PHASE 1 ENVIRONMENTAL ASSESSMENT

Land West of Warrenby, Teesworks

Report Reference: 10035117-AUK-XX-XX-RP-ZZ-0520-03-Land West of Warrenby Redcar Preliminary Risk Assessment

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1 Introduction

1.1 Appointment and Project Aims

Arcadis Consulting (UK) Limited (Arcadis) has been commissioned to complete a Phase 1 Environmental Desk Study for an area of land within the Teesworks site, to the west of Warrenby, Redcar.

The Land West of Warrenby plot (the Site) is a land parcel situated within the wider Teesworks area located across the Redcar, Lackenby, Grangetown and South Bank conurbations of the Borough of Redcar & Cleveland, set in the industrial area generally known as 'South Tees'.

The South Tees Regeneration Masterplan has been developed detailing the industrial-led regeneration of the Former Redcar Steelworks into a world class employment-generating zone and economic growth enabler for the Tees Valley.

The Masterplan has identified the Site as being located within the North Industrial Zone. The site is a priority development area.

This document is intended to support planning application R/2021/1048/FFM: **ENGINEERING OPERATIONS ASSOCIATED WITH GROUND REMEDIATION AND PREPARATION OF THE SITE (AMENDED PLANS SUBMITTED 10.02.2022) FORMER REDCAR STEELWORKS (TEESWORKS) LAND TO WEST OF WARRENBY REDCAR.**

The site is under consideration as a potential location for the Teesside Net Zero carbon capture and storage facility, this facility is to be constructed by a third party under a Development Consent Order (DCO). Although some documentation pertinent to the DCO has been used to produce this report the two projects are not formerly linked and should be assessed separately and in isolation within their respective planning frameworks.

The overarching aim of the works is to deliver a sustainable ground remediation strategy for the contract site which is compliant with regulatory needs (Local Authority and Environment Agency) and has their approval in principle.

This document is intended to support the discharge of planning conditions associated with remediation at the plot.

The site location is shown on Figure 1 in Appendix B

1.2 Objectives and Scope of Work

The aim of this Phase 1 Environmental Assessment is to provide information on potential development constraints prior to carrying out enabling works. This will be used to assess potential environmental risks which may be associated with redevelopment of the site.

To achieve this, the following scope will be carried out.:

- Review relevant information provided by the client,
- Obtain and review environmental database information (Groundsure Report).
- Review of publicly available environmental information.
- Review of relevant planning documents for the site.
- Review of historical Ordnance Survey maps,
- Review of British Geological Survey maps and plans.
- Obtain and review Coal Authority data.
- Review of historic ground investigation reports.
- A site walkover to assess current site conditions and potential areas for concern; and
- Development of a conceptual site model (CSM) in line with UK regulatory information.

It is anticipated this report will be submitted to support the planning process' for the site.

1.3 Proposed Redevelopment

The area comprises disused land associated within a former steelworks site. The client is carrying out enabling works including engineering operations and remediation to form a development platform at approximately 7.3m AOD for a subsequent generic commercial / industrial end use.

It is anticipated that these works will involve excavation (as shown on drawing TSWK-STDC-NZT-ZZ-DR-C-0005 Net Zero Teesside – Remediation Zones – Rev C, contained within Appendix B) of soils to remove obstructions, voids, and preferential pathways). Unsuitable materials or contaminated soils which will be processed or remediated as necessary and placed as engineering fill. It is anticipated that processed / treated site won materials will be used to create the development platform, this may include crushing, screening and the removal of contaminants of concern.

1.4 Sources of Information

The following sources of information have been used in compiling this report:

- Groundsure Report (Appendix C);
- Historical Ordnance Survey Maps (Appendix D);
- Site Walkover and Photo Log (Appendix E);
- British Geological Survey (BGS) published maps and online GeoIndex borehole records;
- Redcar and Cleveland Borough Council Planning Portal;
- DCO application;
- Unexploded Ordnance (UXO) Screening assessment (Appendix F);
- Coal Authority Website; and,
- Gov.uk website.

1.5 Previous Information

The following reports have been prepared for or include the Net Zero plot:

- *Land West of Warrenby, Teesworks, Site Condition Report, Generic Quantitative Risk Assessment and Detailed Quantitative Risk Assessment*, 10035117-AUK-XX-XX-RP-ZZ-0428-02-LWoW_DQRA, prepared by Arcadis for South Tees Development Corporation, dated May 2022 [Arcadis 2022a].
- *4153 & 4154 Area A Former Steelworks Redcar Contract 1 & 2 (Area A) (Final report)*, prepared by Allied Exploration and Geotechnics Limited (AEG) for South Tees Site Company Ltd, dated June 2018 [AEG 2018].
- *The Former SSSI Steelworks, Redcar: Priority Areas Within SSI Landholdings Contract, Contracts 1 and 2 (Area A): Environmental Risk Assessment Report*, Redcar Steelworks-AUK-XX-XX-RP-GE-0001-P1-SSI1_SSI2A_GI_ERA_Final, prepared by Arcadis for South Tees Site Company Ltd, dated June 2018 [Arcadis 2018a].
- *The Former SSSI Steelworks, Redcar: Priority Areas Within SSI Landholdings Contract, Contract 1 and 2A Site Condition Report*, Redcar Steelworks-AUK-XX-XX-RP-GE-0001-02-SSI1_SSI2A_GI_SC, prepared by Arcadis for South Tees Site Company Ltd, dated August 2018 [Arcadis 2018b].
- *The Former SSSI Steelworks, Redcar: Priority Areas Within SSI Landholdings Contract, Contracts 1 and 2A: Geotechnical Risk Assessment Report*, Redcar Steelworks-AUK-XX-XX-RP-GE-0001-P1-SSI1_SSI2A_GI_GRA, prepared by Arcadis for South Tees Site Company Ltd, dated November 2018 [Arcadis 2018c].
- *The Former SSSI Steelworks, Redcar: Priority Areas Within SSI Landholdings Contract, Contract 1 and 2A: Ground Remediation Options Appraisal Report*, Redcar Steelworks-AUK-XX-XX-RP-GE-0001-01-SSI1_SSI2A_GI_ROA, prepared by Arcadis for South Tees Site Company Ltd, dated December 2018 [Arcadis 2018d].

- *SSI Redcar – SSI1, Factual Report – Initial Trial Pitting*, prepared by CH2M for South Tees Site Company Ltd, dated November 2017 [CH2M 2017a].
- *SSI Redcar – SSI2, Factual Report – Initial Trial Pitting*, prepared by CH2M for South Tees Site Company Ltd, dated November 2017 [CH2M 2017b].
- *SSI1 Redcar Works – Phase 1 Geo-Environmental Desk Study,* 678079_SSI1_001 prepared by CH2M, dated August 2017 [CH2M 2017c]
- *SSI2 Redcar Works – Phase 1 Geo-Environmental Desk Study*, 678079_SSI1_001 prepared by CH2M, dated August 2017 [CH2M 2017d]
- *Former SSI Steelworks, Redcar – Initial Ground Investigation Works*, Geoenvironmental Summary, prepared by CH2M for South Tees Site Company Ltd, dated May 2018 [CH2M 2018].
- *Soil and Groundwater Baseline Characterisation Study*, Teesside Works, prepared by Enviros for Corus UK Ltd [Enviros 2004], Comprising:
    - Volume 1 – Factual Report, Ref. Rlp250604corusteessidefactual.Doc dated 25th June 2004 and marked Final;
    - Volume 2 – Interpretive Report Ref. Mwicorusdraftinterpretivemmdv#2.Doc dated 25th June 2004 and marked Final; and,
    - Volume 3 – Summary Report dated June 2004

Arcadis have also been provided with the following report pertaining to the Site:

- *Preliminary Onshore Ground Investigation For Net Zero Teeside (NZT) – South Tees Development Corporation (STDC) 'Main Site' And Onshore CO2 Export Pipeline Corridor Final factual Report*, prepared by AEG for AECOM, dated January 2022 [AEG 2021a].
- *Onshore Unexploded Ordnance Threat and Risk Assessment with Risk Mitigation Strategy: Net Zero Teesside*, Prepared for BP Plc by AECOM and 6 Alpha, NS051-CV-REP-000-00001 dated March 2021.

This document should be read in conjunction with the aforementioned reports.

1.6 Reliability of Information / Limitations

Arcadis warrants that the services performed were conducted in a competent and professional manner in accordance with sound consulting practices and procedures.

Arcadis cannot warrant the actual property conditions described in this report beyond matters amenable to confirm within the limits of this report.

The reader is referred to the Study Limitations, presented in Appendix A

2 Site Setting

2.1 Site location

The site is located within the Teesworks site, off Trunk Road, Redcar TS10 5QW at national grid reference 457141, 525496. The site covers an area of 62.30 hectares and is an area of former industrial land which forms part of a wider steelworks complex.

The current site layout plan is presented on Figure 2 below and in Appendix B.

Figure 2 - Site Plan

Site Plan

2.2 Site Description

A site reconnaissance was undertaken by Arcadis in April 2022. The resulting data (site notes and photos) have been used in parts of this report, where necessary, to supplement and support desk-based information. Access to certain areas of the site was not possible at the time of the visit due to ongoing demolition works, and the inspection was limited to external areas only. The site reconnaissance photos are presented in Appendix E.

The site is roughly rectangular in area and generally level at 7.5 to 7.1m AOD, with a notable exception being the low lying ponds area in the north east where levels are as low as 4.5m AOD.

The southernmost part of the site is occupied by the Redcar Sinter Plant (currently undergoing demolition) and associated raw materials handling facility which includes a number of above ground conveyors, tunnels, and level material laydown/storage areas. The sinter plant was used to combine the basic raw materials for iron making (iron ore, limestone and coke) into pellets which were transferred directly to the blast furnace (outside of the site boundary) to produce iron.

The central area of the site includes large level grassed areas (locally with evidence of hardstanding), the Teesside Management Offices (TMO) and pellet tunnel building, a maintenance building with an above ground diesel tank, car parking and estate roads. Both the TMO and pellet tunnel building are of masonry construction and show signs of ground movement (possibly associated with slag expansion). The diesel tank is understood to have held up to 200 tonnes of fuel. This has been partially, but not fully drained. The tank is housed in a concrete bund which shows no significant staining.

Until recently this area of the site was crossed by a number of above ground conveyors which transferred sinter to the blast furnace and heavy fuel oil and coke oven gas main which ran on overhead gantries. All of these structures have now been demolished or are in the process of removal.

The northern area of the site includes the Blast Furnace Stockhouse (largely demolished), and until recently the RDL stores and canteen (now fully demolished). These are surrounded by large level areas of grass, which locally include evidence of earlier development (concrete foundations). It is also understood a number of shallow brick lined tunnels cross this area of the site with the crown of the tunnel as shallow as 0.5m below ground level. In the northeastern area of the site levels are noted to drop to 4.5m AOD and the topography is notably uneven with areas of fused slag and slag boulders visible.

The northern area of the site is crossed by estate roads, and a number of rail sidings and the hot metal track which previously transferred molten iron from the blast furnace (west of site) to the BOS plant at Lackenby.

The area surrounding the site is summarised below:

- North Teesworks boundary fence with unnamed road, areas of slag, dunes and ponds beyond.
- East Estate road with Teesworks' Long Acres development plot beyond
- South Estate road with Teesworks' Foundry development plot beyond
- West Foundry Development plot including Redcar Blast Furnace complex to northwest,

2.2.1 Potential Areas of Concern

Extensive made ground is anticipated to be present across the site which is anticipated to comprise large amounts of iron and steel making by products (principally slag).

The former heavy industrial usage of the site has included storage of large volumes of raw materials (iron, limestone and coal), pipelines and conveyors for transferring these products and localised storage of fuel.

At the time of writing demolition works are ongoing to several large industrial structures on the site. Given the age of these structures, it is acknowledged that harmful materials may be present within the structures such as asbestos containing materials, hydrocarbons or PCBs in electrical equipment etc., however works are being carried out in a controlled manner and it is anticipated that the current demolition operations do not pose a significant risk of spreading or contaminating soil and groundwater with these materials.

No further significant areas of concern were observed during the site reconnaissance.

3 Site History

Based on the Groundsure report (presented in Appendix C) and the historical maps (presented in Appendix D) the site history is summarised below:

3.1 On-Site History

Table 1 - On-Site History

Year	Details
1857	Much of the site is within the Tees Estuary and is recorded as Bran Sands. A small promontory recorded as Todd Point encroaches into the eastern area of the site.
1893	Works to reclaim the area have commenced with South Gare Breakwater crossing the site from southeast to northwest. A tramway is recorded as running parallel to the breakwater. The northern area of the site includes marshland and ponds Sea walls have been constructed along the western site boundary, much of the southwest of the site is recorded as sand. An iron works has been constructed at Todd Point which extends partially onto site.
1913	The iron works is recorded as Coatham Iron works and has extended slightly. Associated slag wool works and a tar macadam works have been constructed east of the site. A tramway has been constructed crossing the north of the site and extending to the northwest where further land reclamation is ongoing. The northern area of the site includes a rifle range.
1927	The Iron works has extended considerably and is now recorded as the Redcar Iron and Steel Works and occupies much of the northern area of the site. Two additional areas in the north are recorded as slag and tar macadam works. The southern area of the site is recorded as areas of marsh and pond and is named The Marshes.
1938-1953	No significant changes. Small area recorded as “Refuse Tip” to the south of the main building. Further reclamation works and industrial development on surrounding areas.
Year	Details
1969	The Iron and steel works has extended. Drains have been installed in The Marshes area. Further land reclamation on areas surrounding the site.
1974-1976	Mapping incomplete. Much of the southern area of site has been reclaimed
1981	By 1981 the site layout has changed significantly. The 1920’s structures are no longer present and the site resembles the current layout with materials handling, sinter plant and pellet plant in the south and conveyors for transferring sinter north to the blast furnace stockhouse and off site blast furnace complex. The site is served by estate roads and rail infrastructure
1981-2015	The site remained operational between 1981 and 2015. The site remained relatively unchanged other than demolition of the pellet plant in the early 2000’s.

2015-present	In September 2015 the site went into administration and was mothballed

* PCBs typically sorb to soil and are not highly mobile. These contaminants may act as localised point sources beneath existing electrical infrastructure (substations, switchgear etc.).

3.2 Surrounding Area History

Table 2 - Surrounding Area History

Year	Details
1857	Undeveloped land to east. A watercourse (later labelled as The Fleet) is present approximately 400m S-SE of the site. Tidal areas of the Tees estuary to the north, south and west.
1893	Two iron works, railway sidings, Darlington to Saltburn railway constructed to the east. Several ponds and reservoirs are recorded to the north, east and south of the site. Construction has started on the South Gare Breakwater which extends to the northwest of the site as have further land reclamation works west of the site. These are accessed by tramways which cross the site onto the adjoining areas. A sea wall has been constructed to the south of the site to enclose an area which is recorded as marshland.
1913	Further industrial expansion to the east of the site including tar macadam works and slag wool works immediately east, with Redcar Iron works, slag wool works and slag brick works beyond. Further land reclamation activities to the northwest.
1927	Extension of the ironworks in the east (which now extend onto site) including additional rail sidings. With further works buildings to the west of site. Further reclamation to the north and west, including a pumping station on the site boundary.
1938-1953	The ponds and reservoirs have been largely infilled/built over other than those to the south which are recorded as “mud and sand”. No other notable changes other than further land reclamation to the north and west.
1974	Significant changes including removal of structures to the south and west of the site and areas recorded as “active workings” Warrenby station is recorded on rail track immediately east of the site. Drawing RGEN156 showing a potential pre-construction layout for the site and dated 1973-1974 indicates tar lagoons are present to the south, the drawing states “Existing liquid tars to be removed”. This drawing is included in Appendix B.
1980	By 1980 extensive land reclamation has been completed to the south, west and north of the site and the Redcar Blast furnace and Redcar Coke Oven complexes have been constructed to the northwest. Areas to the west and south are occupied by conveyors and rail sidings associated with material storage. Warrenby Station has been demolished and the associated tracks are recorded as “dismantled railway”.
2015-present	All plant surrounding the site was mothballed in 2015 and has been under the maintenance of STSC

In summary the site has undergone two significant phases of redevelopment with reclamation of the site from the Tees estuary in the early 20th Century and subsequent development of the Redcar Iron and Steel works. In the 1960's and 1970's further reclamation works were carried out around the site and the site was developed into the current layout as part of the integrated steelworks complex, following demolition of the earlier 20th Century buildings.

3.3 Regulatory Information

3.3.1 Environmental Permits, consents, and authorisations

The following details of environmental permits, consents, and authorisations within a 500m radius of the Site, have been obtained from the Groundsure Report (Appendix C.

Table 3 - Environmental Permits, Consents and Authorisations On-Site

	Within 500m	Distance and direction of nearest/ most significant	Details
Part (A1) Environmental Permits	1	88m W	Permit for screening coal. Last recorded as active 1/10/2004
Part A(2) and B Permits	0	-	-
Discharge Consents	0	-	-
Dangerous or Hazardous Sites	0	-	-
Recorded pollution incidents	2	0	24/9/2001 On site Waste materials - Tyres Land Impact Category 3 (Minor)
		445m W	3/10/2009 Atmospheric Pollutants and Effects-Dust Land Impact - Category 3 (Minor) Air Impact - Category 2 (Significant)
Active Landfills	3	300m E	**Site reference:** EA/EPR/KP3790ZE/V002 **Waste type:** Household, Commercial, Industrial **Operator:** TATA Steel UK Ltd **Licence holder:** TATA Steel UK Ltd **First recorded:** - **Last recorded:** - **Status:** Closure
Historic Landfills	2	90m W	**Site reference:** 0700/CLE/087 **Waste type:** Inert, Industrial **Operator:** -

	Within 500m	Distance and direction of nearest/ most significant	Details
			Licence holder: British Steel Plc **Licence issue:** 11/12/1979 **Licence Surrender:** 13/04/1997
Historical Industrial Sites	47	On Site	Groundsure records 47 former industrial uses on the site including iron & steel works, works buildings and above ground tanks.
Historical Tanks	34	On site	34 Unspecified Tanks recorded on site through historic mapping.
Historical Energy Features	4	On Site	Four Electricity Substations recorded on site.
Ground Water Abstraction	0	-	-
Surface Water Abstraction	0	-	-
Environmentally Sensitive Sites	3	0m North-	Teesmouth and Cleveland coast adjoins site immediately north- and is classified as: • SSSI • Special Protection Area • Proposed RAMSAR site

3.4 Planning Consents

It is understood that consent has been sought for a future commercial development of the site for a carbon capture and storage facility at the site. It is understood that this is classed as a Nationally Significant Infrastructure Project and permission is being sought for the project under a Development Consent Order (DCO) process.

For clarity this report has been prepared to inform the construction of an enabling works platform for the site and does not consider the DCO.

4 Environmental Setting

4.1 Geology, Hydrogeology and Hydrology

4.1.1 Published Geology

The geology of the site was confirmed by reviewing published geological maps for the area-Sheet 34, Guisborough, 1:50,000 scale and digital 1:10,000 scale mapping. It should be noted that Sheet 34 has been issued as a Provisional Series map. Geology is shown on Figure 3 in Appendix B.

These sources record extensive made ground across the site footprint- this is consistent with the reclamation of the site from the Tees Estuary and the extensive industrial usage of the site.

Superficial deposits underlying the made ground are recorded as Tidal Flat Deposits (TFD)- likely to include layers of clay, silt and sand, and in the east wind blown sand. These in turn are anticipated to be underlain by glaciolacustrine deposits (GL) - a laminated clay with silt partings, and glacial till (GT) - firm or stiff pebbly clay, locally with lenses of gravel. It should be noted that the geological mapping suggests that neither the glacial till, nor the glaciolacustrine deposits are exposed at surface within the site footprint.

Bedrock geology beneath the site is recorded to include the Redcar Mudstone (mudstone with thin sandstones and limestones) across much of the site, with the Penarth Group (mudstone with sandstones) and Mercia Mudstone Group (mudstone with gypsum and sandstone) present beneath the northwest of the site. The Sherwood Sandstone lies unconformably beneath the Mercia Mudstone and will be present at depth beneath the site.

These strata are anticipated to dip to the southeast, however the actual dip may be affected by faulting.

Table 4 – Geology On-Site

	Rock Type	Brief Description	Anticipated Thickness	Anticipated Depth
Bedrock Geology	Redcar Mudstone	Grey, fossiliferous, fissile mudstones and siltstones	0 - >50m	10m (absent in northwest of site)
	Penarth Group	Grey to black mudstones with subordinate limestones and sandstones	10-15m	10m northwest corner of site increases towards the southeast
	Mercia Mudstone	Red and green mudstone with gypsum	230-275m	20m in northwest of site increasing to the southeast
	Sherwood Sandstone	Sandstone, red, yellow and brown	250+m	>250m at shallowest point

The approximate distribution of rocks beneath the site are recorded on the generalised vertical section and cross section provided on BGS Sheet 34 Guisborough.

4.1.2 Borehole Records

No boreholes within the site boundary are available to view on the BGS historic borehole database, however several are available within close proximity to the site. A brief summary of the ground conditions encountered is provided below.

Table 5 – BGS Borehole Archive (https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.156903227.1285241052.1649924275-945219663.1649924275)

BH ID	Made Ground	Superficial Deposits	Bedrock
NZ52SE51 89m S of site	• 5.16 to 0.66mAOD (4.5m) Gravel to boulder sized SLAG	• 0.66 to-2.6m AOD Silt and fine SAND with shells (TFD) • -2.64 to -4.54m AOD soft to firm CLAY (?TFD) • -4.54 to -7.04m AOD Firm to stiff gravelly CLAY (GT)	• -7.04 to -23.04 mAOD (16m). Dark Grey calcareous MUDSTONE with shelly bands (RMF)
NZ5NSE51 164m W of site	• 7.22 to 2.92mAOD (4.3m) Sand to cobble sized SLAG	• 2.92 to-4.98m AOD fine to medium SAND with shells (TFD) • -4.98 to -7.98m AOD Stiff brown gravelly CLAY (GT)	• -7.98 to -37.88 mAOD (29.9m). Red brown very weak MUDSTONE (MMG)

Full details of the geology encountered and additional borehole records can be found at the link included in Appendix C (Groundsure pg114).

4.2 Hydrogeology

Table 6 – Aquifer Designations (https://magic.defra.gov.uk/)

	Rock Type	Aquifer Designation	Aquifer Description
Made ground	Expected across much of the site footprint	-	-
Superficial Geology	Wind Blown Sand (East of site only)	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers -
	Tidal Flat Deposits (expected to be continuous across the bulk of the site)	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers -
	Glaciolacustrine Deposits (expected to be discontinuous)	Unproductive Strata	Rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.
	Glacial Till (expected to be discontinuous)	Secondary Undifferentiated Aquifer	Secondary undifferentiated are aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor value
Bedrock Geology	Redcar Mudstone (expected to be continuous across the bulk of the site)	Secondary Undifferentiated Aquifer	Secondary undifferentiated are aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only limited resource value.
	Penarth Group (north west of site only)	Secondary Undifferentiated Aquifer	Secondary undifferentiated are aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only limited resource value.
	Mercia Mudstone (north west of site only)	Secondary B Aquifer	Predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.
	Sherwood Sandstone	Principal Aquifer	Layers of rock / drift deposits that have high intergranular flow and/or fracture permeability (usually provide a high level of water storage). They may support water supply and/or river base flow on a strategic scale.

Current water quality data of groundwater bodies covered by the Water Framework Directive are presented in Section 6.5 of the Groundsure (Appendix C).

A summary of the presence of groundwater and elevation of identified across the site on two dates is given in Table 7 below, more detailed data is presented in Arcadis 2022a.

Table 7 – Groundwater Elevation Summary

Monitoring Well Screen	Number of Monitoring Wells Gauged	Water Depth (m bgl) & Location	Water Level (m AOD) & Location	Lithology groundwater resting within
13 November 2017				
Made Ground only	7	2.02 (S1-BH05) – 4.84 (S2-BHA04)	2.80 (S2-BHA04) – 3.70 (S1-BH05)	Made Ground
Made Ground / Tidal Flat Deposits	4	1.8 (S2-BHA05) – 4.58 (S1-BH13A)	2.66 (S2-BHA06) – 5.2 (S1-BHA07A)	Made Ground or interface of Made Ground and underlying Tidal Flat Deposits
Tidal Flat Deposits only	1	4.71 (S2-BHA04)	2.82 (S2-BHA04)	Made Ground
15 November 2021				
Made Ground only	3	1.91 (MS\BH03S) – 4.39 (MS\BH07S)	2.76 (MS\BH03S) – 3.72 (MS\BH15S)	Made Ground
Tidal Flat Deposits only	8	2.28 (MS\BH13S) – 4.61 (MS\BH05S)	2.65 (MS\BH04S) – 3.68 (MS\BH15D)	Typically within the Made Ground
Glacial Till & Tidal Flat Deposits / Glacial Till	2	2.4 (MS\BH04D) – 4.01 (MS\BH12S)	2.6 (MS\BH04D) – 3.14 (MS\BH12S)	Top of the Tidal Flat Deposits
Redcar Mudstone	5	1.98 (MS\BH03D) – 5.69 (MS\BH05D)	1.79 (MS\BH05D) – 3.61 (MS\BH17D)	Made Ground or top of the Tidal Flat Deposits

Groundwater flow was noted to be towards the north within the Tidal Flat Deposits and the northeast within the Redcar Mudstone Formation, this flow direction is towards the coast. Groundwater is also anticipated within the Wind Blown Sand, Penarth Group, Mercia Mudstone, and Sherwood Sandstone.

Groundwater within the Tidal Flat Deposits and Blown Sand is expected to be in continuity; continuity within the Glacial Till is expected to be limited and discontinuous with only limited interaction with the overlying deposits. It is expected that lower permeability Glaciolacustrine and Glacial Till deposits will limit downward migration between the superficial and bedrock aquifers. Groundwater within the bedrock aquifer units are considered to be in continuity. No tidal influence has been noted at the site; a full discussion of the hydrogeological regime is given in Arcadis 2022a

4.2.1 Source Protection Zones

The site is not located with a Groundwater Source Protection Zone (SPZ).

4.2.2 Aquifer Salinity

The investigation conducted to date indicates that groundwater beneath the northern portion of the Site to be brackish, while that in the south is likely freshwater. This is consistent with the North Sea being closer to the northern portion of the Site, although it should additionally be noted that the maximum concentration of NaCl in the southern portion of the Site is indicative of brackish water, which may be as a result of land reclamation.

4.2.3 Abstraction Licenses

There are no groundwater abstraction licenses on the site or within 500m.

4.3 Hydrology

4.3.1 Surface Water Resources

There are no surface water features on site. The nearest river is the Fleet which is approximately 150m southeast of the site at its nearest point. The Fleet discharges into the River Tees at a point at which the river is Tidal as part of the Tees Estuary. The Fleet is considered to likely rest within Tidal Flat Deposits and therefore be in continuity with groundwater within this aquifer and also water within the Made Ground.

A number of ponds are present to the north of the site. Anecdotal evidence suggests that these may have been partially or wholly fed by quenching water associated with the Redcar Blast Furnace complex. It is further understood that these ponds have been shrinking since works stopped on site in 2015.

Ordnance Survey mapping records two further ponds approximately 150m south of the site, and a third pond 150m west.

The North Sea is located approximately 450m north of the site at its closest point.

Current water quality data of surface water features covered by the Water Framework Directive are presented in Section 6.4 of the Groundsure (Appendix C)

4.3.2 Abstraction Licenses

There are no surface water abstractions on the site or within 500m.

4.4 Ecologically Protected Sites

Review of DEFRA's magic map website (accessed 07 July 2022) indicates that the land immediately to the north of the Site has ecologically protected status, as detailed below.

- Site of Special Scientific Interest (SSSI) associated with the Teesmouth and Cleveland Coast;
- Special Protection Area (SPA) associated with the Teesmouth and Cleveland Coast; and
- Ramsar Site associated with the Teesmouth and Cleveland Coast. It is understood that following formal consultation in 2018 led by Natural England, the Ramsar boundary in the local area was extended to include land up to the Site boundary in January 2020 (AECOM 2021a), although this is referenced currently as "Proposed Ramsar site" on DEFRA's magic map.

No further sites are located within 500m of the site boundary.

4.5 Flooding Risk

The risk of flooding from Rivers and the sea is recorded as very low (less than 1 in 1000 chance in any given year) (source https://check-long-term-flood-risk.service.gov.uk/map?easting=457680.93&northing=524125.95&map=RiversOrSea).

4.6 Radon Affected Areas

The site is recorded in an area where radon levels are between 1% and 3%, which requires basic radon protection measures in new buildings. This is not considered significant for the proposed enabling works although it will need to be considered further for any proposed development of the site.

4.7 Unexploded Ordnance

A detailed UXO Threat and Rik Assessment prepared by 6Alpha Limited (presented in Appendix F) indicates the site is in an area of High UXO risk. Specific precautions are required for ground investigation or engineering works (e.g. excavation, piling etc.) which are carried out on site.

4.8 Mining

4.8.1 Coal Mining

A review of the Coal Authority interactive map viewer (https://mapapps2.bgs.ac.uk/coalauthority/home.html) indicates the site is not within a development high risk area or areas of known coal mining activity.

4.8.2 Non coal mining

4.8.2.1 Brine extraction

The site is recorded in an area which has historically been subject to brine extraction with the main areas located at Saltholme north of the Tees and South Bank and Middlesborough to the west of the site. The main halite bearing strata targeted by the brine abstraction is the Boulby Halite member. This is believed to be at approximately 550m beneath the site. Given the depth, this is unlikely to affect environmental conditions at the site, the geotechnical/engineering implications for development of the site are outside of the scope of this report.

4.8.2.2 Ironstone Mining

Ironstone mining is widespread in the Cleveland area, with mining restricted to the area south of the outcrop of the Main Seam (ironstone). Records held by the British Geological Survey (https://largeimages.bgs.ac.uk/iip/mineplans.html?id=011625_01) indicate that all workings are at least 5km south of the site and will therefore not affect the proposed enabling works.

5 Site Specific Geology

The site has been subject to several phases of ground investigation in the past. Several of these investigations cover wider areas than the subject area of this report, a brief summary of the works carried out within the current site boundary is provided below.

Table 8 Historic Ground Investigation Summary

Investigation	Date	Scope	Analysis
Enviros Soil and Groundwater Baseline Characterisation Study, Teesside Works	2004	3 Boreholes (max 8m) 25 Trial Pits (max 5.70m)	**Soil & Water-** pH, Heavy Metals, Cyanide, Sulphate, TPH, GRO,BTEX, Phenols, PAH
CH2M-SSI1 SSI- Redcar-SSI 1 Factual Report	2017	61 trial pits (max 5.00m) Covers northern and central areas	**Soil** Asbestos, pH, Heavy Metals, Cyanide, Sulphate, TPH, BTEX, Phenols, PAH, VOC, SVOC, PCB **Soil Leachate** pH, Heavy Metals, Cyanide, Sulphate, TPH, BTEX, Phenols, PAH, ammoniacal nitrogen
CH2M – SSI2 SSI- Redcar-SSI 2 Factual Report	2017	103 trial pits (max 5.0m) Covers southern area of site	**Soil** Asbestos, pH, Heavy Metals, Cyanide, Sulphate, TPH, BTEX, Phenols, PAH, VOC, SVOC, PCB **Soil Leachate** pH, Heavy Metals, Cyanide, Sulphate, TPH, BTEX, Phenols, PAH, ammoniacal nitrogen
CH2M -Summary Former SSI Steelworks-Initial GI - Geoenvironmental Summary	2018	Interpretative report based on CH2M-SSI1 & SSI2.	N/A
AEG -4153&4154 The Former SSI Steelworks, Redcar-GI Contract -Priority Areas Within SSI Landholdings Contract 1 and Contract 2 (Area A)	2018	13 boreholes (max 40.80m) 5 trial pits (max 4.20m)	**Soil** Asbestos, pH, Heavy Metals, Cyanide, Thiocyanate, Sulphate, TPH, Phenols, PAH, PCB, **Water** pH, Heavy Metals, Cyanide, Thiocyanate, Sulphate, Chloride TPH, BTEX, Phenols, PAH, VOC, SVOC, PCB, ammoniacal nitrogen **Ground Gas** CO_2, CH_4, O_2
Arcadis 2018 Redcar Steelworks-AUK-XX-XX-RP-GE-0001-02-SSI1_SSI2A_GI_SCR	2018	Interpretative assessment of the data included within AEG 4153	**N/A**
AEG 4339 Preliminary Onshore Ground Investigation for Net Zero Teesside.	2021	15 Boreholes (max 37.30m) 8 trial pits (max 4.50m)	**Soil** Asbestos, pH, Heavy Metals, Cyanide, Thiocyanate, Sulphate, TPH, Phenols, PAH, PCB, **Water** pH, Heavy Metals, Cyanide, Thiocyanate, Sulphate, TPH, BTEX, Phenols, PAH, VOC, SVOC, ammoniacal nitrogen **Ground Gas** CO_2, CH_4, O_2

Historic investigation locations are shown on Figures 4 and 5 in Appendix B.

Enviros 2004

The Enviros investigation recorded ground conditions to include a layer of made ground across the entire site. This made ground was predominantly granular in nature and was dominated by slag material, however refractory products, ash and concrete were also encountered as were relict foundations, floor slabs etc. The majority of trial pits terminated within the made ground deposits. The maximum thickness of made ground was recorded as 7.00m.

Natural strata were found at a limited number of locations and were found to include Tidal Flat Deposits (typically silty sand with shells). Shallow clay variously described as soft gravelly clay or peaty clay was recorded at four locations north of the sinter plant. These were encountered at relatively shallow depth and recorded as natural soils, however, it is possible that these are in fact made ground deposits as this area is known to have been reclaimed from the Tees.

Screening of the soil chemical data recorded elevated concentrations of pH and sulphate above the screening criteria adopted, with localised exceedances for PAH, lead and zinc.

Groundwater was interpreted to be flowing to the north/northeast. Chemical analysis recorded exceedances for pH and sulphate at two of there locations, with one location also recorded elevated arsenic and another recording elevated copper and cyanide when compared to the adopted Tier 1 screening values.

CH2M 2017

The CH2M investigation included only trial pits and natural ground was not exposed at any locations. The made ground was found to consist of a mix of predominantly granular material including sand and gravel size fragments of slag with varying proportions of cobble and boulder size fragments of slag. Other materials were also located locally including tyres, conveyor belts and demolition type waste. Locally the made ground was noted to exhibit a hydrocarbon odour.

CH2M concluded that "*geoenvironmental testing of Made Ground indicates that the site is unlikely to be a significant source of leachate from heavy metals and other inorganics. Whilst the site does appear to contain contaminants capable of leaching at concentrations above the screening criteria, they are generally only minor exceedances, generally ranging from just above the screening criteria, in the case of zinc, or one to two orders of magnitude greater than the screening criteria, in the case of chromium.*

CH2M also note that asbestos may be present in made ground. Isolated hotspots of non-aqueous phase liquids (NAPL) and tar were identified within structures and Made Ground.

AEG 2018

Shallow ground conditions were found to be dominated by mainly granular made ground consisting of slag, concrete and refractory material, however locally cohesive made ground was also noted. Made ground was found to extend to depths of up to 9.5m below ground level.

Natural strata were found to consist of Tidal Flat Deposits typically found to consist of a silty shelly sand with rare gravel. This was typically underlain by glacial till- typically a stiff gravelly clay and locally glaciolacustrine deposits -a firm or stiff thinly laminated clay. Locally the till was absent.

Bedrock was recorded as a weak grey mudstone which is consistent with the Redcar Mudstone Formation recorded on geological maps for the area. The mudstone was proved to >40m depth in the southeast of the site.

Arcadis 2018

Arcadis carried out an interpretative review of the factual data provided in AEG 4153.

The assessment concluded that soil samples did not generally pose a risk to human health for a commercial end use, however it was noted that asbestos fibres were present in 10% of samples analysed and this could pose a short-term risk if soils were left exposed on site.

The assessment of concentrations in groundwater noted exceedances of water quality standards which were consistent with soil leaching data. It was noted that the effect on deeper groundwater within bedrock aquifers was limited, however a controlled waters risk assessment should be carried out.

AEG 4331 2021

Further ground investigation was carried out by AEG to support the DCO process. Ground conditions were consistent with those identified in previous phases of investigation and included predominantly granular slag rich made ground overlying Tidal Flat Deposits, Glaciolacustrine deposits and Glacial Till. Bedrock encountered was Redcar Mudstone and was proved to 37.30m depth.

Isolated hotspots of NAPL and tar were identified within structures and Made Ground. A detailed review of the laboratory data is being carried out by Arcadis and will be reported separately [Arcadis 2022a].

6 Data Gaps

The sequence of ground investigation works carried out to date have provided a combined total of 233 sampling locations across the site. These provide a reasonable degree of confidence in ground conditions and chemical composition of soil and groundwater across the site. However, due to the presence of structures it has not been possible to investigate a limited number of areas including:

- Area adjoining the blast furnace complex in the north
- Blast furnace stockhouse and stores area
- Sinter plant.

Limited additional ground investigation should be carried out in these areas once demolition/clearance works have been completed.

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7 Preliminary Conceptual Site Model

This section summarises the findings of this desk-based assessment and site reconnaissance in the form of a geo-environmental conceptual site model (CSM).

The CSM provides a qualitative evaluation of potentially active "pollutant linkages" at the site; these being plausible scenarios whereby a contamination source is connected to a possible receptor by one or more pathways:

- Potential sources of contamination: these include any actual or potentially contaminating materials and activities, located either on or in the vicinity of the site.
- Potential pathways for contamination migration: these comprise the routes or mechanisms by which contaminants may migrate from the source to the receptor including environmental migration pathways and human health exposure pathways; and
- Potential receptors of contamination: these include present and/or future land users, ecological systems, water resources and property.

7.1 Potential Contaminant Sources

Based on the information reviewed in this report, potential areas of concern (PAOC) and contaminants of concern (CoC) sources have been identified associated with Made Ground and associated with former site uses. The table below summarises the most significant potential sources and the primary contaminants associated with these sources. Given the size of the site, its long industrial history and the numerous potential point sources present it is not considered practical to list all identified sources here. However table 2 below sets out the identified CoC representative of those likely to be present from other less significant sources.

Table 9 - Potential Contamination Sources

Source / PAOC	Potential Contaminants[1]
On Site	
Made Ground including infilled ponds (mainly slag)	Contaminants include heavy metals, asbestos, hydrocarbons (TPH), polyaromatic hydrocarbons (PAH), pH (acids alkalis) sulphate, sulphur, sulphide, cyanides, thiocyanide. Bulk gases (methane, carbon dioxide) if organic matter present.
Former industrial uses - iron and steel making plant • Blast Furnace Stockhouse • Workshop / stores • Vehicle maintenance • RDL Stores • Pellet Plant • Sinter Plant • Heavy Fuel Oil line • Current and historical tanks	Asbestos, pH, heavy metals, cyanides, thiocyanide, sulphate, TPH including tar, BTEX, phenols, PAH, volatile and semi volatile organic compounds (VOC and SVOC), polychlorinated biphenyls (PCBs), ammoniacal nitrogen
Macadam works	Asbestos, TPH and tars, BTEX, phenols, PAH, VOC, SVOC

[1] This section has been informed with reference to the Industry Profile Metal Manufacturing Refining and Finishing Works – Iron and Steelworks, Gas Works, Coke Works, Coal Carbonisation Plants, and Railway Land produced by the Department of the Environment 1995.

Source / PAOC	Potential Contaminants[1]
Railways	Asbestos, hydrocarbons, ash, PAH, phenol, sulphates, PCBs
Substations	Asbestos, hydrocarbons, PAH, PCBs
Material Storage - Coal/coke breeze, ore, pellet, and sinter,	PAH and metals
Natural geology- Peat *	May give rise to bulk gases (methane, carbon dioxide) if present in superficial
Natural Geology- sulphates *	Redcar Mudstone and Mercia Mudstone group may contain elevated concentrations of sulphate associated with gypsum, pyrite etc. On weathering these may release sulphate ions which can be aggressive to concrete. Similar conditions may also exist where superficial deposits (e.g. glacial till)
Off site	
Made Ground	Contaminants include heavy metals, asbestos, hydrocarbons, acids, alkalis, sulphate, phosphate. Bulk gases (methane, carbon dioxide) if organic matter present.
Tar Lagoon	Tar, PAH, TPH, phenols, SVOC, BTEX
Redcar Coke Ovens (RCO),	Asbestos, pH (acids and bases), Heavy Metals, Cyanide, Sulphate, TPH including tar, BTEX, Phenols, PAH, VOC, SVOC,, nitrogen compounds including ammoniacal nitrogen, glycols.
Power station, and blast furnace complexes	Asbestos, pH (acids and bases), Heavy Metals, TPH, PAH, PCBs

The PAOC are shown on Figure 6 in appendix B.

The following CoC have been discounted as the processes are understood not to have taken place on the site, tin (tinning), and fluoride (pickling with hydrofluoric acid). Phosphorus has been discounted as it is only found within early steel slags and phosphorous pentoxide has not been identified in the petrology testing conducted as the site.

Given the distance from the site and the groundwater flow direction identified by previous ground investigation the RCO have been discounted as posing a significant risk to the site and is not considered further.

7.2 Potential Receptors

7.2.1 Human Health

The principal human health receptor will be future site users. There are no neighbouring residents, however members of the public may visit the adjoining beach/dunes to the north of the site.

The acute risk posed to redevelopment workers will be addressed by construction phase planning and health and safety management.

Other receptors may become relevant following any future development of the site.

7.2.2 Controlled Waters

Controlled waters beneath the site include two superficial Secondary A aquifers (Tidal Flat Deposits and Wind Blown Sand) two Secondary Undifferentiated bedrock aquifers (Redcar Mudstone and Penarth Group), and a Secondary B bedrock aquifer (Mercia Mudstone).

It is also noted that Glacial Till is classed as a Secondary Undifferentiated aquifer. This classification is applied as Glacial Tills may include granular horizons which may be water bearing/permeable strata. However, significant ground investigation has been carried out on the site which has demonstrated that the Glacial Till is dominated by low permeability clay deposits and so this classification is considered overly conservative.

It is also noted that the Sherwood Sandstone Principal Aquifer is present beneath the site. However, the desk study has revealed that this aquifer is at significant depth (>250m) beneath the site and so is not considered a potential receptor at the site.

The site is not located within a groundwater source protection zone, and due to the industrial history of the area there is little/no possibility that groundwater will be abstracted for potable use.

Other potential controlled waters to be assessed at the site include the North Sea approximately 700m north and understood to be hydraulically down gradient of the site and the Fleet located approximately 150m southeast of the site, the Fleet discharges to the River Tees and the Tees Estuary which should also be considered potential receptors.

While it is reported that surface water ponds to the north of the site have been receding since cessation of the use of water for quenching at the Redcar Blast Furnace, these are considered potential receptors at this time as are further ponds to the south.

7.2.3 Built Receptors

The contaminants/potential contaminants on site (in particular ground gases, sulphates and hydrocarbons) may pose a risk to built infrastructure including new buildings, subsurface concrete and water supply pipes. However, the proposed enabling works will not introduce such receptors, so these contaminants can be excluded from further assessment at this stage.

7.3 Potential Pathways

Potential pathways are the routes that link the receptor to the contamination. The potential pathways for this site are summarised in the table below.

Table 10 - Potential Contamination Pathways

Receptor	Pathway
Human Health	Direct contact pathways via which ground contaminants can migrate to human receptors by ingestion and/or absorption - Soft landscaped areas considered to have active direct contact pathway, and direct contact will be active during construction phase when sub-surface soils are exposed/excavated. Airborne pathways via which particulate and/or vaporised ground contaminants can migrate to sensitive receptors within soil (air pores), and the above ground atmosphere
Controlled Waters (Aquifer)	Aquifers are considered of low value/sensitivity due to the industrial history of the area, however potential for leaching of contaminants from soil .to the aquifers is considered active.
Controlled Waters (Surface Water)	The North Sea and ponds in the vicinity of the site are considered potential receptors for site derived contaminants. Notwithstanding anecdotal evidence that the ponds are drying up, the pathway for leaching of site derived contaminants is considered active.

7.4 Preliminary Qualitative Risk Assessment

This assessment has been conducted in the context of the proposed development as outlined in Section 1.3

Table 11 - Preliminary Qualitative Risk Assessment

Potential Receptor	Potential Source	Potential Pathway	Comment
Future Site Users*	Made Ground Point sources of contamination (Section 7.1) including NAPL and tar	Particulate inhalation / dermal contact / ingestion	**Current** Overall risks low given the given the findings of the previous investigation. However, risks cannot be discounted. **Following Development** To be addressed to a level of no unacceptable risk by the GQRA / DQRA which will inform control measure to be implemented as defined by the Remediation Strategy

Potential Receptor	Potential Source	Potential Pathway	Comment
Future Construction Workers	Made Ground Point sources of contamination (Section 7.1) including NAPL and tar Ground Gases	Particulate inhalation / dermal contact / ingestion	Risks to Construction Workers – any redevelopment and construction work should be conducted in full recognition of HS(G)66*1996)*.
Members of pubic	Made Ground Point sources of contamination (Section 7.1) including NAPL and tar	Vertical migration from on-site impacts leaching into groundwater which migrates off-site resulting in indoor/outdoor vapour inhalation	**Current** Overall risks very low given development history. Unknown depth to groundwater or nature of made ground. **Following Development** To be addressed to a level of no unacceptable risk by the GQRA / DQRA which will inform control measure to be implemented as defined by the Remediation Stratergy.
Controlled Water (Tidal Flat Deposits and Wind Blown Sand Aquifer)	Made Ground Point sources of contamination (Section 7.1) including NAPL and tar	Vertical migration from on-site impacts leaching into groundwater body. Potential for preferential pathways down existing piled foundations.	**Current** Overall risks low given the site setting, low sensitivity of the receptor which is indicated to be brackish and of low resource value. However, the risks cannot be discounted. **Following Development** To be addressed to a level of no unacceptable risk by the GQRA / DQRA which will inform control measure to be implemented as defined by the Remediation Stratergy. The proposed development as outlined in Section 1.3 indicates the removal of point sources of contamination such as NAPL and tar, as such the risk from these should be eliminated following completion of the work. The creation of an engineered development platform will reduce infiltration and in the long term reduce the potential for leaching of CoC from Made Ground to the aquifers. Removal of historic structures including piles to 2.5-3.5m bfl (below floor level) will remove preferential pathways from surface to this depth and reduce the potential for downward migration of CoC.

Potential Receptor	Potential Source	Potential Pathway	Comment
Controlled Water (Redcar Mudstone Formation, Penarth Group and Mercia Mudstone)	Made Ground Point sources of contamination (Section 7.1) including NAPL and tar	Vertical migration from overlying aquifers in superficial deposits. Potential for preferential pathways down existing piled foundations.	**Current** Overall risks low given the site setting, low sensitivity of the receptor which is indicated to be brackish of limited permeability, and of low resource value (based on its current classification under the WFD. However, the risks cannot be discounted. **Following Development** To be addressed to a level of no unacceptable risk by the GQRA / DQRA which will inform control measure to be implemented as defined by the Remediation Stratergy. The proposed development as outlined in Section 1.3 indicates the removal of point sources of contamination such as NAPL and tar, as such the risk from these should be eliminated following completion of the work. The creation of an engineered development platform will reduce infiltration to the overlaying superficial aquifers and in the long term reduce the potential for downward migration of CoC. Removal of historic structures including piles to 2.5-3.5m bfl will remove preferential pathways from surface to this depth and reduce the potential for downward migration of CoC.

Potential Receptor	Potential Source	Potential Pathway	Comment
Controlled Water (Surface Water)	Made Ground Point sources of contamination (Section 7.1) including NAPL and tar	Vertical migration from on-site impacts leaching into groundwater body and lateral migration off site.	The North Sea is considered primary surface water receptor due to identified groundwater flow direction this assessment considered protective of other surface water features **Current** Overall risks low given the distance to the receptor, and the lack of tidal influence. However, the risks cannot be discounted. **Following Development** To be addressed to a level of no unacceptable risk by the GQRA / DQRA which will inform control measure to be implemented as defined by the Remediation Stratergy. The proposed development as outlined in Section 1.3 indicates the removal of point sources of contamination such as NAPL and tar, as such the risk from these should be eliminated following completion of the work. The creation of an engineered development platform will reduce infiltration to the overlaying superficial aquifers and in the long term reduce the potential for discharge of CoC from the aquifer to the surface water feature.

* Future Site Users are for a generic commercial / industrial use, and as such would need to be reviewed in the context of a specific development.

7.4.1 Overall Environmental Risk

Based on the information contained within this report, the overall risk to the environment is considered to be **Low**, given the limited sensitivity of the receptors and the wider industrial nature of the area.

However, as noted above, further investigation should be carried out in a limited number of areas which have not been accessible due to structures etc. and further assessment of the risk to surface water and controlled aquifers will be required.

Remedial and earthworks strategies and an construction phase environmental management plan will need to be developed to ensure any risk is not exacerbated during the enabling earthworks.

8 Conclusion

This Phase I report presents an assessment of the geo-environmental information pertaining to the site based on readily available desktop / published sources and a site reconnaissance walkover survey.

The objective of this assessment was to collate and review the available geo-environmental information to determine potential ground contamination risks associated with the site in its current condition and with regards to its future development prospects.

