights 2025 OS AC0000813445

Envirocheck®

LANDMARK INFORMATION GROUP®

General

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

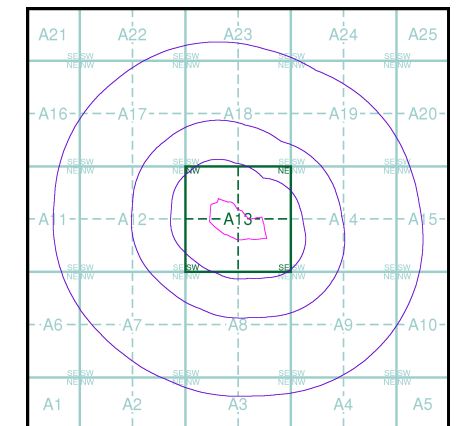
OS Water Network Data

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

Contours (height in meters)

- | | | | | | |
|------------------|-------|-----|----|-----|-----------------|
| Standard Contour | 105 | 100 | 95 | MLW | Mean Low Water |
| Master Contour | 105 | 100 | 95 | MHW | Mean High Water |
| Spot Height | 167.3 | | | | |

OS Water Network Map - Slice A



Order Details

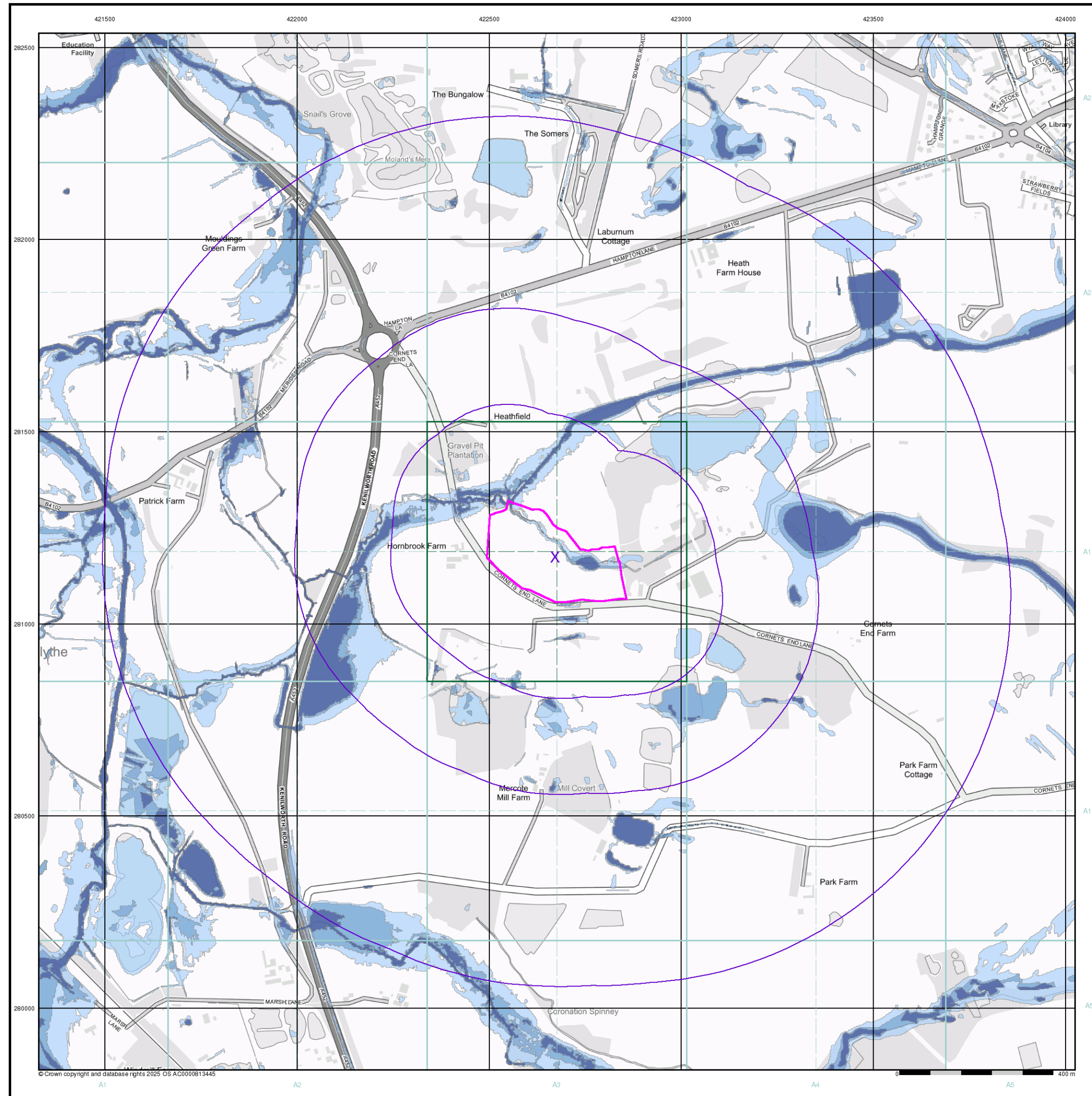
Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 1000

Site Details

Site at 422676,281189

Landmark®
INFORMATION GROUP

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



© Crown copyright and database rights 2025 OS AC0000813445

General

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

Risk of Flooding from Surface Water

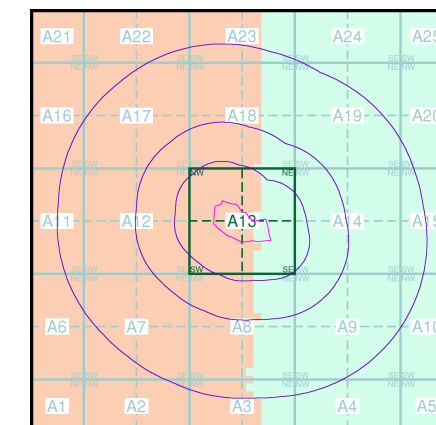
- High - 30 Year Return
- Medium - 100 Year Return
- Low - 1000 Year Return

Suitability

See the suitability map below

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

E/NRW Suitability Map - Slice A



Order Details

Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 1000

Site Details

Site at 422676,281189



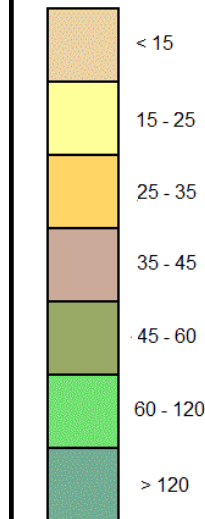
© Crown copyright and database rights 2025 OS AC0000813445

General

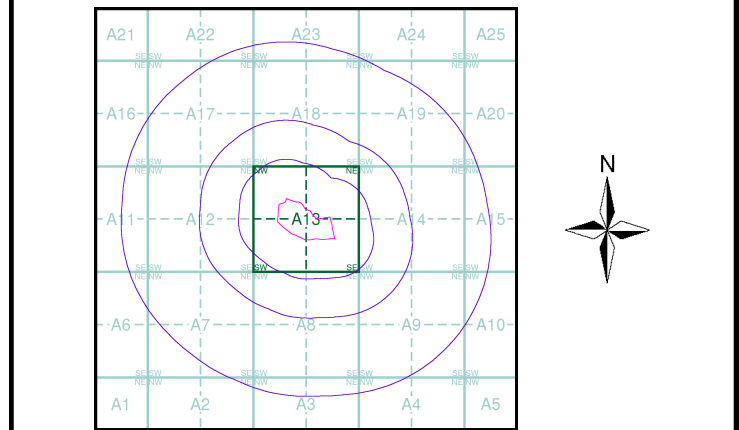
📍 Specified Site 📏 Specified Buffer(s) ✕ Bearing Reference Point

Estimated Soil Chemistry Arsenic

Arsenic Concentrations mg/kg



Estimated Soil Chemistry Arsenic - Slice A

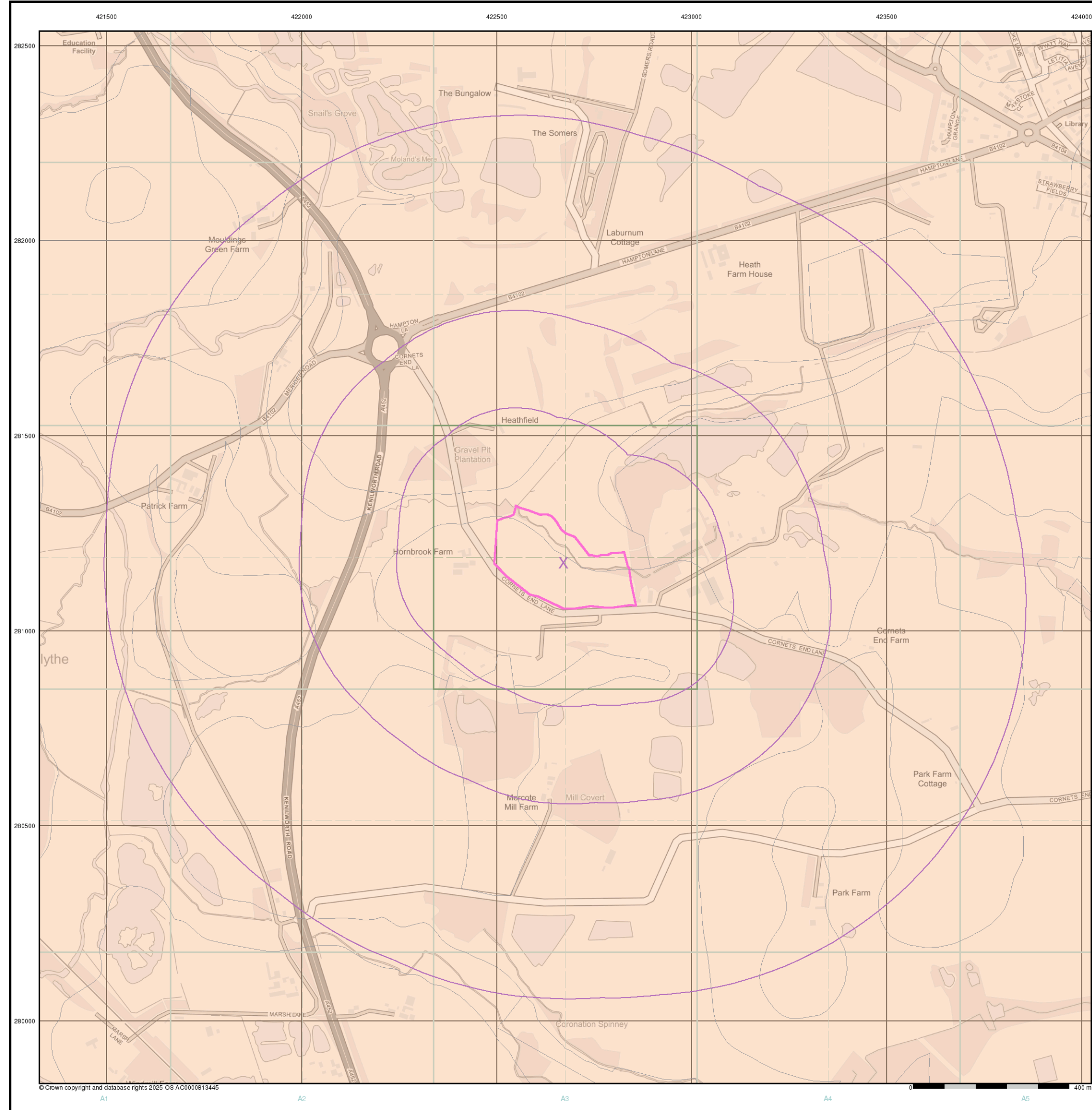


Order Details

Order Details: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 1000

Site Details

Site at 422676,281189



Envirocheck[®]

● LANDMARK INFORMATION GROUP[®]

General

📍 Specified Site 📄 Specified Buffer(s) ✕ Bearing Reference Point

Estimated Soil Chemistry Lead

Lead Concentrations mg/kg

Orange	<100 mg/kg
Green	100 - 200
Purple	200 - 300
Brown	300 - 600
Blue	600 - 1200
Cyan	>1200

Estimated Soil Chemistry Lead - Slice A

Order Details

Order Details:	391714463_1_1
Customer Ref:	fc37351
National Grid Reference:	422670, 281180
Slice:	A
Site Area (Ha):	5.92
Search Buffer (m):	1000

Site Details

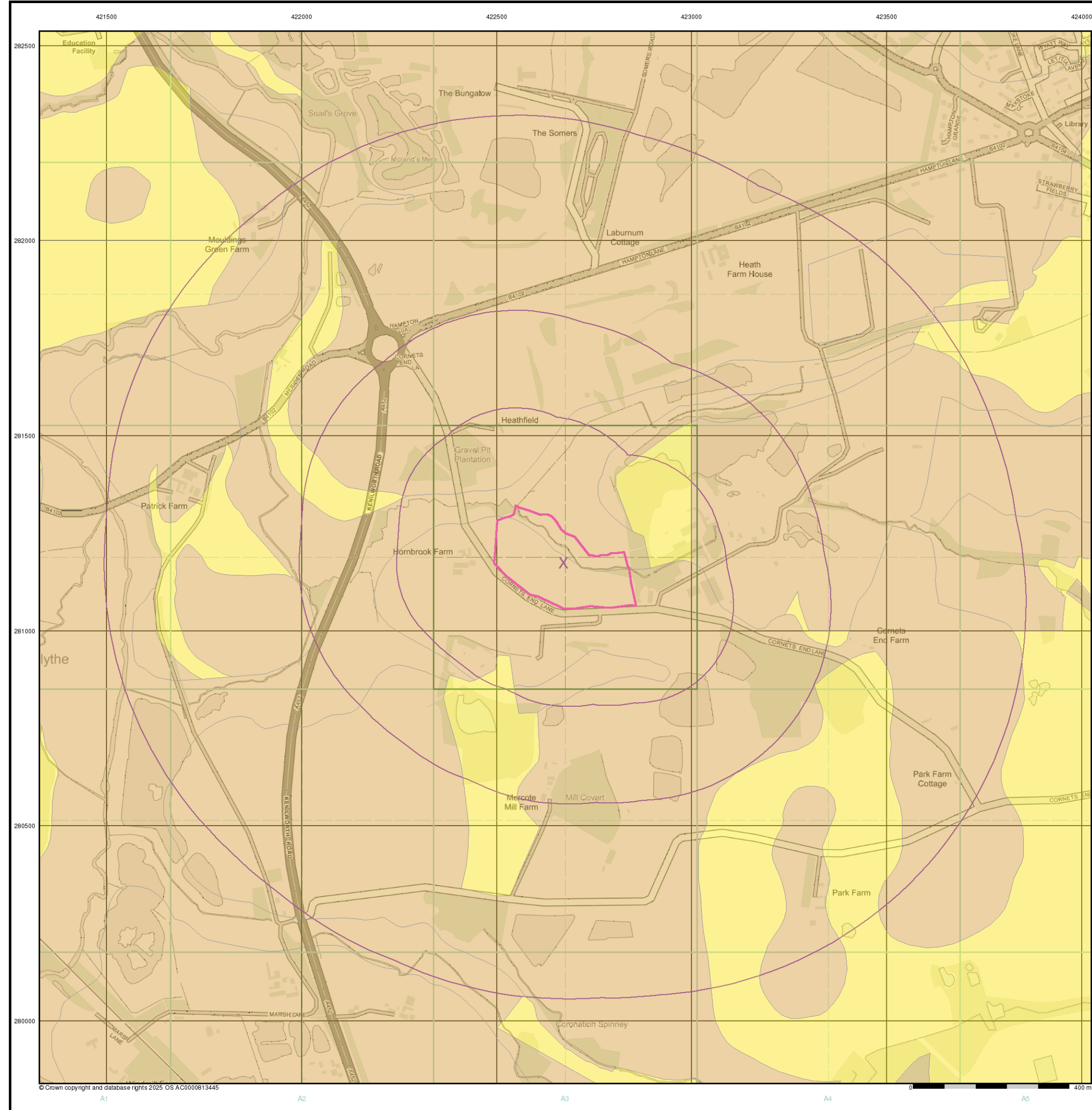
Site at 422676,281189

Landmark[®]

● INFORMATION GROUP

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

A Landmark Information Group Service v50.0 08-Dec-2025 Page 4 of 5



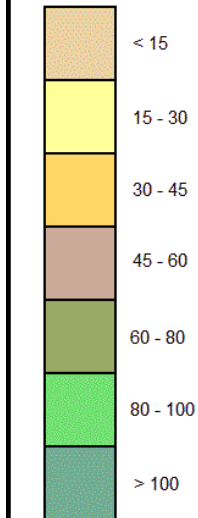
© Crown copyright and database rights 2025 OS AC0000813445

General

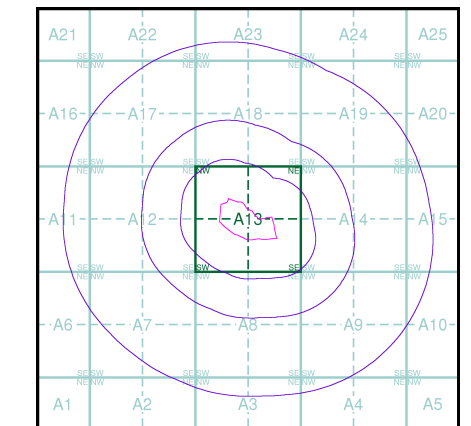
📍 Specified Site 📏 Specified Buffer(s) ✕ Bearing Reference Point

Estimated Soil Chemistry Nickel

Nickel Concentrations mg/kg



Estimated Soil Chemistry Nickel - Slice A

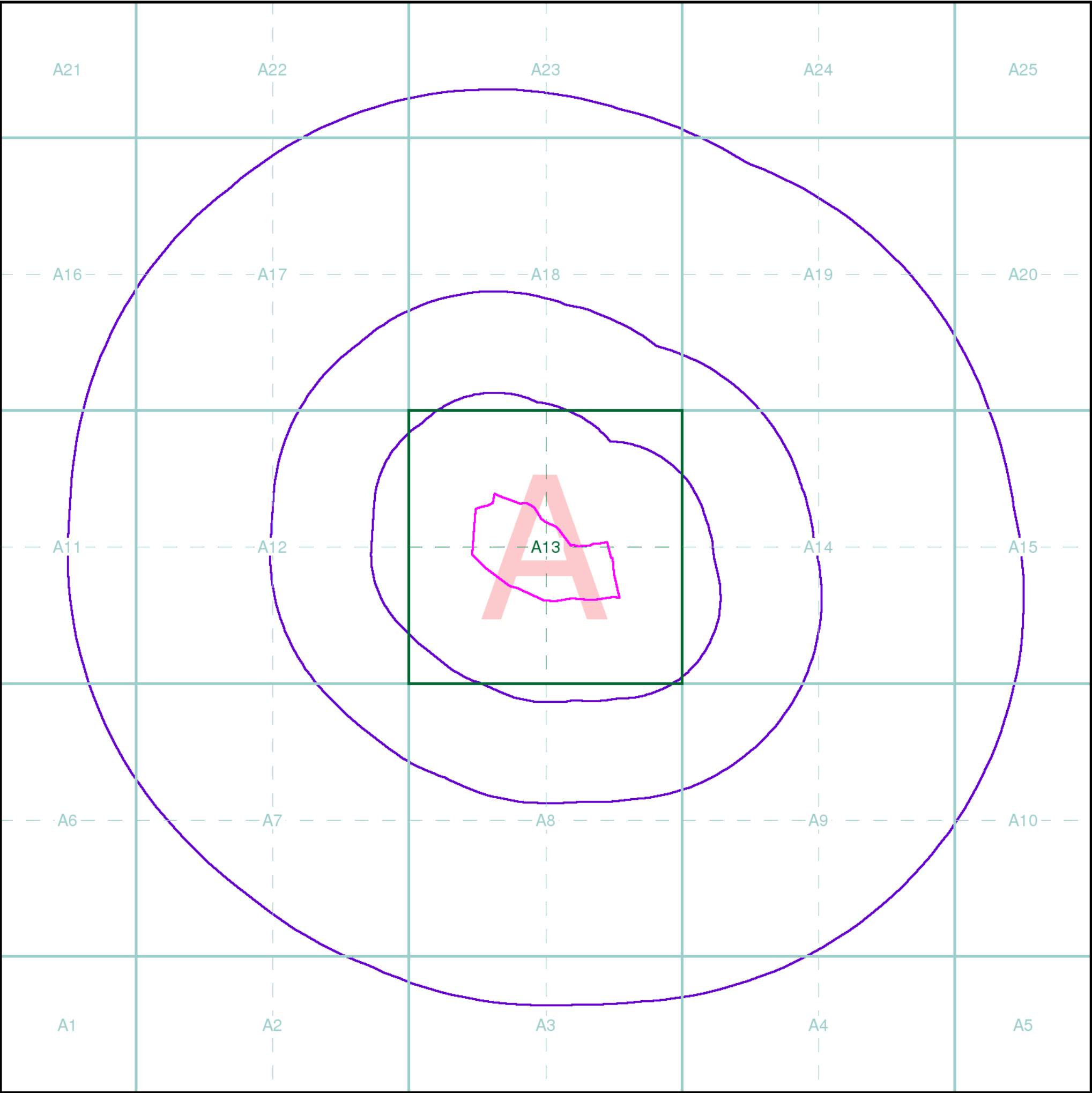


Order Details

Order Details: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 1000

Site Details

Site at 422676,281189



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

Mr S Firth, Firth Consultants Ltd, 37 Nutgrove Avenue, Bristol, BS3 4QF

Order Details

Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422660, 281170
Site Area (Ha): 5.92
Search Buffer (m): 1000

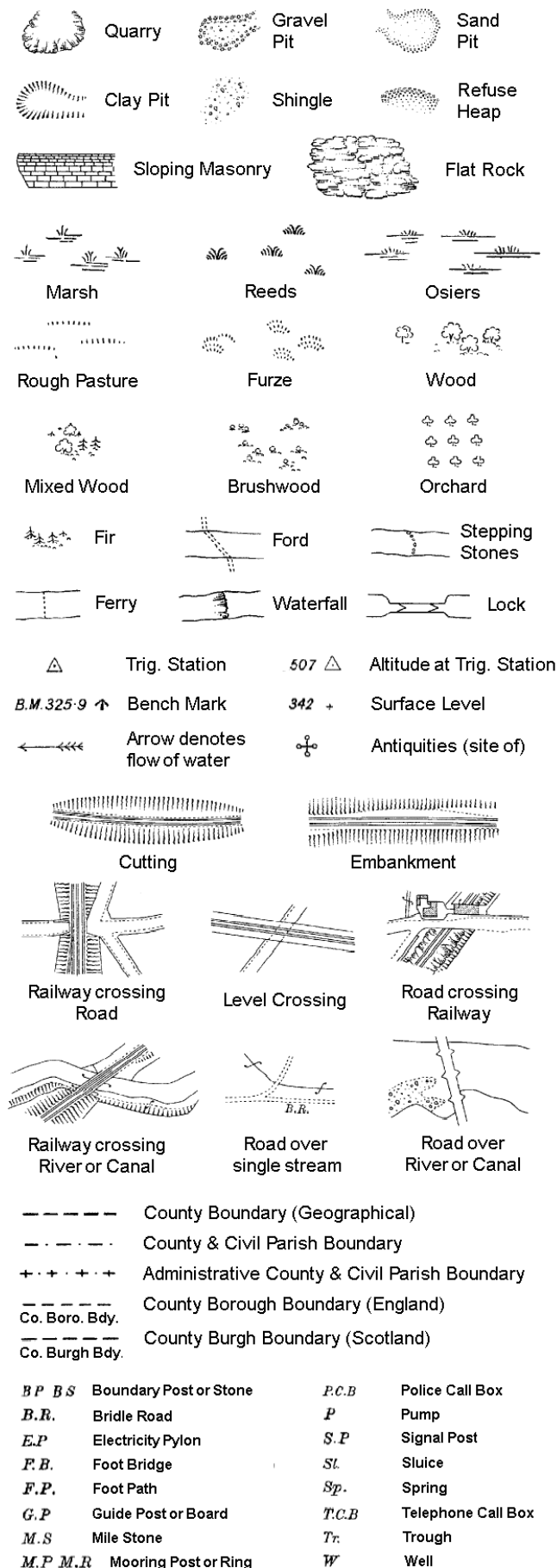
Site Details

Site at 422676,281189

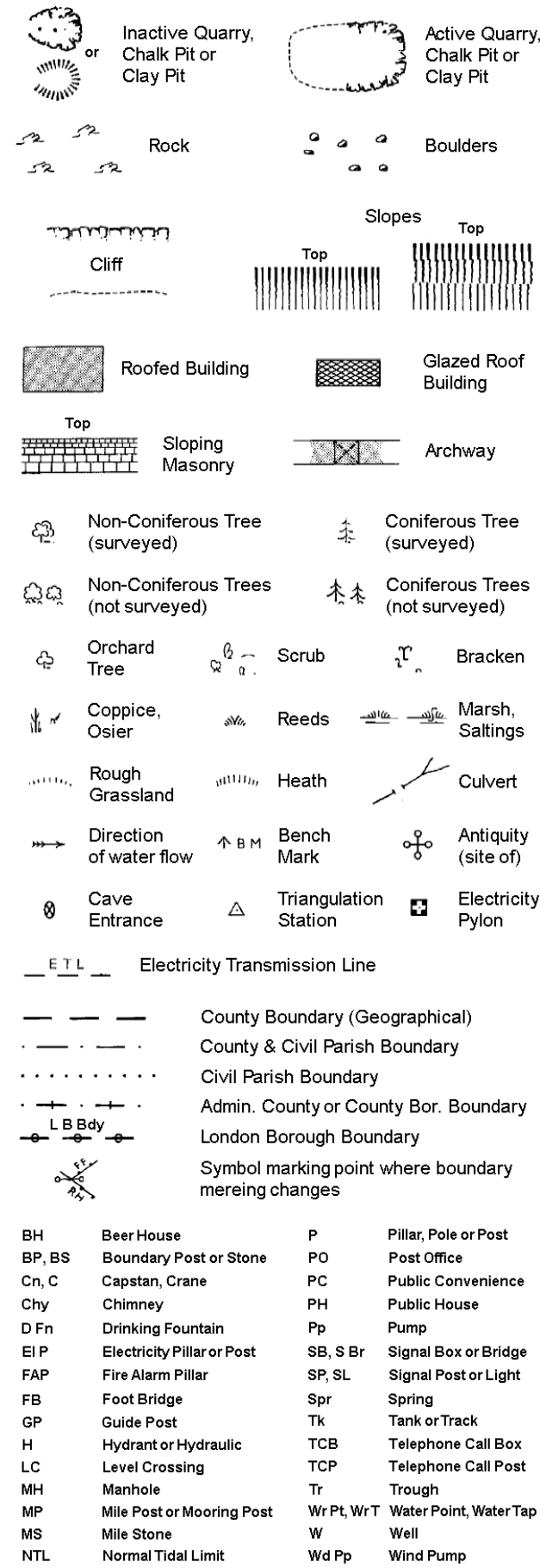
Full Terms and Conditions can be found on the following link:
<http://www.landmarkinfo.co.uk/Terms/Show/515>

Historical Mapping Legends

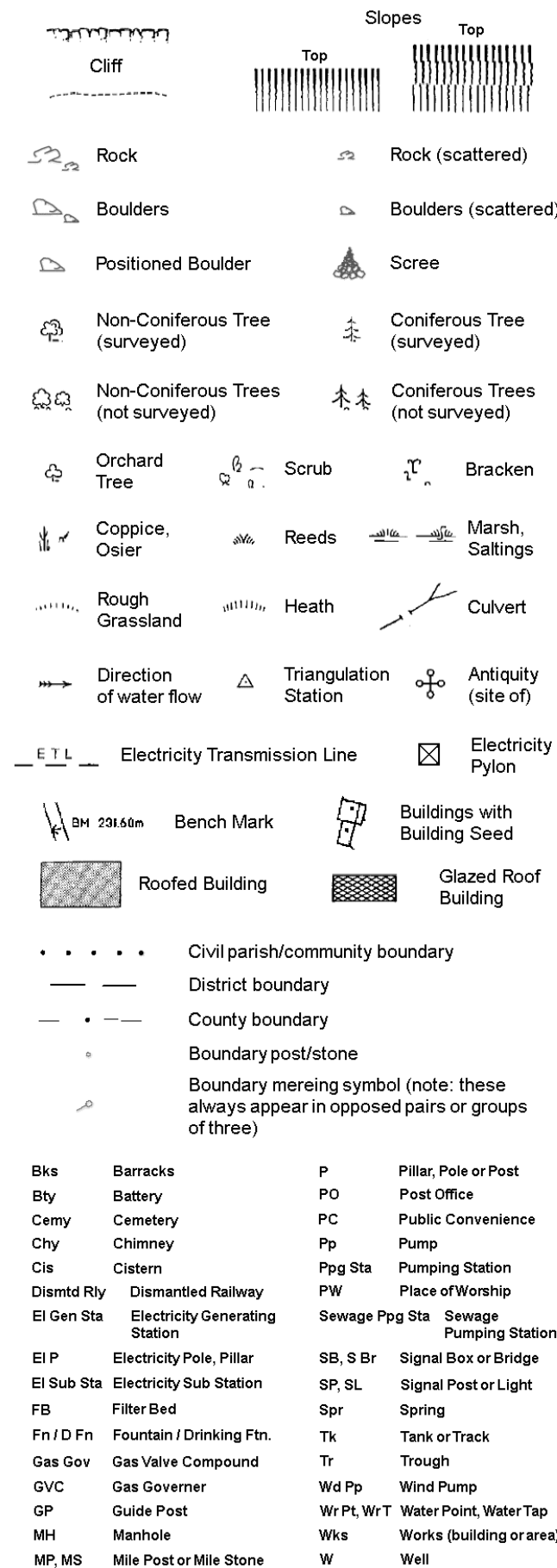
Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



