Hallenbeagle Transfer Station and Material Recycling Facility

Site Condition Report

September 2023

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Document Details

Document title	Hallenbeagle Transfer Station and Material Recycling Facility Site Condition Report
Version	Version 1.0
Date	September 2023
Prepared by	Thomas Willetts – Trainee Hydrogeologist
Reviewed by	Geraldine Guiguet-Doron - Permit Manager
Approved by	Daniel Reeves – Environment and Industrial Risk Advisor Energy North
Distribution	SUEZ Environment Agency

Document Review History

Date	Description	Summary of Changes
September 2023	Version 1	Original document

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1 Introduction

The Environmental Permitting (England and Wales) Regulations 2016 (as amended) require the production of a Site Condition Report (SCR) for any facility that may cause a significant risk to land or groundwater.

This document constitutes the SCR provided to support the development and permit application for Hallenbeagle Transfer Station and Material Recycling Facility (the Site). It is written in line with the requirements of the Environment Agency SCR template.

This report comprises a number of sections; different sections are required to be completed during the lifetime of the facility as detailed below. This report is comprised of Sections 1 to 7.

Permit Application:	Sections 1, 2 and 3 must be completed and submitted with the application.
Permit Life:	Sections 4, 5, 6 and 7 must be maintained.
Permit Surrender:	Add a new document reference in Section 1, Complete sections 8, 9 and 10 and submit with the surrender application.

2 Site Details

Name of Applicant:	SUEZ Recycling and Recovery UK Ltd
Activity Address:	Cornwall Business Park, Hallenbeagle, Scorrier, Redruth, Cornwall, TR16 5EN
National Grid Reference:	SW 72700 44778
Document reference and dates for Site Condition Report at Permit Application and Surrender:	This report is prepared and submitted in support of the development of Hallenbeagle Transfer Station and Material Recycling Facility application. September 2023.
Document references for site plans (including location and boundaries):	Figure 1 – Site Permit Boundary

Note:
The permit application process requires the submission of a site plan to the Environment Agency. Plans must be submitted with the application that shows:

- Site location, the area covered by the site condition report, and the location and nature of the activities and/or waste facilities on the site.
- Locations of receptors, sources of emissions/releases, and monitoring points.
- Site drainage.
- Site surfacing.

If the above information is not shown in the figures accompanying the Site Management Plan, then addition plans must be provided in this SCR.

3 Condition of the Land at Permit Issue

3.1 Environmental Setting

Environmental Setting:

- Geology;
- Hydrogeology, and;
- Hydrology.

The permit application area is within Cornwall Business Park which is located in Scorrier, 3.5km north east of Redruth town centre. The 3.04 hectares area is fenced, unoccupied, sparsely vegetated, and contains occasional stockpiling of unknown soils.

The site location and proposed permit boundary are identified on Figure 1.

3.1.1 Geology

The local geology has been identified from the Phase 2 Geo-environmental Site Investigation in Appendix B. The superficial geology extending across the Site consists of Made Ground and weathered fragments of the Porthtowan Formation which is predominantly gravel sized with occasional boulder sized clasts.

The Made Ground at the Site can be split into two types. Type one varies from 0.4-2.3m in thickness and is laterally extensive, consisting of a mixture of topsoil, clean stone, natural ground, and coarser mine waste material. Type two is an engineered fill varying from 0.7-1m in thickness, consisting of predominantly clean stone. This Made Ground type is spatially restricted to where historical mine working, such as shafts, have been remediated. Where the historical mine features reach greater depths, low permeability concrete installed during remediation is present.

The underlying Porthtowan Formation extends across the entire Site and is made up of interbedded metasandstone and metamudstone.

3.1.2 Hydrogeology

The hydrogeological setting of the Site is taken from Appendix A and B and the Multi-Agency Geographic Information for the Countryside's (MAGIC) website (https://magic.defra.gov.uk/).

The superficial deposits consisting of Made Ground and weathered Porthtowan Formation are classified as a Secondary (Undifferentiated) aquifer, whilst the underlying metasandstones and metamudstones of the Porthtowan Formation are classified as a Secondary B aquifer. The groundwater surrounding the Site is classified as having a high vulnerability however, the Site is not located within a designated groundwater source protection zone. There are no groundwater abstraction points within 1km of the Site perimeter.

3.1.3 Hydrology

The Site is located within the Portreath stream water body catchment area however, there are no surface water features within the confines of the permit area or within 250m of the Site boundary. It is likely that surface water infiltrates directly into the ground rather than collecting as surface water features, as there are also no surface water abstraction points within 1km of the Site. The site is not situated within a floodplain zone and is classified as being located in a Flood Risk Zone 1.

3.2 Pollution History

Pollution History:

- Pollution Incidents, that may have affected land;
- Historical Land Use, and associated contaminants;
- Any visual/olfactory evidence of existing contamination, and;
- Evidence of damage to pollution prevention measures.

3.2.1 Pollution Incidents

All known pollution incidents in and around the Site is provided within the Phase 1 Desk Study (Appendix A) and Phase 2 Geo-environmental site investigation (Appendix B) reports obtained for the permit area. Since the production of these reports there have been no records of further pollution incidents in the vicinity of the Site.

3.2.2 Historical Land Use and Present Site Use

The Site has a history of metalliferous mine works prior to 1800. Historical maps indicate that in 1880 Hallenbeagle Mine and Piniger's Shaft were present at the south and the centre of the Site with two engine house ruins in the north east corner. Unidentified building ruins were present in the south east corner. By 1908, the ruins were not present, however an additional old shaft was identified on the western boundary. By 1972, Hallenbeagle Mine and all shafts were disused. In 1989 Sawmills lane and three small unidentified properties were present in the north east corner of the Site. From 1999 to 2009 the Site was a grassy field with evidence of temporary habitation.

During 2014, Mining Searches UK carried out remedial works at the Site including the plugging of mining features and covering with structural infill. The structural infill consisted of two types of Made Ground. Type one consisted of compacted materials including anthropogenic items and mine workings waste. Where this material was present, there are elevated levels of arsenic compared to the natural soils however, it is not considered to pose an unacceptable risk to long term human health. Mining Searches UK had the remediation signed off and validated by regulators at the time.

Since 2014, the Site has been unoccupied and has become sparsely vegetated.

Presently, three stockpiles consisting of slate, ceramic, quartz, and igneous rock of unknown origin are located in the south east corner of the Site.

3.2.3 Visual/Olfactory Evidence of Existing Contamination

There is no evidence for olfactory contamination at the Site.

There is also no significant visual contamination however, site investigations have found evidence for the presence of anthropogenic materials exclusively in the extensive subsurface Made Ground. The materials include rubber, plastics, textiles, and construction materials.

3.2.4 Evidence of Damage to Pollution Prevention Measures

No pollution prevention measures are present as the Site is currently unoccupied.

3.3 Previous Assessments

Evidence of Historic Contamination:

- Historical Site Investigation;
- Historical Assessments, and;
- Remediation and Verification Reports.

3.3.1 Historical Site Investigations, Assessments, Remediation and Verification Reports

The earliest site investigations carried out in 2007 revealed mine workings and inorganic contamination including elevated arsenic levels however, the soil leaching potential was found to be low.

In 2011, initial proposals for the remediation of the mine working areas were made. These included the excavation of all mine related surface fill material, and the latter infilling with compacted granular aggregates and concrete. Subsequent soil sampling concluded that the concentration of arsenic did not pose an unacceptable risk to long term human health and recommended placing 300mm of clean topsoil and a geotextile layer in areas of soft landscaping.

In 2014, Mining Searches UK carried out extensive works at the Site to confirm its status as being acceptably free from mining related subsidence or settlement risk. Where a natural base was found in mining features, they were infilled with compacted clean stone hardcore or concrete. In shafts of greater depth, concrete cone plugs were installed and overlain with clean stone. A water conduit tunnel was identified and remediated in the north of the Site.

Furthermore, a soils investigation confirmed the stripping, securing, and restoration of the entire Site. The historical site investigations state that the presence of hardstanding and the instillation of a cover system with an agreed remedial strategy for soft landscaping in the north-east corner would mitigate any risks posed to the development associated with inorganic substances in the Made Ground.

4 Permitted Activities

Permitted Activities:	The site will be permitted as a Transfer Station and Material Recycling Facility.
Non-permitted Activities Undertaken:	N/A at this time
References: Plan showing activity layout; Env Risk Assessment.	Figure 1

5 Changes to the Activity

Have there been any changes to the activity boundary?	N/A at this time
Have there been any changes to the permitted activities?	N/A at this time
Have any 'dangerous substances' not identified in the Application Site Condition Report been used or produced as a result of the permitted activities?	N/A at this time
Checklist of supporting information:	*Plan showing any changes to the boundary (where relevant)* *Description of the changes to the permitted activities (where relevant)* *List of 'dangerous substances' used/produced by the permitted activities that were not identified in the Application Site Condition Report (where relevant)*

5.1 Changes to the Activity

N/A at this time

6 Measures Taken to Protect Land

Use records that you collected during the life of the permit to summarise whether pollution prevention measures worked. If you can't, you need to collect land and/or groundwater data to assess whether the land has deteriorated.	
Supporting Information:	Inspection records and summary of findings of inspections for all pollution prevention measures, and; Records of maintenance, repair and replacement of pollution prevention measures.

6.1 Inspection Records

N/A at this time

7 Pollution Incidents That May Have Had an Impact on Land, and Their Remediation

Summarise any pollution incidents that may have damaged the land. Describe how you investigated and remedied each one. If you can't, you need to collect land and /or groundwater reference data to assess whether the land has deteriorated while you've been there.	
Supporting Information:	Records of pollution incidents that may have impacted on land, and; Records of their investigation and remediation.

7.1 Pollution Incidents

N/A at this time.

7.2 Investigation and Remediation Records

N/A at this time.

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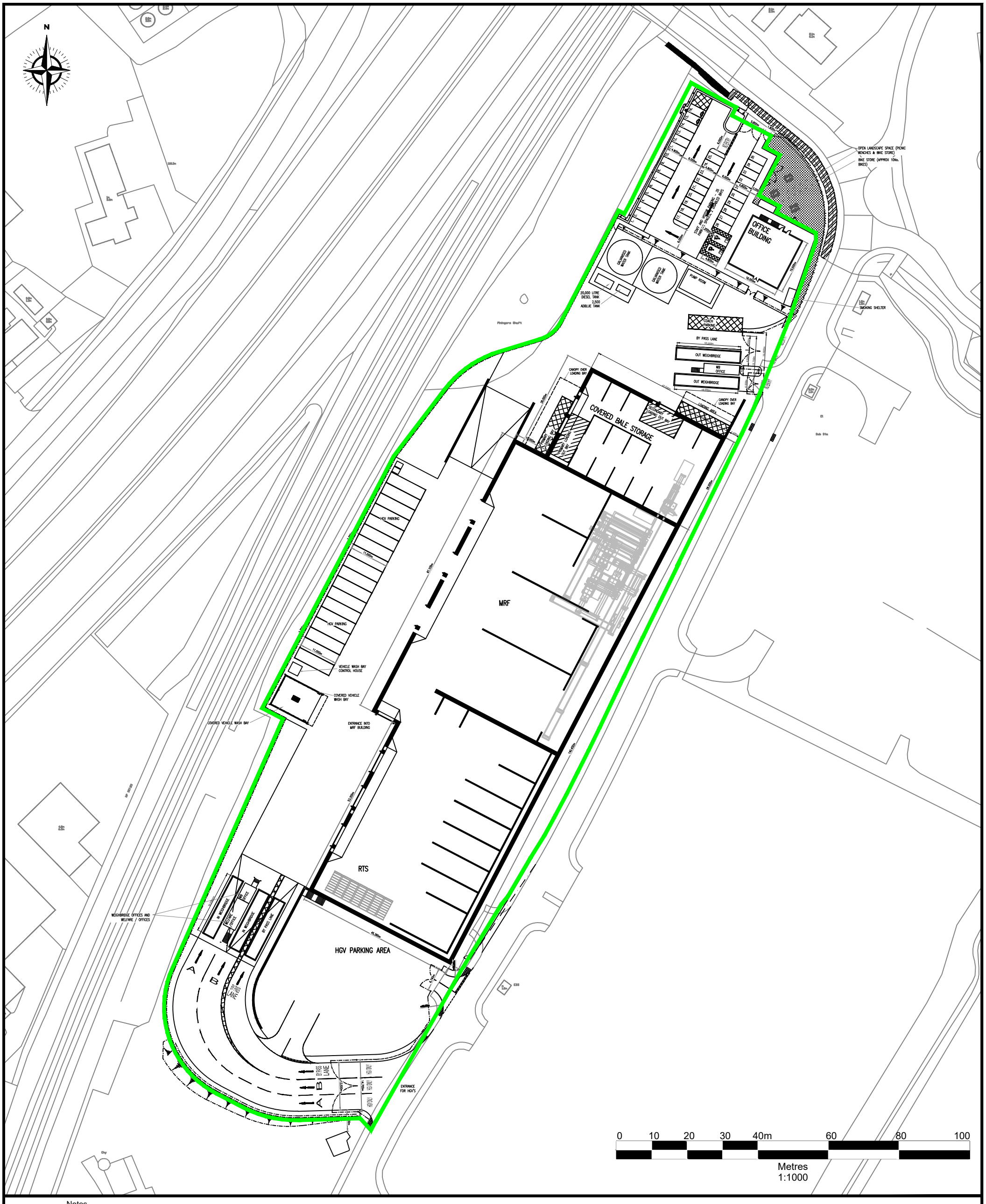
Figures

Figure 1

Site Permit Boundary



Notes

1. Reproduced from the Ordnance Survey Map with the permission of the Controller of Her Majesty's Stationary Office, Crown Copyright, Licence Number 100004910.

Hallenbeagle TS and MRF permit boundary

Darwen Resource Recovey Park, Lower Eccleshill Road, Darwen, BB3 0RP
Tel:(01254)819700, Fax:(01254)819749, Email: richard.bissel@sita.co.uk

Site	Hallenbeagle Transfer Station and Material Recycling Facility
Title	Permit Boundary Plan
Scale	1:1000 @ A3
Date	November 2023
Drawing Ref	Hbg-PER-1123-01
Drawn by	JA
Checked by	GGD

Rev	subject	date

Appendices

Appendix A

Hallenbeagle Phase 1 Desk Study

SUEZ Recycling and Recovery UK Ltd

Hallenbeagle

Phase 1 Desk Study

315111 R01(00)

RSK GEOSCIENCES

JUNE 2022

RSK GENERAL NOTES

Project No.: 315111

Title: Phase 1 Desk Study: Suez, Hallenbeagle, , Redruth TR16 5BN

Client: SUEZ Recycling and Recovery UK Ltd

Date: June 2022

Office: RSK Environment Limited, The Old School House, Stillhouse Lane, Bedminster, Bristol, BS3 4EB. Tel 0117 947 1000

Status: Rev 00

Author	Rachael Lockyer	**Technical reviewer**	Jeremy Leach
Signature		Signature	
Project manager	Rachael Lockyer	**Quality reviewer**	Stacey Brown
Signature		Signature	

Revision control sheet				
Revision ref.	**Date**	**Reason for revision**	**Amended by:**	**Approved by:**
Rev 00	June 22	First issue	n/a	see above

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FIGURES

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EXECUTIVE SUMMARY

Commissioning and purpose of assessment	RSK Environment Limited (RSK) was commissioned by SUEZ Recycling and Recovery UK Ltd (Suez) to carry out a Phase 1 Preliminary Risk Assessment of the land at Hallenbeagle , Redruth, TR16 5BN.
DESK-BASED ASSESSMENT	
Site description and proposed development	The site is currently unoccupied, covers an area of 3.04 hectares and is being considered for commercial use.
History of site and surrounding area	The site was formerly used for Metalliferous Mining. Potential sources of contamination identified on-site comprise Made Ground including trace of mine waste material. Several potentially contaminative current activities have been identified in the surrounding area, including Made Ground associated with historical mining and railway land.
Previous site investigation (SI) reports	A variety of previous geoenvironmental, mining and ecological investigation reports have been provided. Most notably, a report by Mining Searches UK, 2014 details the recent remediation of mining features on site.
Geology and environmental setting	The Site is underlain by Made Ground over metasandstone and metamudstone of the Porthtowan Formation according to published geological data and previous site investigation data for the site. Environmental receptors identified comprise: • Groundwater within The Porthtowan Formation is classified as a secondary aquifer.
Geotechnical constraints assessment	• Existing sub-structures • Filled and made ground • Adverse ground chemistry • Sudden lateral changes in ground conditions
Initial conceptual site model (CSM) and preliminary risk assessment (PRA)	Potentially complete contaminant linkages identified with a risk estimate of moderate to low or above include: • Future site workers [oral, dermal and inhalation exposure with impacted soil, soil vapour and dust, inhalation of vapours from groundwater • Groundwater in secondary A aquifer within the Porthtowan formation bedrock deposits [percolation through permeable strata to aquifer) • Future buildings and services (potable water supply) [direct contact with contaminated soils or groundwater and chemical attack] Uncertainties and data gaps have been identified in the CSM at desk study stage and should be considered in the design of future intrusive investigation if proposed.

1 INTRODUCTION

1.1 Commissioning

RSK Environment Limited (RSK) was commissioned by SUEZ Recycling and Recovery UK Ltd (Suez) to carry out a Phase 1 Preliminary Risk Assessment of the land at Hallenbeagle , Redruth, TR16 5BN. The project was carried out to an agreed brief as set out in RSK's proposal (Ref. 315111 T02 (02), dated 21st April 2022).

RSK's service constraints are shown in Appendix A.

The Site in question is being considered for development for commercial/industrial use.

1.2 Objectives

The objective of the work is:

- To identify any land contamination constraints to the proposed development and to support discharge of relevant planning conditions
- To identify the need for any additional investigation or remediation work to demonstrate that the site is suitable for it's proposed use.

1.3 Scope of works

The scope of this assessment has been developed in accordance with relevant British Standards and authoritative technical guidance as referenced through the report. The assessment of the contamination status of the site is in line with the technical approach presented in Land Contamination Risk Management (LCRM) (Environment Agency, 2021) – which supersedes CLR11 Model Procedures for Land Contamination – and in general accordance with BS 10175: 2011 + A2 2017 (BSI, 2017). It is also compliant with relevant planning policy and guidance.

A brief summary of relevant legislation and policy relating to land contamination is given in Appendix C.

The scope of works for the assessment has included the following:

Desk Study:

- Site walkover
- A study of local geology and hydrogeology including the provision of historical BGS boreholes
- The identification of potential geological hazards, including Radon
- A study of the land-use, development history and environmental data on and around the site and its surroundings from local authority correspondence, an environmental database report and archival Ordnance Survey mapping

- The identification of aquifer vulnerability rating beneath the site and local water abstraction points from Environment Agency records held within the environmental database.
- The identification of potential targets at risk from possible contamination.
- Production of a Preliminary Conceptual Site Model.

1.4 Existing reports

The following reports detailing previous works at the site were made available for review:

Mining and Contamination Reports:

- Crofty Consultancy Environment and Mining Services, Cornwall Food and Energy Park, Hallenbeagle Geo-environmental Report, Reference: 18045, 26th October 2007
- Cornwall Mining Services Ltd, Proposed Eco Park & Gypsy Relocation Sites Hallenbeagle NR Scorrier Redruth Cornwall, Reclamation Strategy, Reference: 4962.Rec.Str, 3rd February 2011.
- Mining Searches UK, Proposed Bio-park land at Hallenbeagle (east), Scorrier, Cornwall, Further Soils analysis report, Reference 54785.FSA.11th March 2013.
- Mining Searches UK, Mining Site Investigation and Securing report for proposed industrial development land at Hallenbeagle (east), Scorrier, Cornwall, Reference 54785.sir, 2nd May 2014
- Cornwall Consultants Ltd, Regulated Mining Search: Metalliferous Minerals, ref: JW/CMS/129874, 06 March 2020.

Ecology Reports

- Spalding Associates (Environmental) Ltd, Japanese Knotweed at Hallenbeagle, September 2007.
- Cormac Contracting Ltd, Cornwall Biopark, Hallenbeagle Estates Ltd, Japanese Knotweed Report, Ref no 1203C028.IJN/JKW001, 15th April 2013
- Cormac Solutions Ltd, Invasive Plant report, Survey of Japanese Knotweed, commercial building plot at Hallenbeagle, Cormac ref 146/JKSR/27.03.18, 3rd April 2018.

Pertinent information from these reports has been summarised in Section 2.

1.5 Limitations

This report is subject to the RSK service constraints given in Appendix A and limitations that may be described through this document.

2 SITE DETAILS

2.1 Site location

Site location details are presented in Table 1 and a site location plan is provided on Figure 1.

Table 1 Site location details

Site name	Hallenbeagle
Full site address and TR16 5BN	Land at Hallenbeagle, Scorrier, Redruth Cornwall TR16 5BN
National Grid reference (centre of site)	172714, 044783

2.2 Site description

The Site boundary and current site layout are shown on Figure 2. The site is known to have been previously remediated for mining features across an area of c. 3.04 hectares. The site is now disused and remains unoccupied, although there's evidence to suggest it was used by travellers in the past. Most notable features on site include a gentle slope towards the south, sparse vegetation and occasional stockpiling. A railway embankment is located along the western site boundary (running NE-SW) with the Paddington to Penzance mainline at the toe and the former Hallenbeagle engine house is located immediately off the southwest site boundary.

2.3 Surrounding land uses

The site is located in Scorrier, near Redruth, within a predominantly commercial/ industrial setting. Immediate surrounding land uses are described in Table 2.

Table 2 Surrounding land uses

North	Railway line, Blackwater Bypass A30, Sawmills Cottage and fields
East	Sawmills Lane, Cormac Solutions Depot and fields
South	Sawmills Lane, fields and Carrs Land Rover Jaguar
West	Railway Line, Carrs Land Rover Jaguar and Blackwater Bypass A30

2.4 Development plans

The proposed layout of the site, at the time of preparing this report, is shown in Appendix B.

The site is intended for commercial end use comprising a new refuse transfer station (RTS) and material recycling facility with associated infrastructure and offices.

3 DESK-BASED ASSESSMENT

The desktop study was designed generally to meet the objectives of a preliminary (phase 1) investigation, as defined by BS 10175:2011 + A2 2017 (BSI, 2017) and this assessment relates to LCRM Stage 1, Tier 1 preliminary risk assessment. The "vicinity" of the site for the purposes of this report is defined as locations situated within an approximate 250 m radius of the site, although certain sources and/ or sensitive targets further than 250 m may also have been considered.

The study aims principally to identify and assess the potential risks and liabilities associated with contamination of the ground, on and in the vicinity of the site. While this includes consideration of current operations and housekeeping on the site, the report does not constitute a comprehensive environmental audit of the site, as covered under ISO 14001.

3.1 Site history

3.1.1 Historical development record

The development history of the site and surrounding area based upon assessment of historical plans and records is detailed in Table 3. The historical maps reviewed are shown within the environmental database report in Appendix D.

Table 3 Summary of historical development

Date of mapping	Historical Land Use (on-site)
Prior 1800	Extracts from an Archive Structural Mining report (1985) contained within a Mining Searches report (2014), suggests that significant workings were described at around 1800 as already being very old, and at that time abandoned. Shallow workings may date back to the late medieval times, with deeper workings being carried out following the development of mining technology during the 16th and 17th centuries. The area was a copper producer, with small quantities of tin, zinc and arsenic.
1880	Maps indicate that Hallenbeagle Mine and Pininger's Shaft are located across the south and centre of site. Two engine house ruins are situated towards the northeast corner and a number of unidentified buildings are located in the southeast corner.
1908	Ruins no longer present on site. An old shaft is labelled along western site boundary.
1972	Hallenbeagle Mine and its associated shafts are now all disused.
1989	Sawmills lane has been constructed across the northeast corner of site with three relatively small unidentified properties.
1999-2009	Site appears to be one grassy field with some vegetation and evidence of temporary habitation (potentially travellers).