8.1 Geo-Environmental Risks

The likely main risks associated with the site is the potential for poor ground conditions related to the presence of made ground. The overall geotechnical risk is considered **Low** at this stage.

Based on a review of the available information, it is unlikely that historical and current land uses of the site will have generated significant contamination impacts to soil and/or groundwater. There is however potential for localised contamination to be present resulting from made ground during construction of the development platform.

The preliminary risk to human health and controlled waters associated with potentially “active” Source-Pathway-Receptor linkages is generally considered to be **Low** at this stage.

Construction materials associated with the site may include materials which would be classed as hazardous waste.

8.2 Recommendations

The overall environmental risks are considered to be low and resulting from potential made ground on site. The ground investigation within data gaps should focus on understanding presence and extent of made ground on site, and the contaminants within the made ground, which would enable assessment if potential pollutant linkages do exist and recommendations for further works / mitigations as part of the redevelopment.

APPENDIX A

Arcadis Study Limitations

This section should be read before reliance is placed on any of the information, opinions, advice, recommendations, or conclusions contained in this report.

1. This report has been prepared by Arcadis (UK) Ltd (Arcadis), with the reasonable skill, care and diligence within the terms of the Appointment and with the resources and manpower agreed with the Client. Arcadis does not accept responsibility for any matters outside the agreed scope.
2. This report has been prepared for the sole benefit of the Client unless agreed otherwise in writing. The contents of this report may not be used or relied upon by any person other than this party without the express written consent and authorisation of Arcadis.
3. Unless stated otherwise, no consultations with authorities or funders or other interested third parties have been carried out. Arcadis is unable to give categorical assurance that the findings will be accepted by these third parties as such bodies may have unpublished, more stringent objectives. Further work may be required by these parties.
4. All work carried out in preparing this report has used, and is based on, Arcadis' professional knowledge and understanding of current relevant legislation. Changes in legislation or regulatory guidance may cause the opinion or advice contained in this report to become inappropriate or incorrect. In giving opinions and advice, pending changes in legislation, of which Arcadis is aware, have been considered. Following delivery of the report, Arcadis has no obligation to advise the Client or any other party of such changes or their repercussions.
5. This report is only valid when used in its entirety. Any information or advice included in the report should not be relied upon until considered in the context of the whole report.
6. Whilst this report and the opinions made are correct to the best of Arcadis' belief, Arcadis cannot guarantee the accuracy or completeness of any information provided by third parties. Arcadis has taken reasonable steps to ensure that the information sources used for this investigation provided accurate information and has therefore assumed this to be the case.
7. This report has been prepared based on the information reasonably available during the project programme. All information relevant to the scope may not have been received.
8. This report refers, within the limitations stated, to the condition of the Site at the time of the inspections. No warranty is given as to the possibility of changes in the condition of the Site since the time of the assessment.
9. The content of this report represents the professional opinion of experienced environmental consultants. Arcadis does not provide specialist legal or other professional advice. The advice of other professionals may be required.
10. Unless otherwise stated the report provides no comment on the nature of building materials, operational integrity of the facility or on any regulatory compliance issues.
11. Unless otherwise stated, an inspection of the Site has not been undertaken and there may be conditions present at the Site which have not been identified within the scope of this assessment.
12. Unless otherwise stated, samples from the Site (soil, groundwater, building fabric or other samples) have not been obtained.
13. Arcadis has relied upon the accuracy of documents, oral information and other material and information provided by the Client and others, and Arcadis assumes no liability for the accuracy of such data, although in the event of apparent conflicts in information, Arcadis would highlight this and seek to resolve.
14. Unless otherwise stated, the scope of works has not included an environmental compliance review, health and safety compliance review, hazardous building materials assessment, Interviews or contacting Local Authority, requests for information to the petroleum officer, sampling or analyses of soil, ground water, surface water, air or hazardous building materials or a chain of title review.
15. Unless otherwise stated, this assessment has considered the ongoing use of the Site and has not been prepared for the purposes of redevelopment which may act as a trigger for Site investigation and remediation works not needed for ongoing us.

APPENDIX B

Figures

Legend

Land West of Warrenby

Red Line

0 750 1500 m

Notes:

REPRODUCED FROM OS MASTERMAP BY PERMISSION OF ORDNANCE SURVEY® ON BEHALF OF THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE. © CROWN COPYRIGHT. ALL RIGHTS RESERVED. LICENCE NUMBER GD 100024393.

CONTACT ARCADIS IN CASE OF ANY QUERIES.

N

Title: Land West of Warrenby - Site Location Plan

Site:
Teesworks - Land West of Warrenby

Client:
South Tees Development Corporation

Project:
10035117

Figure 1

Date: 12/04/2022
Drawn By: DW
DRG No: 10035117-AUK-XX-XX-DR-ZZ-0514-01-Land West Warrenby SLP

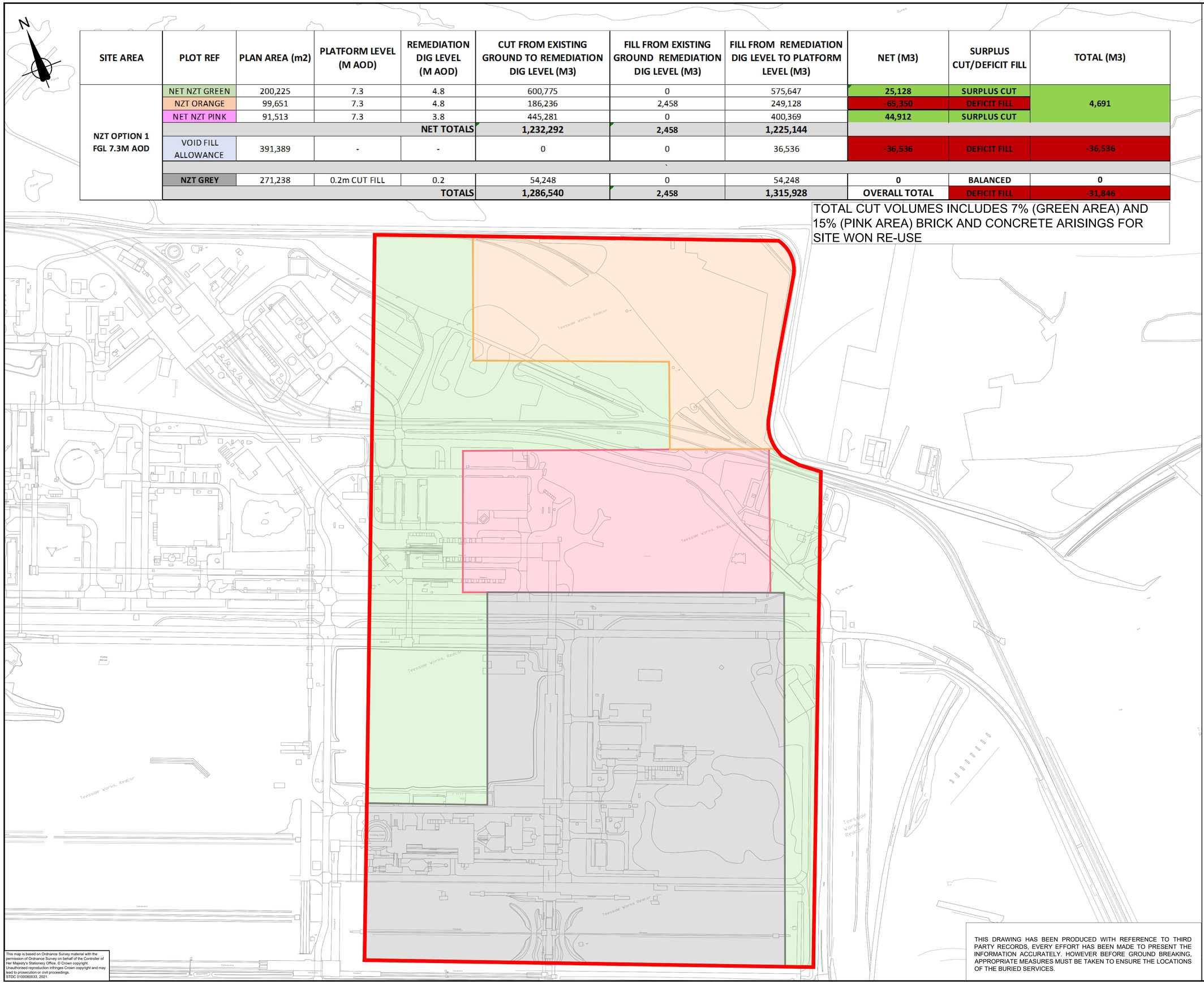
ARCADIS Design & Consultancy for natural and built assets

DO NOT SCALE

Millimetres 100 10 0

SITE AREA	PLOT REF	PLAN AREA (m2)	PLATFORM LEVEL (M AOD)	REMEDIATION DIG LEVEL (M AOD)	CUT FROM EXISTING GROUND TO REMEDIATION DIG LEVEL (M3)	FILL FROM EXISTING GROUND REMEDIATION DIG LEVEL (M3)	FILL FROM REMEDIATION DIG LEVEL TO PLATFORM LEVEL (M3)	NET (M3)	SURPLUS CUT/DEFICIT FILL	TOTAL (M3)
NZT OPTION 1 FGL 7.3M AOD	NET NZT GREEN	200,225	7.3	4.8	600,775	0	575,647	25,128	SURPLUS CUT	4,691
	NZT ORANGE	99,651	7.3	4.8	186,236	2,458	249,128	-65,350	DEFICIT FILL	
	NET NZT PINK	91,513	7.3	3.8	445,281	0	400,369	44,912	SURPLUS CUT	
				NET TOTALS	1,232,292	2,458	1,225,144			
	VOID FILL ALLOWANCE	391,389	-	-	0	0	36,536	-36,536	DEFICIT FILL	-36,536
	NZT GREY	271,238	0.2m CUT FILL	0.2	54,248	0	54,248	0	BALANCED	0
				TOTALS	1,286,540	2,458	1,315,928	OVERALL TOTAL	DEFICIT FILL	-31,846

TOTAL CUT VOLUMES INCLUDES 7% (GREEN AREA) AND 15% (PINK AREA) BRICK AND CONCRETE ARISINGS FOR SITE WON RE-USE



THIS DRAWING HAS BEEN PRODUCED WITH REFERENCE TO THIRD PARTY RECORDS, EVERY EFFORT HAS BEEN MADE TO PRESENT THE INFORMATION ACCURATELY. HOWEVER BEFORE GROUND BREAKING, APPROPRIATE MEASURES MUST BE TAKEN TO ENSURE THE LOCATIONS OF THE BURIED SERVICES.

NOTES

1. DO NOT SCALE FROM THIS DRAWING
2. IN ALL AREAS, PARTICULARLY THE GREEN AND PINK SHADED AREAS, THERE IS A FIRM LIKELIHOOD THAT EXCAVATION WILL NEED TO BE ADVANCED TO GREATER DEPTHS LOCALLY TO REMOVE CERTAIN BURIED STRUCTURES/FEATURES AND/OR TO ADDRESS THE REMOVAL OF CONTAMINATED SOILS

KEY

NZT SITE DEVELOPMENT BOUNDARY, INCLUSIVE OF TEMPORARY CONSTRUCTION LAYDOWN AREA.

THIS FORMS THE ENVELOPE OF THE REMEDIATION WORKS CONTRACT, EXCLUSIVE OF NOMINAL OVER DIG AT ONE OR MORE OF THE BOUNDARIES AND AREAS EXTERNAL TO THIS SITE THAT MAY BE ASSIGNED FOR MATERIALS PROCESSING

THE PROPOSED FINISHED GROUND LEVEL FOR THE REMEDIATION WORKS IS 7.3 AOD

REQUIRED MINIMUM EXCAVATION DEPTH IS 2.5m BELOW THE PROPOSED FINISHED REMEDIATION WORKS LEVEL, i.e., 4.8m AOD

REQUIRED MINIMUM EXCAVATION DEPTH IS 3.5m BELOW THE PROPOSED FINISHED REMEDIATION WORKS LEVEL, i.e., 3.8m AOD

REQUIRED GROUND REMEDIATION WORKS WILL TYPICALLY INVOLVE A LIMITED PROGRAMME OF EXCAVATION AND FILLING (TO SHALLOWER DEPTHS THAN THE AREAS SHADED GREEN AND PINK), WITH THE NEED TO REMOVE BURIED RELIC FOUNDATIONS AND SIMILAR BEING MORE SELECTIVE.

WORKS TO THIS AREA MAY ALSO INCLUDE FILLING UTILISING RESIDUAL MATERIALS FROM THE GREEN, PINK AND GREY SHADED AREAS.

THIS IS THE PROPOSED CONSTRUCTION LAYDOWN AREA FOR THE FOLLOW-ON NZT PROJECT, THAT WILL BE ACCESSED, IN PART, POTENTIALLY FROM JULY 2023, WITH OCCUPANCY INCREASING TO THE END OF 2023.

THE REQUIRED GROUND REMEDIATION WORKS WILL LARGELY BE CONTAINED TO SITE CLEARANCE, A SURFACE SCRAPE, AND A GENERAL, RELATIVELY MINOR CUT/FILL LEVELING OF THE AREA, FOLLOWING WHICH, THE AREA MAY BE CAPPED WITH GRANULAR FINISHING LAYER.

FOR INFORMATION

Rev.	Date	Description	By	Chk'd	App'd
C	29.04.22	VOLUMES UPDATED	LCD	LCD	JMC
B	21.02.22	VOLUMES UPDATED	LCD	LCD	JMC
A	15.02.22	FIRST ISSUE	KW	LCD	JMC

STDC
Teesside Management Offices,
Redcar, TS10 5QW
www.southteesdc.com

South Tees Development Corporation

Project Title:

TEESWORKS
The UK's largest industrial zone

Drawing Name:

NET ZERO TEESSIDE OUTPUT FOR REMEDIATION STRATEGY/MMP

Drawn by: KW	Date: FEB 2022
Checked by: LCD	Date: FEB 2022
Approved by: JMc	Date: FEB 2022

Drawing Number:	Revision:
TSWK-STDC-NZT-ZZ-DR-C-0005	C
Drawing Scale: 1:2000	Page Size: A1

Legend

Land West of Warrenby

Red Line

0 100 200 300 m

Notes:

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CONTACT ARCADIS IN CASE OF ANY QUERIES.

N

Title: Land West of Warrenby - Redline Boundary

Site:
Teesworks - Land West of Warrenby

Client:
South Tees Development Corporation

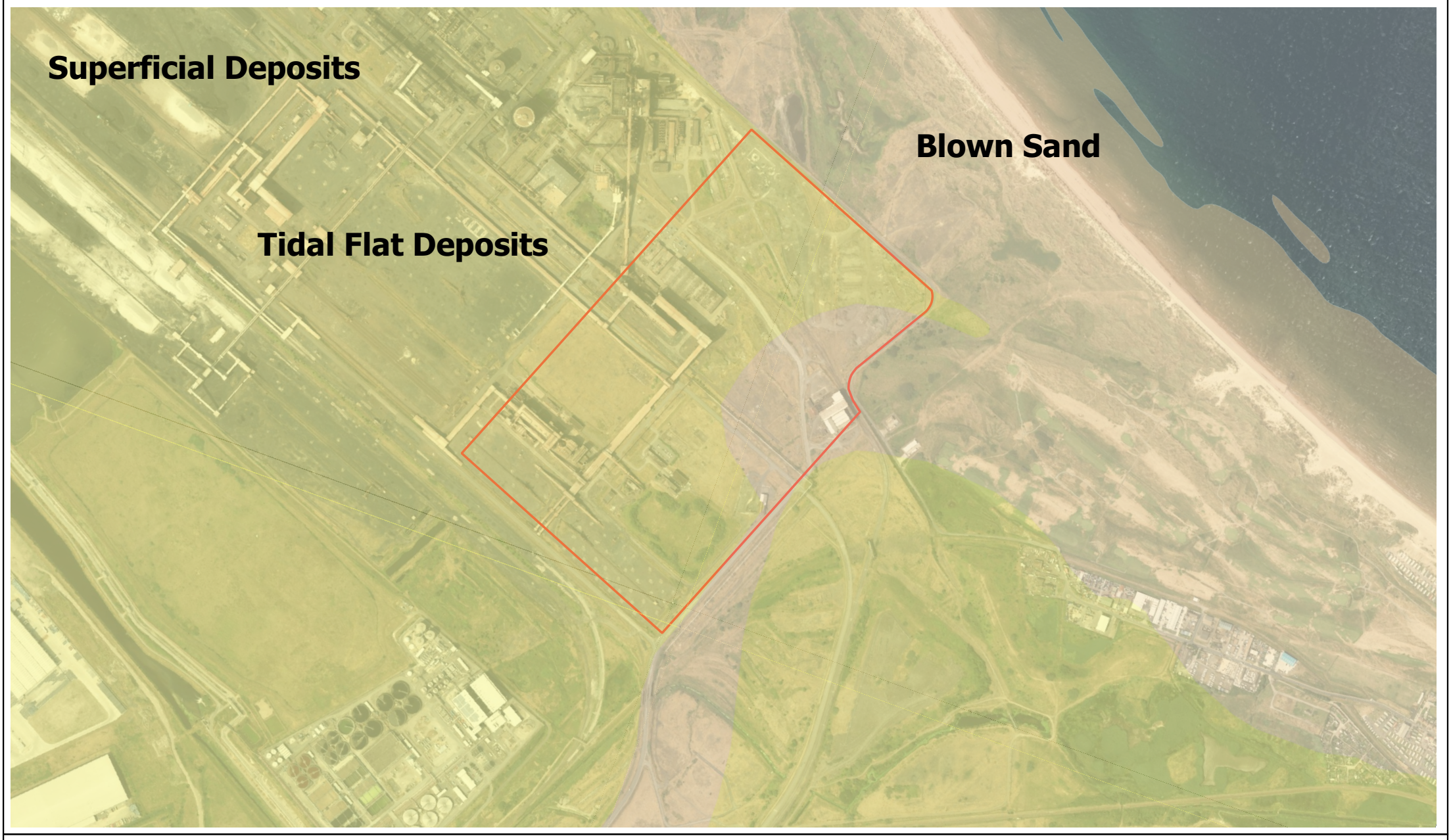
Project:
10035117

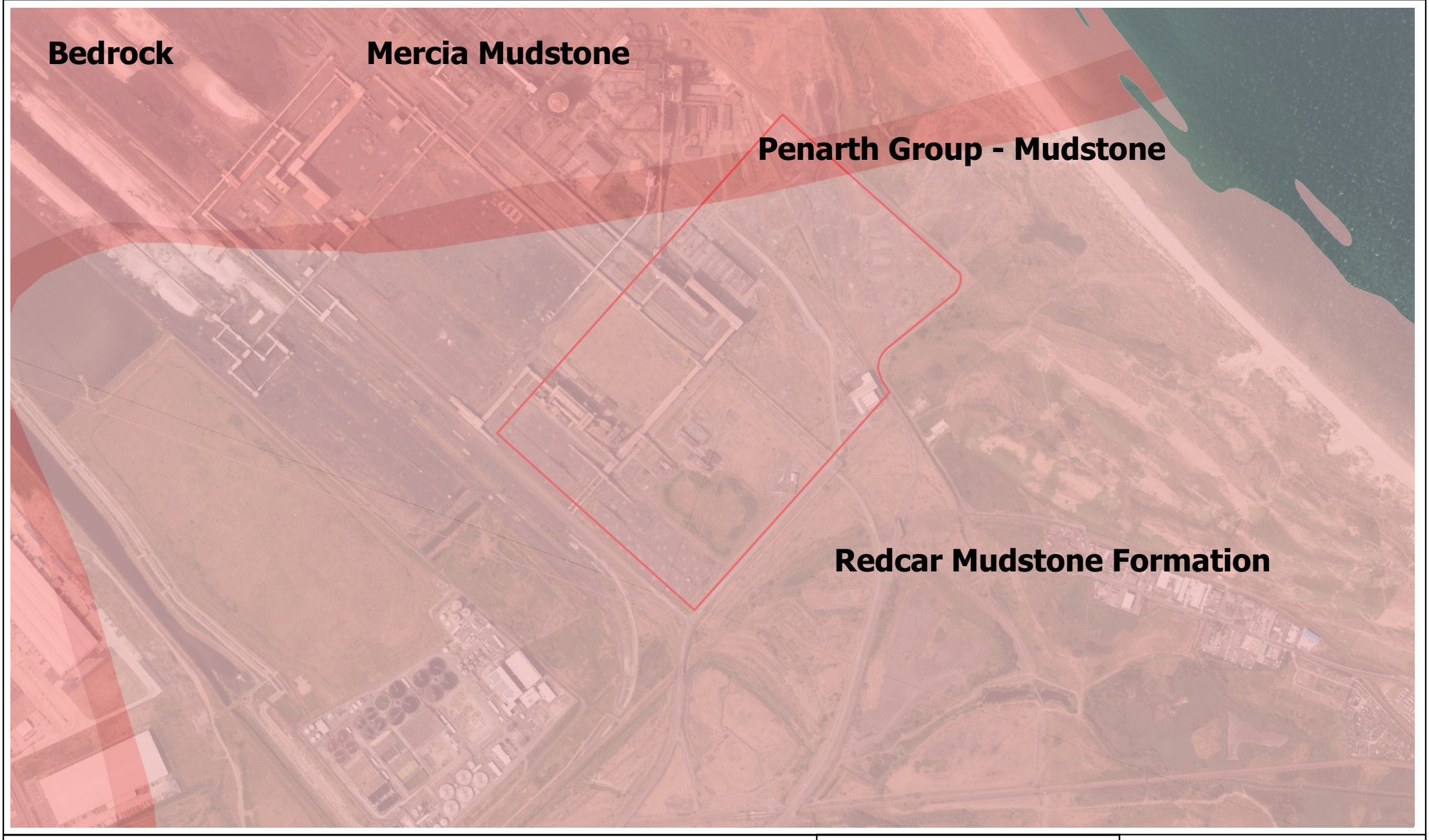
Figure 2

Date: 12/04/2022
Drawn By: DW
DRG No: 10035118-AUK-XX-XX-DR-ZZ-0515-01-Land West Warrenby Redline

ARCADIS Design & Consultancy for natural and built assets

RESERVATION
Class 1 Road 9m wide
AREA F
Future Road 9m wide
CONTRACTOR'S AREA A1
5·500 OD
AREA B1
7·300 OD
Existing Service Reservation
Existing Access Road to be kept open.
Existing 11 kV Cable (approx. location)
Existing Buildings
AREA B2
7·300 OD
RESERVATION
Flow in Existing Water-Courses to be diverted
Note:- Area 3, between 1681E and 2130E is finished 300 below final stockyard level. Stockyards to be brought up to finished level by others
Class 3 Road 9m wide by others
Class 3 Road 9m wide by Others
CONTRACTOR'S AREA A2
5·500 OD
Location & No. of 225mm ø cable duct crossing underneath roads. For details of crossing see Drg No. 3255.06.CI.4002
SERVICE
PELLET PLANT AREA
AREA 1A
5·500 OD
Re-routed electric cables
Ducts under road & rail
Existing 2.75 kV Cable (approx. location)
Match Line
BOTTOM OF RAIL TRACK EXCAVATIONS TO BE BONED IN 300 BELOW ADJACENT TERRACE LEVEL.
AREA 4
AREA 3
SINTER PLANT AREA AREA 2A
5·500 OD
Bank to be cut away and road temporarily upheld, as necessary, to accommodate local foundation construction by Civil Contractor
TRANSFER PIT
Final stockyard level - See also note above
Flow in existing drain to be maintained until foul discharge is diverted into permanent drainage system and Borrow Area A is filled to terrace level.
AREA 2B
7·300 OD
AREA 1B
7·300 OD
Existing 11 kV Cable (approx. location)
Existing Service Reservation
Site Prep Contractor and Resident engineers offices
Sub-contract No2 Piling contractors Area
For details of water supply to Contractors Areas see drg No 3255/06/CI/4205
Existing 300ø W.M.
Existing Road 9m wide
Existing Road 9m wide
Existing 300ø W.M.
Existing Rail Tracks
Signal Cabin
Existing Electric Cable Reservation
Existing Electric Cable Reservation
Contractor to supply and erect a temporary access bridge over British Rail Line
Warrenby Hall Bridge
ZERO
Kerb line at change of direction to be radiused by eye
Existing drain to be extended as shown in 300 mm Class H o.g. jointed concrete pipe.
AREA 8A
5·200 OD
Note:- This area is filled to 5.00 OD pending finalisation of stockyard details
Temporary Decanting Outlets as required for Hydraulic Fill Process
Existing fill to be removed by others in future contract
AREA 7
5·200 OD
These areas to be filled with slag to cover tar deposits
Existing Tars (liquid)
Hydraulically placed sand stockpiled in this area.
DECANTING CHANNEL
Existing P.F. Boiler Ash
Approx. 9·150 O.D.
Existing P.F. Boiler Ash
NOTE: Existing liquid tars etc. to be removed by I.C.I. Access should be available in Sept. 1978
Existing Chemical Waste (solidified)
Training Wall Type K
Selected large stones to be hand-pitched around end of pipes
1600 E
1750 E
2000 E
2250 E
2500 E
2750 E
3000 E
500 N
250 N
ZERO
250 S
REVISIONS
J Road on 417·500N Revised and roads in Pellet/Sinter Area taken out of the Contract
K Trench Foundations in Areas 3 and Sections A-A added
L "Layout" of road on 40·5S revised
M East end of road 40·5S finalised.
N AS BUILT DETAILS ADDED
P SOUTH EDGE AREA 7 EXTENDED
FOR GENERAL NOTES & LEGEND see drg. no. 3255/05/CI/4026
Drg No. 3255·05·CI·4028 Sheet 3
Drg No. 3255·05·CI·4030 Sheet 4
Drg No. 3255·05·CI·4026 Sheet 1
Sheet 2
KEY PLAN
British Steel Corporation
General Steels Division
Development Engineering Department
(Teesside)
SITE PREPARATION CONTRACT PHASE A
W. S. Atkins & Partners
REDCAR





Legend

Land West of Warrenby

Red Line

N

0 100 200 300 400 500 m

Maps

GBR BGS 1:50k Superficial deposits

GBR BGS 1:50k Bedrock

Notes:

CONTACT ARCADIS IN CASE OF ANY QUERIES.

Title: Land West of Warrenby Geology

Site:
Teesworks - Land West of Warrenby

Client:
South Tees Development Corporation

Project:
10035117

Figure 3

Date: 12/04/2022
Drawn By: DW
DRG No: 10035119-AUK-XX-XX-DR-ZZ-0516-01-Land West Warrenby Geology

ARCADIS Design & Consultancy for natural and built assets

Legend

Historic Boreholes

Location Type

- Borehole
- Monitoring Well

Land West of Warrenby Boundary

- Red Line

Notes:

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CONTACT ARCADIS IN CASE OF ANY QUERIES.

N

Title: Land West of Warrenby - Historic Boreholes

Site:
Teesworks - Land West of Warrenby

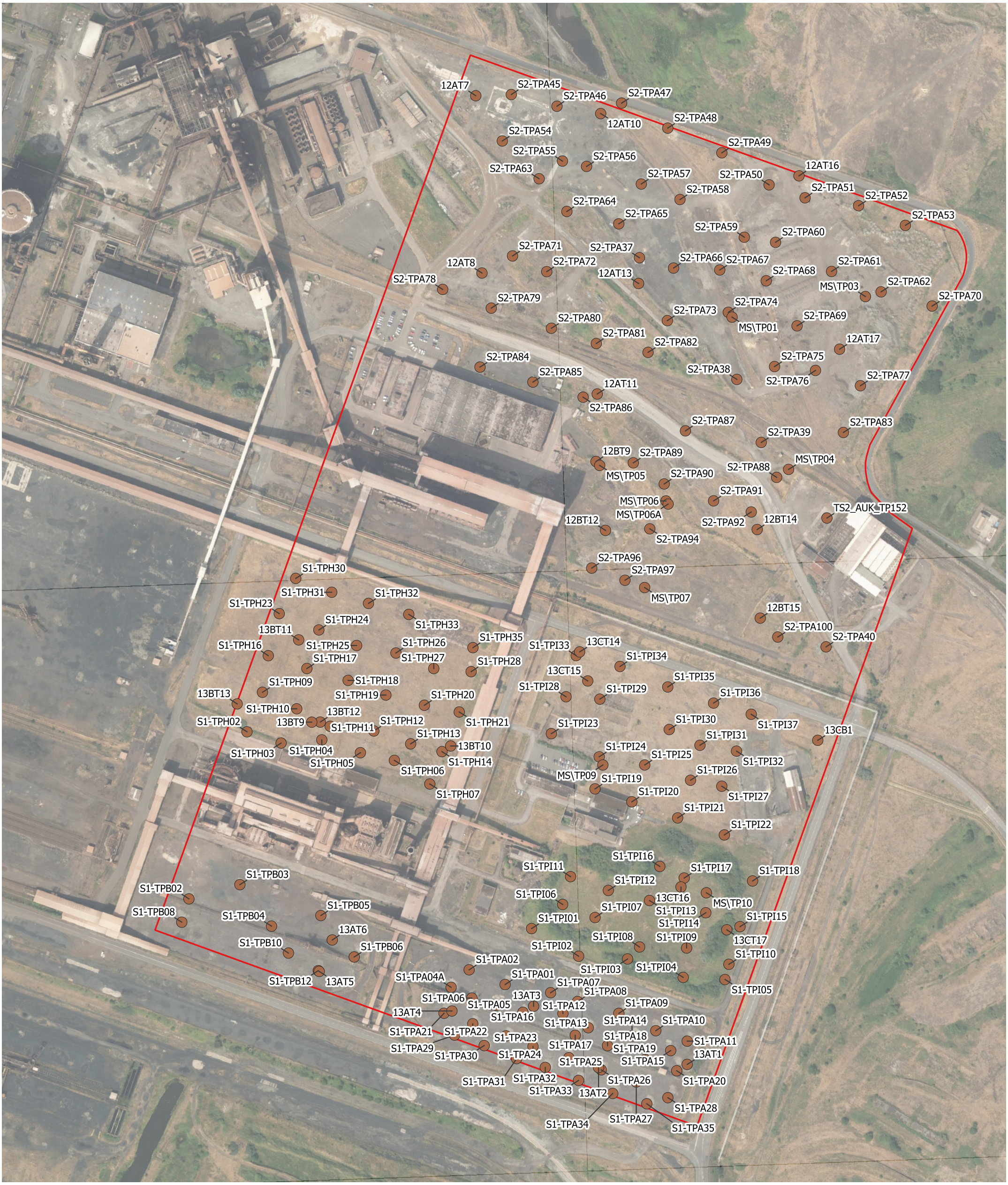
Client:
South Tees Development Corporation

Project:
10035117

Figure 4

Date: 12/04/2022
Drawn By: DW
DRG No: 10035120-AUK-XX-XX-DR-ZZ-0517-01-Land West Warrenby Hist Boreholes

ARCADIS Design & Consultancy for natural and built assets



Legend

Historic Trial Pits

Location Type

- Trial Pit

Land West of Warrenby Boundary

- Red Line

Notes:

CONTACT ARCADIS IN CASE OF ANY QUERIES.

N

Title: Land West of Warrenby - Historic Trial Pits

Site:
Teesworks - Land West of Warrenby

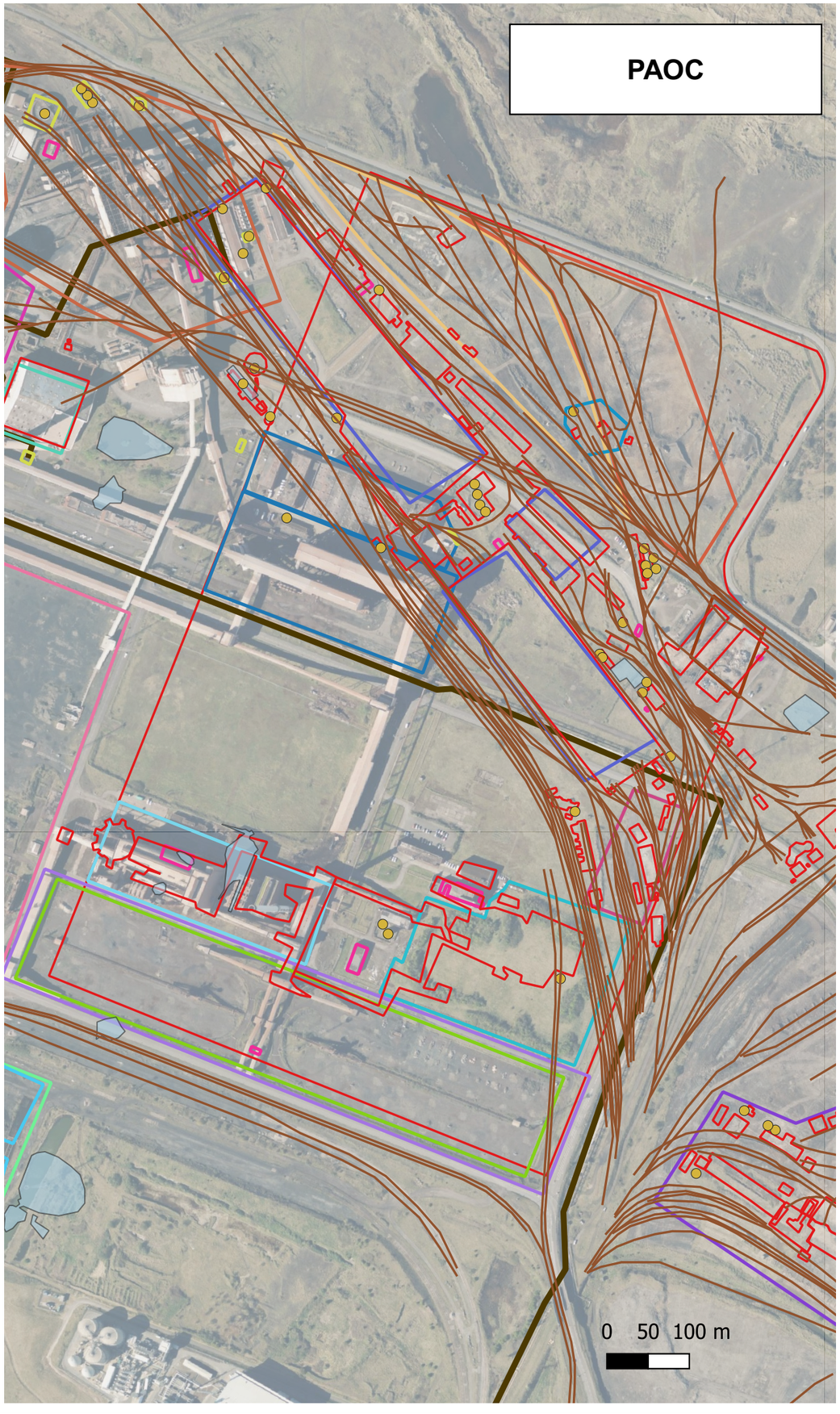
Client:
South Tees Development Corporation

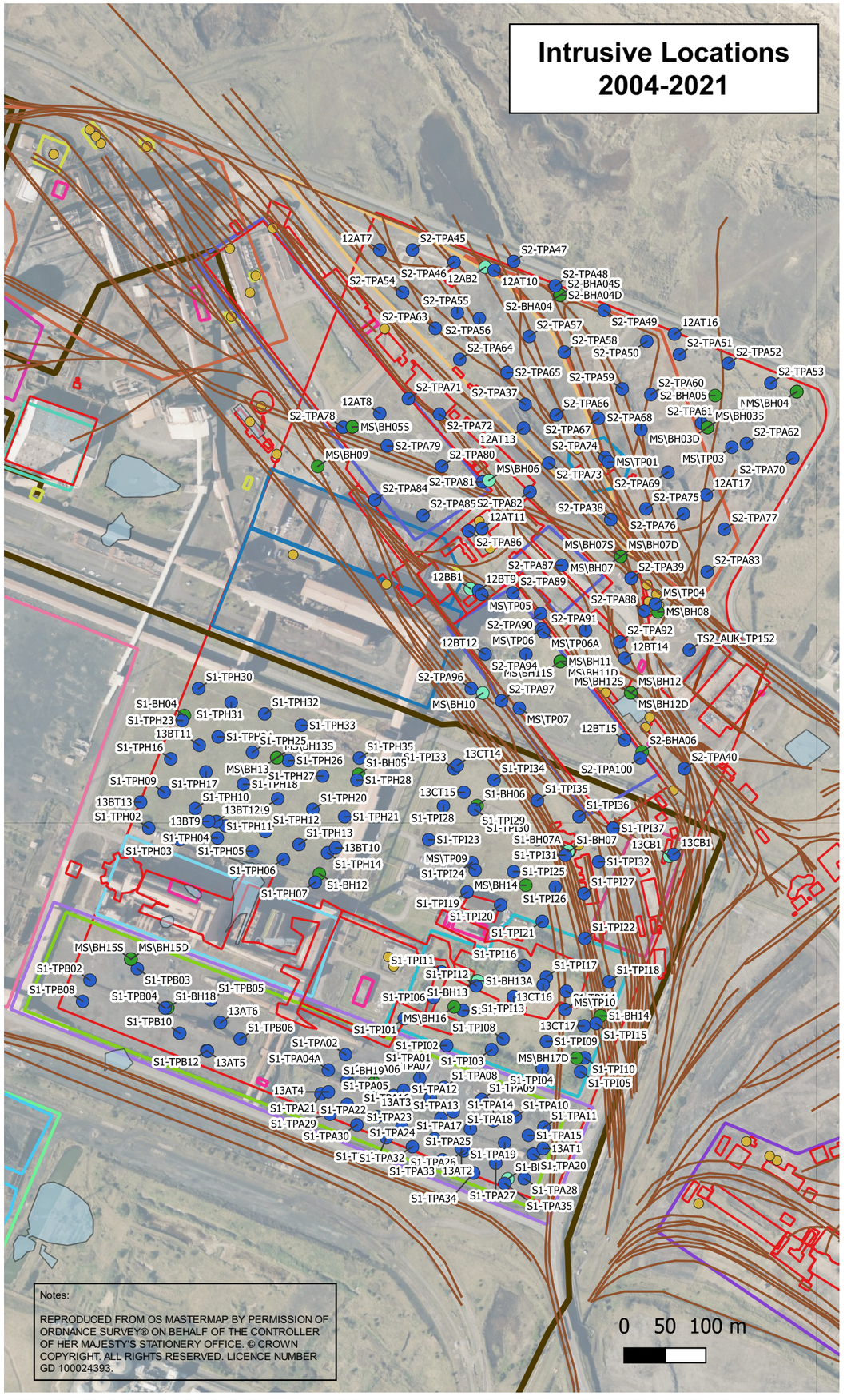
Project:
10035117

Figure 5

Date: 12/04/2022
Drawn By: DW
DRG No: 10035121-AUK-XX-XX-DR-ZZ-0518-01-Land West Warrenby Hist Trial Pits

ARCADIS Design & Consultancy for natural and built assets





Notes:

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Legend

PAOC

STDC Shapefile Data

- Rail / Rail Sidings
- Tank Records
- Infilled Ponds
- Building Records

Merged

- Blast Furnace
- Blast Furnace Stockhouse
- Blended Coal Stocks
- Blended Ore stocks
- By-Products Plant
- Disposal Area
- Existing Tanks
- Former Redcar Iron Works
- Historical Steel Processing
- Pellet Plant
- Pellet Stocking
- Ponding Area
- Power Station
- Sinter Pellet Stocks
- Sinter Plant
- Substation
- Tar Lagoon
- Tar Macadam Works
- Vehicle Maintenance
- Workshop/Stores
- RDL Stores

N

Utilities STDC Data

- FuelOil(L)

- STDC_Remediation_Boundary

Bing

Project: 10035117	Figure 6

Date: 26/07/2022
Drawn By: JALM
DRG No: 10035117-AUK-XX-XX-DR-ZZ-0557-01-LWoW_PAOC

Title: LWoW - Potential Area of Concern

Site - Teesworks - LWoW

APPENDIX C

Groundsure Report

Groundsure LOCATION INTELLIGENCE

Enviro+Geo Insight

456854, 525331

Order Details

Date: 05/04/2022

Your ref: 14061707_____NZT

Our Ref: GS-8650719

Client: darren calvert

Site Details

Location: 456997 525245

Area: 67.16 ha

Authority: Redcar and Cleveland Council

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
13	1.1	Historical industrial land uses	47	4	36	39	-
18	1.2	Historical tanks	34	3	18	79	-
23	1.3	Historical energy features	5	0	0	3	-
24	1.4	Historical petrol stations	0	0	0	0	-
24	1.5	Historical garages	0	0	0	0	-
24	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
25	2.1	Historical industrial land uses	52	6	41	44	-
31	2.2	Historical tanks	51	4	30	116	-
38	2.3	Historical energy features	8	0	0	4	-
39	2.4	Historical petrol stations	0	0	0	0	-
39	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
40	3.1	Active or recent landfill	0	0	0	3	-
41	3.2	Historical landfill (BGS records)	0	0	0	0	-
41	3.3	Historical landfill (LA/mapping records)	3	0	0	0	-
42	3.4	Historical landfill (EA/NRW records)	0	0	1	1	-
42	3.5	Historical waste sites	0	0	0	3	-
43	3.6	Licensed waste sites	0	0	0	4	-
44	3.7	Waste exemptions	0	0	0	0	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
45	4.1	Recent industrial land uses	18	5	20	-	-
47	4.2	Current or recent petrol stations	0	0	0	0	-
48	4.3	Electricity cables	0	0	0	0	-
48	4.4	Gas pipelines	0	0	0	0	-
48	4.5	Sites determined as Contaminated Land	0	0	0	0	-

48	4.6	Control of Major Accident Hazards (COMAH)	3	0	0	0	-
49	4.7	Regulated explosive sites	0	0	0	0	-
49	4.8	Hazardous substance storage/usage	0	1	0	3	-
50	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
50	4.10	Licensed industrial activities (Part A(1))	0	0	1	0	-
50	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
50	4.12	Radioactive Substance Authorisations	0	0	0	0	-
51	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
51	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
51	4.15	Pollutant release to public sewer	0	0	0	0	-
51	4.16	List 1 Dangerous Substances	0	0	0	0	-
51	4.17	List 2 Dangerous Substances	0	0	0	0	-
52	4.18	Pollution Incidents (EA/NRW)	1	0	0	1	-
52	4.19	Pollution inventory substances	0	0	0	0	-
52	4.20	Pollution inventory waste transfers	0	0	0	0	-
53	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
54	5.1	Superficial aquifer	Identified (within 500m)				
56	5.2	Bedrock aquifer	Identified (within 500m)				
58	5.3	Groundwater vulnerability	Identified (within 50m)				
59	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
60	5.5	Groundwater vulnerability- local information	None (within 0m)				
61	5.6	Groundwater abstractions	0	0	0	0	0
61	5.7	Surface water abstractions	0	0	0	0	0
61	5.8	Potable abstractions	0	0	0	0	0
61	5.9	Source Protection Zones	0	0	0	0	-
62	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
63	6.1	Water Network (OS MasterMap)	0	0	5	-	-

64	6.2	Surface water features	0	1	10	-	-
64	6.3	WFD Surface water body catchments	2	-	-	-	-
65	6.4	WFD Surface water bodies	0	0	1	-	-
65	6.5	WFD Groundwater bodies	1	-	-	-	-

Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
66	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
66	7.2	Historical Flood Events	0	0	0	-	-
66	7.3	Flood Defences	0	0	0	-	-
67	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
67	7.5	Flood Storage Areas	0	0	0	-	-
68	7.6	Flood Zone 2	None (within 50m)				
68	7.7	Flood Zone 3	None (within 50m)				

Page	Section	Surface water flooding	
69	8.1	Surface water flooding	1 in 30 year, 0.3m - 1.0m (within 50m)

Page	Section	Groundwater flooding	
71	9.1	Groundwater flooding	Low (within 50m)

Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
72	10.1	Sites of Special Scientific Interest (SSSI)	0	3	0	0	7
73	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	1	3
74	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
74	10.4	Special Protection Areas (SPA)	0	1	0	0	7
76	10.5	National Nature Reserves (NNR)	0	0	0	0	0
76	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
77	10.7	Designated Ancient Woodland	0	0	0	0	0
77	10.8	Biosphere Reserves	0	0	0	0	0
77	10.9	Forest Parks	0	0	0	0	0
77	10.10	Marine Conservation Zones	0	0	0	0	0
77	10.11	Green Belt	0	0	0	0	0
78	10.12	Proposed Ramsar sites	0	1	0	0	7

78	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
78	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
79	10.15	Nitrate Sensitive Areas	0	0	0	0	0
79	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
80	**10.17**	**SSSI Impact Risk Zones**	4	-	-	-	-
83	**10.18**	**SSSI Units**	0	2	1	1	10
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
92	11.1	World Heritage Sites	0	0	0	-	-
92	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
92	11.3	National Parks	0	0	0	-	-
92	11.4	Listed Buildings	0	0	0	-	-
93	11.5	Conservation Areas	0	0	0	-	-
93	11.6	Scheduled Ancient Monuments	0	0	0	-	-
93	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
94	**12.1**	**Agricultural Land Classification**	Non Agricultural (within 250m)				
95	12.2	Open Access Land	0	0	0	-	-
95	12.3	Tree Felling Licences	0	0	0	-	-
95	12.4	Environmental Stewardship Schemes	0	0	0	-	-
95	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
96	**13.1**	**Priority Habitat Inventory**	1	3	11	-	-
97	**13.2**	**Habitat Networks**	6	1	11	-	-
98	**13.3**	**Open Mosaic Habitat**	1	1	0	-	-
99	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
100	**14.1**	**10k Availability**	Identified (within 500m)				
101	**14.2**	**Artificial and made ground (10k)**	0	0	0	1	-
102	**14.3**	**Superficial geology (10k)**	0	0	0	1	-

103	14.4	Landslip (10k)	0	0	0	0	-
104	**14.5**	**Bedrock geology (10k)**	0	0	0	2	-
105	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
106	**15.1**	**50k Availability**	Identified (within 500m)				
107	**15.2**	**Artificial and made ground (50k)**	1	0	0	1	-
108	**15.3**	**Artificial ground permeability (50k)**	2	0	-	-	-
109	**15.4**	**Superficial geology (50k)**	2	1	0	2	-
110	**15.5**	**Superficial permeability (50k)**	Identified (within 50m)				
110	15.6	Landslip (50k)	0	0	0	0	-
110	15.7	Landslip permeability (50k)	None (within 50m)				
111	**15.8**	**Bedrock geology (50k)**	3	0	0	1	-
112	**15.9**	**Bedrock permeability (50k)**	Identified (within 50m)				
112	15.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
113	**16.1**	**BGS Boreholes**	4	0	14	-	-
Page	Section	Natural ground subsidence					
115	**17.1**	**Shrink swell clays**	Very low (within 50m)				
117	**17.2**	**Running sands**	High (within 50m)				
119	**17.3**	**Compressible deposits**	Moderate (within 50m)				
121	**17.4**	**Collapsible deposits**	Negligible (within 50m)				
122	**17.5**	**Landslides**	Very low (within 50m)				
123	**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
125	18.1	Natural cavities	0	0	0	0	-
126	18.2	BritPits	0	0	0	0	-
126	**18.3**	**Surface ground workings**	22	5	38	-	-
128	**18.4**	**Underground workings**	0	0	2	0	0
129	**18.5**	**Historical Mineral Planning Areas**	0	0	1	0	-

129	18.6	Non-coal mining	0	0	0	0	0
129	18.7	Mining cavities	0	0	0	0	0
130	18.8	JPB mining areas	None (within 0m)				
130	18.9	Coal mining	None (within 0m)				
130	18.10	Brine areas	None (within 0m)				
130	18.11	Gypsum areas	None (within 0m)				
130	18.12	Tin mining	None (within 0m)				
131	18.13	Clay mining	None (within 0m)				

Page	Section	Radon	
132	**19.1**	**Radon**	Between 1% and 3% (within 0m)

Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
134	**20.1**	**BGS Estimated Background Soil Chemistry**	21	10	-	-	-
136	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
136	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
137	21.1	Underground railways (London)	0	0	0	-	-
137	21.2	Underground railways (Non-London)	0	0	0	-	-
138	21.3	Railway tunnels	0	0	0	-	-
138	**21.4**	**Historical railway and tunnel features**	23	7	48	-	-
141	21.5	Royal Mail tunnels	0	0	0	-	-
141	**21.6**	**Historical railways**	0	1	5	-	-
142	**21.7**	**Railways**	8	2	4	-	-
142	21.8	Crossrail 1	0	0	0	0	-
143	21.9	Crossrail 2	0	0	0	0	-
143	21.10	HS2	0	0	0	0	-