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



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



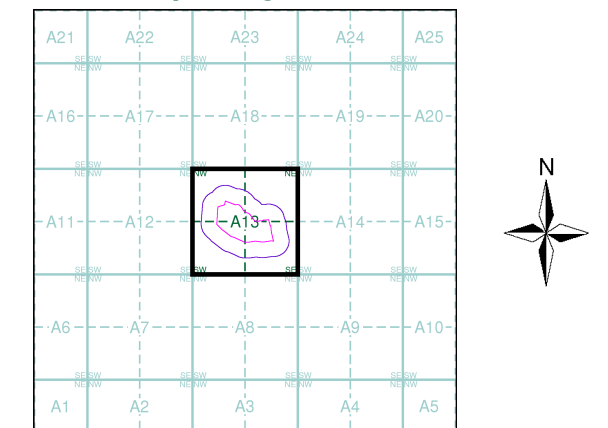
Envirocheck®

LANDMARK INFORMATION GROUP®

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Warwickshire	1:2,500	1887 - 1888	2
Warwickshire	1:2,500	1904	3
Warwickshire	1:2,500	1937	4
Ordnance Survey Plan	1:2,500	1954 - 1955	5
Ordnance Survey Plan	1:2,500	1962	6
Additional SIMs	1:2,500	1978 - 1981	7
Large-Scale National Grid Data	1:2,500	1992	8
Large-Scale National Grid Data	1:2,500	1992 - 1993	9
Historical Aerial Photography	1:2,500	1999	10

Historical Map - Segment A13



Order Details

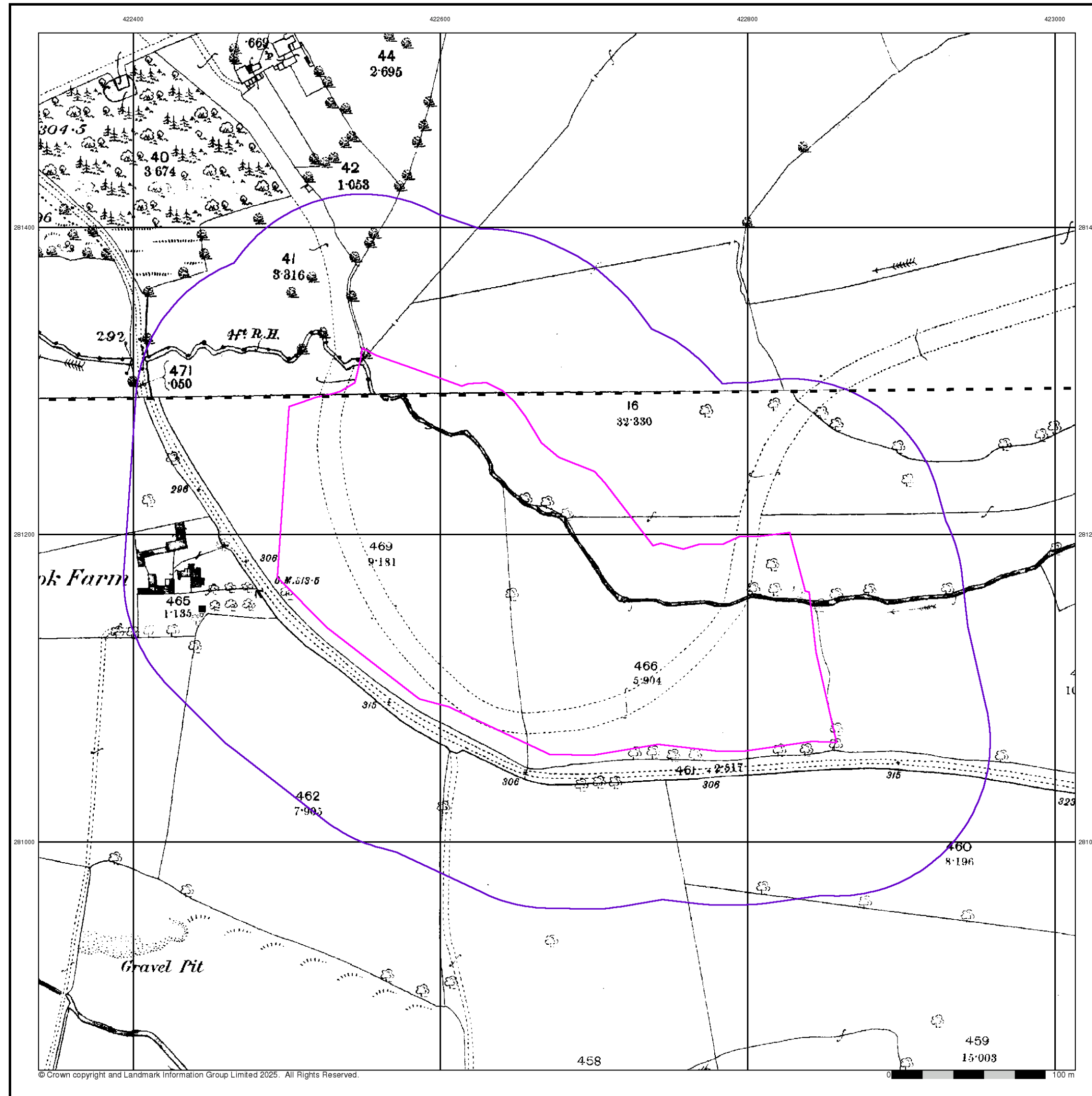
Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 100

Site Details

Site at 422676,281189

Landmark®
INFORMATION GROUP

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



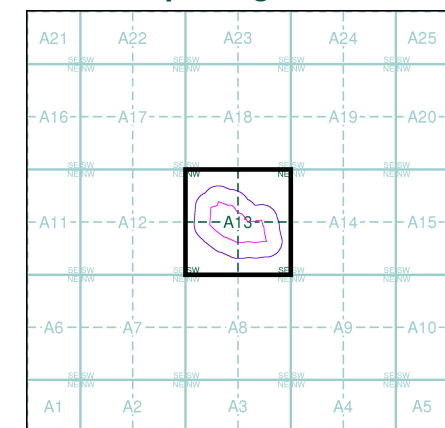
Warwickshire
Published 1887 - 1888
Source map scale - 1:2,500

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)

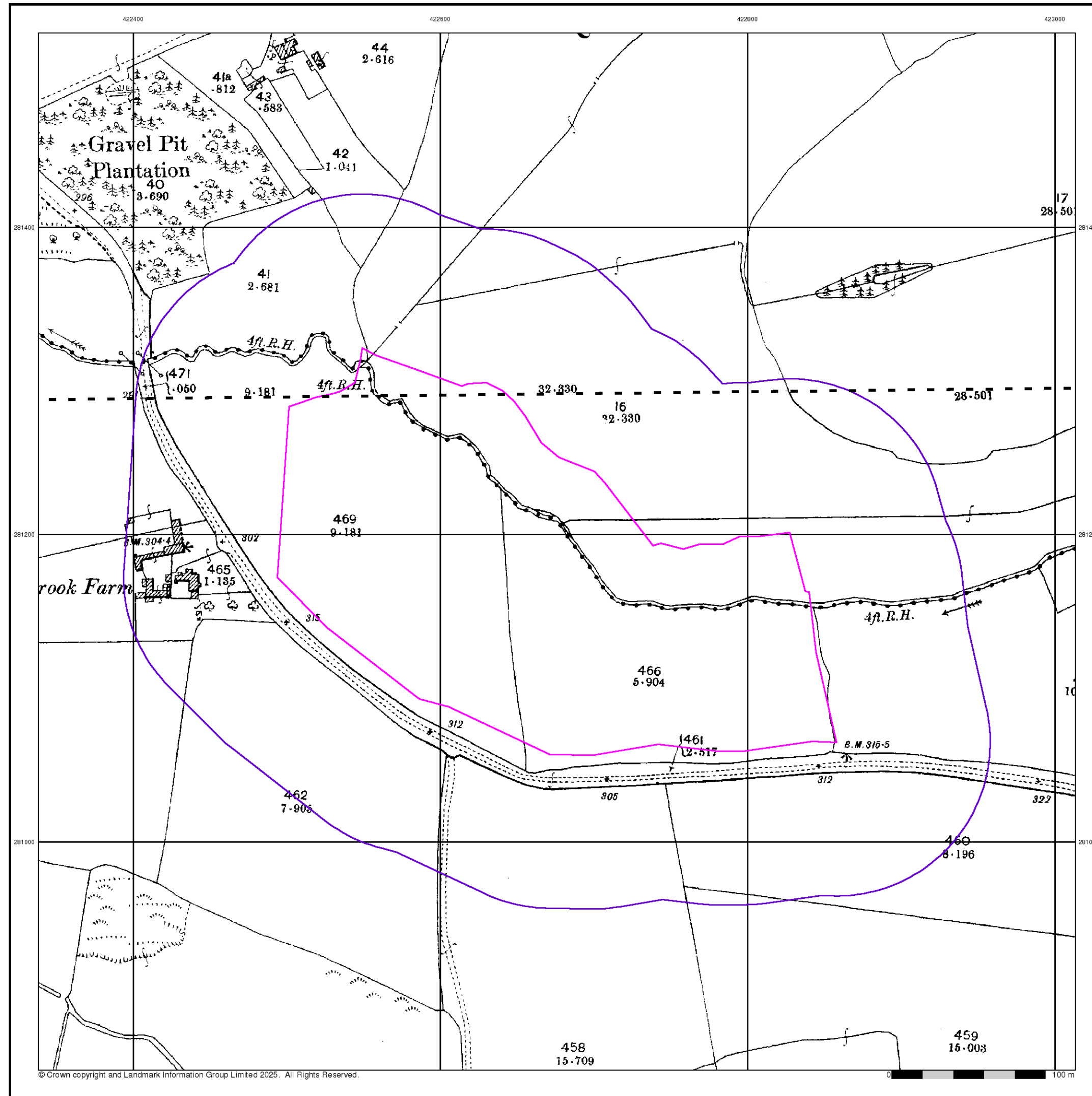
020_03
1888
1:2,500
020_07
1887
1:2,500

Historical Map - Segment A13



Order Details
Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 100

Site Details
Site at 422676,281189



Warwickshire

Published 1904

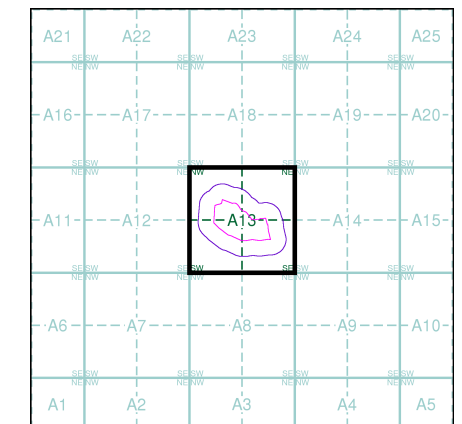
Source map scale - 1:2,500

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)

020_03
1904
1:2,500
020_07
1904
1:2,500

Historical Map - Segment A13

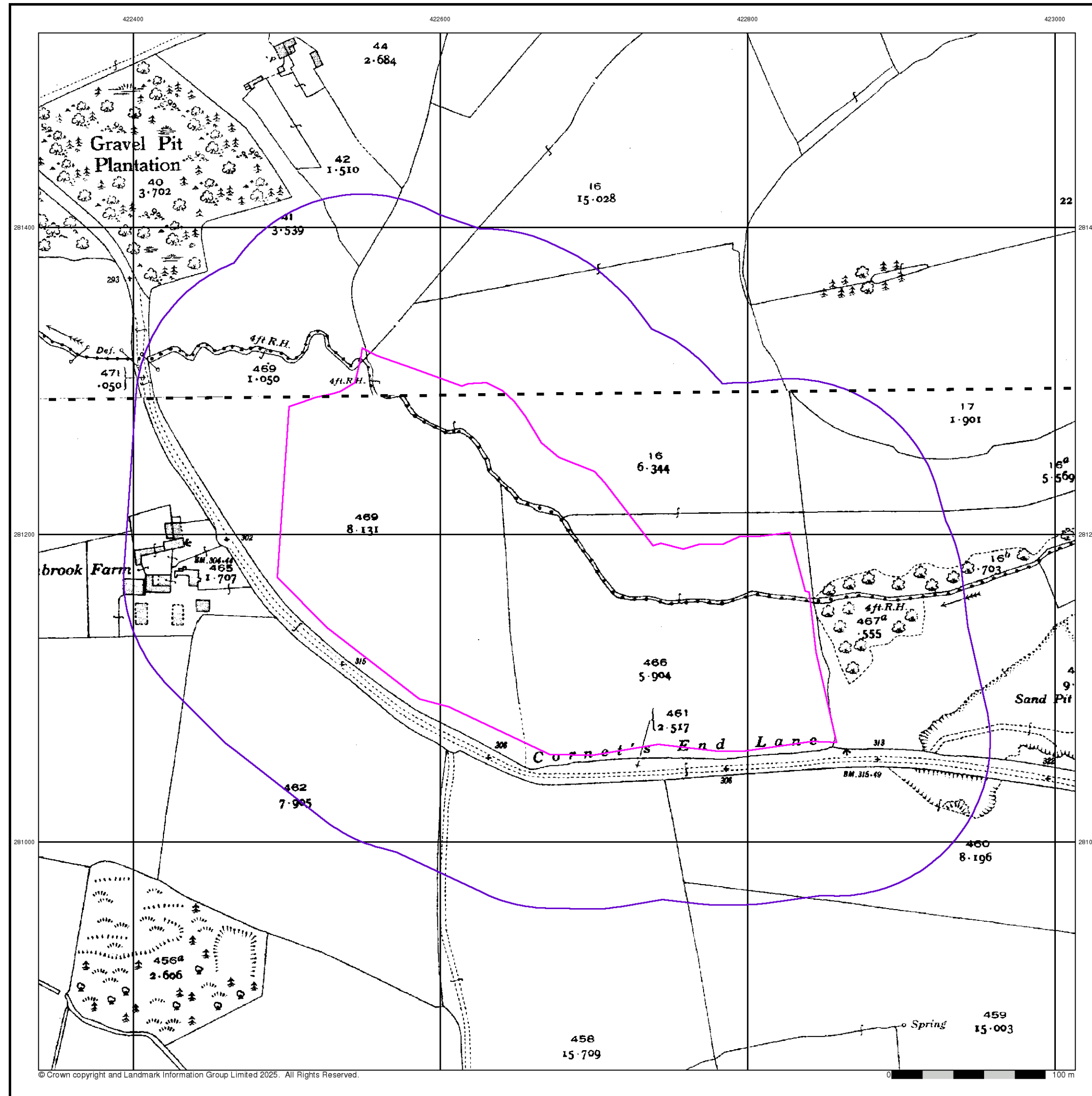


Order Details

Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 100

Site Details

Site at 422676,281189



© Crown copyright and Landmark Information Group Limited 2025. All Rights Reserved.

Envirocheck®

LANDMARK INFORMATION GROUP®

Warwickshire

Published 1937

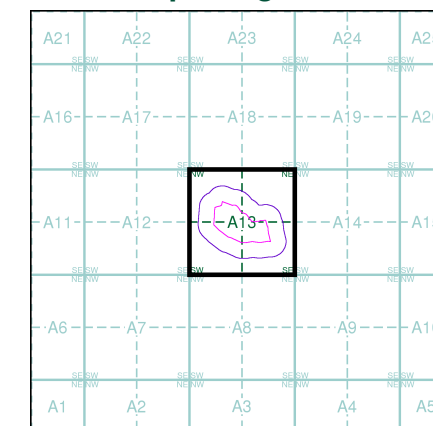
Source map scale - 1:2,500

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)

020_03
1937
1:2,500
020_07
1937
1:2,500

Historical Map - Segment A13



Order Details

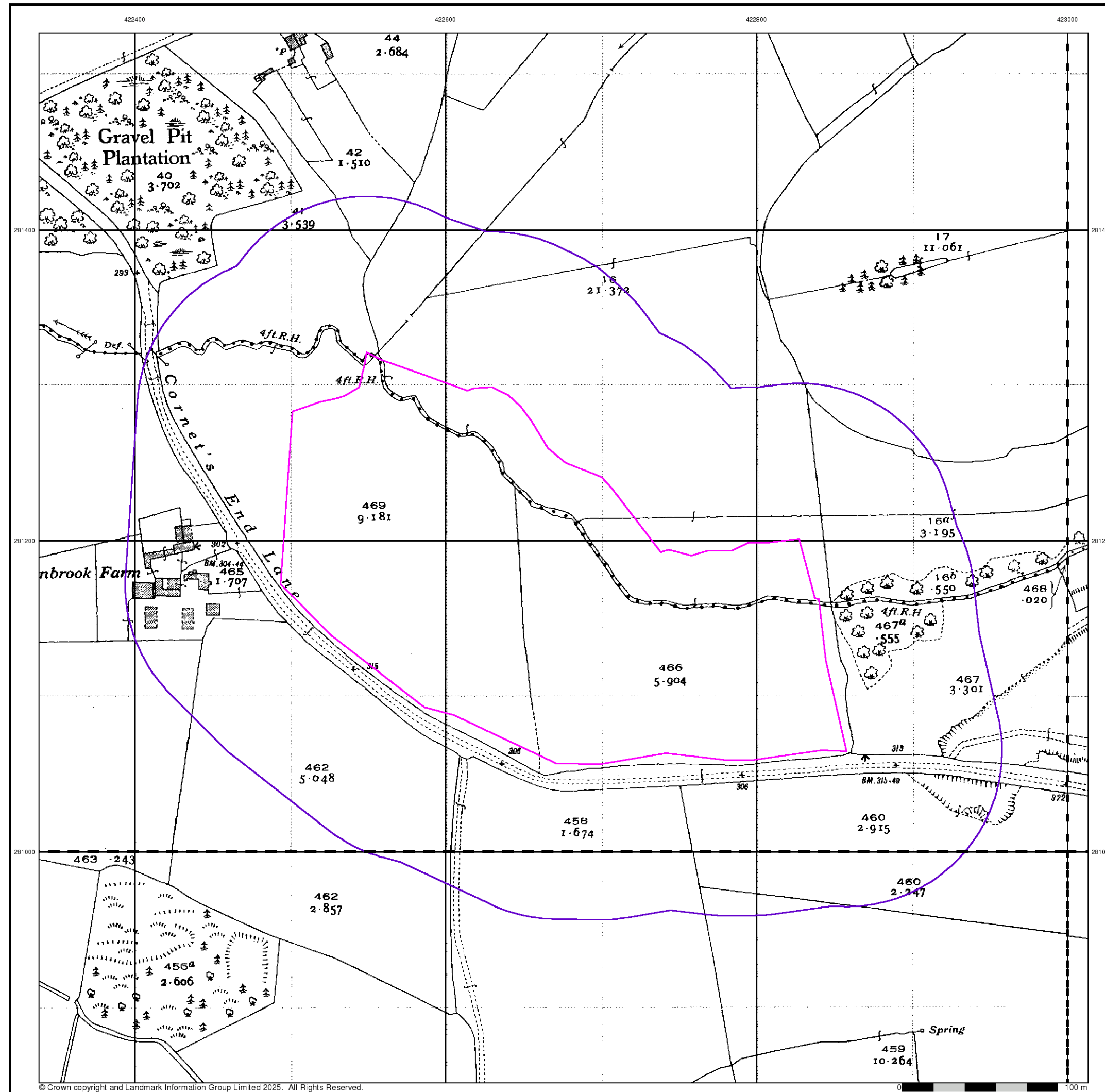
Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 100

Site Details

Site at 422676,281189

Landmark®
INFORMATION GROUP

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



© Crown copyright and Landmark Information Group Limited 2025. All Rights Reserved.

Ordnance Survey Plan

Published 1954 - 1955

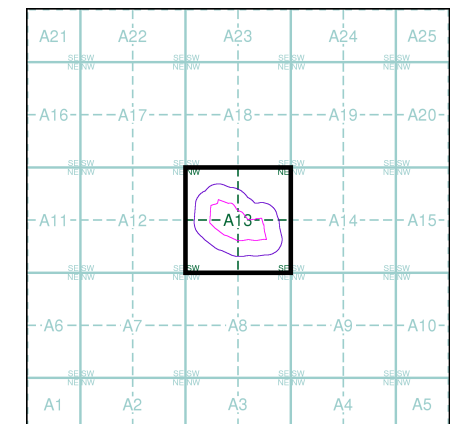
Source map scale - 1:2,500

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)

SP2281 1955 12,500	SP2381 1954 12,500
SP2280 1955 12,500	SP2380 1955 12,500

Historical Map - Segment A13

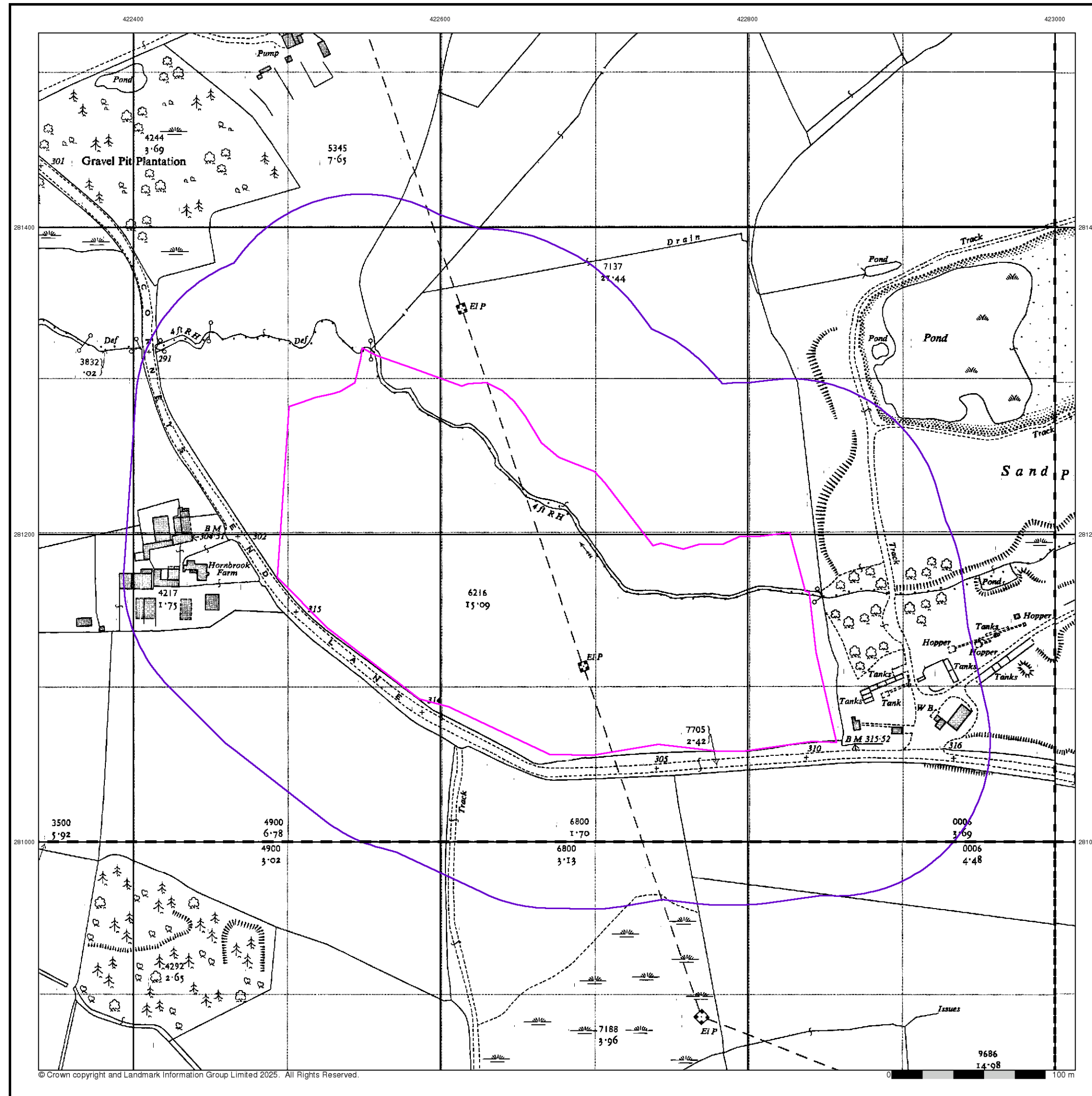


Order Details

Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 100

Site Details

Site at 422676,281189



© Crown copyright and Landmark Information Group Limited 2025. All Rights Reserved.