2014	Mining Searches UK carried out an intrusive ground investigation to identify the extent of mining features on site and take the necessary remedial action. Mining features were plugged and covered with a structural infill. The works were validated and signed off by the regulators at the time.
2016	Site appears unoccupied.
2022	Sparse vegetation cover.
Date of mapping	**Historical Land Use (off-site)**
1880	**0-4m north west:** Railway embankment and tracks**.** **100 - 250m west**: Eastdowns Tin and Copper Mine including a number of active and disused shafts. **0 - 100m south:** Hallenbeagle Copper Mine, including Read's shaft and old shafts, along with the sawmills are located towards the south.
1908	All shafts at Eastdowns Mine are disused according to historical OS maps.
1972	Eastdowns and Hallenbeagle Mine are both disused (including Read's Shaft and a conveyor). Sawmills no longer present to the south.
1989	A30 constructed beyond railway line to the west.
1994	Works no longer present to the south.
2022	Railway embankment still on west boundary. Cormac solutions depot to the east. Carrs Jaguar and Land Rover to the southwest.
Relevant information sources: Historical OS maps ☒ Town plans ☐ Information from the Local Planning Authority ☒ Aerial photography ☒ Previous reports ☒	
Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.	

3.1.2 Unexploded ordnance

A review of publicly available unexploded ordnance (UXO) risk maps indicates that the site is located in an area with low potential for wartime bombs to be present (Zetica, 2022).

3.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see Appendix D) are summarised below in Table 4.

Table 4 Summary of environmental permits, landfills and incidents

Data type	Entries on-site	Entries <250m from site	Entries >250m from site of relevance	Details
Agency and hydrological				
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	0	0	0	-
Enforcement and prohibition notices	0	0	0	-
Pollution incidents to controlled waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	0	0	0	-
Discharge consents	0	11		Nearest 37m W: Carrs JLR Cornwall Business Park (West). Sewage discharges-final/treated effluent. Issued effective 2019.
Registered radioactive substances	0	0	0	-
Landfill and waste				
Active landfills	0	0	0	-
Historical / closed landfills	0	0	0	-

Data type	Entries on-site	Entries <250m from site	Entries >250m from site of relevance	Details
Other waste management licences	1	1	0	On site- Plot 1 Cornwall Business Park, Sawmills Lane – Refuse transfer station planning application 2021. 8m SE- Licensed Waste site at Green E F W Cornwall Limited ATT, 75Kte HCl waste TS + treatment (2013-2017)
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	-
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	0	0	0	-
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	1	0	0	Hazardous substance storage/usage on site: Calor gas limited, plot 1, Cornwall business park east. No details available..
Contaminated land Part 2A register entries and notices	0	0	0	-
Contemporary trade directory entries	0	0	0	-
Fuel station entries				
Note: Entries have only been included within the table where they are located within a 250m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.				

3.3 Information from regulatory authorities

3.3.1 Planning records

Planning records held by the Local Authority Planning Department pertaining to the site and relevant to the current assessment are summarised in Table 5.

Table 5 Planning information

Year	Details and application reference no.	Part of site
2014	Ref no. PA14/09431. Application for Non Material Amendment to PA12/06846 for Proposed erection and operation of an energy from waste facility using advanced thermal conversion to treat commercial and industrial waste(s), together with the reception of untreated waste(s) for treatment and or preparation into refuse derived fuel (RDF), with ancillary development including provision for vehicle parking, foul and surface water drainage, landscaping and fencing (application accompanied by an environmental statement); namely amendment to Condition 16 to provide for the submission of the noise mitigation scheme prior to the development being brought into use and not prior to construction of any part of the development. Decision – Approved Unconditional	Entire site- Hallenbeagle Mine Sawmills Lane Scorrier Cornwall TR16 5BE
2014	Ref no. PA14/01261. Erection of new terminal H pole 41AHCA19 with 4 Back Stays and underground cable attached as per plan enclosed	Adjacent to east boundary.
2009	Ref no.C1/SA04/0545/09/M. Construct estate roads & services, structural landscaping, plot layout & building design to each plot sites: 040444, 040409, 040363. Decision – Approved with conditions	Road constructed along east boundary.
2009	Ref No. C1/LB04/0388/09/B. Stabilisation works to listed engine houses sites: 040444, 040245	Immediately adjacent to south boundary
1992	Ref no. C1/PA04/1402/92. Two touring caravan pitches to be leased to Carrick District council to place itinerant gypsies on for short periods sites: 040338. Decision - approved	Highwinds Sawmill Lane Hallenbeagle Scorrier

3.3.2 Site services

Buried utility services and their backfill can provide preferential pathways for gas, vapour or groundwater to migrate along to another part of the site or to a receptor. They can also represent significant constraints to development.

Service plans obtained from utility companies either by RSK or the client are contained in Appendix F; these are dated May 2022. Buried services present on-site or located adjacent to site boundaries that could represent a pathway for migration of groundwater and gases/ vapours comprise:

- Western Power Distribution: electricity cables are located underneath the road adjacent to the east of site.

- South West Water: water pipes are located underneath the road adjacent to the east of site
- BT Open Reach: Lines located underneath the north east corner of site and parallel to the eastern and northern boundary
- Virgin media ducts are positioned off site, on the opposite side of the railway

3.4 Summary of previous investigations

A summary of pertinent information from previous investigations is included below in Table 6. Relevant information relating to the identified ground and groundwater conditions has not been included within the table below but has been incorporated into the relevant parts of Sections 3.5 - geology and 3.6 – mining and quarrying.

Table 6 Summary of previous Geo-environmental/mining investigation reports

Report Details	**1. Crofty Consultancy, Cornwall Food and Energy Park Hallenbeagle Geo-Environmental Report. 25th October 2007.**
Site coverage	This investigation was undertaken across the land occupied by the former Hallenbeagle Mine which included the area west of the railway line, area further east of Sawmill Lane and the current site of interest.
Summary scope of works	The purpose of such investigation was to determine the contamination status of the site and to collect factual site data (hydraulic and geotechnical). The intrusive works were carried out between 13th September and 13th October 2007 and comprised: 32 trial trenches, 24 trial pits, 5 soakaway tests, 34 dynamic probes and 30 dynamic cone penetrometer tests.
Does the client have reliance upon the report?	Yes

Key factual findings	Inorganic (primarily arsenic) contamination was found present in the near surface soil under the site. Arsenic values were recorded between 87mg/kg and 234mg/kg, presenting a potential risk to human health. Soil leaching potential tested low. Groundwater was not encountered in excavations (except for small area of perched water in concrete lined tanks within trial pit TP3. (this report references a report written by H_2OK in May 2002, which suggests the area is artificially drained by an adit, known as County adit, approximately 75m from the surface.) The investigation found a shallow tunnel/adit on the northern part of site, two capped shafts (concrete cap/plug), twelve infilled shafts/pits (including soil, sand and very weak sandy concrete) and many lodes (note these were not stopes or worked lodes). An upper layer of Made Ground was encountered in all holes, succeeded by a layer of Head Deposits. In most parts, the Head Deposits were underlain by a layer of the Weathered Porthtowan Formation, with solid bedrock at depth. In other parts of the site, the Head Deposits were underlain by completely weathered Porthtowan Formation.
Report Details	2. **Cornwall Mining Services Ltd, Proposed Eco Park & Gypsy Relocation Sites Hallenbeagle NR Scorrier Redruth Cornwall, Reclamation Strategy, Reference: 4962.Rec.Str, 3rd February 2011**.
Site coverage	Land at Hallenbeagle
Summary scope of works	A desk based study of previous reports, mining and geology of the area. To propose a remedial strategy of the mine workings and provide engineering calculations associated with mass concrete plugging.
Does the client have reliance upon the report?	Yes
Key factual findings	Strategy proposed an initial site stripping exercise to remove all surface fill material, topsoil and soft subsoil to reveal a competent, recognisable, natural, undisturbed ground horizon where unaffected by features. Each feature is to be secured. Where the base of features lie within 5.0 metres of the existing ground level, they will be excavated to confirm sound base and sides, then infilled using compacted 'as dug' material where suitable, or using imported suitably compacted granular aggregate. In some case a C10 concrete infill may be used. Shafts and deep features such as pits and lode outcrop workings are to be secured by mass concrete plugging.
Report Details	**3. Mining Searches UK, Proposed Bio-park land at Hallenbeagle (east), Scorrier, Cornwall, Further Soils analysis report, Reference 54785.FSA.11th March 2013.**
Site coverage	Land at Hallenbeagle (east)
Summary scope of works	Soil sampling was undertaken in areas of the proposed open space and areas of previously high levels of arsenic and then subjected to Physiologically Based Extraction Testing (PBET).
Does the client have reliance upon the report?	Yes
Key factual findings	The PBET results and CLEA method were applied to assess a site specific Arsenic concentration. The revised safe concentration of

	Arsenic for industrial development was given as 2300.00mg/kg. As a result the report considered that levels of Arsenic found within the site did not pose an unacceptable risk to long term human health. However it was recommended to import 300mm of clean topsoil and provide a geotextile layer in areas of softscape or planting areas.
Report Details	**4. Mining Searches UK, Mining Site Investigation and Securing report for proposed industrial development land at Hallenbeagle (east), Scorrier, Cornwall, Reference 54785.sir, 2nd May 2014**
Site coverage	This investigation incorporates the current site location, land south of site and the land east of Sawmills lane where Cormac Solutions currently resides.
Summary scope of works	Investigation works included controlled machine site stripping, machine excavation and rotary drilling, followed by appropriate mass concrete plugging.
Does the client have reliance upon the report?	Yes
Key factual findings	Backfilled mine workings were identified. Two open shafts were found and secured by means of mass concrete plugging (Piningers and Jeffrey's shafts). The report indicates the site area to be acceptably free from mining related settlement or subsidence risk. Where a firm natural base was confirmed, features were infilled with compacted (as dug) material, 4" clean stone hardcore, or a lean mix concrete, typically C10. Where a firm base was not present for any discovered deeper feature, within a reasonable depth, the feature was secured by mass concrete plugging. The sides of the features were 'coned; out to form an adequate taper. Plugs were formed from a single pour of grade C35 class 4 sulphate resisting concrete. For smaller shaft which did not exceed a width of 1.5m, typical plug thickness was approximately 1.5m. Those exceeding 1.5m were plugged between 1.6 m to 3.2m thickness. The securing excavation were infilled above the plug with structural fill, typically clean stone up to approximately 3.0 m below the proposed finished floor levels of the proposed development. An arched tunnel in the northern part of site was found (northeast-southwest orientation) approximately between 2.3 m and 3.1 m below existing surface, base between 3.55 m and 5.1. The tunnel was partially open and damp, indicating it may be a conduit for water. The tunnel was 64m long with access to the surface. The drainage tunnel has been secured in a way to maintain a conduit for water. The tunnel was infill was 4" clean stone to the top of the pre-existing tunnel arch. A protective layer of geotextile sheeting was laid over the clean stone, to allow for an infill of C10 lean mix concrete up to approximately 3.0 metres below the proposed finished floor level. Plans and photographs of exploratory holes and remediated features are included within the report. (e.g. Piningers shaft, new shelf at approx. 112.7, top of new concrete plug approx. 115.0.)
Report Details	5. Mining Searches UK, Further Soils analysis report, Reference: JM.BP.61526.PBET, 5th September 2014

Site coverage	Entire site.
Summary scope of works	Obtained Arsenic PBET results and produced a Site Specific Assessment criterion for Arsenic. Eight samples were analysed to assess the Arsenic bioaccessibility.
Does the client have reliance upon the report?	Yes
Key factual findings	Report confirms the site has been stripped, secured and reinstated. Site has been levelled with a blanket layer of made ground of variable thickness, comprising a mix of soil types on site; topsoil, natural ground (clays, gravel and shale) and coarser mine waste material. The mine waste tip areas were identified as having elevated levels of arsenic compared to the natural soils. The upper confidence limit (UC) for the revised data is 2069.54/kg, based on soil samples from the existing soil (post remedial works) and Croft's Consultancy's soil investigation 2007. Applying the PBET results and the CLEA method, the revised safe concentration for Arsenic using the industrial development is given as 3180.00 mg/kg/. It is therefore considered that levels of Arsenic found within the site, do not pose an unacceptable risk to long term human health.

Table 7 Summary of previous Ecology reports

Report Details	**6. Spalding Associates (Environmental) Ltd, Japanese Knotweed at Hallenbeagle, September 2007.**
Site coverage	Survey covered the northern end of the current site and off-site towards the east/southeast.
Summary scope of works	To re-map the distribution of Japanese Knotweed on site and formulate a strategy for dealing with the problem.
Does the client have reliance upon the report?	Unknown
Key factual findings	Found 21 separate patches of knotweed amounting to 2377m^2. Since the rhizomes can be viable 3 metres below ground, a total of 30,507m^3 of soil would have to be removed from site to ensure complete clearance of Japanese Knotweed. They recommended initial treatment by spraying with glyphosate, excavation to at least 3m and 7m of the perimeter of the knotweed, and burial to at least 5n with cell lining, geotextile and concreted over.
Report Details	**7. Cormac Contracting Ltd, Cornwall Biopark, Hallenbeagle Estates Ltd, Japanese Knotweed Report, Ref no 1203C028.IJN/JKW001, 15th April 2013**
Site coverage	Northern end of site and off-site towards the east/southeast.
Summary scope of works	Surveying of site for invasive species and to carry out subsequent intervention.
Does the client have reliance upon the report?	Unknown

Key factual findings	All areas of Japanese knotweed (except for two) are reported to have been excavated and removed. No further knotweed was observed in these sites at a later inspection.
Report Details	**8. Cormac Solutions Ltd, Invasive Plant report, Survey of Japanese Knotweed, commercial building plot at Hallenbeagle, Cormac ref 146/JKSR/27.03.18, 3rd April 2018.**
Site coverage	Southern half of site
Summary scope of works	Located the infestations, record plant area, height and health, propose a method of control to eradicate the infestation, prevent further spread and protect infrastructure.
Does the client have reliance upon the report?	Unknown
Key factual findings	No Japanese Knotweed was found within the site or immediate surrounding area. It was recommended that a further visual survey is undertaken between May and November prior to commencement of building work, and that during construction and ground disturbance a watching brief is undertaken to locate and identify any residual rhizome or plant matter.

3.5 Site geology

3.5.1 Anticipated geological sequence

Published records (British Geological Survey, 2022) for the area, available historical borehole logs and previous investigation reports indicate the geology of the site to be characterised by the succession recorded in Table 8. There are 5 publicly available BGS historical boreholes located on or within 250 m of the site, a selection of which are presented in Appendix E.

Table 8 Site geology

Strata	Description	Estimated thickness	Permeability
Made Ground/ Engineered Fill	A mix of soil types on site; topsoil, clean stone, natural ground (clays, gravel and shale) and coarser mine waste material.	Approximately 1.5 m to 3 m (dependant upon depth to mining features found or competent bedrock).	Variable
Concrete	Concrete Plugs installed during remediation of mining features.	Approximately 1.5 m to 2.5 m (dependant on dimensions of original mining feature (e.g. shaft).	Low
Porthtowan Formation	Metamudstone and Metasandstone	Unknown (encountered at approx. 3.0 m in previous investigations)	Variable
Relevant information sources: BGS Geoindex ☒ BGS borehole logs ☐ Previous SI reports ☒			

3.5.2 Radon

The environmental database report indicates that the site is located within an area where either 10-30% or more than 30% of homes are above the Action Level (termed an 'Affected Area') and indicates that full radon protection measures are required.

Although the radon data used in production of the ukradon.org indicative atlas comes from measurements in homes, the maps indicate the likely extent of the local radon hazard in all buildings.

In Affected Areas radon concentrations are generally low in well-ventilated workplaces such as workshops, but problems have been found in some more confined workplaces, such as offices, where rates of ventilation are relatively slow. HSE guidance suggests that where a premise is in an Affected Area, the employer should take a precautionary approach and undertake measurements in all premises located within an Affected Area. Based on the information in the database report, it would be prudent to arrange monitoring of any poorly ventilated areas to determine if there is a current risk to site staff. If the site is considered for future residential development, further assessment will be required, in line with the guidance provided in BRE publication 211 "Radon: Guidance on Protective Measures for New Dwellings (2015)".

3.6 Mining and quarrying

The site lies within Cornwall and West Devon Mining Landscape World Heritage Site.

The remains of a Cornish engine house lie in the southeast corner of site and another engine house is located 6m from south boundary. Both are grade II listed.

The environmental database report confirms the presence of a historical copper mine on-site dating back to the 1800's. A number of disused shafts were recorded across site on historical maps dated between 1908 and 1980. A further 110 records of underground mining features have been documented within a 250m radius search around the site boundaries.

According to the environmental database report, there are three records of mining cavities within 250m of site. The nearest is located 16m NW at Hallenbeagle, Scorrier. There are nine instances of surface ground workings on site, including cuttings and refuse heaps dated between 1879 and 1958. A further 75 records of a similar nature are located within 250m of site.

Previous investigations on-site have located and identified numerous mining features and have been validated to have remediated the area accordingly (see table 6).

3.7 Hydrogeology

A summary of the hydrogeological setting of the site, with respect to the anticipated geological sequence set out in Section 3.5 is presented below in Table 9.

Table 9 Summary of hydrogeological setting

Condition	Description
Aquifer characteristics	The site is underlain by a secondary A aquifer relating to the Porthtowan Formation.
Depth to groundwater and flow	Groundwater was not encountered during previous investigations on-site. The anticipated depth to the groundwater table is in the order of >3m below ground level estimated from previous investigations and borehole records.
Groundwater recharge/ attenuation	Most of the site is currently unsurfaced and will therefore drain to ground.
Historical implications for hydrogeology	There are references to a shallow adit located on-site in a report by Mining Searches 2014. A drainage tunnel in the northern part of site was found and secured in a way to maintain a conduit for water.
Licensed groundwater abstractions	The environmental database report indicates that there are no groundwater abstractions within a 1km radius of the site.
Source protection zones	Information available in the environmental database report indicates that the site does not lie within a currently designated groundwater Source Protection Zone (SPZ).

3.8 Hydrology

A summary of the hydrology within the site area is summarised in Table 10.

Table 10 Summary of hydrology in site area

Condition	Description
Surface watercourses/features	There are no ponds, streams or drainage ditches on or adjacent (up to 250m) of the site. The site lies within the Portreath Stream water body catchment.
Surface water abstractions	There are no surface water abstractions identified by the environmental database, within a 1 km radius of the site.
Site drainage	Surface drainage from the site appears to be discharged straight into the ground.
Preliminary flood risk assessment	The groundsure report shows that the site does not lie within a designated floodplain. The risk of flooding each year has been assessed by the EA as negligible. A flood risk assessment (FRA) is outside the scope of this report.

3.9 Sensitive land uses

Table 11 provides a summary of any environmentally sensitive areas identified within 250 m of the site based on the environmental database report.

Table 11 Environmentally sensitive areas

Feature	Present within 250m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	No	Designation type, distance and direction from site	-
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	No	Designation type, distance and direction from site	-
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	No	Designation type, distance and direction from site	-
Nearest high sensitivity development, e.g. residential	n/a	Designation type, distance and direction from site	-

4 SITE RECONNAISSANCE FINDINGS

A site reconnaissance survey was completed on 20th June 2022 by RSK, accompanied by the client representative. The characteristics of the site observed during the walkover and from current ordnance Survey maps are summarised in Table 12.

A site plan is provided in Figure 2 with photographic records included in Appendix G detailing the main features identified below.

Whilst the walkover summary includes consideration of current operations and housekeeping on the site as potential sources of contamination, it does not constitute a comprehensive environmental audit of the site, as covered under ISO 14001.

Table 12 Site reconnaissance findings

Feature	Description
Physical characteristics	
Access constraints	Main vehicular access is via a padlocked gate in the northeast corner.
Site topography	The ground slopes generally downwards towards the southwest.
Surface cover	The site is covered in a variety of grass species with some patches of exposed compacted gravel/clay.
Site drainage	No evidence of waterlogging or flooding. Two manholes observed in the north corner, potentially associated with drainage (manholes were not opened during walkover).
Surface water	There are no streams or drainage ditches on or adjacent to the site
Trees and hedges	There are native species hedges and vegetation (including ferns, gorse, heather) with the occasional tree along the north, south and west boundaries. These are protected by a textile fence.
Invasive species	Despite a history of Japanese Knotweed on site, there was no obvious evidence of Japanese Knotweed identified during the walkover. However, it should be noted that a detailed survey of the possible presence or absence of invasive species is outside of the scope of investigation and consideration should be given to commissioning a specialist survey, as necessary.
Existing buildings on-site	No buildings are present on site.
Retaining walls and adjacent buildings on or close to site boundary	Hedges are constructed on stone walls or earth embankments along north and west boundaries.
Basements on-site	No evidence of existing or infilled basements was observed. (note: site has been remediated for mining features, so any form of basement should have been infilled).

Feature	Description
Made ground, earthworks and quarrying	This area was the site of a former mine and has undergone subsequent remediation works. The site has been stripped, excavated and filled with engineered fill (potentially a combination of naturally derived local material and imported fill/concrete). There are three stockpiles of material between 1.0 m and 2.0 m high, with a flat top (now covered with grass) in the southeast corner.
Potentially unstable slopes on or close to site	There is a railway cutting slope immediately to the west of the site. Unable to assess the slope condition during the walkover due to visual and access constraints.
Buried and overhead services present	Two manholes were observed in the north of site, potentially drainage services. No overhead services present.
Environmental characteristics	
Underground/ above ground storage tanks and pipework	None observed
Potentially hazardous materials storage and use	None observed
Asbestos-containing materials	No obvious asbestos containing materials observed.
Waste storage	None observed
Fly-tipping	None observed
Electricity sub-stations/ transformers	There are two existing sub-station located approximately 10m east and southeast of site (on the opposite side of the access road).
Evidence of possible land contamination on-site	None observed
Potential off-site sources of ground contamination	Industrial/commercial land uses east, south and west including railway, vehicle dealerships and Cormac solutions depot.

No potentially significant land contamination or geotechnical issues were identified during the site reconnaissance survey.

5 PRELIMINARY GEOTECHNICAL CONSTRAINTS

5.1 Design class

BS EN 1997-1 defines three different Geotechnical Categories that structures may fall into, which are summarised as follows:

- Category 1: Small and relatively simple structures for which it is possible to ensure that the fundamental requirements will be satisfied on the basis of experience and qualitative geotechnical investigations; with negligible risk
- Category 2: Conventional types of structure and foundation with no exceptional risk or difficult ground or loading conditions
- Category 3: Structures or part of structures, which fall outside limits of Geotechnical Categories 1 and 2. Examples include very large or unusual structures; structures involving abnormal risks, or unusual or exceptionally difficult ground or loading conditions; structures in highly seismic areas; structures in areas of probable site instability or persistent ground movements that require separate investigation or special measures.

Based on the information provided above on the proposed development and in view of the anticipated ground conditions, a Geotechnical Category 2 been assumed for the purposes of designing the geotechnical investigation. This should be reviewed at all stages of the investigation and revised where necessary.

5.2 Preliminary geotechnical hazards assessment

A summary of commonly occurring geotechnical hazards associated with the anticipated geology outlined in Section 3.5 above is given in Table 13 together with an assessment of whether the site may be affected by each of the stated hazards.

Table 13 Summary of preliminary geotechnical risks that may affect site

Hazard category	Hazard status based on desk study findings and proposed development		Engineering considerations if hazard affects site
	Could be present and/or affect site	Unlikely to be present and/or affect site	
Sudden lateral changes in ground conditions	☒	☐	Likely to affect ground engineering and foundation design and construction
Shrinkable clay soils	☐	☒	Design to NHBC Standards Chapter 4 or similar

Hazard category	Hazard status based on desk study findings and proposed development		Engineering considerations if hazard affects site
	Could be present and/or affect site	Unlikely to be present and/or affect site	
Highly compressible and low bearing capacity soils, (including peat and soft clay)	☐	☒	Likely to affect ground engineering and foundation design and construction
Silt-rich soils susceptible to rapid loss of strength in wet conditions	☐	☒	Likely to affect ground engineering and foundation design and construction
Running sand at and below water table	☐	☒	Likely to affect ground engineering and foundation design and construction
Karstic dissolution features (including 'swallow holes' in Chalk terrain)	☐	☒	May affect ground engineering and foundation design and construction – refer to Section 4.1.2
Evaporite dissolution features and/or subsidence	☐	☒	May affect ground engineering and foundation design and construction
Ground subject to or at risk from landslides	☐	☒	Likely to require special stabilisation measures
Ground subject to peri-glacial valley cambering with gulls possibly present	☐	☒	Likely to affect ground engineering and foundation design and construction
Ground subject to or at risk from coastal or river erosion	☐	☒	Likely to require special protection/stabilisation measures
High groundwater table (including waterlogged ground)	☐	☒	May affect temporary and permanent works
Rising groundwater table due to diminishing abstraction in urban area	☐	☒	May affect deep foundations, basements and tunnels
Geological faults, fissures and break lines	☐	☒	May affect ground engineering and foundation design and construction
Underground mining including shafts and adits (e.g. coal, mineral)	☐	☒	Likely to require further assessment including potentially special stabilisation measures
Effects of extreme temperature (e.g. cold stores or brick kilns/furnaces)	☐	☒	Likely to affect ground engineering and foundation design and construction

Hazard category	Hazard status based on desk study findings and proposed development		Engineering considerations if hazard affects site
	Could be present and/or affect site	Unlikely to be present and/or affect site	
Existing sub-structures (e.g. tunnels, foundations, basements, and adjacent sub-structures)	☒	☐	Likely to affect ground engineering and foundation design and construction
Filled and made ground (including embankments, infilled ponds and quarries)	☒	☐	Likely to affect ground engineering and foundation design and construction
Adverse ground chemistry (including expansive slags and weathering of sulphides to sulphates)	☒	☐	May affect ground engineering and foundation design and construction
Site topography	☐	☒	May affect ground engineering and foundation design and construction
Note: Seismicity is not included in the above table as this is not normally a design consideration in the UK.			