Recent aerial photograph

Capture Date: 19/04/2021

Site Area: 67.16ha

Recent site history - 2019 aerial photograph

Capture Date: 26/08/2019

Site Area: 67.16ha

Recent site history - 2015 aerial photograph

Capture Date: 08/10/2015

Site Area: 67.16ha

Recent site history - 2007 aerial photograph

Capture Date: 07/09/2007

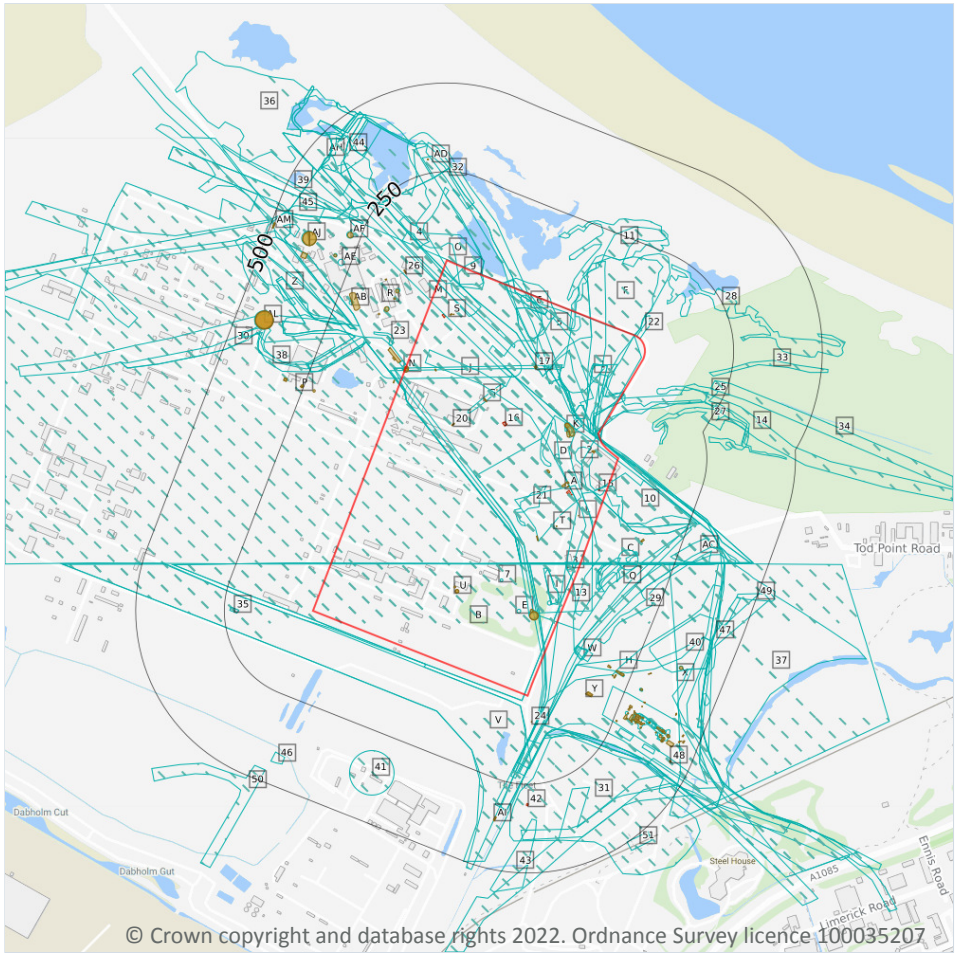
Site Area: 67.16ha

Recent site history - 1999 aerial photograph

Capture Date: 10/09/1999

Site Area: 67.16ha

1 Past land use



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

1.1 Historical industrial land uses

Records within 500m	126

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 13**

ID	Location	Land use	Dates present	Group ID
1	**On site**	**Sand Pit**	**1913**	**1307383**

ID	Location	Land use	Dates present	Group ID
2	On site	Unspecified Ground Workings	1927	1309859
3	On site	Railway Building	1974	1322578
4	On site	Tramway Sidings	1893	1323206
5	On site	Tramway Sidings	1927	1323208
6	On site	Refuse Heap	1969	1328141
7	On site	Chimney	1983	1333630
8	On site	Iron Works	1913	1347129
9	On site	Slag and Tar Macadam Works	1927	1387949
10	On site	Unspecified Works	1913	1390300
11	On site	Unspecified Ground Workings	1969	1394144
12	On site	Unspecified Ground Workings	1927	1395506
13	On site	Iron and Steel Works	1952	1398977
14	On site	Railway Sidings	1927	1402732
21	On site	Sand Pit	1913	1307381
B	On site	Unspecified Commercial/Industrial	1983	1307069
B	On site	Unspecified Works	1991	1366800
C	On site	Slag Wool Works	1913	1313735
C	On site	Tramway Sidings	1893	1339148
C	On site	Railway Sidings	1974 - 1980	1394282
D	On site	Unspecified Tank	1940	1325975
D	On site	Refuse Heap	1940	1328143
E	On site	Unspecified Tank	1983	1326030
E	On site	Unspecified Tank	1983 - 1991	1340719
F	On site	Refuse Heap	1969	1328142
F	On site	Unspecified Ground Workings	1940	1368393
G	On site	Chimneys	1969	1338554
G	On site	Unspecified Works	1969	1392723
H	On site	Railway Sidings	1952	1338943

ID	Location	Land use	Dates present	Group ID
I	**On site**	**Refuse Heap**	**1927**	**1341599**
I	**On site**	**Chimney**	**1983 - 1991**	**1403644**
I	**On site**	**Refuse Heap**	**1952**	**1406899**
J	**On site**	**Railway Sidings**	**1969**	**1342528**
K	**On site**	**Unspecified Tanks**	**1969**	**1342732**
K	**On site**	**Unspecified Tanks**	**1940**	**1352530**
L	**On site**	**Iron Works**	**1893**	**1346238**
L	**On site**	**Tramway Sidings**	**1913**	**1377141**
M	**On site**	**Iron and Steel Works**	**1940**	**1352010**
M	**On site**	**Railway Sidings**	**1940**	**1398225**
N	**On site**	**Unspecified Tank**	**1940**	**1354908**
N	**On site**	**Unspecified Tank**	**1927**	**1376105**
O	**On site**	**Refuse Heap**	**1940**	**1363271**
O	**On site**	**Refuse Heap**	**1969**	**1378820**
P	**On site**	**Unspecified Works**	**1980**	**1387726**
Q	**On site**	**Railway Sidings**	**1927**	**1399328**
Q	**On site**	**Iron Works**	**1927**	**1403181**
R	**On site**	**Iron and Steel Works**	**1927**	**1402131**
22	0m NE	Unspecified Ground Workings	1969	1309861
N	4m W	Pumping Station	1927 - 1940	1389829
V	23m S	Railway Sidings	1974 - 1991	1382132
V	32m S	Railway Sidings	1983	1402731
C	51m E	Unspecified Ground Workings	1952	1368704
C	55m E	Unspecified Ground Workings	1927	1345726
H	57m SE	Tramway Sidings	1913	1340382
C	59m E	Sand Pit	1913	1307385
23	60m W	Refuse Heap	1940	1328126
W	74m E	Railway Station	1974	1362374

ID	Location	Land use	Dates present	Group ID
25	78m SE	Refuse Heap	1940	1328145
W	79m E	Railway Station	1952	1369158
X	80m SE	Slag Wool Works	1952	1338882
H	81m SE	Iron Workings	1893	1332416
H	81m SE	Slag Wool Works	1927	1356308
W	82m E	Railway Station	1927	1365976
R	93m W	Unspecified Tank	1980	1325974
C	95m E	Unspecified Tank	1913	1374627
R	103m W	Unspecified Tank	1980	1325972
C	116m E	Unspecified Tanks	1893	1319156
27	116m SE	Unspecified Ground Workings	1969	1309860
28	125m NE	Unspecified Ground Workings	1969 - 1980	1397742
29	127m E	Refuse Heap	1952	1395371
C	134m E	Unspecified Tank	1913	1359060
30	136m W	Refuse Heap	1969	1375256
31	137m SE	Refuse Heap	1952	1328139
32	156m N	Unspecified Ground Workings	1980	1309864
Z	171m W	Refuse Heap	1940	1389271
33	190m E	Unspecified Ground Workings	1969 - 1980	1406095
AB	205m W	Unspecified Tank	1980	1325973
AA	207m E	Unspecified Tanks	1927	1319159
34	207m SE	Tramway Sidings	1913	1323209
35	209m W	Railway Building	1974 - 1991	1339788
36	212m NW	Unspecified Ground Workings	1969 - 1980	1370233
H	214m E	Iron Works	1913	1324088
Z	233m W	Refuse Heap	1969	1348777
AC	233m E	Unspecified Ground Workings	1980	1309858
AD	235m N	Unspecified Heap	1940	1312073

ID	Location	Land use	Dates present	Group ID
37	236m E	Unspecified Workings	1983	1323438
38	246m W	Refuse Heap	1940	1353962
39	259m NW	Refuse Heap	1940	1328119
AE	267m W	Unspecified Tank	1980	1325967
40	268m E	Slag Brick Works	1913	1315433
AC	270m E	Refuse Heap	1940	1399069
AF	270m W	Unspecified Tank	1980	1325959
H	274m SE	Unspecified Tanks	1952	1319158
H	274m E	Unspecified Tank	1952	1326033
H	287m E	Unspecified Tank	1952	1363882
H	291m E	Unspecified Tank	1927	1378048
AE	294m W	Unspecified Tank	1980	1325960
H	296m E	Unspecified Tanks	1952	1359421
H	301m E	Unspecified Tanks	1927	1399447
41	301m S	Unspecified Workings	1974	1323436
H	316m E	Unspecified Tanks	1893	1400853
H	321m E	Unspecified Tank	1913	1326032
AH	333m N	Slag Works	1940	1323523
AH	333m N	Refuse Heap	1940	1328118
H	338m E	Unspecified Tank	1952	1398143
H	342m E	Unspecified Tank	1913	1364372
43	348m S	Unspecified Pit	1983 - 1991	1339784
H	354m SE	Unspecified Tanks	1952	1319157
H	357m E	Unspecified Tank	1952	1376191
H	365m E	Unspecified Tank	1913	1386855
AJ	365m W	Unspecified Tank	1980	1325961
AK	367m E	Unspecified Tank	1893	1326034
44	372m NW	Unspecified Works	1927	1328835

ID	Location	Land use	Dates present	Group ID
45	375m NW	Railway Sidings	1980	1403546
H	377m E	Unspecified Tanks	1952	1394575
H	379m E	Unspecified Tank	1952	1396977
X	380m E	Slag Wool Works	1913	1366588
H	388m E	Unspecified Tank	1913	1377978
AL	396m W	Unspecified Tank	1980	1325971
46	409m S	Cuttings	1983 - 1991	1398946
AJ	420m W	Refuse Heap	1940	1328127
47	422m E	Refuse Heap	1952	1328150
49	447m E	Unspecified Heap	1952	1311937
X	457m E	Refuse Heap	1952	1328140
50	466m S	Cuttings	1983 - 1991	1372848
51	499m SE	Railway Station	1983 - 1991	1379260

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	**134**

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'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
17	**On site**	**Tanks**	**1952**	**221874**
18	**On site**	**Tanks**	**1983 - 1993**	**215820**
19	**On site**	**Unspecified Tank**	**1952**	**215469**
20	**On site**	**Unspecified Tank**	**1952 - 1953**	**210492**
A	**On site**	**Unspecified Tank**	**1952**	**202864**

ID	Location	Land use	Dates present	Group ID
A	On site	Tanks	1952	206251
A	On site	Tanks	1952	206252
A	On site	Tanks	1952	206253
D	On site	Tanks	1929 - 1952	213158
E	On site	Unspecified Tank	1980 - 1993	209605
E	On site	Unspecified Tank	1980 - 1993	216090
E	On site	Unspecified Tank	1986	220838
G	On site	Unspecified Tank	1952	202861
G	On site	Unspecified Tank	1952	202866
G	On site	Unspecified Tank	1952 - 1953	212146
G	On site	Unspecified Tank	1952	220154
J	On site	Unspecified Tank	1952	209707
J	On site	Unspecified Tank	1952	211569
J	On site	Unspecified Tank	1952	215282
J	On site	Unspecified Tank	1952	220751
K	On site	Unspecified Tank	1952	202865
K	On site	Tanks	1952	209127
K	On site	Tanks	1952	209984
L	On site	Unspecified Tank	1952	202863
N	On site	Unspecified Tank	1929	202860
N	On site	Unspecified Tank	1952	216378
N	On site	Unspecified Tank	1929	216436
S	On site	Unspecified Tank	1952	202858
S	On site	Unspecified Tank	1952	202859
T	On site	Unspecified Tank	1952	210408
T	On site	Unspecified Tank	1952	217603
U	On site	Unspecified Tank	1979	214528
U	On site	Unspecified Tank	1979 - 1993	215619

ID	Location	Land use	Dates present	Group ID
U	**On site**	**Unspecified Tank**	**1984 - 1993**	**216178**
N	17m W	Unspecified Tank	1983 - 1997	219951
N	20m W	Unspecified Tank	1952	221669
N	35m W	Unspecified Tank	1952	210861
24	74m S	Unspecified Tank	1952	202894
26	95m W	Unspecified Tank	1952	219576
R	95m W	Unspecified Tank	1983 - 1997	208556
R	96m W	Unspecified Tank	1983 - 1997	208511
R	103m W	Unspecified Tank	1983 - 1997	219289
R	123m W	Unspecified Tank	1983 - 1997	217199
R	139m W	Unspecified Tank	1983 - 1997	213650
C	139m E	Unspecified Tank	1915 - 1929	217938
Y	151m E	Tanks	1929	206254
Y	154m E	Unspecified Tank	1952 - 1954	209534
AA	179m E	Unspecified Tank	1929	202892
AB	182m W	Tanks	1983 - 1997	209845
AA	186m E	Unspecified Tank	1952 - 1954	211692
AA	201m E	Unspecified Tank	1929	202893
AA	206m E	Tanks	1929	208535
AA	207m E	Tanks	1929	206255
P	215m W	Unspecified Tank	1983 - 1993	215038
AA	219m E	Tanks	1952 - 1954	220678
P	251m W	Unspecified Tank	1981 - 1993	218604
P	251m W	Unspecified Tank	1980	217715
P	252m W	Unspecified Tank	1981	208982
H	258m E	Unspecified Tank	1952 - 1954	213458
AF	272m W	Unspecified Tank	1983 - 1997	209630
H	275m E	Unspecified Tank	1952	202900

ID	Location	Land use	Dates present	Group ID
H	278m E	Unspecified Tank	1952 - 1954	209785
H	278m E	Unspecified Tank	1952	202901
H	280m E	Unspecified Tank	1952	215363
H	280m E	Unspecified Tank	1954	210220
H	281m E	Unspecified Tank	1952	209105
H	282m E	Unspecified Tank	1954	211775
H	283m E	Unspecified Tank	1952	210159
H	284m E	Unspecified Tank	1954	219524
AD	288m N	Unspecified Tank	1967	202855
H	290m E	Unspecified Tank	1929	202902
H	290m E	Tanks	1952 - 1954	213359
H	294m E	Unspecified Tank	1952 - 1954	217831
AE	295m W	Unspecified Tank	1983 - 1997	221482
H	295m E	Unspecified Tank	1952	220529
H	296m E	Unspecified Tank	1954	210674
H	297m E	Unspecified Tank	1952 - 1954	221354
H	299m E	Unspecified Tank	1952 - 1954	215335
H	299m E	Unspecified Tank	1952 - 1954	222069
AG	301m W	Tanks	1980 - 1981	211731
AG	302m W	Tanks	1993	215467
H	304m E	Unspecified Tank	1952	214661
H	304m E	Tanks	1929 - 1954	219743
H	304m E	Unspecified Tank	1954	214434
H	305m E	Tanks	1929	206256
H	306m E	Unspecified Tank	1952	202896
H	306m E	Unspecified Tank	1952 - 1954	209530
H	310m E	Unspecified Tank	1952 - 1954	212866
H	311m E	Unspecified Tank	1952	202899

ID	Location	Land use	Dates present	Group ID
H	311m E	Unspecified Tank	1952	211889
H	311m E	Unspecified Tank	1952	218775
H	312m E	Unspecified Tank	1954	221736
H	314m E	Unspecified Tank	1952	202903
H	314m E	Unspecified Tank	1954	219654
H	314m E	Unspecified Tank	1952	202895
H	314m E	Unspecified Tank	1952	202897
H	324m E	Unspecified Tank	1894	202898
H	325m E	Unspecified Tank	1952 - 1954	215961
H	328m E	Unspecified Tank	1894 - 1915	217322
H	334m E	Unspecified Tank	1952	219097
H	334m E	Unspecified Tank	1954	217095
H	346m E	Unspecified Tank	1894	202904
AI	353m S	Unspecified Tank	1894 - 1929	216024
AI	354m S	Unspecified Tank	1952 - 1954	213998
AJ	365m W	Unspecified Tank	1997	215578
AJ	365m W	Unspecified Tank	1983	215232
AK	369m E	Unspecified Tank	1894	202905
H	373m E	Tanks	1894 - 1929	214577
H	374m E	Unspecified Tank	1952 - 1954	216190
AJ	374m W	Unspecified Tank	1980 - 1993	216781
AJ	377m W	Unspecified Tank	1980 - 1993	220056
AJ	378m W	Unspecified Tank	1981	218428
H	387m E	Unspecified Tank	1929 - 1954	209880
H	388m E	Unspecified Tank	1952	212336
H	389m E	Unspecified Tank	1954	209161
H	390m E	Unspecified Tank	1952	210555
H	390m E	Unspecified Tank	1954	217812

ID	Location	Land use	Dates present	Group ID
AL	395m W	Gas Holder	1981	212053
H	396m E	Tanks	1929 - 1954	216355
AL	396m W	Gas Holder	1993	217797
AL	397m W	Gas Holder	1980	216131
H	397m E	Unspecified Tank	1952	202909
H	399m E	Unspecified Tank	1952	202907
H	407m E	Unspecified Tank	1929 - 1954	220499
H	408m E	Unspecified Tank	1953	221438
H	408m E	Unspecified Tank	1953 - 1954	217762
H	413m E	Unspecified Tank	1952 - 1954	209282
48	440m SE	Unspecified Tank	1952 - 1954	215478
H	444m E	Unspecified Tank	1929	202908
H	446m E	Unspecified Tank	1952	202910
H	448m E	Unspecified Tank	1953 - 1954	219085
H	455m E	Unspecified Tank	1952 - 1954	215927
AM	489m W	Tanks	1980 - 1981	217772
AM	490m W	Tanks	1993	214149

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	**8**

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'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
15	**On site**	**Electricity Substation**	**1983 - 1993**	**127813**

ID	Location	Land use	Dates present	Group ID
16	**On site**	**Electricity Substation**	**1952**	**121366**
A	**On site**	**Electricity Substation**	**1952**	**117464**
A	**On site**	**Electricity Substation**	**1952**	**117465**
S	**On site**	**Electricity Substation**	**1952**	**127585**
42	304m S	Electricity Substation	1973	117463
AL	395m W	Gas Holder	1981 - 1993	126923
AL	397m W	Gas Holder	1980	127749

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	**0**

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'.

This data is sourced from Ordnance Survey / Groundsure.

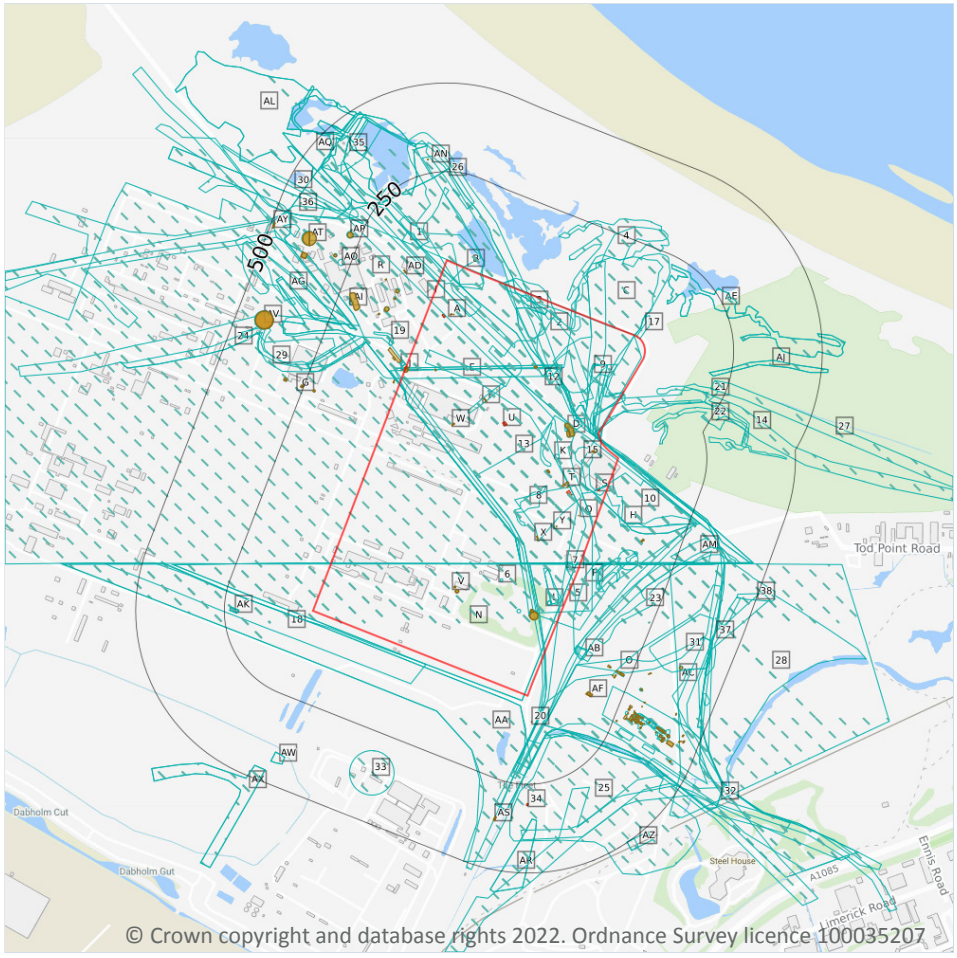
1.6 Historical military land

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 tanks

Historical energy features

2.1 Historical industrial land uses

Records within 500m	143

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 25**

ID	Location	Land Use	Date	Group ID
1	**On site**	**Tramway Sidings**	**1893**	**1323206**
2	**On site**	**Tramway Sidings**	**1927**	**1323208**
3	**On site**	**Refuse Heap**	**1969**	**1328141**

ID	Location	Land Use	Date	Group ID
4	On site	Unspecified Ground Workings	1969	1394144
5	On site	Iron and Steel Works	1952	1398977
6	On site	Chimney	1983	1333630
7	On site	Railway Building	1974	1322578
8	On site	Sand Pit	1913	1307381
9	On site	Sand Pit	1913	1307383
10	On site	Unspecified Works	1913	1390300
11	On site	Iron Works	1913	1347129
12	On site	Slag and Tar Macadam Works	1927	1387949
13	On site	Iron Works	1927	1403181
14	On site	Railway Sidings	1927	1402732
15	On site	Unspecified Ground Workings	1927	1309859
16	On site	Unspecified Ground Workings	1927	1395506
B	On site	Refuse Heap	1969	1378820
B	On site	Refuse Heap	1940	1363271
B	On site	Slag and Tar Macadam Works	1927	1387949
C	On site	Refuse Heap	1969	1328142
C	On site	Unspecified Ground Workings	1940	1368393
D	On site	Unspecified Tanks	1969	1342732
D	On site	Unspecified Tanks	1940	1352530
E	On site	Railway Sidings	1969	1342528
F	On site	Unspecified Works	1969	1392723
F	On site	Chimneys	1969	1338554
G	On site	Unspecified Works	1980	1387726
H	On site	Railway Sidings	1980	1394282
I	On site	Railway Sidings	1940	1398225
I	On site	Iron and Steel Works	1940	1352010
J	On site	Unspecified Tank	1940	1354908

ID	Location	Land Use	Date	Group ID
J	**On site**	**Unspecified Tank**	**1927**	**1376105**
K	**On site**	**Unspecified Tank**	**1940**	**1325975**
K	**On site**	**Refuse Heap**	**1940**	**1328143**
L	**On site**	**Chimney**	**1991**	**1403644**
L	**On site**	**Refuse Heap**	**1952**	**1406899**
L	**On site**	**Chimney**	**1983**	**1403644**
L	**On site**	**Refuse Heap**	**1927**	**1341599**
M	**On site**	**Unspecified Tank**	**1991**	**1340719**
M	**On site**	**Unspecified Tank**	**1983**	**1340719**
M	**On site**	**Unspecified Tank**	**1983**	**1326030**
N	**On site**	**Unspecified Works**	**1991**	**1366800**
N	**On site**	**Unspecified Commercial/Industrial**	**1983**	**1307069**
O	**On site**	**Railway Sidings**	**1952**	**1338943**
P	**On site**	**Railway Sidings**	**1974**	**1394282**
P	**On site**	**Tramway Sidings**	**1893**	**1339148**
P	**On site**	**Slag Wool Works**	**1913**	**1313735**
P	**On site**	**Railway Sidings**	**1927**	**1399328**
Q	**On site**	**Iron Works**	**1893**	**1346238**
Q	**On site**	**Tramway Sidings**	**1913**	**1377141**
R	**On site**	**Railway Sidings**	**1927**	**1399328**
R	**On site**	**Iron and Steel Works**	**1927**	**1402131**
17	0m NE	Unspecified Ground Workings	1969	1309861
J	4m W	Pumping Station	1927	1389829
J	6m W	Pumping Station	1940	1389829
18	23m S	Railway Sidings	1974	1382132
AA	32m S	Railway Sidings	1991	1382132
AA	32m S	Railway Sidings	1983	1402731
P	51m E	Unspecified Ground Workings	1952	1368704

ID	Location	Land Use	Date	Group ID
P	55m E	Unspecified Ground Workings	1927	1345726
O	57m SE	Tramway Sidings	1913	1340382
P	59m E	Sand Pit	1913	1307385
19	60m W	Refuse Heap	1940	1328126
AB	74m E	Railway Station	1974	1362374
21	78m SE	Refuse Heap	1940	1328145
AB	79m E	Railway Station	1952	1369158
AC	80m SE	Slag Wool Works	1952	1338882
O	81m SE	Iron Workings	1893	1332416
O	81m SE	Slag Wool Works	1927	1356308
AB	82m E	Railway Station	1927	1365976
R	93m W	Unspecified Tank	1980	1325974
P	95m E	Unspecified Tank	1913	1374627
R	103m W	Unspecified Tank	1980	1325972
P	116m E	Unspecified Tanks	1893	1319156
22	116m SE	Unspecified Ground Workings	1969	1309860
AE	125m NE	Unspecified Ground Workings	1969	1397742
AE	125m NE	Unspecified Ground Workings	1980	1397742
23	127m E	Refuse Heap	1952	1395371
P	134m E	Unspecified Tank	1913	1359060
24	136m W	Refuse Heap	1969	1375256
25	137m SE	Refuse Heap	1952	1328139
26	156m N	Unspecified Ground Workings	1980	1309864
AG	171m W	Refuse Heap	1940	1389271
AJ	190m E	Unspecified Ground Workings	1969	1406095
AJ	190m E	Unspecified Ground Workings	1980	1406095
AI	205m W	Unspecified Tank	1980	1325973
AH	207m E	Unspecified Tanks	1927	1319159

ID	Location	Land Use	Date	Group ID
27	207m SE	Tramway Sidings	1913	1323209
AK	209m W	Railway Building	1991	1339788
AK	209m W	Railway Building	1983	1339788
AK	209m W	Railway Building	1974	1339788
AL	212m NW	Unspecified Ground Workings	1969	1370233
AL	212m NW	Unspecified Ground Workings	1980	1370233
O	214m E	Iron Works	1913	1324088
AG	233m W	Refuse Heap	1969	1348777
AM	233m E	Unspecified Ground Workings	1980	1309858
AN	235m N	Unspecified Heap	1940	1312073
28	236m E	Unspecified Workings	1983	1323438
29	246m W	Refuse Heap	1940	1353962
30	259m NW	Refuse Heap	1940	1328119
AO	267m W	Unspecified Tank	1980	1325967
31	268m E	Slag Brick Works	1913	1315433
AM	270m E	Refuse Heap	1940	1399069
AP	270m W	Unspecified Tank	1980	1325959
O	274m SE	Unspecified Tanks	1952	1319158
O	274m E	Unspecified Tank	1952	1326033
O	287m E	Unspecified Tank	1952	1363882
O	291m E	Unspecified Tank	1927	1378048
32	292m SE	Railway Sidings	1974	1394282
AO	294m W	Unspecified Tank	1980	1325960
O	296m E	Unspecified Tanks	1952	1359421
O	301m E	Unspecified Tanks	1927	1399447
33	301m S	Unspecified Workings	1974	1323436
O	316m E	Unspecified Tanks	1893	1400853
O	321m E	Unspecified Tank	1913	1326032

ID	Location	Land Use	Date	Group ID
AQ	333m N	Refuse Heap	1940	1328118
AQ	333m N	Slag Works	1940	1323523
O	338m E	Unspecified Tank	1952	1398143
O	342m E	Unspecified Tank	1913	1364372
AR	348m S	Unspecified Pit	1991	1339784
AR	348m S	Unspecified Pit	1983	1339784
O	354m SE	Unspecified Tanks	1952	1319157
O	357m E	Unspecified Tank	1952	1376191
O	365m E	Unspecified Tank	1913	1386855
AT	365m W	Unspecified Tank	1980	1325961
AU	367m E	Unspecified Tank	1893	1326034
35	372m NW	Unspecified Works	1927	1328835
36	375m NW	Railway Sidings	1980	1403546
O	377m E	Unspecified Tanks	1952	1394575
O	379m E	Unspecified Tank	1952	1396977
AC	380m E	Slag Wool Works	1913	1366588
O	388m E	Unspecified Tank	1913	1377978
AV	396m W	Unspecified Tank	1980	1325971
AW	409m S	Cuttings	1991	1398946
AW	409m S	Cuttings	1983	1398946
AT	420m W	Refuse Heap	1940	1328127
37	422m E	Refuse Heap	1952	1328150
38	447m E	Unspecified Heap	1952	1311937
AC	457m E	Refuse Heap	1952	1328140
AX	466m S	Cuttings	1991	1372848
AX	466m S	Cuttings	1983	1372848
AZ	499m SE	Railway Station	1991	1379260
AZ	499m SE	Railway Station	1983	1379260

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	201

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 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 25**

ID	Location	Land Use	Date	Group ID
A	On site	Unspecified Tank	1952	202858
A	On site	Unspecified Tank	1952	202859
D	On site	Unspecified Tank	1952	202865
D	On site	Tanks	1952	209127
D	On site	Tanks	1952	209984
D	On site	Tanks	1952	209984
D	On site	Tanks	1952	209127
E	On site	Unspecified Tank	1952	220751
E	On site	Unspecified Tank	1952	215282
E	On site	Unspecified Tank	1952	211569
E	On site	Unspecified Tank	1952	209707
F	On site	Unspecified Tank	1953	212146
F	On site	Unspecified Tank	1952	202861
F	On site	Unspecified Tank	1952	212146
F	On site	Unspecified Tank	1952	220154
F	On site	Unspecified Tank	1952	202866
H	On site	Tanks	1983	215820
H	On site	Tanks	1993	215820
J	On site	Unspecified Tank	1929	216436
J	On site	Unspecified Tank	1952	216378
J	On site	Unspecified Tank	1952	216378
J	On site	Unspecified Tank	1929	202860
K	On site	Tanks	1929	213158

ID	Location	Land Use	Date	Group ID
K	On site	Tanks	1952	213158
K	On site	Tanks	1952	213158
M	On site	Unspecified Tank	1986	209605
M	On site	Unspecified Tank	1986	220838
M	On site	Unspecified Tank	1980	216090
M	On site	Unspecified Tank	1980	209605
M	On site	Unspecified Tank	1993	216090
M	On site	Unspecified Tank	1993	209605
Q	On site	Unspecified Tank	1952	202863
T	On site	Tanks	1952	206253
T	On site	Tanks	1952	206251
T	On site	Unspecified Tank	1952	202864
T	On site	Tanks	1952	206252
V	On site	Unspecified Tank	1984	215619
V	On site	Unspecified Tank	1984	216178
V	On site	Unspecified Tank	1979	215619
V	On site	Unspecified Tank	1979	214528
V	On site	Unspecified Tank	1993	215619
V	On site	Unspecified Tank	1993	216178
W	On site	Unspecified Tank	1953	210492
W	On site	Unspecified Tank	1952	210492
W	On site	Unspecified Tank	1952	210492
X	On site	Unspecified Tank	1952	215469
X	On site	Unspecified Tank	1952	215469
Y	On site	Unspecified Tank	1952	210408
Y	On site	Unspecified Tank	1952	217603
Z	On site	Tanks	1952	221874
Z	On site	Tanks	1952	221874

ID	Location	Land Use	Date	Group ID
J	17m W	Unspecified Tank	1983	219951
J	17m W	Unspecified Tank	1997	219951
J	20m W	Unspecified Tank	1952	221669
J	35m W	Unspecified Tank	1952	210861
20	74m S	Unspecified Tank	1952	202894
AD	95m W	Unspecified Tank	1952	219576
R	95m W	Unspecified Tank	1983	208556
R	95m W	Unspecified Tank	1997	208556
AD	95m W	Unspecified Tank	1952	219576
R	96m W	Unspecified Tank	1997	208511
R	96m W	Unspecified Tank	1983	208511
R	103m W	Unspecified Tank	1997	219289
R	103m W	Unspecified Tank	1983	219289
R	123m W	Unspecified Tank	1997	217199
R	123m W	Unspecified Tank	1983	217199
R	139m W	Unspecified Tank	1983	213650
P	139m E	Unspecified Tank	1915	217938
R	139m W	Unspecified Tank	1997	213650
P	140m E	Unspecified Tank	1929	217938
AF	151m E	Tanks	1929	206254
AF	154m E	Unspecified Tank	1952	209534
AF	155m E	Unspecified Tank	1954	209534
AH	179m E	Unspecified Tank	1929	202892
AI	182m W	Tanks	1997	209845
AI	182m W	Tanks	1983	209845
AH	186m E	Unspecified Tank	1952	211692
AH	186m E	Unspecified Tank	1954	211692
AH	201m E	Unspecified Tank	1929	202893

ID	Location	Land Use	Date	Group ID
AH	206m E	Tanks	1929	208535
AH	207m E	Tanks	1929	206255
G	215m W	Unspecified Tank	1983	215038
G	215m W	Unspecified Tank	1993	215038
AH	219m E	Tanks	1952	220678
AH	219m E	Tanks	1954	220678
G	251m W	Unspecified Tank	1993	218604
G	251m W	Unspecified Tank	1993	218604
G	251m W	Unspecified Tank	1981	218604
G	251m W	Unspecified Tank	1980	217715
G	252m W	Unspecified Tank	1983	218604
G	252m W	Unspecified Tank	1981	208982
O	258m E	Unspecified Tank	1952	213458
O	259m E	Unspecified Tank	1954	213458
AP	272m W	Unspecified Tank	1997	209630
AP	272m W	Unspecified Tank	1983	209630
O	275m E	Unspecified Tank	1952	202900
O	278m E	Unspecified Tank	1952	209785
O	278m E	Unspecified Tank	1952	202901
O	278m E	Unspecified Tank	1954	209785
O	280m E	Unspecified Tank	1952	215363
O	280m E	Unspecified Tank	1954	210220
O	281m E	Unspecified Tank	1952	209105
O	282m E	Unspecified Tank	1954	211775
O	283m E	Unspecified Tank	1952	210159
O	284m E	Unspecified Tank	1954	219524
AN	288m N	Unspecified Tank	1967	202855
O	290m E	Unspecified Tank	1929	202902

ID	Location	Land Use	Date	Group ID
O	290m E	Tanks	1952	213359
O	291m E	Tanks	1954	213359
O	294m E	Unspecified Tank	1952	217831
O	295m E	Unspecified Tank	1954	217831
AO	295m W	Unspecified Tank	1997	221482
AO	295m W	Unspecified Tank	1983	221482
O	295m E	Unspecified Tank	1952	220529
O	296m E	Unspecified Tank	1954	210674
O	297m E	Unspecified Tank	1952	221354
O	298m E	Unspecified Tank	1954	221354
O	299m E	Unspecified Tank	1952	215335
O	299m E	Unspecified Tank	1952	222069
O	299m E	Unspecified Tank	1954	215335
O	300m E	Unspecified Tank	1954	222069
G	301m W	Tanks	1981	211731
G	302m W	Tanks	1993	215467
G	302m W	Tanks	1980	211731
O	304m E	Tanks	1929	219743
O	304m E	Unspecified Tank	1952	214661
O	304m E	Unspecified Tank	1954	214434
O	305m E	Tanks	1929	206256
O	306m E	Unspecified Tank	1952	209530
O	306m E	Unspecified Tank	1952	202896
O	306m E	Unspecified Tank	1954	209530
O	307m E	Tanks	1954	219743
O	310m E	Unspecified Tank	1952	212866
O	311m E	Unspecified Tank	1952	202899
O	311m E	Unspecified Tank	1952	211889

ID	Location	Land Use	Date	Group ID
O	311m E	Unspecified Tank	1954	212866
O	311m E	Unspecified Tank	1952	218775
O	312m E	Unspecified Tank	1954	221736
O	314m E	Unspecified Tank	1952	202903
O	314m E	Unspecified Tank	1954	219654
O	314m E	Unspecified Tank	1952	202897
O	314m E	Unspecified Tank	1952	202895
O	324m E	Unspecified Tank	1894	202898
O	325m E	Unspecified Tank	1952	215961
O	326m E	Unspecified Tank	1954	215961
O	328m E	Unspecified Tank	1894	217322
O	328m E	Unspecified Tank	1915	217322
O	334m E	Unspecified Tank	1952	219097
O	334m E	Unspecified Tank	1954	217095
O	346m E	Unspecified Tank	1894	202904
AS	353m S	Unspecified Tank	1894	216024
AS	353m S	Unspecified Tank	1915	216024
AS	353m S	Unspecified Tank	1929	216024
AS	354m S	Unspecified Tank	1954	213998
AS	355m S	Unspecified Tank	1952	213998
AT	365m W	Unspecified Tank	1997	215578
AT	365m W	Unspecified Tank	1983	215232
AU	369m E	Unspecified Tank	1894	202905
O	373m E	Tanks	1894	214577
O	373m E	Tanks	1914	214577
O	373m E	Tanks	1929	214577
O	374m E	Unspecified Tank	1952	216190
AT	374m W	Unspecified Tank	1980	216781

ID	Location	Land Use	Date	Group ID
AT	374m W	Unspecified Tank	1993	216781
AT	374m W	Unspecified Tank	1981	216781
O	374m E	Unspecified Tank	1954	216190
AT	377m W	Unspecified Tank	1980	220056
AT	377m W	Unspecified Tank	1993	220056
AT	378m W	Unspecified Tank	1981	218428
O	387m E	Unspecified Tank	1929	209880
O	388m E	Unspecified Tank	1952	212336
O	388m E	Unspecified Tank	1952	209880
O	389m E	Unspecified Tank	1954	209161
O	389m E	Unspecified Tank	1954	209880
O	390m E	Unspecified Tank	1952	210555
O	390m E	Unspecified Tank	1954	217812
AV	395m W	Gas Holder	1981	212053
O	396m E	Tanks	1929	216355
AV	396m W	Gas Holder	1993	217797
AV	397m W	Gas Holder	1980	216131
O	397m E	Unspecified Tank	1952	202909
O	398m E	Tanks	1954	216355
O	399m E	Unspecified Tank	1952	202907
O	407m E	Unspecified Tank	1929	220499
O	408m E	Unspecified Tank	1953	221438
O	408m E	Unspecified Tank	1953	217762
O	408m E	Unspecified Tank	1954	217762
O	409m E	Unspecified Tank	1954	220499
O	413m E	Unspecified Tank	1952	209282
O	414m E	Unspecified Tank	1954	209282
O	440m SE	Unspecified Tank	1952	215478

ID	Location	Land Use	Date	Group ID
O	441m SE	Unspecified Tank	1954	215478
O	444m E	Unspecified Tank	1929	202908
O	446m E	Unspecified Tank	1952	202910
O	448m E	Unspecified Tank	1953	219085
O	449m E	Unspecified Tank	1954	219085
O	455m E	Unspecified Tank	1952	215927
O	456m E	Unspecified Tank	1954	215927
AY	489m W	Tanks	1981	217772
AY	490m W	Tanks	1980	217772
AY	490m W	Tanks	1993	214149

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	**12**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 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 25**

ID	Location	Land Use	Date	Group ID
A	**On site**	**Electricity Substation**	**1952**	**127585**
A	**On site**	**Electricity Substation**	**1952**	**127585**
S	**On site**	**Electricity Substation**	**1983**	**127813**
S	**On site**	**Electricity Substation**	**1993**	**127813**
T	**On site**	**Electricity Substation**	**1952**	**117464**
T	**On site**	**Electricity Substation**	**1952**	**117465**
U	**On site**	**Electricity Substation**	**1952**	**121366**
U	**On site**	**Electricity Substation**	**1952**	**121366**
34	304m S	Electricity Substation	1973	117463
AV	395m W	Gas Holder	1981	126923

ID	Location	Land Use	Date	Group ID
AV	396m W	Gas Holder	1993	126923
AV	397m W	Gas Holder	1980	127749

This data is sourced from Ordnance Survey / Groundsure.

2.4 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. 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'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m	0

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 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'.

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill

Site Outline

Search buffers in metres (m)

Active or recent landfill

Historical landfill (EA/NRW)

Historical landfill (LA/OS)

Historical waste sites

Licensed waste sites

3.1 Active or recent landfill

Records within 500m	3

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

Features are displayed on the Waste and landfill map on **page 40**

ID	Location	Details	
3	299m E	Operator: Tata Steel U K Limited Site Address: Teesside Works, Steel House, Redcar, Cleveland, TS10 5QW	WML Number: 60138 EPR Reference: BRI003 Landfill type: A04: Household, Commercial & Industrial Waste Landfill Status: Closure IPPC Reference: - EPR Number: EA/EPR/KP3790ZE/V002

ID	Location	Details	
5	336m S	Operator: York Potash Processing & Ports Limited Site Address: Land/ Premises At, Bran Sands, Redcar, Cleveland, TS6 6UE	WML Number: 60092 EPR Reference: YPP001 Landfill type: A02: Other Landfill Site taking Special Waste Status: Modified IPPC Reference: - EPR Number: EA/EPR/FB3601GS/V004
6	374m E	Operator: Tata Steel U K Limited Site Address: Teesside Works, Steel House, Redcar, Cleveland, TS10 5QW	WML Number: 60138 EPR Reference: BRI003 Landfill type: A04: Household, Commercial & Industrial Waste Landfill Status: Closure IPPC Reference: - EPR Number: EA/EPR/KP3790ZE/V002

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m	**0**

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	**3**

Landfill sites identified from Local Authority records and high detail historical mapping.

Features are displayed on the Waste and landfill map on **page 40**

ID	Location	Site address	Source	Data type
1	**On site**	**Refuse Tip**	**1952 mapping**	**Polygon**
A	**On site**	**Refuse Tip**	**1952 mapping**	**Polygon**
A	**On site**	**Refuse Tip**	**1952 mapping**	**Polygon**

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m	2

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

Features are displayed on the Waste and landfill map on **page 40**

ID	Location	Details		
B	93m N	Site Address: Warrenby, Land Adjacent To Redcar Blast Furnace, Redcar, Cleveland Licence Holder Address: Teesside Division, Steel House, Redcar, Cleveland	Waste Licence: Yes Site Reference: 0700/CLE/087 Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: YP1/L/BRI012 Licence Issue: 11/12/1979 Licence Surrender: 13/04/1997	Operator: - Licence Holder: British Steel Plc First Recorded - Last Recorded: -
4	325m W	Site Address: Blast Furnace Plant, Redcar Complex, Cleveland Licence Holder Address: Steel House, Redcar, Cleveland	Waste Licence: Yes Site Reference: IPC 68, 0700/CLE/068, BRI002 Waste Type: Industrial Environmental Permitting Regulations (Waste) Reference: YP4/L/BRI002 Licence Issue: 19/07/1993 Licence Surrender: -	Operator: British Steel Corporation Licence Holder: British Steel Corporation First Recorded - Last Recorded: -

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m	3

Waste site records derived from Local Authority planning records and high detail historical mapping.

Features are displayed on the Waste and landfill map on **page 40**

ID	Location	Address	Further Details	Date
2	264m NW	Site Address: N/A	Type of Site: Ground Workings and Refuse Heap Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1929

ID	Location	Address	Further Details	Date
7	424m S	Site Address: N/A	Type of Site: Ground Workings and Refuse Heap Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1953
8	447m E	Site Address: N/A	Type of Site: Ground Workings and Refuse Heap Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1953

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m **4**

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

Features are displayed on the Waste and landfill map on **page 40**

ID	Location	Details		
B	307m NW	Site Name: Warrenby Site Address: Land Adjacent To Redcar Blast Furnace, Redcar, Cleveland, TS10 5RD Correspondence Address: Steel House, Redcar, Cleveland, TS10 5RD	Type of Site: Landfill taking Non-Biodegradeable Wastes Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: BRI012 EPR reference: - Operator: British Steel - Teesside Division Waste Management licence No: 60250 Annual Tonnage: 0	Issue Date: 11/12/1979 Effective Date: - Modified: - Surrendered Date: 13/04/1997 Expiry Date: - Cancelled Date: - Status: Surrendered
B	307m NW	Site Name: Warrenby Site Address: Land Adjacent To Redcar Blast Furnace, Redcar, Cleveland, TS10 5RD Correspondence Address: -	Type of Site: Landfill taking Non-Biodegradeable Wastes Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BRI012 EPR reference: EA/EPR/WP3990ZG/S002 Operator: British Steel - Teesside Division Waste Management licence No: 60250 Annual Tonnage: 150000	Issue Date: 11/12/1979 Effective Date: - Modified: - Surrendered Date: Apr 13 1997 12:00AM Expiry Date: - Cancelled Date: - Status: Surrendered

ID	Location	Details		
B	307m NW	Site Name: Warrenby Site Address: Land Adjacent To Redcar Blast Furnace, Redcar, Cleveland, TS10 5RD Correspondence Address: -	Type of Site: Landfill taking Non-Biodegradeable Wastes Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BRI012 EPR reference: EA/EPR/WP3990ZG/S002 Operator: British Steel - Teesside Division Waste Management licence No: 60250 Annual Tonnage: 150000	Issue Date: 11/12/1979 Effective Date: - Modified: - Surrendered Date: Apr 13 1997 12:00AM Expiry Date: - Cancelled Date: - Status: Surrendered
B	307m NW	Site Name: Warrenby Site Address: Land Adjacent To Redcar Blast Furnace, Redcar, Cleveland, TS10 5RD Correspondence Address: -	Type of Site: Landfill taking Non-Biodegradeable Wastes Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BRI012 EPR reference: EA/EPR/WP3990ZG/S002 Operator: British Steel - Teesside Division Waste Management licence No: 60250 Annual Tonnage: 150000	Issue Date: 11/12/1979 Effective Date: - Modified: - Surrendered Date: Apr 13 1997 12:00AM Expiry Date: - Cancelled Date: - Status: Surrendered

This data is sourced from the Environment Agency and Natural Resources Wales.

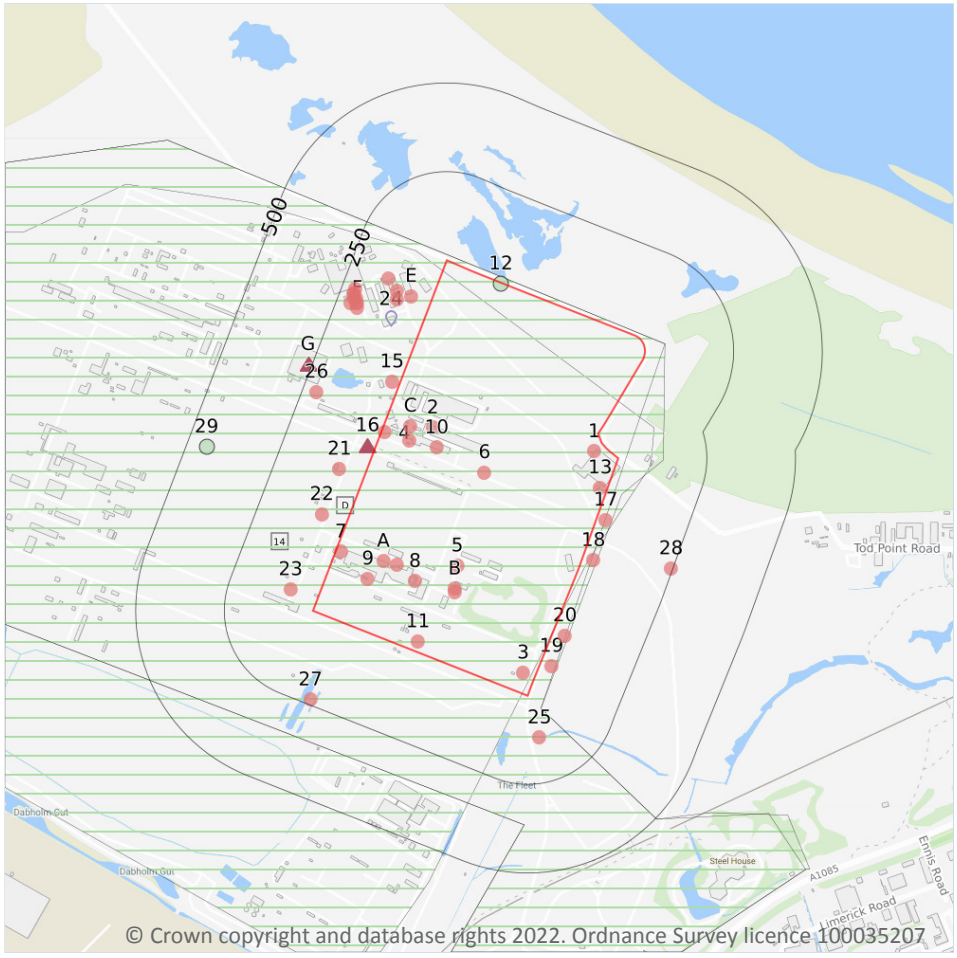
3.7 Waste exemptions

Records within 500m	0

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

This data is sourced from the Environment Agency and Natural Resources Wales.