Envirocheck®

LANDMARK INFORMATION GROUP®

Ordnance Survey Plan

Published 1962

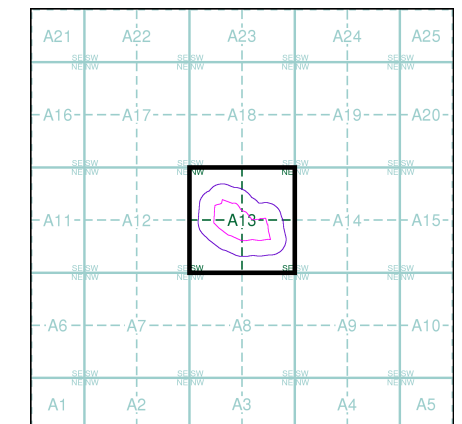
Source map scale - 1:2,500

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)

SP2281 1962 12,500	SP2381 1962 12,500
SP2280 1962 12,500	SP2380 1962 12,500

Historical Map - Segment A13



Order Details

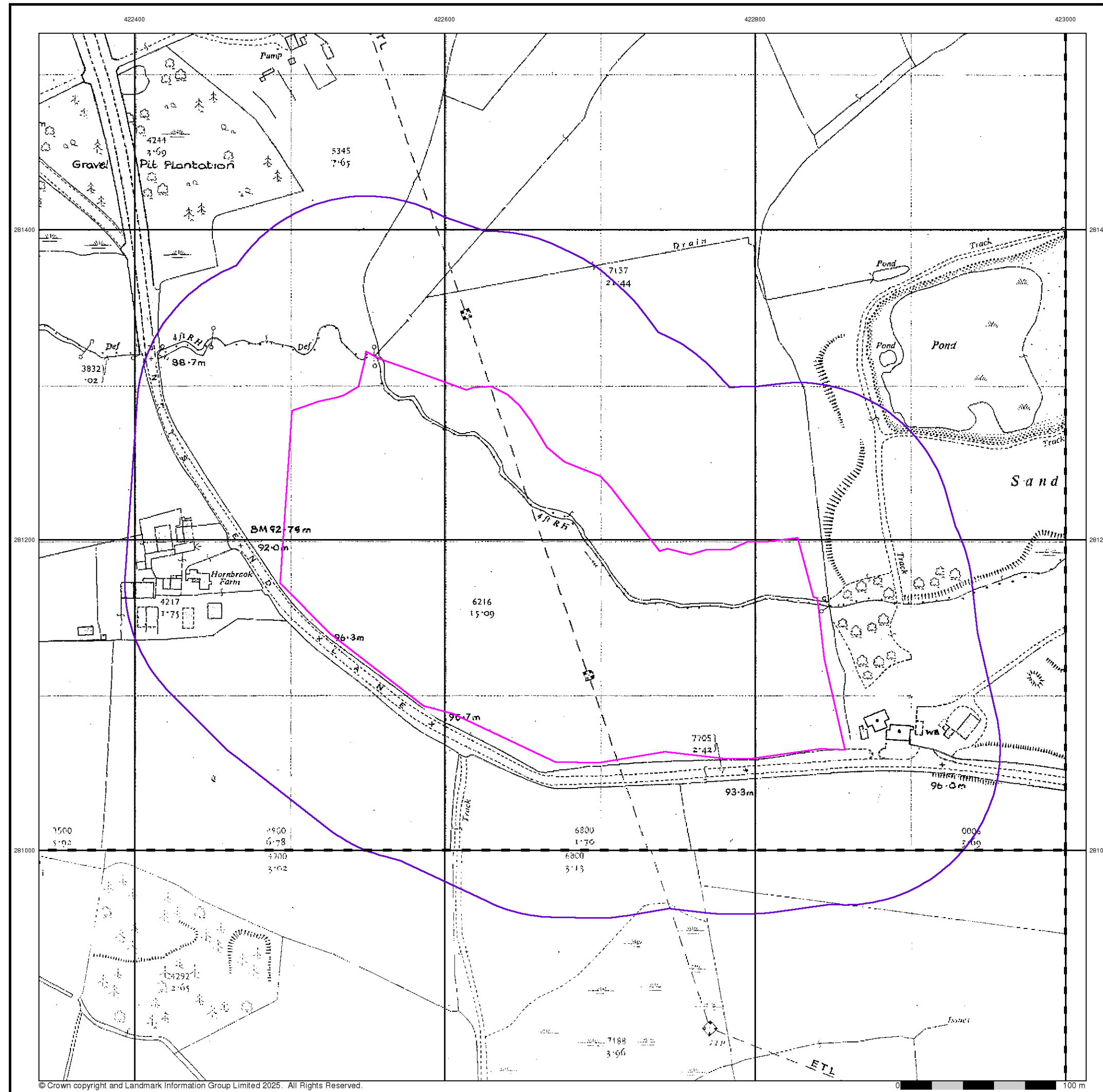
Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 100

Site Details

Site at 422676,281189

Landmark®
INFORMATION GROUP

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



Additional SIMs

Published 1978 - 1981

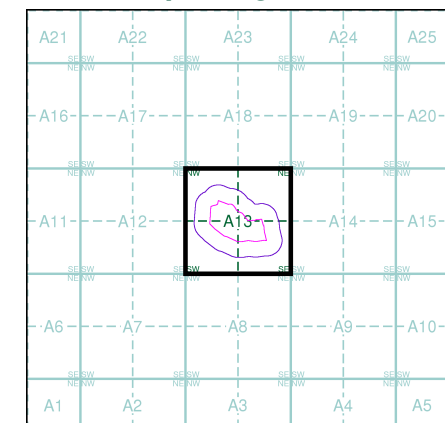
Source map scale - 1:2,500

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)

SP2281	1978	1:2,500
SP2280	1981	1:2,500

Historical Map - Segment A13

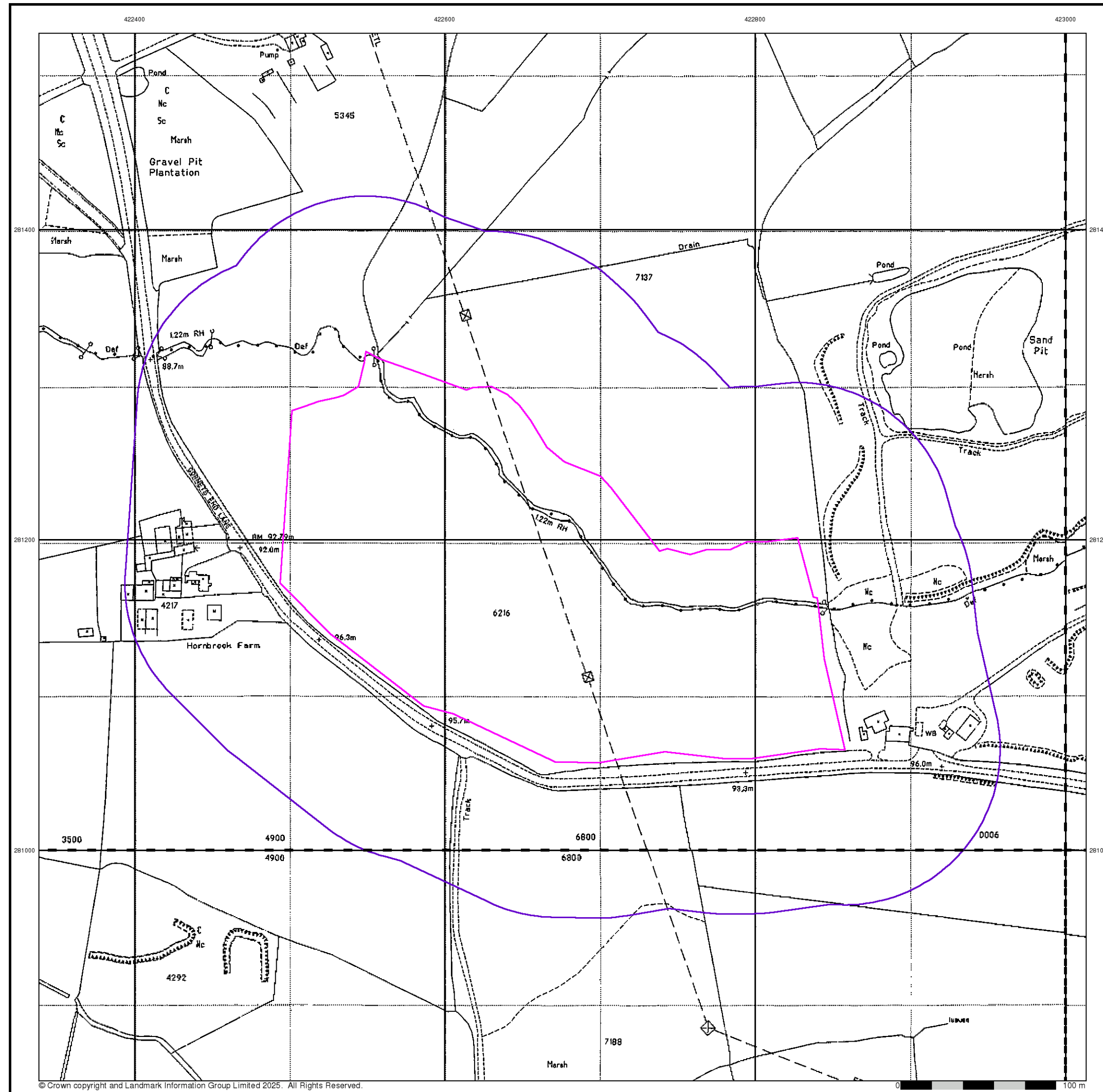


Order Details

Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 100

Site Details

Site at 422676,281189



© Crown copyright and Landmark Information Group Limited 2025. All Rights Reserved.

Large-Scale National Grid Data

Published 1992

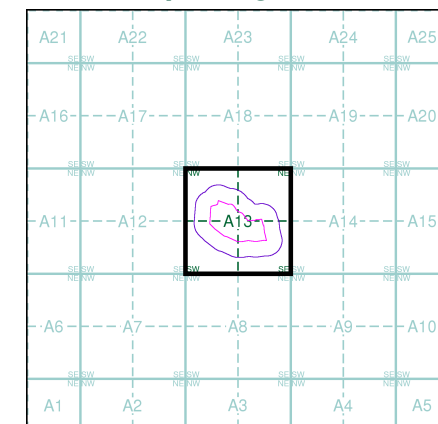
Source map scale - 1:2,500

'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)

SP2281 1992 1:2,500	SP2381 1992 1:2,500
SP2280 1992 1:2,500	SP2380 1992 1:2,500

Historical Map - Segment A13

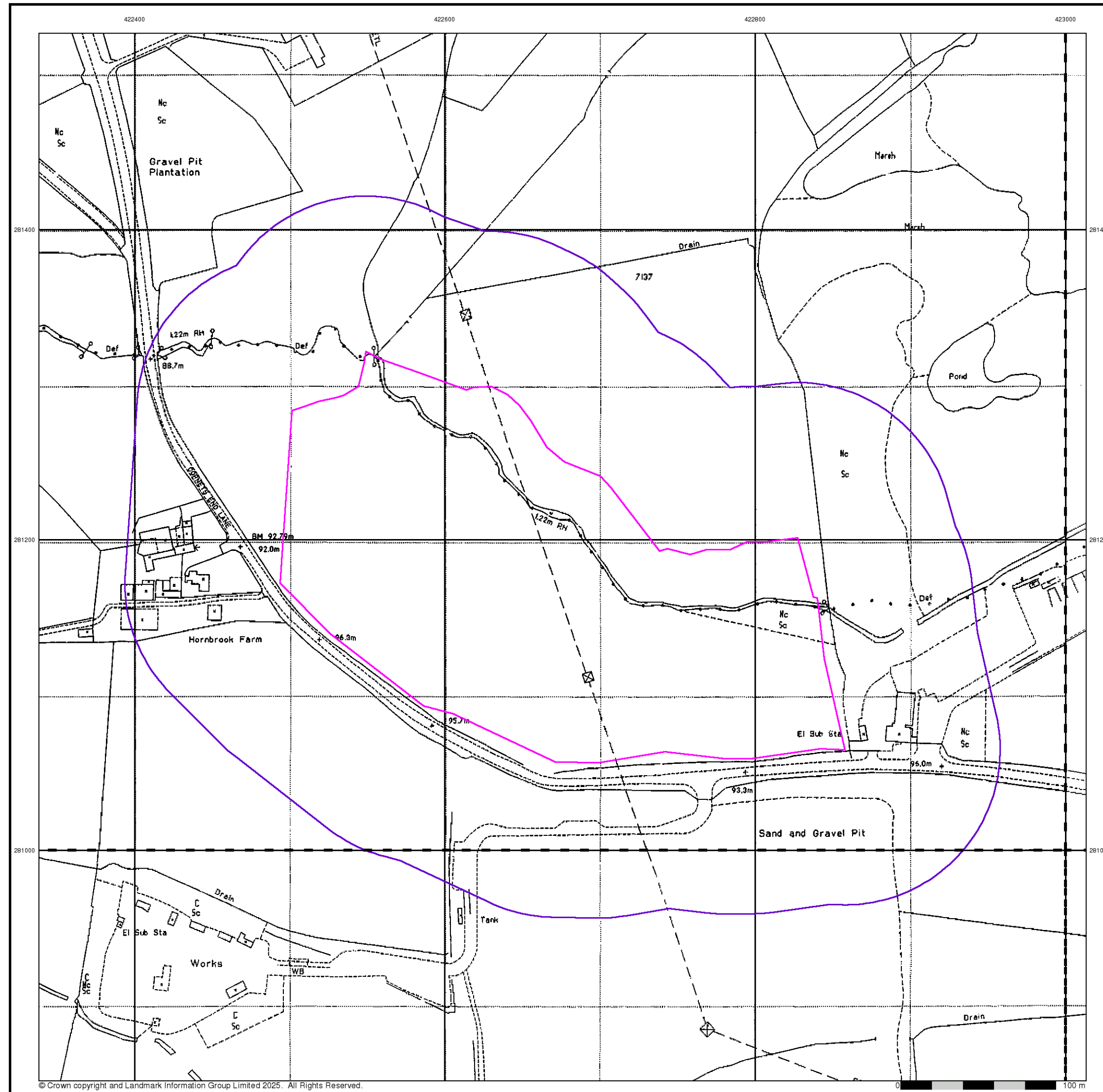


Order Details

Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 100

Site Details

Site at 422676,281189



Large-Scale National Grid Data

Published 1992 - 1993

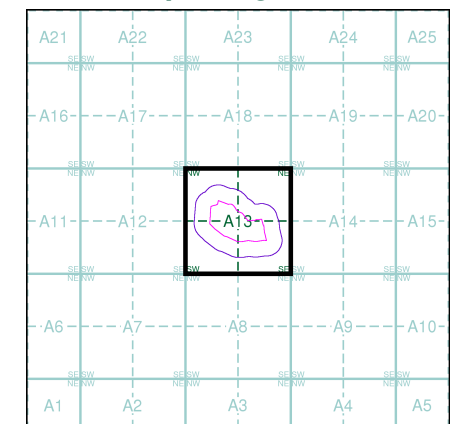
Source map scale - 1:2,500

'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)

SP2281 1993 12,500	SP2381 1992 12,500
SP2280 1992 12,500	SP2380 1992 12,500

Historical Map - Segment A13

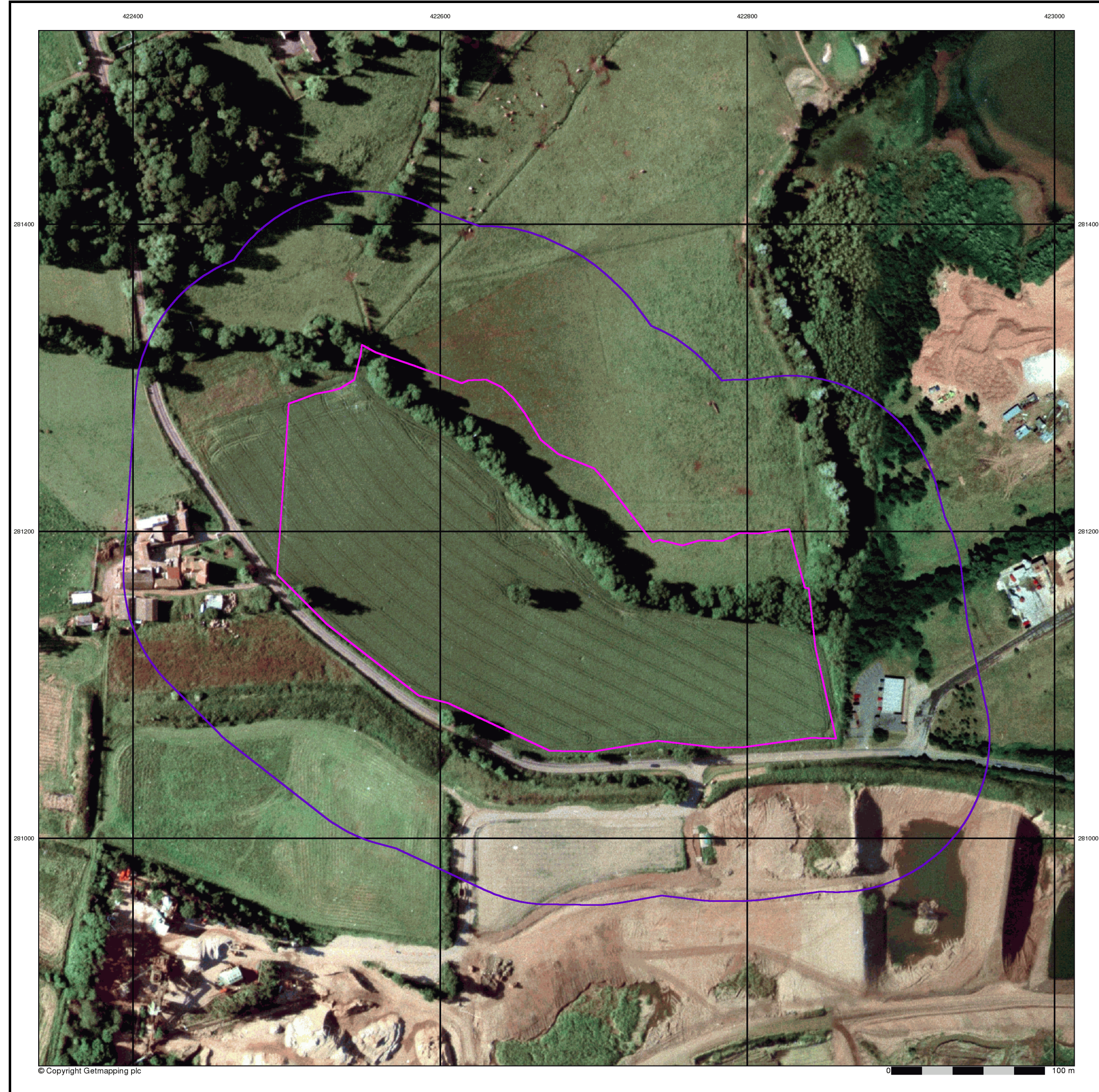


Order Details

Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 100

Site Details

Site at 422676,281189



Envirocheck[®]

LANDMARK INFORMATION GROUP[®]

Historical Aerial Photography

Published 1999

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

A21	A22	A23	A24	A25
A16	A17	A18	A19	A20
A11	A12	A13	A14	A15
A6	A7	A8	A9	A10
A1	A2	A3	A4	A5

Order Details

Order Number:	391714463_1_1
Customer Ref:	fc37351
National Grid Reference:	422670, 281180
Slice:	A
Site Area (Ha):	5.92
Search Buffer (m):	100

Site Details

Site at 422676,281189

Landmark[®]

INFORMATION GROUP

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

A Landmark Information Group Service v50.0 08-Dec-2025 Page 10 of 10

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		Minor Roads		
	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				
	County Borough Boundary (England)				
	County Burgh Boundary (Scotland)				
	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
	Bracken		Heath
	Marsh		Reeds
	Building		Glasshouse
	Sloping Masonry		Pylon
	Cutting		Embankment
	Road Under		Road Over
	Level Crossing		Foot Bridge
	Standard Gauge Multiple Track		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
	Civil Parish		
	BP, BS Boundary Post or Stone		Police Station
	Church		Post Office
	Club House		Public Convenience
	Fire Engine Station		Public House
	Foot Bridge		Signal Box
	Fountain		Spring
	Guide Post		Telephone Call Box
	Mile Post		Telephone Call Post
	Mile Stone		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
	Mean high water (springs)		Mean low water (springs)
	Telephone line (where shown)		Electricity transmission line (with poles)
	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

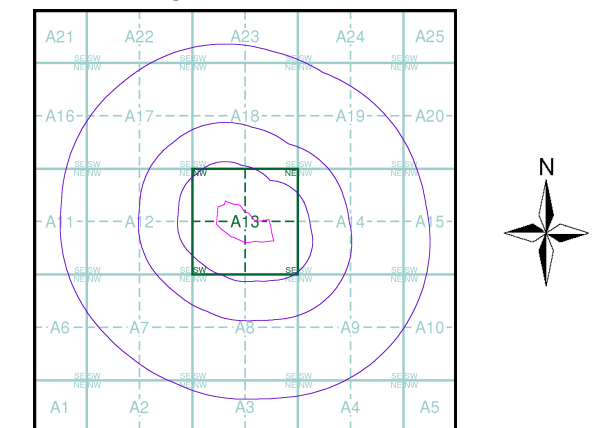
Envirocheck[®]

LANDMARK INFORMATION GROUP[®]

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Warwickshire	1:10,560	1886	2
Warwickshire	1:10,560	1905	3
Warwickshire	1:10,560	1905	4
Warwickshire	1:10,560	1937	5
Ordnance Survey Plan	1:10,000	1955	6
Ordnance Survey Plan	1:10,000	1968	7
Ordnance Survey Plan	1:10,000	1970	8
Ordnance Survey Plan	1:10,000	1983 - 1986	9
10K Raster Mapping	1:10,000	1999	10
10K Raster Mapping	1:10,000	2006	11
VectorMap Local	1:10,000	2025	12

Historical Map - Slice A



Order Details

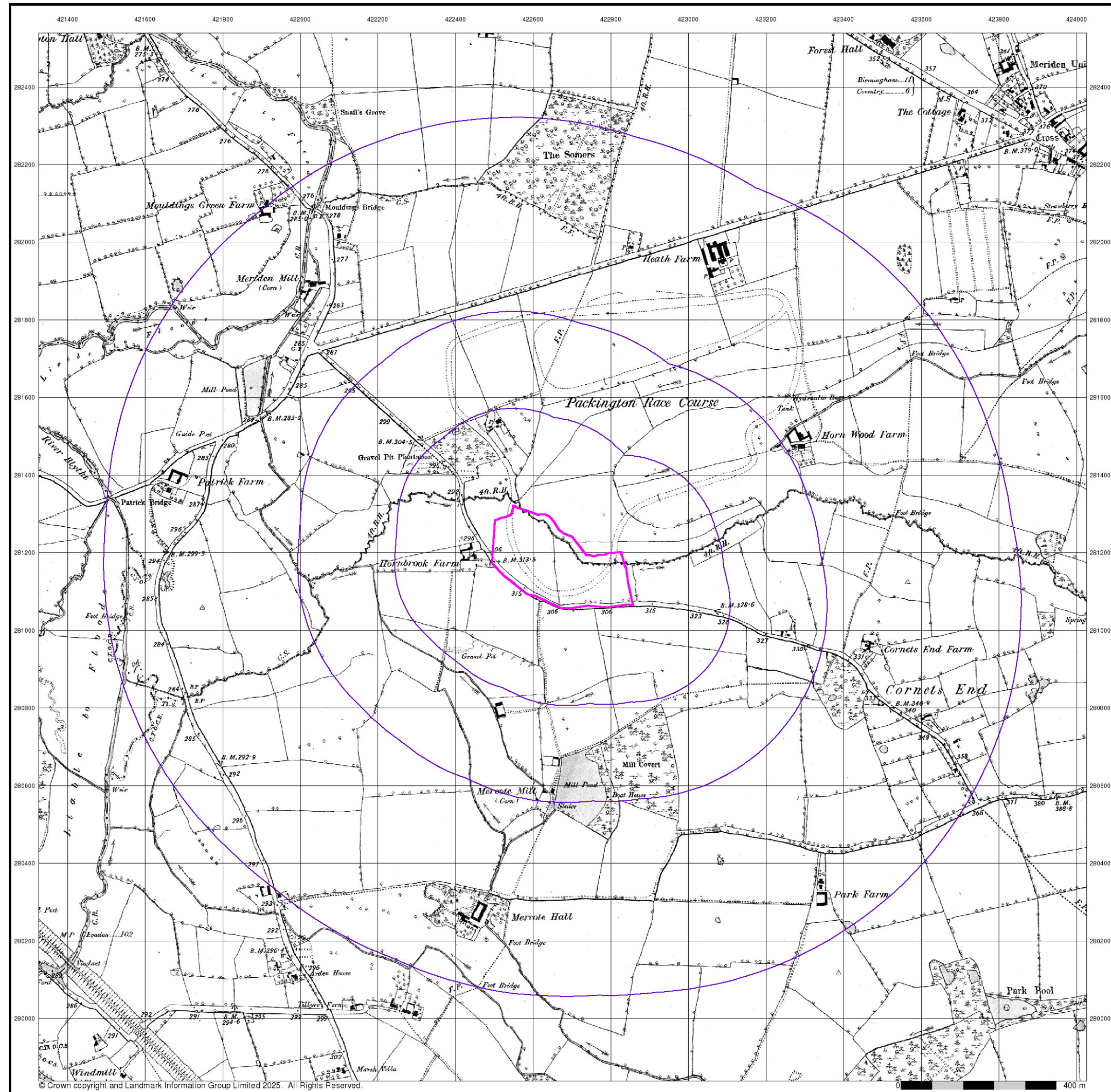
Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 1000

Site Details

Site at 422676,281189

Landmark[®]
INFORMATION GROUP

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



Envirocheck®

LANDMARK INFORMATION GROUP®

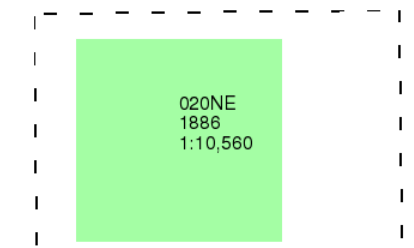
Warwickshire

Published 1886

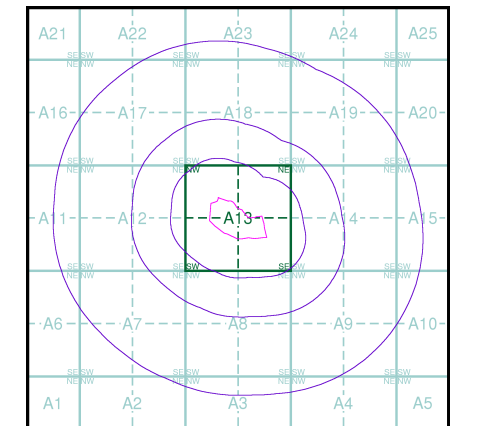
Source map scale - 1:10,560

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

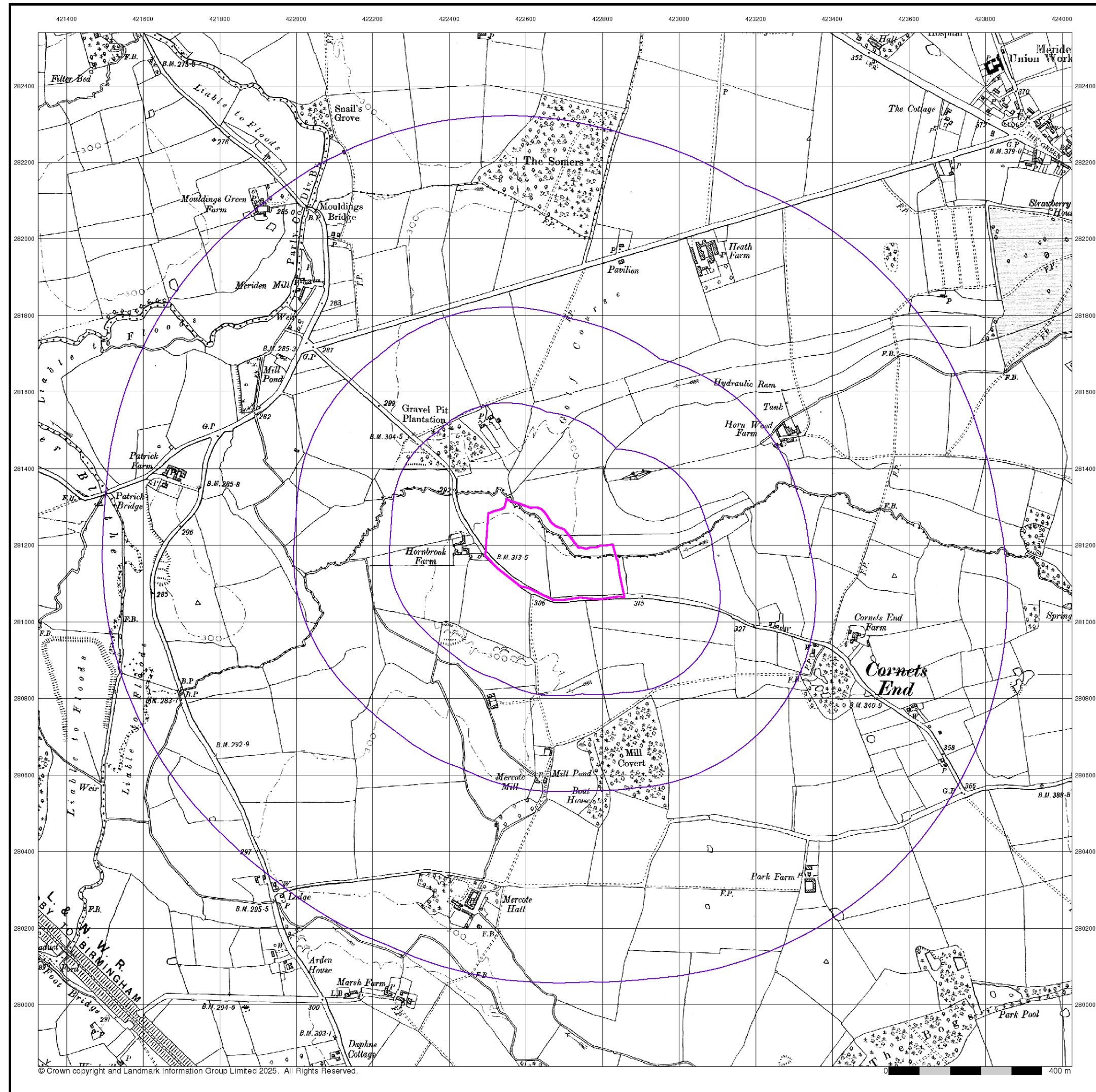
Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 1000

Site Details

Site at 422676,281189

Landmark®
LANDMARK INFORMATION GROUP

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



Envirocheck®

LANDMARK INFORMATION GROUP®

Warwickshire

Published 1905

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)

020NE
1905
1:10,560

Historical Map - Slice A

Order Details

Order Number:	391714463_1_1
Customer Ref:	fc37351
National Grid Reference:	422670, 281180
Slice:	A
Site Area (Ha):	5.92
Search Buffer (m):	1000