The hazard posed by underground mining hazard has been discounted from this assessment due to a report provided by Mining Searches UK confirming that site has been sufficiently remediated and that mining features no longer pose a risk to development.

6 INITIAL CONCEPTUAL SITE MODEL

In the UK land contamination is assessed using a risk-based approach taking account of the magnitude (severity of the hazard) and likelihood (probability) of occurrence. A 'receptor' is something that could be adversely affected by contamination (e.g. people, an ecological system, property or a water body). A 'pathway' is a route or means by which a receptor is or could be exposed to or affected by a contaminant. A 'contaminant source' is a hazard but it can only pose a risk to a receptor where a pathway is present. The relationship between sources, pathways and receptors are referred to as a conceptual site model. A risk can only be released where a contaminant source, pathway and receptor are all in place, referred to as a 'pollutant linkage'.

In line with LCRM (Environment Agency, 2021) and BS 10175: 2011 + A2 2017 (BSI, 2017), RSK has used information in the preceding sections to identify hazards (sources of contaminants), receptors that may be impacted and plausible linking pathways. Where all three are present this is termed a potentially complete contaminant linkage and a qualitative risk estimation is made.

6.1 Potential soil, soil vapour and groundwater linkages

6.1.1 Potential sources of contamination

Potential sources of soil and groundwater contamination identified from current activities and the history of the site and surrounding area are presented in Table 14. Ground gas sources are addressed in the next section.

Table 14 Potential sources of soil and groundwater contamination

Potential sources	Contaminants of concern
On-site	
Made Ground including stockpile material (comprising a mix of soil types on site; topsoil, natural ground (clays, gravel and shale) and coarser mine waste material.)	Heavy metals, hydrocarbons, PAHs, asbestos
Naturally occurring elevated concentrations of heavy metals	Heavy metals
Off-site	
Made Ground (comprising a mix of soil types on site; topsoil, natural ground (clays, gravel and shale) and coarser mine waste material.)	Heavy metals, hydrocarbons, PAH, asbestos
Historical and current railway, 0-4m north-west of site	Petroleum hydrocarbons, heavy metals, inorganics, PAHs, asbestos, herbicides

The electrical substations adjacent to site have not been considered due to their recent construction (ie post 1986 and the ban on PCB use).

6.1.2 Sensitive receptors and linking exposure/ migration pathways

Sensitive receptors identified at or in the vicinity of the site that could be affected by the potential sources identified above comprise:

- Future site users – commercial site workers [oral, dermal and inhalation exposure with impacted soil, soil vapour and dust, inhalation of vapours from groundwater]
- Current adjacent site users –commercial [migration of contamination via dust/fibre deposition, vapour or groundwater migration combined with inhalation]
- Future buildings and services (potable water supply) [direct contact with contaminated soils or groundwater and chemical attack]
- Groundwater in secondary A aquifer within the Porthtowan formation bedrock deposits [percolation through permeable strata to aquifer)

Potential linking pathways are show in brackets for each item above.

Please note that construction workers and future maintenance workers have not been identified in the conceptual model as receptors because risks are considered to be managed through health and safety procedures according to the CDM Regulations.

Ecological receptors are only considered within the conceptual model in the context of statutory protected sites.

6.2 Potential ground gas linkages

6.2.1 Ground gas generation potential

Potential ground gas sources identified for the site and surrounding are shown in Table 15.

Table 15 Potential ground gas sources

Potential sources	Indicative ground gas generation potential (CIEH, 2008)	Additional information
On-site		
Made Ground	Low	Remediation report indicates the Made Ground on-site comprises a mix of soil types; topsoil, natural ground (clays, gravel and shale) and coarser mine waste material
Mine workings more than 50 years since last worked	Low	Generation potential should have been reduced due to remediation works and type of historical mining (metalliferous mining).

Potential sources	Indicative ground gas generation potential (CIEH, 2008)	Additional information
Off-site		
Mine workings more than 50 years since last worked	Low	Generation potential should have been reduced due to remediation works and type of historical mining (metalliferous mining).

No significant potential sources of ground gas generation have been identified therefore this potential issue has not been taken forward.

6.3 Preliminary risk assessment

The preliminary risk assessment findings and potentially complete contaminant linkages are shown in Table 16 overleaf. The risk classification based on the combination of hazard consequence and probability using a risk matrix from CIRIA C552 (Rudland et al., 2001), a summary of which is included in Appendix H. This relates to Tier 1 preliminary risk assessment in LCRM (Environment Agency, 2021).

Table 16 Risk estimation for potentially complete contaminant linkages

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Potential risk	Justification
On site						
Contaminants within Made ground including stockpile material	Future site users – commercial/ industrial workers	Oral, dermal and inhalation exposure with impacted soil, soil vapour and dust, inhalation of vapours from groundwater	Low	Medium	Moderate/Low	Made Ground on site could include mine waste materials. Hardstanding across the proposed development should reduce or eliminate direct contact and release of soils dust and vapours into the air. However there will potentially be minor areas of open/ soft landscaping around the edges of site. .
	Current adjacent site users –commercial	Migration of contamination via dust/fibre deposition, vapour or groundwater migration combined with inhalation	Unlikely	Medium	Low	Hardstanding across the proposed development should reduce or eliminate direct contact and release of soils dust and vapours into the air.
	Future buildings and services (potable water supply pipes)	Direct contact with concrete, chemical attack	Likely	Medium	Moderate	The concrete will be permanently in contact with the Made Ground and therefore could come under chemical attack. Made ground beneath site may contain mine waste materials, including sulphates. Appropriate geotechnical testing should be carried out to confirm concrete design to mitigate the risk.

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Potential risk	Justification
On site						
		Direct contact with potable water supply and permeation of chemicals	Likely	Medium	Moderate	Made Ground on site could include mine waste materials. The potable pipe supply, for proposed offices, is likely to come into contact with Made Ground.
	Groundwater in secondary A aquifer within the Porthtowan formation bedrock deposits	Leaching from unsaturated zone soils	Low	Mild	Low	Proposed site surfacing will comprise of hardstanding which will restrict leaching. However there are two locations of proposed infiltration features/ soakaways/permeable paving. Leaching of contaminants from the Made Ground through the unsaturated zone could occur in these localised areas. Groundwater is anticipated to be at depths greater than 3m, reducing likelihood of groundwater movement in shallow soils. Groundwater flow is likely downgradient towards the south, away from the closest residential receptors.

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Potential risk	Justification
On site						
		Remobilisation	Low	Mild	Low	Fluctuations in water levels of any perched or shallow groundwater, and infiltration via soakaways in the Made Ground may occur, potentially mobilising contaminants in the soil. Groundwater depth is currently unknown but assumed to be at a depth greater than 3m. Groundwater is anticipated to be at depths greater than 3m, reducing likelihood of groundwater movement in shallow soils. Groundwater flow is likely downgradient towards the south, away from the closest residential receptors.
Naturally occurring elevated concentrations of heavy metals	Future site users – commercial/ industrial workers	Oral and inhalation exposure with impacted soil and dust	Likely	Mild	Moderate/Low	Previous investigations have shown arsenic to be present albeit below the SSAC. Hardstanding across the proposed development should reduce or eliminate direct contact and release of soils dust. However there will potentially be minor areas of open/ soft landscaping around the edges of site.
	Current adjacent site users –commercial	Migration of contamination via dust/fibre deposition, vapour or groundwater migration combined with inhalation	Unlikely	Medium	Low	Hardstanding across the proposed development should reduce or eliminate direct contact and release of soils dust and vapours into the air.

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Potential risk	Justification
On site						
	Groundwater in secondary A aquifer within the Porthtowan formation bedrock deposits	Leaching from unsaturated zone soils	Low	Mild	Low	Proposed site surfacing will comprise of hardstanding which will restrict leaching. However there are two locations of proposed infiltration features/ soakaways/permeable paving. Leaching of contaminants from the Made Ground through the unsaturated zone could occur in these localised areas. Groundwater is anticipated to be at depths greater than 3m, reducing likelihood of groundwater movement in shallow soils. Groundwater flow is likely downgradient towards the south, away from the closest residential receptors.
Off site						
Made Ground (comprising a mix of soil types on site; topsoil, natural ground (clays, gravel and shale) and coarser mine waste material.)	Future site users – commercial/ industrial workers	Migration of contamination via dust/fibre deposition, vapour or groundwater migration combined with inhalation	Low	Mild	Low	Southern end of site is directly adjacent to former mine features and the railway is approximately level with site. Groundwater is more likely to be at shallow depth at this point on site (being downgradient).
Historical and current railway, 0-4m north-west of site	Future site users – commercial/ industrial workers	Migration of contamination via dust/fibre deposition, vapour or groundwater migration combined with inhalation	Low	Mild	Low	Southern end of site is directly adjacent to former mine features and the railway is approximately level with site. Groundwater is more likely to be at shallow depth at this point on site (being downgradient).

Risk matrix		Consequences			
		Severe	Medium	Mild	Minor
Probability	Highly likely	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very low	Very low

Potentially complete contaminant linkages with a potential risk of moderate to low or higher identified in in Table 16 comprise:

- Future site users – site workers [oral, dermal and inhalation exposure with impacted soil, soil vapour and dust, inhalation of vapours from groundwater
- Groundwater in secondary A aquifer within the Porthtowan formation bedrock deposits [percolation through permeable strata to aquifer)
- Future buildings and services (potable water supply) [direct contact with contaminated soils or groundwater and chemical attack]

These potentially complete contaminant linkages need to be assessed further through appropriate site investigation to target the identified sources of potential contamination and assess the feasibility of identified pathways.

6.4 Data gaps and uncertainties

Key data gaps and uncertainties identified in the CSM at desk study stage include:

- Confirmation of the anticipated hydrogeology beneath the site, including depth to groundwater and flow direction.
- Identification of sulphate concentrations in Made Ground (with regards to attack of concrete)
- Location of potable water supply in proposed development
- Identification of soil vapour concentrations
- Concentration of contamination in soil in the areas of proposed open landscaping space

7 6 CONCLUSIONS AND RECOMMENDATIONS

7.1 6.1 Geo-environmental assessment

Based on the results of the Preliminary Risk Assessment the contaminant linkages that have been identified to be potentially complete and to require further action are:

- Future site users – site workers [oral, dermal and inhalation exposure with impacted soil, soil vapour and dust, inhalation of vapours from groundwater
- Groundwater in secondary A aquifer within the Porthtowan formation bedrock deposits [percolation through permeable strata to aquifer)
- Future buildings and services (potable water supply) [direct contact with contaminated soils or groundwater and chemical attack]

Data gaps and uncertainties have been considered and further assessment is considered to be required.

7.2 6.2 Recommendations

A ground investigation will be required to confirm remedial measures undertaken by others, including geotechnical and chemical properties of the backfill materials. This will enable assessment of the risk to sensitive receptors from potential contamination sources and to acquire geotechnical parameters for design.

8 REFERENCES

Previous SI reports and other site related information

Crofty Consultancy Environment and Mining Services, Cornwall Food and Energy Park, Hallenbeagle Geo-environmental Report, Reference: 18045, 26th October 2007

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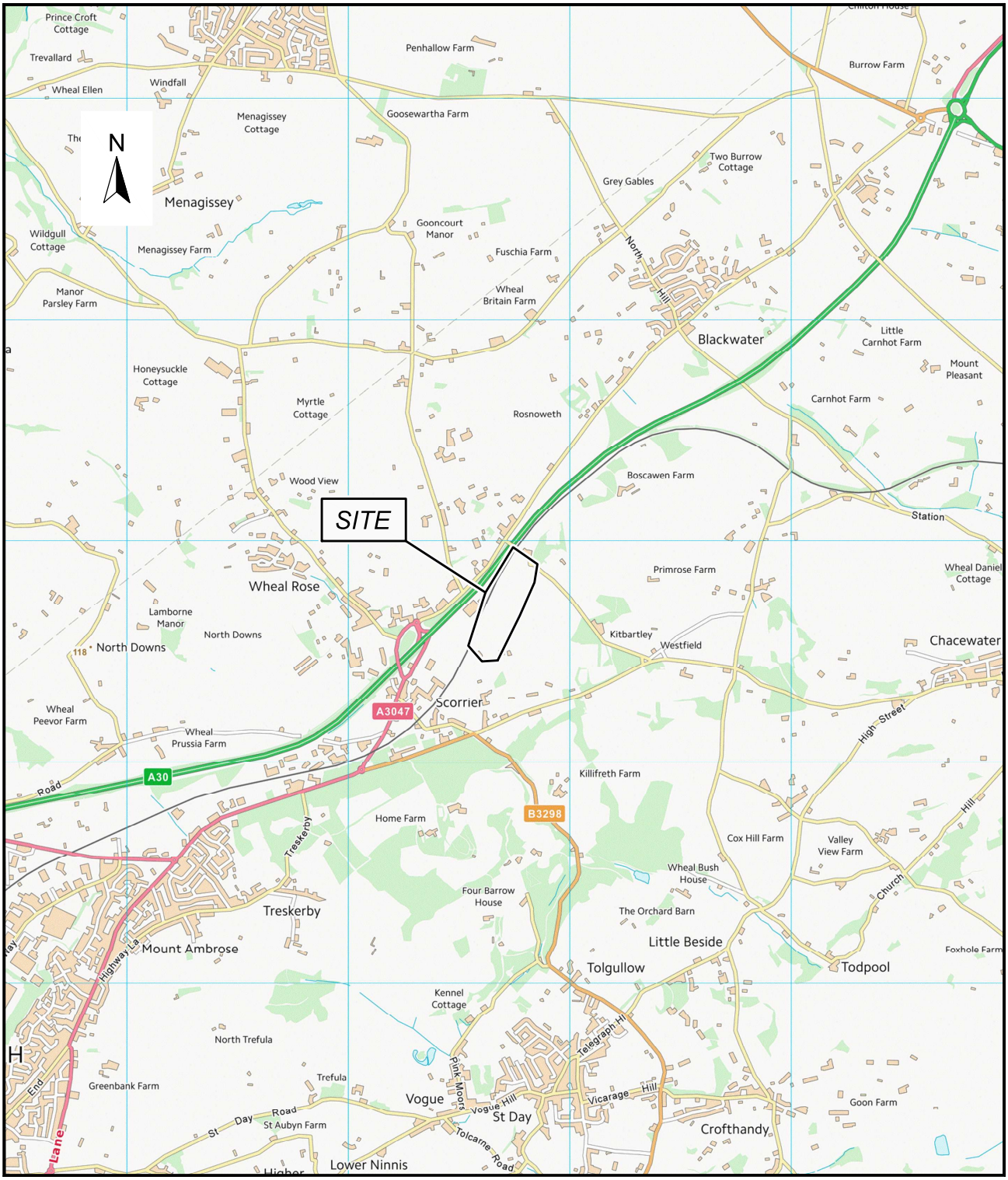
FIGURES

FIGURE 1 SITE LOCATION PLAN



RSK
The Old School,
Stillhouse Lane,
Bedminster,
Bristol,
BS3 4EB

Tel: +44 (0)117 947 1006
Email: info@rsk.co.uk
Web: www.rsk.co.uk

Client: Suez

Project Title: Hallenbeagle

Drawing Title: SITE LOCATION MAP

Rev	Drawn	Date	Checked	Date	Approved	Date
00	MB	22.06.22	RL	22.06.22	-	-

Dimensions	Scale	Original Size
m	1:25,000	A4

Project Number	Grid Ref	Scale Bar	Drawing Number
315111	SW 727 447	0 250 500 750 1,000m	FIGURE 1

FIGURE 2 SITE LAYOUT PLAN

LEGEND

SITE BOUNDARY

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
00	22.06.2022	-	MB	RL	-

RSK

The Old School,
Stillhouse Lane,
Bedminster,
Bristol,
BS3 4EB

Tel: +44 (0)117 947 1006
Email: info@rsk.co.uk
Web: www.rsk.co.uk

Client: Suez

Project Title: Hallenbeagle

Drawing Title: SITE LAYOUT PLAN

Drawn	Date	Checked	Date	Approved	Date
MB	22.06.22	RL	22.06.22	-	-

Dimensions	Scale	Original Size
m	1:2000	A3

Project Number	Drawing Number
315111	Figure 2

Drawing File	Rev
315111 - FIG2 - REV00 - SLP	00

0 20 40 60 80 100m

APPENDICES

APPENDIX A
SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Suez (the "Client") in accordance with the terms of a contract [RSK Environment Standard Terms and Conditions] between RSK and the Client, dated 21st April 2022. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by an environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.
2. Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the Client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, persistent, bioaccumulative or toxic chemicals (including PFAS/ PFOS) or other radioactive or hazardous materials, unless specifically identified in the Services.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services or accreditation system (such as UKAS ISO 17020:2012 clause 7.1.6):
    a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.

b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.

c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the Client and RSK.

8. The intrusive environmental site investigation aspects of the Services are a limited sampling of the site at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope between the client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species are not present.

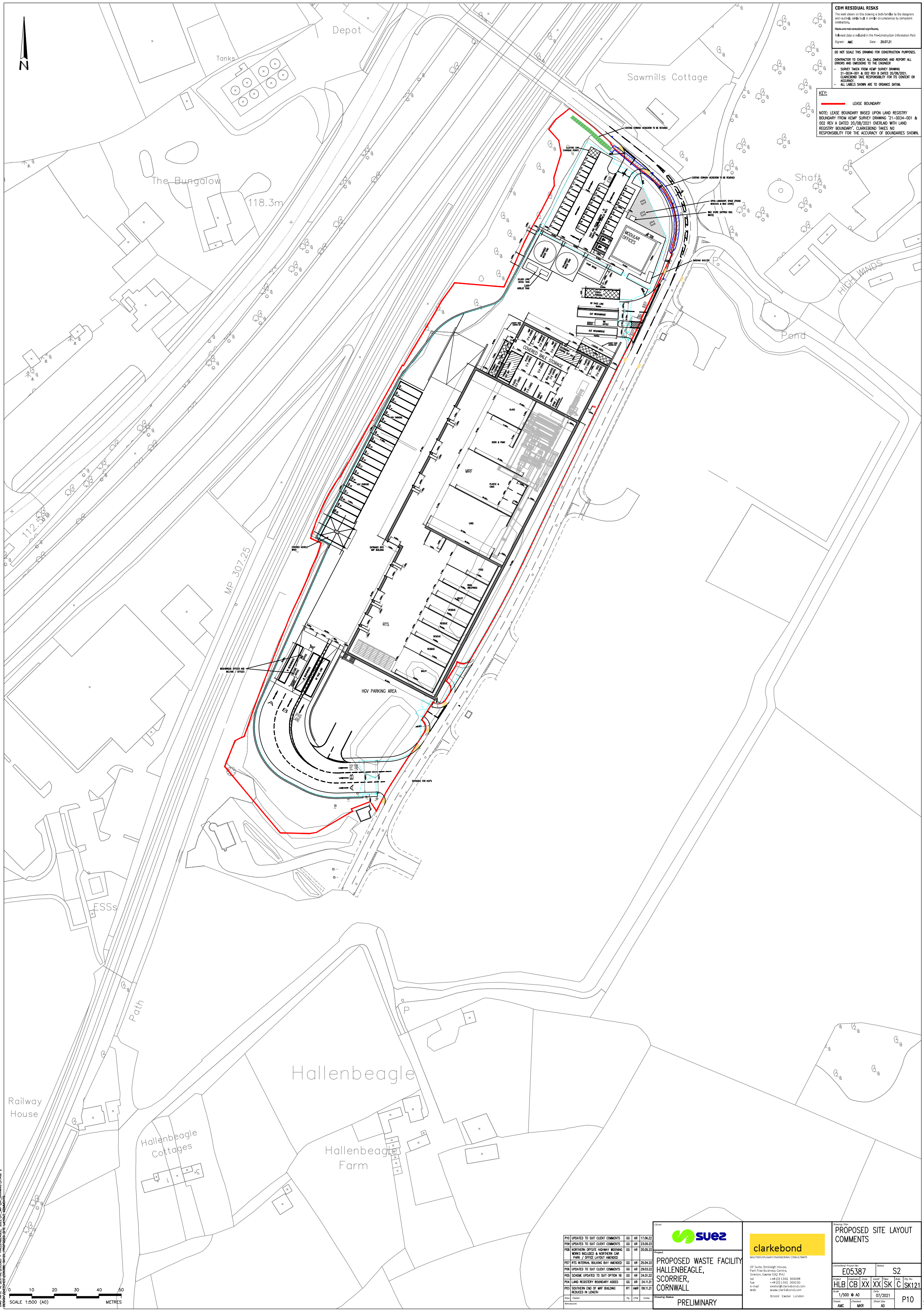
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.

10. The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.

11. Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works.

12. Unless stated otherwise, only preliminary geotechnical recommendations are presented in this report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed.

APPENDIX B
DEVELOPMENT DRAWINGS



CDM RESIDUAL RISKS

The work shown on this drawing is both familiar to the designers and routinely safely built in similar circumstances by competent contractors.

~~Risks are not considered significant.~~

Relevant data is included in the Pre-Construction Information Pack

Signed: AMC Date: 20.07.21

DO NOT SCALE THIS DRAWING FOR CONSTRUCTION PURPOSES.

CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ENGINEER

- SURVEY TAKEN FROM KEMP SURVEY DRAWING 21-0034-001 & 002 REV B DATED 20/08/2021. CLARKEBOND TAKE RESPONSIBILITY FOR ITS CONTENT OR ACCURACY.
- ALL LABELS SHOWN ARE TO ORDANCE DATUM.

KEY:

LEASE BOUNDARY

NOTE: LEASE BOUNDARY BASED UPON LAND REGISTRY BOUNDARY FROM KEMP SURVEY DRAWING '21-0034-001 & 002 REV A DATED 20/08/2021 OVERLAID WITH LAND REGISTRY BOUNDARY'. CLARKEBOND TAKES NO RESPONSIBILITY FOR THE ACCURACY OF BOUNDARIES SHOWN.