4 Current industrial land use



Site Outline

Search buffers in metres (m)

Recent industrial land uses

Control of Major Accident Hazards

Hazardous substance storage/usage

Part A(1) industrial activities

Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m	43

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 45**

ID	Location	Company	Address	Activity	Category
1	**On site**	**Tank**	**North Yorkshire, TS10**	**Tanks (Generic)**	**Industrial Features**
2	**On site**	**Hoppers**	**North Yorkshire, TS10**	**Hoppers and Silos**	**Farming**
3	**On site**	**Pylon**	**North Yorkshire, TS6**	**Electrical Features**	**Infrastructure and Facilities**

ID	Location	Company	Address	Activity	Category
4	**On site**	**Pylon**	**North Yorkshire, TS10**	**Electrical Features**	**Infrastructure and Facilities**
5	**On site**	**Pylon**	**North Yorkshire, TS10**	**Electrical Features**	**Infrastructure and Facilities**
6	**On site**	**Pylon**	**North Yorkshire, TS10**	**Electrical Features**	**Infrastructure and Facilities**
7	**On site**	**Travelling Crane**	**North Yorkshire, TS10**	**Travelling Cranes and Gantries**	**Industrial Features**
8	**On site**	**Chimney**	**North Yorkshire, TS10**	**Chimneys**	**Industrial Features**
9	**On site**	**Chimney**	**North Yorkshire, TS10**	**Chimneys**	**Industrial Features**
10	**On site**	**Hoppers**	**North Yorkshire, TS10**	**Hoppers and Silos**	**Farming**
11	**On site**	**Pylon**	**North Yorkshire, TS10**	**Electrical Features**	**Infrastructure and Facilities**
13	**On site**	**Electricity Sub Station**	**North Yorkshire, TS10**	**Electrical Features**	**Infrastructure and Facilities**
A	**On site**	**Electricity Sub Station**	**North Yorkshire, TS10**	**Electrical Features**	**Infrastructure and Facilities**
A	**On site**	**Hopper**	**North Yorkshire, TS10**	**Hoppers and Silos**	**Farming**
B	**On site**	**Tank**	**North Yorkshire, TS10**	**Tanks (Generic)**	**Industrial Features**
B	**On site**	**Tank**	**North Yorkshire, TS10**	**Tanks (Generic)**	**Industrial Features**
C	**On site**	**Chimney**	**North Yorkshire, TS10**	**Chimneys**	**Industrial Features**
C	**On site**	**Chimney**	**North Yorkshire, TS10**	**Chimneys**	**Industrial Features**
15	23m W	Tank	North Yorkshire, TS10	Tanks (Generic)	Industrial Features
17	26m E	Pylon	North Yorkshire, TS10	Electrical Features	Infrastructure and Facilities
18	31m E	Pipe Gantry	North Yorkshire, TS10	Travelling Cranes and Gantries	Industrial Features
19	32m E	Pipe Gantry	North Yorkshire, TS6	Travelling Cranes and Gantries	Industrial Features
20	35m E	Works	North Yorkshire, TS10	Unspecified Works Or Factories	Industrial Features
E	58m W	Crane	North Yorkshire, TS10	Travelling Cranes and Gantries	Industrial Features

ID	Location	Company	Address	Activity	Category
21	73m W	Pylon	North Yorkshire, TS10	Electrical Features	Infrastructure and Facilities
22	74m W	Pylon	North Yorkshire, TS10	Electrical Features	Infrastructure and Facilities
23	81m W	Pylon	North Yorkshire, TS10	Electrical Features	Infrastructure and Facilities
E	92m W	Tank	North Yorkshire, TS10	Tanks (Generic)	Industrial Features
E	100m W	Tank	North Yorkshire, TS10	Tanks (Generic)	Industrial Features
25	123m S	Pipe Gantry	North Yorkshire, TS6	Travelling Cranes and Gantries	Industrial Features
E	135m W	Tank	North Yorkshire, TS10	Tanks (Generic)	Industrial Features
F	188m W	Tank	North Yorkshire, TS10	Tanks (Generic)	Industrial Features
F	193m W	Tank	North Yorkshire, TS10	Tanks (Generic)	Industrial Features
F	197m W	Tank	North Yorkshire, TS10	Tanks (Generic)	Industrial Features
F	202m W	Tank	North Yorkshire, TS10	Tanks (Generic)	Industrial Features
F	205m W	Tank	North Yorkshire, TS10	Tanks (Generic)	Industrial Features
F	210m W	Tank	North Yorkshire, TS10	Tanks (Generic)	Industrial Features
F	210m W	Chimney	North Yorkshire, TS10	Chimneys	Industrial Features
26	211m W	Tank	North Yorkshire, TS10	Tanks (Generic)	Industrial Features
F	213m W	Tank	North Yorkshire, TS10	Tanks (Generic)	Industrial Features
F	214m W	Chimney	North Yorkshire, TS10	Chimneys	Industrial Features
27	236m S	Pylon	North Yorkshire, TS6	Electrical Features	Infrastructure and Facilities
28	245m E	Pipe Gantry	North Yorkshire, TS10	Travelling Cranes and Gantries	Industrial Features

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	**0**

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	0

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m	0

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m	0

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m	3

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

Features are displayed on the Current industrial land use map on **page 45**

ID	Location	Company	Address	Operational status	Tier
14	**On site**	**British Steel Corporation ltd(bsc)**	**British Steel Corporation ltd (bsc), Redcar Works, Redcar**	**Historical NIHHS Site**	**-**
D	**On site**	**Sahaviriya Steel Industries Uk Limited**	**Sahaviriya Steel Industries Uk Limited, Steel House, Redcar, Cleveland, TS10 5QW**	**Historical COMAH Site**	**COMAH Upper Tier Operator**
D	**On site**	**South Tees Site Company Limited**	**South Tees Site Company Limited, Redcar, Steel House, Trunk Road, Redcar, Cleveland, TS10 5QW**	**Current COMAH Site**	**COMAH Upper Tier Operator**

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m	0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m	4

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

Features are displayed on the Current industrial land use map on **page 45**

ID	Location	Details	
16	22m W	Application reference number: L/1992/0971/HD Application status: Historical Consent Application date: 30/11/1992 Address: British Steel PLC, BSC Redcar Works, Redcar, TS10 4RF	Details: No Details Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
G	261m W	Application reference number: No Details Application status: Approved Application date: No Details Address: South Tees Site Company Limited, Trunk Road, Redcar, Cleveland, England, TS10 5QW	Details: No Details Enforcement: No Details Date of enforcement: No Details Comment: No Details
G	261m W	Application reference number: R/2011/0211/HD Application status: Withdrawn Application date: 13/04/2011 Address: Sahaviriya Steel Industries UK Ltd, Redcar Blast Furnace and Coke Ovens, Trunk Road, Redcar, TS10 5QW	Details: Change of ownership. Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
G	261m W	Application reference number: R/2011/0210/HD Application status: Historical Consent Application date: 13/04/2011 Address: Sahaviriya Steel Industries UK Ltd, Redcar Blast Furnace and Coke Ovens, Trunk Road, Redcar, TS10 5QW	Details: Consent for new inventory. Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m	0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m	1

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on **page 45**

ID	Location	Details	
24	88m W	Operator: MULTISERV (ASR) LTD Installation Name: - Process: OTHER MINERAL ACTIVITIES; SCREENING ETC COAL ETC (UNLESS EXEMPT LOCATION) Permit Number: BM0206 Original Permit Number: BM0206	EPR Reference: - Issue Date: 26/03/2004 Effective Date: 01/04/2004 Last date noted as effective: 01/10/2004 Status: SUPERSEDED BY PAS

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m	0

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	0

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m	0

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m	0

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m	0

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m	0

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m	0

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m	2

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on **page 45**

ID	Location	Details	
12	**On site**	**Incident Date: 24/09/2001** **Incident Identification: 32506** **Pollutant: Specific Waste Materials** **Pollutant Description: Tyres**	**Water Impact: Category 4 (No Impact)** **Land Impact: Category 3 (Minor)** **Air Impact: Category 4 (No Impact)**
29	445m W	Incident Date: 03/10/2009 Incident Identification: 721753 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Dust	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 2 (Significant)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m	0

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m	0

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

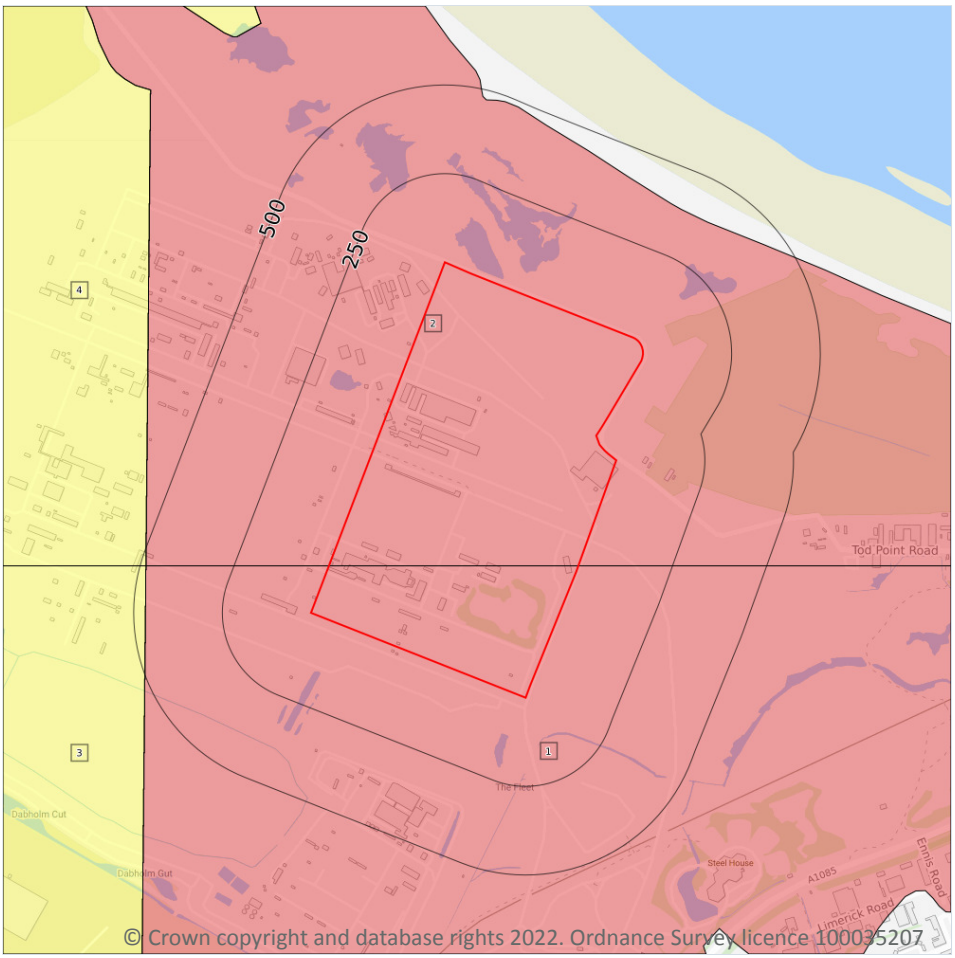
4.21 Pollution inventory radioactive waste

Records within 500m	0

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

5 Hydrogeology - Superficial aquifer



Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive
- Unknown

5.1 Superficial aquifer

Records within 500m	4

Aquifer status of groundwater held within superficial geology.

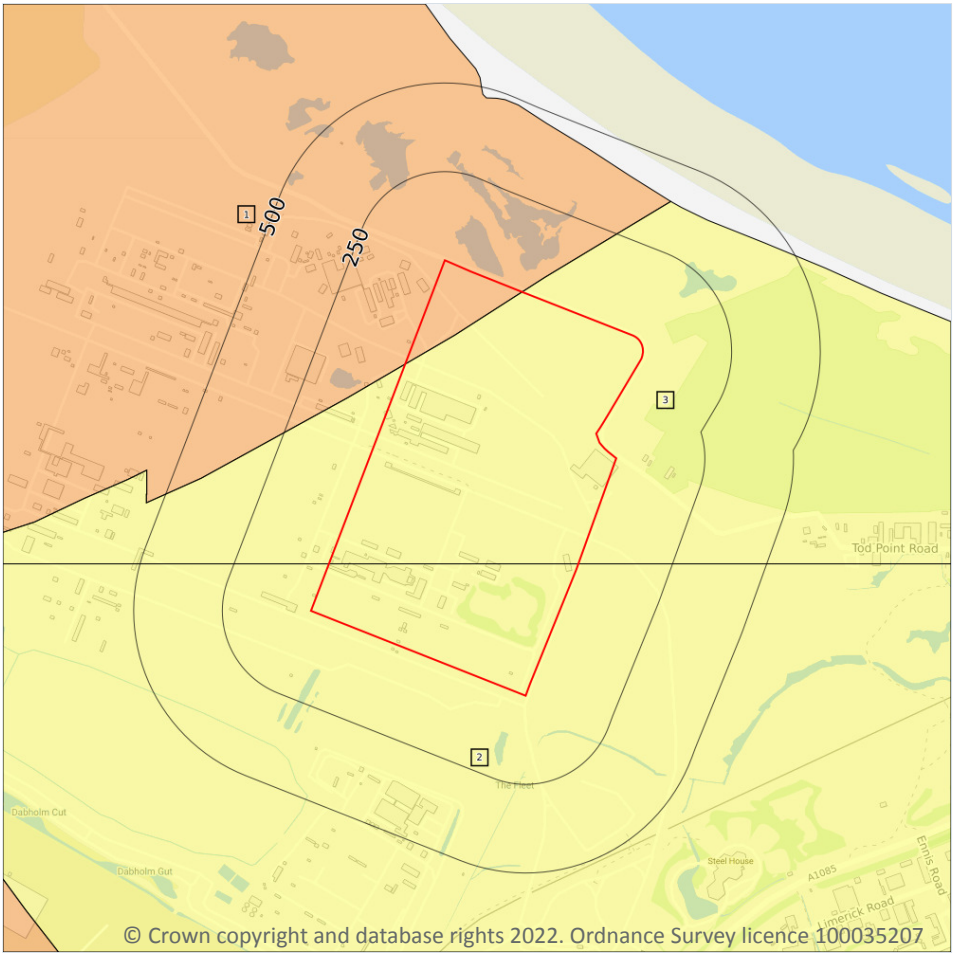
Features are displayed on the Hydrogeology map on **page 54**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

ID	Location	Designation	Description
3	467m W	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
4	484m W	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Bedrock aquifer



Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive

5.2 Bedrock aquifer

Records within 500m **3**

Aquifer status of groundwater held within bedrock geology.

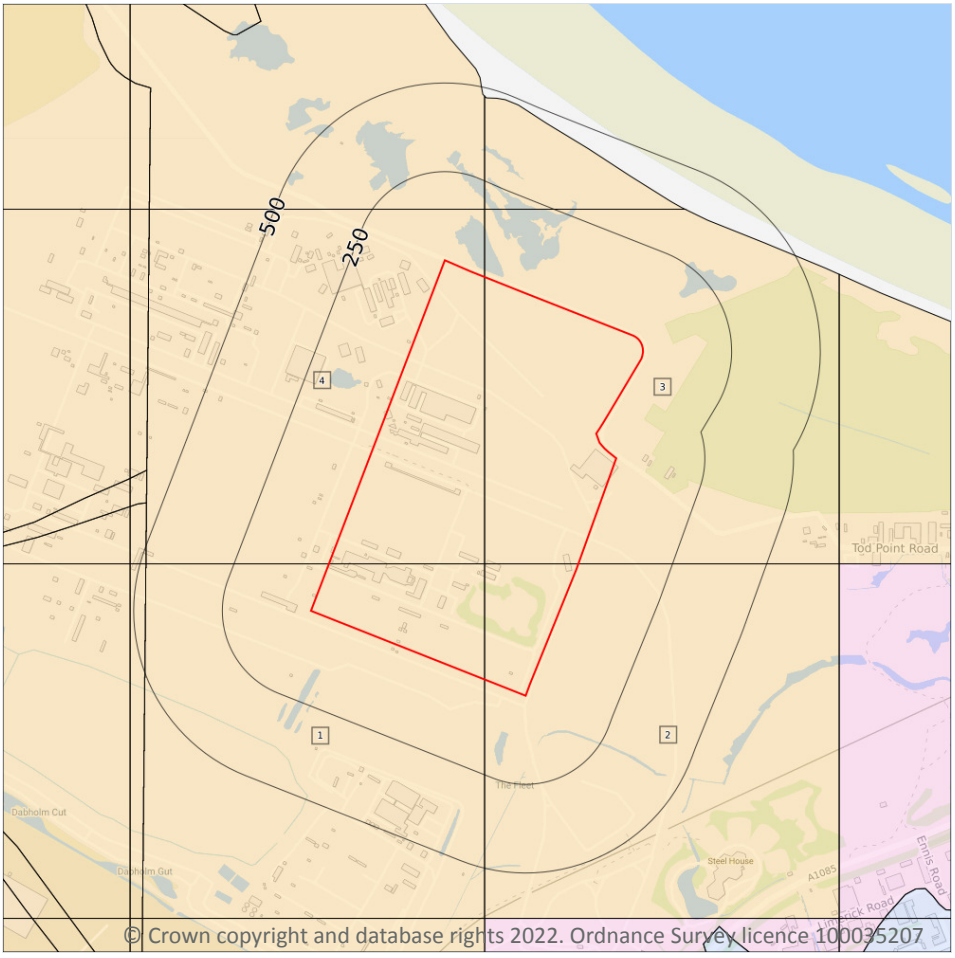
Features are displayed on the Bedrock aquifer map on **page 56**

ID	Location	Designation	Description
1	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	On site	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

ID	Location	Designation	Description
3	**On site**	**Secondary (undifferentiated)**	**Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type**

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Groundwater vulnerability



Site Outline

Search buffers in metres (m)

Superficial vulnerability

- Principal superficial aquifer, high vulnerability
- Secondary superficial aquifer, high vulnerability
- Principal superficial aquifer, medium vulnerability
- Secondary superficial aquifer, medium vulnerability
- Principal superficial aquifer, low vulnerability
- Secondary superficial aquifer, low vulnerability

Bedrock vulnerability

- Principal bedrock aquifer, high vulnerability
- Secondary bedrock aquifer, high vulnerability
- Principal bedrock aquifer, medium vulnerability
- Secondary bedrock aquifer, medium vulnerability
- Principal bedrock aquifer, low vulnerability
- Secondary bedrock aquifer, low vulnerability

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m	4

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 58**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: High Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High	Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures
2	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: High Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High	Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures
3	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: High Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: No Data	Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures
4	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: High Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High	Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site	0

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

5.5 Groundwater vulnerability- local information

Records on site	0

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

This data is sourced from the British Geological Survey and the Environment Agency.

Abstractions and Source Protection Zones

5.6 Groundwater abstractions

Records within 2000m	0

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m	0

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m	0

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m	0

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.

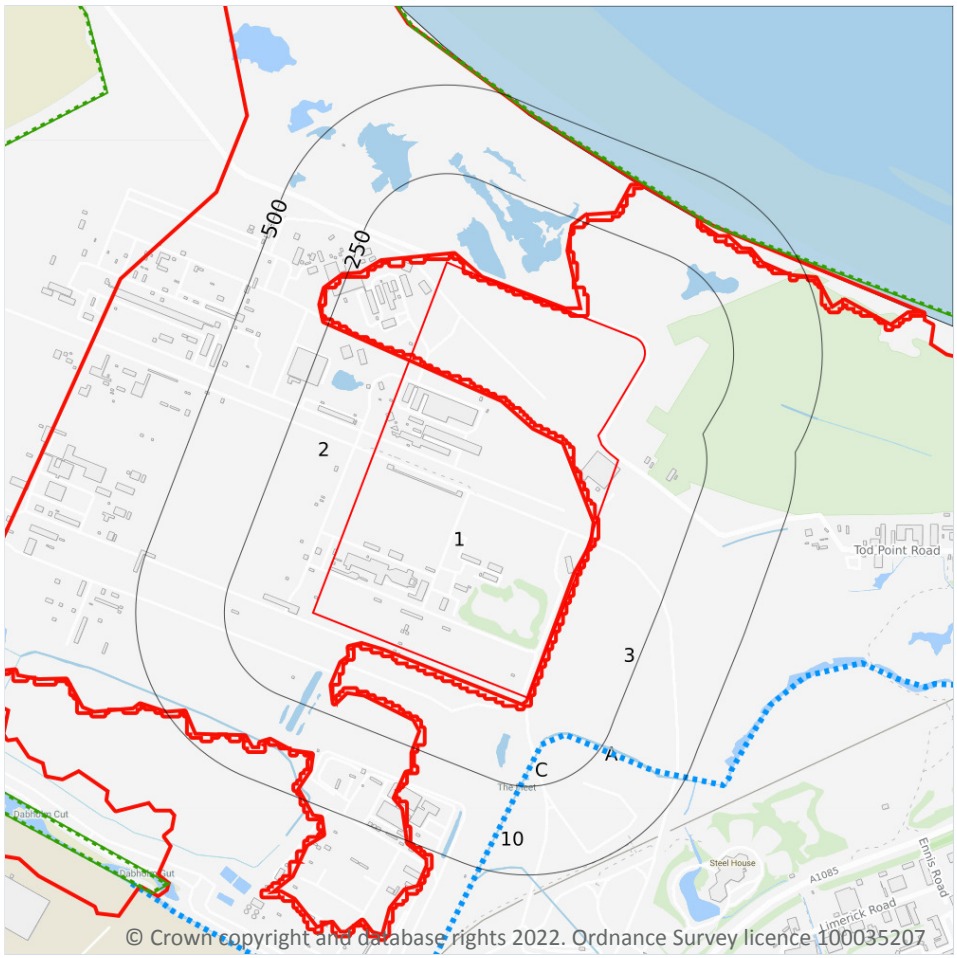
5.10 Source Protection Zones (confined aquifer)

Records within 500m	0

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.

6 Hydrology



Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

WFD River, canal and surface water transfer water bodies

WFD Lake water bodies

WFD Transitional and coastal water bodies

WFD Surface water body catchments boundaries

WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m	**5**

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 63**

ID	Location	Type of water feature	Ground level	Permanence	Name
A	124m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	The Fleet

ID	Location	Type of water feature	Ground level	Permanence	Name
C	149m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	The Fleet
C	213m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	The Fleet
C	228m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
10	230m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	The Fleet

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	**11**

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 63**

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	**2**

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 63**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
2	**On site**	**Coastal Catchment**	**Not part of a river WB catchment**	**368**	**Tees Lower and Estuary**	**Tees**
3	**On site**	**River**	**Tees Estuary (S Bank)**	**GB103025072320**	**Tees Lower and Estuary**	**Tees**

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified	1

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

Features are displayed on the Hydrology map on **page 63**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
8	137m SE	River	Tees Estuary (S Bank)	GB103025072320	Moderate	Fail	Moderate	2019

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site	1

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 63**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
1	**On site**	**Tees Mercia Mudstone & Redcar Mudstone**	**GB40302G701300**	**Poor**	**Poor**	**Good**	**2019**

This data is sourced from the Environment Agency and Natural Resources Wales.

7 River and coastal flooding

7.1 Risk of flooding from rivers and the sea

Records within 50m	0

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m	0

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m	0

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m	0

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m	0

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.

River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m	0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

This data is sourced from the Environment Agency and Natural Resources Wales.

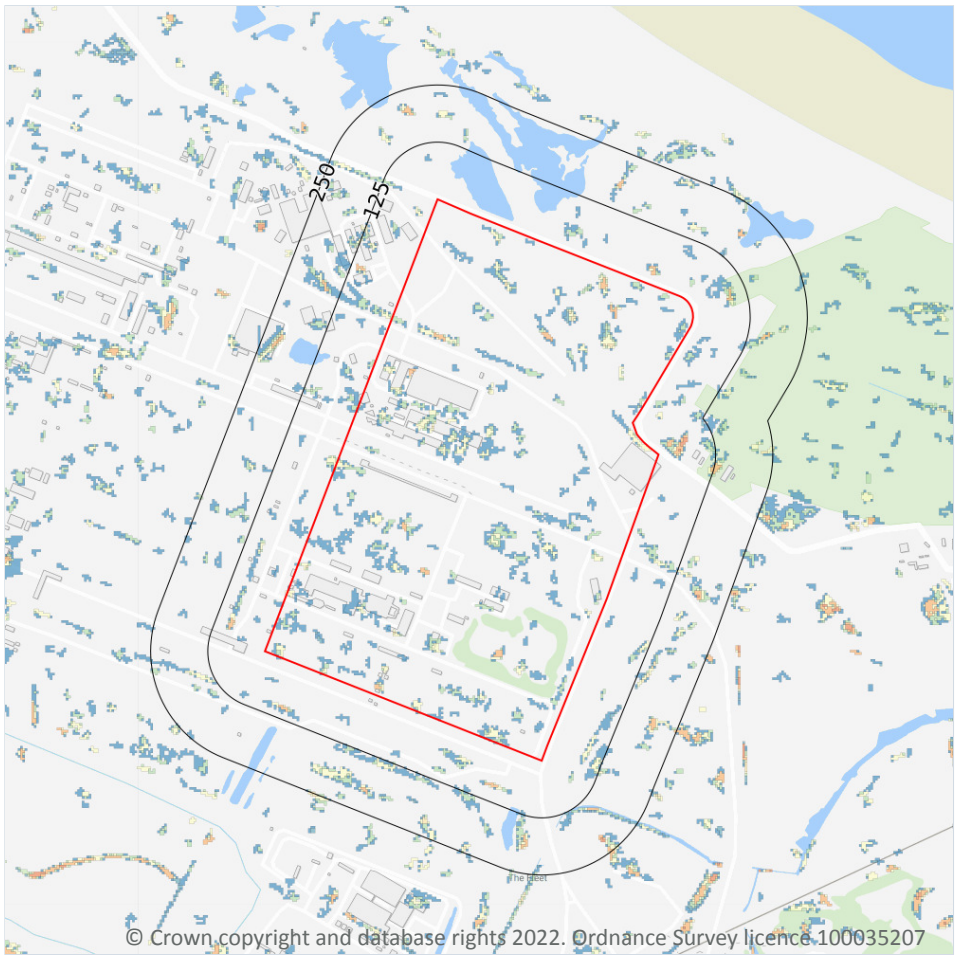
7.7 Flood Zone 3

Records within 50m	0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

8 Surface water flooding



Site Outline
Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

8.1 Surface water flooding

Highest risk on site	**1 in 30 year, 0.1m - 0.3m**
Highest risk within 50m	**1 in 30 year, 0.3m - 1.0m**

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 69**

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Greater than 1.0m
1 in 250 year	Between 0.3m and 1.0m
1 in 100 year	Between 0.3m and 1.0m
1 in 30 year	Between 0.1m and 0.3m

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding

Site Outline

Search buffers in metres (m)

High

Moderate - High

Moderate

Low

Negligible

9.1 Groundwater flooding

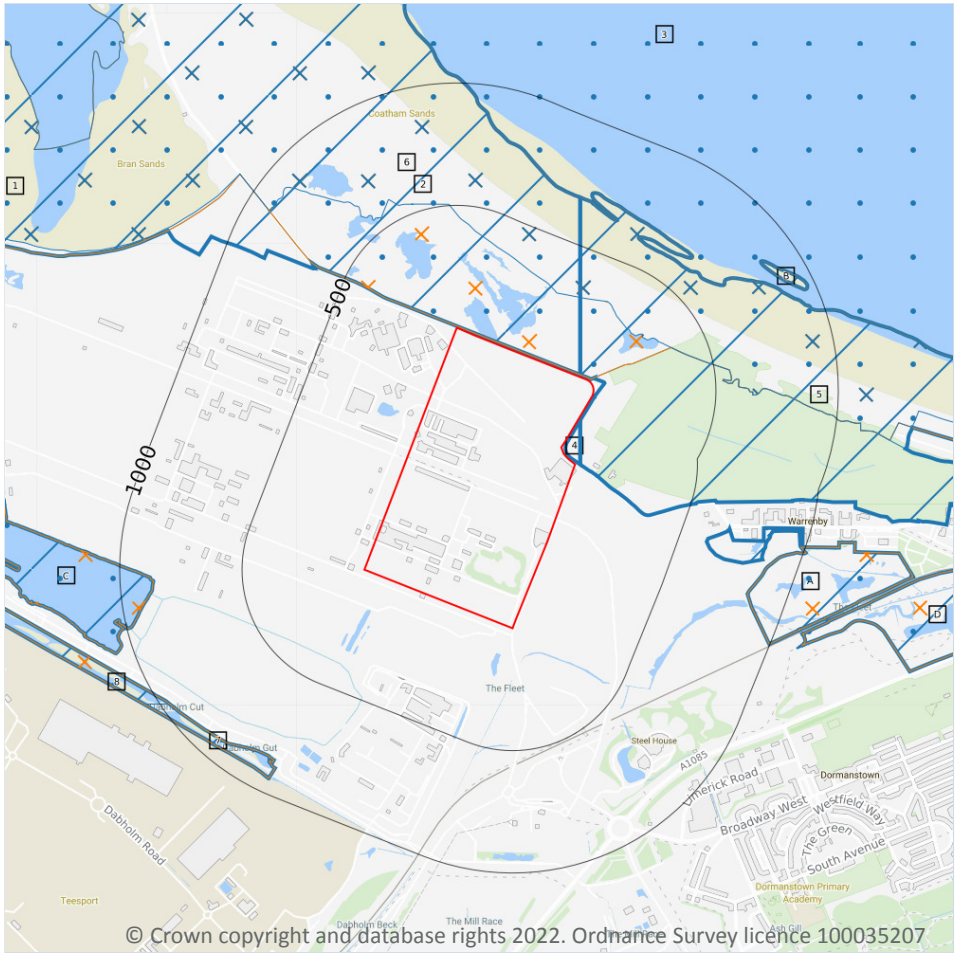
Highest risk on site	**Low**
Highest risk within 50m	**Low**

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 71**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



Site Outline

Search buffers in metres (m)

- Sites of Special Scientific Interest (SSSI)
- Conserved wetland sites (Ramsar sites)
- Special Protection Areas (SPA)
- National Nature Reserves (NNR)
- Proposed Ramsar sites

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	**10**

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on **page 72**

ID	Location	Name	Data source
1	6m N	Teesmouth and Cleveland Coast	Natural England

ID	Location	Name	Data source
4	8m SE	Teesmouth and Cleveland Coast	Natural England
5	8m SE	Teesmouth and Cleveland Coast	Natural England
A	613m E	Teesmouth and Cleveland Coast	Natural England
B	851m NE	Teesmouth and Cleveland Coast	Natural England
C	864m W	Teesmouth and Cleveland Coast	Natural England
D	1108m E	Teesmouth and Cleveland Coast	Natural England
-	1448m N	Teesmouth and Cleveland Coast	Natural England
-	1730m N	Teesmouth and Cleveland Coast	Natural England
-	1801m E	Teesmouth and Cleveland Coast	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	**4**

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

Features are displayed on the Environmental designations map on **page 72**

ID	Location	Site	Details
6	260m NE	Name: Teesmouth and Cleveland Coast Site status: Listed Data source: Natural England	Overview: Medium-large site encompassing a range of habitats (sand and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes) on and around an estuary which has been much-modified by human activities. Together these habitats support internationally important numbers of waterbirds. Ramsar criteria: -
B	850m NE	Name: Teesmouth and Cleveland Coast Site status: Listed Data source: Natural England	Overview: Medium-large site encompassing a range of habitats (sand and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes) on and around an estuary which has been much-modified by human activities. Together these habitats support internationally important numbers of waterbirds. Ramsar criteria: -

ID	Location	Site	Details
-	1447m N	Name: Teesmouth and Cleveland Coast Site status: Listed Data source: Natural England	Overview: Medium-large site encompassing a range of habitats (sand and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes) on and around an estuary which has been much-modified by human activities. Together these habitats support internationally important numbers of waterbirds. Ramsar criteria: -
-	1730m N	Name: Teesmouth and Cleveland Coast Site status: Listed Data source: Natural England	Overview: Medium-large site encompassing a range of habitats (sand and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes) on and around an estuary which has been much-modified by human activities. Together these habitats support internationally important numbers of waterbirds. Ramsar criteria: -

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m	**0**

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m	**8**

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

Features are displayed on the Environmental designations map on **page 72**

ID	Location	Name	Species of interest	Habitat description	Data source
3	6m N	Teesmouth and Cleveland Coast	Pied avocet; Red knot; Ruff; Common redshank; Sandwich tern; Common tern; Little tern	Marine areas, Sea inlets; Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Salt marshes, Salt pastures, Salt steppes; Coastal sand dunes, Sand beaches, Machair; Bogs, Marshes, Water fringed vegetation, Fens; Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Shingle, Sea cliffs, Islets	Natural England

ID	Location	Name	Species of interest	Habitat description	Data source
A	842m E	Teesmouth and Cleveland Coast	Pied avocet; Red knot; Ruff; Common redshank; Sandwich tern; Common tern; Little tern	Marine areas, Sea inlets; Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Salt marshes, Salt pastures, Salt steppes; Coastal sand dunes, Sand beaches, Machair; Bogs, Marshes, Water fringed vegetation, Fens; Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Shingle, Sea cliffs, Islets	Natural England
7	856m SW	Teesmouth and Cleveland Coast	Pied avocet; Red knot; Ruff; Common redshank; Sandwich tern; Common tern; Little tern	Marine areas, Sea inlets; Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Salt marshes, Salt pastures, Salt steppes; Coastal sand dunes, Sand beaches, Machair; Bogs, Marshes, Water fringed vegetation, Fens; Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Shingle, Sea cliffs, Islets	Natural England
C	864m W	Teesmouth and Cleveland Coast	Pied avocet; Red knot; Ruff; Common redshank; Sandwich tern; Common tern; Little tern	Marine areas, Sea inlets; Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Salt marshes, Salt pastures, Salt steppes; Coastal sand dunes, Sand beaches, Machair; Bogs, Marshes, Water fringed vegetation, Fens; Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Shingle, Sea cliffs, Islets	Natural England
D	1108m E	Teesmouth and Cleveland Coast	Pied avocet; Red knot; Ruff; Common redshank; Sandwich tern; Common tern; Little tern	Marine areas, Sea inlets; Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Salt marshes, Salt pastures, Salt steppes; Coastal sand dunes, Sand beaches, Machair; Bogs, Marshes, Water fringed vegetation, Fens; Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Shingle, Sea cliffs, Islets	Natural England
-	1510m W	Teesmouth and Cleveland Coast	Pied avocet; Red knot; Ruff; Common redshank; Sandwich tern; Common tern; Little tern	Marine areas, Sea inlets; Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Salt marshes, Salt pastures, Salt steppes; Coastal sand dunes, Sand beaches, Machair; Bogs, Marshes, Water fringed vegetation, Fens; Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Shingle, Sea cliffs, Islets	Natural England

ID	Location	Name	Species of interest	Habitat description	Data source
-	1516m W	Teesmouth and Cleveland Coast	Pied avocet; Red knot; Ruff; Common redshank; Sandwich tern; Common tern; Little tern	Marine areas, Sea inlets; Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Salt marshes, Salt pastures, Salt steppes; Coastal sand dunes, Sand beaches, Machair; Bogs, Marshes, Water fringed vegetation, Fens; Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Shingle, Sea cliffs, Islets	Natural England
-	1739m W	Teesmouth and Cleveland Coast	Pied avocet; Red knot; Ruff; Common redshank; Sandwich tern; Common tern; Little tern	Marine areas, Sea inlets; Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Salt marshes, Salt pastures, Salt steppes; Coastal sand dunes, Sand beaches, Machair; Bogs, Marshes, Water fringed vegetation, Fens; Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Shingle, Sea cliffs, Islets	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m	**0**

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m	**0**

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m	0

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m	0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m	0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m	0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m	0

Areas designated to prevent urban sprawl by keeping land permanently open.

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m	8

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

Features are displayed on the Environmental designations map on **page 72**

ID	Location	Name	Status
2	6m N	Teesmouth and Cleveland Coast	Proposed
A	842m E	Teesmouth and Cleveland Coast	Proposed
B	851m NE	Teesmouth and Cleveland Coast	Proposed
8	856m SW	Teesmouth and Cleveland Coast	Proposed
C	864m W	Teesmouth and Cleveland Coast	Proposed
D	1108m E	Teesmouth and Cleveland Coast	Proposed
-	1448m N	Teesmouth and Cleveland Coast	Proposed
-	1730m N	Teesmouth and Cleveland Coast	Proposed

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m	0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m	0

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m	0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

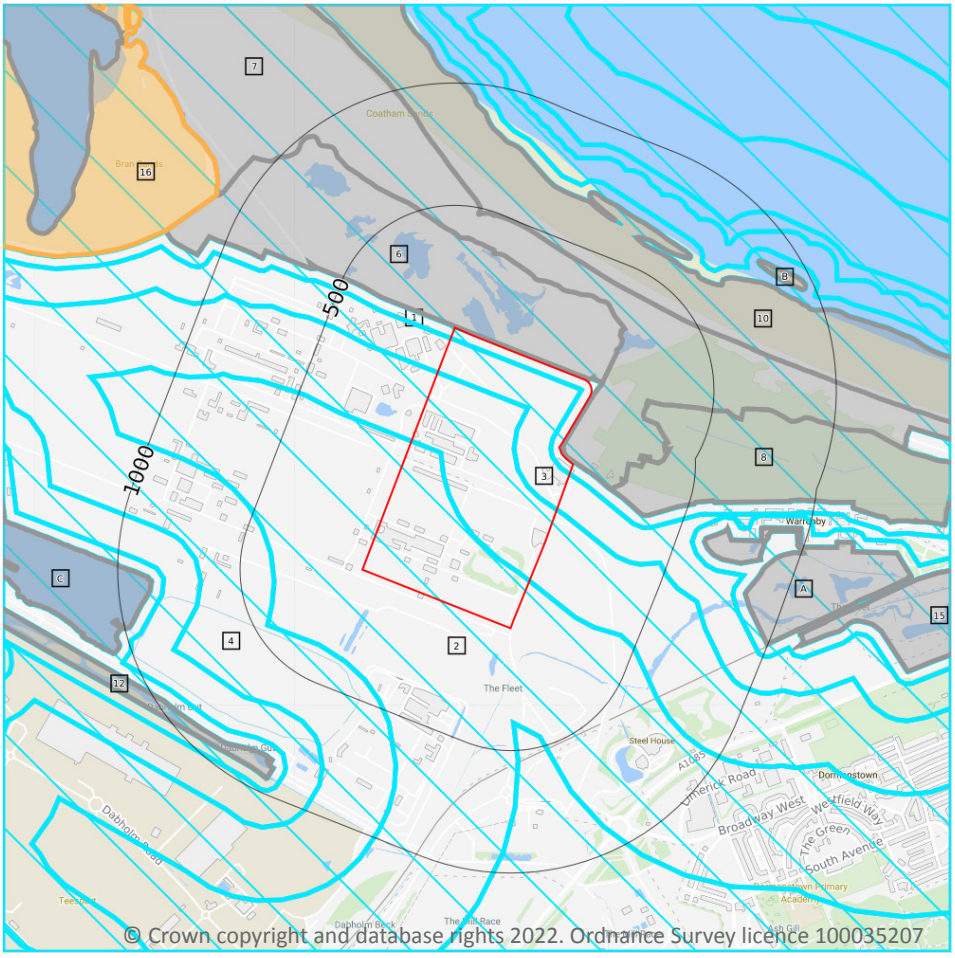
10.16 Nitrate Vulnerable Zones

Records within 2000m	0

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

This data is sourced from Natural England and Natural Resources Wales.

SSSI Impact Zones and Units



Site Outline

Search buffers in metres (m)

SSSI Impact Risk Zones

SSSI Units

- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

10.17 SSSI Impact Risk Zones

Records on site	4

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 80**

ID	Location	Type of developments requiring consultation
1	**On site**	**All applications - All planning applications - except householder applications.**

ID	Location	Type of developments requiring consultation
2	**On site**	**Infrastructure - Pipelines, pylons and overhead cables. any transport proposal including road, rail and by water (excluding routine maintenance). airports, helipads and other aviation proposals.** **Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines.** **Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, review of minerals permissions (romp), extensions, variations to conditions etc. oil & gas exploration/extraction.** **Rural non-residential - Large non residential developments outside existing settlements/urban areas where net additional gross internal floorspace is > 1,000m² or footprint exceeds 0.2ha.** **Residential - Residential development of 10 units or more.** **Rural residential - Any residential development of 10 or more houses outside existing settlements/urban areas.** **Air pollution - Any industrial/agricultural development that could cause air pollution (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 200m², manure stores > 250t).** **Combustion - General combustion processes >20mw energy input. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.** **Waste - Landfill. incl: inert landfill, non-hazardous landfill, hazardous landfill.** **Composting - Any composting proposal with more than 500 tonnes maximum annual operational throughput. incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.** **Discharges - Any discharge of water or liquid waste of more than 2m³/day to ground (ie to seep away) or to surface water, such as a beck or stream.** **Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .**

ID	Location	Type of developments requiring consultation
3	**On site**	**All applications - All planning applications (except householder) outside or extending outside existing settlements/urban areas affecting greenspace, farmland, semi natural habitats or landscape features such as trees, hedges, streams, rural buildings/structures.** **Infrastructure - Pipelines, pylons and overhead cables. any transport proposal including road, rail and by water (excluding routine maintenance). airports, helipads and other aviation proposals.** **Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines.** **Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, review of minerals permissions (romp), extensions, variations to conditions etc. oil & gas exploration/extraction.** **Rural non-residential - Large non residential developments outside existing settlements/urban areas where net additional gross internal floorspace is > 1,000m² or footprint exceeds 0.2ha.** **Residential - Residential development of 10 units or more.** **Rural residential - Any residential developments outside of existing settlements/urban areas with a total net gain in residential units.** **Air pollution - Any development that could cause air pollution or dust either in its construction or operation (incl: industrial/commercial processes, livestock & poultry units, slurry lagoons & digestate stores, manure stores).** **Combustion - All general combustion processes. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.** **Waste - Mechanical and biological waste treatment, inert landfill, non-hazardous landfill, hazardous landfill, household civic amenity recycling facilities construction, demolition and excavation waste, other waste management.** **Composting - Any composting proposal. incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.** **Discharges - Any discharge of water or liquid waste that is discharged to ground (ie to seep away) or to surface water, such as a beck or stream.** **Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .**

ID	Location	Type of developments requiring consultation
4	On site	**All applications - All planning applications (except householder) outside or extending outside existing settlements/urban areas affecting greenspace, farmland, semi natural habitats or landscape features such as trees, hedges, streams, rural buildings/structures. Infrastructure - Pipelines, pylons and overhead cables. any transport proposal including road, rail and by water (excluding routine maintenance). airports, helipads and other aviation proposals. Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines. Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, review of minerals permissions (romp), extensions, variations to conditions etc. oil & gas exploration/extraction. Rural non-residential - Large non residential developments outside existing settlements/urban areas where net additional gross internal floorspace is > 1,000m² or footprint exceeds 0.2ha. Residential - Residential development of 10 units or more. Rural residential - Any residential developments outside of existing settlements/urban areas with a total net gain in residential units. Air pollution - Any development that could cause air pollution (incl: industrial/commercial processes, livestock & poultry units, slurry lagoons & digestate stores, manure stores). Combustion - All general combustion processes. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion. Waste - Mechanical and biological waste treatment, inert landfill, non-hazardous landfill, hazardous landfill, household civic amenity recycling facilities construction, demolition and excavation waste, other waste management. Composting - Any composting proposal. incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management. Discharges - Any discharge of water or liquid waste that is discharged to ground (ie to seep away) or to surface water, such as a beck or stream. Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .**

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	**14**

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

Features are displayed on the SSSI Impact Zones and Units map on **page 80**

ID: 6
Location: 6m N
SSSI name: Teesmouth and Cleveland Coast
Unit name: Coatham Quarries And Lagoons
Broad habitat:
Condition: Not Recorded
Reportable features:

Feature name	Feature condition	Date of assessment
>20,000 Non-breeding waterbirds	Favourable	01/01/1900
Aggregations of non-breeding birds - Redshank, Tringa totanus	-	-
Fixed dune grassland	-	-
Invert. assemblage F111 bare sand & chalk	-	-
Redshank, Tringa totanus - A162, nb	-	-
Sand dune; strandline, embryo and mobile dunes (SD1-6)	-	-
Waterbird assemblage	-	-

ID: 7
Location: 8m SE
SSSI name: Teesmouth and Cleveland Coast
Unit name: South Gare And Coatham Dunes
Broad habitat:
Condition: Not Recorded
Reportable features:

Feature name	Feature condition	Date of assessment
Assemblages of breeding birds - Mixed: Sand-dunes and Saltmarsh, Lowland open waters and their margins	-	-
Fixed dune grassland	-	-
Humid dune slacks	-	-
Invert. assemblage F111 bare sand & chalk	-	-
Sand dune; strandline, embryo and mobile dunes (SD1-6)	-	-

ID: 8
Location: 180m E
SSSI name: Teesmouth and Cleveland Coast
Unit name: Cleveland Golf Course
Broad habitat:
Condition: Not Recorded
Reportable features:

Feature name	Feature condition	Date of assessment
Assemblages of breeding birds - Mixed: Sand-dunes and Saltmarsh, Lowland open waters and their margins	-	-

Feature name	Feature condition	Date of assessment
Fixed dune grassland	-	-
Humid dune slacks	-	-
Invert. assemblage F111 bare sand & chalk	-	-

ID: 10
Location: 405m NE
SSSI name: Teesmouth and Cleveland Coast
Unit name: South Gare To Marske
Broad habitat:
Condition: Not Recorded
Reportable features:

Feature name	Feature condition	Date of assessment
>20,000 Non-breeding waterbirds	Favourable	01/01/1900
Aggregations of breeding birds - Common tern, Sterna hirundo	-	-
Aggregations of breeding birds - Little tern, Sterna albifrons	-	-
Aggregations of non-breeding birds - Knot, Calidris canutus	-	-
Aggregations of non-breeding birds - Redshank, Tringa totanus	-	-
Aggregations of non-breeding birds - Ringed plover, Charadrius hiaticula	-	-
Aggregations of non-breeding birds - Sanderling, Calidris alba	-	-
Assemblages of breeding birds - Mixed: Sand-dunes and Saltmarsh, Lowland open waters and their margins	-	-
EC - Hettangian Sinemurian and Pliensbachian	Favourable	15/11/2021
Fixed dune grassland	-	-
Knot, Calidris canutus - A143, nb	-	-
Little tern, Sterna albifrons - A195, b	-	-
Redshank, Tringa totanus - A162, nb	-	-
SM4-28 - Saltmarsh	-	-
Sand dune; strandline, embryo and mobile dunes (SD1-6)	-	-
Waterbird assemblage	-	-

ID: A
Location: 613m E
SSSI name: Teesmouth and Cleveland Coast
Unit name: Coatham Marsh
Broad habitat:
Condition: Not Recorded
Reportable features:

Feature name	Feature condition	Date of assessment
>20,000 Non-breeding waterbirds	Favourable	01/01/1900
Aggregations of non-breeding birds - Gadwall, Anas strepera	-	-
Assemblages of breeding birds - Mixed: Sand-dunes and Saltmarsh, Lowland open waters and their margins	-	-

ID: B
Location: 851m NE
SSSI name: Teesmouth and Cleveland Coast
Unit name: South Gare To Marske
Broad habitat:
Condition: Not Recorded
Reportable features:

Feature name	Feature condition	Date of assessment
>20,000 Non-breeding waterbirds	Favourable	01/01/1900
Aggregations of breeding birds - Common tern, Sterna hirundo	-	-
Aggregations of breeding birds - Little tern, Sterna albifrons	-	-
Aggregations of non-breeding birds - Knot, Calidris canutus	-	-
Aggregations of non-breeding birds - Redshank, Tringa totanus	-	-
Aggregations of non-breeding birds - Ringed plover, Charadrius hiaticula	-	-
Aggregations of non-breeding birds - Sanderling, Calidris alba	-	-
Assemblages of breeding birds - Mixed: Sand-dunes and Saltmarsh, Lowland open waters and their margins	-	-
EC - Hettangian Sinemurian and Pliensbachian	Favourable	15/11/2021
Fixed dune grassland	-	-
Knot, Calidris canutus - A143, nb	-	-
Little tern, Sterna albifrons - A195, b	-	-

Feature name	Feature condition	Date of assessment
Redshank, Tringa totanus - A162, nb	-	-
SM4-28 - Saltmarsh	-	-
Sand dune; strandline, embryo and mobile dunes (SD1-6)	-	-
Waterbird assemblage	-	-

ID: 12
Location: 856m SW
SSSI name: Teesmouth and Cleveland Coast
Unit name: Bran Sands Lagoon And Dabholme Gut
Broad habitat:
Condition: Not Recorded
Reportable features:

Feature name	Feature condition	Date of assessment
>20,000 Non-breeding waterbirds	Favourable	01/01/1900
Aggregations of breeding birds - Common tern, Sterna hirundo	-	-
Aggregations of non-breeding birds - Gadwall, Anas strepera	-	-
Aggregations of non-breeding birds - Redshank, Tringa totanus	-	-
Aggregations of non-breeding birds - Shelduck, Tadorna tadorna	-	-

ID: C
Location: 864m W
SSSI name: Teesmouth and Cleveland Coast
Unit name: Bran Sands Lagoon And Dabholme Gut
Broad habitat:
Condition: Not Recorded
Reportable features:

Feature name	Feature condition	Date of assessment
>20,000 Non-breeding waterbirds	Favourable	01/01/1900
Aggregations of breeding birds - Common tern, Sterna hirundo	-	-
Aggregations of non-breeding birds - Gadwall, Anas strepera	-	-
Aggregations of non-breeding birds - Redshank, Tringa totanus	-	-
Aggregations of non-breeding birds - Shelduck, Tadorna tadorna	-	-

ID: 15
Location: 1108m E
SSSI name: Teesmouth and Cleveland Coast
Unit name: Coatham Marsh
Broad habitat:
Condition: Not Recorded
Reportable features:

Feature name	Feature condition	Date of assessment
>20,000 Non-breeding waterbirds	Favourable	01/01/1900
Aggregations of non-breeding birds - Gadwall, Anas strepera	-	-
Assemblages of breeding birds - Mixed: Sand-dunes and Saltmarsh, Lowland open waters and their margins	-	-

ID: 16
Location: 1115m NW
SSSI name: Teesmouth and Cleveland Coast
Unit name: Bran Sands
Broad habitat:
Condition: Unfavourable - Declining
Reportable features:

Feature name	Feature condition	Date of assessment
>20,000 Non-breeding waterbirds	Favourable	15/03/2018
Aggregations of breeding birds - Common tern, Sterna hirundo	Favourable	15/03/2018
Aggregations of non-breeding birds - Knot, Calidris canutus	Unfavourable - Declining	15/03/2018
Aggregations of non-breeding birds - Redshank, Tringa totanus	Favourable	15/03/2018
Aggregations of non-breeding birds - Ringed plover, Charadrius hiaticula	Unfavourable - Declining	15/03/2018
Aggregations of non-breeding birds - Sanderling, Calidris alba	Unfavourable - Declining	15/03/2018
Aggregations of non-breeding birds - Sandwich tern, Sterna sandvicensis	Unfavourable - Declining	15/03/2018
Fixed dune grassland	Favourable	15/03/2018
Knot, Calidris canutus - A143, nb	Unfavourable - Declining	15/03/2018
Redshank, Tringa totanus - A162, nb	Favourable	15/03/2018
Sand dune; strandline, embryo and mobile dunes (SD1-6)	Favourable	15/03/2018
Sandwich tern, Sterna sandvicensis - A191, nb	Unfavourable - Declining	15/03/2018

Feature name	Feature condition	Date of assessment
Waterbird assemblage	Favourable	15/03/2018

ID: -
Location: 1448m N
SSSI name: Teesmouth and Cleveland Coast
Unit name: South Gare To Marske
Broad habitat:
Condition: Not Recorded
Reportable features:

Feature name	Feature condition	Date of assessment
>20,000 Non-breeding waterbirds	Favourable	01/01/1900
Aggregations of breeding birds - Common tern, Sterna hirundo	-	-
Aggregations of breeding birds - Little tern, Sterna albifrons	-	-
Aggregations of non-breeding birds - Knot, Calidris canutus	-	-
Aggregations of non-breeding birds - Redshank, Tringa totanus	-	-
Aggregations of non-breeding birds - Ringed plover, Charadrius hiaticula	-	-
Aggregations of non-breeding birds - Sanderling, Calidris alba	-	-
Assemblages of breeding birds - Mixed: Sand-dunes and Saltmarsh, Lowland open waters and their margins	-	-
EC - Hettangian Sinemurian and Pliensbachian	Favourable	15/11/2021
Fixed dune grassland	-	-
Knot, Calidris canutus - A143, nb	-	-
Little tern, Sterna albifrons - A195, b	-	-
Redshank, Tringa totanus - A162, nb	-	-
SM4-28 - Saltmarsh	-	-
Sand dune; strandline, embryo and mobile dunes (SD1-6)	-	-
Waterbird assemblage	-	-

ID: 19
Location: 1528m W
SSSI name: Teesmouth and Cleveland Coast
Unit name: River Tees
Broad habitat:
Condition: Not Recorded
Reportable features:

Feature name	Feature condition	Date of assessment
>20,000 Non-breeding waterbirds	Favourable	01/01/1900
Aggregations of breeding birds - Common tern, Sterna hirundo	-	-
Aggregations of breeding birds - Little tern, Sterna albifrons	-	-
Aggregations of non-breeding birds - Redshank, Tringa totanus	-	-
Aggregations of non-breeding birds - Sandwich tern, Sterna sandvicensis	-	-
Common seal, Phoca vitulina	-	-
Little tern, Sterna albifrons - A195, b	-	-
Redshank, Tringa totanus - A162, nb	-	-
Sandwich tern, Sterna sandvicensis - A191, nb	-	-
Waterbird assemblage	-	-

ID: -
Location: 1730m N
SSSI name: Teesmouth and Cleveland Coast
Unit name: South Gare To Marske
Broad habitat:
Condition: Not Recorded
Reportable features:

Feature name	Feature condition	Date of assessment
>20,000 Non-breeding waterbirds	Favourable	01/01/1900
Aggregations of breeding birds - Common tern, Sterna hirundo	-	-
Aggregations of breeding birds - Little tern, Sterna albifrons	-	-
Aggregations of non-breeding birds - Knot, Calidris canutus	-	-
Aggregations of non-breeding birds - Redshank, Tringa totanus	-	-
Aggregations of non-breeding birds - Ringed plover, Charadrius hiaticula	-	-

Feature name	Feature condition	Date of assessment
Aggregations of non-breeding birds - Sanderling, Calidris alba	-	-
Assemblages of breeding birds - Mixed: Sand-dunes and Saltmarsh, Lowland open waters and their margins	-	-
EC - Hettangian Sinemurian and Pliensbachian	Favourable	15/11/2021
Fixed dune grassland	-	-
Knot, Calidris canutus - A143, nb	-	-
Little tern, Sterna albifrons - A195, b	-	-
Redshank, Tringa totanus - A162, nb	-	-
SM4-28 - Saltmarsh	-	-
Sand dune; strandline, embryo and mobile dunes (SD1-6)	-	-
Waterbird assemblage	-	-

ID: -
Location: 1801m E
SSSI name: Teesmouth and Cleveland Coast
Unit name: Coatham Village Green
Broad habitat:
Condition: Not Recorded
Reportable features:

Feature name	Feature condition	Date of assessment
Assemblages of breeding birds - Mixed: Sand-dunes and Saltmarsh, Lowland open waters and their margins	-	-
Fixed dune grassland	-	-
Invert. assemblage F111 bare sand & chalk	-	-

This data is sourced from Natural England and Natural Resources Wales.