Site Details

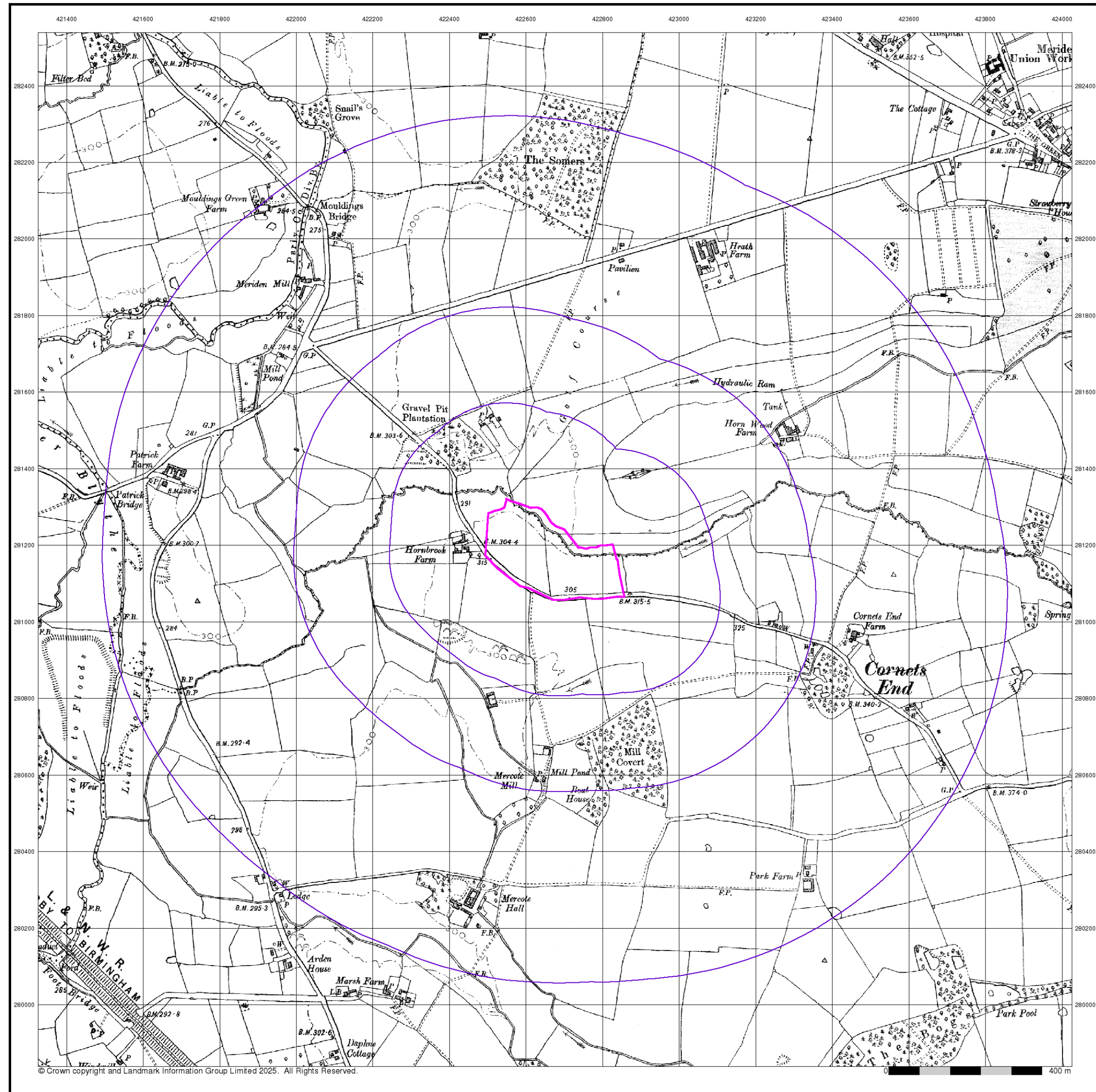
Site at 422676,281189

Landmark®

INFORMATION GROUP

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

A Landmark Information Group Service v50.0 08-Dec-2025 Page 3 of 12



Envirocheck®

LANDMARK INFORMATION GROUP®

Warwickshire

Published 1905

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)

020NE
1905
1:10,560

Historical Map - Slice A

Order Details

Order Number:	391714463_1_1
Customer Ref:	fc37351
National Grid Reference:	422670, 281180
Slice:	A
Site Area (Ha):	5.92
Search Buffer (m):	1000

Site Details

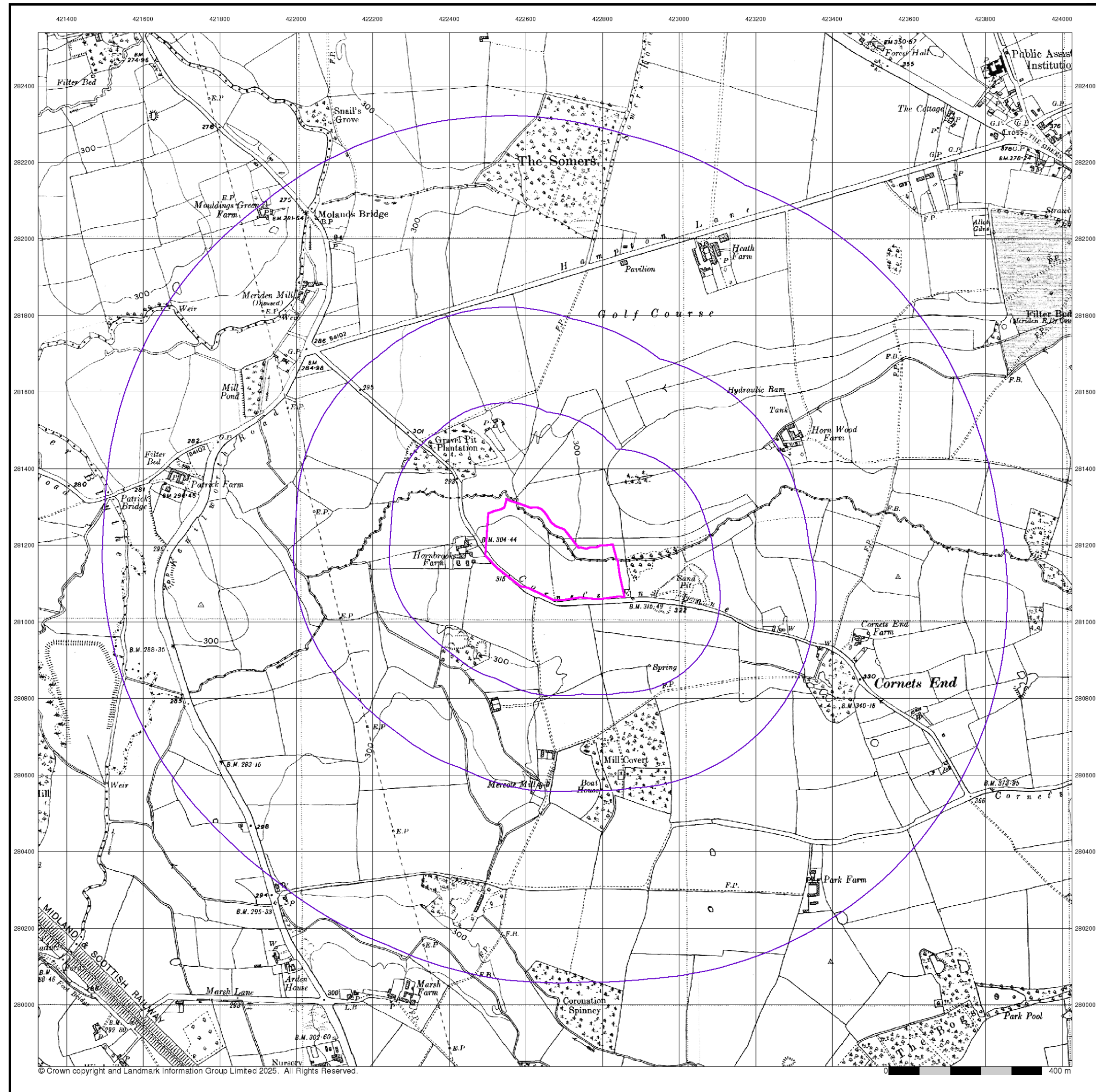
Site at 422676,281189

Landmark®

INFORMATION GROUP

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

A Landmark Information Group Service v50.0 08-Dec-2025 Page 4 of 12



Envirocheck®

LANDMARK INFORMATION GROUP®

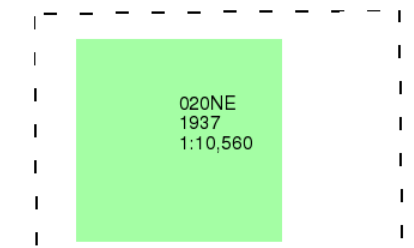
Warwickshire

Published 1937

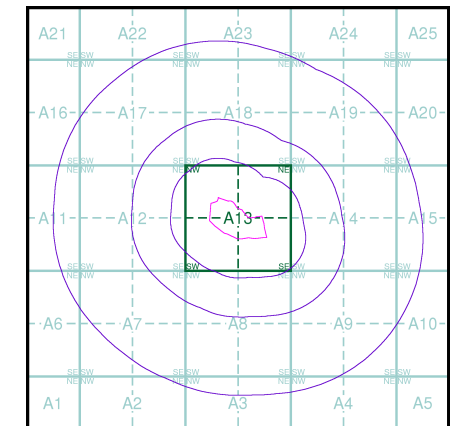
Source map scale - 1:10,560

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

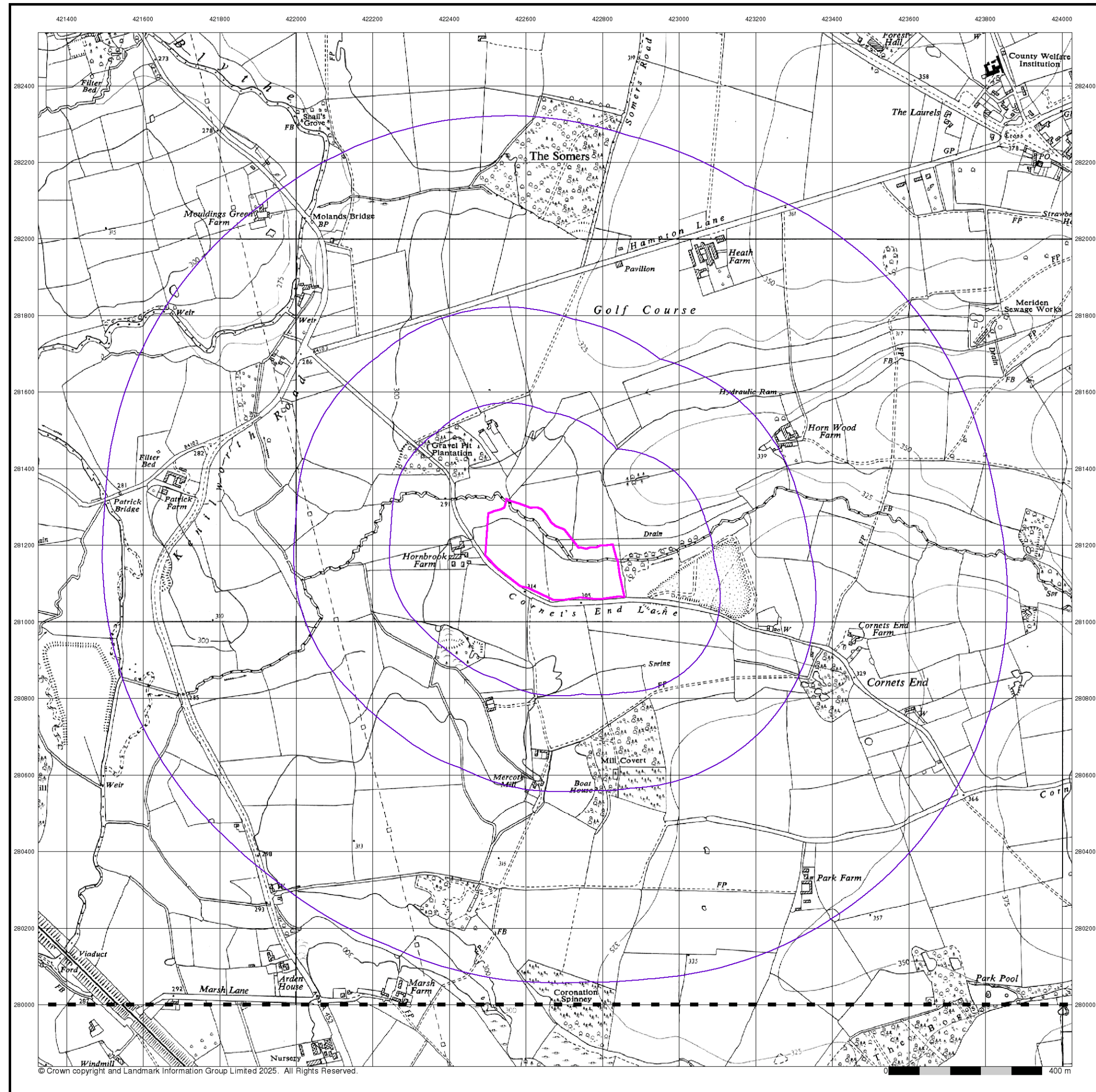
Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 1000

Site Details

Site at 422676,281189

Landmark®
INFORMATION GROUP

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



Envirocheck[®]

LANDMARK INFORMATION GROUP[®]

Ordnance Survey Plan

Published 1955

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)

SP28SW	1955
1:10,560	
SP27NW	1955
1:10,560	

Historical Map - Slice A

N

Order Details

Order Number:	391714463_1_1
Customer Ref:	fc37351
National Grid Reference:	422670, 281180
Slice:	A
Site Area (Ha):	5.92
Search Buffer (m):	1000

Site Details

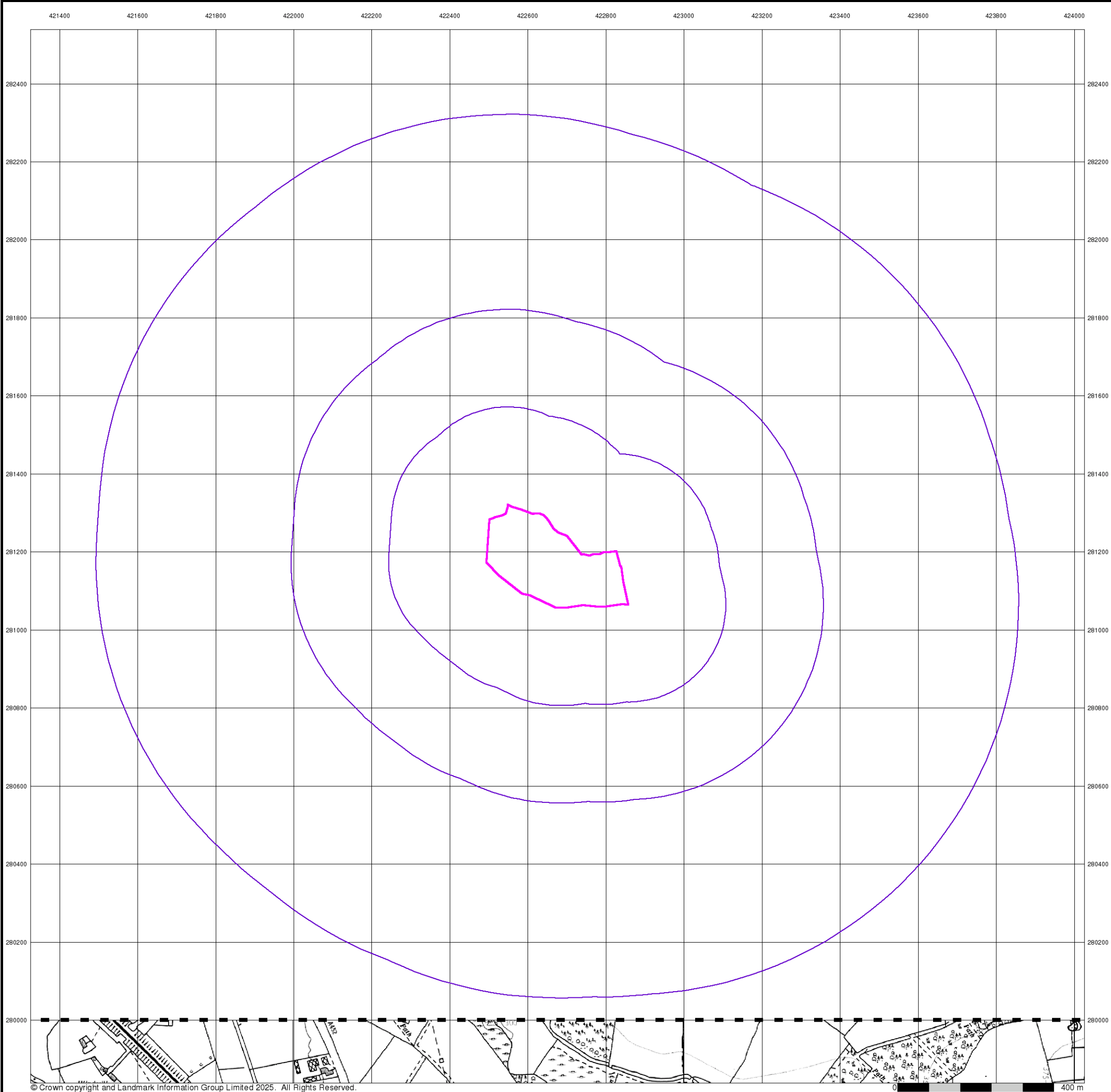
Site at 422676,281189

Landmark[®]

INFORMATION GROUP

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

A Landmark Information Group Service v50.0 08-Dec-2025 Page 6 of 12



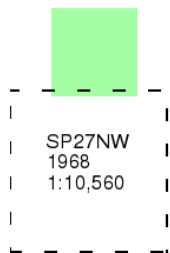
Ordnance Survey Plan

Published 1968

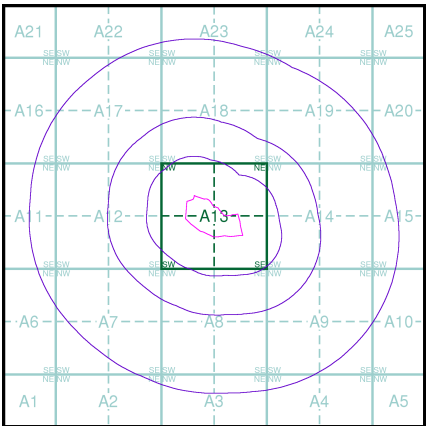
Source map scale - 1:10,000

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

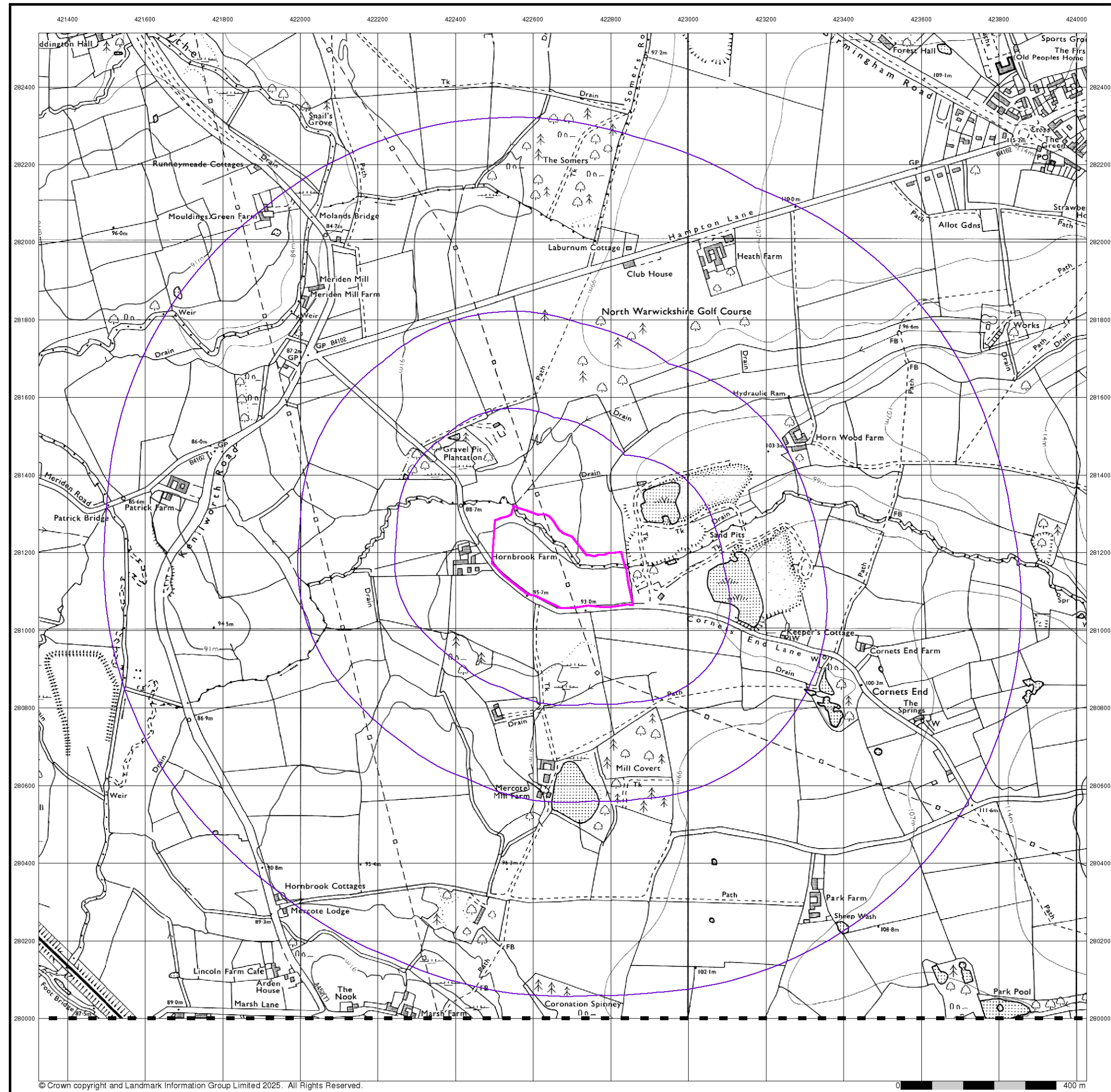


Order Details

Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 1000

Site Details

Site at 422676,281189



© Crown copyright and Landmark Information Group Limited 2025. All Rights Reserved.



Envirocheck[®]

LANDMARK INFORMATION GROUP[®]

Ordnance Survey Plan

Published 1970

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)

SP28SW

1970

1:10,000

Historical Map - Slice A

N

Order Details

Order Number:	391714463_1_1
Customer Ref:	fc37351
National Grid Reference:	422670, 281180
Slice:	A
Site Area (Ha):	5.92
Search Buffer (m):	1000

Site Details

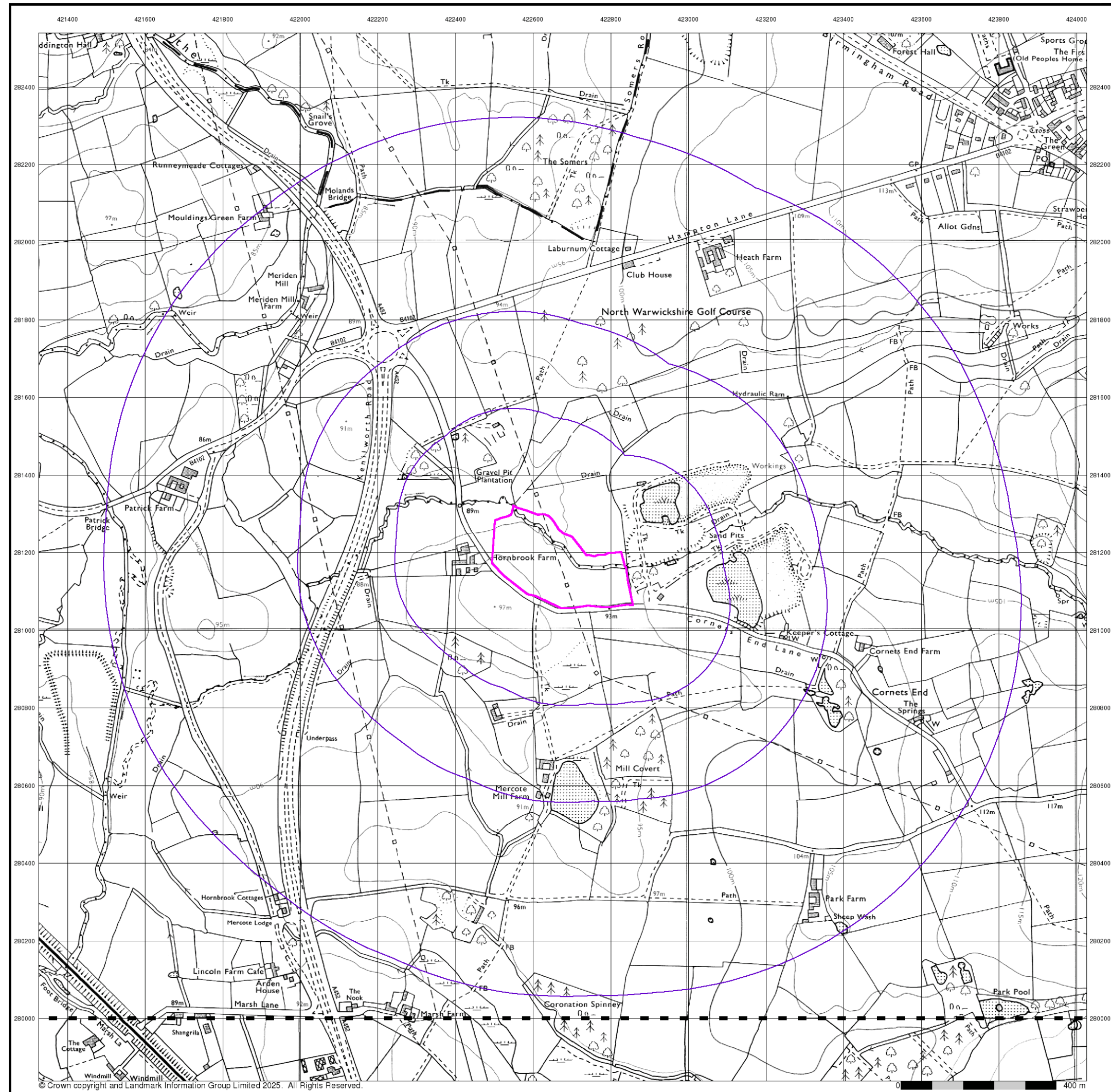
Site at 422676,281189

Landmark[®]

INFORMATION GROUP

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

A Landmark Information Group Service v50.0 08-Dec-2025 Page 8 of 12



Envirocheck®

LANDMARK INFORMATION GROUP®

Ordnance Survey Plan

Published 1983 - 1986

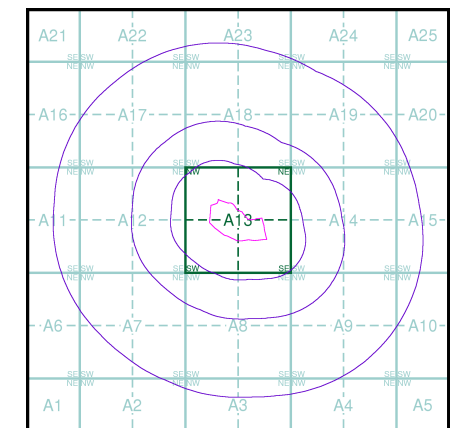
Source map scale - 1:10,000

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)

SP28SW	1983
1:10,000	
SP27NW	1986
1:10,000	

Historical Map - Slice A



Order Details

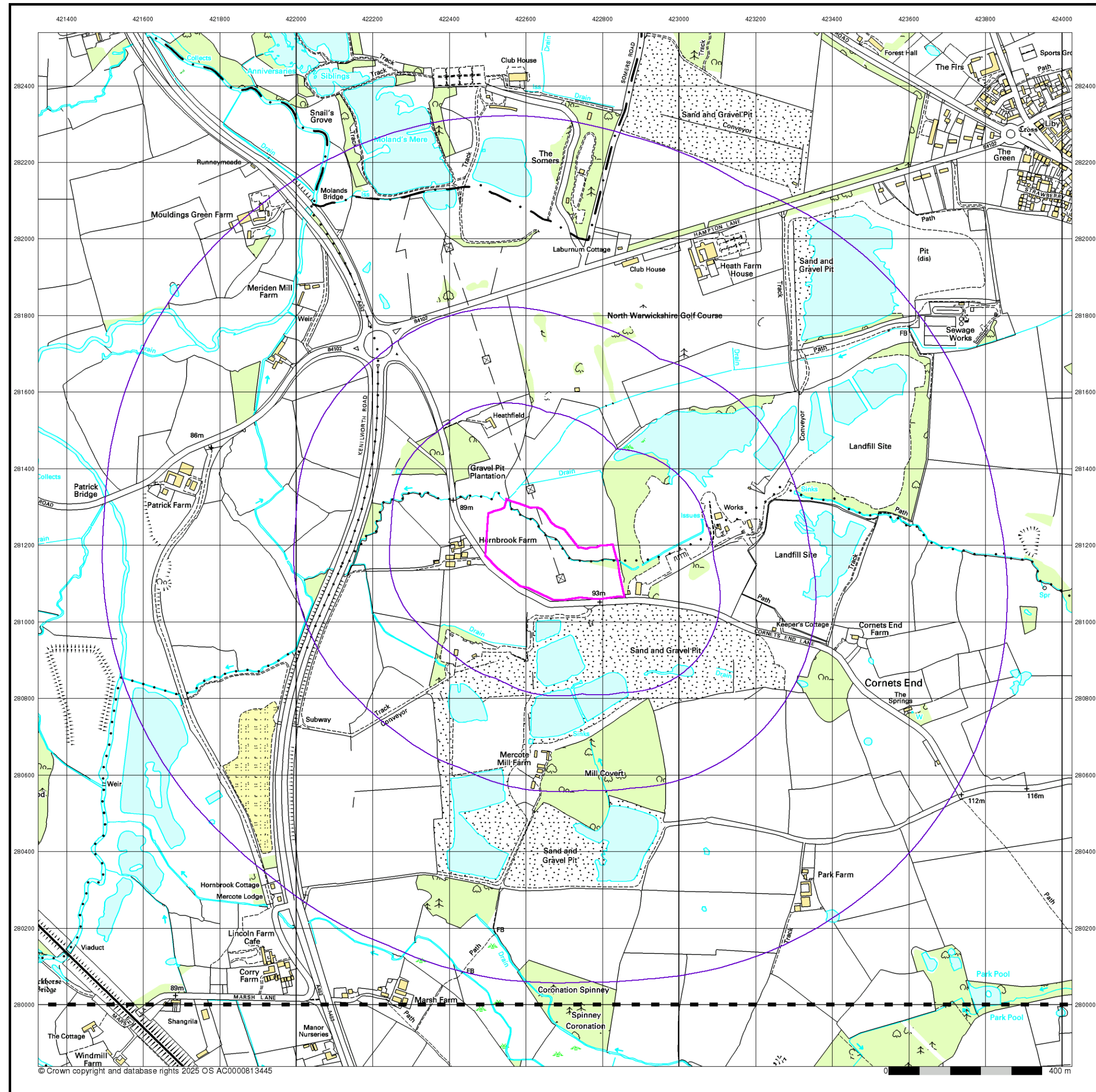
Order Number: 391714463_1_1
Customer Ref: fc37351
National Grid Reference: 422670, 281180
Slice: A
Site Area (Ha): 5.92
Search Buffer (m): 1000