Rev	Detail	By	Chk	Date
P10	UPDATED TO SUIT CLIENT COMMENTS	GG	AR	17.06.22
P09	UPDATED TO SUIT CLIENT COMMENTS	GG	AR	23.05.22
P08	NORTHERN OFFSITE HIGHWAY WIDENING WORKS INCLUDED & NORTHERN CAR PARK / OFFICE LAYOUT AMENDED	GG	AR	20.05.22
P07	RTS INTERNAL BULKING BAY AMENDED	GG	AR	25.04.22
P06	UPDATED TO SUIT CLIENT COMMENTS	GG	AR	29.03.22
P05	SCHEME UPDATED TO SUIT OPTION 1B	GG	AR	24.01.22
P04	LAND REGISTERY BOUNDARY ADDED	GG	AR	24.11.21
P03	SOUTHERN END OF MRF BUILDING REDUCED IN LENGTH	RT	AMR	09.11.21

Revisions

Client: SUEZ

Project: PROPOSED WASTE FACILITY HALLENBEAGLE, SCORRIER, CORNWALL

Drawing Status: PRELIMINARY

clarkebond
MULTIDISCIPLINARY ENGINEERING CONSULTANTS
GF Suite, Bickleigh House,
Park Five Business Centre,
Sowton, Exeter EX2 7HU
tel +44 (0) 1392 369098
fax +44 (0) 1392 369100
e-mail exeter@clarkebond.com
web www.clarkebond.com
Bristol Exeter London

Drawing Title: PROPOSED SITE LAYOUT COMMENTS

ClarkeBond Project No.	Status
E05387	S2

Project	Originator	Zone	Level	Type	Role	Drg No.
HLB	CB	XX	XX	SK	C	SK121

Scale	Date	
1/500 @ A0	07/2021	P10
Drawn: AMC	Checked: MKR	Sheet Size: A0

APPENDIX C
SUMMARY OF LEGISLATION AND POLICY RELATING TO LAND CONTAMINATION

Part IIA of the Environmental Protection Act 1990

Part IIA of the Environmental Protection Act 1990 (Part IIA) and its associated Contaminated Land Regulations 2000 (SI 2000/227), which came into force in England on 1 April 2000, formed the basis for the current regulatory framework and the statutory regime for the identification and remediation of contaminated land. Part IIA of the EPA 1990 defines contaminated land as 'any land which appears to the Local Authority in whose area it is situated to be in such a condition by reason of substances in, on or under the land, that significant harm is being caused, or that there is significant possibility of significant harm being caused, or that pollution of controlled waters is being or is likely to be caused'. Controlled waters are considered to include all groundwater, inland waters and estuaries.

In August 2006, the Contaminated Land (England) Regulations 2006 (SI 2006/1380) were implemented, which extended the statutory regime to include Part IIA of the EPA as originally introduced on 1 April 2000, together with changes intended chiefly to address land that is contaminated by virtue of radioactivity. These have been replaced subsequently by the Contaminated Land (England) (Amendment) Regulations 2012, which now exclude land that is contaminated by virtue of radioactivity.

The intention of Part IIA is to deal with contaminated land issues that are considered to cause significant harm on land that is not undergoing development (see Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, April 2012). This document replaces Annex III of Defra Circular 01/2006, published in September 2006 (the remainder of this document is now obsolete).

Planning Policy

Land contamination is often addressed via the planning process during redevelopment of sites. This approach was documented in Planning Policy Statement: Planning and Pollution Control PPS23, which states that it remains the responsibility of the landowner and developer to identify land affected by contamination and carry out sufficient remediation to render the land suitable for use. PPS23 was withdrawn early in 2012 and has been replaced by much reduced guidance within the National Planning Policy Framework (NPPF), reference ISBN: 978-1-5286-1033-9, July 2021. For sites in Wales, reference should be made to Planning Policy Wales (Welsh Government. Edition 11, February 2021).

The new framework has limited guidance on contaminated land, as follows:

Chapter 11. Making effective use of land

117 Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or 'brownfield' land.

118. Planning policies and decisions should:

c) give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land.

Chapter 15. Conserving and enhancing the natural environment

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

Ground conditions and pollution

178. Planning policies and decisions should ensure that:

a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990; and

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.

179. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

Water Resources Act (WRA)

The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 updated the Water Resources Act 1991, which introduced the offence of causing or knowingly permitting pollution of controlled waters. The Act provides the Environment Agency with powers to implement remediation necessary to protect controlled waters and recover all reasonable costs of doing so.

Water Framework Directive (WFD)

The Water Framework Directive 2000/60/EC is designed to:

- Enhance the status and prevent further deterioration of aquatic ecosystems and associated wetlands that depend on the aquatic ecosystems
- Promote the sustainable use of water
- Reduce pollution of water, especially by ‘priority’ and ‘priority hazardous’ substances
- Ensure progressive reduction of groundwater pollution.

The WFD requires a management plan for each river basin be developed every six years.

Groundwater Directive (GWD)

The 1980 Groundwater Directive 80/68/EEC and the 2006 Groundwater Daughter Directive 2006/118/EC of the WFD are the main European legislation in place to protect groundwater. The 1980 Directive is due to be repealed in December 2013. The European legislation has been transposed into national legislation by regulations and directions to the Environment Agency.

Priority Substances Directive (PSD)

The Priority Substances Directive 2008/105/EC is a 'Daughter' Directive of the WFD, which sets out a priority list of substances posing a threat to or via the aquatic environment. The PSD establishes environmental quality standards for priority substances, which have been set at concentrations that are safe for the aquatic environment and for human health. In addition, there is a further aim of reducing (or eliminating) pollution of surface water (rivers, lakes, estuaries and coastal waters) by pollutants on the list. The WFD requires that countries establish a list of dangerous substances that are being discharged and EQS for them. In England and Wales, this list is provided in the River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2010. In order to achieve the objectives of the WFD, classification schemes are used to describe where the water environment is of good quality and where it may require improvement.

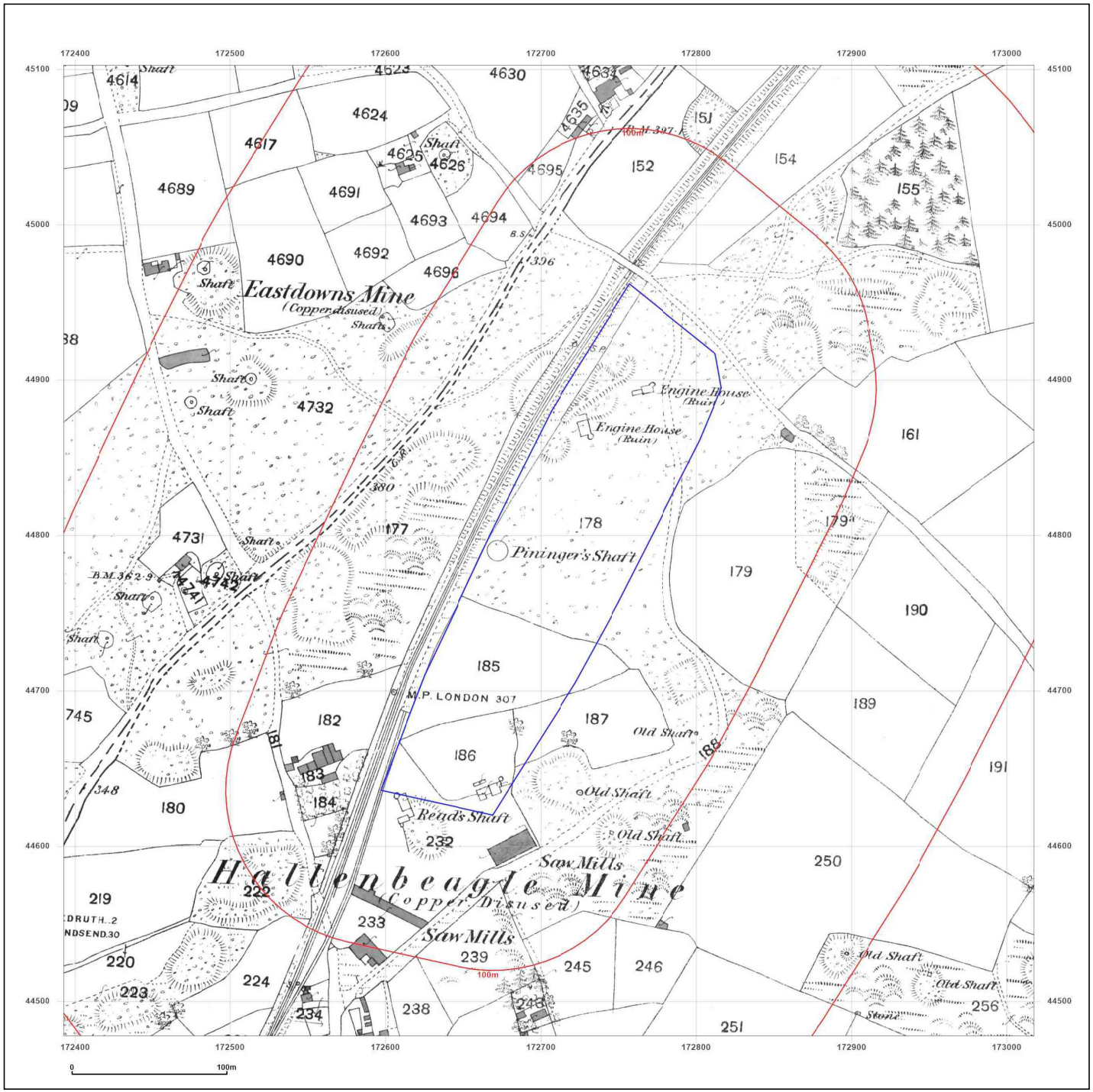
Environmental Permitting Regulations (EPR)

The Environmental Permitting (England and Wales) Regulations 2016 (as amended) provide a single regulatory framework that streamlines and integrates waste management licensing, pollution prevention and control, water discharge consenting, groundwater authorisations, and radioactive substances regulation. Schedule 22, paragraph 6 of EPR 2016 states: 'the regulator must, in exercising its relevant functions, take all necessary measures - (a) to prevent the input of any hazardous substance to groundwater; and (b) to limit the input of non-hazardous pollutants to groundwater so as to ensure that such inputs do not cause pollution of groundwater.'

Notes:

1. *The above information is provided for background but does not constitute site-specific advice*
2. *The above summary applies to England only. Variations exist within other countries of the United Kingdom*

APPENDIX D
ENVIRONMENTAL DATABASE REPORT



Groundsure INSIGHTS

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SCIENTIFIC SERVICES LTD, MITCHELL & WEBBER FUEL DEPOT, ROAD FROM JUNCTION AT VENAYR TO JUNCTION AT MITCHELL AND WEBBER FUEL DEPOT, GOONEARL, SCORRIER, TR16 5UT

Client Ref: P02124976
Report Ref: GS-8716439_2500
Grid Ref: 172705, 44790

Map Name: County Series
Map date: 1880
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1880
Revised 1880
Edition N/A
Copyright N/A
Levelled N/A

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

Production date: 04 May 2022

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

Groundsure INSIGHTS

Site Details:

SCIENTIFIC SERVICES LTD, MITCHELL & WEBBER FUEL DEPOT, ROAD FROM JUNCTION AT VENAYR TO JUNCTION AT MITCHELL AND WEBBER FUEL DEPOT, GOONEARL, SCORRIER, TR16 5UT

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Report Ref: GS-8716439_2500
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Map Name: County Series
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Scale: 1:2,500
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Revised 1908
Edition N/A
Copyright N/A
Levelled N/A

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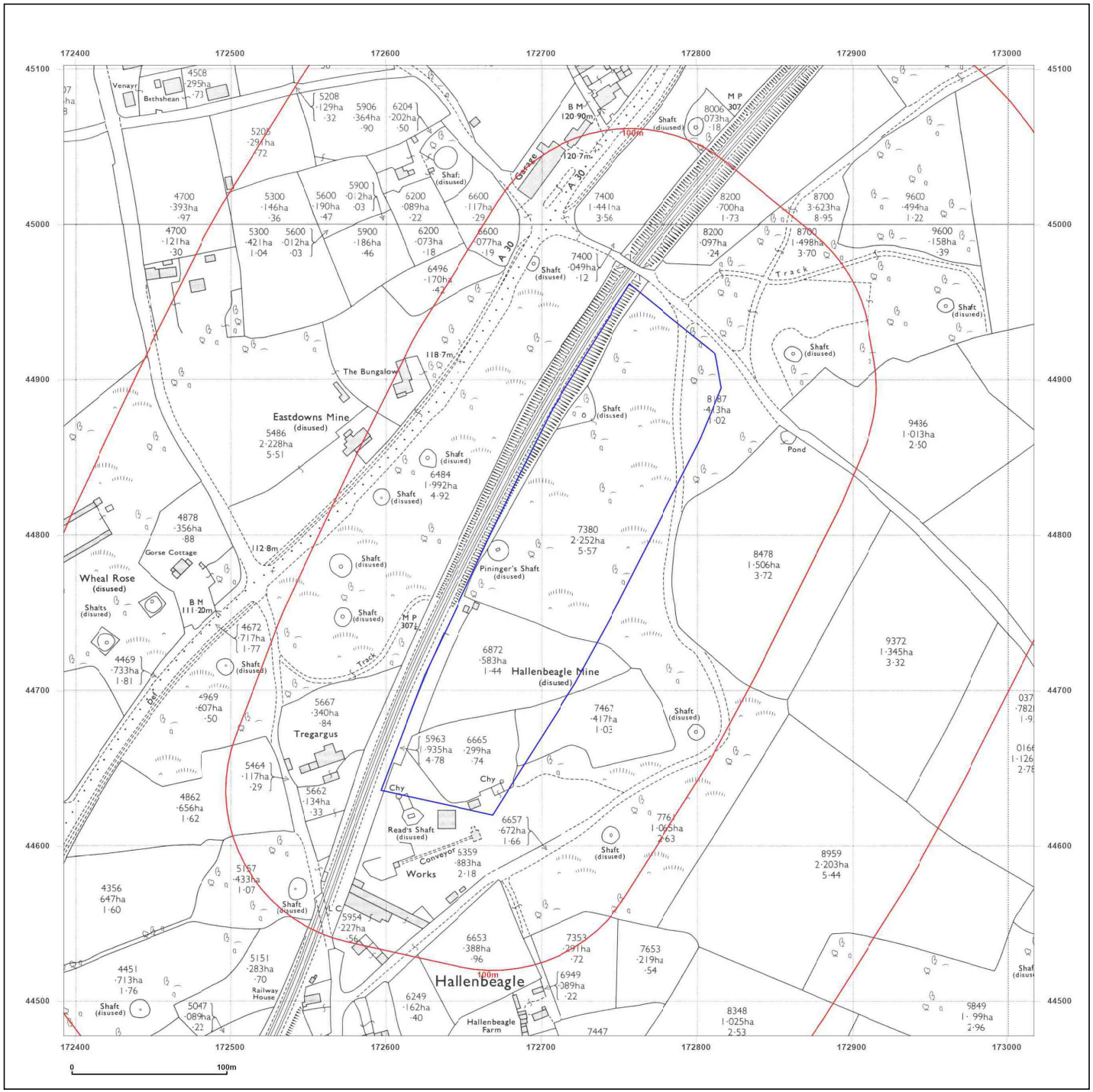

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INSIGHTS

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Surveyed 1971
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Edition N/A
Copyright 1972
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Surveyed N/A
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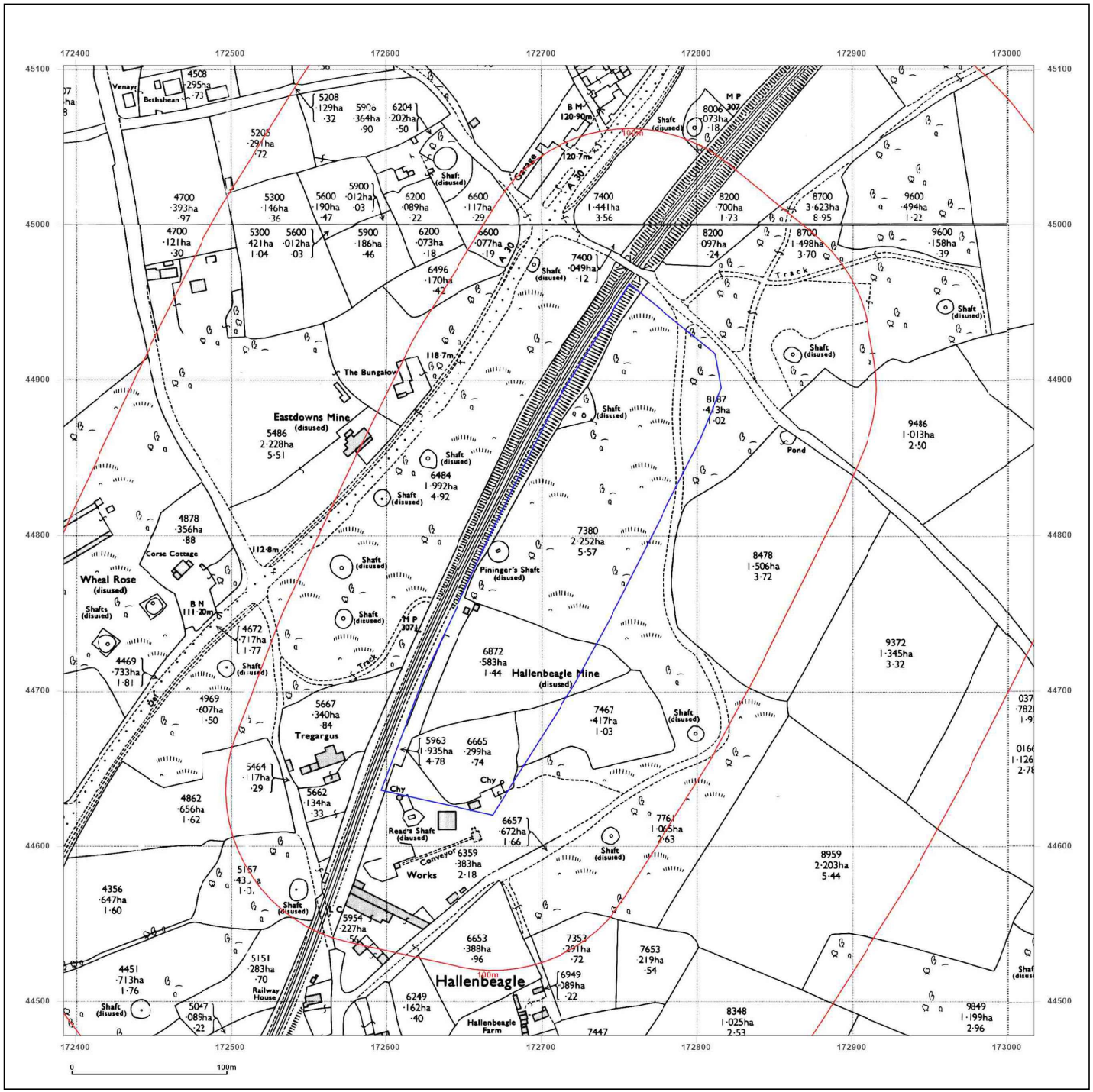

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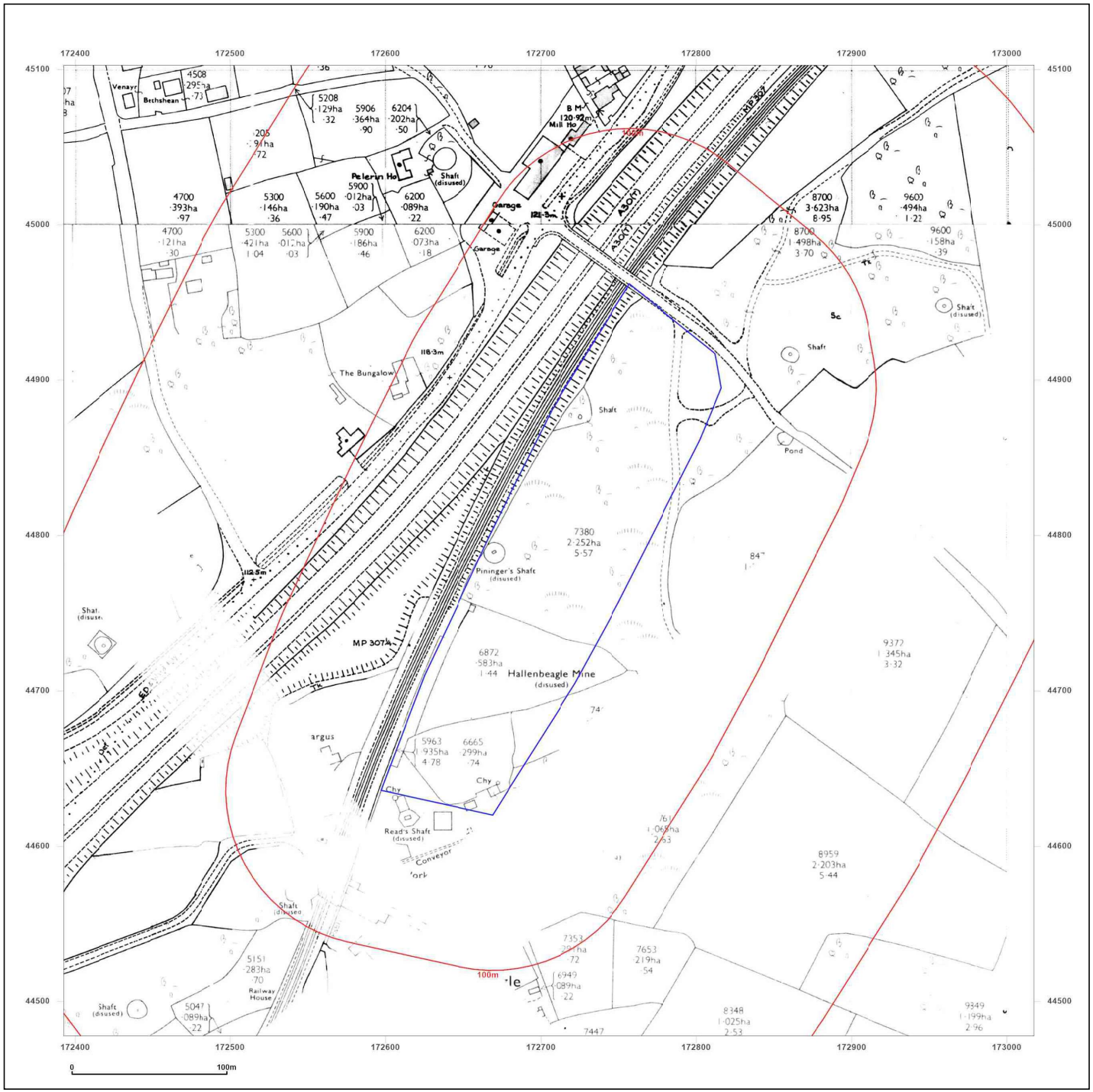

Groundsure INSIGHTS

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Surveyed 1972
Revised 1989
Edition N/A
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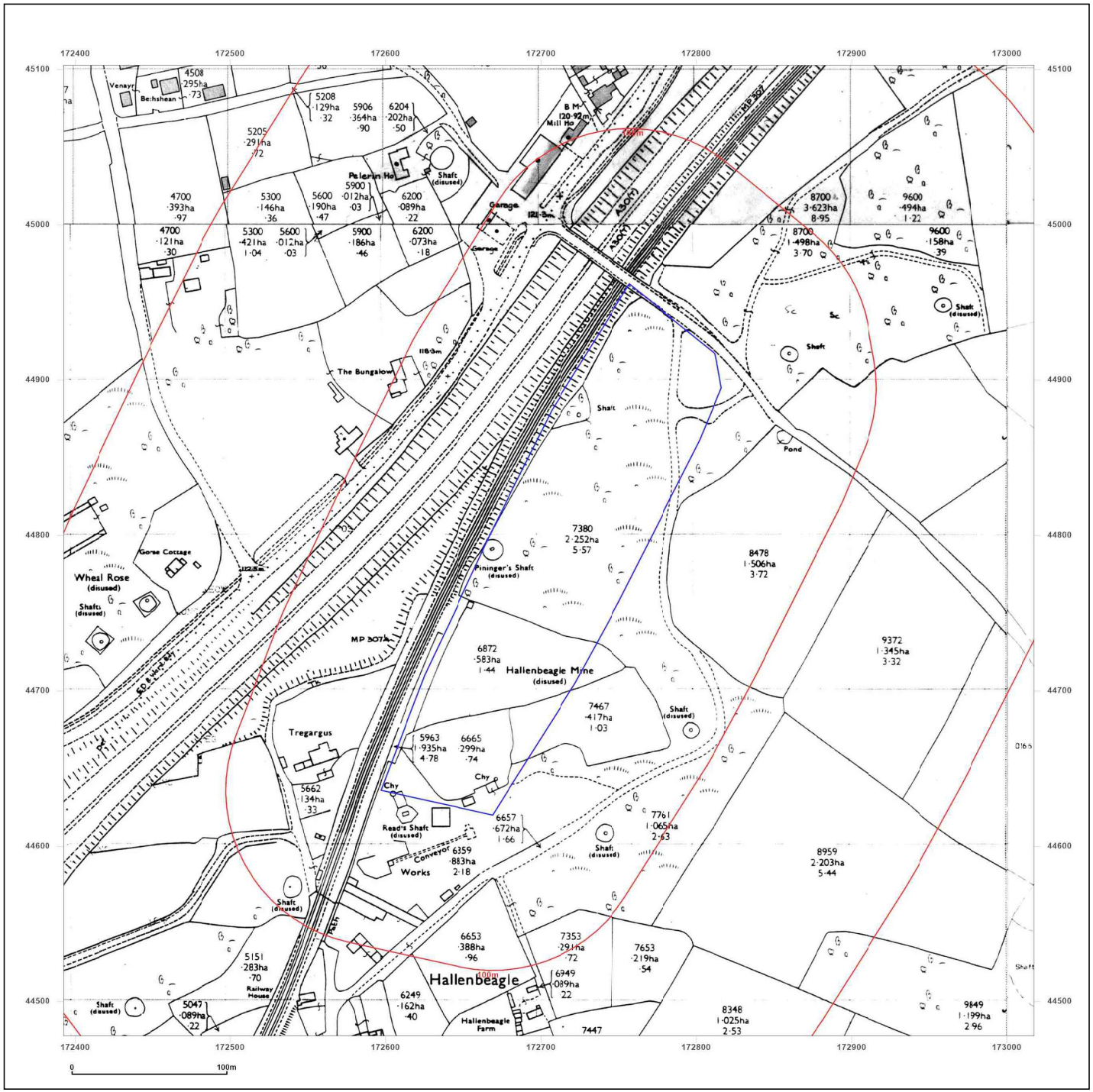