11 Visual and cultural designations

11.1 World Heritage Sites

Records within 250m	0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m	0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m	0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m	0

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m	0

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m	0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

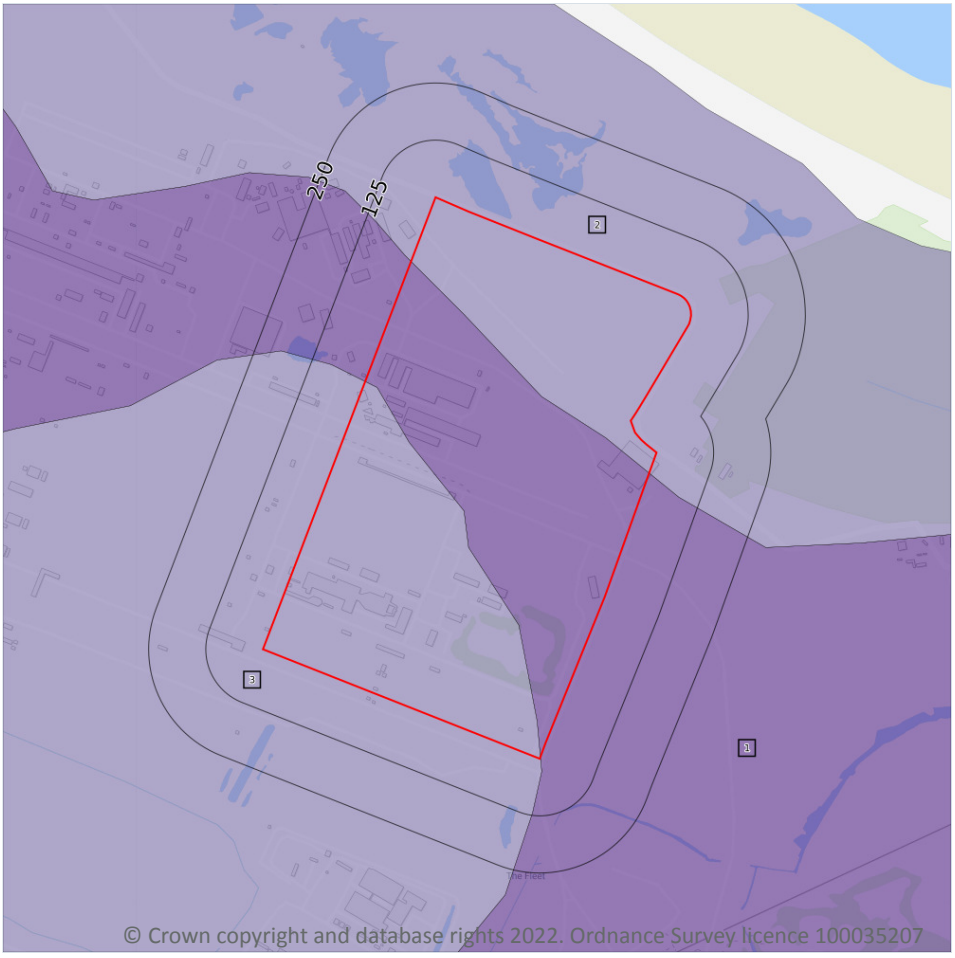
11.7 Registered Parks and Gardens

Records within 250m	0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

12 Agricultural designations



Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m	3

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 94**

ID	Location	Classification	Description
1	On site	Urban	-
2	On site	Non Agricultural	-

ID	Location	Classification	Description
3	**On site**	**Non Agricultural**	-

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m	**0**

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m	**0**

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	**0**

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.

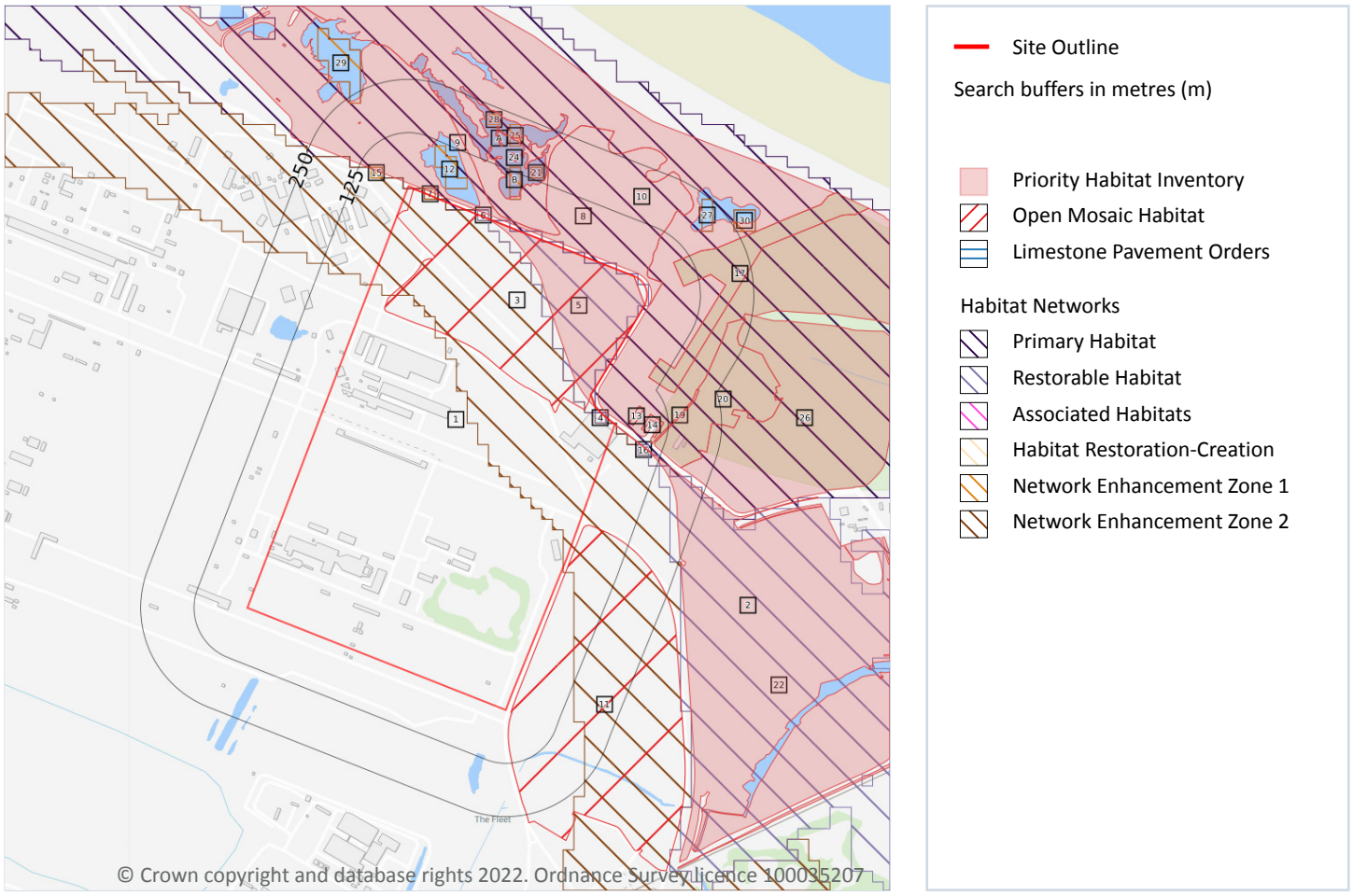
12.5 Countryside Stewardship Schemes

Records within 250m	**0**

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

This data is sourced from Natural England.

13 Habitat designations



13.1 Priority Habitat Inventory

Records within 250m	15

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on **page 96**

ID	Location	Main Habitat	Other habitats
2	**On site**	**No main habitat but additional habitats present**	**Additional: CFPGM (FEP 50%); RBEDS (FEP 50%); LCGRA (FEP 50%); LMEAD (FEP 50%)**
9	6m N	Coastal sand dunes	Main habitat: CSDUN (INV > 50%)
10	8m SE	Coastal sand dunes	Main habitat: RBEDS (INV > 50%); CSDUN (INV > 50%, ENSIS L1)

ID	Location	Main Habitat	Other habitats
13	34m E	No main habitat but additional habitats present	Main habitat: RBEDS (INV > 50%); CSDUN (INV > 50%, ENSIS L1)
A	60m N	No main habitat but additional habitats present	Main habitat: RBEDS (INV > 50%); CSDUN (ENSIS L1)
14	63m E	Coastal sand dunes	Main habitat: RBEDS (INV > 50%); CSDUN (ENSIS L1)
17	83m NE	Coastal sand dunes	Main habitat: RBEDS (INV > 50%); CSDUN (INV > 50%, ENSIS L1)
19	101m E	Coastal sand dunes	Main habitat: RBEDS (INV > 50%); CSDUN (INV > 50%, ENSIS L1)
B	103m N	Coastal sand dunes	Main habitat: RBEDS (INV > 50%); CSDUN (INV > 50%, ENSIS L1)
20	103m E	Coastal sand dunes	Main habitat: CSDUN (INV > 50%, ENSIS L1)
23	148m N	Coastal sand dunes	Main habitat: RBEDS (INV > 50%); CSDUN (ENSIS L1)
24	149m N	Coastal sand dunes	Main habitat: RBEDS (INV > 50%); CSDUN (ENSIS L1)
A	170m N	Coastal sand dunes	Main habitat: RBEDS (INV > 50%); CSDUN (ENSIS L1)
26	180m E	Coastal sand dunes	Main habitat: CSDUN (INV > 50%)
A	187m N	Coastal sand dunes	Main habitat: RBEDS (INV > 50%); CSDUN (ENSIS L1)

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	**18**

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

Features are displayed on the Habitat designations map on **page 96**

ID	Location	Type	Habitat
1	**On site**	**Network Enhancement Zone 2**	**Not specified**
4	**On site**	**Restorable Habitat**	**Not specified**
5	**On site**	**Restorable Habitat**	**Not specified**
6	**On site**	**Restorable Habitat**	**Not specified**
7	**On site**	**Network Enhancement Zone 1**	**Not specified**
8	**On site**	**Primary Habitat**	**Coastal sand dunes**
12	29m N	Network Enhancement Zone 1	Not specified

ID	Location	Type	Habitat
B	61m N	Network Enhancement Zone 1	Not specified
15	65m W	Network Enhancement Zone 1	Not specified
16	67m E	Restorable Habitat	Not specified
18	99m E	Restorable Habitat	Not specified
21	126m N	Network Enhancement Zone 1	Not specified
22	131m E	Restorable Habitat	Not specified
25	177m N	Network Enhancement Zone 1	Not specified
27	183m NE	Network Enhancement Zone 1	Not specified
28	205m N	Network Enhancement Zone 1	Not specified
29	224m NW	Network Enhancement Zone 1	Not specified
30	245m NE	Network Enhancement Zone 1	Not specified

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m	**2**

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

Features are displayed on the Habitat designations map on **page 96**

ID	Location	Site reference	Identification confidence	Primary source	Secondary source	Tertiary source
3	**On site**	**NLUD Ref: 73100018**	**Low**	**National Land Use Database - Previously Developed Land**	**UK Perspectives Aerial Photography**	**-**
11	9m E	NLUD Ref: 73100017	Low	National Land Use Database - Previously Developed Land	UK Perspectives Aerial Photography	-

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m	0

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.

14 Geology 1:10,000 scale - Availability

Site Outline

Search buffers in metres (m)

Full coverage

Partial coverage

No coverage

14.1 10k Availability

Records within 500m	2

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 100**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**No coverage**	**NZ52NE**
2	**On site**	**No coverage**	**No coverage**	**No coverage**	**No coverage**	**NoCov**

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Artificial and made ground

Site Outline

Search buffers in metres (m)

- Reclaimed ground
- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

14.2 Artificial and made ground (10k)

Records within 500m	1

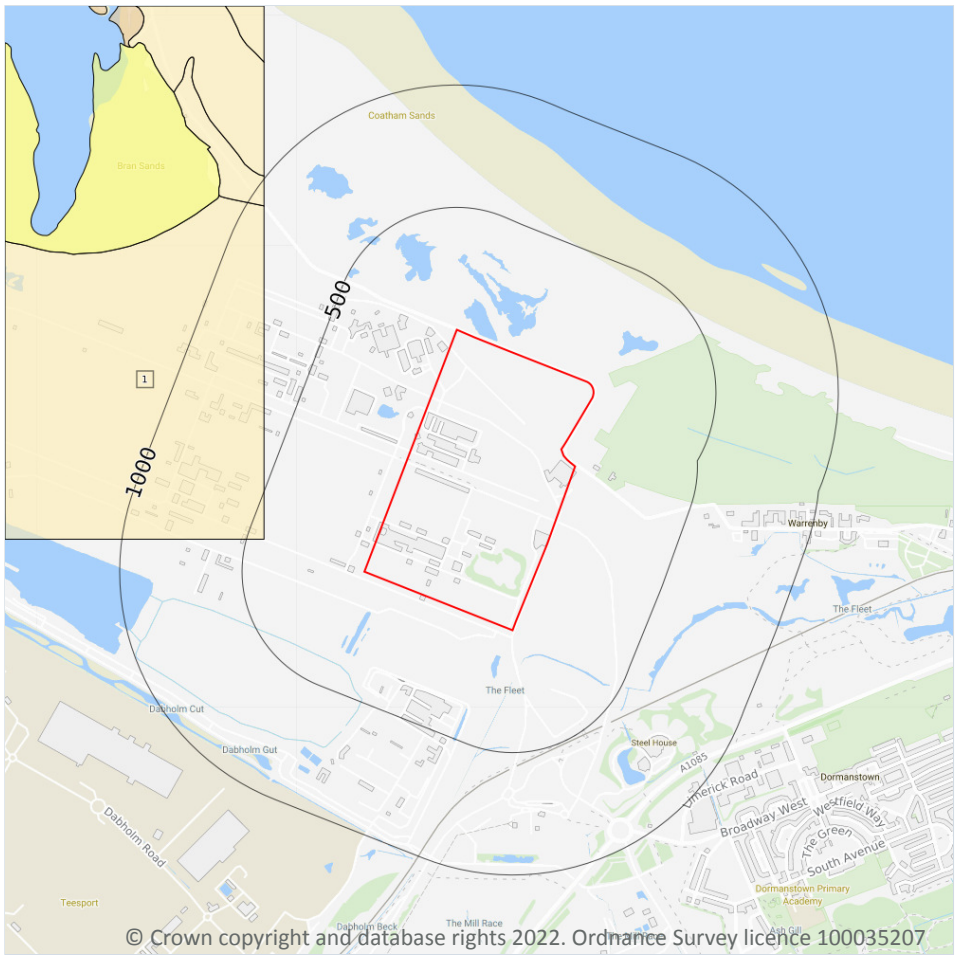
Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 101**

ID	Location	LEX Code	Description	Rock description
1	431m W	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m	1

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 102**

ID	Location	LEX Code	Description	Rock description
1	431m W	MEA-XSZC	Marine Or Estuarine Alluvium - Sand, Silt And Clay	Sand, Silt And Clay

This data is sourced from the British Geological Survey.

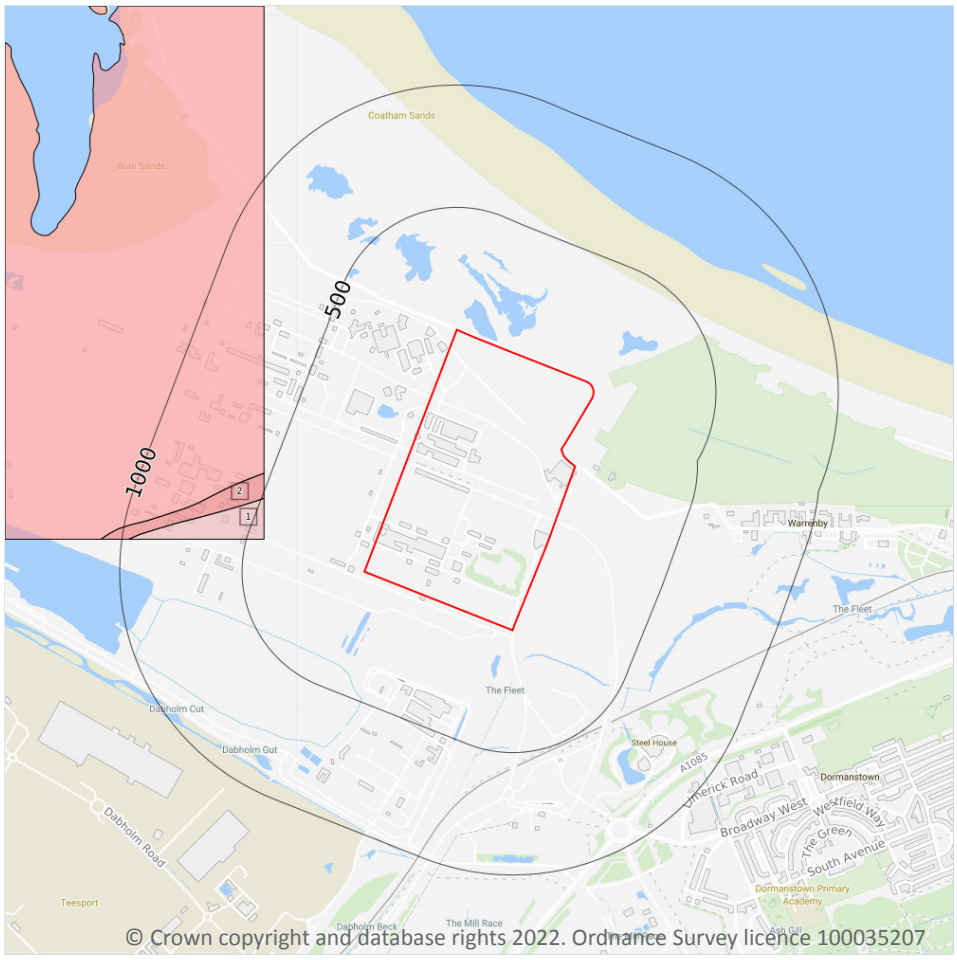
14.4 Landslip (10k)

Records within 500m	0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m	2

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 104**

ID	Location	LEX Code	Description	Rock age
1	431m W	RMU-MDST	Redcar Mudstone Formation - Mudstone	Pliensbachian Age - Hettangian Age
2	490m W	PNG-MDST	Penarth Group - Mudstone	Rhaetian Age

This data is sourced from the British Geological Survey.

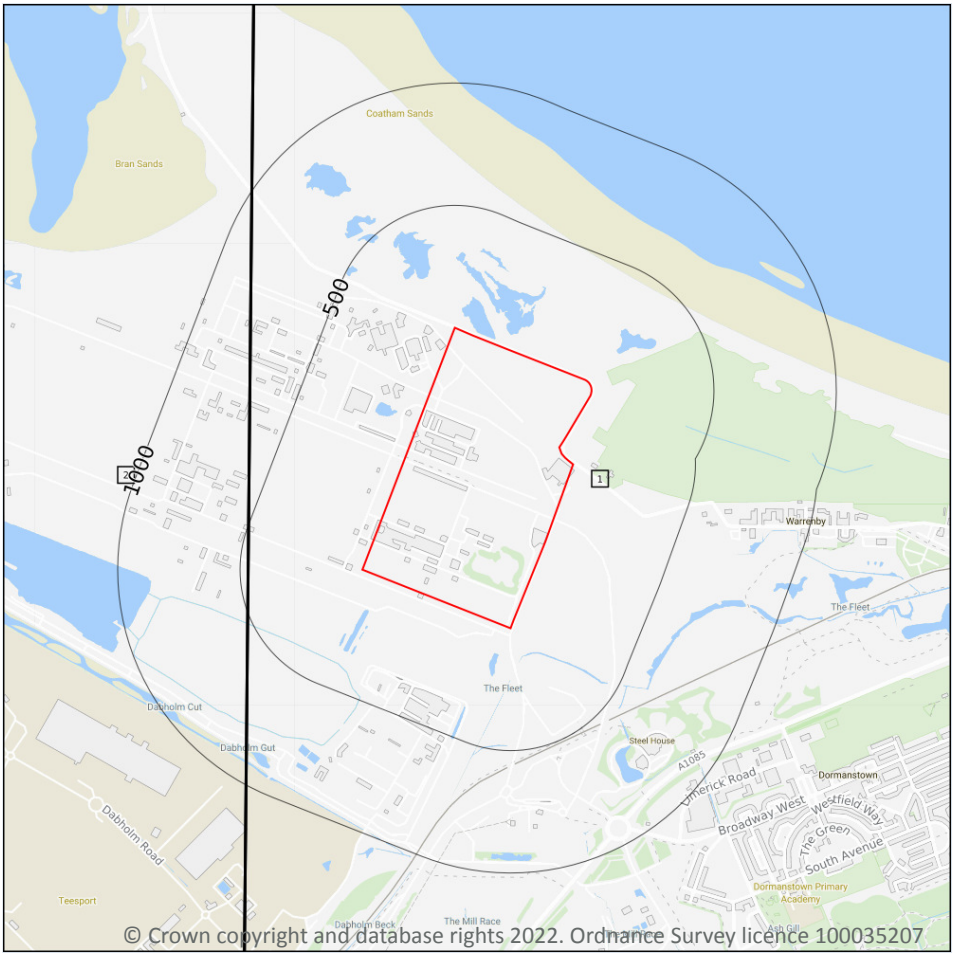
14.6 Bedrock faults and other linear features (10k)

Records within 500m	0

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.

15 Geology 1:50,000 scale - Availability



Site Outline

Search buffers in metres (m)

Geological map tile

15.1 50k Availability

Records within 500m	2

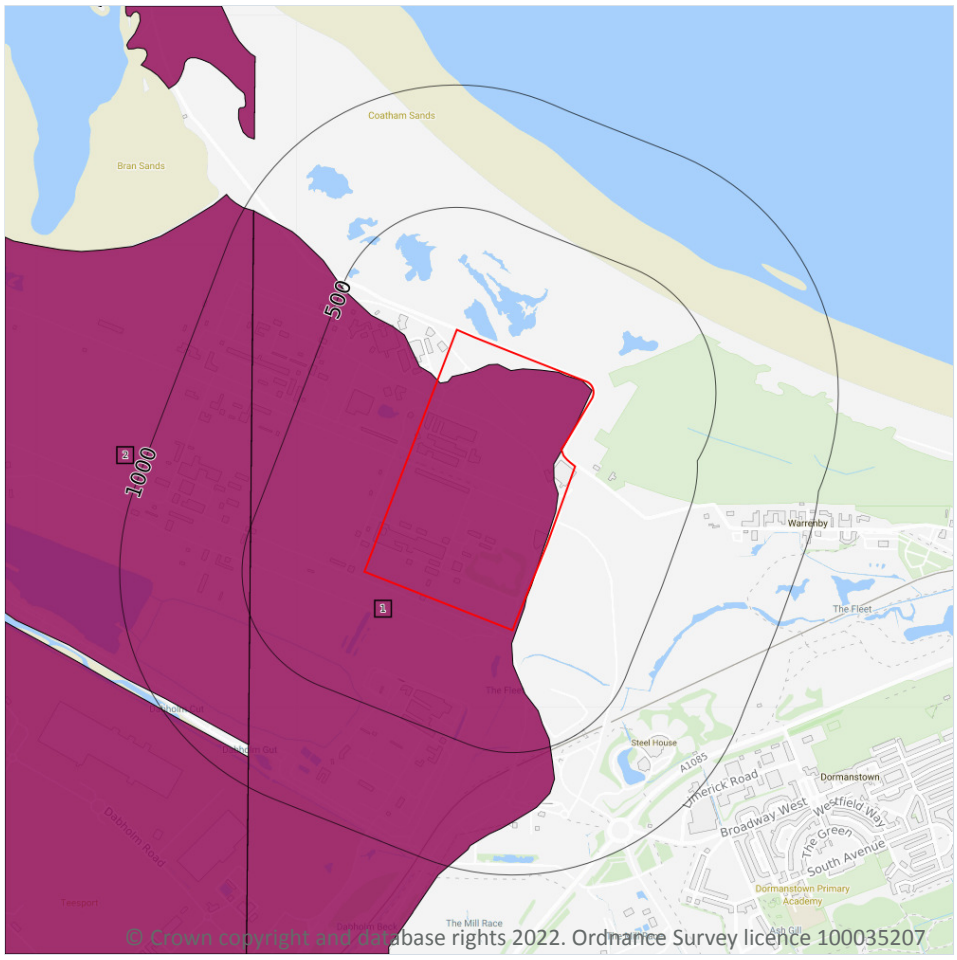
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 106**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**Full**	**EW034_guisborough_v4**
2	467m W	Full	Full	Full	Full	EW033_stockton_v4

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Artificial and made ground



Site Outline

Search buffers in metres (m)

- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

15.2 Artificial and made ground (50k)

Records within 500m	2

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 107**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**MGR-ARTDP**	**MADE GROUND (UNDIVIDED)**	**ARTIFICIAL DEPOSIT**
2	467m W	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

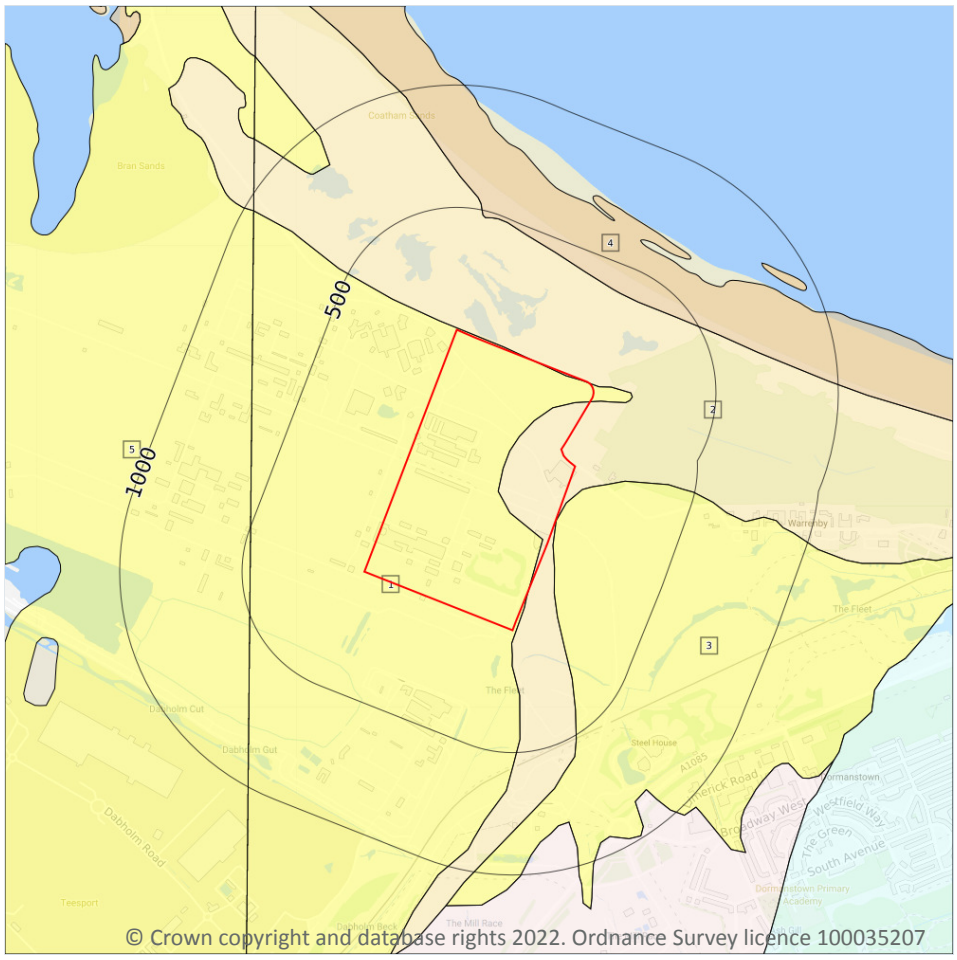
Records within 50m	2

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Mixed**	**Very High**	**Low**
On site	**Mixed**	**Very High**	**Low**

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m **5**

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 109**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**TFD-XSZ**	**TIDAL FLAT DEPOSITS**	**SAND AND SILT**
2	**On site**	**BSA-S**	**BLOWN SAND**	**SAND**
3	2m E	TFD-XSZ	TIDAL FLAT DEPOSITS	SAND AND SILT
4	385m NE	BTFU-S	BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED)	SAND

ID	Location	LEX Code	Description	Rock description
5	467m W	TFD-XSZC	TIDAL FLAT DEPOSITS	SAND, SILT AND CLAY

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	**6**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Intergranular**	**High**	**Moderate**
On site	**Intergranular**	**High**	**High**
On site	**Intergranular**	**High**	**High**
On site	**Intergranular**	**High**	**Moderate**
2m E	Intergranular	High	Moderate
19m SE	Intergranular	High	Moderate

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	**0**

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

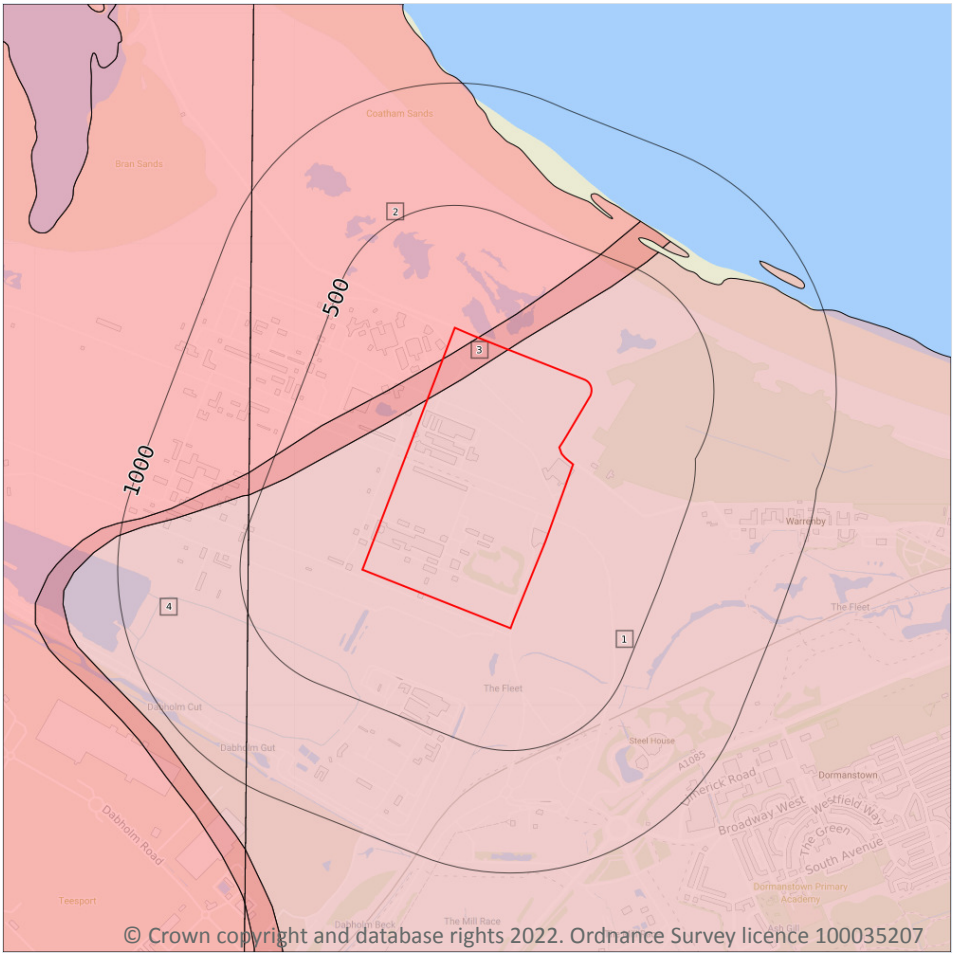
15.7 Landslip permeability (50k)

Records within 50m	**0**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m	4

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 111**

ID	Location	LEX Code	Description	Rock age
1	On site	RMU-MDST	REDCAR MUDSTONE FORMATION - MUDSTONE	HETTANGIAN
2	On site	MMG-MDST	MERCIA MUDSTONE GROUP - MUDSTONE	-
3	On site	PNG-MDST	PENARTH GROUP - MUDSTONE	RHAETIAN

ID	Location	LEX Code	Description	Rock age
4	467m W	RMU-MDST	REDCAR MUDSTONE FORMATION - MUDSTONE	HETTANGIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	**4**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Fracture**	**Low**	**Low**
On site	**Fracture**	**Low**	**Low**
On site	**Fracture**	**Low**	**Low**
On site	**Fracture**	**Low**	**Low**

This data is sourced from the British Geological Survey.

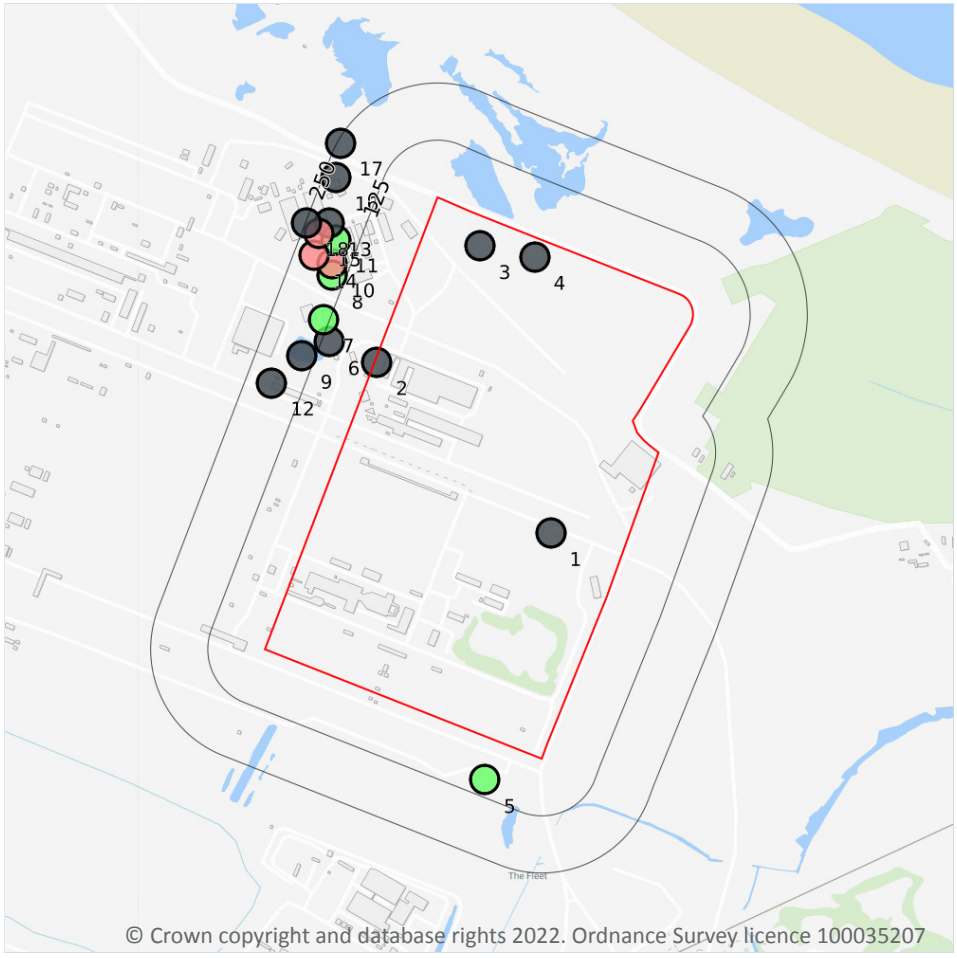
15.10 Bedrock faults and other linear features (50k)

Records within 500m	**0**

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.

16 Boreholes



Site Outline

Search buffers in metres (m)

Confidential

0 - 10m

10 - 30m

30m+

Unknown

16.1 BGS Boreholes

Records within 250m	18

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

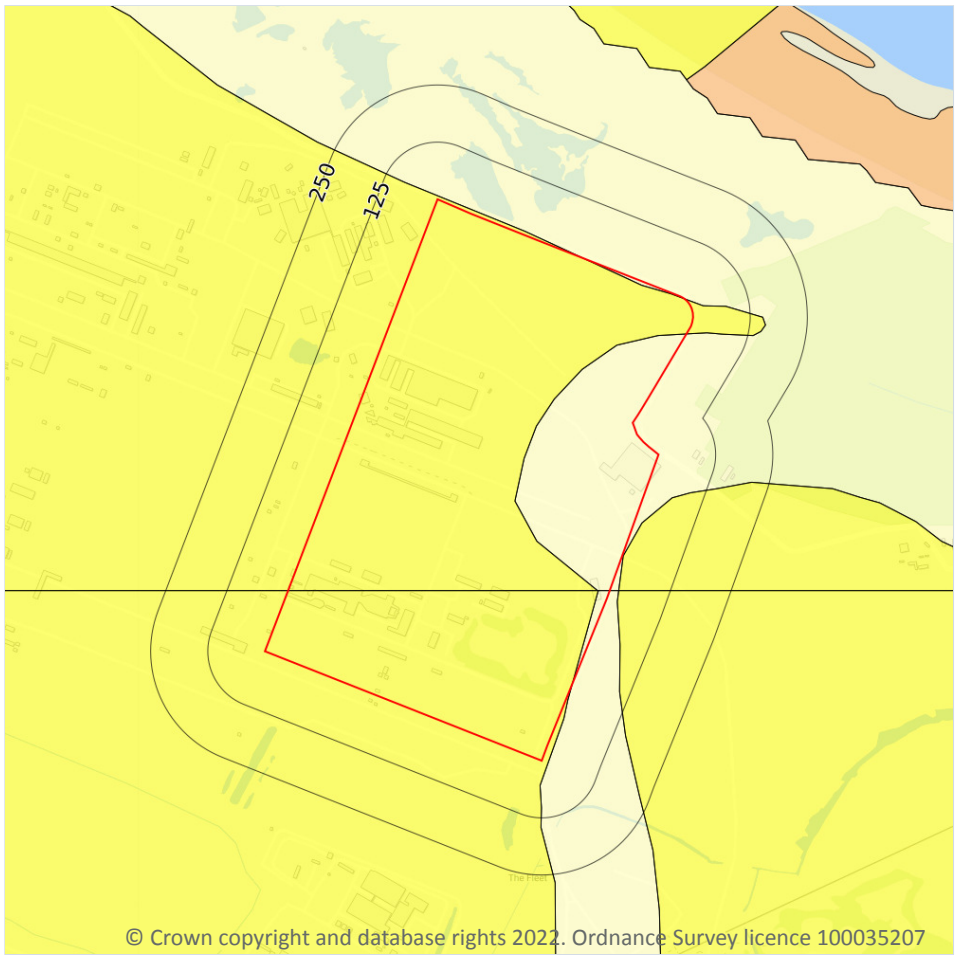
Features are displayed on the Boreholes map on **page 113**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	On site	457135 525121	LIGHTING TOWER REDCAR WORKS	-	Y	N/A
2	On site	456755 525495	STEELWORKS EXTENSION, REDCAR	-	Y	N/A
3	On site	456980 525750	STEELWORKS EXTENSION, REDCAR	-	Y	N/A

ID	Location	Grid reference	Name	Length	Confidential	Web link
4	**On site**	**457100 525725**	**STEELWORKS EXTENSION, REDCAR**	**-**	**Y**	**N/A**
5	89m S	456991 524582	REDCAR STAGE 2 3001	28.2	N	796776
6	109m W	456650 525540	STEELWORKS EXTENSION, REDCAR	-	Y	N/A
7	138m W	456638 525588	REDCAR STAGE II 3118	28.7	N	718367
8	154m W	456658 525685	REDCAR STAGE II 3915	27.2	N	718378
9	155m W	456590 525510	STEELWORKS EXTENSION, REDCAR	-	Y	N/A
10	164m W	456657 525710	REDCAR STAGE II 3903A	45.1	N	718375
11	175m W	456665 525763	REDCAR STAGE II 3904	22.6	N	718376
12	194m W	456525 525450	STEELWORKS EXTENSION, REDCAR	-	Y	N/A
13	202m W	456650 525800	STEELWORKS EXTENSION, REDCAR	-	Y	N/A
14	207m W	456618 525729	REDCAR STAGE II 3905C	30.5	N	718377
15	216m W	456627 525778	REDCAR STAGE II 3901A	39.0	N	718374
16	224m W	456665 525900	STEELWORKS EXTENSION, BLAST FURNACE AREA	-	Y	N/A
17	244m NW	456675 525975	STEELWORKS EXTENSION, BLAST FURNACE AREA	-	Y	N/A
18	249m W	456600 525800	STEELWORKS EXTENSION, BLAST FURNACE AREA	-	Y	N/A

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.1 Shrink swell clays

Records within 50m	4

The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

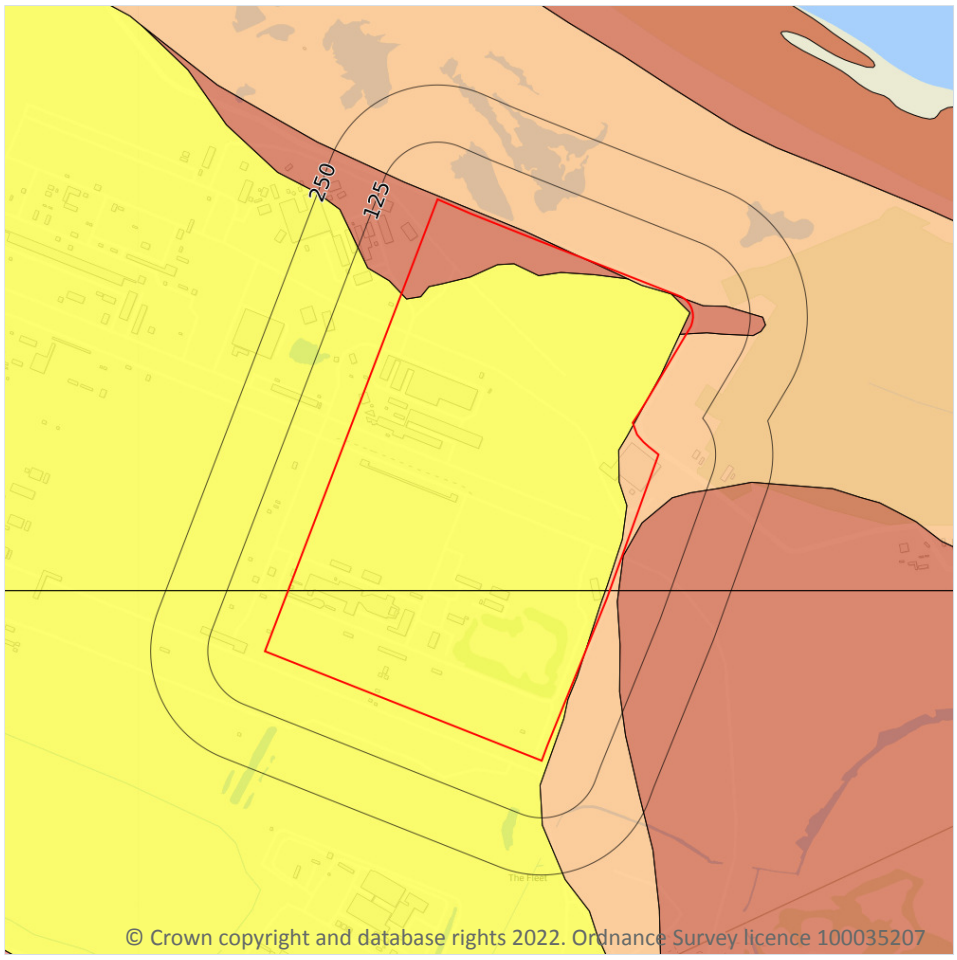
Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 115**

Location	Hazard rating	Details
On site	**Negligible**	**Ground conditions predominantly non-plastic.**
On site	**Very low**	**Ground conditions predominantly low plasticity.**
2m E	Very low	Ground conditions predominantly low plasticity.