Site Details

Site at 422676,281189

Landmark
INFORMATION GROUP

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



Envirocheck[®]

● LANDMARK INFORMATION GROUP[®]

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)

SP28SW	1999
1:10,000	
SP27NW	1999
1:10,000	

Historical Map - Slice A

Order Details

Order Number:	391714463_1_1
Customer Ref:	fc37351
National Grid Reference:	422670, 281180
Slice:	A
Site Area (Ha):	5.92
Search Buffer (m):	1000

Site Details

Site at 422676,281189

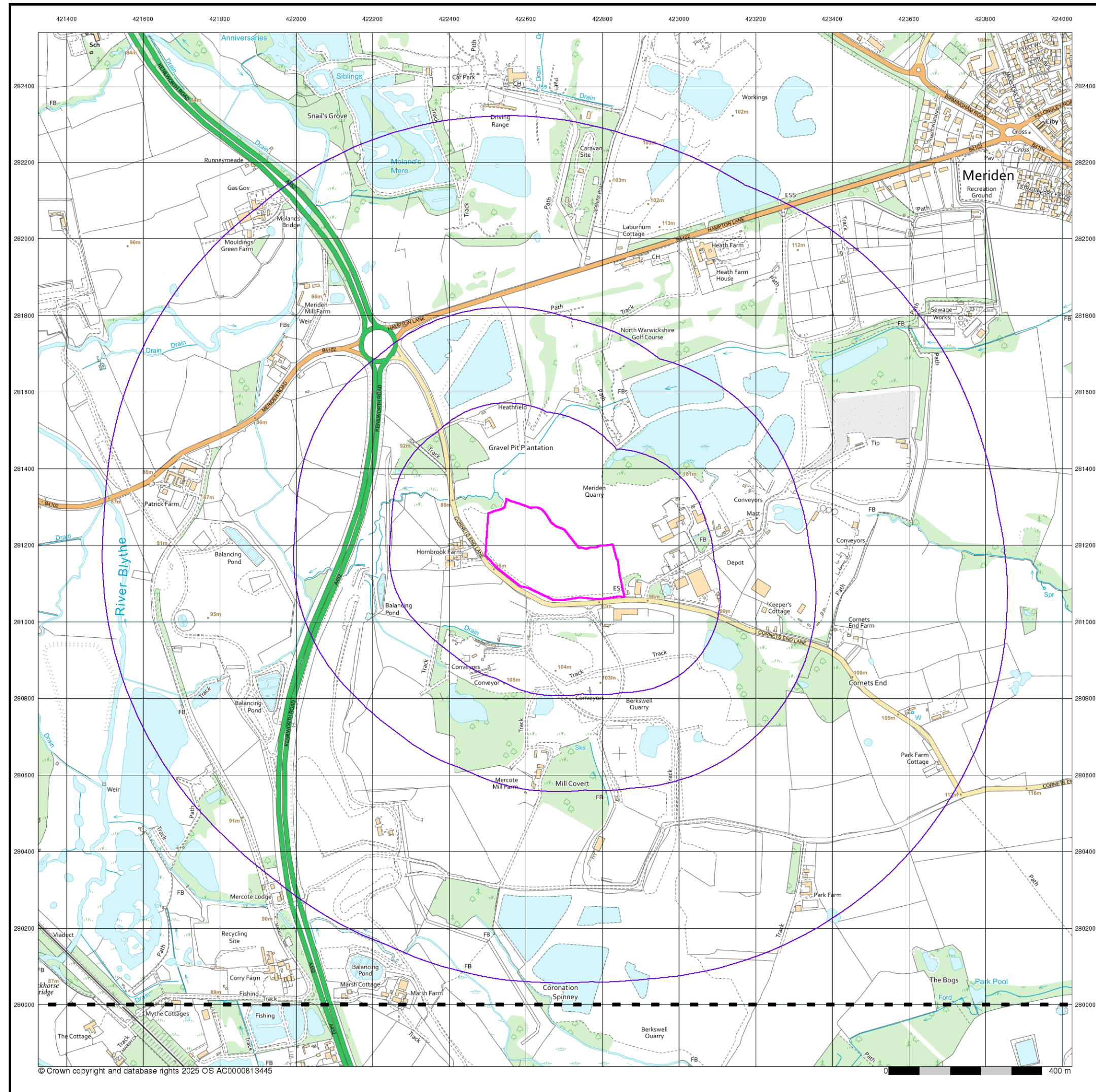
Landmark[®]

● INFORMATION GROUP

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

© Crown copyright and database rights 2025 OS AC0000813445

A Landmark Information Group Service v50.0 08-Dec-2025 Page 10 of 12



Envirocheck[®]

LANDMARK INFORMATION GROUP[®]

VectorMap Local

Published 2025

Source map scale - 1:10,000

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

Map Name(s) and Date(s)

SP28SW
2025
Variable

SP27NW
2025
Variable

Historical Map - Slice A

Order Details

Order Number:	391714463_1_1
Customer Ref:	fc37351
National Grid Reference:	422670, 281180
Slice:	A
Site Area (Ha):	5.92
Search Buffer (m):	1000

Site Details

Site at 422676,281189

Landmark[®]

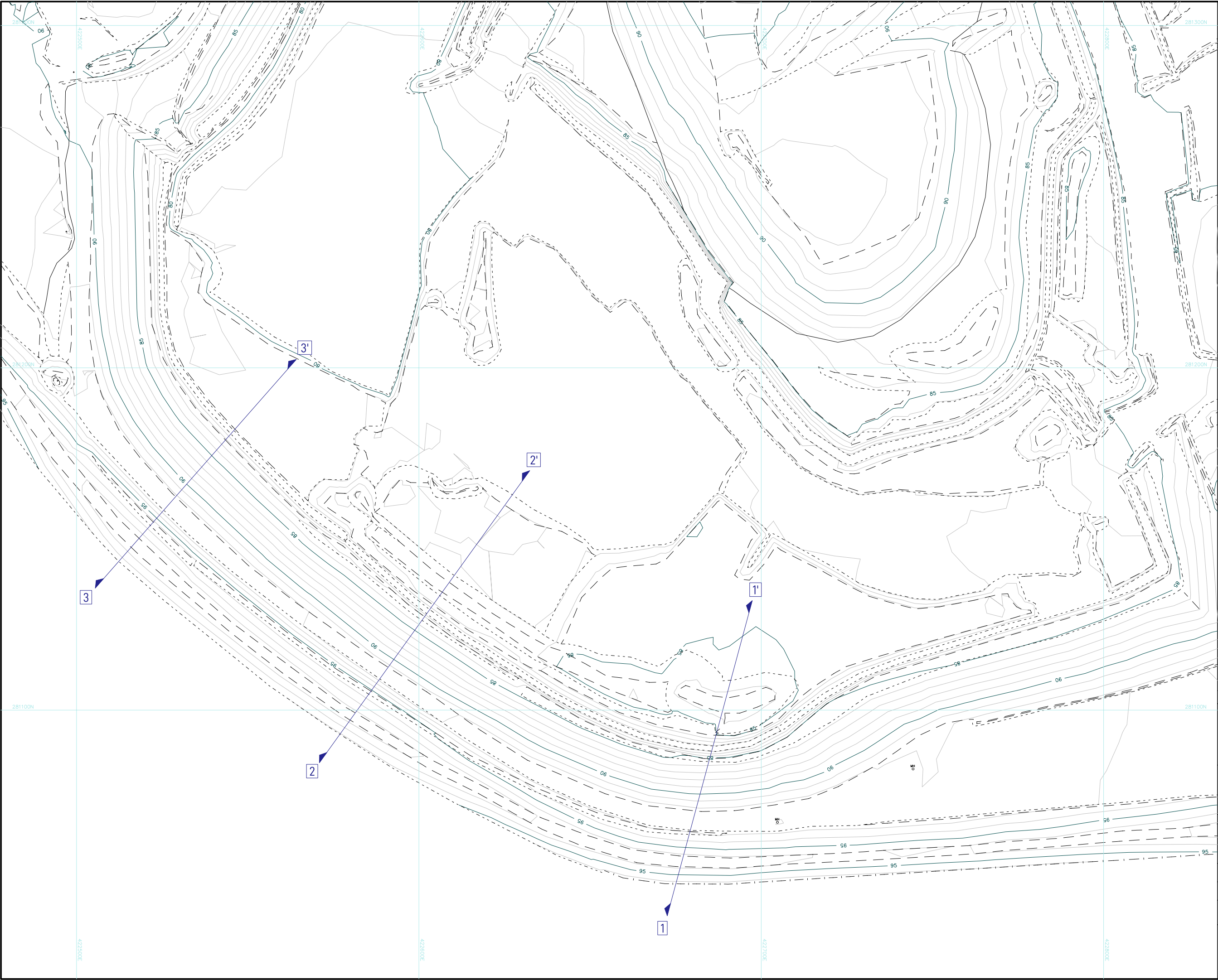
INFORMATION GROUP

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

A Landmark Information Group Service v50.0 08-Dec-2025 Page 12 of 12

APPENDIX 2

Topographical Survey and Cross Sections



NOTES

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.



01	First Issue	RB	17/12/25
Rev.	Revision Detail	Drawn	Date

CLIENT:



PROJECT:

MERIDEN QUARRY

TITLE:

BANANA FIELD
TOPOGRAPHIC SURVEY
(DATED MARCH 2025)

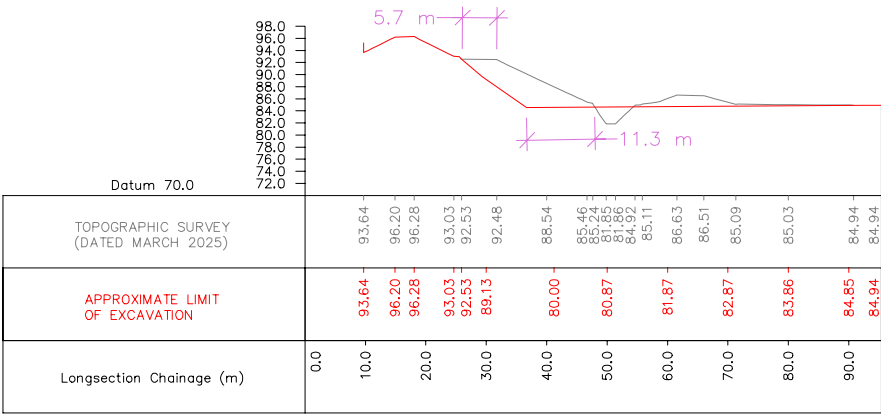
DRAWN: RB	CHECKED: DH	DATE: DEC '25
SCALE: 1:1000	ORIGINAL SHEET SIZE: A3	STATUS: DRAFT

DRAWING NO.	25-273-D-001	REVISION: 01
-------------	--------------	--------------

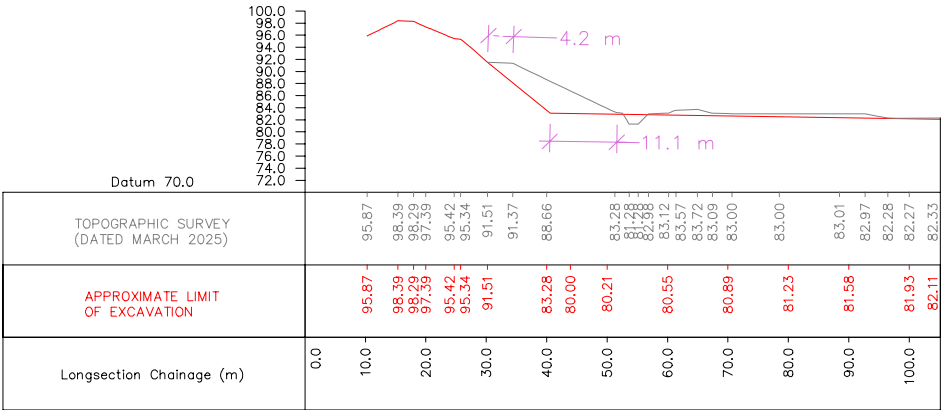


Unit 7
1 Lower Bar
Newport, Shropshire
TF10 7BE
E-mail: info@novageo.co.uk

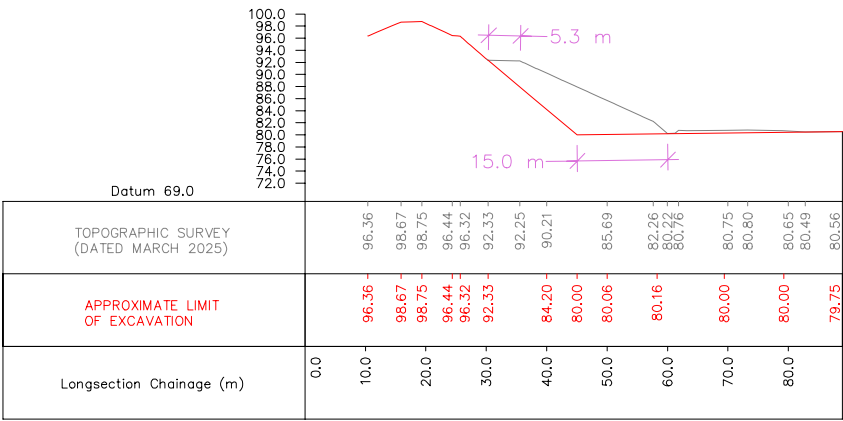
NOVA GEO CONSULTING LTD



XS 1 – 1'



XS 2 – 2'



XS 3 – 3'

NOTES

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.

01	First Issue	RB	17/12/25
Rev.	Revision Detail	Drawn	Date

CLIENT:



N.R.S.
WasteCare Ltd

PROJECT:

MERIDEN QUARRY

TITLE:

BANANA FIELD
CROSS SECTIONS

DRAWN:	CHECKED:	DATE:
RB	DH	DEC '25
SCALE:	ORIGINAL SHEET SIZE:	STATUS:
1:1250	A3	DRAFT

DRAWING NO.	REVISION:
25-273-D-002	01



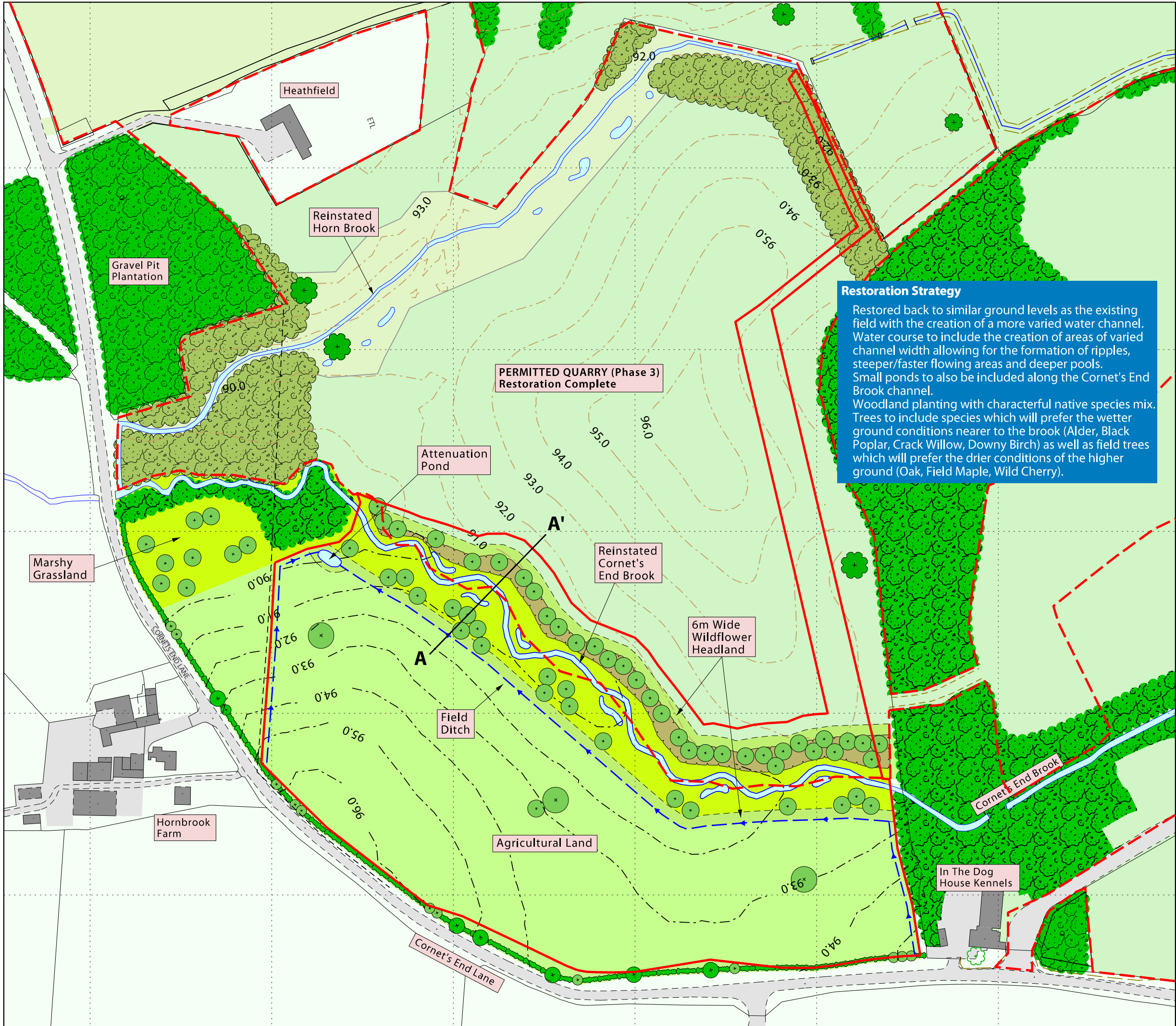
NOVA GEO
CONSULTING

Unit 7
1 Lower Bar
Newport, Shropshire
TF10 7BE
E-mail: info@novageo.co.uk

NOVA GEO CONSULTING LTD

APPENDIX 3

Restoration Plan



Restoration Strategy

Restored back to similar ground levels as the existing field with the creation of a more varied water channel. Water course to include the creation of areas of varied channel width allowing for the formation of ripples, steeper/faster flowing areas and deeper pools. Small ponds to also be included along the Cornet's End Brook channel.

Woodland planting with characterful native species mix. Trees to include species which will prefer the wetter ground conditions nearer to the brook (Alder, Black Poplar, Crack Willow, Downy Birch) as well as field trees which will prefer the drier conditions of the higher ground (Oak, Field Maple, Wild Cherry).

Legend

- Application Boundary = 6.47 Hectares
- Existing Permission Boundary
- Existing Contours (maOD)
- Surrounding Areas of Hardstanding
- Buildings within the Surrounding Area
- Existing Woodland / Plantations
- Existing trees
- Existing Hedgerow
- Proposed Contours (maOD)
- Agricultural Land
- Marshy/Wet Grassland
- Proposed Tree Planting
- Proposed Scrub
- Proposed Woodland / Tree Planting
- Water Bodies and Courses



Site Name:

Meriden Quarry

Drawing Name:

Banana Field Extension
Concept Restoration

Drawn By:

NF / LMB

Scale @ A3:

1:2000

Date:

April 2017

Drawing Number:

M096-00110-7



APPENDIX 4

BGS Borehole Records

SP 28 Sw/18

168 

222

NGR SP 218 822 in parish of

Shaft _____ ft., diameter _____ ft. Bore _____ ft. Diameter of bore : at top _____ ins., at bottom _____ ins.

Details of permanent lining tubes (internal diameters preferred).

Water struck at depths of (feet).

Rest-level of water ^{below} top of well _____ feet. Suction at _____ feet. Yield on _____ hours' test _____ days' test

_____ gallons per _____ (with pump of capacity _____ g.p.h.); depressing water level to _____ feet

below top. Time of recovery _____ hrs. Amount normally pumped daily _____ g.p.h. for _____ hours

Quality (attach copy of analysis if available).

Sunk by I. G. S. & G. for Mr. W. G. S. Date of well 1903

Information from The Grand, S. & G SB 3/236

4/6 This Co. was bought out by County T.A. in 1921. In 1921-22 "Return" of 1922 shows no sale of a finished source property
This Co. (p. 102-7)
For Summary see anti

For Survey use only

(*11815) Wt.29051/O.369 10,000 9/39
A.& E.W.Ltd. Gp.686

(11932) Wt.30370/0370 10,000 9/30 A. & E.W.Ltd. Gp.685

Name and Number of Shaft or Bore given by Geological Survey:

North Warwickshire Water Co.
SB 2/236

168



222

GEOLOGICAL CLASSIFICATION	DESCRIPTION	THICKNESS		Depth
		Ft	In.	
KM Cord. Mudstone.	Hard strong sand & gypsum	3		
	" " "	30		
	" " " "	1	9	
	" " " "	85	3	
				456 3
				544 6
PP D.H. Land 7/64				
Agard. Mudstone 27/6/05				
16 N J Pugh, County Water Engineer, in letter dated 16 vi 42, file 9509/37, states that he has no knowledge of this well, & asks for a copy of the record. An old employee of the Co, he says, believes that a trial bore was made for the Co somewhere in the vicinity of the farm in Merden village, from his recollection yield was unsatisfactory. AFB 19 vi 42 Mr. Le Grand, Lutcliffe Well in a letter dated 27/7/42 (9509/37/108/114) states "from original notes on our maps we have very good reasons to believe that the site of the boring made by us in 1903 at Lutcliffe for N. Staffs. Warwick Water Co. will be located on the Ordnance Survey map. The site is approximately 1/4 mile S.E. of Widdington Hall close by the second 2 1/2" bench mark by the roadside." 28/7/42 Sited on field slip A				

has been not
done for 100
years & this
is the first
time it has
been done
1980



RECORD OF WELL (SHAFT OR BORE)

SP2817W
168
222

At *The Northern Warwickshire Water Co.**
Town or Village *Merriden* County *Warwick* Six-inch quar *Non 20 NE/W*
Exact site *NGR SP 218 822* in parish of *SP28 SW/181*
Level of ground surface above sea-level (O.D.) *276* ft. If well starts below ground surface, sta
Shaft *222* ft., diameter *222* ft. Bore *222* ft. Diameter of bore: at top *222* ins.; at bottom *222* ins.
Details of permanent lining tubes (internal diameters preferred)
Water struck at depths of (feet)
Rest-level of water below top of well *222* feet. Suction at *222* feet. Yield on *222* hours' test
gallons per *222* (with pump of capacity *222* g.p.h.); depressing water level to *222* feet
below top. Time of recovery *222* hrs. Amount normally pumped daily *222* g.p.h. for *222* hours.
Quality (attach copy of analysis if available)
Sunk by *I. G. S. & G.* for Mr. *I. G. S. & G.* Date of well *1903*
Information from *Le Grand, S. & G.* *58 4/236*

(For Survey use only). GEOLOGICAL CLASSIFICATION.	NATURE OF STRATA (and any additional remarks).	THICKNESS		DEPTH	
		Feet.	Inches.	Feet.	Inches.
	<i>Clay & stones</i>	3		3	
	<i>clay & stones</i>	3		6	
<i>Drift</i>	<i>Ballast & clay</i>	5		11	
<i>35</i>	<i>Clay, stones & sand</i>	6	6	17	6
	<i>clay & boulders</i>	8	6	21	
	<i>sandy clay & boulders</i>	14		35	
<i>KM</i>	<i>Red marl</i>	11	6	46	6
<i>58</i>	<i>" " & marlstone</i>	46	6	93	
<i>? Arden Sst</i>	<i>light sandstone</i>	12	6	105	6
<i>46</i>	<i>Red marl & blue stone</i>	19	6	125	
	<i>Grey marl & stone</i>	14		139	
	<i>Red marl & stones</i>	3	6	142	6
	<i>Hard " & gypsum</i>	27	9	170	3
	<i>Red stony marl & grey veins</i>	3	3	173	6
	<i>Grey marl & stones</i>	3	6	177	
	<i>Hard rock, marl & sandstone</i>	2	9	179	9
<i>KM</i>	<i>" " & gypsum</i>	21	6	201	3
<i>402 1/2</i>	<i>Stoney marl</i>	1	3	202	6
	<i>Hard blue & red rock</i>	5		207	6
	<i>Red stoney marl</i>	6	6	214	
<i>Intassie</i>	<i>" " & gypsum</i>	2	6	216	6
	<i>marl & stones</i>	2	3	218	9
<i>Mercia</i>	<i>Hard marl</i>	30	3	249	
<i>Mudstone</i>	<i>" stoney marl & gypsum</i>	2	9	251	9
	<i>" " "</i>	38	3	290	
	<i>Stoney marl, sticky</i>	11		301	
	<i>" " "</i>	56		357	
	<i>" " & veins of gypsum</i>	3	6	360	6
	<i>" " "</i>	52		412	6
	<i>Hard blue stone</i>	4	10	417	4
	<i>" white rock</i>		6	417	10
	<i>" rock</i>	3	8	421	6

* This Co. was bought out by County T.C. in 1921. In the "Arden" section of 1921 there is no note of a Mercian source 1/24/45
in this Co. (p. 25-7).

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

For Survey use only

Date
received

G.S.M. Office
File No.

Site marked
on 1" map
(use symbol)

(*11815) Wt. 29051/0.369 10,000 9/89
A. & E.W. Ltd. Gp. 686

(11932) Wt.30870/0370 10,000 9/55 A.E.W.Ltd. Gp.685

Name and Number of Shaft or Bore given by Geological Survey:

*North Warwickshire Water Co.
SB 3/236*

SP28/17
168

GEOLOGICAL CLASSIFICATION	DESCRIPTION	THICKNESS		DEPTH
		Ft	In	
KM Contd. Mudstone.	<i>Hard stony mud + gypsum</i>	3		222 456 3 544 6
	<i>" " "</i>	30		
	<i>" " "</i>	1	9	
PP D.H.Land 7/64	<i>" " "</i>	85	3	
	<i>" " "</i>			
Agreed. Mr. P. H. H. H. 27/6/98				
<i>16 N J Pugh, Coventry Water Engineers, in letter dated 16 vi 42, file 9509/37, states that he has no knowledge of this well, & asks for a copy of the record. An old employee of the Co, he says, believes that a trial bore was made for the Co somewhere in the vicinity of the pond in Mander village. From his recollection yield was unsatisfactory.</i> <i>ATB 19 vi 42</i> <i>Mr. Le Grand, Litchfield & Bell in a letter dated 27/7/42 (9509/37/168/114) states: "From marginal notes on our maps we have very good reason to believe that the site of the boring made by us in 1903 at Litchfield for N. Staffs. Warwick Water Co. will be located on the Ordnance Survey map. The site is approximately 1/4 mile S.E. of Litchfield Hall close by the second 2 1/2' bench mark by the roadside." 28/7/42.</i> <i>Sited on field clip A</i>				



SP28/17

168/
222

NOT SITED

Neither farmer nor Water Authority have details or
knowledge of this b.h.
Mainly in Mercia Mudstone therefore do not expect large
quantities of water.
Assume unsuccessful, filled.

16.2.82 V.A.C.



SP 28 SW 334

2298 8107

Keeper's Cottage

Surface level +99.0 m
Water struck at +93.5 m
152 mm shell
December 1980

Block A

Overburden 3.2 m
Mineral 10.3 m
Bedrock 0.5 m+

LOG

Geological classification	Lithology	Thickness	Depth
	Made ground	3.2	3.2
Glacial Sand and Gravel	Sand; mainly medium, subangular to subrounded, quartzite and quartz	10.3	13.5
Triassic	Mudstone, red-brown and green	0.5+	14.0

GRADING

Mean for deposit percentages			Depth below surface (m)	percentages						
Fines	Sand	Gravel		Fines	Sand			Gravel		
				- $\frac{1}{4}$	+- $\frac{1}{4}$	+-1	+1-4	+4-16	+16-64	+64 mm
5	92	3	3.2-4.2	16	10	67	1	4	2	0
			4.2-5.2	3	24	71	1	0	1	0
			5.2-6.2	5	50	44	1	0	0	0
			6.2-7.2	3	48	46	1	2	0	0
			7.2-8.2	5	39	56	0	0	0	0
			8.2-9.2	2	33	60	0	4	1	0
			9.2-10.2	4	35	60	0	1	0	0
			10.2-11.2	2	32	61	2	2	1	0
			11.2-12.2	3	22	58	4	6	7	0
			12.2-13.5	5	19	70	4	2	0	0
			Mean	5	31	60	1	2	1	0



Institute of Geological Sciences
Industrial Minerals Assessment Unit
BOREHOLE RECORD SHEET

Registration Number

6 in. quarter sheet

Accn. no.