Groundsure INSIGHTS

Site Details:

SCIENTIFIC SERVICES LTD, MITCHELL & WEBBER FUEL DEPOT, ROAD FROM JUNCTION AT VENAYR TO JUNCTION AT MITCHELL AND WEBBER FUEL DEPOT, GOONEARL, SCORRIER, TR16 5UT

Client Ref: P02124976
Report Ref: GS-8716439_2500
Grid Ref: 172705, 44790

Map Name: National Grid
Map date: 1989-1994
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1972
Revised 1989
Edition N/A
Copyright 1989
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Revised 1989
Edition N/A
Copyright 1989
Levelled 1972

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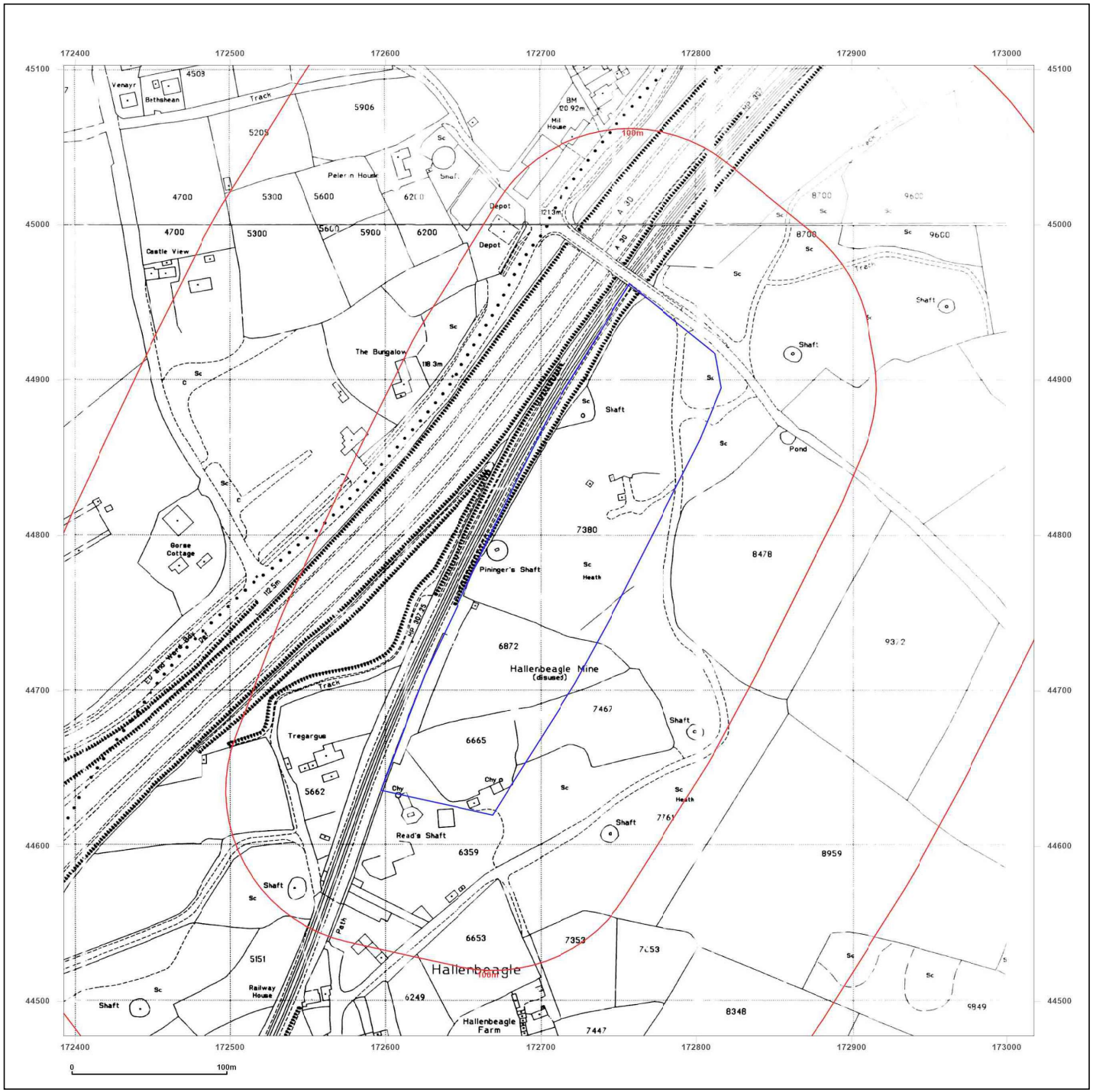

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Site Details:

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Client Ref: P02124976
Report Ref: GS-8716439_2500
Grid Ref: 172705, 44790

Map Name: National Grid
Map date: 1994-1995
Scale: 1:2,500
Printed at: 1:2,500

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Edition N/A
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Edition N/A
Copyright 1995
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Client Ref: P02124976
Report Ref: GS-8716439_Landline_1_1
Grid Ref: 172706, 44641

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

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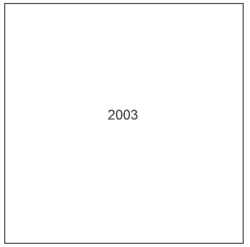

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Site Details:

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Client Ref: P02124976
Report Ref: GS-8716439_Landline_1_2
Grid Ref: 172706, 44941

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

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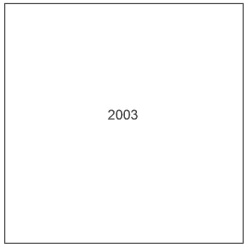

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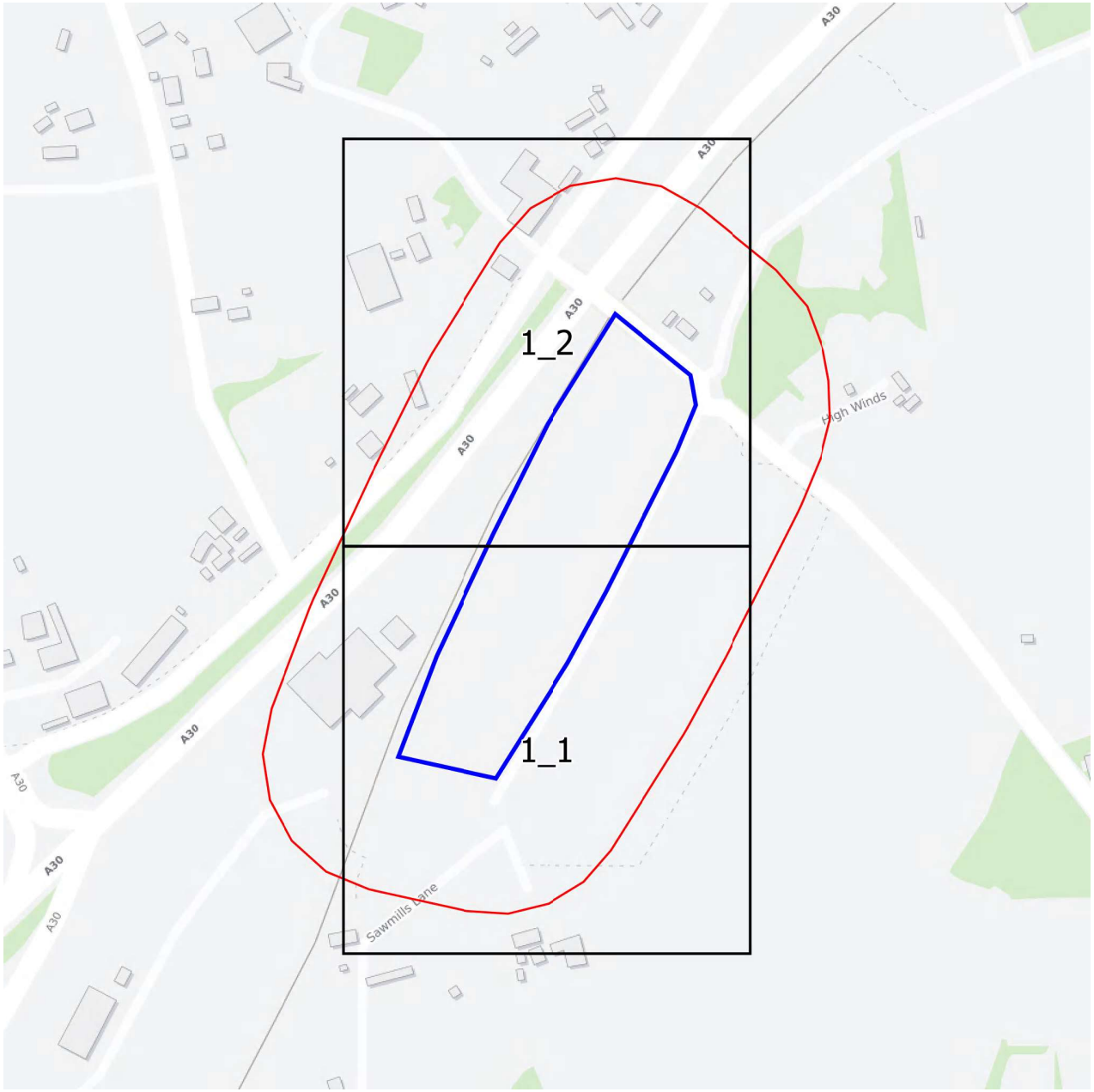
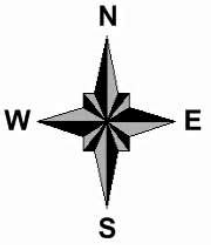
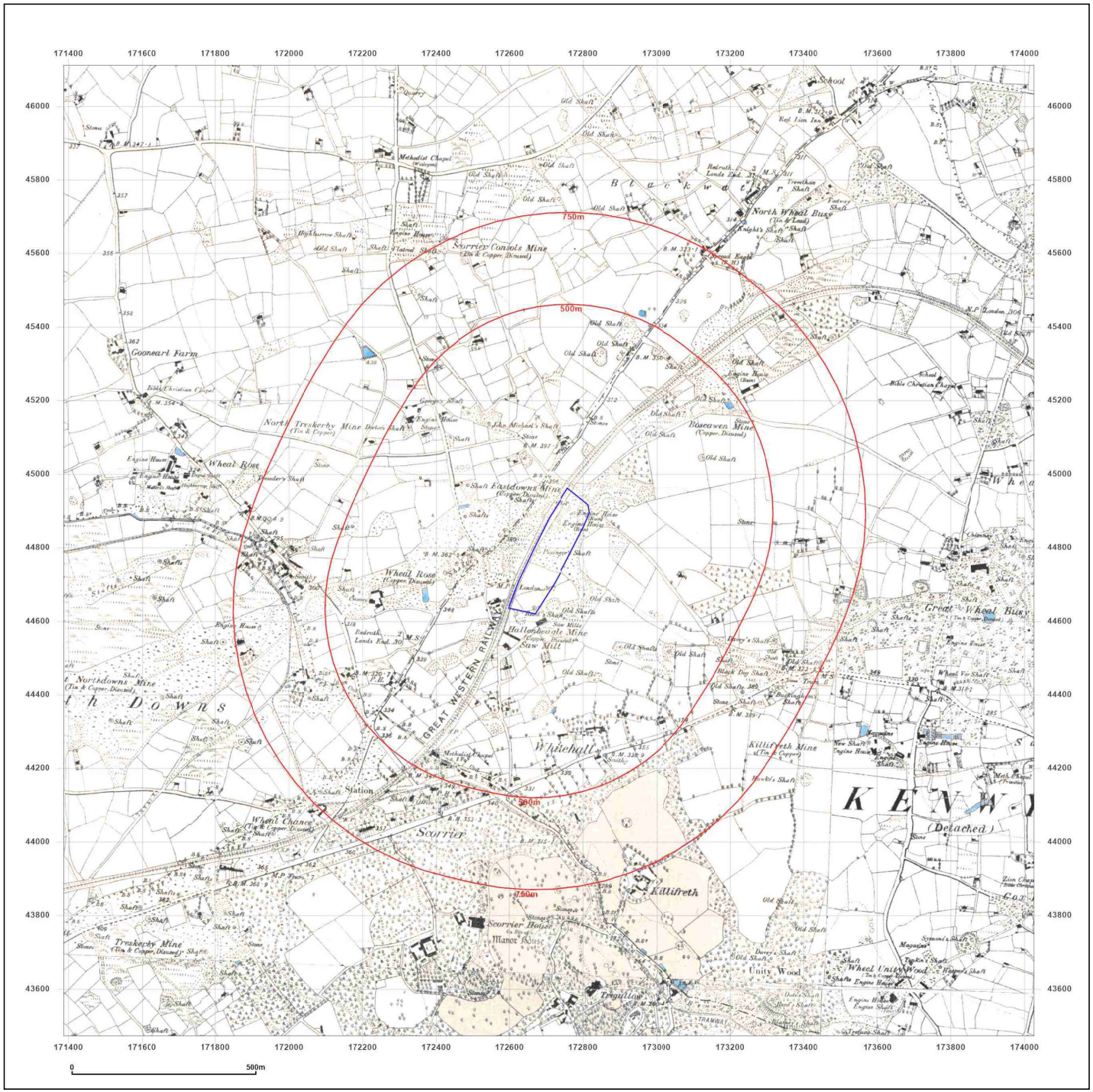


Groundsure INSIGHTS

Landline Scale Grid Index





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Site Details:

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Client Ref: P02124976
Report Ref: GS-8716439
Grid Ref: 172706, 44791

Map Name: County Series
Map date: **1888**
Scale: 1:10,560
Printed at: 1:10,560

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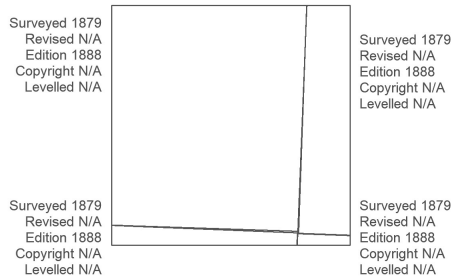

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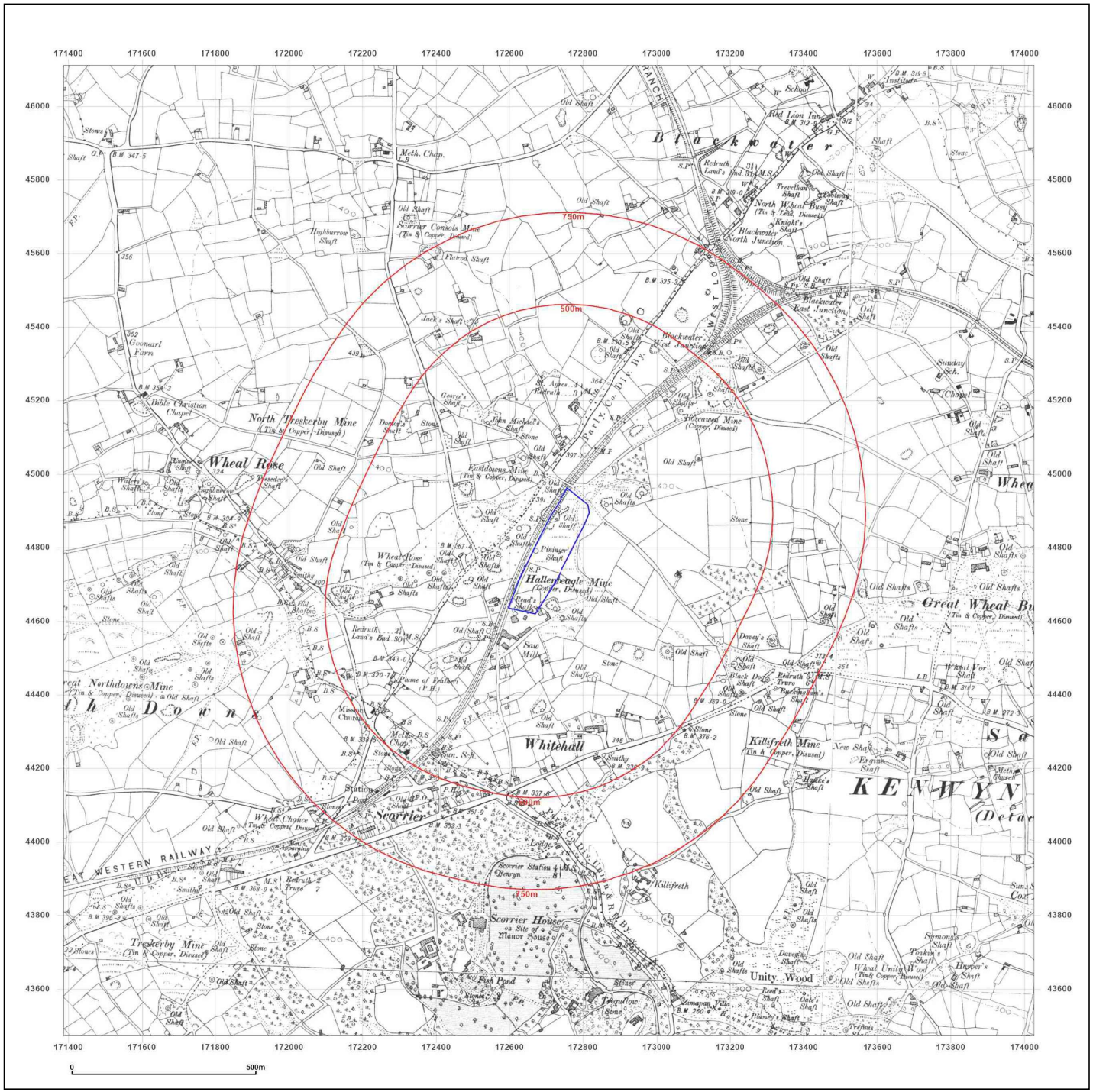

Groundsure INSIGHTS

Site Details:

SCIENTIFIC SERVICES LTD, MITCHELL & WEBBER FUEL DEPOT, ROAD FROM JUNCTION AT VENAYR TO JUNCTION AT MITCHELL AND WEBBER FUEL DEPOT, GOONEARL, SCORRIER, TR16 5UT

Client Ref: P02124976
Report Ref: GS-8716439
Grid Ref: 172706, 44791

Map Name: County Series
Map date: 1906-1908
Scale: 1:10,560
Printed at: 1:10,560

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Surveyed 1878
Revised 1908
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1878
Revised 1908
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1906
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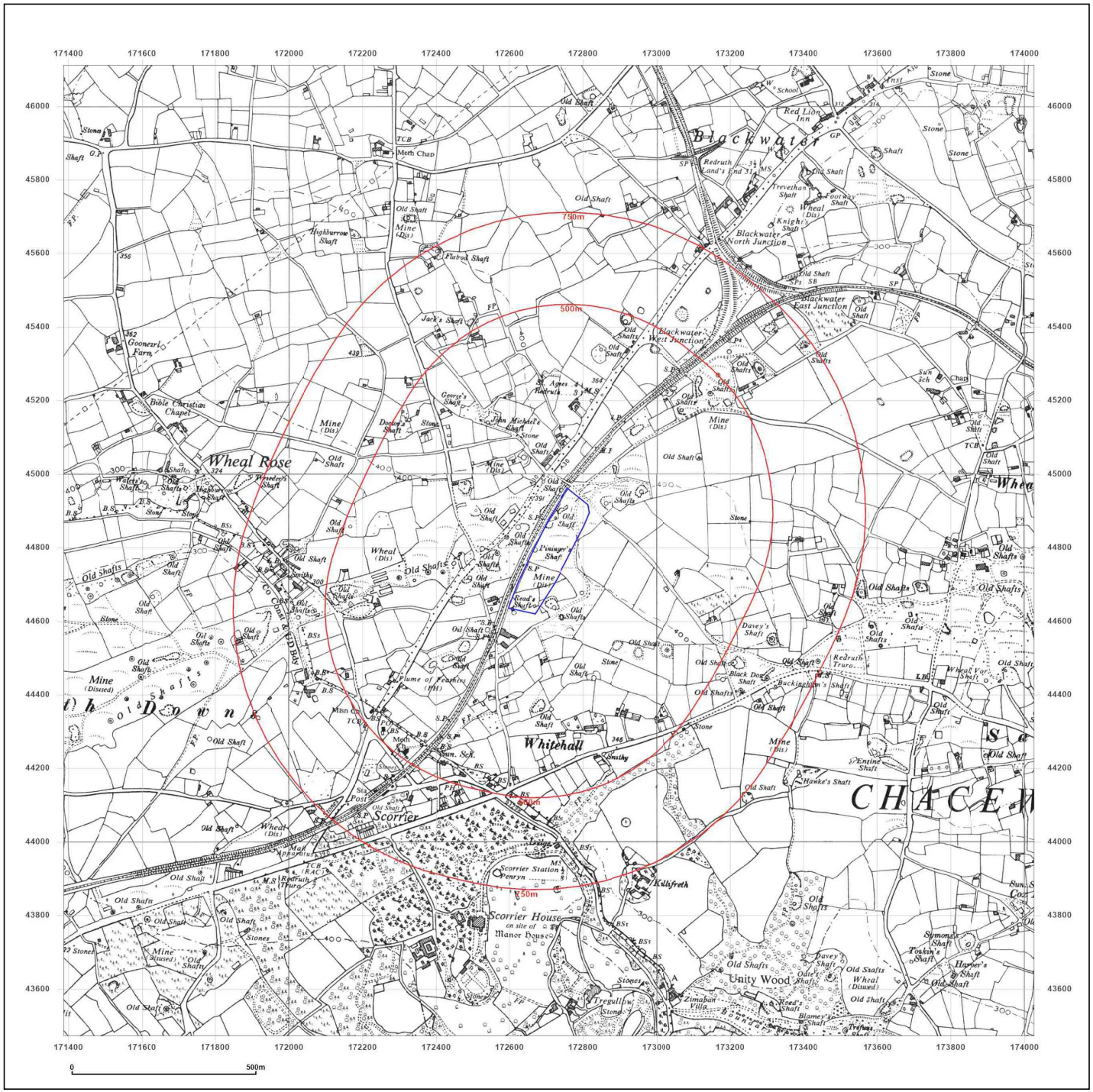

Groundsure INSIGHTS

Site Details:

SCIENTIFIC SERVICES LTD, MITCHELL & WEBBER FUEL DEPOT, ROAD FROM JUNCTION AT VENAYR TO JUNCTION AT MITCHELL AND WEBBER FUEL DEPOT, GOONEARL, SCORRIER, TR16 5UT