Location	Hazard rating	Details
19m E	Very low	Ground conditions predominantly low plasticity.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.2 Running sands

Records within 50m	5

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

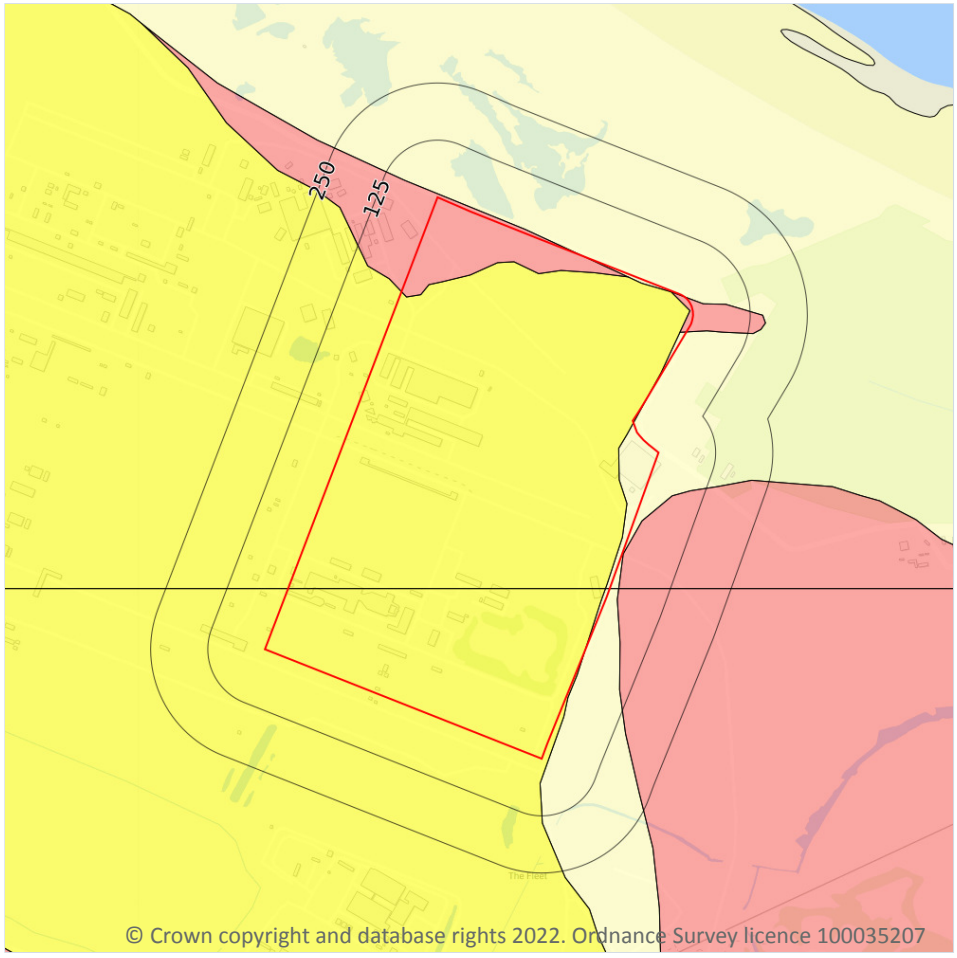
Features are displayed on the Natural ground subsidence - Running sands map on **page 117**

Location	Hazard rating	Details
On site	**Very low**	**Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.**

Location	Hazard rating	Details
On site	**Low**	**Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.**
On site	**High**	**Running sand conditions are almost certainly present. Constraints will apply to land uses involving excavation or the addition or removal of water.**
2m E	High	Running sand conditions are almost certainly present. Constraints will apply to land uses involving excavation or the addition or removal of water.
19m E	High	Running sand conditions are almost certainly present. Constraints will apply to land uses involving excavation or the addition or removal of water.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.3 Compressible deposits

Records within 50m	5

The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 119**

Location	Hazard rating	Details
On site	**Negligible**	**Compressible strata are not thought to occur.**
On site	**Very low**	**Compressibility and uneven settlement problems are not likely to be significant on the site for most land uses.**

Location	Hazard rating	Details
On site	**Moderate**	**Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.**
2m E	Moderate	Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.
19m E	Moderate	Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits

Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.4 Collapsible deposits

Records within 50m	1

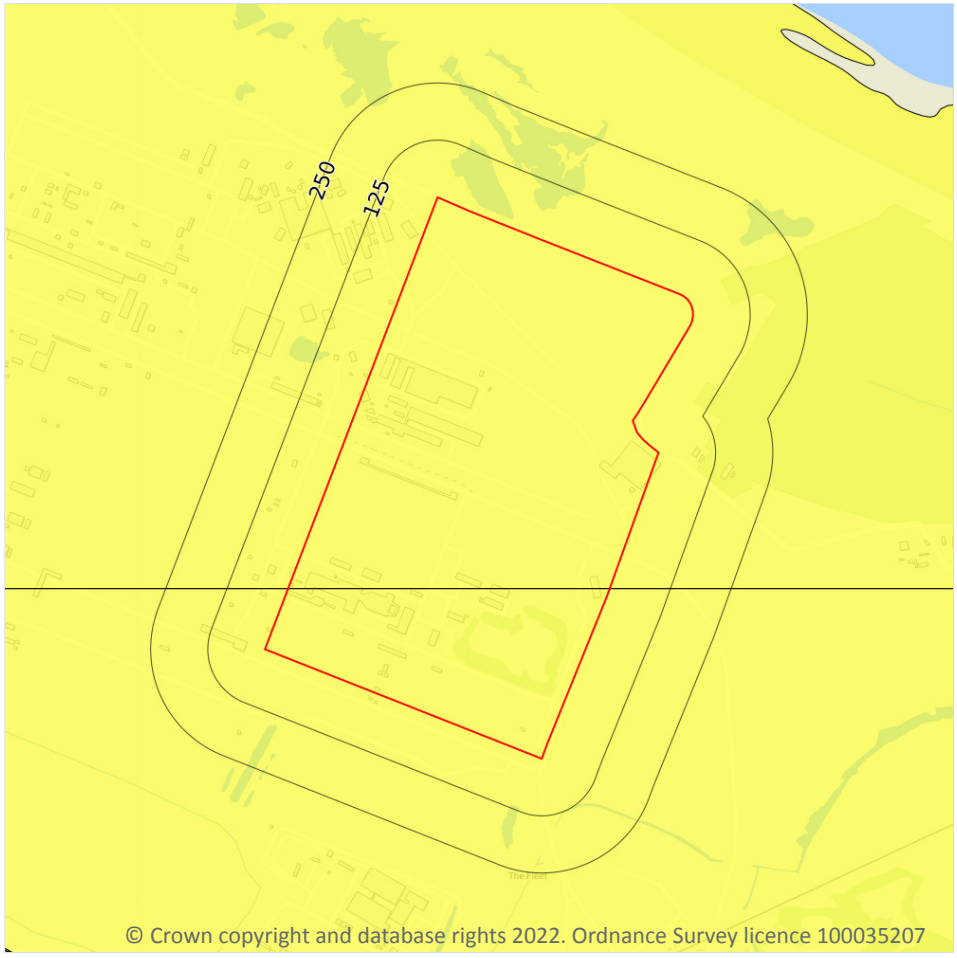
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 121**

Location	Hazard rating	Details
On site	**Negligible**	**Deposits with potential to collapse when loaded and saturated are believed not to be present.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.5 Landslides

Records within 50m	1

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 122**

Location	Hazard rating	Details
On site	**Very low**	**Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Ground dissolution of soluble rocks

Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.6 Ground dissolution of soluble rocks

Records within 50m	1

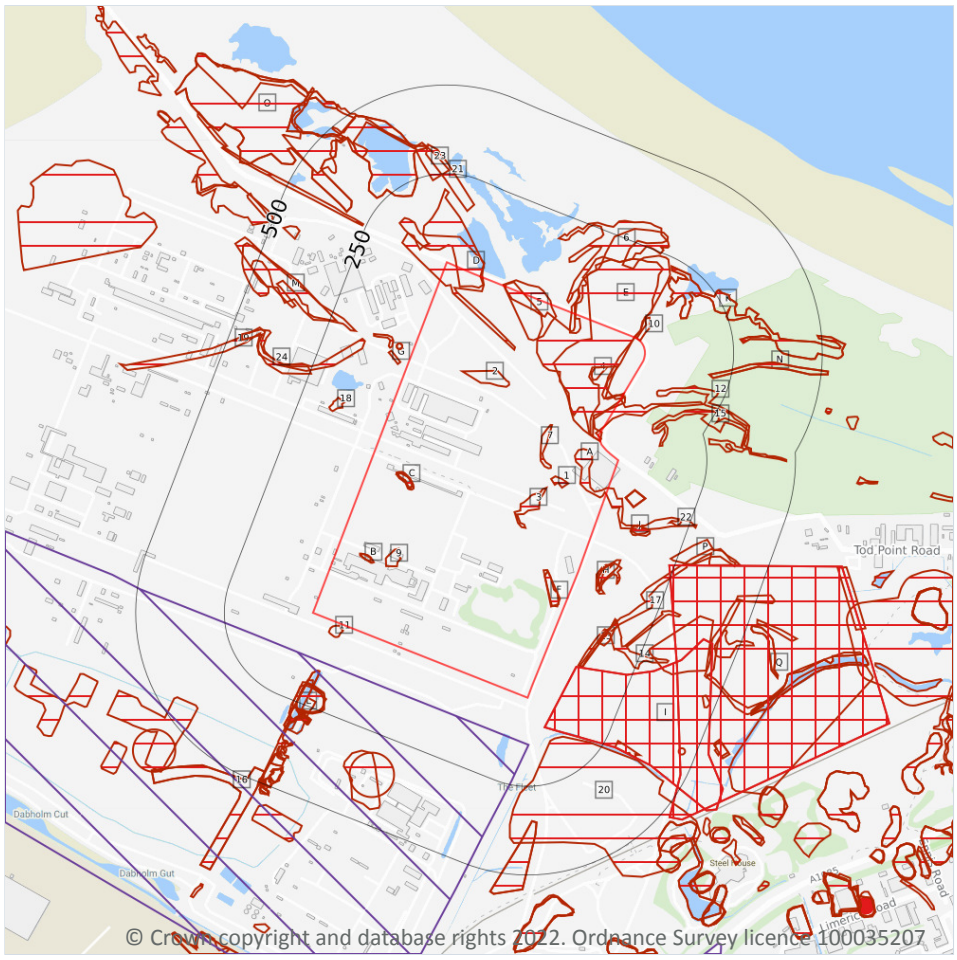
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 123**

Location	Hazard rating	Details
On site	**Negligible**	**Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.**

This data is sourced from the British Geological Survey.

18 Mining, ground workings and natural cavities



Site Outline

Search buffers in metres (m)

Natural cavities (Area)

Natural cavities (Point)

BritPits

Surface ground workings

Underground workings

Historical Mineral Planning Areas

Mining Cavities

Non Coal Mining

Sporadic underground mining of restricted extent possible

Localised small scale underground mining possible

Small scale mining possible

Underground mining known or likely within or in close proximity

Underground mining known within or in very close proximity

18.1 Natural cavities

Records within 500m	0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

18.2 BritPits

Records within 500m	0

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m	65

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 125**

ID	Location	Land Use	Year of mapping	Mapping scale
1	On site	Reservoirs	1969	1:10560
2	On site	Pond	1893	1:10560
3	On site	Sand Pit	1913	1:10560
4	On site	Sand Pit	1913	1:10560
5	On site	Refuse Heap	1969	1:10560
6	On site	Unspecified Ground Workings	1969	1:10560
7	On site	Refuse Heap	1940	1:10560
8	On site	Unspecified Ground Workings	1927	1:10560
9	On site	Pond	1969	1:10560
A	On site	Unspecified Ground Workings	1927	1:10560
B	On site	Pond	1893	1:10560
B	On site	Pond	1913	1:10560
C	On site	Pond	1940	1:10560
C	On site	Pond	1893	1:10560
C	On site	Pond	1913	1:10560
C	On site	Pond	1927	1:10560
D	On site	Refuse Heap	1969	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
D	**On site**	**Refuse Heap**	**1940**	**1:10560**
E	**On site**	**Refuse Heap**	**1969**	**1:10560**
E	**On site**	**Unspecified Ground Workings**	**1940**	**1:10560**
F	**On site**	**Refuse Heap**	**1952**	**1:10560**
F	**On site**	**Refuse Heap**	**1927**	**1:10560**
10	0m NE	Unspecified Ground Workings	1969	1:10560
11	6m S	Pond	1952	1:10560
G	22m W	Reservoir	1927	1:10560
G	33m W	Reservoir	1969	1:10560
G	33m W	Reservoir	1940	1:10560
H	51m E	Unspecified Ground Workings	1952	1:10560
H	55m E	Unspecified Ground Workings	1927	1:10560
A	56m E	Reservoir	1893	1:10560
A	56m E	Reservoir	1913	1:10560
A	56m E	Reservoir	1927	1:10560
H	59m E	Sand Pit	1913	1:10560
G	60m W	Refuse Heap	1940	1:10560
12	78m SE	Refuse Heap	1940	1:10560
I	81m SE	Iron Workings	1893	1:10560
13	99m E	Ponds	1913	1:10560
J	100m E	Pond	1893	1:10560
J	100m E	Pond	1913	1:10560
14	104m E	Ponds	1893	1:10560
15	116m SE	Unspecified Ground Workings	1969	1:10560
K	125m NE	Unspecified Ground Workings	1969	1:10560
K	125m NE	Unspecified Ground Workings	1980	1:10000
17	127m E	Refuse Heap	1952	1:10560
18	129m W	Pond	1969	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
19	136m W	Refuse Heap	1969	1:10560
20	137m SE	Refuse Heap	1952	1:10560
L	147m S	Ponds	1991	1:10000
L	147m S	Pond	1983	1:10000
21	156m N	Unspecified Ground Workings	1980	1:10000
M	171m W	Refuse Heap	1940	1:10560
L	177m S	Ponds	1952	1:10560
L	189m S	Ponds	1893	1:10560
N	190m E	Unspecified Ground Workings	1969	1:10560
N	190m E	Unspecified Ground Workings	1980	1:10000
L	192m S	Pond	1913	1:10560
22	196m E	Pond	1893	1:10560
L	197m S	Pond	1927	1:10560
O	212m NW	Unspecified Ground Workings	1969	1:10560
O	212m NW	Unspecified Ground Workings	1980	1:10000
M	233m W	Refuse Heap	1969	1:10560
P	233m E	Unspecified Ground Workings	1980	1:10000
23	235m N	Unspecified Heap	1940	1:10560
Q	236m E	Unspecified Workings	1983	1:10000
24	246m W	Refuse Heap	1940	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m	**2**

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

Features are displayed on the Mining, ground workings and natural cavities map on **page 125**

ID	Location	Land Use	Year of mapping	Mapping scale
I	81m SE	Iron Workings	1893	1:10560
Q	236m E	Unspecified Workings	1983	1:10000

This is data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m	**1**

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

Features are displayed on the Mining, ground workings and natural cavities map on **page 125**

ID	Location	Site Name	Mineral	Type	Planning Status	Planning Status Date
16	119m S	Wilton Works	Not available	Surface mineral working	Valid	Not available

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m	**0**

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m	**0**

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

18.8 JPB mining areas

Records on site	0

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site	0

Areas which could be affected by past, current or future coal mining.

This data is sourced from the Coal Authority.

18.10 Brine areas

Records on site	0

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.11 Gypsum areas

Records on site	0

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	0

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

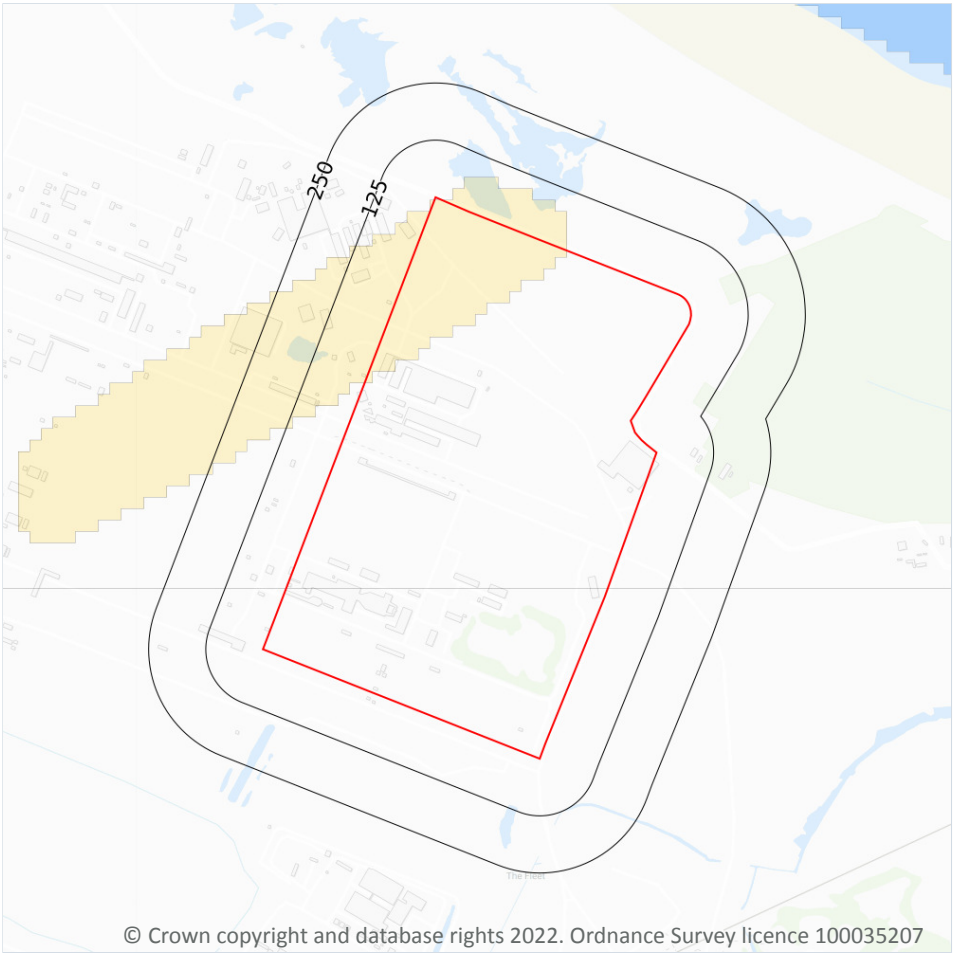
18.13 Clay mining

Records on site	0

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).

19 Radon



Site Outline

Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

19.1 Radon

Records on site	2

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 132**

Location	Estimated properties affected	Radon Protection Measures required
On site	**Between 1% and 3%**	**None**
On site	**Less than 1%**	**None****

This data is sourced from the British Geological Survey and Public Health England.

20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m **31**

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km^2. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km^2; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
2m E	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
6m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
7m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
9m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
9m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
10m SW	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
16m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
16m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
19m SE	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
19m SE	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m	0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km^2).

This data is sourced from the British Geological Survey.

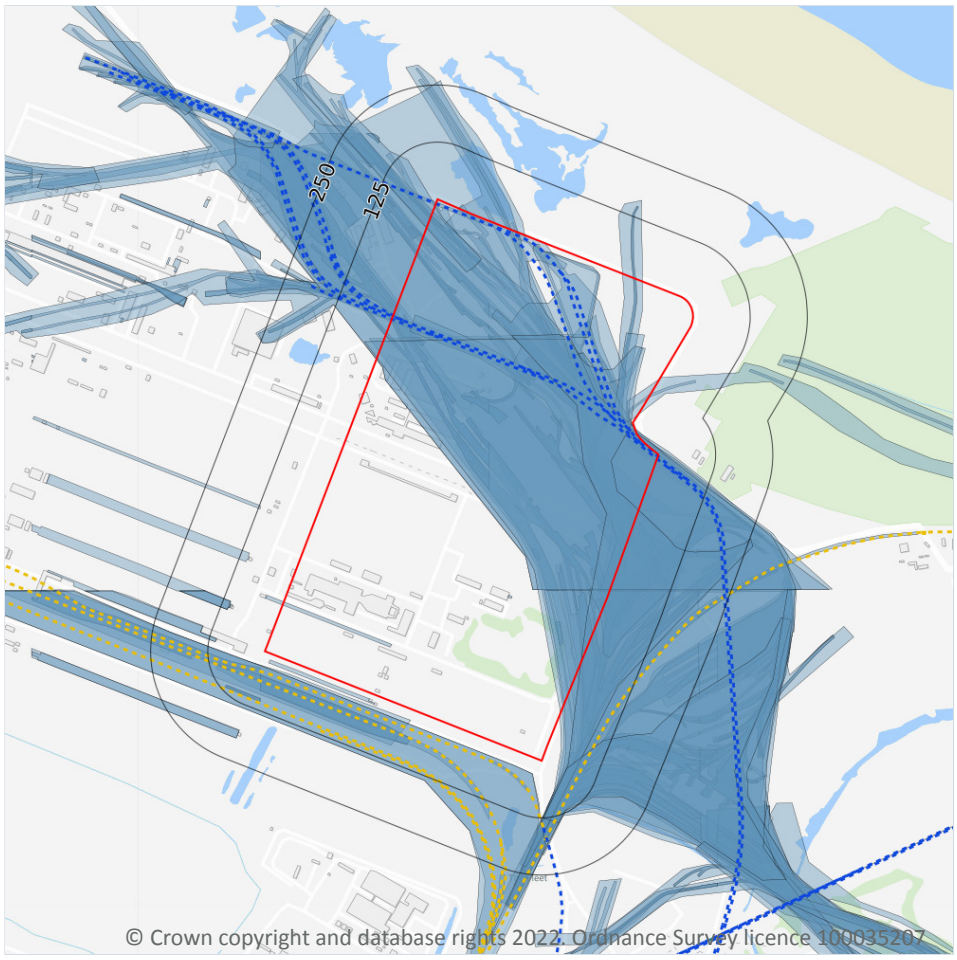
20.3 BGS Measured Urban Soil Chemistry

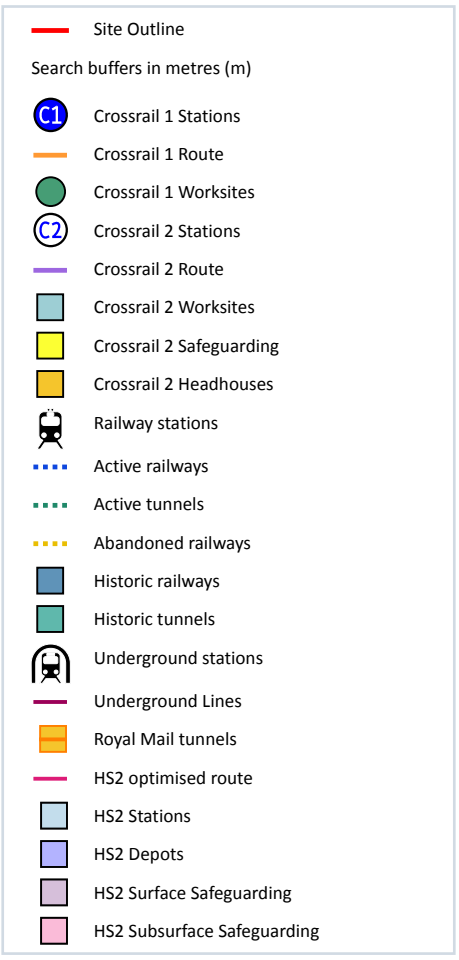
Records within 50m	0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km^2.

This data is sourced from the British Geological Survey.

21 Railway infrastructure and projects





21.1 Underground railways (London)

Records within 250m	0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m	0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m	0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m	78

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on **page 137**

Location	Land Use	Year of mapping	Mapping scale
On site	**Railway Sidings**	**1894**	**2500**
On site	**Railway Sidings**	**1929**	**2500**
On site	**Railway Sidings**	**1953**	**1250**
On site	**Railway Sidings**	**1983**	**1250**
On site	**Railway Sidings**	**1984**	**1250**
On site	**Railway Sidings**	**1952**	**1250**
On site	**Railway Sidings**	**1973**	**1250**
On site	**Railway Sidings**	**1952**	**2500**
On site	**Railway Sidings**	**1954**	**2500**
On site	**Railway Sidings**	**1980**	**1250**
On site	**Railway Sidings**	**1997**	**1250**
On site	**Tramway Sidings**	**1894**	**2500**
On site	**Tramway Sidings**	**1915**	**2500**
On site	**Tramway Sidings**	**1929**	**2500**
On site	**Railway Sidings**	**1927**	**10560**
On site	**Railway Sidings**	**1969**	**10560**
On site	**Railway Sidings**	**1980**	**10000**

Location	Land Use	Year of mapping	Mapping scale
On site	**Railway Sidings**	**1940**	**10560**
On site	**Railway Sidings**	**1952**	**10560**
On site	**Railway Sidings**	**1974**	**10000**
On site	**Tramway Sidings**	**1893**	**10560**
On site	**Tramway Sidings**	**1927**	**10560**
On site	**Tramway Sidings**	**1913**	**10560**
13m S	Railway Sidings	1984	1250
23m S	Railway Sidings	1974	10000
32m S	Railway Sidings	1991	10000
32m S	Railway Sidings	1983	10000
38m S	Railway Sidings	1988	1250
39m S	Railway Sidings	1993	1250
39m S	Railway Sidings	1973	1250
52m S	Railway Sidings	1984	1250
52m S	Railway Sidings	1976	1250
52m S	Railway Sidings	1976	1250
53m S	Railway Sidings	1979	1250
53m S	Railway Sidings	1993	1250
57m SE	Tramway Sidings	1913	10560
60m SE	Tramway Sidings	1915	2500
99m S	Railway Sidings	1993	1250
100m S	Railway Sidings	1988	1250
100m S	Railway Sidings	1981	1250
102m W	Railway Sidings	1988	1250
105m E	Railway Sidings	1973	1250
105m W	Railway Sidings	1993	1250
106m W	Railway Sidings	1993	1250
107m W	Railway Sidings	1981	1250

Location	Land Use	Year of mapping	Mapping scale
109m W	Railway Sidings	1988	1250
109m W	Railway Sidings	1993	1250
121m W	Railway Sidings	1993	1250
128m S	Railway Sidings	1952	1250
132m S	Railway Sidings	1952	1250
150m E	Railway Sidings	1929	2500
150m E	Railway Sidings	1894	2500
153m E	Railway Sidings	1914	2500
155m E	Railway Sidings	1973	1250
155m E	Railway Sidings	1952	1250
158m E	Railway Sidings	1952	1250
160m SE	Railway Sidings	1929	2500
163m E	Railway Sidings	1952	1250
168m E	Railway Sidings	1983	1250
169m W	Railway Sidings	1993	1250
174m S	Railway Sidings	1973	1250
178m NW	Railway Sidings	1952	1250
179m NW	Railway Sidings	1952	2500
181m S	Railway Sidings	1993	1250
182m S	Railway Sidings	1988	1250
183m E	Railway Sidings	1952	2500
198m E	Railway Sidings	1914	2500
198m E	Railway Sidings	1929	2500
200m E	Railway Sidings	1894	2500
207m SE	Tramway Sidings	1913	10560
209m E	Railway Sidings	1952	1250
216m E	Railway Sidings	1914	2500
222m E	Railway Sidings	1929	2500

Location	Land Use	Year of mapping	Mapping scale
229m E	Railway Sidings	1983	1250
232m E	Railway Sidings	1915	2500
242m E	Railway Sidings	1915	2500
243m S	Railway Sidings	1973	1250
245m E	Railway Sidings	1952	1250

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m	0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m	6

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

Features are displayed on the Railway infrastructure and projects map on **page 137**

Location	Description
41m S	Abandoned
60m S	Disused
86m SE	Abandoned
109m S	Disused
116m S	Disused
200m S	Disused

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m	14

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

Features are displayed on the Railway infrastructure and projects map on **page 137**

Location	Name	Type
On site		**rail**
On site		**rail**
On site		**rail**
On site		**rail**
On site		**rail**
On site		**rail**
On site		**rail**
On site		**rail**
22m E		rail
41m W		rail
96m W		rail
131m W		rail
145m S		rail
178m S		rail

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m	0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m	0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m	0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 ltd.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference.

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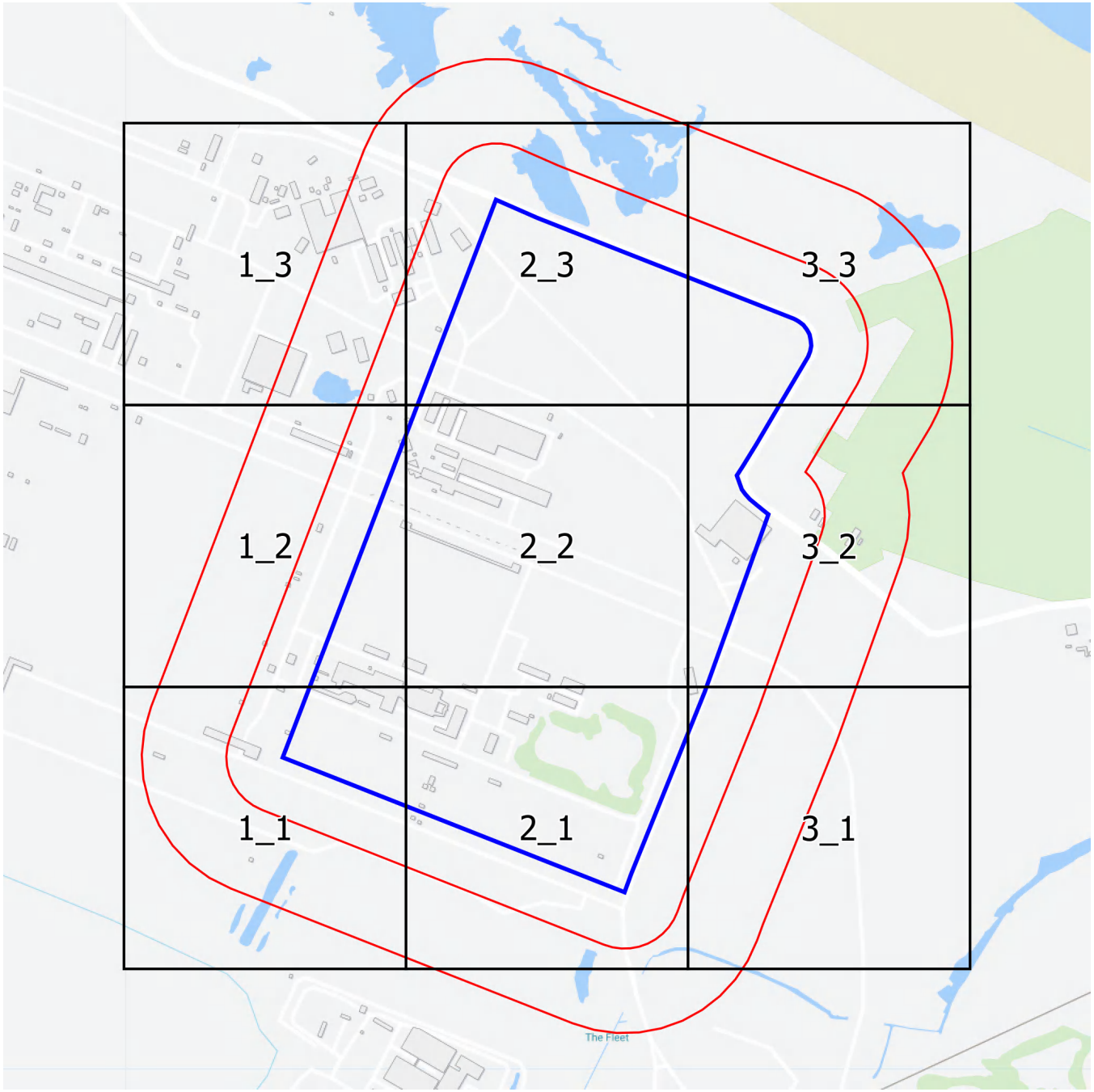
APPENDIX D

Historical Maps



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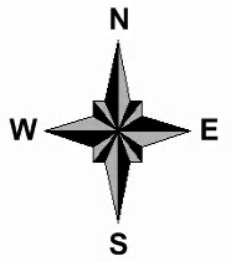
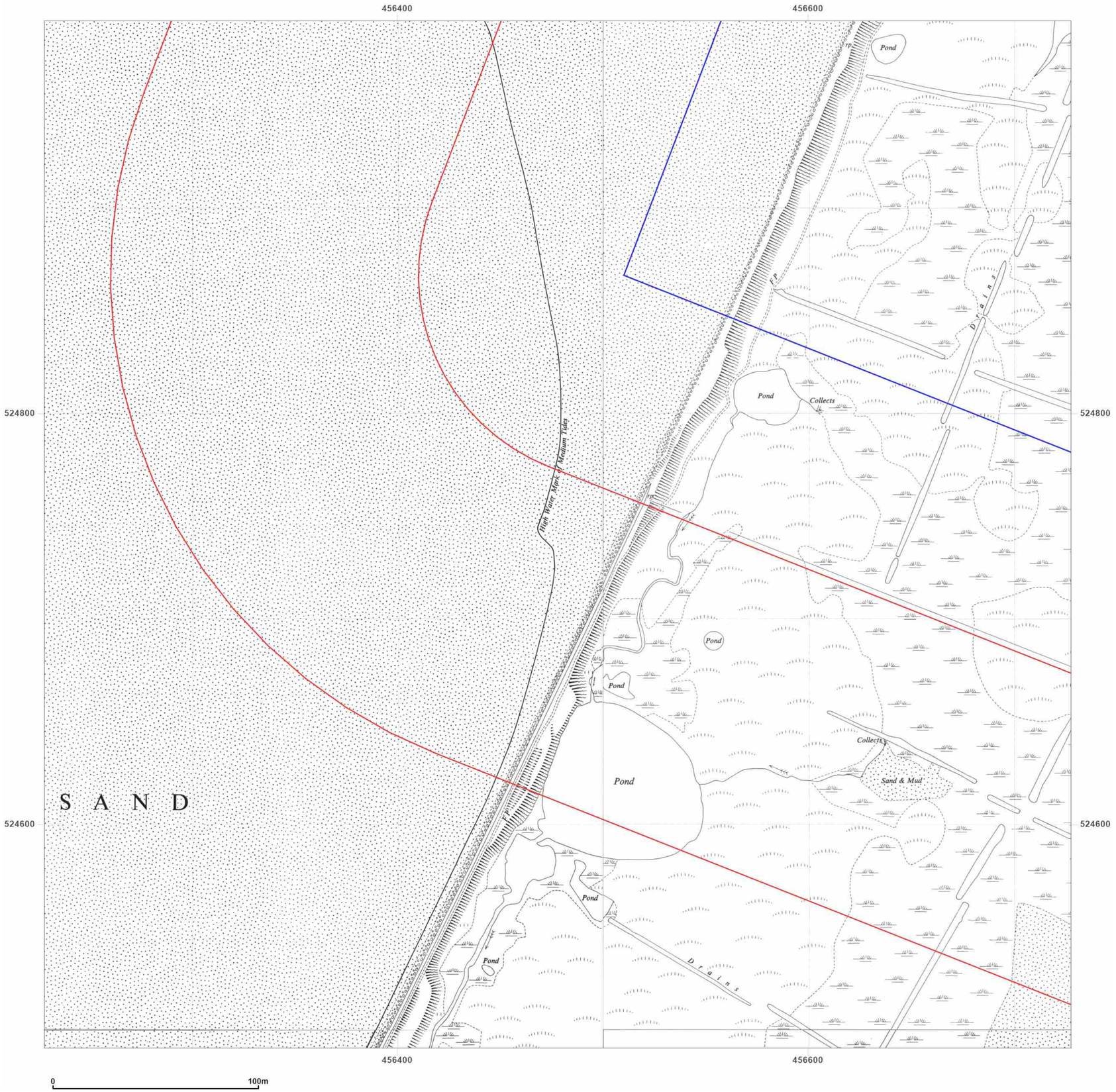
1:1,250 Scale Grid Index





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Grid Ref: 456478, 524741

Map Name: National Grid

Map date: **1952**

Scale: 1:1,250

Printed at: 1:2,000

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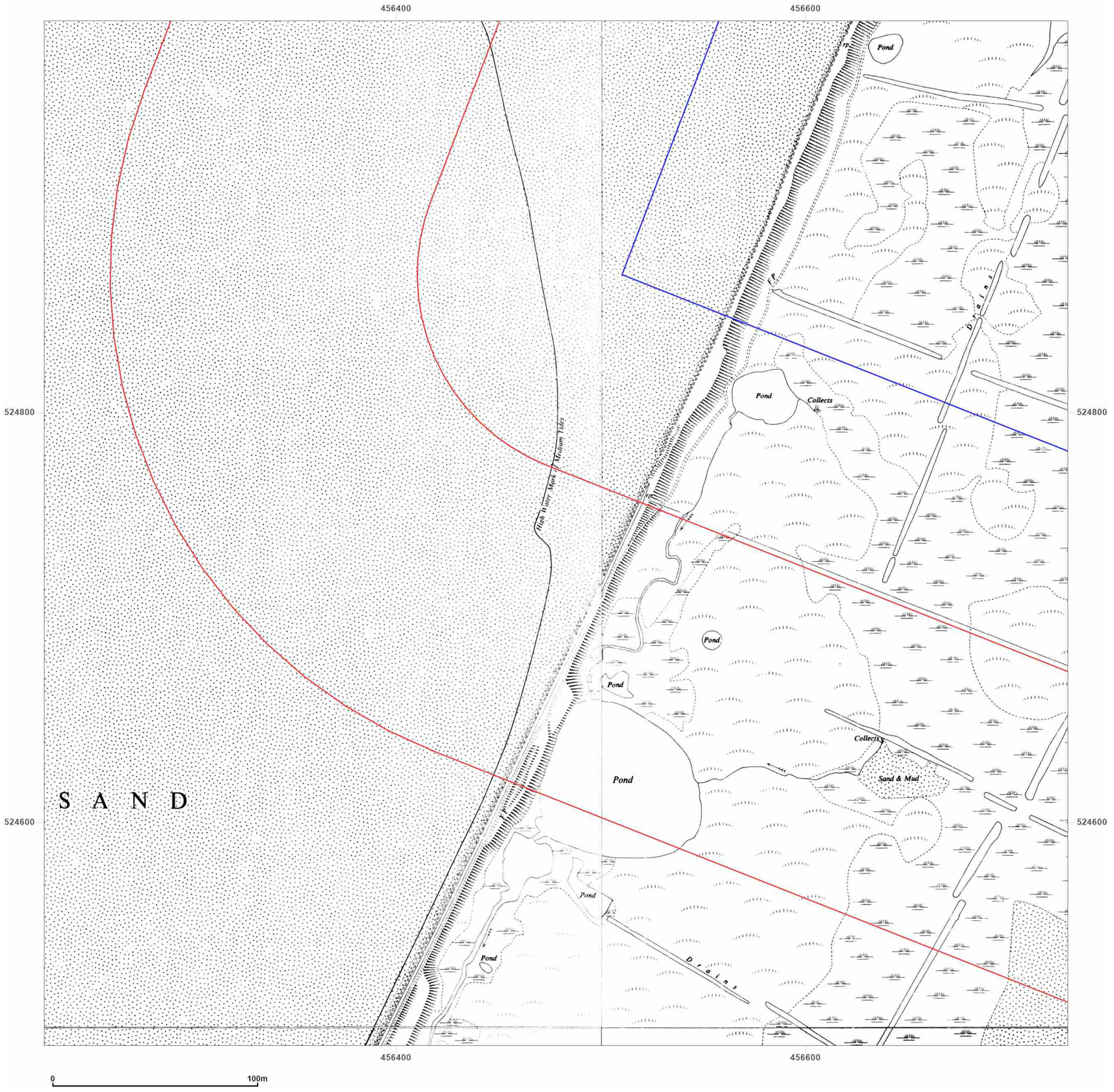

Groundsure INSIGHTS

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Grid Ref: 456478, 524741

Map Name: National Grid

Map date: **1953-1955**

Scale: 1:1,250

Printed at: 1:2,000

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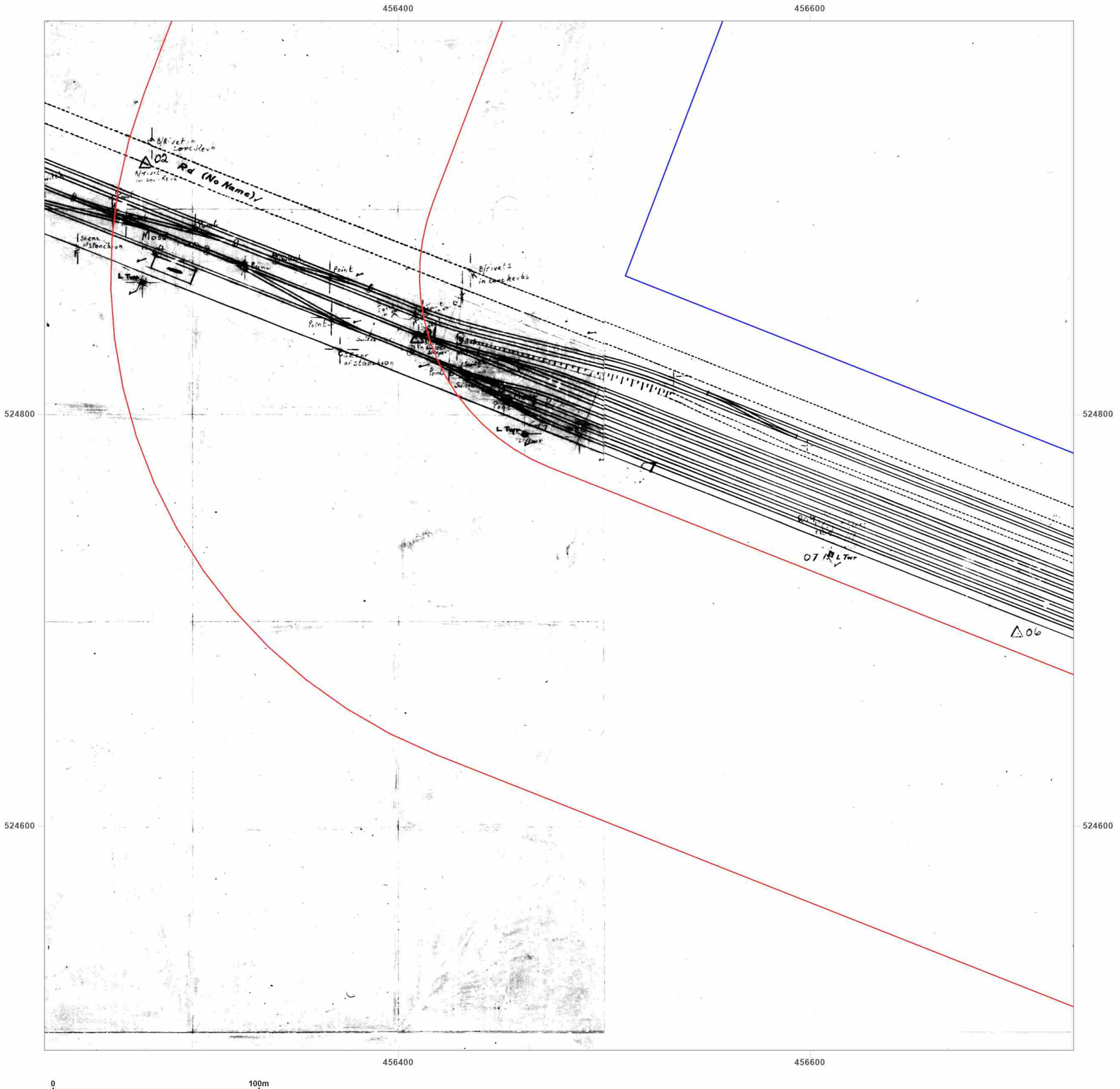

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Grid Ref: 456478, 524741

Map Name: National Grid
Map date: **1974**
Scale: 1:1,250
Printed at: 1:2,000

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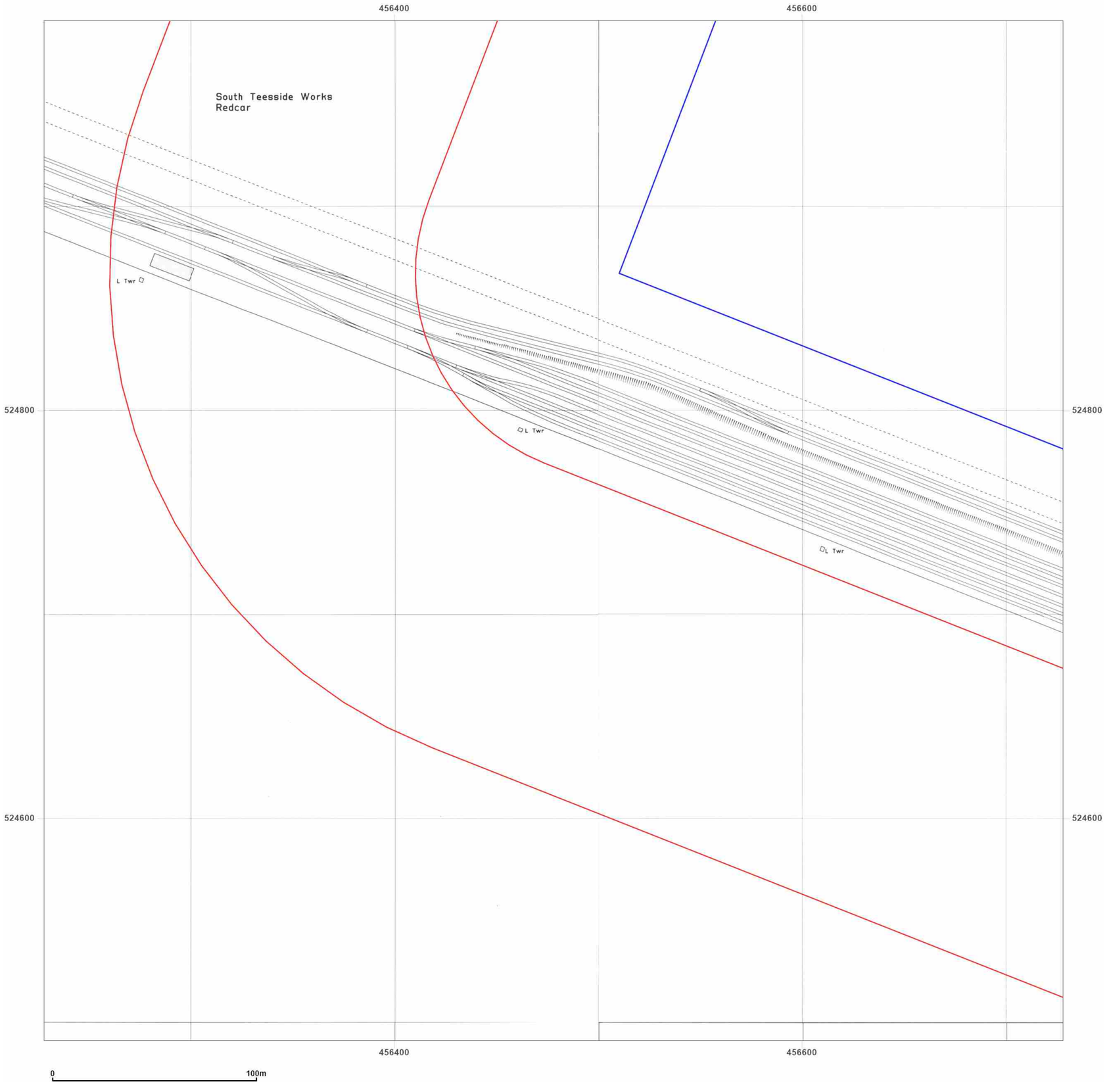