Suffix

SP28SW

334

Temp. No.

50 28

SL+99.0

2298 8107 Cornet's End

Borehole diam. 152mm

Water struck at 5.5m.

Remarks: Sample

50 28-1 3.2 - 4.2
2 4.2 - 5.2
3 5.2 - 6.2
4 6.2 - 7.2
5 7.2 - 8.2
6 8.2 - 9.2
7 9.2 - 10.2
8 10.2 - 11.2
9 11.2 - 12.2
10 12.2 - 13.5
11S 13.5 - 14.0

Classification	Thick- ness (m)	Lithology
Overburden	3.2	MGR
Mineral	10.3	SSG /GS9
Bedrock	0.5+	MMG

hostrat. code	Description	Thick ⁿ (m)	Depth to base (m)	Sample No.
14R	Made Ground	3.2	3.2	
GS9 or SS9	Sand, pebbly after 10.5m Gravel: fine and coarse, R/R qtzite, qtz and with some set Sand: med with fine SA/SR qtz and qtzite	10.3	13.5	1-10
1MG	Mudstone, red-brown and green, 10R 4/4 and SGY 7/2, banded + lumps of - grey, fine coralline KS	0.5+	14.0	11S
	Borehole complete 14.0m.			

SP28SW/350

DOUGLAS TECHNICAL SERVICES LIMITED
25-1267 RECORD OF BORING 320

CONTRACT No 25-1267

RECORD OF BORING

2292 8127

BORED FOR LEIGH ANALYTICAL SERVICES LIMITED
LOCATION SAND QUARRY, CORNETS END LANE, MERIDEN

BOREHOLE No. 2

TYPE OF BORING SHELL & AUGER

NATIONAL GRID REF.
GROUND SURFACE LEVEL 95.62 m. A.O.D.
DATE STARTED 7/12/78
DATE COMPLETED 11/12/78

DIAMETER	200 mm
LINING TUBES	200 mm
INCLINATION	VERTICAL

DESCRIPTION OF STRATA	SECTION	DEPTH BELOW SURFACE m	THICK- NESS m	O.D. LEVEL	SAMPLES			S.P.T. Blows per 300mm	GROUND WATER OBSERVATIONS	REMARKS
					TYPE	No.	DEPTH m			
FIRM FRIABLE RED-BROWN SANDY SILTY CLAY WITH SCATTERED ANGULAR TO SUB-ROUNDED FINE AND MEDIUM GRAVEL	X	0 - 00		95-62	●		0 - 00			
	o				B	1				
	o				●	2				
	X				●		1 - 50			
	X									
	X									
	X	2 - 20		93-42						
REDDISH BROWN FINE AND MEDIUM SAND WITH SCATTERED FINE & MEDIUM ROUNDED GRAVEL, POCKETS OF RED CLAY & ORGANIC MATERIAL WITH A SLIGHT ODOUR	o				●		3 - 00			
	o				B	3				
	o				●	4				
	o				B	5	4 - 50			
	o				●	6				
	o				●		5 - 00			
	o				B	7				
	o				●	8				
	o				●		6 - 00			
	o				B	9				
	o				●	10				
REDDISH BROWN TO BROWN SUB-ROUNDED TO ROUNDED WELL GRADED GRAVEL WITH SOME FINE & MEDIUM SAND	o	7 - 00		88-62	●		7 - 00		AT 4 - 00 p.m. CASING TO 7.00	
	o				B	11			WATER LEVEL 5.70m	
	o				●	12				7/12/78
	o	7 - 50		88-12	●		7 - 50			11/12/78
	o				B	13			A.M. WATER LEVEL 2.70 m	
REDDISH BROWN FINE AND MEDIUM SAND WITH SCATTERED SUB-ROUNDED & ROUNDED GRAVEL & OCCASIONAL COBBLES	o				●		8 - 50			
	o				B	14				
(CONTINUED)	o	(10-00)		(85-62)	●		10-00			

WEATHER

● DISTURBED SAMPLE ■ UNDISTURBED SAMPLE

VERTICAL SCALE 1:50

□ R RAYMOND PENETRATION TEST

FIG

2

FIG

2



SP283w/350

DOUGLAS TECHNICAL SERVICES LIMITED RECORD OF BORING

CONTRACT No 25-1267

BORED FOR LEIGH ANALYTICAL SERVICES LIMITED
LOCATION SAND QUARRY, CORNETS' ENO LANE, MERIDEN

BOREHOLE No. 2 (CONTINUED)

TYPE OF BORING SHELL & AUGER

NATIONAL GRID REF.
GROUND SURFACE LEVEL 95.62 m.A.O.D.
DATE STARTED 7/12/78
DATE COMPLETED 11/12/78

DIAMETER 200 mm
LINING TUBES 200 mm
INCLINATION VERTICAL

DESCRIPTION OF STRATA	SECTION	DEPTH BELOW SURFACE m	THICK- NESS m	O.D. LEVEL	SAMPLES			S.P.T. Blows per 300mm	GROUND WATER OBSERVATIONS	REMARKS
					TYPE	No.	DEPTH m			
(CONTINUED)										
REDDISH BROWN FINE AND MEDIUM SAND WITH SCATTERED SUBROUNDED & ROUNDED GRAVEL AND OCCASIONAL COBBLES		10-00		35-62	B	15	10-00			
					B	16	11-00			
FIRM TO STIFF RED-BROWN MOTTLED LIGHT GREYISH GREEN SILTY CLAY WITH SOME SUBROUNDED WELL GRADED GRAVEL AND OCCASIONAL COBBLES		11-50		84-12	B	17	11-50			
		12-00		83-62			12-00		STANDPIPE INSTALLED TO 12-00 m	
									STANDPIPE COVER LEVEL 95.830 m.A.O.D.	

WEATHER

● DISTURBED SAMPLE

■ UNDISTURBED SAMPLE

VERTICAL SCALE 1:50

□ R RAYMOND PENETRATION TEST
□ C CONE PENETRATION TEST

FIG

4



SP28SW/351

DOUGLAS TECHNICAL SERVICES LIMITED

CONTRACT No 25-1267

RECORD OF BORING

2295 8107

BORED FOR LEIGH ANALYTICAL SERVICES LIMITED
LOCATION SAND QUARRY, CORNETS END LANE, MERIDEN

BOREHOLE No. 3

TYPE OF BORING SHELL & AUGER

NATIONAL GRID REF.
GROUND SURFACE LEVEL 97.99 m. A.O.O.
DATE STARTED 5/12/78
DATE COMPLETED 6/12/78

DIAMETER 150 mm
LINING TUBES 150 mm
INCLINATION VERTICAL

DESCRIPTION OF STRATA	SECTION	DEPTH BELOW SURFACE m	THICK- NESS m	O.D. LEVEL	SAMPLES			S.P.T. Blows per 300mm	GROUND WATER OBSERVATIONS	REMARKS
					TYPE	No.	DEPTH m			
BROWN / GREYISH BROWN FINE SAND WITH SCATTERED GREY ORGANIC POCKETS & SLIGHT ODOUR		0-00		97-99	B	1	0-00			
							1-00			
					B	2				
							2-00		DEPOSITS BECOMING MOIST AT 1.90m	
					B	3				
BROWN SUB-ANGULAR TO ROUNDED WELL GRADED GRAVEL WITH A LITTLE SILTY FINE SAND		2-90		95-09			2-90			
							3-00			
					B	4				
FIRM RED-BROWN WITH GREY SLIGHTLY SILTY CLAY WITH SOME WELL GRADED GRAVEL		4-10		93-89	B	5	4-00			
						6	4-10			
		4-60		93-39			4-60			
REDDISH BROWN FINE AND MEDIUM SAND WITH A LITTLE SUB-ROUNDED TO ROUNDED WELL GRADED GRAVEL (GRAVEL CONTENT DECREASING WITH DEPTH)					B	7				
						8	5-50			
							6-00			
					B	9				
						10			P.M. WATER LEVEL 6.00m	CASING TO 7.00m 5/12/78
							7-00		A.M. WATER LEVEL 5.70m	6/12/78
					B	11				
						12				
							8-00			
					B	13				
						14				
							9-00			
REDDISH BROWN SLIGHTLY SILTY FINE & MEDIUM SAND WITH SOME SUB-ROUNDED AND ROUNDED WELL GRADED GRAVEL (CONTINUED)		9-60		88-39						
		(10-00)		(87-99)						

WEATHER

● DISTURBED SAMPLE

■ UNDISTURBED SAMPLE

VERTICAL SCALE 1:50

□ R RAYMOND PENETRATION TEST

FIG

5



SP28SW/351

DOUGLAS TECHNICAL SERVICES LIMITED RECORD OF BORING

CONTRACT No 25 - 1257

BORED FOR LEIGH ANALYTICAL SERVICES LIMITED
LOCATION SAND QUARRY, CORNETS END LANE MERIDEN

BOREHOLE No. 3 (CONTINUED)

TYPE OF BORING SHELL & AUGER

NATIONAL GRID REF.
GROUND SURFACE LEVEL 97.99 m.A.O.D.
DATE STARTED 5/12/78
DATE COMPLETED 6/12/78

DIAMETER 150 mm
LINING TUBES 150 mm
INCLINATION VERTICAL

DESCRIPTION OF STRATA	SECTION	DEPTH BELOW SURFACE m	THICK- NESS m	O.D. LEVEL	SAMPLES			S.P.T. Blows per 300mm	GROUND WATER OBSERVATIONS	REMARKS
					TYPE	No.	DEPTH m			
(CONTINUED)										
REDDISH BROWN SLIGHTLY SILTY FINE & MEDIUM SAND WITH SOME SUBROUNDED AND ROUNDED WELL GRADED GRAVEL		10-00		87-99	B	15	10-00			
						16				
		11-00		86-99	B	17	11-00			
REDDISH BROWN FINE AND MEDIUM SAND WITH ISOLATED ROUNDED FINE GRAVEL						18				
----- WITH SOME SUBANGULAR TO ROUNDED WELL GRADED GRAVEL					B	19	12-00			
						20				
FIRM TO STIFF DARK RED MOTTLED LIGHT GREYISH GREEN SILTY CLAY		12-60		85-39	B	21	12-60		AT MID/DAY WATER LEVEL 6.50 m	CASING TO 12.00 m
		13-00		84-99	B	22	13-00			6/12/78
									STANDPIPE INSTALLED TO 13.00 m	
									STANDPIPE COVER LEVEL 98.185 m.A.O.D.	

WEATHER

- DISTURBED SAMPLE
- B BULK SAMPLE

- UNDISTURBED SAMPLE
- W GROUND WATER SAMPLE

VERTICAL SCALE 1:50

- R RAYMOND PENETRATION TEST
- C CONE PENETRATION TEST

FIG

6

APPENDIX 5

Meriden Quarry Borehole Logs



Log of Borehole: BH1

Project No.: A192879

Project: Cornets End

X Coordinate: 422585

Y Coordinate: 281692

Status: Gas and Groundwater Borehole

Elevation: 92.66

Total Depth: 5.5

Project Manager:

SUBSURFACE PROFILE				SAMPLE				Well Completion Details
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	
0		Ground Surface	92.6					
0.5		Red orange clay with gravels	0.0					
1								
2								
3								
4								
5								
6			86.6					
6.5		Red stiff sandy mudstone	6.0					
7			86.1					
7.5			6.5					
8								
9								
10								
Drilled By: Apex Drilling Services				Hole Size:				
Drill Method: Rotary				Datum: 96.56				
Drill Date: 1992				Sheet: 1 of 1				



Log of Borehole: BH2

Project No.: A192879

Project: Cornets End

X Coordinate: 422435

Y Coordinate: 281533

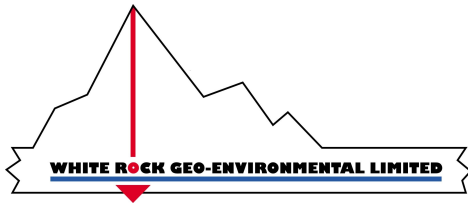
Status: Gas and Groundwater Borehole

Elevation: 93.9

Total Depth: 6.1

Project Manager:

SUBSURFACE PROFILE				SAMPLE				Well Completion Details
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	
0		Ground Surface	93.9					
		Brown friable TOP SOIL	0.0					
			93.3					
		Red orange clay with gravels	0.6					
1								
2								
3								
4								
5			88.7					
		Red stiff sandy CLAY	5.2					
			88.3					
		Red orange dry Mercia Mudsone	5.6					
6			87.8					
			6.1					
7								
8								
9								
10								
Drilled By: Apex Drilling Services				Hole Size:				
Drill Method: Rotary				Datum: 93.90				
Drill Date: 1992				Sheet: 1 of 1				



Log of Borehole: BH3

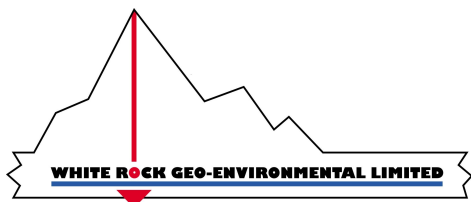
Project No.: A192879
Project: Cornets End
X Coordinate: 422418 281295
Y Coordinate:
Status: Gas and Groundwater Borehole

Elevation: 90.418
Total Depth: 5.6
Project Manager:

SUBSURFACE PROFILE				SAMPLE				Well Completion Details
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	
0		Ground Surface	90.4					
		Brown friable gravelly TOP SOIL	0.0					
		Red orange clay with gravels						
1								
2								
3								
4								
5		Red stiff sandy CLAY	85.6					
		Red orange dry Mercia Mudsone	4.8					
			84.8					
6			5.6					
7								
8								
9								
10								

Drilled By: Apex Drilling Services
Drill Method: Rotary
Drill Date: 24/9/2019

Hole Size:
Datum: 90.418
Sheet: 1 of 1



Log of Borehole: BH4

Project No.: A192879

Project: Cornets End

X Coordinate: 422581

Y Coordinate: 281096

Status: Gas and Groundwater Borehole

Elevation: 96.157

Total Depth: 12.6

Project Manager:

SUBSURFACE PROFILE				SAMPLE				Well Completion Details
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	
0		Ground Surface	96.2					
		Brown friable gravelly TOP SOIL	0.0					
		Red orange clay with gravels						
1								
2								
3								
4								
5								
6								
7								
8			87.9					
		Red stiff sandy CLAY	8.3					
9								
10								

Drilled By: Apex Drilling Services

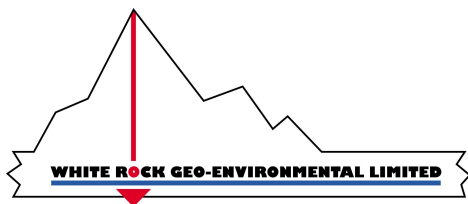
Drill Method: Rotary

Drill Date: 24/9/2019

Hole Size:

Datum: 96.157

Sheet: 1 of 2



Log of Borehole: BH4

Project No.: A192879

Project: Cornets End

X Coordinate: 422581

Y Coordinate: 281096

Status: Gas and Groundwater Borehole

Elevation: 96.157

Total Depth: 12.6

Project Manager:

SUBSURFACE PROFILE				SAMPLE				Well Completion Details
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	
11								
12		Red orange dry Mercia Mudstone	84.2 12.0					
			83.6 12.6					
13								
14								
15								
16								
17								
18								
19								
20								

Drilled By: Apex Drilling Services

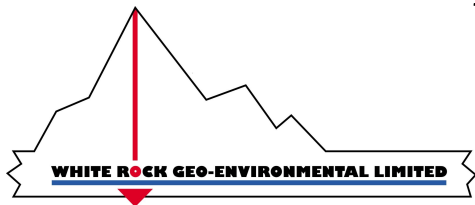
Drill Method: Rotary

Drill Date: 24/9/2019

Hole Size:

Datum: 96.157

Sheet: 2 of 2



Log of Borehole: BH5

Project No.: A192879

Project: Cornets End

X Coordinate: 422847

Y Coordinate: 281064

Status: Gas and Groundwater Borehole

Elevation: 96.032

Total Depth: 12.4

Project Manager:

SUBSURFACE PROFILE				SAMPLE				Well Completion Details
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	
0		Ground Surface	96.0					
		Brown friable gravelly TOP SOIL	0.0					
		Red orange clay with gravels						
1								
2								
3								
4								
5								
6								
7								
8								
9								
10			86.0					
			10.0					

Drilled By: Apex Drilling Services

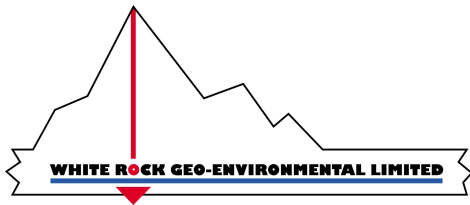
Drill Method: Rotary

Drill Date: 24/9/2019

Hole Size:

Datum: 96.032

Sheet: 1 of 2



Log of Borehole: BH5

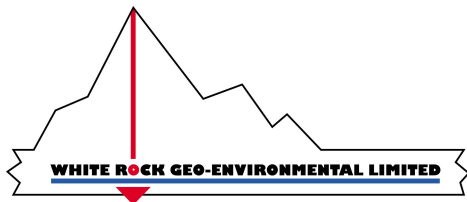
Project No.: A192879
Project: Cornets End
X Coordinate: 422847
Y Coordinate: 281064
Status: Gas and Groundwater Borehole

Elevation: 96.032
Total Depth: 12.4
Project Manager:

SUBSURFACE PROFILE				SAMPLE				Well Completion Details
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	
11		Red stiff sandy CLAY	84.6					
12		Red orange dry Mercia Mudstone	11.4					
13			83.6					
14			12.4					
15								
16								
17								
18								
19								
20								

Drilled By: Apex Drilling Services
Drill Method: Rotary
Drill Date: 24/9/2019

Hole Size:
Datum: 96.032
Sheet: 2 of 2



Log of Borehole: BH6

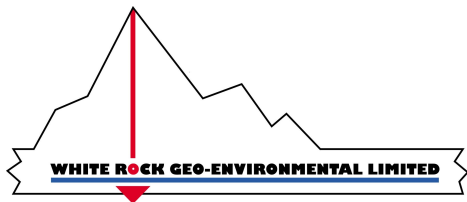
Project No.: A192879
Project: Cornets End
X Coordinate: 423503
Y Coordinate: 281252
Status: Gas and Groundwater Borehole

Elevation: 106.95
Total Depth: 12
Project Manager:

SUBSURFACE PROFILE				SAMPLE				Well Completion Details
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	
0		Ground Surface	107.0					
0.0		Brown friable soil and hardcore MADE GROUND	0.0					
1								
2								
3		Red orange clay with gravels	104.1					
2.9			2.9					
4								
5								
6								
7		Red stiff sandy CLAY	99.8					
7.2			7.2					
8								
9		Red orange dry Mercia Mudsone	97.7					
9.3			9.3					
10								

Drilled By: Apex Drilling Services
Drill Method: Rotary
Drill Date: 24/9/2019

Hole Size:
Datum: 106.95
Sheet: 1 of 2



Log of Borehole: BH6

Project No.: A192879
Project: Cornets End
X Coordinate: 423503
Y Coordinate: 281252
Status: Gas and Groundwater Borehole

Elevation: 106.95
Total Depth: 12
Project Manager:

SUBSURFACE PROFILE				SAMPLE				Well Completion Details
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	
11								
12			95.0 12.0					
13								
14								
15								
16								
17								
18								
19								
20								

Drilled By: Apex Drilling Services
Drill Method: Rotary
Drill Date: 24/9/2019

Hole Size:
Datum: 106.95
Sheet: 2 of 2



Log of Borehole: BH7

Project No.: A192879

Project: Cornets End

X Coordinate: 423298

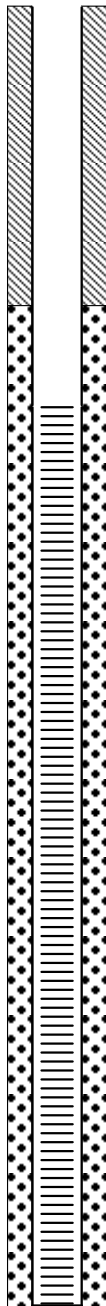
Y Coordinate: 281605

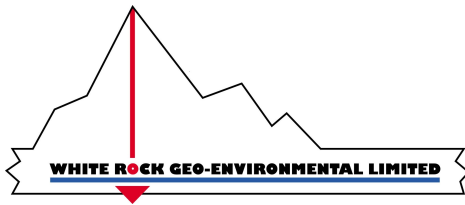
Status: Gas and Groundwater Borehole

Elevation: 96.56

Total Depth: 6.5

Project Manager:

SUBSURFACE PROFILE				SAMPLE				Well Completion Details
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	
0		Ground Surface	96.6					
		Brown friable TOP SOIL	0.0					
		Red orange clay with gravels						
1								
2								
3								
4								
5								
6		Red stiff sandy CLAY	90.8 5.8					
		Red orange dry Mercia Mudsone	90.4 6.2					
			90.1 6.5					
Drilled By: Apex Drilling Services				Hole Size:				
Drill Method: Rotary				Datum: 96.56				
Drill Date: 1992				Sheet: 1 of 1				



Log of Borehole: BH8

Project No.: A192879

Project: Cornets End

X Coordinate: 422613

Y Coordinate: 281358

Status: Gas and Groundwater Borehole

Elevation: 91.157

Total Depth: 7.1

Project Manager:

SUBSURFACE PROFILE				SAMPLE				Well Completion Details
Depth (m)	Symbol	Description	Depth/Elev.	Number	Type	Recovery	Vapour	
0		Ground Surface	91.2					
		Brown friable TOP SOIL	0.0					
			90.6					
		Red orange clay with gravels	0.6					
1								
2								
3								
4								
5								
6								
			84.9					
		Red stiff sandy CLAY	6.3					
		Red orange dry Mercia Mudsone						
7			84.1					
			7.1					
8								
9								
10								

Drilled By: Apex Drilling Services

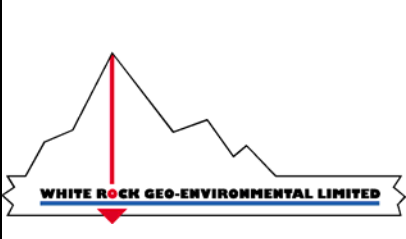
Drill Method: Rotary

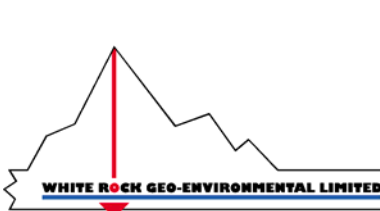
Drill Date: 25/9/2019

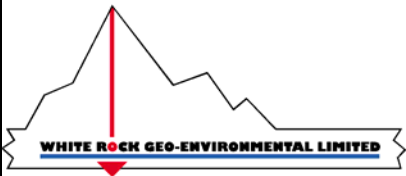
Hole Size:

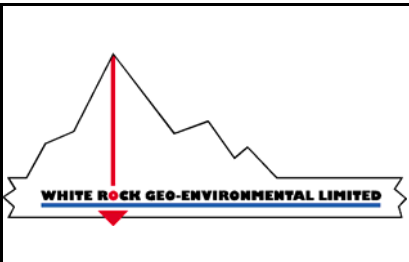
Datum: 91.157

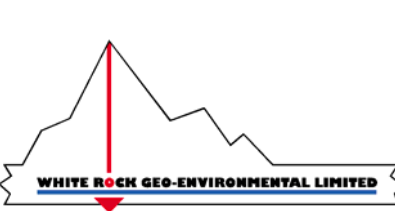
Sheet: 1 of 1

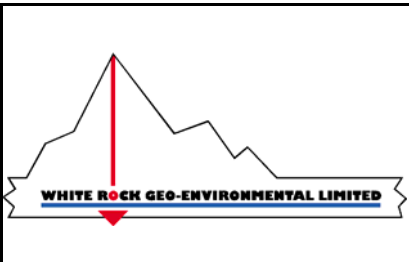
	Core Logging			
	Project Ref	Cornets End	Hole Type	Rotary Core
	Project ID	192879	Level	96.157
	Client	NRS	Co-ordinates	422581 281096
	Logged by	A Morris	Date	25/09/2019
			Borehole ID	BH4D
			Depth Range	13.5-16.4mbgl
Core Photography	Depth (mbgl)	Depth (mAOD)		Stratum Description
	13.5-15.4			Loose stiff red CLAY.
	15.4-16.4*			Very stiff red CLAY with green/grey clay deposit between 15.4m and 15.9m. Natural fracture planes through centre producing tabloid fragments.
Comments: * Measurements given by drillers - actual core is only 70cm long.				

Core Logging	
	Project Ref Project ID Client Logged by Cornets End 192879 NRS A Morris Hole Type Level Co-ordinates Date Rotary Core 96.157 422581 281096 25/09/2019 Borehole ID BH4D Depth Range 16.4-17.5mbgl
Core Photography	Stratum Description
	Depth (mbgl) 16.40-17.50 Depth (mAOD) Stratum Description Very stiff dry red CLAY with infrequent green/grey clay deposits. Natural fracture planes through centre producing tabloid fragments.
Comments:	

	Core Logging			
	Project Ref	Cornets End	Hole Type	Rotary Core
	Project ID	192879	Level	96.157
	Client	NRS	Co-ordinates	422581 281096
	Logged by	A Morris	Date	25/09/2019
			Borehole ID	BH4D
			Depth Range	17.5- 22.05mbgl
Core Photography	Depth (mbgl)	Depth (mAOD)		Stratum Description
	17.5-21.5			No Recovery
	21.5-22.05			Very stiff red CLAY with infrequent green/grey clay deposits.
Comments:				

	Core Logging			
	Project Ref Cornets End		Hole Type Rotary Core	Borehole ID BH4D Depth Range 23.20 -24.40mbgl
	Project ID 192879		Level 96.157	
	Client NRS		Co-ordinates 422581 281096	
	Logged by A Morris		Date 25/09/2019	
Core Photography	Depth (mbgl)	Depth (mAOD)		Stratum Description
	23.2 - 23.29			Green/grey CLAY
	23.29 - 24.40			
Comments:				

	Core Logging			
	Project Ref Cornets End		Hole Type Rotary Core	Borehole ID
	Project ID 192879		Level 96.157	BH4D
	Client NRS		Co-ordinates 422581	Depth Range
	Logged by A Morris		Date 25/09/2019	22.05 -23.20mbgl
Core Photography	Depth (mbgl)	Depth (mAOD)		Stratum Description
	22.05-23.17			Very stiff red/brown CLAY with infrequent grey/green CLAY deposits
	23.17-23.20			Very stiff green/grey CLAY
Comments:				

	Core Logging			
	Project Ref Cornets End		Hole Type Rotary Core	Borehole ID
	Project ID 192879		Level 96.157	BH4D
	Client NRS		Co-ordinates 422581 281096	Depth Range
	Logged by A Morris		Date 25/09/2019	24.40 -25.00mbgl
Core Photography	Depth (mbgl)	Depth (mAOD)		Stratum Description
	24.40-25.00			Very stiff red/brown CLAY with green/grey clay marbelling.
Comments:				

APPENDIX 6
Laboratory Permeability Test Certificates

PERMEABILITY IN A TRIAXIAL CELL

Location 1
 Sample Ref 1
 Sample Depth 0.30 m
 Sample Type CC

Description:

Firm orangish brown slightly gravelly sandy CLAY.

SPECIMEN DETAILS

Depth within original sample 2mm
 Orientation within original Vertical
 Specimen preparation Undisturbed

TEST DETAILS

		INITIAL	FINAL
Diameter	mm	99.12	98.36
Height	mm	101.50	100.72
Water Content	%	14.9	17.7
Bulk Density	Mg/m ³	2.07	2.17
Dry Density	Mg/m ³	1.80	1.84
Average Laboratory Temperature	°C	20	
Source of Permeant Water		De-aired tap water	

SATURATION STAGE

Saturation initially by constant water content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value) 0.80 0.95

CONSOLIDATION STAGE

Effective pressure kPa 100
 Volume change mL 18.0

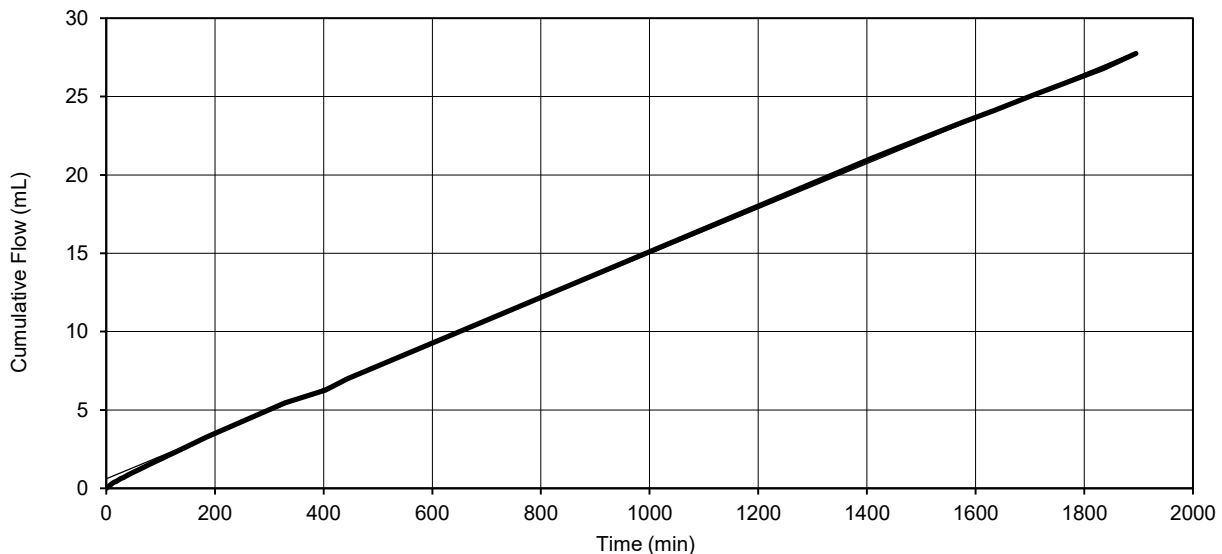
PERMEABILITY STAGE

Measured under constant head conditions in a triaxial cell

Pressure difference across specimen kPa 20
 Hydraulic gradient 20.2
 Mean effective stress kPa 100
 Correction for head loss kPa 0

TEST DURATIONS

Saturation days 2
 Consolidation days 2
 Flow days 2

Coefficient of Permeability $k_v \text{ at } 20^\circ\text{C} = 1.6 \times 10^{-9} \text{ m/s}$ 

Tested by DN

Checked and Approved by

P Heritage - Project Manager
 09/02/2026

Project Number:

GEO / 44094

Project Name:

MERIDEN QUARRY
25-273

GEOLABS®

PERMEABILITY IN A TRIAXIAL CELL

Location 2
 Sample Ref 2
 Sample Depth 0.30 m
 Sample Type CC

Description:

Firm red brown mottled dark grey slightly gravelly sandy CLAY. Gravel and sand fine to medium.