Client Ref: P02124976
Report Ref: GS-8716439
Grid Ref: 172706, 44791

Map Name: Provisional
Map date: **1958**
Scale: 1:10,560
Printed at: 1:10,560

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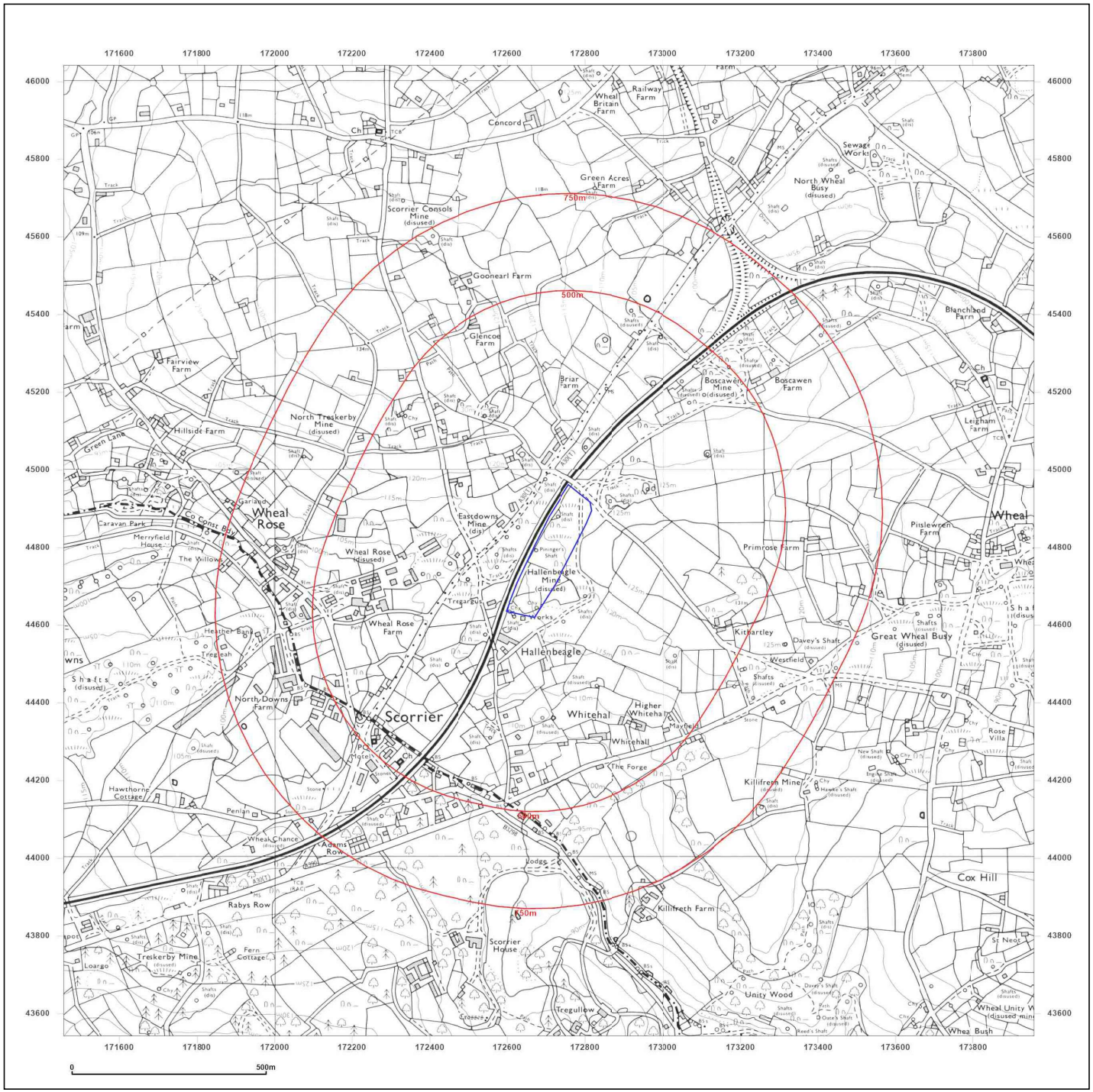

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Site Details:

SCIENTIFIC SERVICES LTD, MITCHELL & WEBBER FUEL DEPOT, ROAD FROM JUNCTION AT VENAYR TO JUNCTION AT MITCHELL AND WEBBER FUEL DEPOT, GOONEARL, SCORRIER, TR16 5UT

Client Ref: P02124976
Report Ref: GS-8716439
Grid Ref: 172706, 44791

Map Name: National Grid
Map date: **1974-1975**
Scale: 1:10,000
Printed at: 1:10,000

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Revised 1974
Edition N/A
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Surveyed 1973
Revised 1974
Edition N/A
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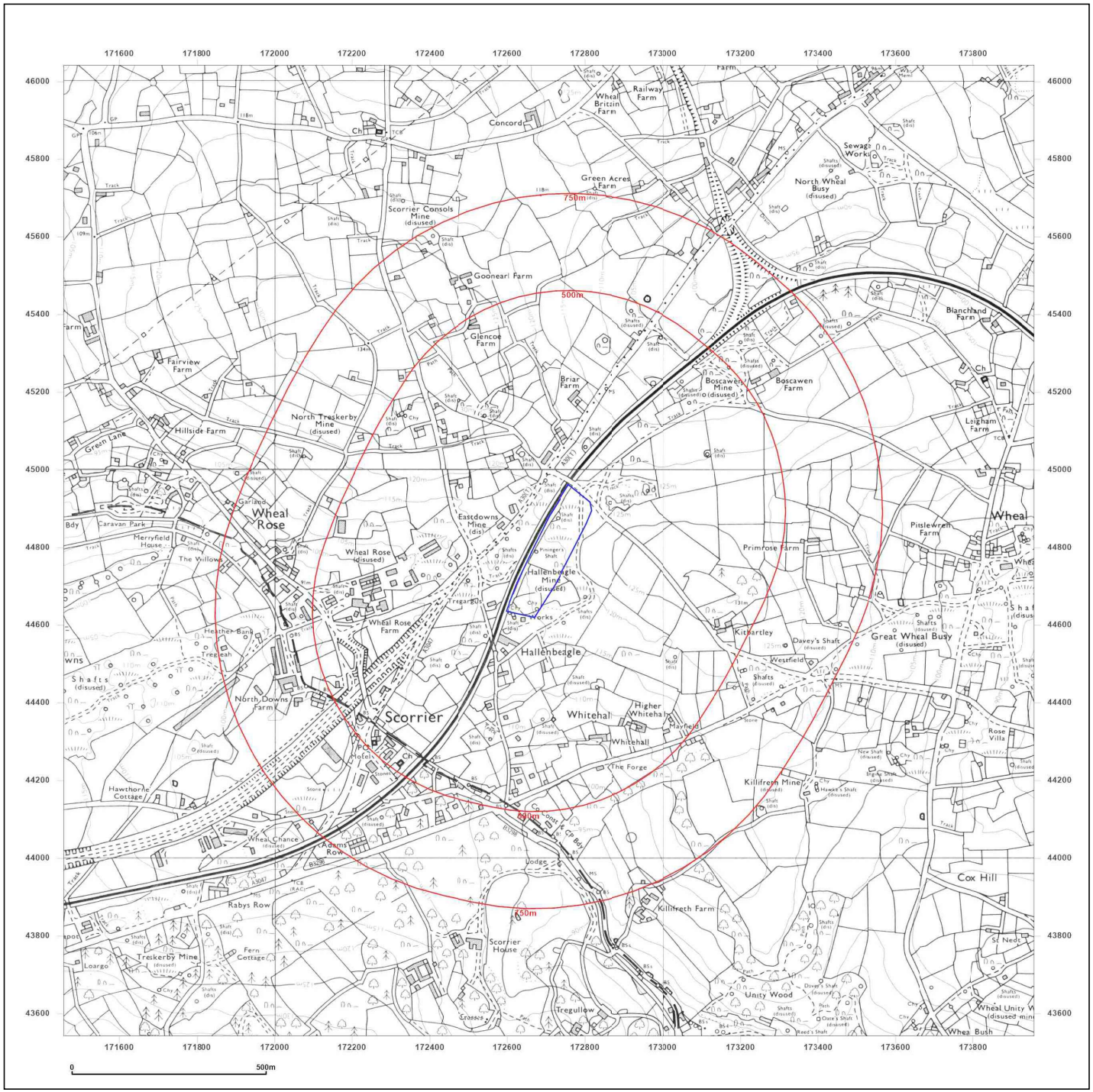

Groundsure INSIGHTS

Site Details:

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Client Ref: P02124976
Report Ref: GS-8716439
Grid Ref: 172706, 44791

Map Name: National Grid
Map date: **1980**
Scale: 1:10,000
Printed at: 1:10,000

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Revised 1980
Edition N/A
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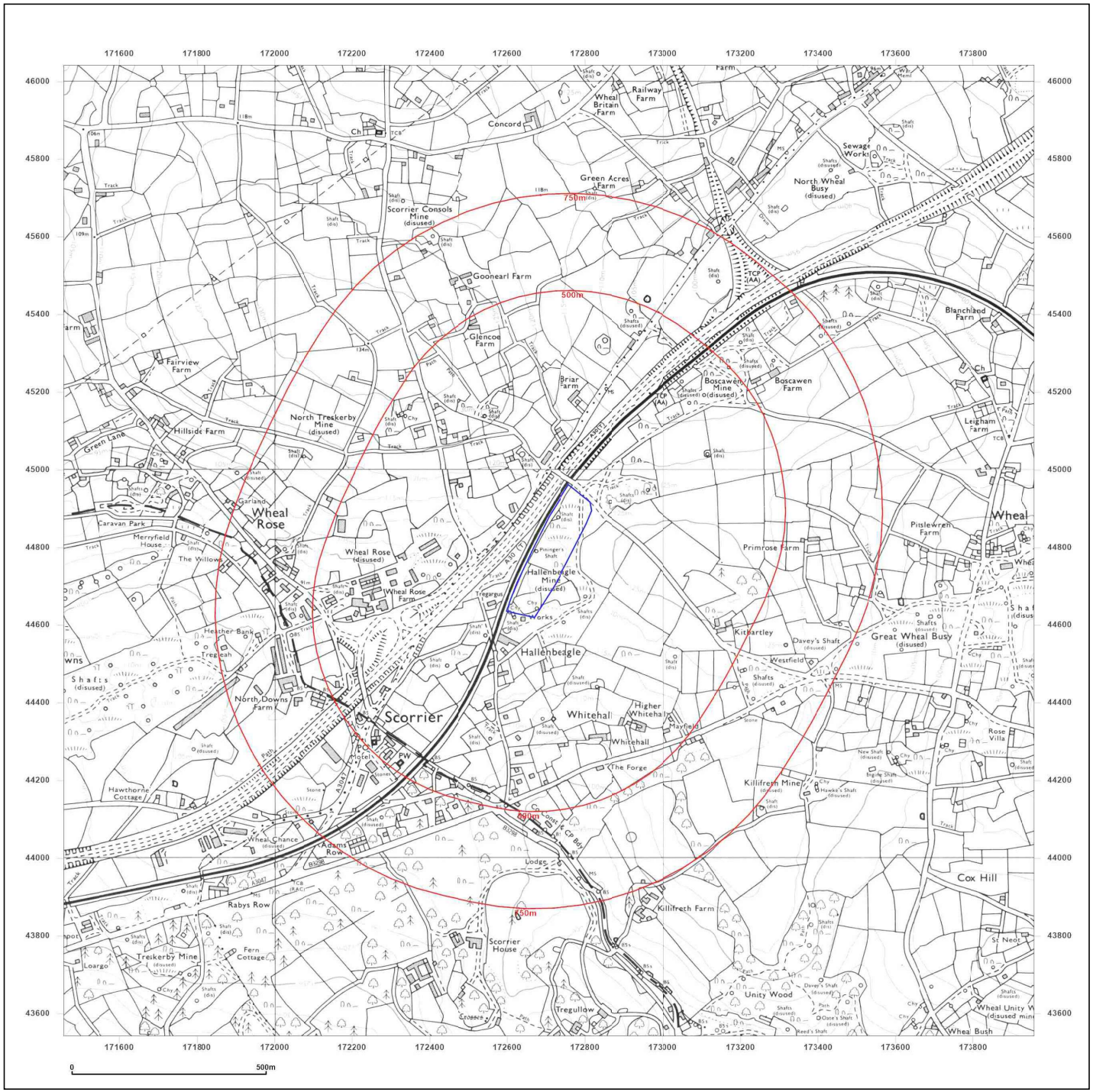

Groundsure INSIGHTS

Site Details:

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Client Ref: P02124976
Report Ref: GS-8716439
Grid Ref: 172706, 44791

Map Name: National Grid
Map date: **1988-1992**
Scale: 1:10,000
Printed at: 1:10,000

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Surveyed 1972
Revised 1988
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1973
Revised 1992
Edition N/A
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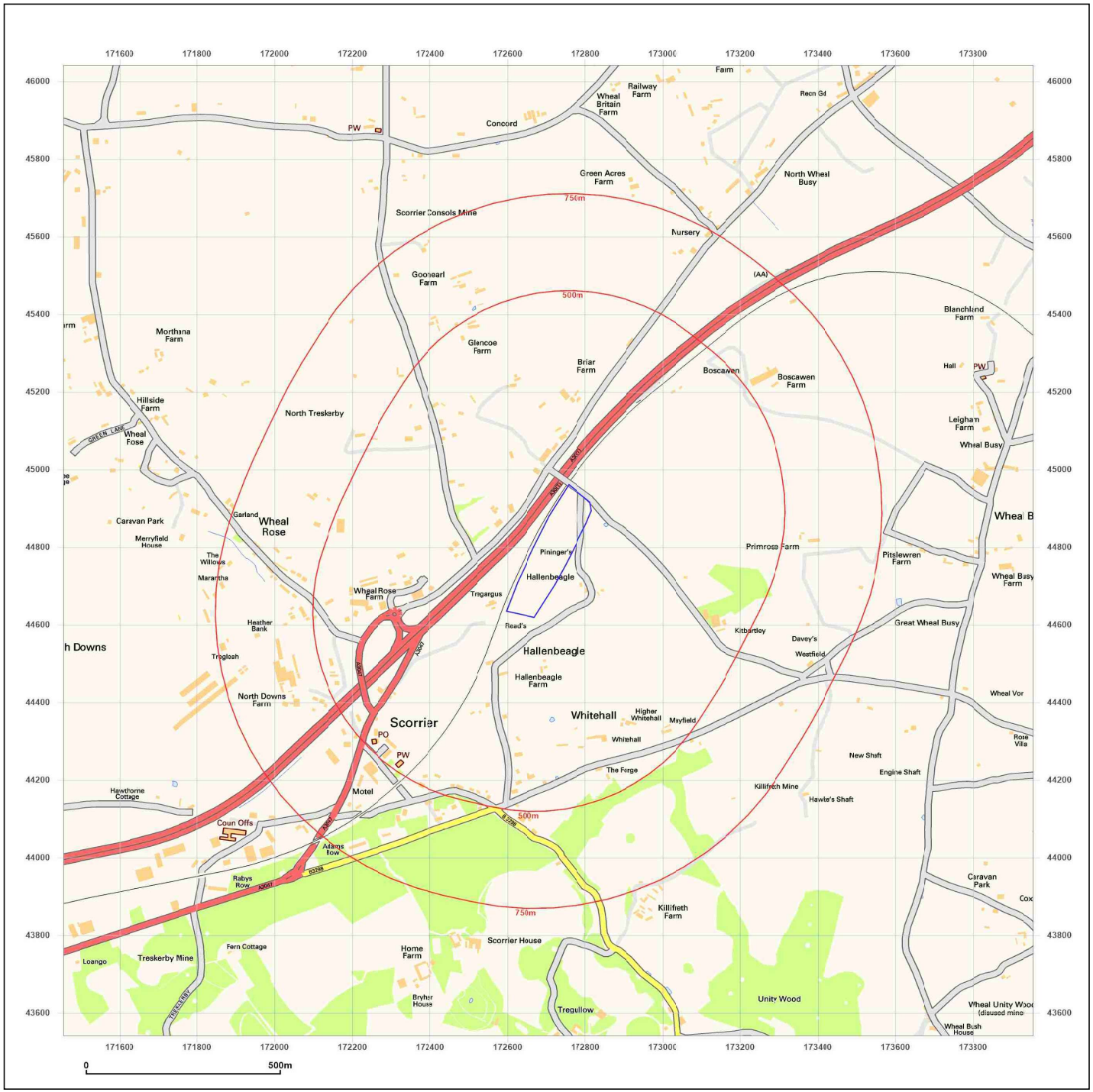

Groundsure INSIGHTS

Site Details:

SCIENTIFIC SERVICES LTD, MITCHELL & WEBBER FUEL DEPOT, ROAD FROM JUNCTION AT VENAYR TO JUNCTION AT MITCHELL AND WEBBER FUEL DEPOT, GOONEARL, SCORRIER, TR16 5UT

Client Ref: P02124976
Report Ref: GS-8716439
Grid Ref: 172706, 44791

Map Name: National Grid
Map date: 2001
Scale: 1:10,000
Printed at: 1:10,000

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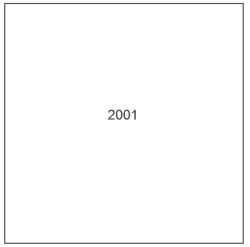

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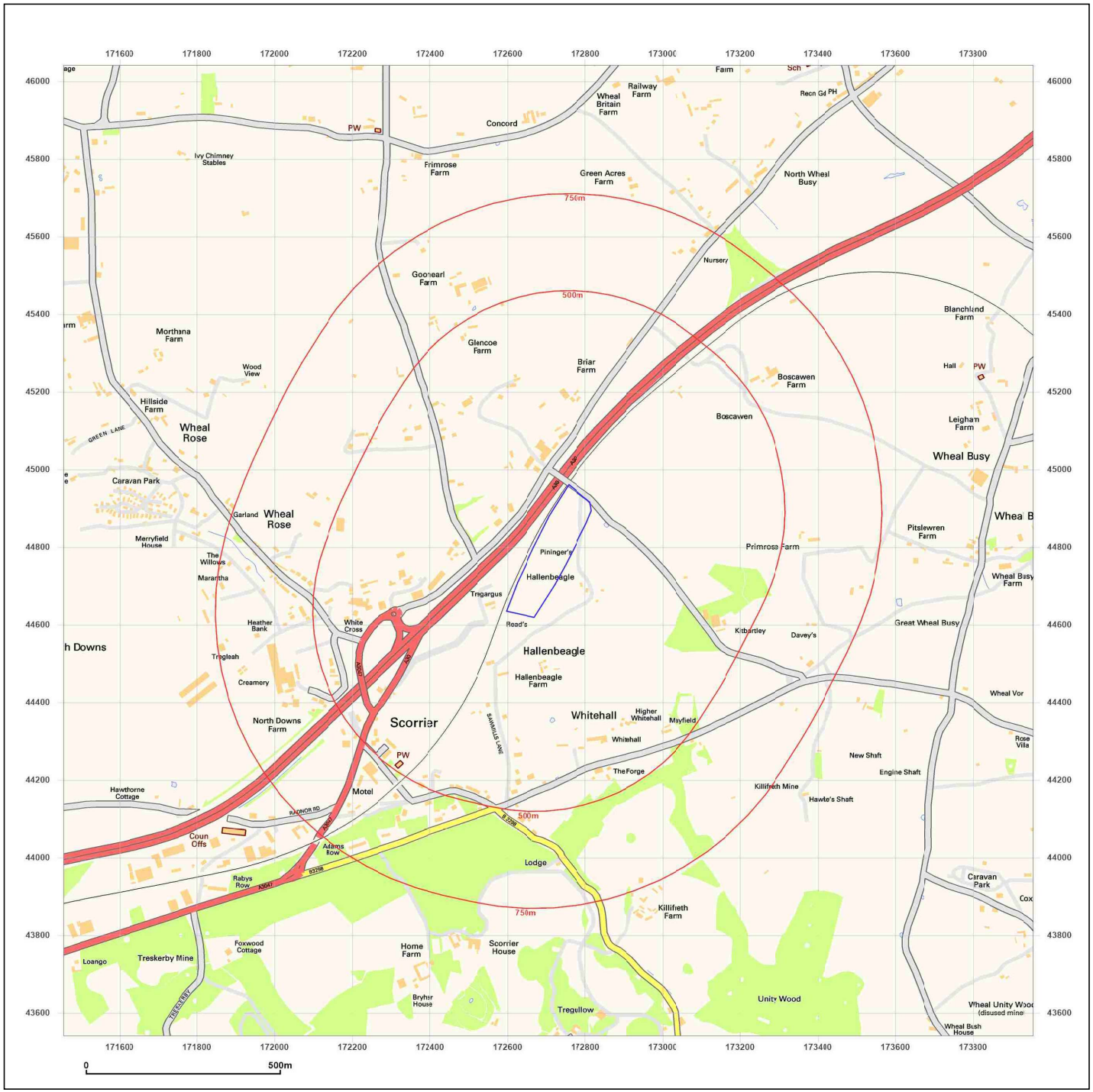

Groundsure INSIGHTS

Site Details:

SCIENTIFIC SERVICES LTD, MITCHELL & WEBBER FUEL DEPOT, ROAD FROM JUNCTION AT VENAYR TO JUNCTION AT MITCHELL AND WEBBER FUEL DEPOT, GOONEARL, SCORRIER, TR16 5UT

Client Ref: P02124976
Report Ref: GS-8716439
Grid Ref: 172706, 44791

Map Name: National Grid
Map date: 2010
Scale: 1:10,000
Printed at: 1:10,000

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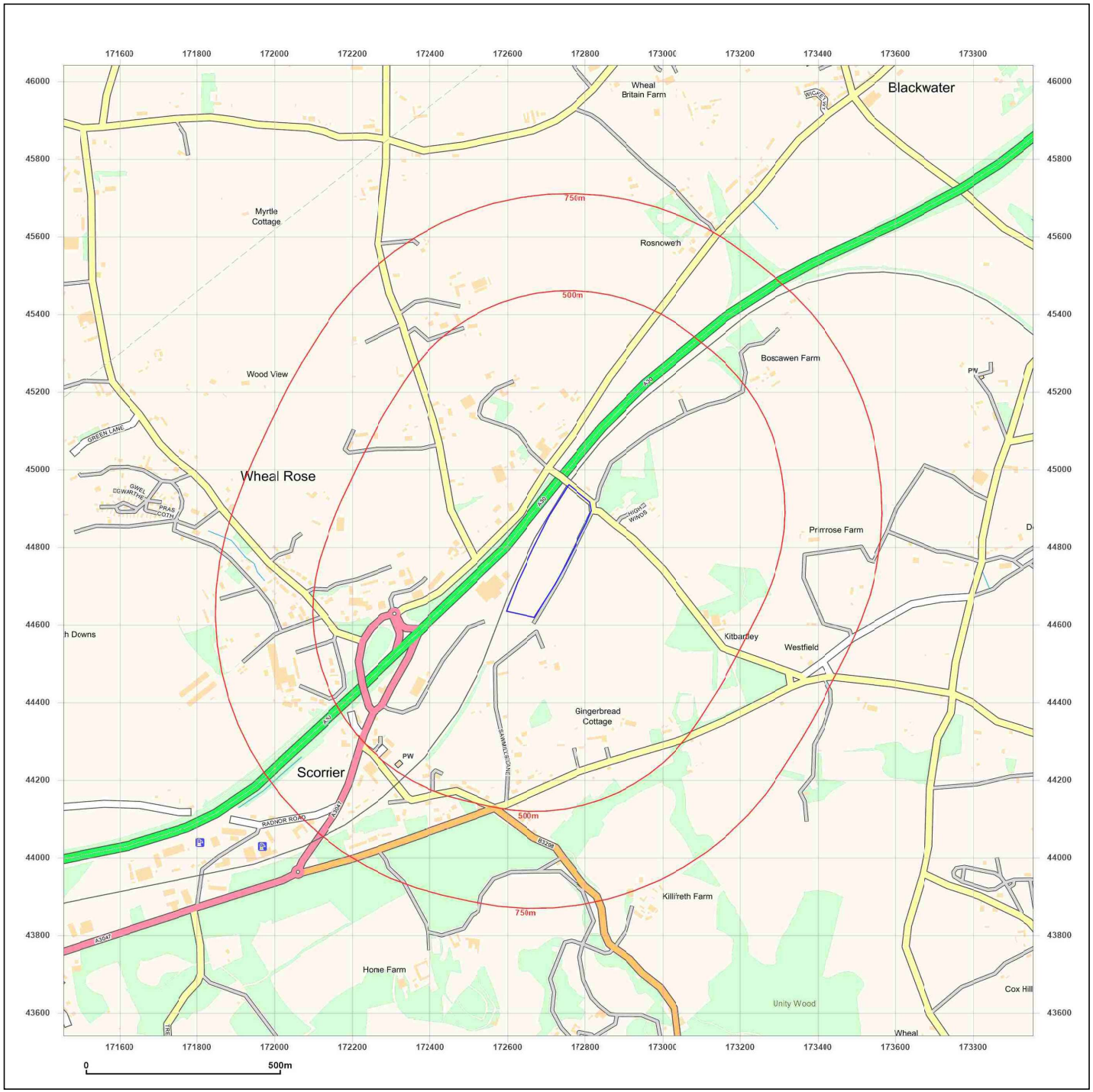