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Grid Ref: 456478, 524741

Map Name: National Grid

Map date: **1975-1976**

Scale: 1:1,250

Printed at: 1:2,000

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Revised 1975
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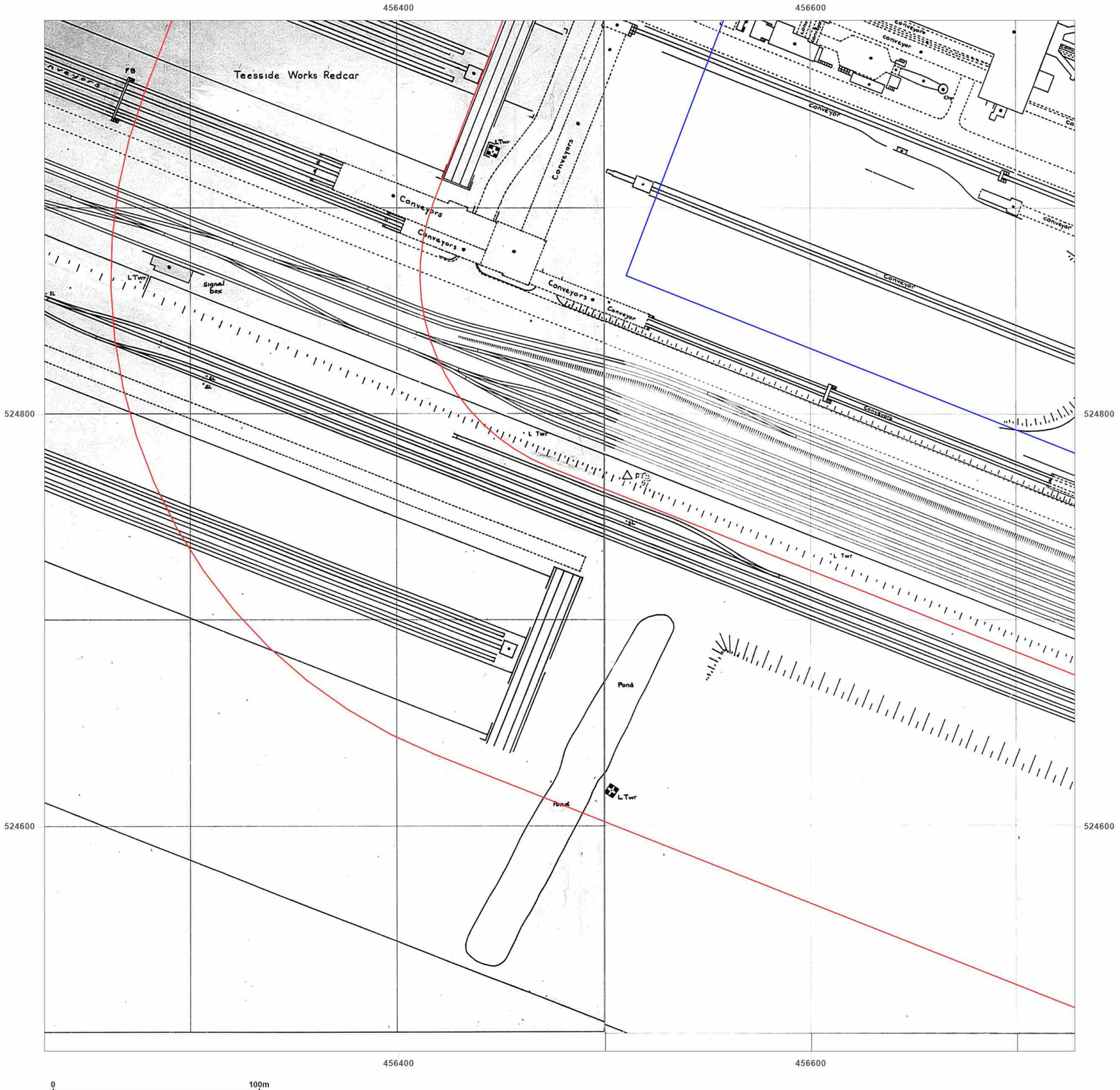

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Grid Ref: 456478, 524741

Map Name: National Grid

Map date: **1976-1981**

Scale: 1:1,250

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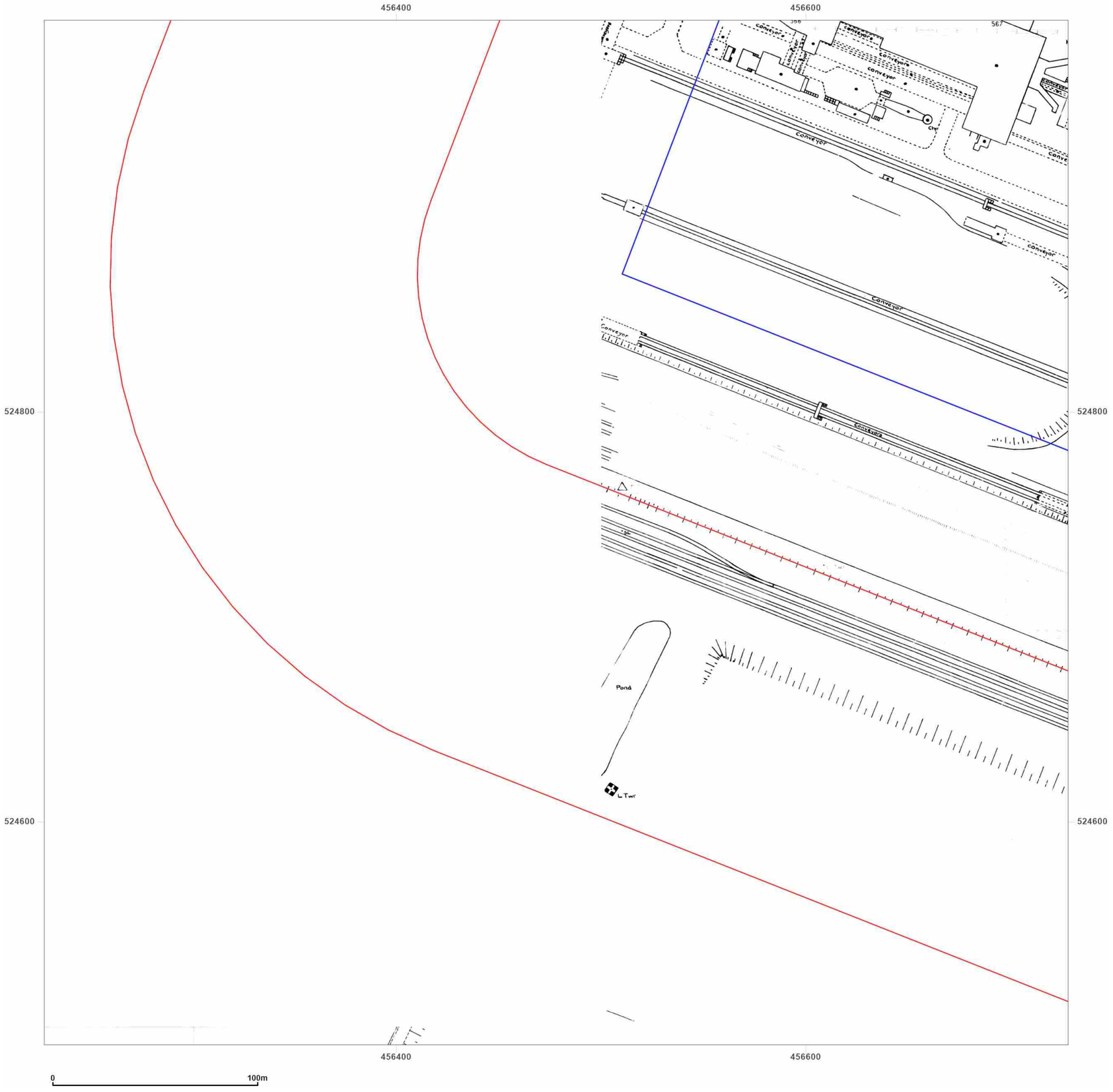

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Map Name: National Grid

Map date: **1981-1984**

Scale: 1:1,250

Printed at: 1:2,000

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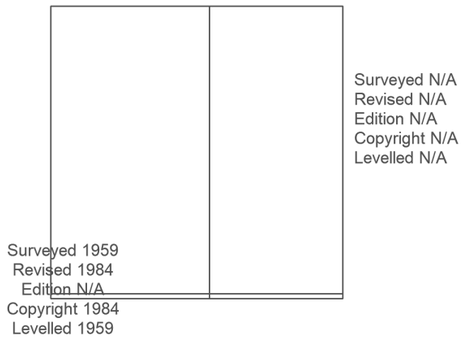

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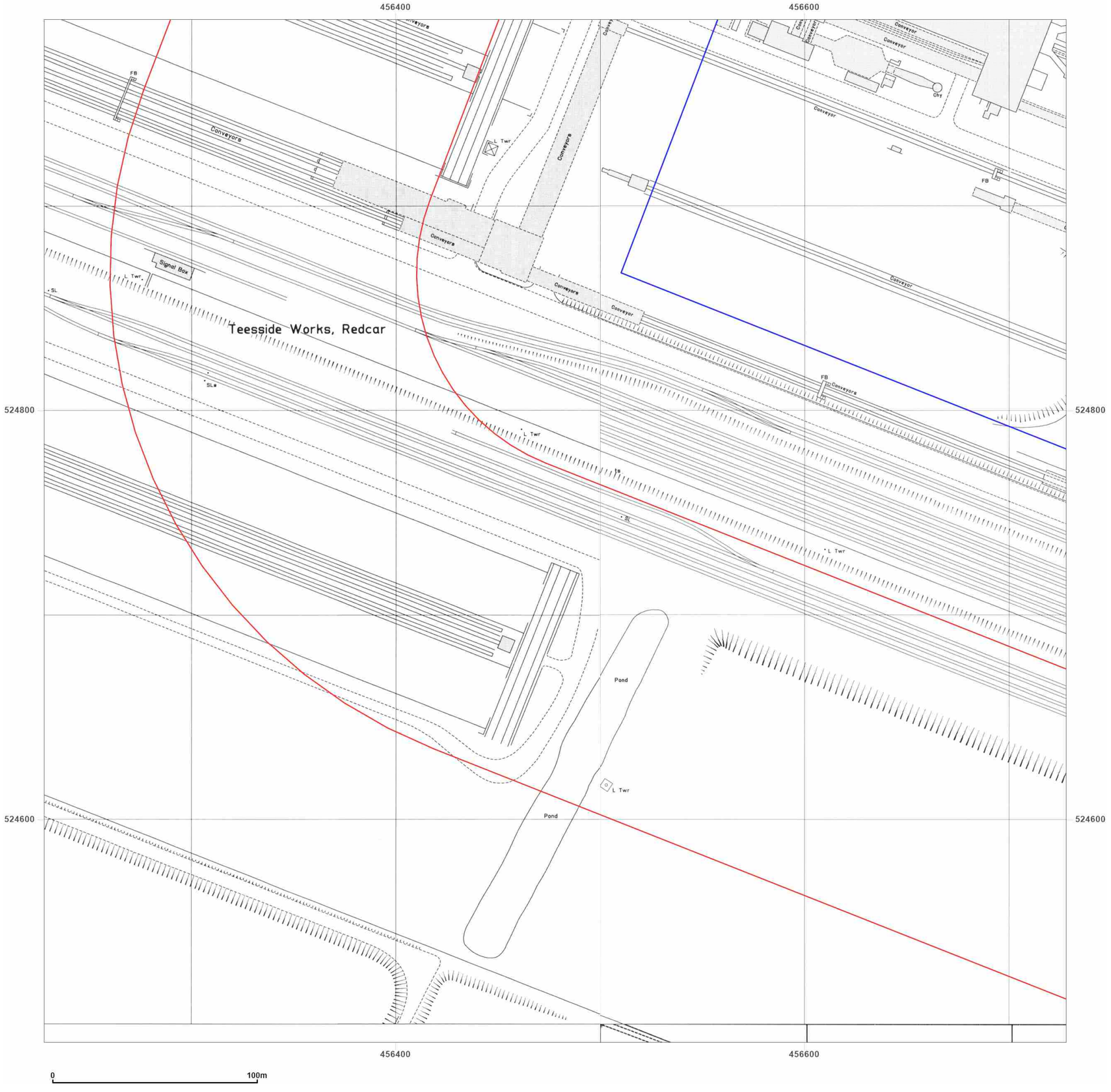

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Grid Ref: 456478, 524741

Map Name: National Grid

Map date: **1984-1989**

Scale: 1:1,250

Printed at: 1:2,000

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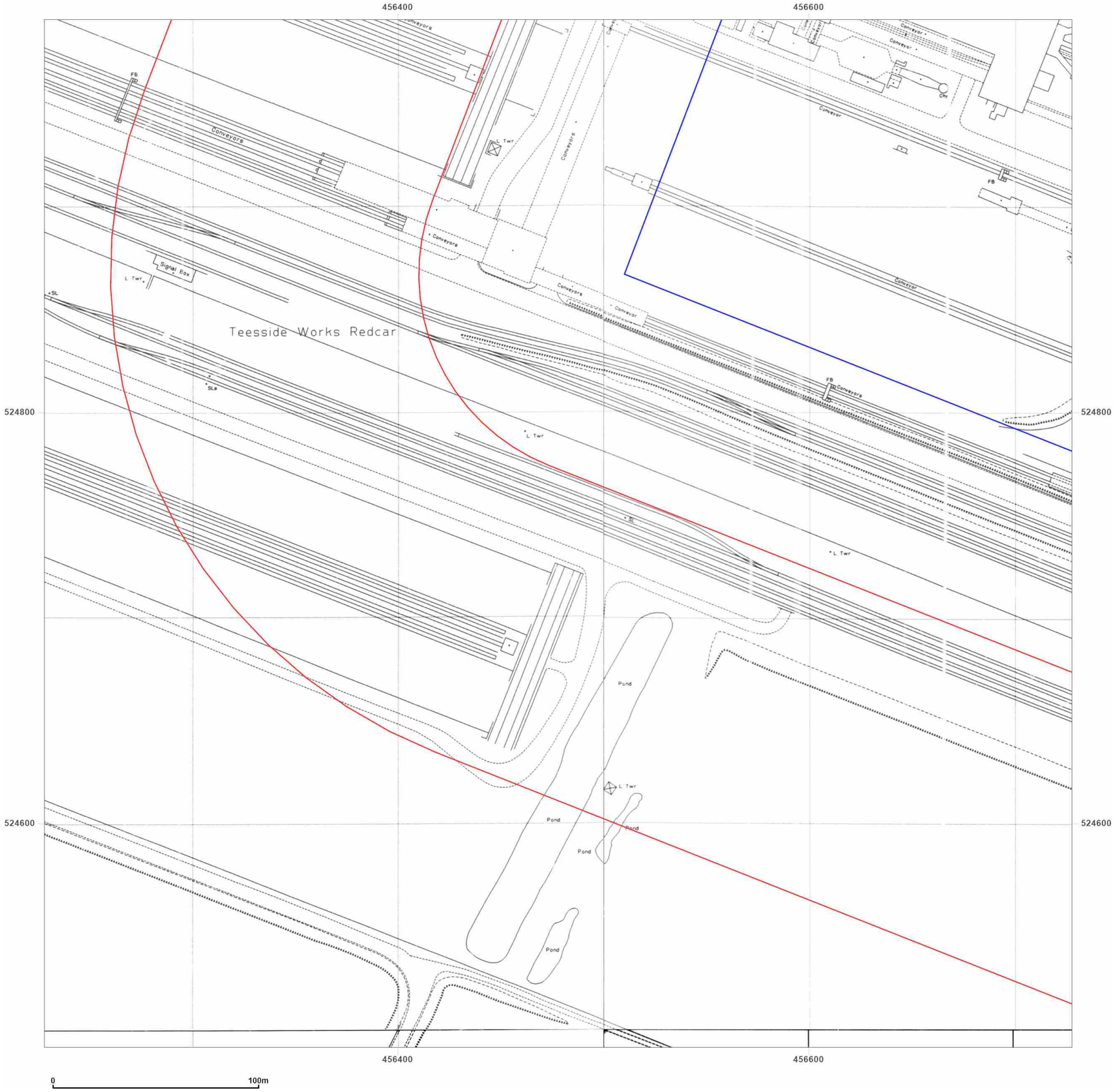

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Grid Ref: 456478, 524741

Map Name: National Grid

Map date: **1989-1993**

Scale: 1:1,250

Printed at: 1:2,000

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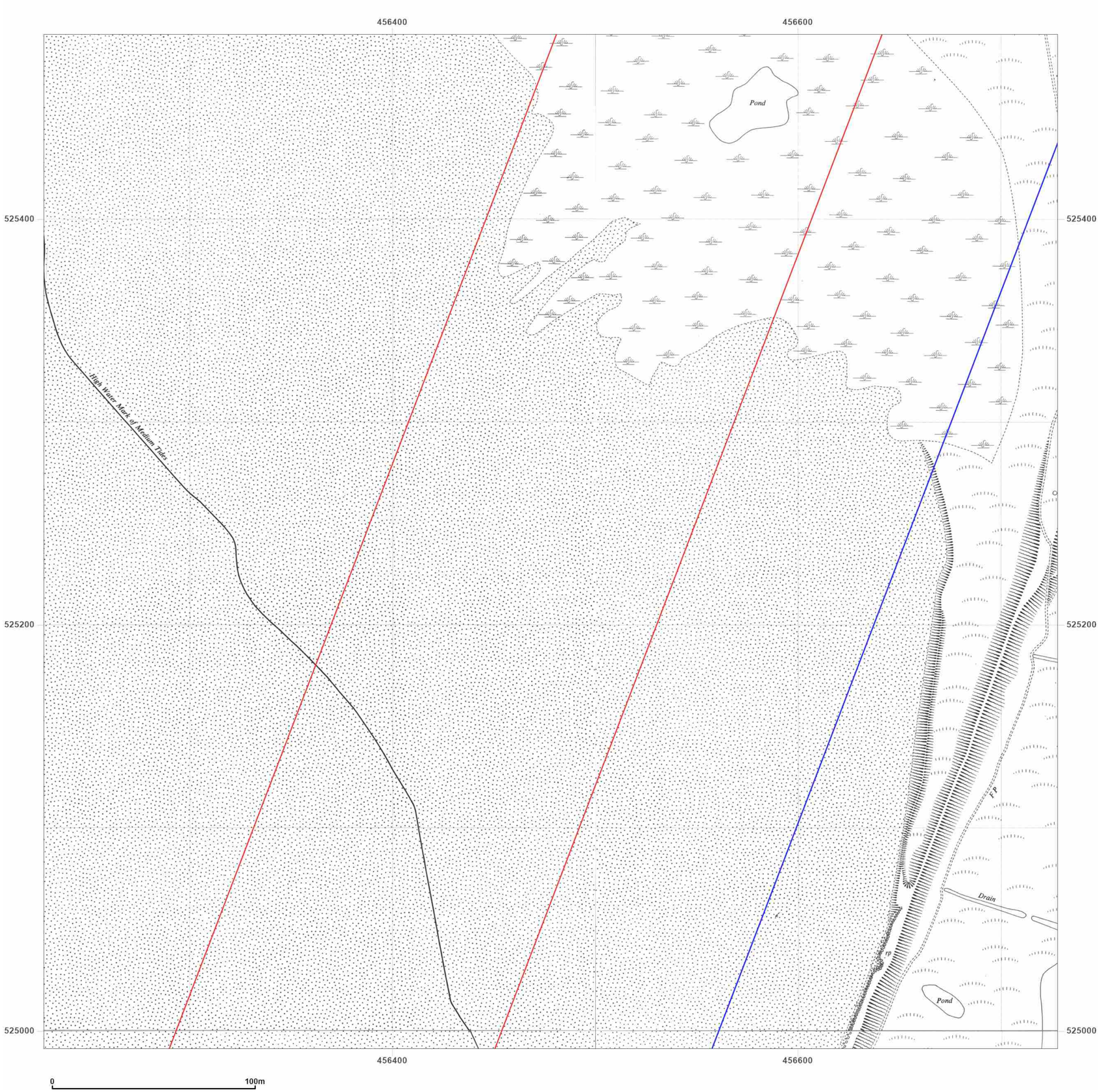

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Grid Ref: 456478, 525241

Map Name: National Grid

Map date: **1952**

Scale: 1:1,250

Printed at: 1:2,000

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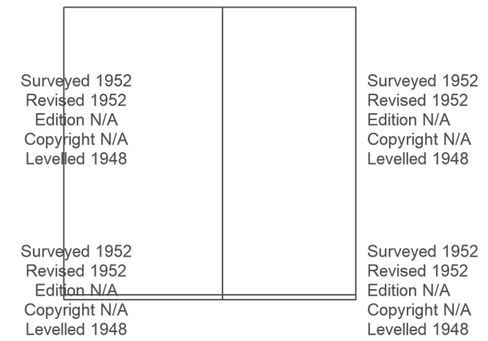

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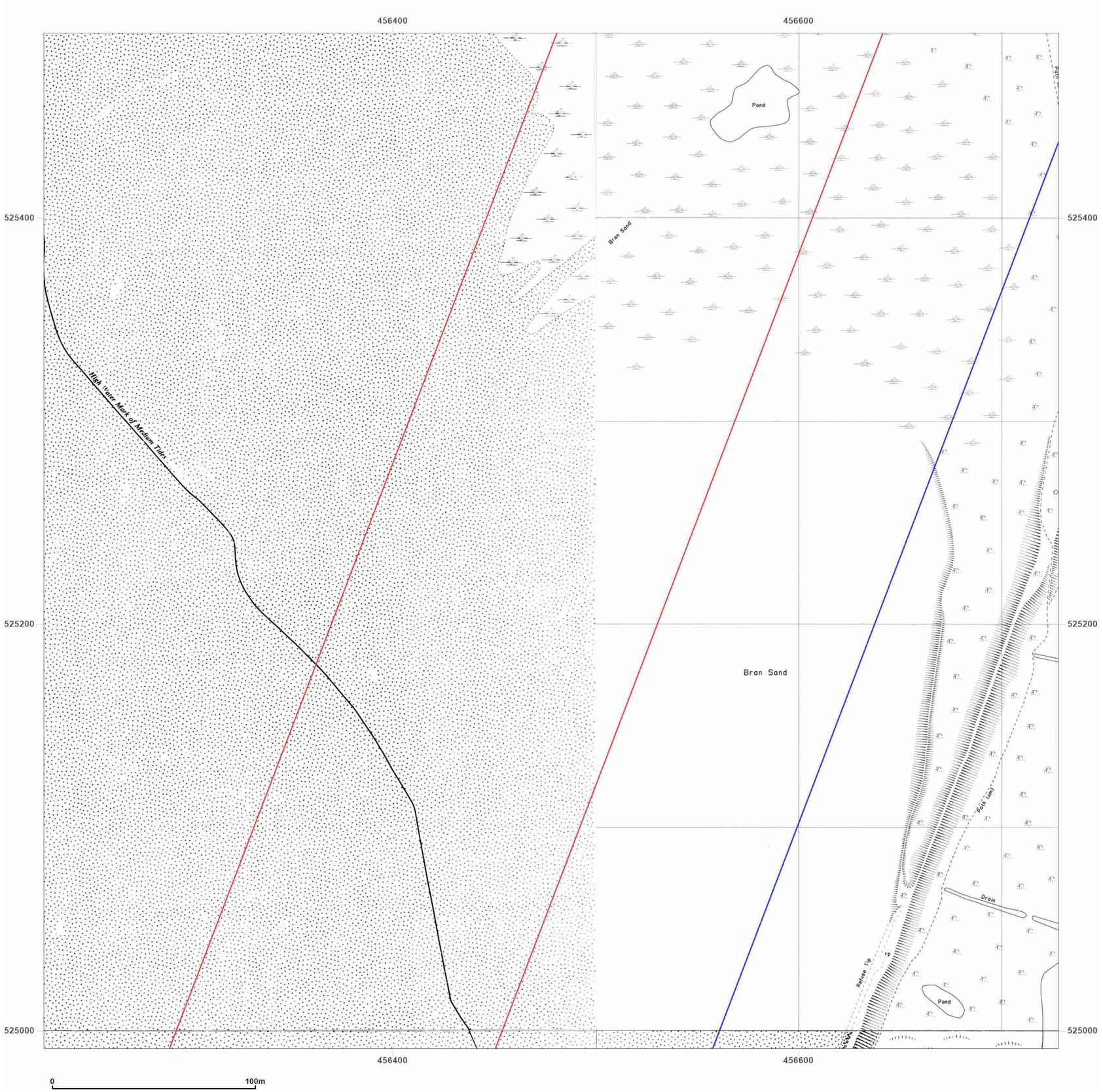

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Map Name: National Grid

Map date: **1953**

Scale: 1:1,250

Printed at: 1:2,000

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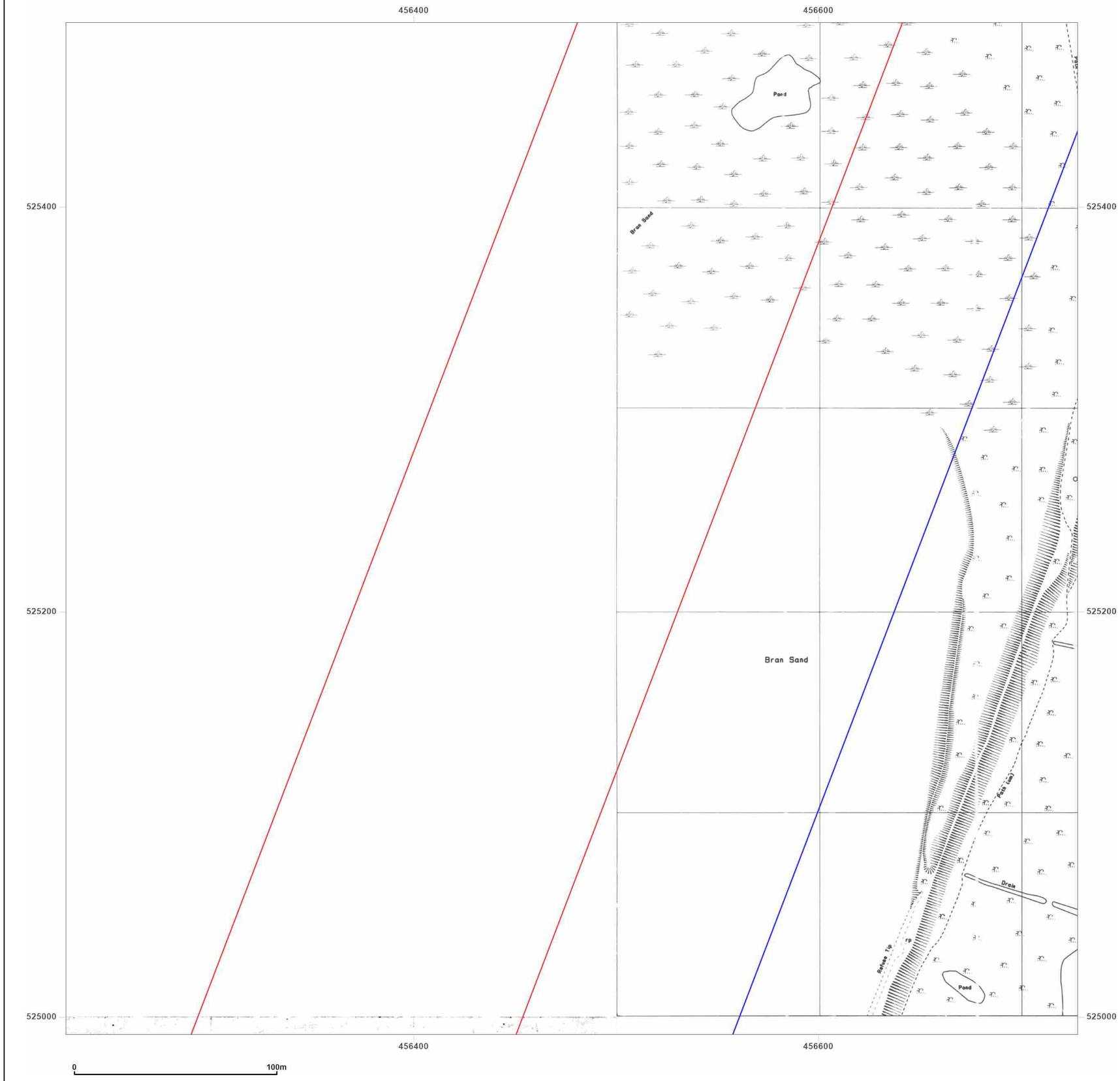

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_1_2
Grid Ref: 456478, 525241

Map Name: National Grid

Map date: **1974-1977**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A
Revised N/A
Edition N/A
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Surveyed N/A
Revised N/A
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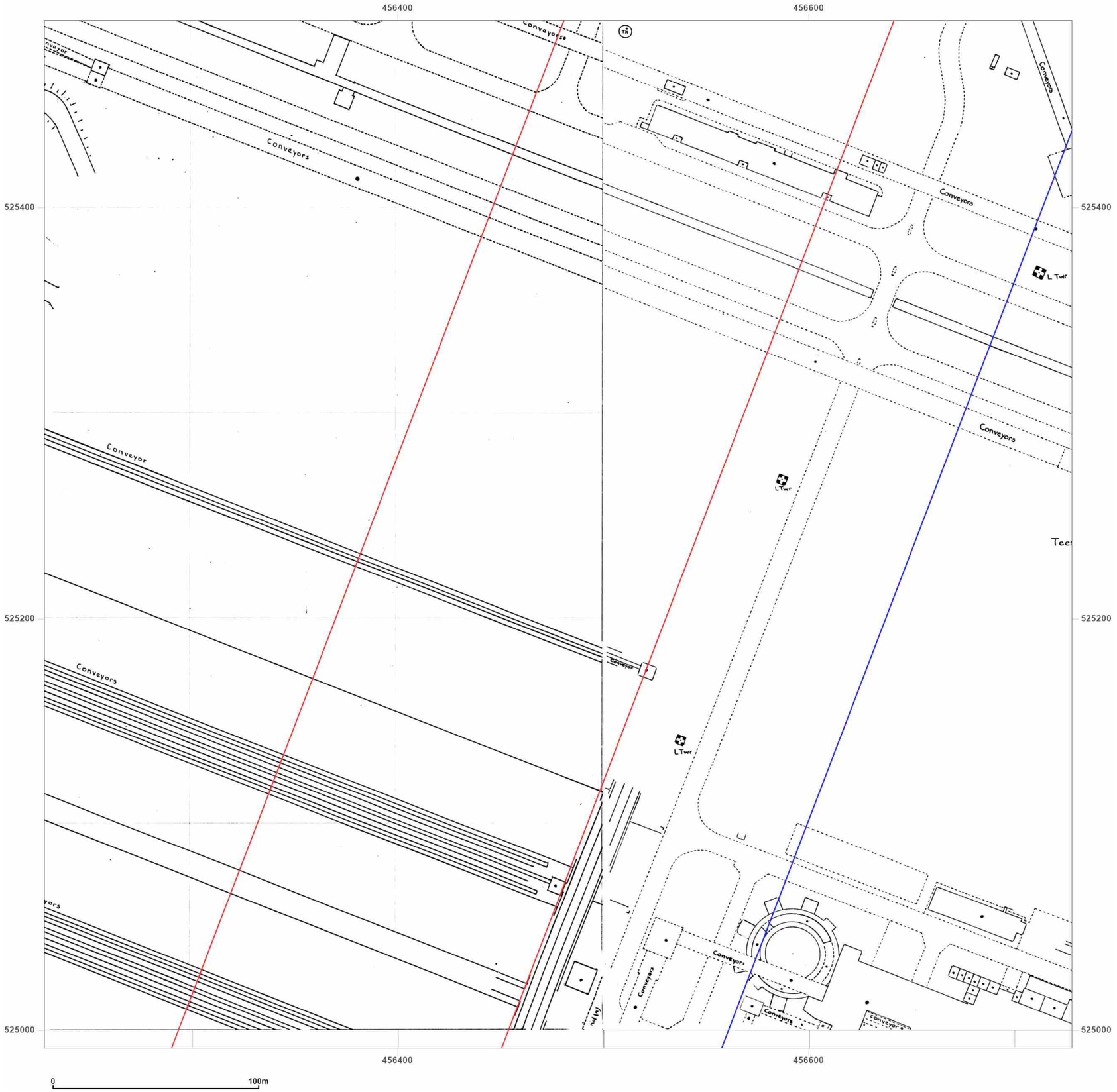

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_1_2
Grid Ref: 456478, 525241

Map Name: National Grid

Map date: **1976-1981**

Scale: 1:1,250

Printed at: 1:2,000

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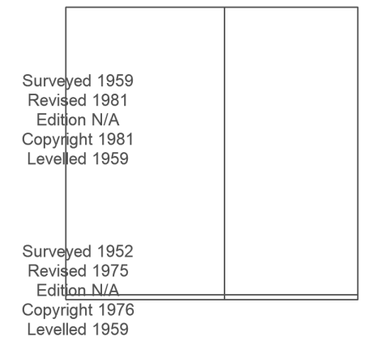

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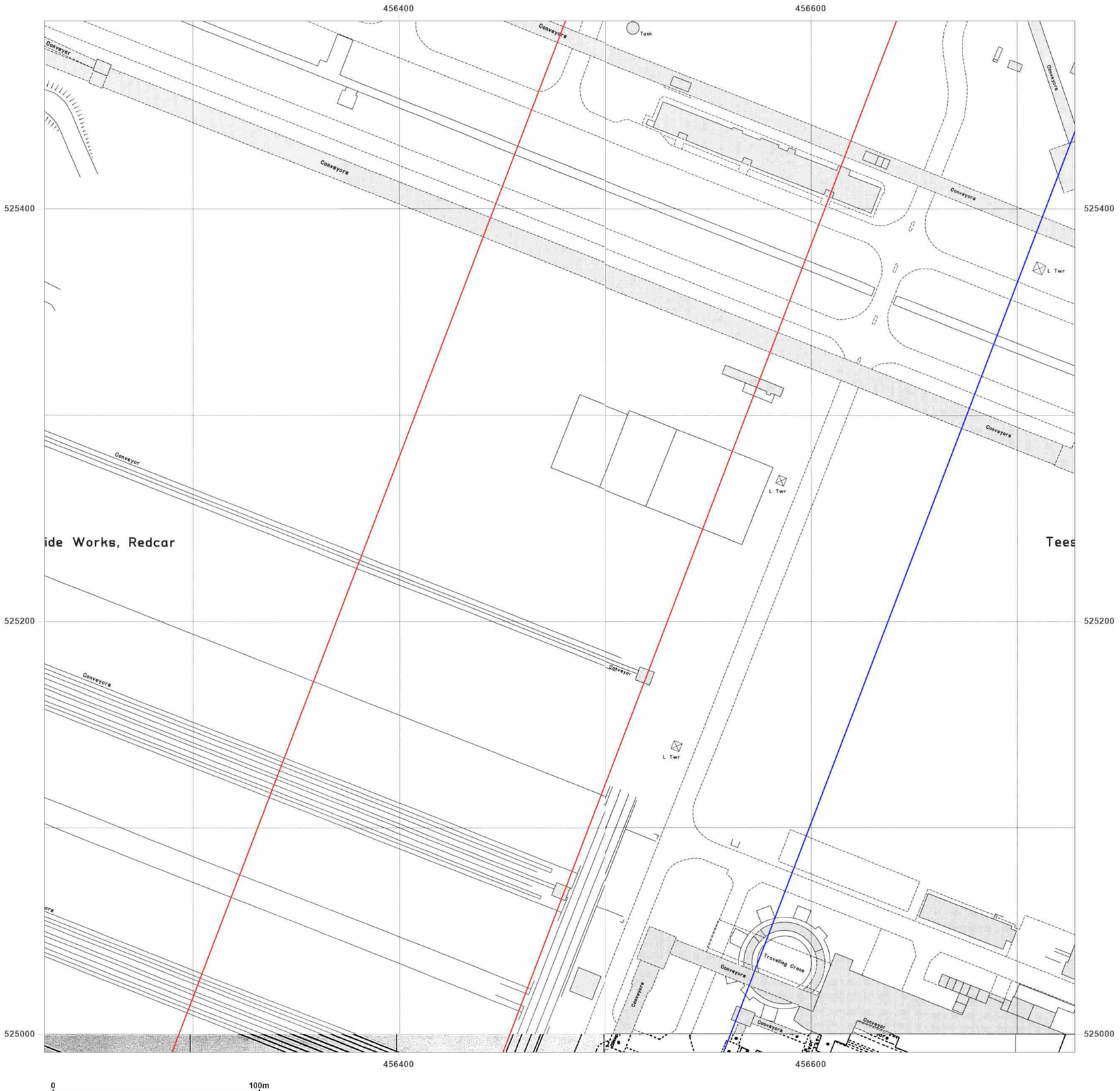

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_1_2
Grid Ref: 456478, 525241

Map Name: National Grid

Map date: **1979-1983**

Scale: 1:1,250

Printed at: 1:2,000

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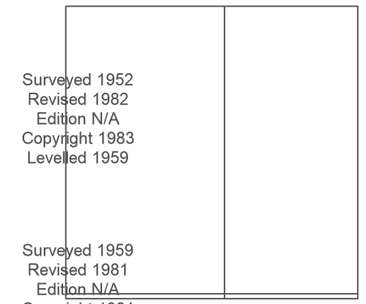

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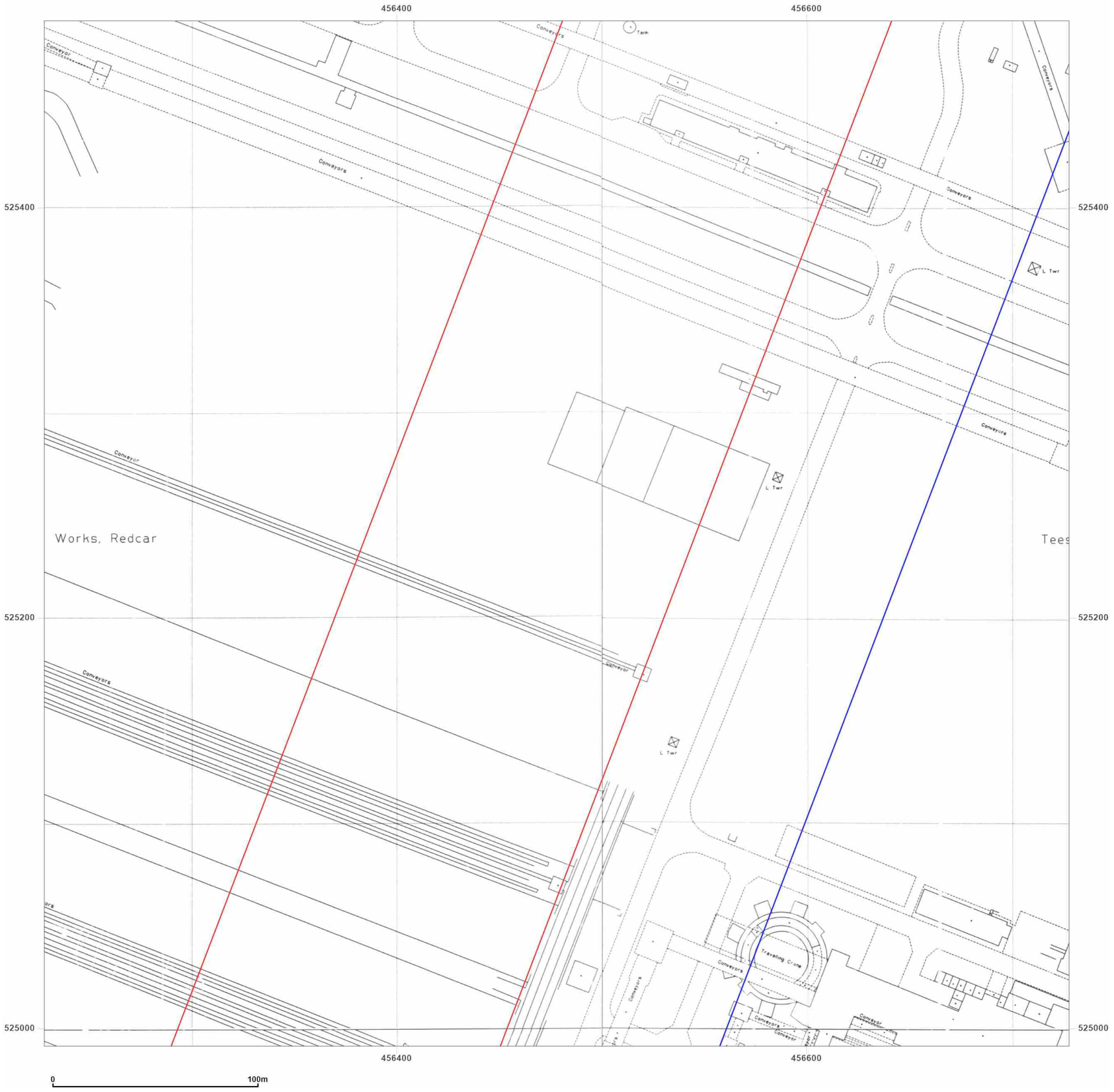

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_1_2
Grid Ref: 456478, 525241

Map Name: National Grid
Map date: **1993**
Scale: 1:1,250
Printed at: 1:2,000

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Levelled N/A

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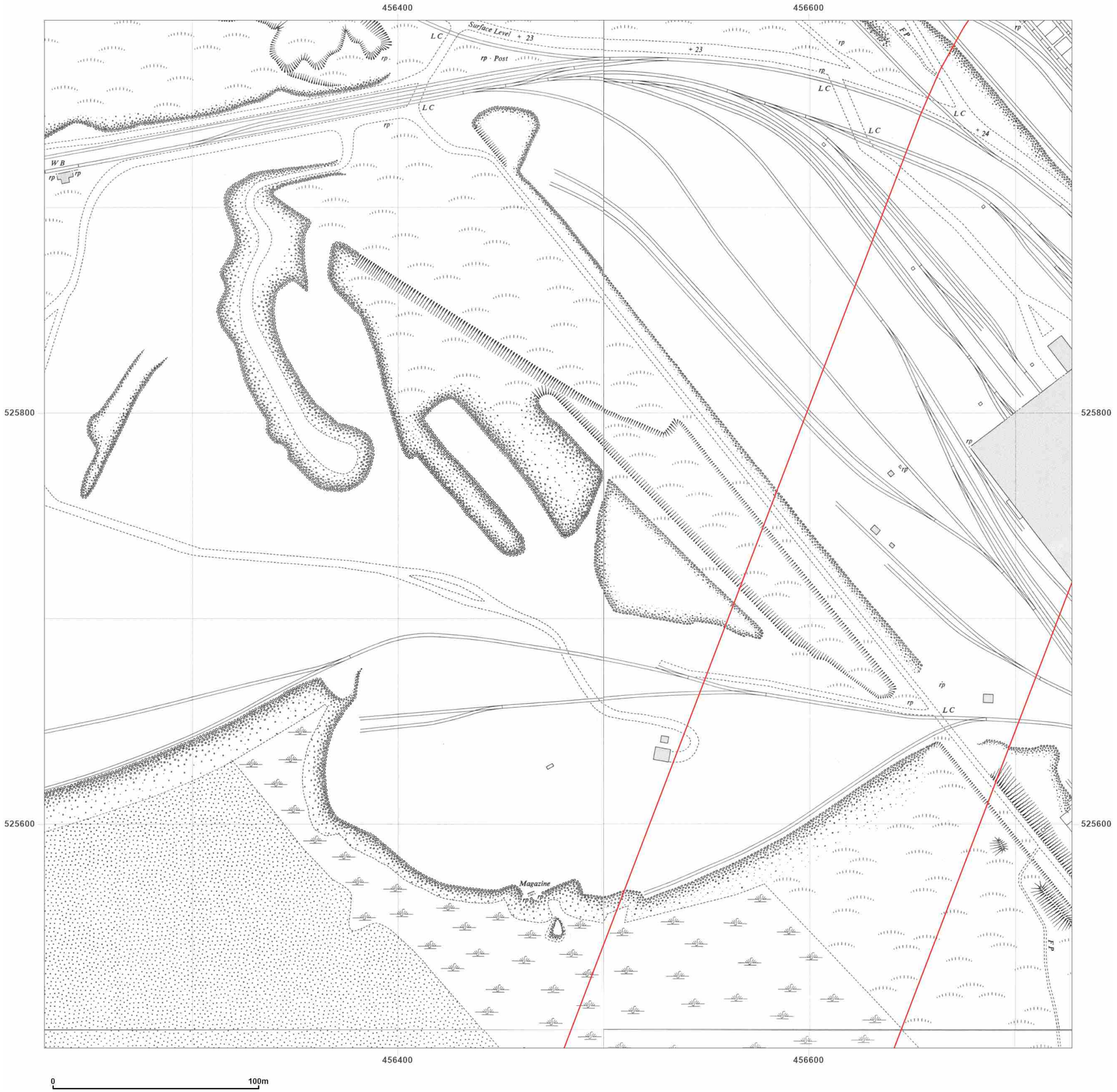

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_1_3
Grid Ref: 456478, 525741

Map Name: National Grid

Map date: **1952**

Scale: 1:1,250

Printed at: 1:2,000

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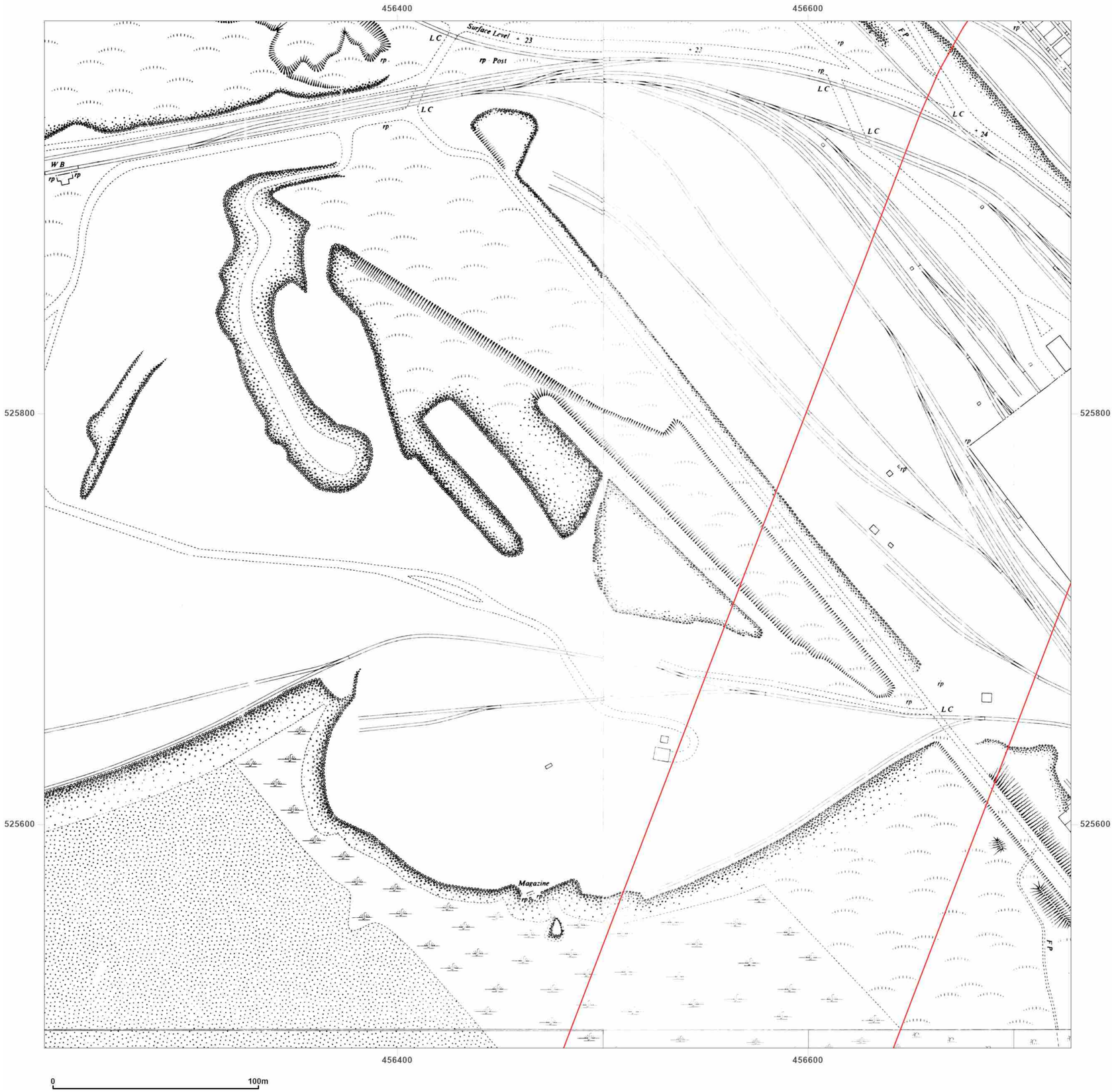

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_1_3
Grid Ref: 456478, 525741