SPECIMEN DETAILS

Depth within original sample 10mm
 Orientation within original Vertical
 Specimen preparation Undisturbed

TEST DETAILS

		INITIAL	FINAL
Diameter	mm	98.36	97.88
Height	mm	101.28	100.79
Water Content	%	23.1	24.1
Bulk Density	Mg/m ³	1.92	1.97
Dry Density	Mg/m ³	1.56	1.59
Average Laboratory Temperature	°C	20	
Source of Permeant Water		De-aired tap water	

SATURATION STAGE

Saturation initially by constant water content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value) 0.51 0.97

CONSOLIDATION STAGE

Effective pressure kPa 100
 Volume change mL 11.3

PERMEABILITY STAGE

Measured under constant head conditions in a triaxial cell

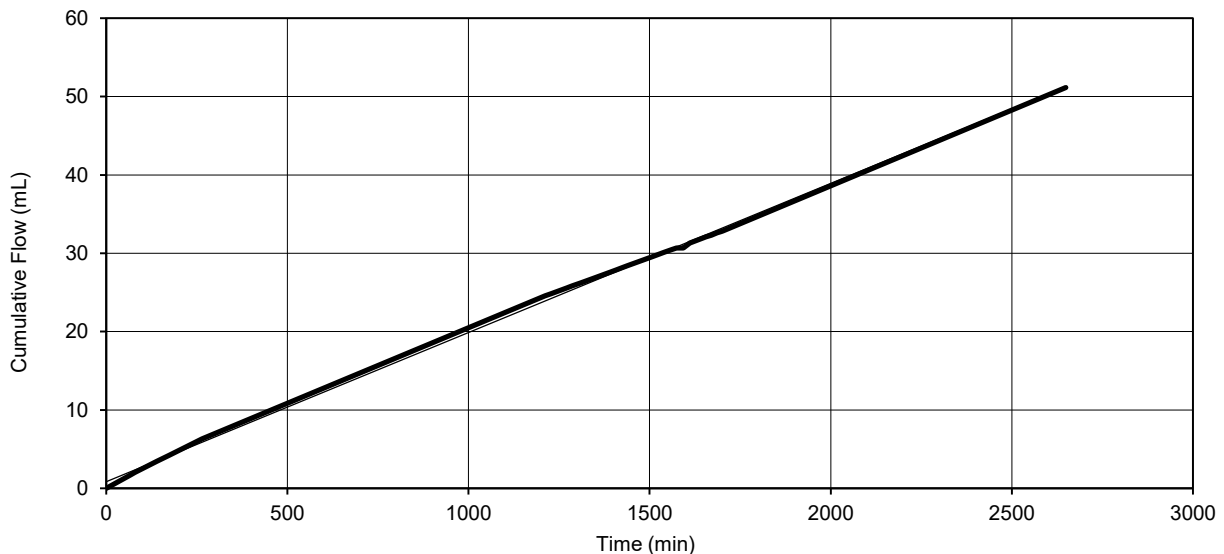
Pressure difference across specimen kPa 20
 Hydraulic gradient 20.2
 Mean effective stress kPa 100
 Correction for head loss kPa 0

TEST DURATIONS

Saturation days 3
 Consolidation days 1
 Flow days 2

Coefficient of Permeability

k_v at 20 °C = 2.1×10^{-9} m/s



Tested by DN

Checked and Approved by

P. Heritage

P Heritage - Project Manager
 13/02/2026

Project Number:

GEO / 44094

Project Name:

**MERIDEN QUARRY
 25-273**

GEOLABS®



PERMEABILITY IN A TRIAXIAL CELL

Location 3
 Sample Ref 3
 Sample Depth 0.30 m
 Sample Type CC

Description:

Firm reddish brown mottled light grey gravelly sandy CLAY. Gravel and sand fine to coarse.

SPECIMEN DETAILS

Depth within original sample n/a
 Orientation within original n/a
 Specimen preparation Undisturbed

TEST DETAILS

		INITIAL	FINAL
Diameter	mm	99.63	99.06
Height	mm	101.53	100.94
Water Content	%	22.2	22.6
Bulk Density	Mg/m ³	1.99	2.03
Dry Density	Mg/m ³	1.63	1.65
Average Laboratory Temperature	°C	20	
Source of Permeant Water		De-aired tap water	

SATURATION STAGE

Saturation initially by constant water content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value) 0.60 0.96

CONSOLIDATION STAGE

Effective pressure kPa 100
 Volume change mL 13.6

PERMEABILITY STAGE

Measured under constant head conditions in a triaxial cell

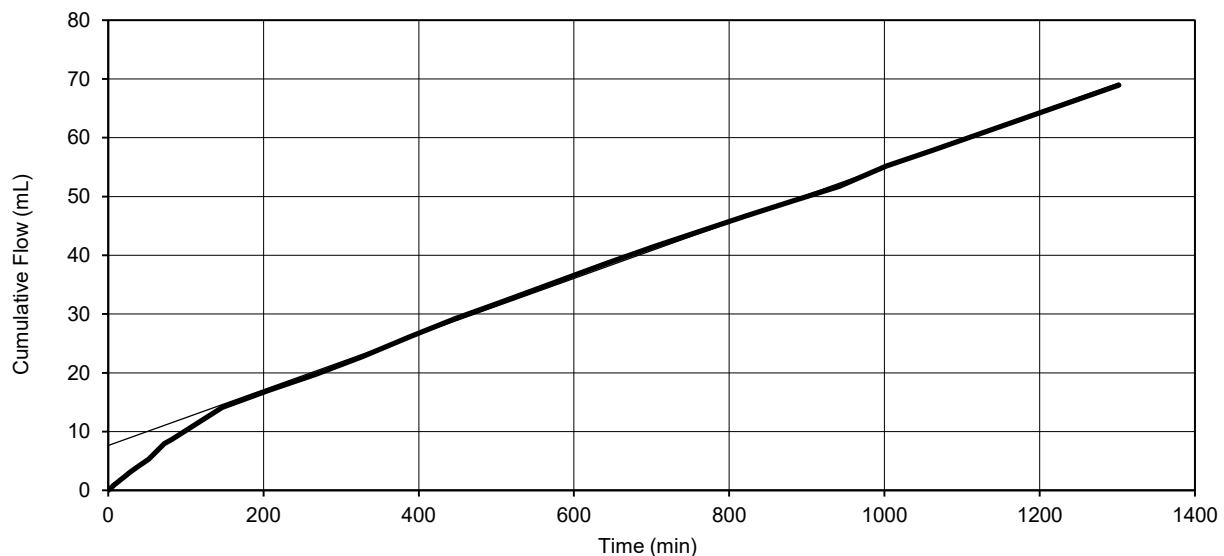
Pressure difference across specimen kPa 20
 Hydraulic gradient 20.2
 Mean effective stress kPa 100
 Correction for head loss kPa 0

TEST DURATIONS

Saturation days 3
 Consolidation days 1
 Flow days 1

Coefficient of Permeability

k_v at 20 °C = 5.1×10^{-9} m/s



Tested by DN

Checked and Approved by

P. Heritage

P Heritage - Project Manager
 06/03/2026

Project Number:

GEO / 44094

Project Name:

**MERIDEN QUARRY
 25-273**

GEOLABS®



APPENDIX 7

RTM Outputs for Scenario 1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Antimony	from Level 1
Target Concentration	5.00E-03	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	6.00E-03	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	
Calculated decay rate	λ	7.70E-101	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	2.51E+02	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	1.49E+03	fraction
Decay rate used	λ	5.17E-104	d ⁻¹
Rate of contaminant flow due to retardation	u	2.94E-07	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	2.74E-04	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	2.19E+01	

Remedial Targets

Remedial Target	1.10E-01	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀	2.74E-04	mg/l Ogata Banks
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	Kd	2.51E+02 l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	K _{oc,n}	l/kg
Sorption coefficient for ionised species	K _{oc,i}	l/kg
pH value	pH	
acid dissociation constant	pKa	fraction
Fraction of organic carbon in aquifer	foc	
Soil water partition coefficient	Kd	2.51E+02 l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

Longitudinal dispersivity	ax	2.23E-01	3.80E-01	2.23E-01	m
Transverse dispersivity	az	2.23E-02	3.80E-02	2.23E-02	m
Vertical dispersivity	ay	1.00E-99	3.80E-02	2.23E-01	
Note values of dispersivity must be > 0					
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x					
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{0.44} , az = ax/10, ay = ax/100 are assumed					

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

Calculated concentrations for distance-concentration graph

Ogata Banks		
From calculation sheet		
Distance	Concentration	mg/l
0	6.0E-03	
0.2	5.98E-03	
0.4	5.95E-03	
0.6	5.89E-03	
0.8	5.80E-03	
1.0	5.67E-03	
1.1	5.48E-03	
1.3	5.24E-03	
1.5	4.93E-03	
1.7	4.56E-03	
1.9	4.13E-03	
2.1	3.67E-03	
2.3	3.18E-03	
2.5	2.69E-03	
2.7	2.21E-03	
2.9	1.77E-03	
3.0	1.37E-03	
3.2	1.04E-03	
3.4	5.81E-04	
3.6	4.05E-04	
3.8	2.74E-04	

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Arsenic		from Level 1
Target Concentration	$5.00E-03$	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	$5.00E-02$	mg/l	Source of parameter value
Half life for degradation of contaminant in water	$9.00E+99$	days	
Calculated decay rate	$7.70E-101$	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	$6.20E+02$	m	
Plume thickness at source	$6.00E+00$	m	
Saturated aquifer thickness	$6.00E+00$	m	
Bulk density of aquifer materials	$1.78E+00$	g/cm ³	
Effective porosity of aquifer	$3.00E-01$	fraction	
Hydraulic gradient	$5.90E-01$	fraction	
Hydraulic conductivity of aquifer	$2.23E-04$	m/d	
Distance to compliance point	$3.80E+00$	m	
Distance (lateral) to compliance point perpendicular to flow direction	$0.00E+00$	m	
Distance (depth) to compliance point perpendicular to flow direction	$0.00E+00$	m	
Time since pollutant entered groundwater	$7.30E+06$	days	time variant options only
Parameters values determined from options			
Partition coefficient	$4.94E+01$	l/kg	see options
Longitudinal dispersivity	$2.23E-01$	m	see options
Transverse dispersivity	$2.23E-02$	m	see options
Vertical dispersivity	$1.00E-99$	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	$4.39E-04$	m/d
Retardation factor	Rf	$2.94E+02$	fraction
Decay rate used	λ	$2.62E-103$	d ⁻¹
Rate of contaminant flow due to retardation	u	$1.49E-06$	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	$5.00E-02$	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	$1.00E+00$	

Remedial Targets

Remedial Target	$5.00E-03$	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C _o	$5.00E-02$	Ogata Banks
		$7.3E+06$	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	Kd	$4.94E+01$ l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	K _{oc,n}	l/kg
Sorption coefficient for ionised species	K _{oc,i}	l/kg
pH value	pH	
acid dissociation constant	pKa	fraction
Fraction of organic carbon in aquifer	foc	
Soil water partition coefficient	Kd	$4.94E+01$ l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

Longitudinal dispersivity	ax	Enter value	Calc value	Xu & Eckstein	m
Transverse dispersivity	az	$2.23E-02$	$1.90E-01$	$2.23E-01$	m
Vertical dispersivity	ay	$1.00E-99$	$1.90E-02$	$2.23E-01$	m
Note values of dispersivity must be > 0					
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x					
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{0.44} ; az = ax/10, ay = ax/100 are assumed					

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	$5.0E-02$
0.2	$5.00E-02$
0.4	$5.00E-02$
0.6	$5.00E-02$
0.8	$5.00E-02$
1.0	$5.00E-02$
1.1	$5.00E-02$
1.3	$5.00E-02$
1.5	$5.00E-02$
1.7	$5.00E-02$
1.9	$5.00E-02$
2.1	$5.00E-02$
2.3	$5.00E-02$
2.5	$5.00E-02$
2.7	$5.00E-02$
2.9	$5.00E-02$
3.0	$5.00E-02$
3.2	$5.00E-02$
3.4	$5.00E-02$
3.6	$5.00E-02$
3.8	$5.00E-02$

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Barium		from Level 1
Target Concentration	C _T	1.30E+00	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	2.00E+00	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	
Calculated decay rate	λ	7.70E-101	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	1.12E+02	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	6.66E+02	fraction
Decay rate used	λ	1.16E-103	d ⁻¹
Rate of contaminant flow due to retardation	u	6.59E-07	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	1.51E+00	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.32E+00	

Remedial Targets

Remedial Target	1.72E+00	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀	1.51E+00	mg/l Ogata Banks
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	Kd	1.12E+02 l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	K _{oc,n}	l/kg
Sorption coefficient for ionised species	K _{oc,i}	l/kg
pH value	pH	
acid dissociation constant	pKa	
Fraction of organic carbon in aquifer	foc	fraction
Soil water partition coefficient	Kd	1.12E+02 l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

Longitudinal dispersivity	ax	Enter value 2.23E-01	Calc value 1.90E-01	Xu & Eckstein 2.23E-01	m
Transverse dispersivity	az	2.23E-02	1.90E-02	2.23E-02	m
Vertical dispersivity	ay	1.00E-99	1.90E-02	2.23E-01	
Note values of dispersivity must be > 0					
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x					
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{0.44} , az = ax/10, ay = ax/100 are assumed					

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

Calculated concentrations for distance-concentration graph

Ogata Banks		mg/l
From calculation sheet		
Distance	Concentration	
0	2.0E+00	
0.2	2.00E+00	
0.4	2.00E+00	
0.6	2.00E+00	
0.8	2.00E+00	
1.0	2.00E+00	
1.1	2.00E+00	
1.3	1.99E+00	
1.5	1.99E+00	
1.7	1.98E+00	
1.9	1.98E+00	
2.1	1.97E+00	
2.3	1.95E+00	
2.5	1.93E+00	
2.7	1.91E+00	
2.9	1.88E+00	
3.0	1.84E+00	
3.2	1.80E+00	
3.4	1.75E+00	
3.6	1.59E+00	
3.8	1.51E+00	

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Chromium	from Level 1
Target Concentration	4.70E-03	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	5.00E-02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	
Calculated decay rate	λ	7.70E-101	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	7.94E+03	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	4.71E+04	fraction
Decay rate used	λ	1.63E-105	d ⁻¹
Rate of contaminant flow due to retardation	u	9.31E-09	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	0.00E+00	mg/l
Attenuation factor (one way vertical dispersion, COICED)	AF	breakthrough at compliance point	

Remedial Targets

Remedial Target	No impact	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀	0.00E+00	mg/l Ogata Banks
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	Kd	7.94E+03 l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	K _{oc,n}	l/kg
Sorption coefficient for ionised species	K _{oc,i}	l/kg
pH value	pH	
acid dissociation constant	pKa	fraction
Fraction of organic carbon in aquifer	foc	
Soil water partition coefficient	Kd	7.94E+03 l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

	Enter value	Calc value	Xu & Eckstein	m	
Longitudinal dispersivity	ax	2.23E-01	1.90E-01	2.23E-01	m
Transverse dispersivity	az	2.23E-02	1.90E-02	2.23E-02	m
Vertical dispersivity	ay	1.00E-99	1.90E-02	2.23E-01	
Note values of dispersivity must be > 0					
For calculated value, assumes $a_x = 0.1 * x$, $a_z = 0.01 * x$, $a_y = 0.001 * x$					
Xu & Eckstein (1995) report $a_x = 0.83(\log_{10}x)^{0.44}$; $a_z = ax/10$, $a_y = ax/100$ are assumed					

Calculated concentrations for distance-concentration graph

Ogata Banks	
From calculation sheet	
Distance	Concentration
	mg/l
0	5.0E-02
0.2	2.02E-02
0.4	3.20E-03
0.6	1.76E-04
0.8	3.20E-06
1.0	9.86E-09
1.1	0.00E+00
1.3	0.00E+00
1.5	0.00E+00
1.7	0.00E+00
1.9	0.00E+00
2.1	0.00E+00
2.3	0.00E+00
2.5	0.00E+00
2.7	0.00E+00
2.9	0.00E+00
3.0	0.00E+00
3.2	0.00E+00
3.4	0.00E+00
3.6	0.00E+00
3.8	0.00E+00

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Copper		from Level 1
Target Concentration	C _T	3.47E-02	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	2.00E-01	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	
Calculated decay rate	λ	7.70E-101	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	5.01E+02	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	2.97E+03	fraction
Decay rate used	λ	2.59E-104	d ⁻¹
Rate of contaminant flow due to retardation	u	1.47E-07	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	8.38E-06	mg/l
Attenuation factor (one way vertical dispersion, COICED)	AF	2.39E+04	

Remedial Targets

Remedial Target	8.28E+02	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀	8.38E-06	mg/l Ogata Banks
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	Kd	5.01E+02 l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	K _{oc,n}	l/kg
Sorption coefficient for ionised species	K _{oc,i}	l/kg
pH value	pH	
acid dissociation constant	pKa	fraction
Fraction of organic carbon in aquifer	foc	
Soil water partition coefficient	Kd	5.01E+02 l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

Longitudinal dispersivity	ax	Enter value	Calc value	Xu & Eckstein	m
Transverse dispersivity	az	2.23E-01	1.90E-01	2.23E-01	m
Vertical dispersivity	ay	2.23E-02	1.90E-02	2.23E-02	m
		1.00E-99	1.90E-02	1.23E-01	
Note values of dispersivity must be > 0					
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x					
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{0.44} ; az = ax/10, ay = ax/100 are assumed					

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	2.0E-01
0.2	1.96E-01
0.4	1.88E-01
0.6	1.76E-01
0.8	1.60E-01
1.0	1.39E-01
1.1	1.15E-01
1.3	9.15E-02
1.5	6.85E-02
1.7	4.84E-02
1.9	3.22E-02
2.1	2.01E-02
2.3	1.17E-02
2.5	6.40E-03
2.7	3.27E-03
2.9	1.04E-03
3.0	4.57E-04
3.2	1.87E-04
3.4	7.13E-05
3.6	2.53E-05
3.8	8.38E-06

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Lead		from Level 1
Target Concentration	C_T	$2.00E-04$ mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C_0	$5.00E-02$ mg/l	Source of parameter value
Half life for degradation of contaminant in water	$t_{1/2}$	$9.00E+99$ days	
Calculated decay rate	λ	$7.70E-101$ days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	S_z	$6.20E+02$ m	
Plume thickness at source	S_y	$6.00E+00$ m	
Saturated aquifer thickness	d_a	$6.00E+00$ m	
Bulk density of aquifer materials	ρ	$1.78E+00$ g/cm ³	
Effective porosity of aquifer	n	$3.00E-01$ fraction	
Hydraulic gradient	i	$5.90E-01$ fraction	
Hydraulic conductivity of aquifer	K	$2.23E-04$ m/d	
Distance to compliance point	x	$3.80E+00$ m	
Distance (lateral) to compliance point perpendicular to flow direction	z	$0.00E+00$ m	
Distance (depth) to compliance point perpendicular to flow direction	y	$0.00E+00$ m	
Time since pollutant entered groundwater	t	$7.30E+06$ days	time variant options only
Parameters values determined from options			
Partition coefficient	K_d	$1.31E+04$ l/kg	see options
Longitudinal dispersivity	α_x	$2.23E-01$ m	see options
Transverse dispersivity	α_z	$2.23E-02$ m	see options
Vertical dispersivity	α_y	$1.00E-99$ m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	$4.39E-04$ m/d
Retardation factor	R_f	$7.77E+04$ fraction
Decay rate used	λ	$9.91E-106$ d ⁻¹
Rate of contaminant flow due to retardation	u	$5.64E-09$ m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ed}	$0.00E+00$ mg/l
Attenuation factor (one way vertical dispersion, COICED)	AF	breakthrough at compliance point

Remedial Targets

Remedial Target	No impact	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C_{ed}/C_0	$0.00E+00$ mg/l	Ogata Banks
		$7.3E+06$ days	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	K_d	$1.31E+04$ l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	f_{oc}	
Organic carbon partition coefficient	K_{oc}	
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	$K_{oc,n}$	
Sorption coefficient for ionised species	$K_{oc,i}$	
pH value	pH	
acid dissociation constant	pKa	
Fraction of organic carbon in aquifer	f_{oc}	
Soil water partition coefficient	K_d	$1.31E+04$ l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

Longitudinal dispersivity	α_x	Enter value	Calc value	Xu & Eckstein	m
Transverse dispersivity	α_z	$2.23E-02$	$1.90E-01$	$2.23E-01$	m
Vertical dispersivity	α_y	$1.00E-99$	$1.90E-02$	$2.23E-01$	m
Note values of dispersivity must be > 0					
For calculated value, assumes $\alpha_x = 0.1 * x$, $\alpha_z = 0.01 * x$, $\alpha_y = 0.001 * x$					
Xu & Eckstein (1995) report $\alpha_x = 0.83(\log_{10}x)^{0.44}$, $\alpha_z = \alpha_x/10$, $\alpha_y = \alpha_x/100$ are assumed					

Calculated concentrations for distance-concentration graph

Ogata Banks		
From calculation sheet		
Distance	Concentration	
	mg/l	
0	5.0E-02	
0.2	1.19E-02	
0.4	5.67E-04	
0.6	4.43E-06	
0.8	2.78E-09	
1.0	0.00E+00	
1.1	0.00E+00	
1.3	0.00E+00	
1.5	0.00E+00	
1.7	0.00E+00	
1.9	0.00E+00	
2.1	0.00E+00	
2.3	0.00E+00	
2.5	0.00E+00	
2.7	0.00E+00	
2.9	0.00E+00	
3.0	0.00E+00	
3.2	0.00E+00	
3.4	0.00E+00	
3.6	0.00E+00	
3.8	0.00E+00	

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Mercury	from Level 1
Target Concentration	1.00E-05	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	1.00E-03	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	
Calculated decay rate	λ	7.70E-101	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	6.31E+03	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	3.74E+04	fraction
Decay rate used	λ	2.06E-105	d ⁻¹
Rate of contaminant flow due to retardation	u	1.17E-08	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	0.00E+00	mg/l
Attenuation factor (one way vertical dispersion, COICED)	AF	breakthrough at compliance point	

Remedial Targets

Remedial Target	No impact	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀	0.00E+00	mg/l Ogata Banks
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)	Kd	6.31E+03	l/kg
Soil water partition coefficient	Kd		
Entry for non-polar organic chemicals (option)	foc		fraction
Fraction of organic carbon in aquifer	foc		
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)	K _{oc,n}		l/kg
Sorption coefficient for related species	K _{oc,n}		l/kg
Sorption coefficient for ionised species	pH		
pH value	pKa		fraction
acid dissociation constant	foc		
Fraction of organic carbon in aquifer	Kd	6.31E+03	l/kg
Soil water partition coefficient			

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

	Enter value	Calc value	Xu & Eckstein	m	
Longitudinal dispersivity	ax	2.23E-01	1.90E-01	2.23E-01	m
Transverse dispersivity	az	2.23E-02	1.90E-02	2.23E-02	m
Vertical dispersivity	ay	1.00E-99	1.90E-02	2.23E-01	
Note values of dispersivity must be > 0					
For calculated value, assumes $ax = 0.1 * x$, $az = 0.01 * x$, $ay = 0.001 * x$					
Xu & Eckstein (1995) report $ax = 0.83(\log_{10}x)^{0.44}$; $az = ax/10$, $ay = ax/100$ are assumed					

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

Calculated concentrations for distance-concentration graph

Ogata Banks	From calculation sheet
Distance	Concentration
	mg/l
0	1.0E-03
0.2	4.82E-04
0.4	1.13E-04
0.6	1.16E-05
0.8	4.97E-07
1.0	8.68E-09
1.1	3.25E-11
1.3	0.00E+00
1.5	0.00E+00
1.7	0.00E+00
1.9	0.00E+00
2.1	0.00E+00
2.3	0.00E+00
2.5	0.00E+00
2.7	0.00E+00
2.9	0.00E+00
3.0	0.00E+00
3.2	0.00E+00
3.4	0.00E+00
3.6	0.00E+00
3.8	0.00E+00

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Nickel		from Level 1
Target Concentration	C _T 1.63E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	4.00E-02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	
Calculated decay rate	λ	7.70E-101	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	1.26E+03	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	7.47E+03	fraction
Decay rate used	λ	1.03E-104	d ⁻¹
Rate of contaminant flow due to retardation	u	5.87E-08	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	0.00E+00	mg/l
Attenuation factor (one way vertical dispersion, COICED)	AF	breakthrough at compliance point	

Remedial Targets

Remedial Target	No impact	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀ 7.3E+06	mg/l days	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	Kd	1.26E+03 l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	K _{oc,n}	l/kg
Sorption coefficient for ionised species	K _{oc,i}	l/kg
pH value	pH	
acid dissociation constant	pKa	fraction
Fraction of organic carbon in aquifer	foc	
Soil water partition coefficient	Kd	1.26E+03 l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

	Enter value	Calc value	Xu & Eckstein	m
Longitudinal dispersivity	ax	2.23E-01	1.90E-01	2.23E-01 m
Transverse dispersivity	az	2.23E-02	1.90E-02	2.23E-02 m
Vertical dispersivity	ay	1.00E-99	1.90E-02	2.23E-01
Note values of dispersivity must be > 0				
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x				
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{0.44} ; az = ax/10, ay = ax/100 are assumed				

Calculated concentrations for distance-concentration graph

Ogata Banks		mg/l
From calculation sheet		
Distance	Concentration	
0	4.0E-02	
0.2	3.57E-02	
0.4	2.88E-02	
0.6	2.07E-02	
0.8	1.29E-02	
1.0	6.93E-03	
1.1	3.17E-03	
1.3	1.23E-03	
1.5	4.00E-04	
1.7	1.09E-04	
1.9	2.51E-05	
2.1	2.85E-06	
2.3	4.50E-07	
2.5	5.92E-08	
2.7	6.50E-09	
2.9	5.93E-10	
3.0	0.00E+00	
3.2	0.00E+00	
3.4	0.00E+00	
3.6	0.00E+00	
3.8	0.00E+00	

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Zinc		from Level 1
Target Concentration	C_T	3.00E-02	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C_0	4.00E-01	mg/l	Source of parameter value
Half life for degradation of contaminant in water	$t_{1/2}$	9.00E+99	days	
Calculated decay rate	λ	7.70E-101	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	S_z	6.20E+02	m	
Plume thickness at source	S_y	6.00E+00	m	
Saturated aquifer thickness	d_a	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	K_d	7.82E+03	l/kg	see options
Longitudinal dispersivity	α_x	2.23E-01	m	see options
Transverse dispersivity	α_z	2.23E-02	m	see options
Vertical dispersivity	α_y	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	R_f	4.64E+04	fraction
Decay rate used	λ	1.66E-105	d ⁻¹
Rate of contaminant flow due to retardation	u	9.45E-09	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ed}	0.00E+00	mg/l
Attenuation factor (one way vertical dispersion, COICED)	AF	breakthrough at compliance point	

Remedial Targets

Remedial Target	No impact	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C_{ed}/C_0	0.00E+00	mg/l Ogata Banks
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	K_d	7.82E+03 l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	f_{oc}	fraction
Organic carbon partition coefficient	K_{oc}	l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	$K_{oc,n}$	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	l/kg
pH value	pH	
acid dissociation constant	pKa	fraction
Fraction of organic carbon in aquifer	f_{oc}	
Soil water partition coefficient	K_d	7.82E+03 l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