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Site Details:

SCIENTIFIC SERVICES LTD, MITCHELL & WEBBER FUEL DEPOT, ROAD FROM JUNCTION AT VENAYR TO JUNCTION AT MITCHELL AND WEBBER FUEL DEPOT, GOONEARL, SCORRIER, TR16 5UT

Client Ref: P02124976
Report Ref: GS-8716439
Grid Ref: 172706, 44791

Map Name: National Grid
Map date: 2022
Scale: 1:10,000
Printed at: 1:10,000

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Enviro+Geo Insight

SCIENTIFIC SERVICES LTD, MITCHELL & WEBBER FUEL DEPOT, ROAD FROM JUNCTION AT VENAYR TO JUNCTION AT MITCHELL AND WEBBER FUEL DEPOT, GOONEARL, SCORRIER, TR16 5UT

Order Details

Date: 04/05/2022

Your ref: P02124976

Our Ref: GS-8716440

Client: Stacey Brown

Site Details

Location: 172714 044783

Area: 3.04 ha

Authority: Cornwall Council (Unitary)

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

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
14	1.1	Historical industrial land uses	25	25	107	127	-
25	1.2	Historical tanks	0	0	0	0	-
25	1.3	Historical energy features	0	0	0	0	-
25	1.4	Historical petrol stations	0	0	0	0	-
26	1.5	Historical garages	0	0	2	0	-
26	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
27	2.1	Historical industrial land uses	40	37	148	171	-
42	2.2	Historical tanks	0	0	0	0	-
42	2.3	Historical energy features	0	0	0	0	-
42	2.4	Historical petrol stations	0	0	0	0	-
42	2.5	Historical garages	0	0	4	0	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
44	3.1	Active or recent landfill	0	0	0	0	-
44	3.2	Historical landfill (BGS records)	0	0	0	0	-
45	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
45	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
45	3.5	Historical waste sites	1	0	1	0	-
46	3.6	Licensed waste sites	0	2	0	0	-
47	3.7	Waste exemptions	0	1	8	13	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
50	4.1	Recent industrial land uses	1	3	8	-	-
51	4.2	Current or recent petrol stations	0	0	0	0	-
51	4.3	Electricity cables	0	0	0	0	-
52	4.4	Gas pipelines	0	0	0	0	-
52	4.5	Sites determined as Contaminated Land	0	0	0	0	-

52	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
52	4.7	Regulated explosive sites	0	0	0	0	-
52	**4.8**	**Hazardous substance storage/usage**	0	1	0	0	-
53	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
53	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
53	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
53	4.12	Radioactive Substance Authorisations	0	0	0	0	-
54	**4.13**	**Licensed Discharges to controlled waters**	0	1	10	5	-
56	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
56	4.15	Pollutant release to public sewer	0	0	0	0	-
57	4.16	List 1 Dangerous Substances	0	0	0	0	-
57	4.17	List 2 Dangerous Substances	0	0	0	0	-
57	**4.18**	**Pollution Incidents (EA/NRW)**	0	0	1	0	-
57	4.19	Pollution inventory substances	0	0	0	0	-
58	4.20	Pollution inventory waste transfers	0	0	0	0	-
58	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
59	5.1	Superficial aquifer	None (within 500m)				
60	**5.2**	**Bedrock aquifer**	Identified (within 500m)				
62	**5.3**	**Groundwater vulnerability**	Identified (within 50m)				
63	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
63	5.5	Groundwater vulnerability- local information	None (within 0m)				
64	**5.6**	**Groundwater abstractions**	0	0	0	0	12
67	5.7	Surface water abstractions	0	0	0	0	0
68	5.8	Potable abstractions	0	0	0	0	0
68	5.9	Source Protection Zones	0	0	0	0	-
68	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
69	6.1	Water Network (OS MasterMap)	0	0	0	-	-

69	6.2	Surface water features	0	0	0	-	-
70	6.3	WFD Surface water body catchments	1	-	-	-	-
70	6.4	WFD Surface water bodies	0	0	0	-	-
71	6.5	WFD Groundwater bodies	2	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
72	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
72	7.2	Historical Flood Events	0	0	0	-	-
72	7.3	Flood Defences	0	0	0	-	-
73	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
73	7.5	Flood Storage Areas	0	0	0	-	-
74	7.6	Flood Zone 2	None (within 50m)				
74	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
75	8.1	Surface water flooding	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding					
77	9.1	Groundwater flooding	Negligible (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
78	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	3
79	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
79	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
79	10.4	Special Protection Areas (SPA)	0	0	0	0	0
79	10.5	National Nature Reserves (NNR)	0	0	0	0	0
80	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
80	10.7	Designated Ancient Woodland	0	0	0	0	1
80	10.8	Biosphere Reserves	0	0	0	0	0
80	10.9	Forest Parks	0	0	0	0	0
81	10.10	Marine Conservation Zones	0	0	0	0	0
81	10.11	Green Belt	0	0	0	0	0
81	10.12	Proposed Ramsar sites	0	0	0	0	0

81	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
81	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
82	10.15	Nitrate Sensitive Areas	0	0	0	0	0
82	**10.16**	**Nitrate Vulnerable Zones**	0	1	0	0	5
83	**10.17**	**SSSI Impact Risk Zones**	4	-	-	-	-
86	**10.18**	**SSSI Units**	0	0	0	0	3
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
88	**11.1**	**World Heritage Sites**	1	0	0	-	-
89	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
89	11.3	National Parks	0	0	0	-	-
89	**11.4**	**Listed Buildings**	1	1	0	-	-
90	11.5	Conservation Areas	0	0	0	-	-
90	11.6	Scheduled Ancient Monuments	0	0	0	-	-
90	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
91	**12.1**	**Agricultural Land Classification**	Grade 3b (within 250m)				
92	**12.2**	**Open Access Land**	0	2	2	-	-
93	12.3	Tree Felling Licences	0	0	0	-	-
93	**12.4**	**Environmental Stewardship Schemes**	0	0	1	-	-
93	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
94	**13.1**	**Priority Habitat Inventory**	1	1	3	-	-
95	**13.2**	**Habitat Networks**	2	1	4	-	-
95	13.3	Open Mosaic Habitat	0	0	0	-	-
96	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
97	**14.1**	**10k Availability**	Identified (within 500m)				
98	14.2	Artificial and made ground (10k)	0	0	0	0	-
99	14.3	Superficial geology (10k)	0	0	0	0	-

99	14.4	Landslip (10k)	0	0	0	0	-
100	**14.5**	**Bedrock geology (10k)**	0	1	0	0	-
101	**14.6**	**Bedrock faults and other linear features (10k)**	0	0	1	1	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
102	**15.1**	**50k Availability**	Identified (within 500m)				
103	15.2	Artificial and made ground (50k)	0	0	0	0	-
103	15.3	Artificial ground permeability (50k)	0	0	-	-	-
104	15.4	Superficial geology (50k)	0	0	0	0	-
104	15.5	Superficial permeability (50k)	None (within 50m)				
104	15.6	Landslip (50k)	0	0	0	0	-
104	15.7	Landslip permeability (50k)	None (within 50m)				
105	**15.8**	**Bedrock geology (50k)**	2	0	0	0	-
106	**15.9**	**Bedrock permeability (50k)**	Identified (within 50m)				
106	**15.10**	**Bedrock faults and other linear features (50k)**	2	0	5	4	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
107	**16.1**	**BGS Boreholes**	0	2	3	-	-
Page	Section	Natural ground subsidence					
109	**17.1**	**Shrink swell clays**	Negligible (within 50m)				
110	**17.2**	**Running sands**	Negligible (within 50m)				
112	**17.3**	**Compressible deposits**	Negligible (within 50m)				
113	**17.4**	**Collapsible deposits**	Very low (within 50m)				
114	**17.5**	**Landslides**	Very low (within 50m)				
116	**17.6**	**Ground dissolution of soluble rocks**	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
118	18.1	Natural cavities	0	0	0	0	-
119	18.2	BritPits	0	0	0	0	-
119	**18.3**	**Surface ground workings**	9	22	53	-	-
122	**18.4**	**Underground workings**	14	15	93	110	333
143	18.5	Historical Mineral Planning Areas	0	0	0	0	-

143	**18.6**	**Non-coal mining**	1	2	3	5	8
145	**18.7**	**Mining cavities**	0	1	2	2	18
147	18.8	JPB mining areas	None (within 0m)				
147	18.9	Coal mining	None (within 0m)				
148	18.10	Brine areas	None (within 0m)				
148	18.11	Gypsum areas	None (within 0m)				
148	**18.12**	**Tin mining**	Identified (within 0m)				
148	18.13	Clay mining	None (within 0m)				

Page	Section	Radon					
149	**19.1**	**Radon**	Greater than 30% (within 0m)				

Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
151	**20.1**	**BGS Estimated Background Soil Chemistry**	2	2	-	-	-
151	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
152	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-

Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
153	21.1	Underground railways (London)	0	0	0	-	-
153	21.2	Underground railways (Non-London)	0	0	0	-	-
154	21.3	Railway tunnels	0	0	0	-	-
154	**21.4**	**Historical railway and tunnel features**	2	1	3	-	-
154	21.5	Royal Mail tunnels	0	0	0	-	-
155	21.6	Historical railways	0	0	0	-	-
155	**21.7**	**Railways**	0	5	1	-	-
155	21.8	Crossrail 1	0	0	0	0	-
155	21.9	Crossrail 2	0	0	0	0	-
156	21.10	HS2	0	0	0	0	-

Recent aerial photograph

Capture Date: 22/06/2019

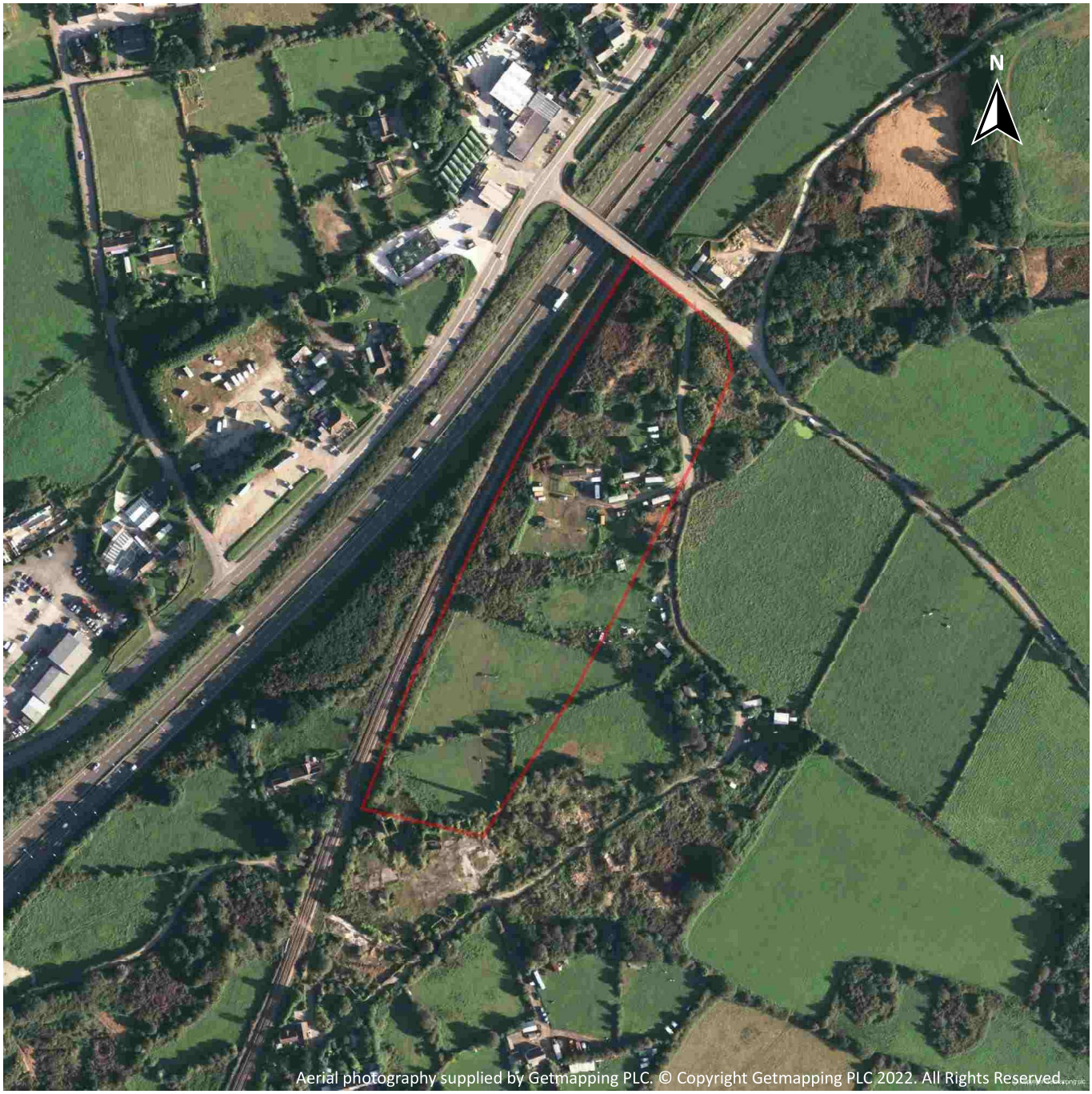
Site Area: 3.04ha

Recent site history - 2016 aerial photograph

Capture Date: 15/08/2016

Site Area: 3.04ha

Recent site history - 2009 aerial photograph



Capture Date: 10/09/2009

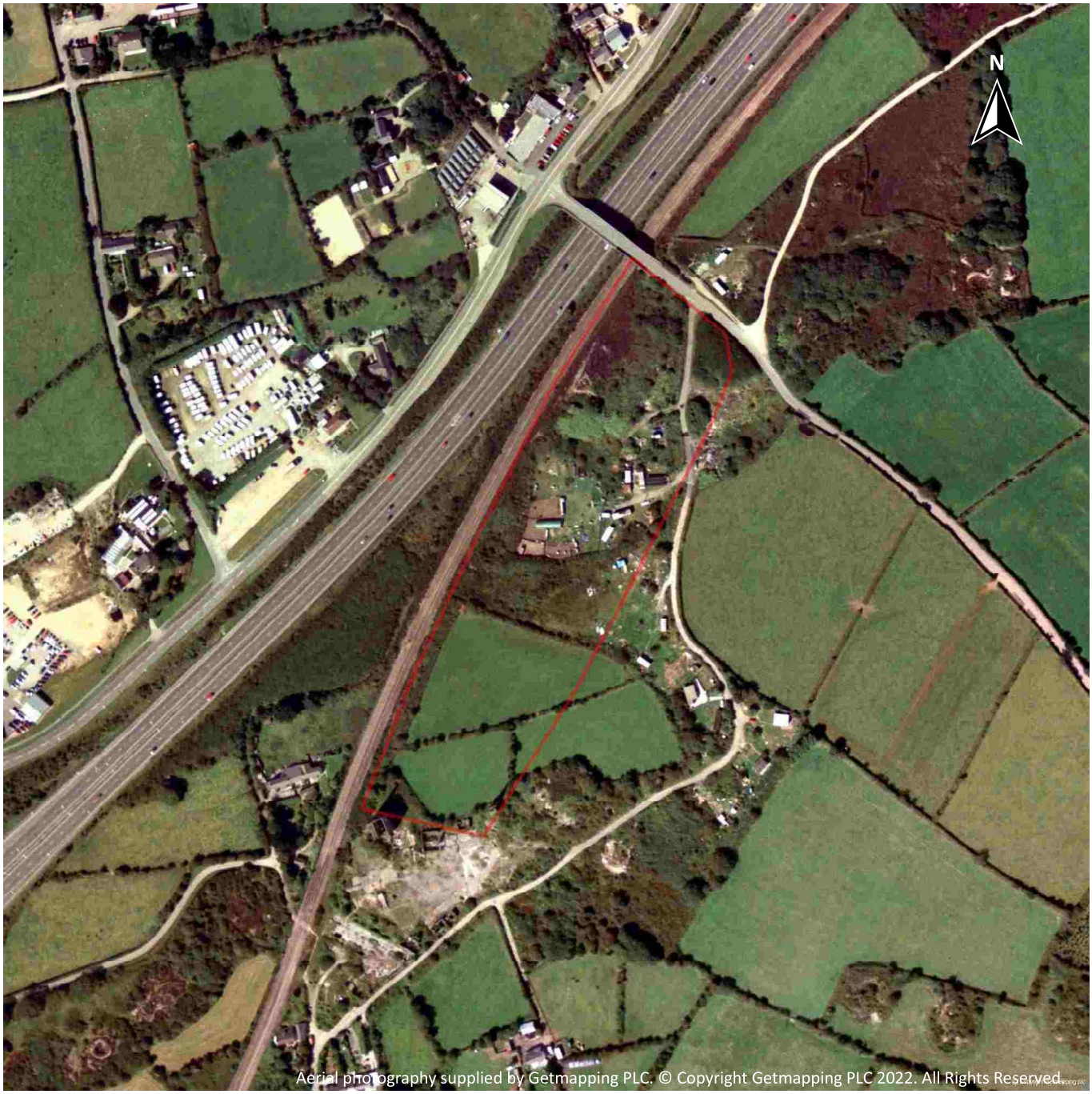
Site Area: 3.04ha

Recent site history - 2005 aerial photograph

Capture Date: 09/06/2005

Site Area: 3.04ha

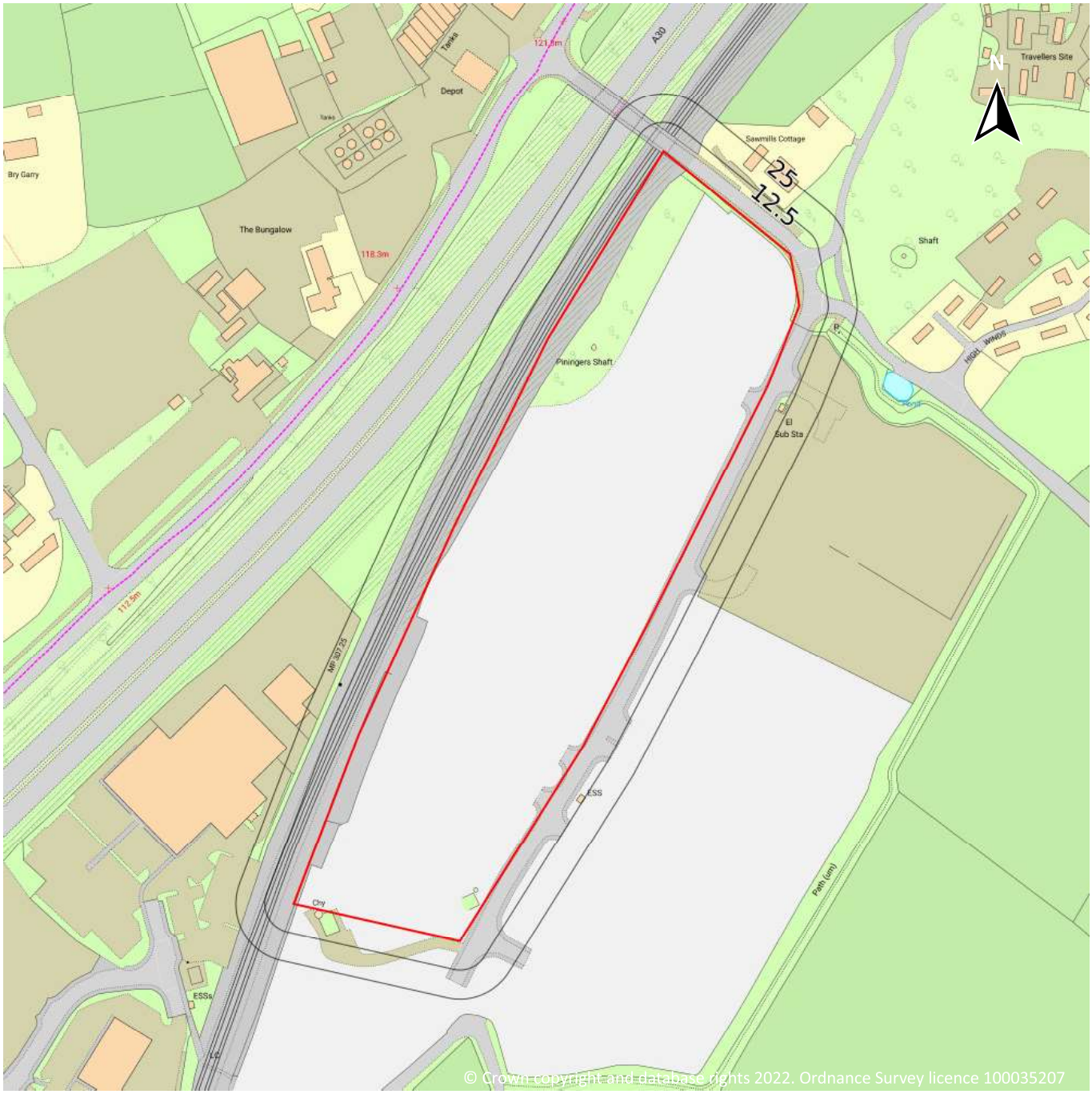
Recent site history - 1999 aerial photograph



Capture Date: 02/09/1999

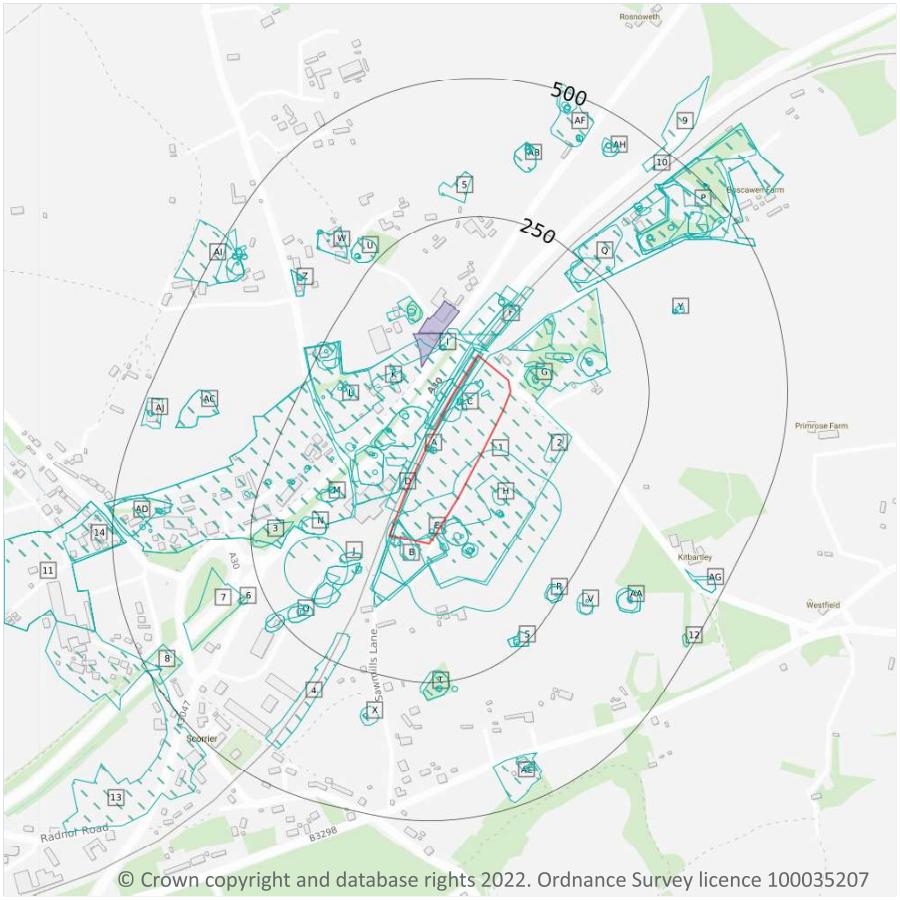
Site Area: 3.04ha

OS MasterMap site plan



Site Area: 3.04ha

1 Past land use



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical garages

1.1 Historical industrial land uses

Records within 500m	284

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

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

ID	Location	Land use	Dates present	Group ID
1	**On site**	**Disused Copper Mine**	**1879**	**29894**