Longitudinal dispersivity	α_x	Enter value	Calc value	Xu & Eckstein	m
Transverse dispersivity	α_z	2.23E-01	1.90E-01	2.23E-01	m
Vertical dispersivity	α_y	2.23E-02	1.90E-02	2.23E-02	m
		1.00E-99	1.90E-02	1.00E-01	
Note values of dispersivity must be > 0					
For calculated value, assumes $\alpha_x = 0.1 * x$, $\alpha_z = 0.01 * x$, $\alpha_y = 0.001 * x$					
Xu & Eckstein (1995) report $\alpha_x = 0.83(\log_{10} x)^{0.44}$, $\alpha_z = \alpha_x/10$, $\alpha_y = \alpha_x/100$ are assumed					

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

Calculated concentrations for distance-concentration graph

Ogata Banks		
From calculation sheet		
Distance	Concentration	
	mg/l	
0	4.0E-01	
0.2	1.64E-01	
0.4	2.67E-02	
0.6	1.54E-03	
0.8	2.98E-05	
1.0	1.00E-07	
1.1	0.00E+00	
1.3	0.00E+00	
1.5	0.00E+00	
1.7	0.00E+00	
1.9	0.00E+00	
2.1	0.00E+00	
2.3	0.00E+00	
2.5	0.00E+00	
2.7	0.00E+00	
2.9	0.00E+00	
3.0	0.00E+00	
3.2	0.00E+00	
3.4	0.00E+00	
3.6	0.00E+00	
3.8	0.00E+00	

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Benzo(a)pyrene	from Level 1
Target Concentration	5.00E-08	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	3.80E-03	mg/l
Half life for degradation of contaminant in water	t _{1/2}	1.06E+03	days
Calculated decay rate	λ	6.55E-04	days ⁻¹
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m
Plume thickness at source	Sy	6.00E+00	m
Saturated aquifer thickness	da	6.00E+00	m
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³
Effective porosity of aquifer	n	3.00E-01	fraction
Hydraulic gradient	i	5.90E-01	fraction
Hydraulic conductivity of aquifer	K	2.23E-04	m/d
Distance to compliance point	x	3.80E+00	m
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m
Time since pollutant entered groundwater	t	7.30E+06	days

Parameters values determined from options

Partition coefficient	Kd	3.86E+02	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	2.29E+03	fraction
Decay rate used	λ	2.86E-07	d ⁻¹
Rate of contaminant flow due to retardation	u	1.91E-07	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	7.26E-07	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	5.23E+03	

Remedial Targets

Remedial Target	2.62E-04	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀	7.26E-07	mg/l Ogata Banks
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)

Soil water partition coefficient Kd l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer foc 3.00E-03 fraction

Organic carbon partition coefficient Koc 1.29E+05 l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species K_{oc,n} l/kg

Sorption coefficient for ionised species K_{oc,i} l/kg

pH value pH

acid dissociation constant pKa

Fraction of organic carbon in aquifer foc

Soil water partition coefficient Kd 3.86E+02 l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

Longitudinal dispersivity	ax	Enter value 2.23E-01	Calc value 3.80E-01	Xu & Eckstein 2.23E-01	m
Transverse dispersivity	az	2.23E-02	3.80E-02	2.23E-02	m
Vertical dispersivity	ay	1.00E-99	3.80E-02	2.23E-01	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x
Xu & Eckstein (1995) report ax = 0.83(log₁₀x)^{0.44}; az = ax/10, ay = ax/100 are assumed

Calculated concentrations for distance-concentration graph

Ogata Banks

From calculation sheet

Distance	Concentration
	mg/l
0	3.8E-03
0.2	3.03E-03
0.4	2.42E-03
0.6	1.92E-03
0.8	1.52E-03
1.0	1.19E-03
1.1	9.25E-04
1.3	7.07E-04
1.5	5.30E-04
1.7	3.88E-04
1.9	2.76E-04
2.1	1.90E-04
2.3	1.26E-04
2.5	6.83E-05
2.7	4.10E-05
2.9	2.36E-05
3.0	1.30E-05
3.2	6.80E-06
3.4	3.39E-06
3.6	1.61E-06
3.8	7.26E-07

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant		Naphthalene		from Level 1
Target Concentration	C _T	2.00E-05	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	1.50E+00	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	3.00E+02	days	
Calculated decay rate	λ	2.31E-03	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	1.94E+00	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	1.25E+01	fraction
Decay rate used	λ	1.85E-04	d ⁻¹
Rate of contaminant flow due to retardation	u	3.51E-05	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	1.10E-05	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.37E+05	

Remedial Targets

Remedial Target	2.74E+00	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀	1.10E-05	mg/l
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	3.00E-03	fraction
Organic carbon partition coefficient	Koc	6.46E+02	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	K _{oc,n}		l/kg
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	1.94E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

Longitudinal dispersivity	ax	Enter value	Calc value	Xu & Eckstein	m
Transverse dispersivity	az	2.23E-01	1.90E-01	2.23E-01	m
Vertical dispersivity	ay	2.23E-02	1.90E-02	2.23E-02	m
		1.00E-99	1.90E-02	2.23E-01	
Note values of dispersivity must be > 0					
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x					
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{0.44} ; az = ax/10, ay = ax/100 are assumed					

Calculated concentrations for distance-concentration graph

Ogata Banks		
From calculation sheet		
Distance	Concentration	
	mg/l	
0	1.5E+00	
0.2	8.30E-01	
0.4	4.60E-01	
0.6	2.55E-01	
0.8	1.41E-01	
1.0	7.89E-02	
1.1	4.32E-02	
1.3	2.39E-02	
1.5	1.32E-02	
1.7	7.33E-03	
1.9	4.06E-03	
2.1	2.25E-03	
2.3	1.24E-03	
2.5	6.88E-04	
2.7	3.81E-04	
2.9	2.11E-04	
3.0	1.17E-04	
3.2	6.46E-05	
3.4	3.58E-05	
3.6	1.98E-05	
3.8	1.10E-05	

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Benzene	from Level 1
Target Concentration	1.00E-03	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	2.20E+00	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	3.50E+02	days	
Calculated decay rate	λ	1.98E-03	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	2.01E-01	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	2.19E+00	fraction
Decay rate used	λ	9.03E-04	d ⁻¹
Rate of contaminant flow due to retardation	u	2.00E-04	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	5.54E-05	mg/l
Attenuation factor (one way vertical dispersion, COICED)	AF	3.97E+04	

Remedial Targets

Remedial Target	3.97E+01	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀	5.54E-05	mg/l Ogata Banks
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)		
Soil water partition coefficient	Kd	l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	foc	3.00E-03 fraction
Organic carbon partition coefficient	Koc	6.70E+01 l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	K _{oc,n}	l/kg
Sorption coefficient for ionised species	K _{oc,i}	l/kg
pH value	pH	
acid dissociation constant	pKa	
Fraction of organic carbon in aquifer	foc	fraction
Soil water partition coefficient	Kd	2.01E-01 l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

Longitudinal dispersivity	ax	Enter value	Calc value	Xu & Eckstein	m
Transverse dispersivity	az	2.23E-01	1.90E-01	2.23E-01	m
Vertical dispersivity	ay	2.23E-02	1.90E-02	2.23E-02	m
		1.00E-99	1.90E-02	2.23E-01	
Note values of dispersivity must be > 0					
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x					
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{0.44} ; az = ax/10, ay = ax/100 are assumed					

Calculated concentrations for distance-concentration graph

Ogata Banks		mg/l
From calculation sheet		
Distance	Concentration	
0	2.2E+00	
0.2	1.30E+00	
0.4	7.63E-01	
0.6	4.49E-01	
0.8	2.65E-01	
1.0	1.56E-01	
1.1	9.18E-02	
1.3	5.40E-02	
1.5	3.18E-02	
1.7	1.87E-02	
1.9	1.10E-02	
2.1	6.50E-03	
2.3	3.83E-03	
2.5	2.25E-03	
2.7	1.33E-03	
2.9	7.82E-04	
3.0	4.60E-04	
3.2	2.71E-04	
3.4	1.60E-04	
3.6	9.40E-05	
3.8	5.54E-05	

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		Chloride		from Level 1
Target Concentration	C _T	2.16E+01	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	8.00E+01	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	
Calculated decay rate	λ	7.70E-101	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	1.50E-01	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	1.89E+00	fraction
Decay rate used	λ	4.08E-101	d ⁻¹
Rate of contaminant flow due to retardation	u	2.32E-04	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	8.00E+01	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.00E+00	

Remedial Targets

Remedial Target	2.16E+01	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀	8.00E+01	Ogata Banks
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	1.50E-01	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	K _{oc,n}		l/kg
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		fraction
Fraction of organic carbon in aquifer	foc		
Soil water partition coefficient	Kd	1.50E-01	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

Longitudinal dispersivity	ax	Enter value	Calc value	Xu & Eckstein	m
Transverse dispersivity	az	2.23E-02	1.90E-01	2.23E-01	m
Vertical dispersivity	ay	1.00E-99	1.90E-02	2.23E-01	m

Note values of dispersivity must be > 0
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x
Xu & Eckstein (1995) report ax = 0.83(log₁₀x)^{0.44}; az = ax/10, ay = ax/100 are assumed

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

Calculated concentrations for distance-concentration graph

Ogata Banks

From calculation sheet

Distance	Concentration
	mg/l
0	8.0E+01
0.2	8.00E+01
0.4	8.00E+01
0.6	8.00E+01
0.8	8.00E+01
1.0	8.00E+01
1.1	8.00E+01
1.3	8.00E+01
1.5	8.00E+01
1.7	8.00E+01
1.9	8.00E+01
2.1	8.00E+01
2.3	8.00E+01
2.5	8.00E+01
2.7	8.00E+01
2.9	8.00E+01
3.0	8.00E+01
3.2	8.00E+01
3.4	8.00E+01
3.6	8.00E+01
3.8	8.00E+01

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Sulphate	from Level 1
Target Concentration	C _T 4.37E+01	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀ 1.00E+02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2} 9.00E+99	days	
Calculated decay rate	λ 7.70E-101	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz 6.20E+02	m	
Plume thickness at source	Sy 6.00E+00	m	
Saturated aquifer thickness	da 6.00E+00	m	
Bulk density of aquifer materials	ρ 1.78E+00	g/cm ³	
Effective porosity of aquifer	n 3.00E-01	fraction	
Hydraulic gradient	i 5.90E-01	fraction	
Hydraulic conductivity of aquifer	K 2.23E-04	m/d	
Distance to compliance point	x 3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z 0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y 0.00E+00	m	
Time since pollutant entered groundwater	t 7.30E+06	days	time variant options only
Parameters values determined from options			
Partition coefficient	Kd 9.62E-01	l/kg	see options
Longitudinal dispersivity	ax 2.23E-01	m	see options
Transverse dispersivity	az 2.23E-02	m	see options
Vertical dispersivity	ay 1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	6.71E+00	fraction
Decay rate used	λ	1.15E-101	d ⁻¹
Rate of contaminant flow due to retardation	u	6.54E-05	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	1.00E+02	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.00E+00	

Remedial Targets

Remedial Target	4.37E+01	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀ 1.00E+02	mg/l	Ogata Banks
	7.3E+06	days	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	Kd	9.62E-01 l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	K _{oc,n}	l/kg
Sorption coefficient for ionised species	K _{oc,i}	l/kg
pH value	pH	
acid dissociation constant	pKa	fraction
Fraction of organic carbon in aquifer	foc	
Soil water partition coefficient	Kd	9.62E-01 l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

	Enter value	Calc value Xu & Eckstein	m
Longitudinal dispersivity	ax 2.23E-01	1.90E-01	2.23E-01 m
Transverse dispersivity	az 2.23E-02	1.90E-02	2.23E-02 m
Vertical dispersivity	ay 1.00E-99	1.90E-02	2.23E-01
Note values of dispersivity must be > 0			
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x			
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{0.44} , az = ax/10, ay = ax/100 are assumed			

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

Calculated concentrations for distance-concentration graph

Ogata Banks

From calculation sheet

Distance	Concentration
	mg/l
0	1.0E+02
0.2	1.00E+02
0.4	1.00E+02
0.6	1.00E+02
0.8	1.00E+02
1.0	1.00E+02
1.1	1.00E+02
1.3	1.00E+02
1.5	1.00E+02
1.7	1.00E+02
1.9	1.00E+02
2.1	1.00E+02
2.3	1.00E+02
2.5	1.00E+02
2.7	1.00E+02
2.9	1.00E+02
3.0	1.00E+02
3.2	1.00E+02
3.4	1.00E+02
3.6	1.00E+02
3.8	1.00E+02

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		Ammoniacal nitrogen		from Level 1
Target Concentration	C _T	6.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	3.00E-01	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	2.19E+03	days	
Calculated decay rate	λ	3.17E-04	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	4.75E+00	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	2.92E+01	fraction
Decay rate used	λ	1.08E-05	d ⁻¹
Rate of contaminant flow due to retardation	u	1.50E-05	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	2.71E-02	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.11E+01	

Remedial Targets

Remedial Target	6.64E-01	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀	2.71E-02	mg/l Ogata Banks
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	Kd	4.75E+00 l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	K _{oc,n}	l/kg
Sorption coefficient for ionised species	K _{oc,i}	l/kg
pH value	pH	
acid dissociation constant	pKa	fraction
Fraction of organic carbon in aquifer	foc	
Soil water partition coefficient	Kd	4.75E+00 l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

	Enter value	Calc value	Xu & Eckstein	m	
Longitudinal dispersivity	ax	2.23E-01	1.90E-01	2.23E-01	m
Transverse dispersivity	az	2.23E-02	1.90E-02	2.23E-02	m
Vertical dispersivity	ay	1.00E-99	1.90E-02	2.23E-01	
Note values of dispersivity must be > 0					
For calculated value, assumes $ax = 0.1 * x$, $az = 0.01 * x$, $ay = 0.001 * x$					
Xu & Eckstein (1995) report $ax = 0.83(\log_{10}x)^{0.44}$, $az = ax/10$, $ay = ax/100$ are assumed					

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	3.0E-01
0.2	2.66E-01
0.4	2.36E-01
0.6	2.09E-01
0.8	1.85E-01
1.0	1.64E-01
1.1	1.46E-01
1.3	1.29E-01
1.5	1.15E-01
1.7	1.02E-01
1.9	9.02E-02
2.1	8.00E-02
2.3	7.09E-02
2.5	6.29E-02
2.7	5.58E-02
2.9	4.94E-02
3.0	4.38E-02
3.2	3.89E-02
3.4	3.45E-02
3.6	3.06E-02
3.8	2.71E-02

APPENDIX 8

RTM Outputs for Scenario 2

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		Ammoniacal Nitrogen		from Level 1
Target Concentration	C _T	6.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	1.54E+00	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	2.19E+03	days	
Calculated decay rate	λ	3.17E-04	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	4.75E+00	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	2.92E+01	fraction
Decay rate used	λ	1.08E-05	d ⁻¹
Rate of contaminant flow due to retardation	u	1.50E-05	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	1.39E-01	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.11E+01	

Remedial Targets

Remedial Target	6.64E-01	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀	1.39E-01	mg/l Ogata Banks
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	Kd	4.75E+00 l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	K _{oc,n}	l/kg
Sorption coefficient for ionised species	K _{oc,i}	l/kg
pH value	pH	
acid dissociation constant	pKa	fraction
Fraction of organic carbon in aquifer	foc	
Soil water partition coefficient	Kd	4.75E+00 l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

	Enter value	Calc value	Xu & Eckstein	m	
Longitudinal dispersivity	ax	2.23E-01	1.90E-01	2.23E-01	m
Transverse dispersivity	az	2.23E-02	1.90E-02	2.23E-02	m
Vertical dispersivity	ay	1.00E-99	1.90E-02	2.23E-01	
Note values of dispersivity must be > 0					
For calculated value, assumes $ax = 0.1 * x$, $az = 0.01 * x$, $ay = 0.001 * x$					
Xu & Eckstein (1995) report $ax = 0.83(\log_{10}x)^{0.44}$, $az = ax/10$, $ay = ax/100$ are assumed					

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	1.5E+00
0.2	1.37E+00
0.4	1.21E+00
0.6	1.07E+00
0.8	9.52E-01
1.0	8.44E-01
1.1	7.49E-01
1.3	6.64E-01
1.5	5.89E-01
1.7	5.22E-01
1.9	4.63E-01
2.1	4.11E-01
2.3	3.64E-01
2.5	3.23E-01
2.7	2.86E-01
2.9	2.54E-01
3.0	2.25E-01
3.2	2.00E-01
3.4	1.77E-01
3.6	1.57E-01
3.8	1.39E-01

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Arsenic		from Level 1
Target Concentration	$5.00E-03$	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C_0	$5.10E-02$	mg/l	Source of parameter value
Half life for degradation of contaminant in water	$t_{1/2}$	$9.00E+99$	days	
Calculated decay rate	λ	$7.70E-101$	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	S_z	$6.20E+02$	m	
Plume thickness at source	S_y	$6.00E+00$	m	
Saturated aquifer thickness	d_a	$6.00E+00$	m	
Bulk density of aquifer materials	ρ	$1.78E+00$	g/cm ³	
Effective porosity of aquifer	n	$3.00E-01$	fraction	
Hydraulic gradient	i	$5.90E-01$	fraction	
Hydraulic conductivity of aquifer	K	$2.23E-04$	m/d	
Distance to compliance point	x	$3.80E+00$	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	$0.00E+00$	m	
Distance (depth) to compliance point perpendicular to flow direction	y	$0.00E+00$	m	
Time since pollutant entered groundwater	t	$7.30E+06$	days	time variant options only
Parameters values determined from options				
Partition coefficient	K_d	$4.94E+01$	l/kg	see options
Longitudinal dispersivity	α_x	$2.23E-01$	m	see options
Transverse dispersivity	α_z	$2.23E-02$	m	see options
Vertical dispersivity	α_y	$1.00E-99$	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	$4.39E-04$	m/d
Retardation factor	R_f	$2.94E+02$	fraction
Decay rate used	λ	$2.62E-103$	d ⁻¹
Rate of contaminant flow due to retardation	u	$1.49E-06$	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ed}	$5.10E-02$	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	$1.00E+00$	

Remedial Targets

Remedial Target	$5.00E-03$	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C_{ed}/C_0	$5.10E-02$	mg/l
		$7.3E+06$	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is $9.9E+99$.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	K_d	$4.94E+01$ l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	f_{oc}	fraction
Organic carbon partition coefficient	K_{oc}	l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	$K_{oc,n}$	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	l/kg
pH value	pH	
acid dissociation constant	pKa	fraction
Fraction of organic carbon in aquifer	f_{oc}	
Soil water partition coefficient	K_d	$4.94E+01$ l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

Longitudinal dispersivity	α_x	Enter value	Calc value	Xu & Eckstein	m
Transverse dispersivity	α_z	$2.23E-01$	$1.90E-01$	$2.23E-01$	m
Vertical dispersivity	α_y	$2.23E-02$	$1.90E-02$	$2.23E-02$	m
		$1.00E-99$	$1.90E-02$	$2.23E-01$	
Note values of dispersivity must be > 0					
For calculated value, assumes $\alpha_x = 0.1 * x$, $\alpha_z = 0.01 * x$, $\alpha_y = 0.001 * x$					
Xu & Eckstein (1995) report $\alpha_x = 0.83(\log_{10} x)^{0.44}$, $\alpha_z = \alpha_x/10$, $\alpha_y = \alpha_x/100$ are assumed					

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as $9.0E+99$.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

Calculated concentrations for distance-concentration graph

Ogata Banks

From calculation sheet

Distance	Concentration
	mg/l
0	$5.1E-02$
0.2	$5.10E-02$
0.4	$5.10E-02$
0.6	$5.10E-02$
0.8	$5.10E-02$
1.0	$5.10E-02$
1.1	$5.10E-02$
1.3	$5.10E-02$
1.5	$5.10E-02$
1.7	$5.10E-02$
1.9	$5.10E-02$
2.1	$5.10E-02$
2.3	$5.10E-02$
2.5	$5.10E-02$
2.7	$5.10E-02$
2.9	$5.10E-02$
3.0	$5.10E-02$
3.2	$5.10E-02$
3.4	$5.10E-02$
3.6	$5.10E-02$
3.8	$5.10E-02$

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant	Chloride			from Level 1
Target Concentration	C _T	2.16E+01	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	1.16E+02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	
Calculated decay rate	λ	7.70E-101	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	1.50E-01	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	1.89E+00	fraction
Decay rate used	λ	4.08E-101	d ⁻¹
Rate of contaminant flow due to retardation	u	2.32E-04	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	1.16E+02	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.00E+00	

Remedial Targets

Remedial Target	2.16E+01	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀	1.16E+02	Ogata Banks
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	1.50E-01	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	K _{oc,n}		l/kg
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		fraction
Fraction of organic carbon in aquifer	foc		
Soil water partition coefficient	Kd	1.50E-01	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

	Enter value	Calc value	Xu & Eckstein	m	
Longitudinal dispersivity	ax	2.23E-01	1.90E-01	2.23E-01	m
Transverse dispersivity	az	2.23E-02	1.90E-02	2.23E-02	m
Vertical dispersivity	ay	1.00E-99	1.90E-02	2.23E-01	
Note values of dispersivity must be > 0					
For calculated value, assumes $ax = 0.1 * x$, $az = 0.01 * x$, $ay = 0.001 * x$					
Xu & Eckstein (1995) report $ax = 0.83(\log_{10}x)^{0.44}$; $az = ax/10$, $ay = ax/100$ are assumed					

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

Calculated concentrations for distance-concentration graph

Ogata Banks

From calculation sheet

Distance	Concentration
	mg/l
0	1.2E+02
0.2	1.16E+02
0.4	1.16E+02
0.6	1.16E+02
0.8	1.16E+02
1.0	1.16E+02
1.1	1.16E+02
1.3	1.16E+02
1.5	1.16E+02
1.7	1.16E+02
1.9	1.16E+02
2.1	1.16E+02
2.3	1.16E+02
2.5	1.16E+02
2.7	1.16E+02
2.9	1.16E+02
3.0	1.16E+02
3.2	1.16E+02
3.4	1.16E+02
3.6	1.16E+02
3.8	1.16E+02

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Lead		from Level 1
Target Concentration	C _T	2.00E-04	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	5.50E-02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	
Calculated decay rate	λ	7.70E-101	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	1.31E+04	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	7.79E+04	fraction
Decay rate used	λ	9.89E-106	d ⁻¹
Rate of contaminant flow due to retardation	u	5.63E-09	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	0.00E+00	mg/l
Attenuation factor (one way vertical dispersion, COICED)	AF	breakthrough at compliance point	

Remedial Targets

Remedial Target	No impact	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀	0.00E+00	mg/l Ogata Banks
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	Kd	1.31E+04 l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	K _{oc,n}	l/kg
Sorption coefficient for ionised species	K _{oc,i}	l/kg
pH value	pH	
acid dissociation constant	pKa	fraction
Fraction of organic carbon in aquifer	foc	
Soil water partition coefficient	Kd	1.31E+04 l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

Longitudinal dispersivity	ax	2.23E-01	1.90E-01	2.23E-01	m
Transverse dispersivity	az	2.23E-02	1.90E-02	2.23E-02	m
Vertical dispersivity	ay	1.00E-99	1.90E-09	2.23E-01	
Note values of dispersivity must be > 0					
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x					
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{0.44} ; az = ax/10, ay = ax/100 are assumed					

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

Calculated concentrations for distance-concentration graph

Ogata Banks		
From calculation sheet		
Distance	Concentration	
	mg/l	
0	5.5E-02	
0.2	1.31E-02	
0.4	6.17E-04	
0.6	4.77E-06	
0.8	2.95E-09	
1.0	0.00E+00	
1.1	0.00E+00	
1.3	0.00E+00	
1.5	0.00E+00	
1.7	0.00E+00	
1.9	0.00E+00	
2.1	0.00E+00	
2.3	0.00E+00	
2.5	0.00E+00	
2.7	0.00E+00	
2.9	0.00E+00	
3.0	0.00E+00	
3.2	0.00E+00	
3.4	0.00E+00	
3.6	0.00E+00	
3.8	0.00E+00	

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Nickel		from Level 1
Target Concentration	C _T 1.63E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	4.40E-02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	
Calculated decay rate	λ	7.70E-101	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	1.26E+03	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	7.47E+03	fraction
Decay rate used	λ	1.03E-104	d ⁻¹
Rate of contaminant flow due to retardation	u	5.87E-08	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	0.00E+00	mg/l
Attenuation factor (one way vertical dispersion, COICED)	AF	breakthrough at compliance point	

Remedial Targets

Remedial Target	No impact	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀ 7.3E+06	mg/l days	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	Kd	1.26E+03 l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	K _{oc,n}	l/kg
Sorption coefficient for ionised species	K _{oc,i}	l/kg
pH value	pH	
acid dissociation constant	pKa	fraction
Fraction of organic carbon in aquifer	foc	
Soil water partition coefficient	Kd	1.26E+03 l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

	Enter value	Calc value	Xu & Eckstein	m
Longitudinal dispersivity	ax	2.23E-01	1.90E-01	2.23E-01 m
Transverse dispersivity	az	2.23E-02	1.90E-02	2.23E-02 m
Vertical dispersivity	ay	1.00E-99	1.90E-02	2.23E-01
Note values of dispersivity must be > 0				
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x				
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{0.44} ; az = ax/10, ay = ax/100 are assumed				

Calculated concentrations for distance-concentration graph

Ogata Banks		
From calculation sheet		
Distance	Concentration	mg/l
0	4.4E-02	
0.2	3.92E-02	
0.4	3.17E-02	
0.6	2.27E-02	
0.8	1.42E-02	
1.0	7.63E-03	
1.1	3.49E-03	
1.3	1.35E-03	
1.5	4.40E-04	
1.7	1.20E-04	
1.9	2.76E-05	
2.1	3.14E-06	
2.3	4.95E-07	
2.5	6.52E-08	
2.7	7.15E-09	
2.9	6.53E-10	
3.0	0.00E+00	
3.2	0.00E+00	
3.4	0.00E+00	
3.6	0.00E+00	
3.8	0.00E+00	

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater See Note

Input Parameters (using pull down menu)

Contaminant	Sulphate	from Level 1
Target Concentration	4.37E+01	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
-------------	------------------------------

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	1.85E+02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	
Calculated decay rate	λ	7.70E-101	days ⁻¹	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.20E+02	m	
Plume thickness at source	Sy	6.00E+00	m	
Saturated aquifer thickness	da	6.00E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm ³	
Effective porosity of aquifer	n	3.00E-01	fraction	
Hydraulic gradient	i	5.90E-01	fraction	
Hydraulic conductivity of aquifer	K	2.23E-04	m/d	
Distance to compliance point	x	3.80E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	7.30E+06	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	9.62E-01	l/kg	see options
Longitudinal dispersivity	ax	2.23E-01	m	see options
Transverse dispersivity	az	2.23E-02	m	see options
Vertical dispersivity	ay	1.00E-99	m	see options

Calculated Parameters Variable

Groundwater flow velocity	v	4.39E-04	m/d
Retardation factor	Rf	6.71E+00	fraction
Decay rate used	λ	1.15E-101	d ⁻¹
Rate of contaminant flow due to retardation	u	6.54E-05	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ed}	1.85E+02	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.00E+00	

Remedial Targets

Remedial Target	4.37E+01	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	3.8	m	
Concentration of contaminant at compliance point after	C _{ed} /C ₀	1.85E+02	mg/l Ogata Banks
		7.3E+06	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)		
Soil water partition coefficient	Kd	9.62E-01 l/kg
Entry for non-polar organic chemicals (option)		
Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg
Entry for ionic organic chemicals (option)		
Sorption coefficient for related species	K _{oc,n}	l/kg
Sorption coefficient for ionised species	K _{oc,i}	l/kg
pH value	pH	
acid dissociation constant	pKa	fraction
Fraction of organic carbon in aquifer	foc	
Soil water partition coefficient	Kd	9.62E-01 l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

	Enter value	Calc value	Xu & Eckstein	m
Longitudinal dispersivity	ax	2.23E-01	1.80E-01	2.23E-01 m
Transverse dispersivity	az	2.23E-02	1.80E-02	2.23E-02 m
Vertical dispersivity	ay	1.00E-99	1.80E-02	2.23E-01
Note values of dispersivity must be > 0				
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x				
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{0.44} , az = ax/10, ay = ax/100 are assumed				

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Meriden Quarry, Banana Field
Completed by:	SF
Date:	#####
Version:	2

Calculated concentrations for distance-concentration graph

Ogata Banks

From calculation sheet

Distance	Concentration
	mg/l
0	1.9E+02
0.2	1.85E+02
0.4	1.85E+02
0.6	1.85E+02
0.8	1.85E+02
1.0	1.85E+02
1.1	1.85E+02
1.3	1.85E+02
1.5	1.85E+02
1.7	1.85E+02
1.9	1.85E+02
2.1	1.85E+02
2.3	1.85E+02
2.5	1.85E+02
2.7	1.85E+02
2.9	1.85E+02
3.0	1.85E+02
3.2	1.85E+02
3.4	1.85E+02
3.6	1.85E+02
3.8	1.85E+02