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Unspecified Old Shafts**	**1958**	**24102**
A	**On site**	**Unspecified Shaft**	**1879**	**42309**
A	**On site**	**Unspecified Disused Shaft**	**1974 - 1992**	**54918**
A	**On site**	**Unspecified Shaft**	**1908**	**56671**
B	**On site**	**Sawmills**	**1879**	**56618**
B	**On site**	**Unspecified Heap**	**1879**	**36167**
B	**On site**	**Chimney**	**1974 - 1992**	**42533**
B	**On site**	**Sawmills**	**1908**	**46167**
B	**On site**	**Unspecified Shaft**	**1908 - 1958**	**47296**
B	**On site**	**Unspecified Works**	**1974 - 1992**	**49371**
C	**On site**	**Engine House**	**1879**	**31258**
C	**On site**	**Engine House**	**1879**	**31259**
C	**On site**	**Unspecified Heap**	**1879**	**36019**
C	**On site**	**Refuse Heap**	**1908 - 1958**	**40125**
C	**On site**	**Refuse Heap**	**1908 - 1958**	**41912**
C	**On site**	**Cuttings**	**1879**	**44529**
C	**On site**	**Unspecified Disused Shaft**	**1974 - 1992**	**44779**
C	**On site**	**Unspecified Old Shaft**	**1908 - 1958**	**47492**
C	**On site**	**Cuttings**	**1908**	**58311**
C	**On site**	**Cuttings**	**1958**	**58684**
D	**On site**	**Railway Sidings**	**1958**	**36728**
E	**On site**	**Chimney**	**1974 - 1992**	**43617**
E	**On site**	**Unspecified Disused Mine**	**1958**	**44866**
E	**On site**	**Unspecified Disused Mine**	**1974 - 1992**	**50819**
E	3m SE	Refuse Heap	1908 - 1958	43505
E	6m SE	Unspecified Heap	1879	36166
B	8m S	Unspecified Disused Shaft	1974 - 1992	44199
D	8m NW	Disused Copper Mine	1879	42035

ID	Location	Land use	Dates present	Group ID
D	12m N	Disused Copper Mine	1908	59702
C	13m NW	Unspecified Heap	1879	36020
C	13m NW	Refuse Heap	1908 - 1958	53321
F	16m NE	Cuttings	1879	41298
E	18m SE	Unspecified Shaft	1879	26506
D	21m NW	Unspecified Heap	1879	36021
D	21m NW	Refuse Heap	1908 - 1958	45089
F	22m NE	Cuttings	1908	40620
D	23m NW	Unspecified Pit	1879	33999
E	28m SE	Unspecified Old Shafts	1908 - 1958	42840
G	29m E	Refuse Heap	1908 - 1958	48305
G	32m E	Unspecified Heap	1879	36015
F	37m N	Cuttings	1988	57000
G	38m NE	Unspecified Heap	1879	36018
E	39m SE	Unspecified Old Shafts	1879	50574
G	43m E	Unspecified Old Shafts	1908 - 1958	45315
G	44m NE	Refuse Heaps	1908	37051
G	45m E	Unspecified Disused Shafts	1974 - 1992	41934
D	46m NW	Unspecified Heap	1879	36164
D	46m NW	Refuse Heap	1908 - 1958	46232
H	50m SE	Unspecified Heap	1879	36165
D	53m NW	Unspecified Old Shafts	1908 - 1958	47381
D	54m NW	Unspecified Disused Shafts	1974 - 1980	41405
E	55m SE	Unspecified Old Shafts	1958	58424
D	55m NW	Refuse Heaps	1958	37052
E	55m SE	Refuse Heap	1908	22028
I	55m NW	Unspecified Disused Shaft	1974 - 1980	57437
I	59m NW	Unspecified Old Shaft	1908	33398

ID	Location	Land use	Dates present	Group ID
D	61m NW	Unspecified Disused Shafts	1974 - 1980	37470
J	62m SW	Refuse Heap	1908	22022
J	62m SW	Unspecified Heap	1879	36162
E	63m SE	Unspecified Old Shafts	1908	47881
E	66m SE	Unspecified Disused Shafts	1974 - 1992	45659
B	69m S	Sawmill	1879	37287
D	70m NW	Unspecified Disused Shafts	1974 - 1980	59305
E	71m SE	Unspecified Old Shafts	1879	49155
I	71m NW	Unspecified Old Shaft	1958	33404
H	73m SE	Unspecified Old Shafts	1958	24101
D	73m NW	Unspecified Old Shafts	1908	60173
J	74m SW	Refuse Heap	1908	22023
J	74m SW	Unspecified Heap	1879	36168
D	74m NW	Unspecified Disused Shafts	1974 - 1980	38820
H	76m SE	Unspecified Old Shaft	1908	38928
D	76m NW	Unspecified Old Shafts	1958	49304
J	76m SW	Unspecified Old Shaft	1908	33399
D	77m W	Disused Tin and Copper	1908	23530
J	78m SW	Unspecified Disused Shaft	1974 - 1992	60006
G	78m NE	Unspecified Pit	1908	43289
H	78m SE	Unspecified Disused Shafts	1974 - 1992	56189
D	79m NW	Unspecified Old Shafts	1908	54293
D	83m NW	Unspecified Old Shafts	1958	50485
H	83m SE	Unspecified Old Shaft	1879	46628
J	88m SW	Unspecified Old Shaft	1958	33401
G	91m NE	Unspecified Pit	1879	53169
K	91m NW	Unspecified Pit	1908	44457
K	91m NW	Unspecified Pit	1879	44873

ID	Location	Land use	Dates present	Group ID
F	97m NE	Unspecified Heap	1879	36025
F	100m NE	Unspecified Disused Shaft	1980	51246
F	100m NE	Unspecified Disused Shaft	1973	55660
2	101m SE	Unspecified Pit	1879	34000
L	107m NW	Unspecified Disused Mine	1974 - 1980	53062
G	108m NE	Refuse Heap	1958	21985
M	109m W	Unspecified Heap	1879	36163
M	109m W	Refuse Heap	1908 - 1958	49791
K	112m NW	Unspecified Shafts	1879	18820
N	114m W	Unspecified Heap	1879	36160
N	114m W	Refuse Heap	1908 - 1958	38598
D	116m NW	Unspecified Shaft	1879	26519
K	117m NW	Unspecified Shafts	1879	18805
D	117m NW	Unspecified Old Shafts	1908 - 1958	55094
J	118m SW	Refuse Heaps	1958	37056
M	119m W	Unspecified Disused Shafts	1974 - 1980	49729
M	122m W	Unspecified Old Shafts	1958	24103
I	122m NW	Refuse Heap	1879	21986
I	124m NW	Unspecified Disused Mine	1958	22634
G	127m E	Refuse Heap	1908 - 1958	42057
G	133m E	Unspecified Heap	1879	36016
I	136m NW	Unspecified Disused Shaft	1980 - 1988	45190
I	136m NW	Unspecified Disused Shaft	1973	47760
J	137m SW	Refuse Heap	1908	22021
J	137m SW	Unspecified Heap	1879	36155
I	138m NW	Unspecified Old Shaft	1908 - 1958	45958
D	144m NW	Unspecified Shafts	1879	18818
G	144m E	Unspecified Old Shafts	1908 - 1958	49286

ID	Location	Land use	Dates present	Group ID
G	146m E	Unspecified Disused Shafts	1974 - 1992	58471
L	160m NW	Unspecified Heap	1879	36022
L	160m NW	Refuse Heap	1908 - 1958	46748
3	175m W	Unspecified Heap	1992	36161
D	175m W	Unspecified Shafts	1879	18817
D	175m W	Unspecified Old Shaft	1908	33402
L	176m NW	Unspecified Shafts	1879	18819
L	176m NW	Unspecified Old Shaft	1908	33403
D	178m W	Unspecified Disused Shafts	1974 - 1992	44765
L	184m NW	Unspecified Old Shaft	1958	33405
D	193m W	Unspecified Shafts	1879	18816
D	193m W	Unspecified Old Shafts	1908	24105
O	193m SW	Refuse Heap	1908	22020
O	193m SW	Unspecified Heap	1879	36147
D	193m W	Unspecified Disused Shafts	1974 - 1992	56236
4	196m S	Railway Sidings	1908 - 1958	56465
O	198m SW	Refuse Heaps	1958	37055
D	200m W	Unspecified Old Shafts	1958	24104
P	202m NE	Disused Copper Mine	1908	47387
P	202m NE	Disused Copper Mine	1879	55554
L	205m NW	Unspecified Shafts	1879	18813
O	205m SW	Unspecified Disused Shaft	1974 - 1992	46492
O	206m SW	Unspecified Old Shaft	1958	33400
Q	209m NE	Unspecified Heap	1879	36017
L	210m NW	Unspecified Heap	1879	36023
L	213m NW	Refuse Heap	1908 - 1958	44383
Q	218m NE	Refuse Heap	1908 - 1958	50945
R	222m SE	Unspecified Heap	1958	60282

ID	Location	Land use	Dates present	Group ID
S	225m SE	Refuse Heap	1908	47100
S	225m SE	Refuse Heap	1879	54475
R	227m SE	Unspecified Heap	1879	44235
R	227m SE	Unspecified Heap	1908	52393
L	228m NW	Unspecified Heap	1879	36024
S	229m SE	Unspecified Old Shaft	1908 - 1958	38034
T	229m S	Refuse Heap	1908 - 1958	59819
D	232m W	Unspecified Disused Shafts	1974 - 1992	57494
T	233m S	Unspecified Heap	1879	36146
S	233m SE	Unspecified Disused Shaft	1974 - 1992	52345
D	234m W	Unspecified Old Shafts	1908 - 1958	52592
L	237m NW	Unspecified Shaft	1879	26527
S	239m SE	Unspecified Old Shaft	1879	54261
R	240m SE	Unspecified Old Shafts	1879	24095
O	242m SW	Refuse Heap	1908	22024
O	242m SW	Unspecified Heap	1879	36148
T	256m S	Unspecified Disused Shaft	1974 - 1992	51661
U	257m NW	Unspecified Heap	1879	36026
U	257m NW	Refuse Heap	1908 - 1958	44959
T	258m S	Unspecified Old Shaft	1908 - 1958	56490
T	261m S	Unspecified Disused Shaft	1974 - 1992	55248
D	261m W	Unspecified Old Shafts	1908 - 1958	58110
Q	266m NE	Unspecified Old Shaft	1879	33064
U	274m NW	Unspecified Shaft	1879	39157
U	274m NW	Unspecified Shaft	1908	54159
5	276m N	Refuse Heap	1879	21983
U	276m NW	Unspecified Disused Shaft	1973	45051
U	276m NW	Unspecified Disused Shaft	1980 - 1988	53403

ID	Location	Land use	Dates present	Group ID
U	276m NW	Unspecified Shaft	1958	54499
V	279m SE	Unspecified Heap	1908 - 1958	39825
6	282m SW	Unspecified Heap	1879	36154
7	283m SW	Cuttings	1980 - 1992	56350
V	285m SE	Unspecified Heap	1879	49735
V	293m SE	Unspecified Old Shafts	1879	24096
W	294m NW	Refuse Heap	1908	37397
W	294m NW	Refuse Heap	1879	37492
D	304m W	Unspecified Old Shafts	1908 - 1958	42648
X	310m S	Unspecified Heap	1879	36145
Y	321m E	Unspecified Disused Shaft	1980 - 1988	47467
Y	321m E	Unspecified Disused Shaft	1973	56066
Y	322m E	Unspecified Old Shaft	1958	33065
X	324m S	Unspecified Disused Shaft	1974 - 1992	45576
Z	325m NW	Refuse Heap	1908	49397
Z	325m NW	Refuse Heap	1879	52163
Y	326m E	Unspecified Heap	1879	36013
P	331m NE	Unspecified Disused Mine	1980 - 1988	57497
P	331m NE	Unspecified Disused Mine	1973	59282
P	333m NE	Refuse Heaps	1908 - 1958	60964
AA	334m SE	Unspecified Heap	1958	40643
Y	335m E	Unspecified Old Shaft	1908	45285
Y	335m E	Unspecified Old Shaft	1879	45681
P	337m NE	Unspecified Disused Mine	1958	56609
W	337m NW	Unspecified Shaft	1879	26526
P	339m NE	Unspecified Heap	1879	36012
AA	340m SE	Unspecified Heap	1908	56632
AA	340m SE	Unspecified Heap	1879	46137

ID	Location	Land use	Dates present	Group ID
Z	341m NW	Unspecified Old Shaft	1908	33060
AB	341m N	Refuse Heap	1908	21982
AB	341m N	Unspecified Heap	1879	36027
Z	343m NW	Unspecified Shaft	1879	26528
AA	355m SE	Unspecified Old Shaft	1958	33397
AA	356m SE	Unspecified Disused Shaft	1974 - 1992	40414
P	357m NE	Unspecified Disused Shafts	1973	46005
P	357m NE	Unspecified Disused Shafts	1980 - 1988	59752
P	357m NE	Unspecified Old Shafts	1908 - 1958	56097
W	357m NW	Unspecified Disused Shaft	1973	41195
W	357m NW	Unspecified Disused Shaft	1980 - 1988	43570
W	357m NW	Unspecified Shaft	1908 - 1958	48391
AA	361m SE	Unspecified Old Shaft	1908	50862
AA	361m SE	Unspecified Old Shaft	1879	54725
P	361m NE	Unspecified Old Shaft	1879	33063
AC	366m NW	Refuse Heap	1879	48298
AC	366m NW	Refuse Heap	1908	48179
AB	375m N	Unspecified Old Shaft	1879	39538
AB	375m N	Unspecified Old Shaft	1908	43443
AB	377m N	Unspecified Disused Shaft	1980 - 1988	58920
P	378m NE	Unspecified Heap	1879	36014
AB	382m N	Unspecified Old Shafts	1958	24191
P	385m NE	Unspecified Old Shafts	1908	24202
P	386m NE	Unspecified Disused Shafts	1973	55827
P	386m NE	Unspecified Disused Shafts	1980 - 1988	59648
AD	395m W	Unspecified Heap	1879	36159
AD	395m W	Refuse Heap	1908 - 1958	46068
P	397m NE	Unspecified Disused Shafts	1980 - 1988	38334

ID	Location	Land use	Dates present	Group ID
P	397m NE	Unspecified Disused Shafts	1973	54318
AD	406m W	Unspecified Shaft	1879	26505
AD	412m W	Unspecified Old Shafts	1908 - 1958	38293
AE	414m S	Forge	1992	22988
AF	414m NE	Unspecified Heaps	1879	31674
AD	414m W	Unspecified Disused Shaft	1974 - 1992	58771
P	418m NE	Refuse Heap	1908	21984
AE	419m S	Smithy	1958	24752
AG	424m SE	Refuse Heap	1908 - 1958	41578
AF	427m NE	Unspecified Disused Shafts	1980 - 1988	53055
AF	427m NE	Unspecified Old Shafts	1908	24190
AF	427m NE	Unspecified Old Shaft	1879	33062
AF	428m NE	Unspecified Disused Shafts	1973	51330
AH	428m NE	Unspecified Heap	1879	42018
AH	428m NE	Unspecified Heap	1908	42619
AD	428m W	Unspecified Old Shafts	1958	24106
AF	432m NE	Unspecified Old Shafts	1958	24189
AH	434m NE	Unspecified Heap	1958	54514
AI	435m NW	Tin and Copper Mine	1879	29988
AI	435m NW	Unspecified Heap	1879	36093
AI	436m NW	Disused Tin and Copper	1908	23531
AI	436m NW	Refuse Heap	1908 - 1958	59270
AE	436m SE	Smithy	1879	60553
AE	437m SE	Smithy	1908	58826
8	439m SW	Cuttings	1980 - 1992	44576
AD	441m W	Unspecified Old Shafts	1908 - 1958	60517
AD	441m W	Chimney	1879	25036
AH	442m NE	Unspecified Disused Shaft	1973	40360

ID	Location	Land use	Dates present	Group ID
AH	442m NE	Unspecified Disused Shaft	1980 - 1988	56223
P	445m NE	Unspecified Old Shafts	1908 - 1958	58685
AG	446m SE	Unspecified Heap	1879	36175
AI	446m NW	Chimney	1980 - 1988	37552
AI	446m NW	Chimney	1973	41428
9	449m NE	Refuse Heap	1908	21981
AI	450m NW	Engine House	1879	31295
AI	453m NW	Unspecified Shaft	1879	26530
AJ	456m W	Refuse Heap	1879	21987
10	459m NE	Unspecified Shaft	1879	26523
AI	459m NW	Unspecified Shaft	1958	47808
AI	462m NW	Unspecified Disused Shaft	1980 - 1988	51672
AI	462m NW	Unspecified Disused Shaft	1973	57308
AF	464m N	Refuse Heap	1908 - 1958	43878
AI	466m NW	Unspecified Shaft	1908	54428
AF	467m N	Unspecified Old Shaft	1879	33061
AF	467m N	Unspecified Old Shafts	1908 - 1958	52813
AF	471m N	Unspecified Disused Shafts	1973	42249
AF	471m N	Unspecified Disused Shafts	1980 - 1988	52562
P	474m NE	Unspecified Old Shaft	1879	33069
11	475m W	Disused Tin and Copper Mine	1879	32058
AJ	475m W	Unspecified Shaft	1879	26481
AJ	475m W	Unspecified Old Shaft	1908 - 1958	52652
AK	475m W	Refuse Heap	1879	50193
AK	475m W	Refuse Heap	1908	57646
12	476m SE	Unspecified Heap	1879	36173
13	477m SW	Refuse Heaps	1879	37057
14	483m W	Refuse Heap	1908	55169

ID	Location	Land use	Dates present	Group ID
P	494m NE	Unspecified Disused Shafts	1980 - 1988	52633
P	494m NE	Unspecified Disused Shafts	1973	59504
P	497m NE	Unspecified Old Shafts	1908 - 1958	60038

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	0

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

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	0

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

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m	0

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

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m	2

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

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

ID	Location	Land use	Dates present	Group ID
I	75m NW	Garage	1989	683
I	75m NW	Garage	1971 - 1989	759

This data is sourced from Ordnance Survey / Groundsure.

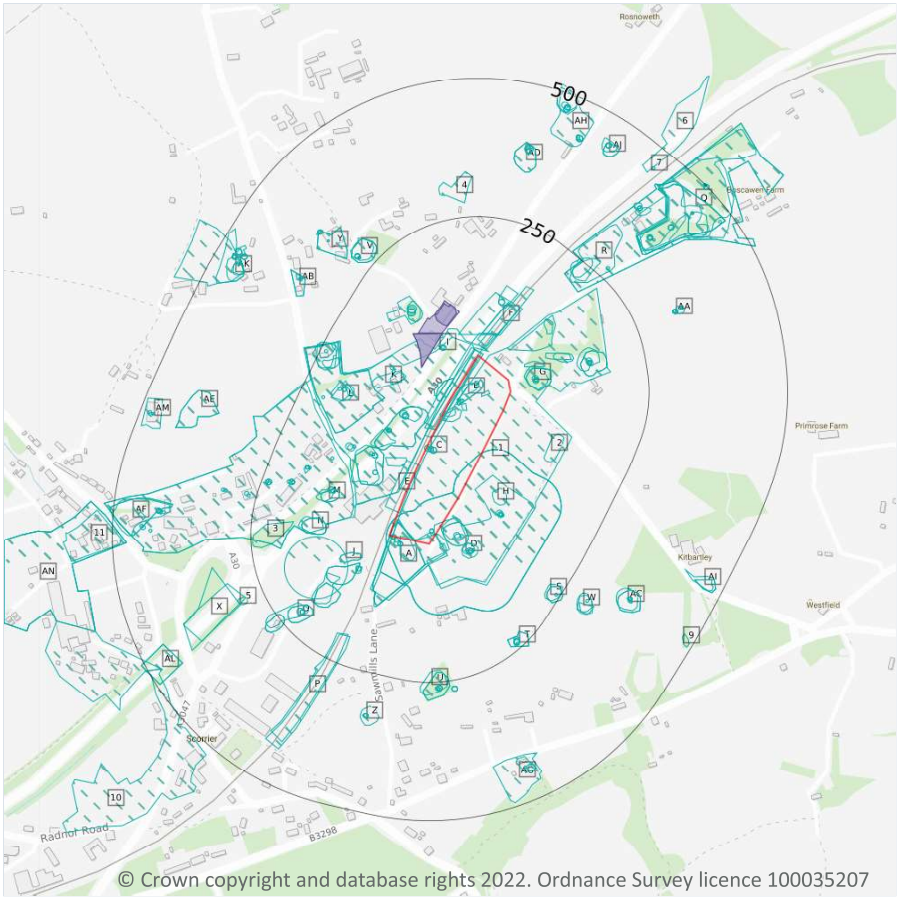
1.6 Historical military land

Records within 500m	0

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

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

2 Past land use - un-grouped



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical garages

2.1 Historical industrial land uses

Records within 500m	396

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

Features are displayed on the Past land use - un-grouped map on **page 27**

ID	Location	Land Use	Date	Group ID
1	On site	Disused Copper Mine	1879	29894
A	On site	Sawmills	1908	46167
A	On site	Unspecified Shaft	1908	47296

ID	Location	Land Use	Date	Group ID
A	On site	Chimney	1992	42533
A	On site	Unspecified Works	1992	49371
A	On site	Chimney	1980	42533
A	On site	Unspecified Works	1980	49371
A	On site	Chimney	1974	42533
A	On site	Unspecified Works	1974	49371
A	On site	Sawmills	1879	56618
A	On site	Unspecified Heap	1879	36167
B	On site	Refuse Heap	1908	40125
B	On site	Unspecified Old Shaft	1908	47492
B	On site	Refuse Heap	1908	41912
B	On site	Cuttings	1908	58311
B	On site	Cuttings	1958	58684
B	On site	Cuttings	1879	44529
B	On site	Unspecified Disused Shaft	1992	44779
B	On site	Refuse Heap	1958	40125
B	On site	Refuse Heap	1958	41912
B	On site	Unspecified Old Shaft	1958	47492
B	On site	Unspecified Disused Shaft	1980	44779
B	On site	Unspecified Disused Shaft	1974	44779
B	On site	Engine House	1879	31258
B	On site	Engine House	1879	31259
B	On site	Unspecified Heap	1879	36019
C	On site	Unspecified Shaft	1908	56671
C	On site	Unspecified Disused Shaft	1992	54918
C	On site	Unspecified Old Shafts	1958	24102
C	On site	Unspecified Disused Shaft	1980	54918
C	On site	Unspecified Disused Shaft	1974	54918

ID	Location	Land Use	Date	Group ID
C	**On site**	**Unspecified Shaft**	**1879**	**42309**
D	**On site**	**Unspecified Disused Mine**	**1992**	**50819**
D	**On site**	**Unspecified Disused Mine**	**1980**	**50819**
D	**On site**	**Unspecified Disused Mine**	**1974**	**50819**
D	**On site**	**Chimney**	**1992**	**43617**
D	**On site**	**Unspecified Disused Mine**	**1958**	**44866**
D	**On site**	**Chimney**	**1980**	**43617**
D	**On site**	**Chimney**	**1974**	**43617**
E	**On site**	**Railway Sidings**	**1958**	**36728**
D	3m SE	Refuse Heap	1958	43505
A	5m S	Unspecified Shaft	1958	47296
D	6m SE	Refuse Heap	1908	43505
D	6m SE	Unspecified Heap	1879	36166
A	8m S	Unspecified Disused Shaft	1992	44199
A	8m S	Unspecified Disused Shaft	1980	44199
A	8m S	Unspecified Disused Shaft	1974	44199
E	8m NW	Disused Copper Mine	1879	42035
E	12m N	Disused Copper Mine	1908	59702
B	13m NW	Refuse Heap	1908	53321
B	13m NW	Unspecified Heap	1879	36020
F	16m NE	Cuttings	1879	41298
D	18m SE	Unspecified Shaft	1879	26506
E	21m NW	Refuse Heap	1908	45089
E	21m NW	Unspecified Heap	1879	36021
F	22m NE	Cuttings	1908	40620
B	22m NW	Refuse Heap	1958	53321
E	23m NW	Unspecified Pit	1879	33999
D	28m SE	Unspecified Old Shafts	1958	42840