Map Name: National Grid

Map date: **1953**

Scale: 1:1,250

Printed at: 1:2,000

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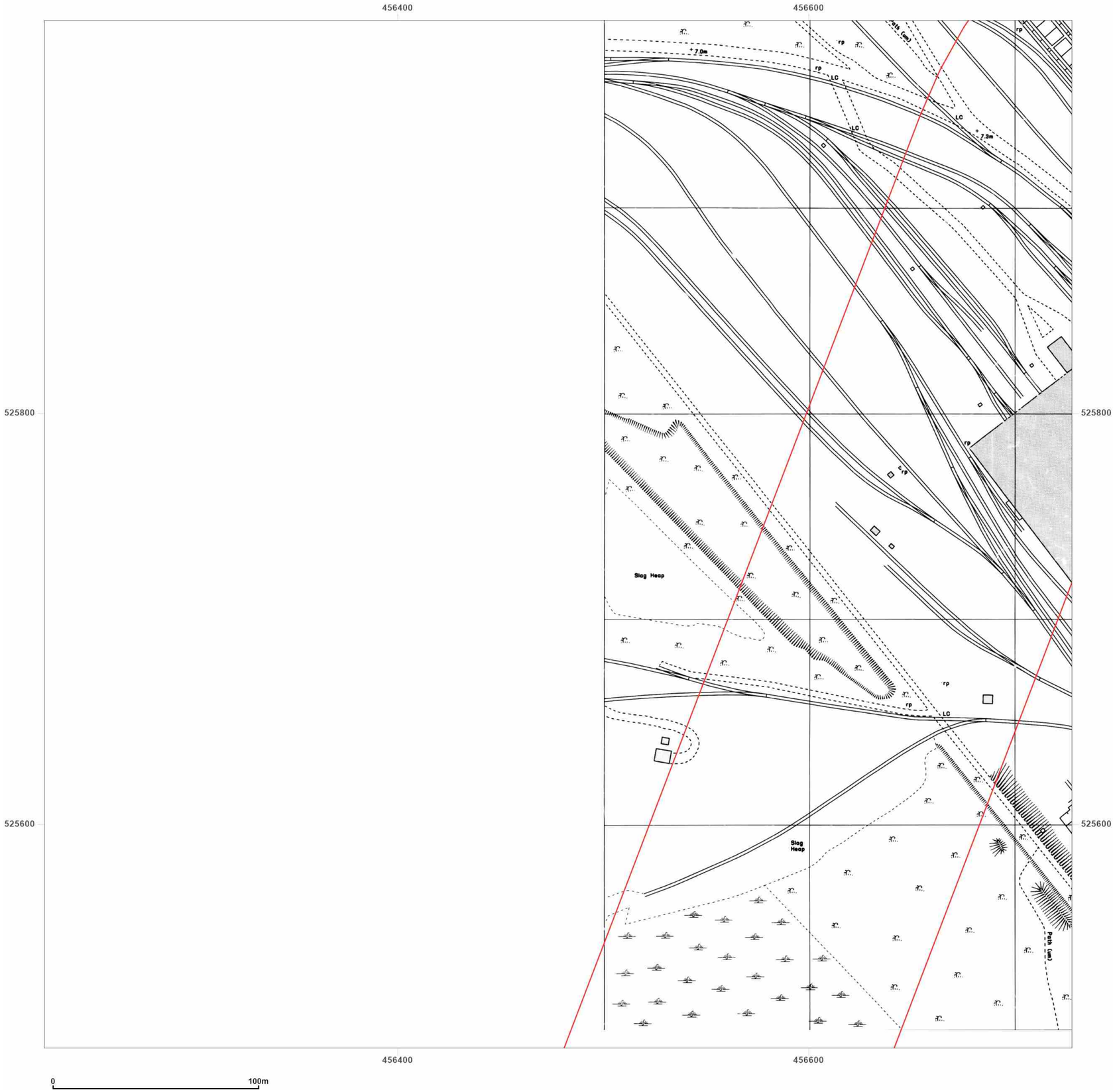

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_1_3
Grid Ref: 456478, 525741

Map Name: National Grid

Map date: **1953**

Scale: 1:1,250

Printed at: 1:2,000

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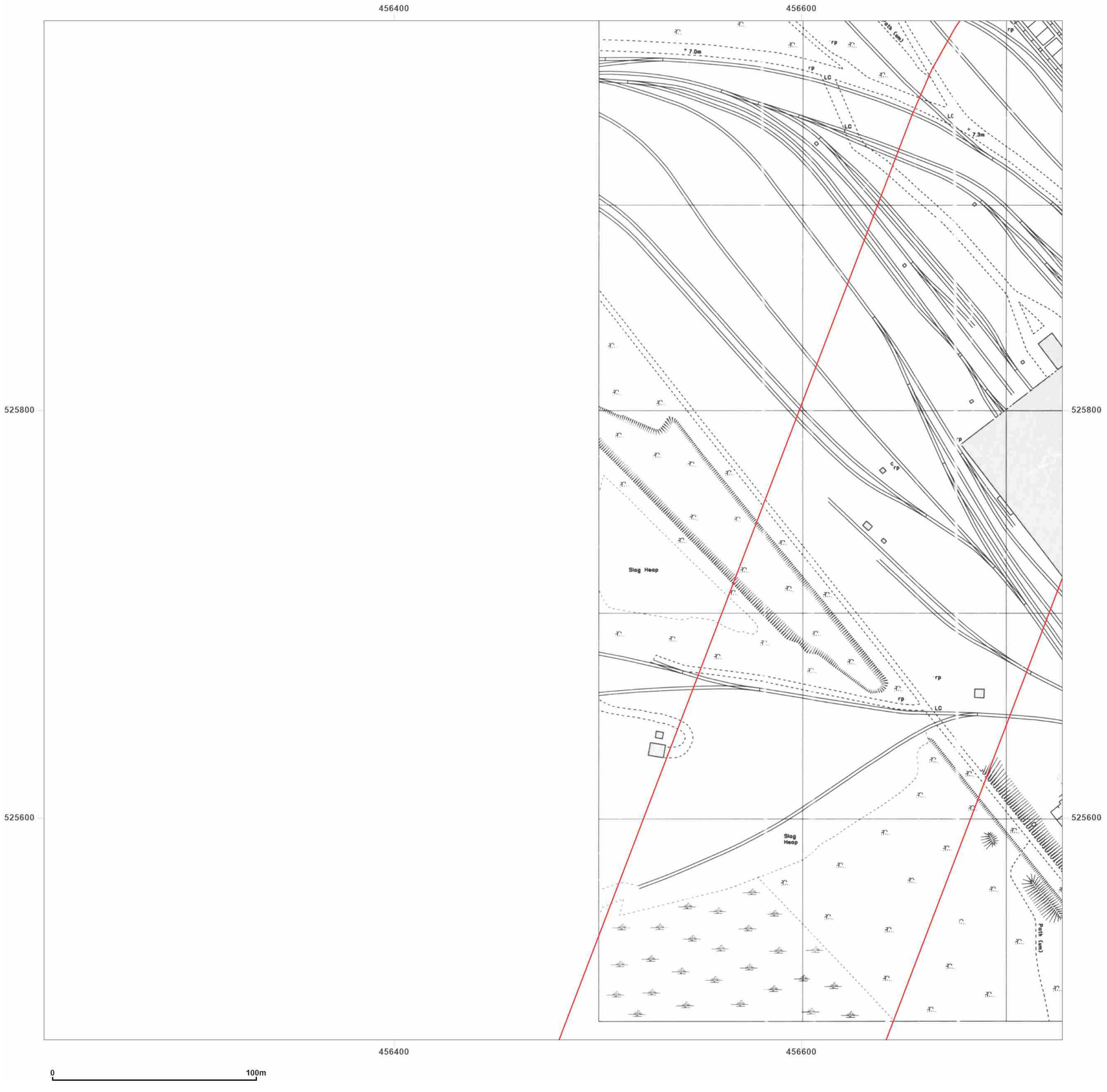

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_1_3
Grid Ref: 456478, 525741

Map Name: National Grid

Map date: **1977**

Scale: 1:1,250

Printed at: 1:2,000

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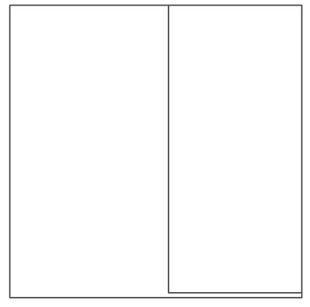

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Edition N/A
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Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_1_3
Grid Ref: 456478, 525741

Map Name: National Grid

Map date: **1977-1981**

Scale: 1:1,250

Printed at: 1:2,000

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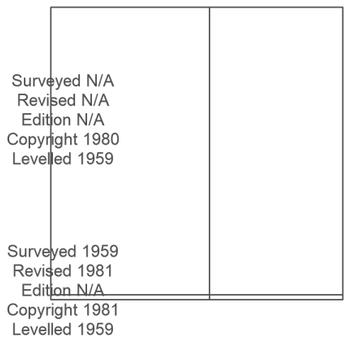

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Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_1_3
Grid Ref: 456478, 525741

Map Name: National Grid

Map date: **1981-1983**

Scale: 1:1,250

Printed at: 1:2,000

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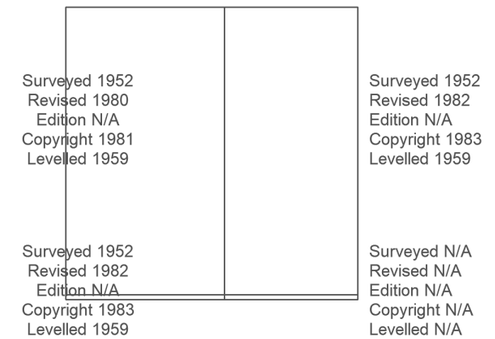

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Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_1_3
Grid Ref: 456478, 525741

Map Name: National Grid

Map date: **1993**

Scale: 1:1,250

Printed at: 1:2,000

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Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_1_3
Grid Ref: 456478, 525741

Map Name: National Grid

Map date: **1993**

Scale: 1:1,250

Printed at: 1:2,000

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Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_1_3
Grid Ref: 456478, 525741

Map Name: National Grid

Map date: **1993**

Scale: 1:1,250

Printed at: 1:2,000

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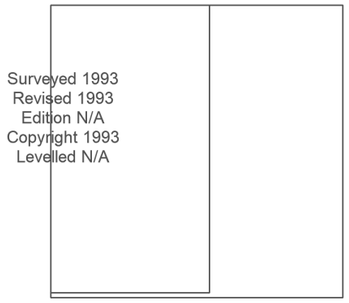

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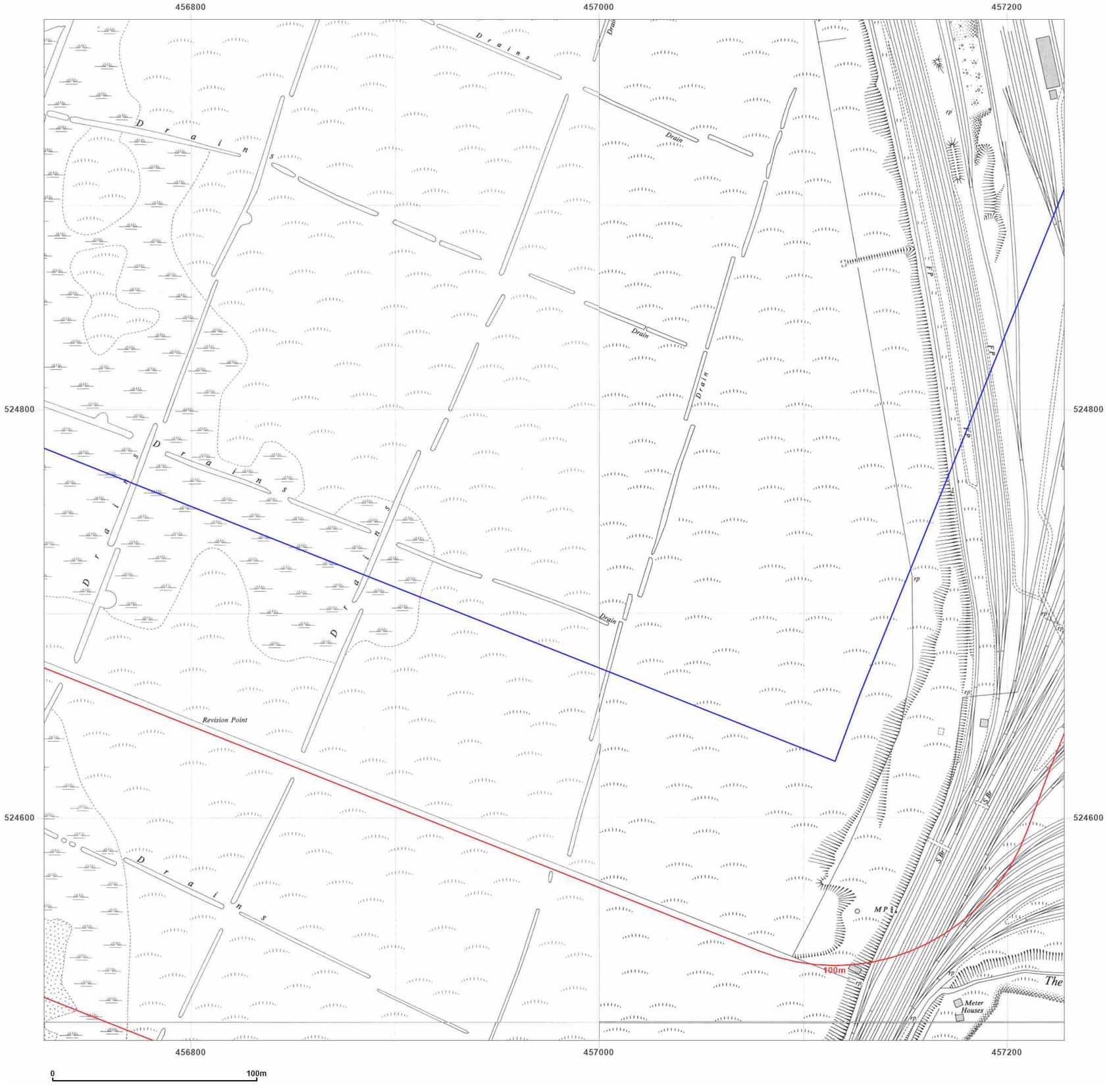

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718_1250_2_1
Grid Ref: 456978, 524741

Map Name: National Grid

Map date: **1952**

Scale: 1:1,250

Printed at: 1:2,000

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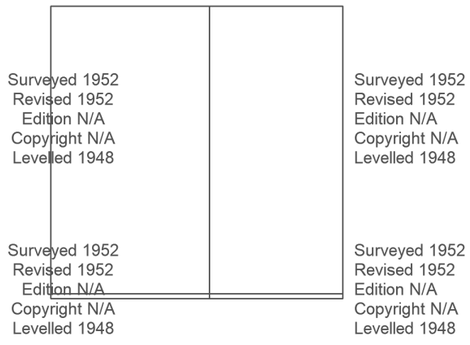

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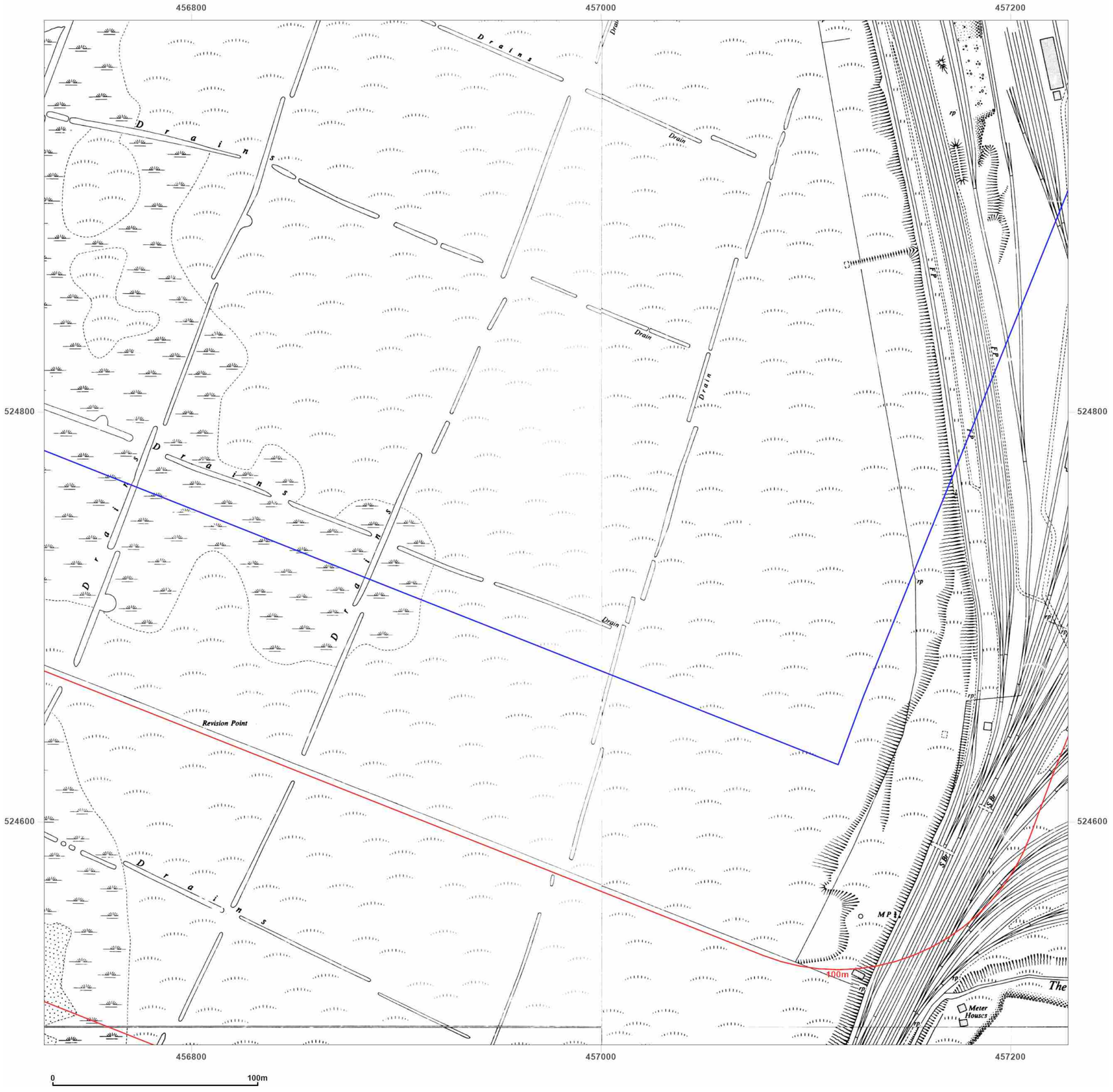

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718_1250_2_1
Grid Ref: 456978, 524741

Map Name: National Grid

Map date: **1953-1954**

Scale: 1:1,250

Printed at: 1:2,000

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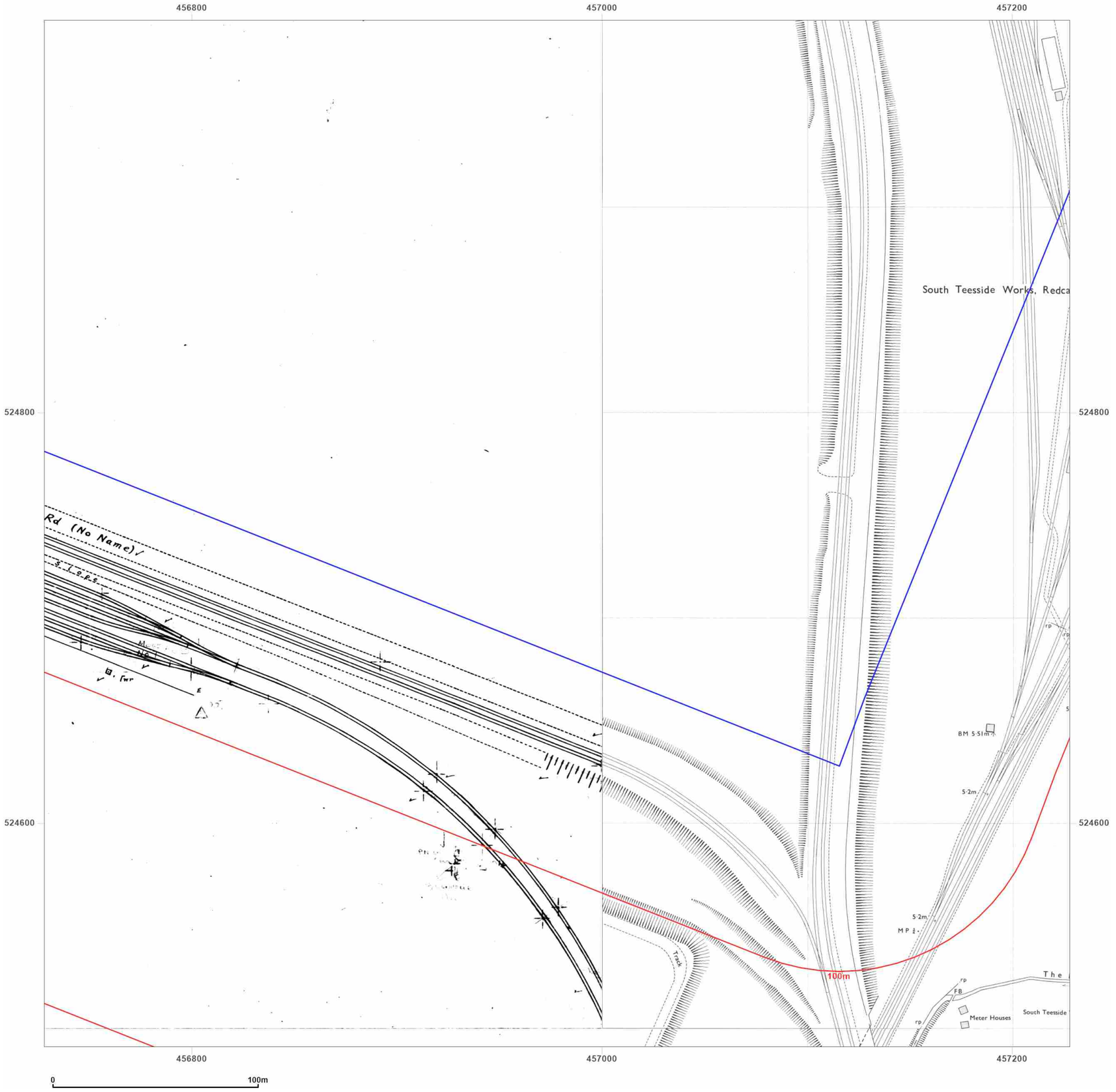

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_1
Grid Ref: 456978, 524741

Map Name: National Grid

Map date: **1973-1974**

Scale: 1:1,250

Printed at: 1:2,000

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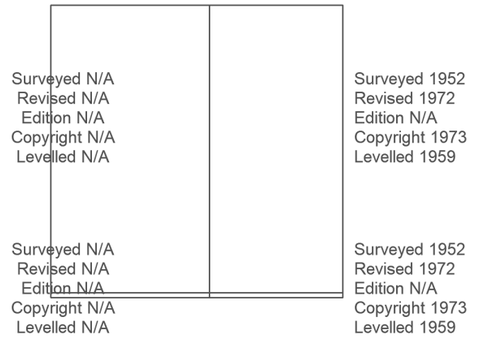

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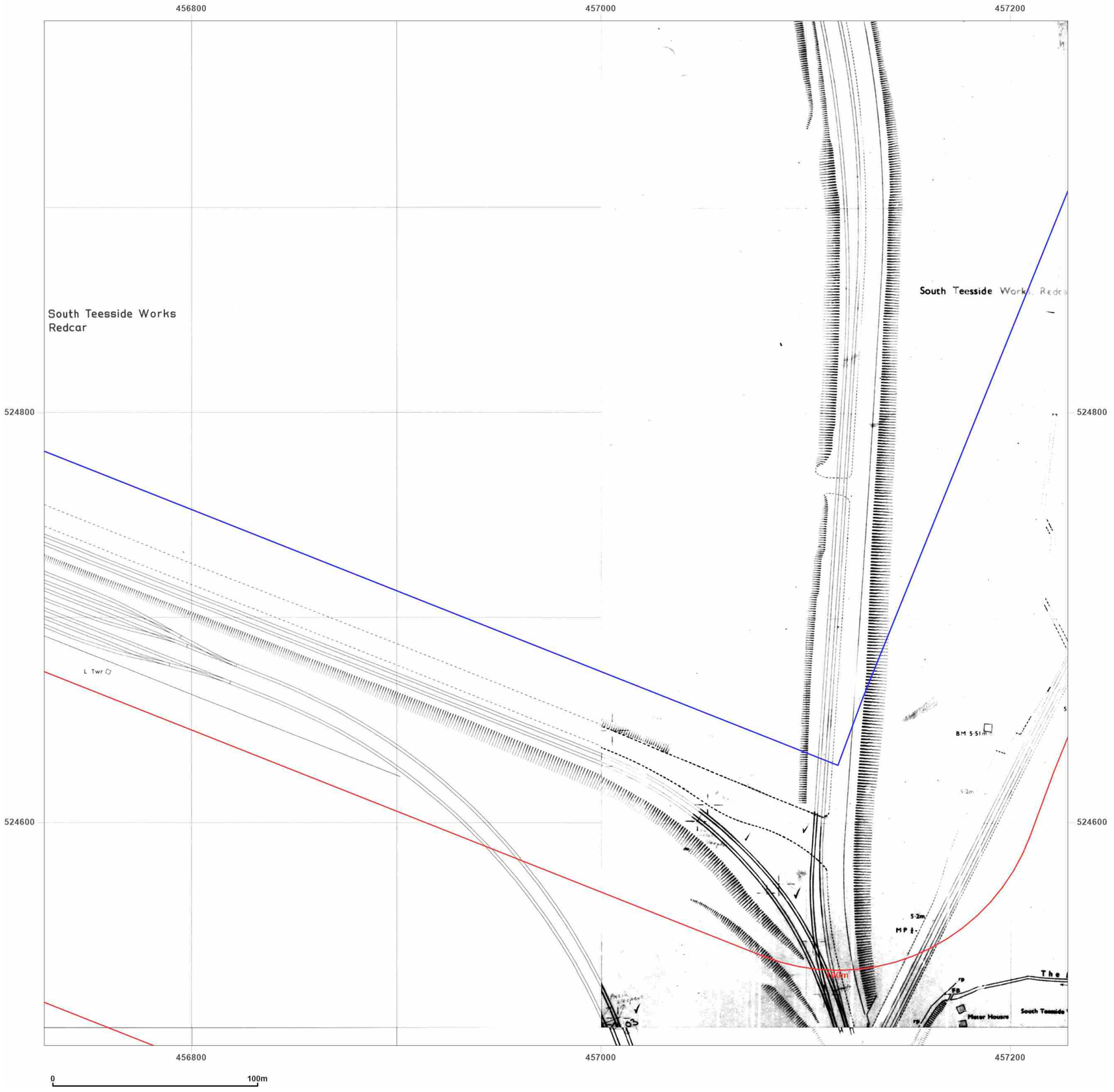

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_1
Grid Ref: 456978, 524741

Map Name: National Grid

Map date: **1974-1976**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1952 Revised 1975 Edition N/A Copyright 1975 Levelled 1959	Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A

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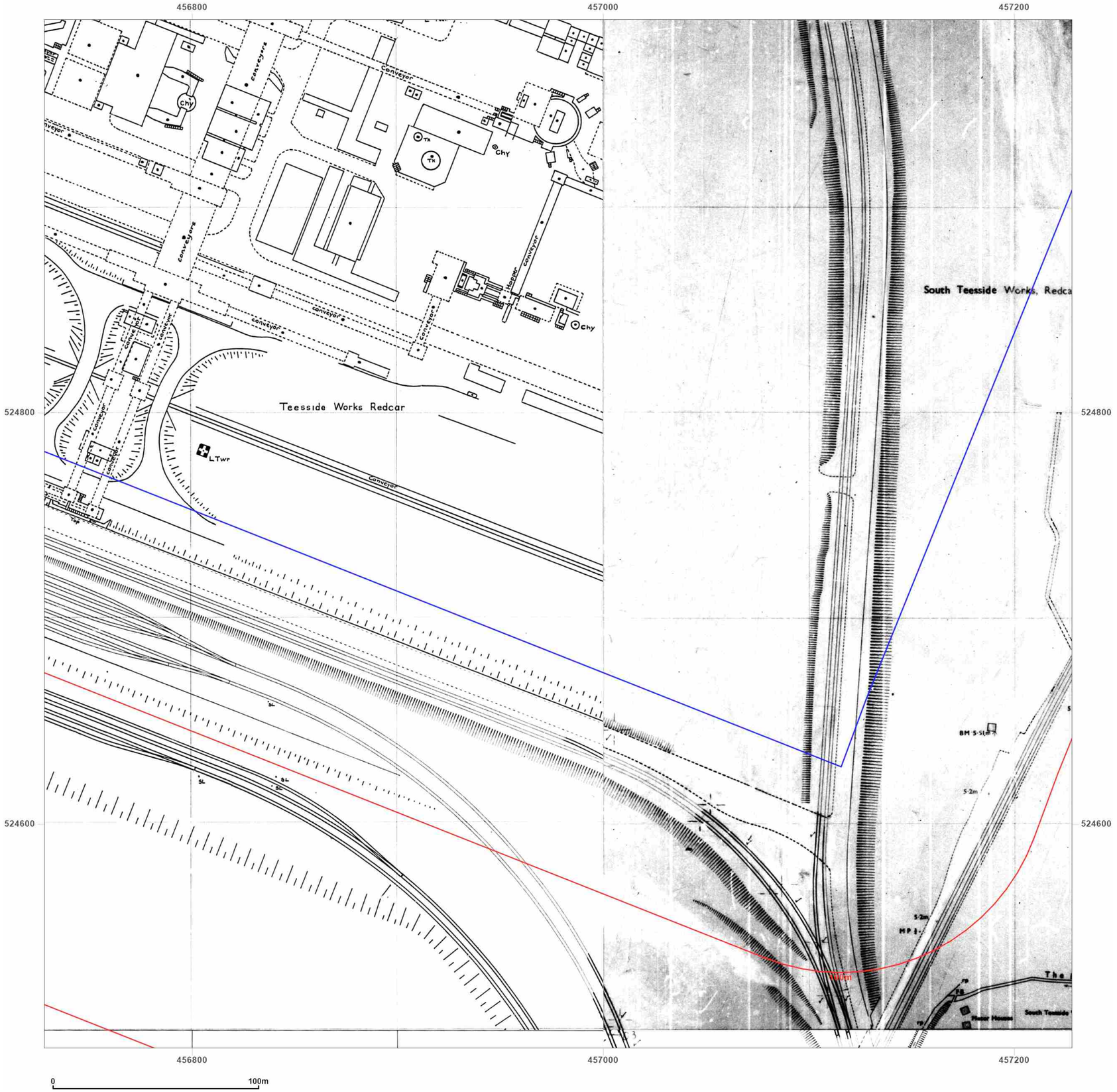

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_1
Grid Ref: 456978, 524741

Map Name: National Grid

Map date: **1976-1979**

Scale: 1:1,250

Printed at: 1:2,000

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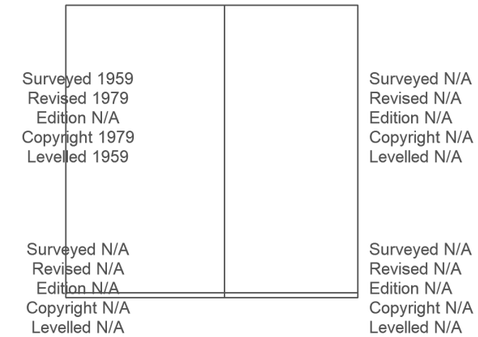

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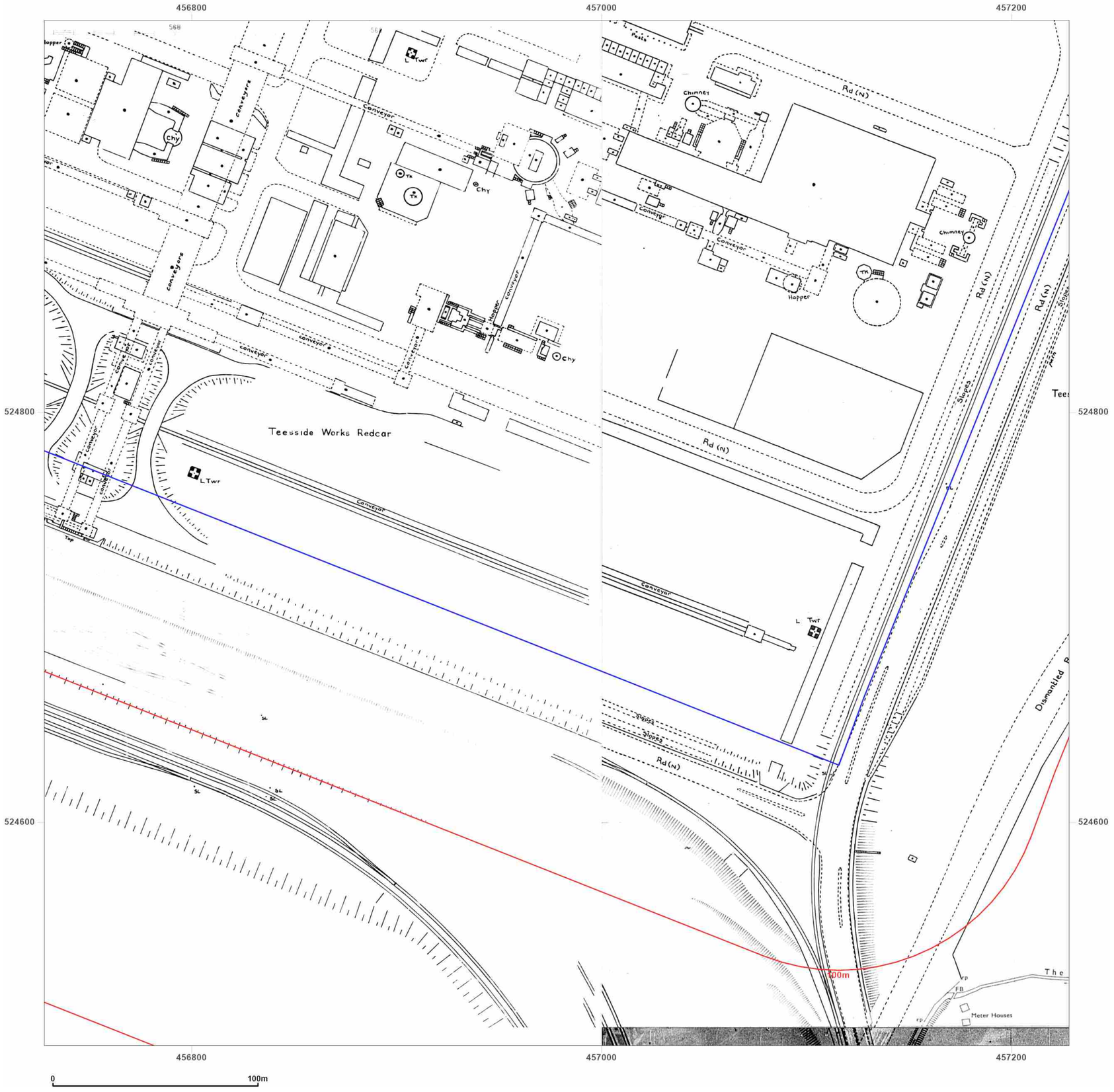

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_1
Grid Ref: 456978, 524741

Map Name: National Grid

Map date: **1980-1981**

Scale: 1:1,250

Printed at: 1:2,000

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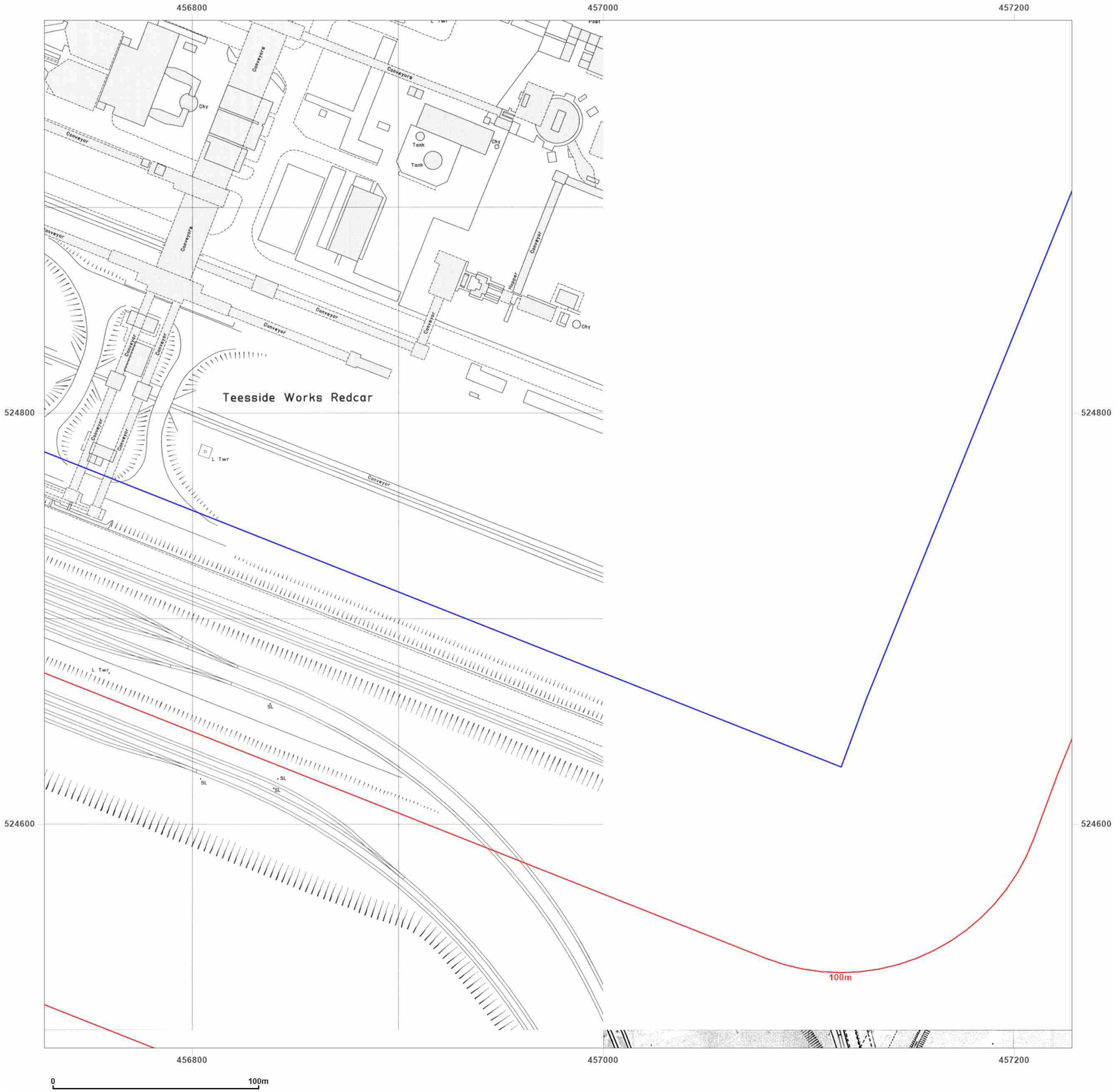

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_1
Grid Ref: 456978, 524741

Map Name: National Grid

Map date: **1980-1984**

Scale: 1:1,250

Printed at: 1:2,000

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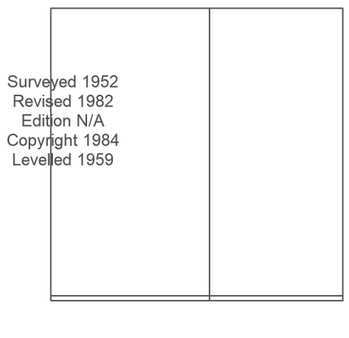

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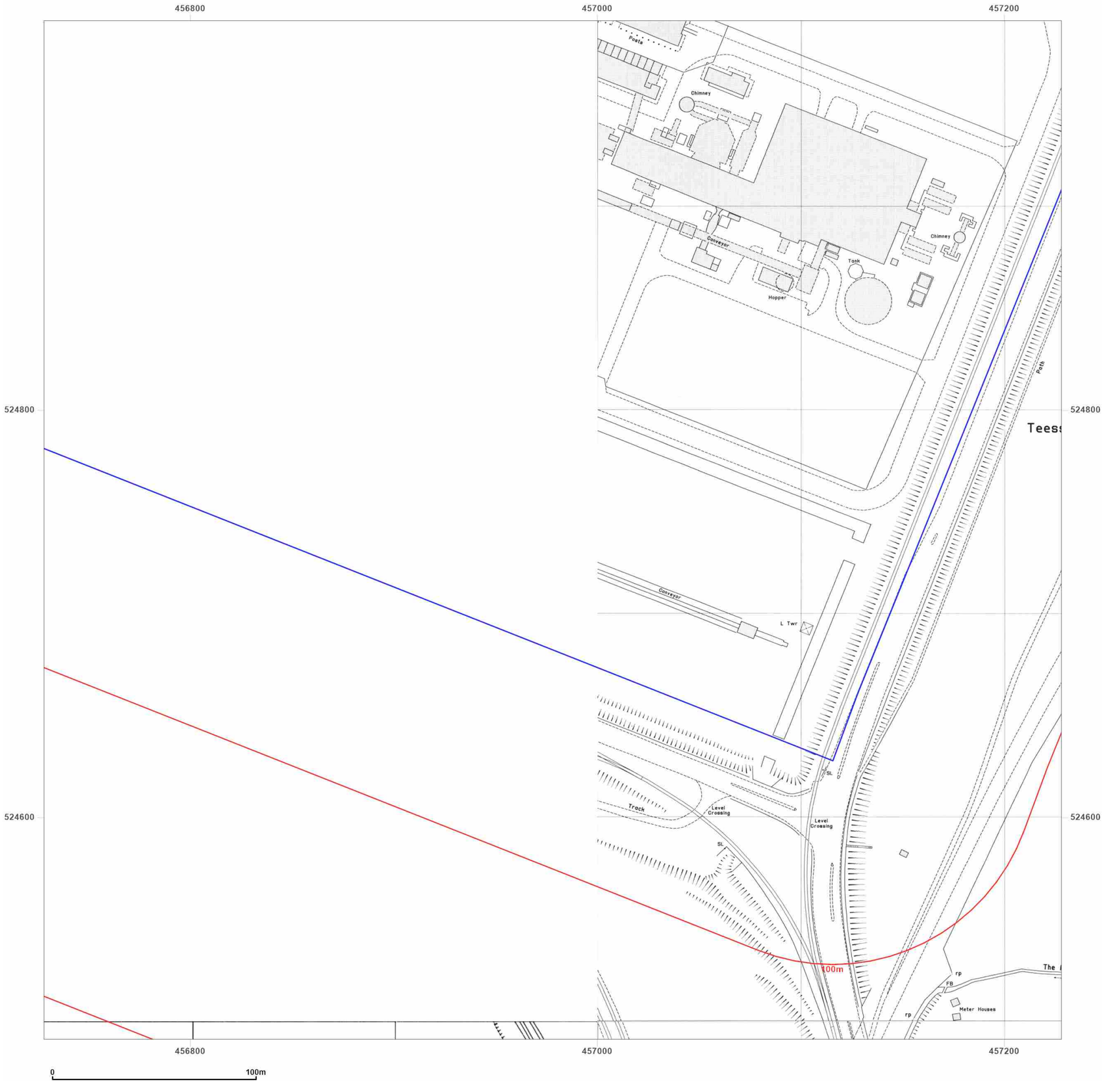

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_1
Grid Ref: 456978, 524741

Map Name: National Grid

Map date: **1986-1989**

Scale: 1:1,250

Printed at: 1:2,000

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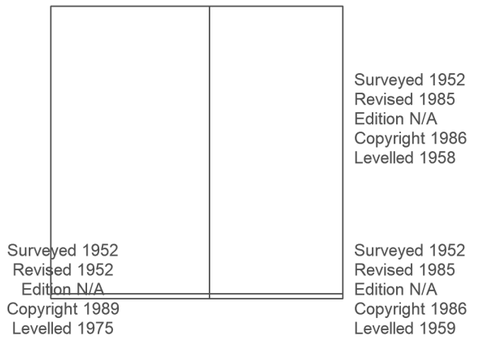

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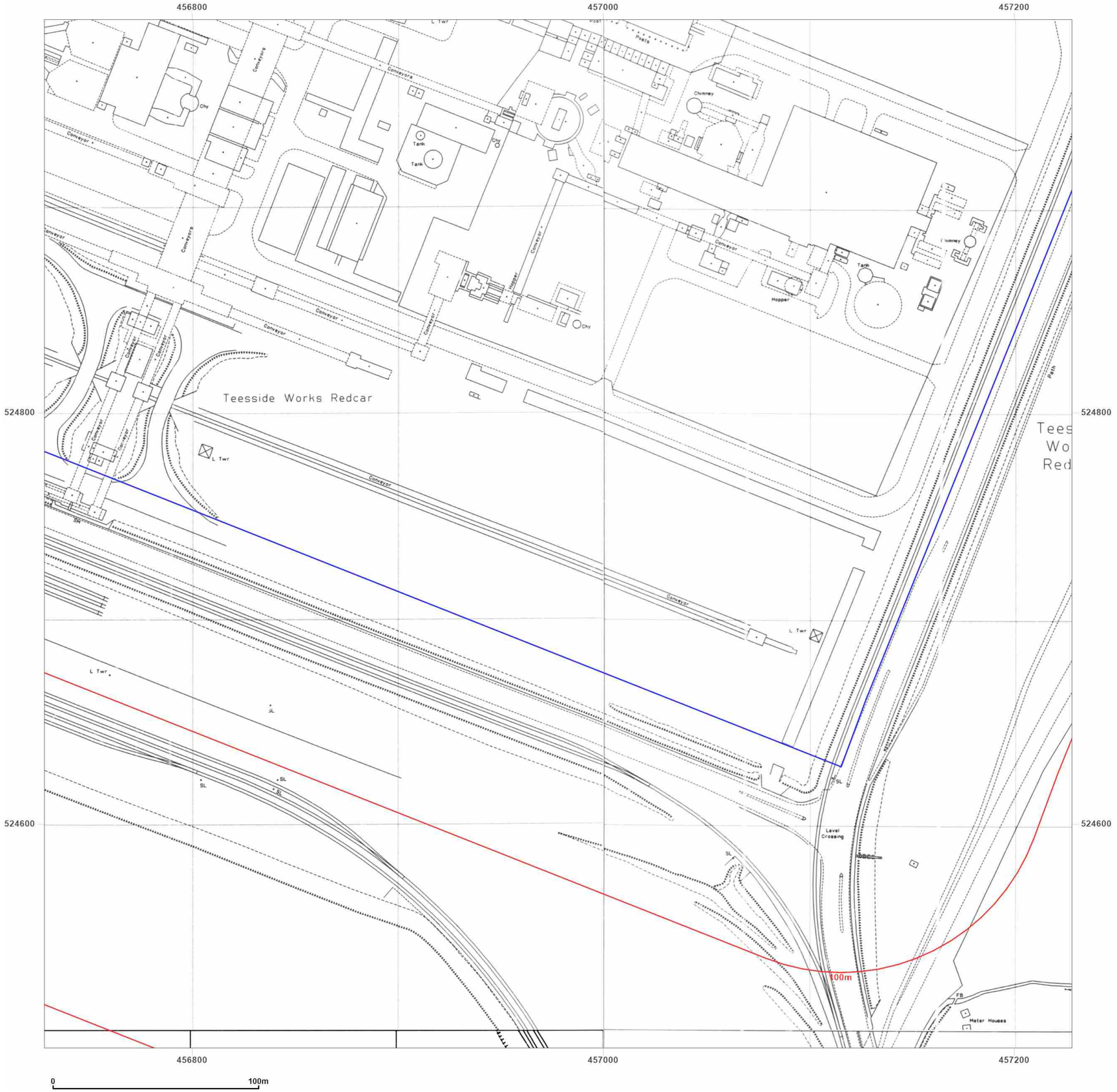

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_1
Grid Ref: 456978, 524741

Map Name: National Grid

Map date: **1989-1993**

Scale: 1:1,250

Printed at: 1:2,000

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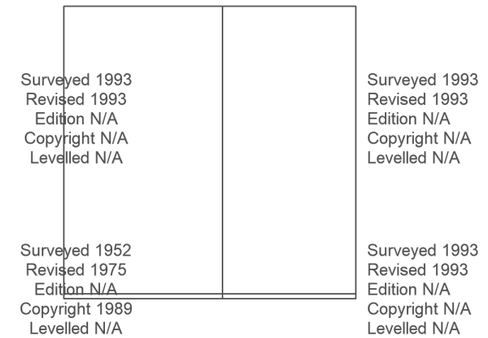

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Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_2
Grid Ref: 456978, 525241

Map Name: National Grid

Map date: **1952**

Scale: 1:1,250

Printed at: 1:2,000

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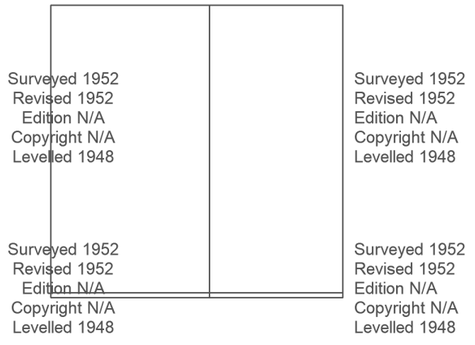

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Production date: 05 April 2022

Map legend available at:
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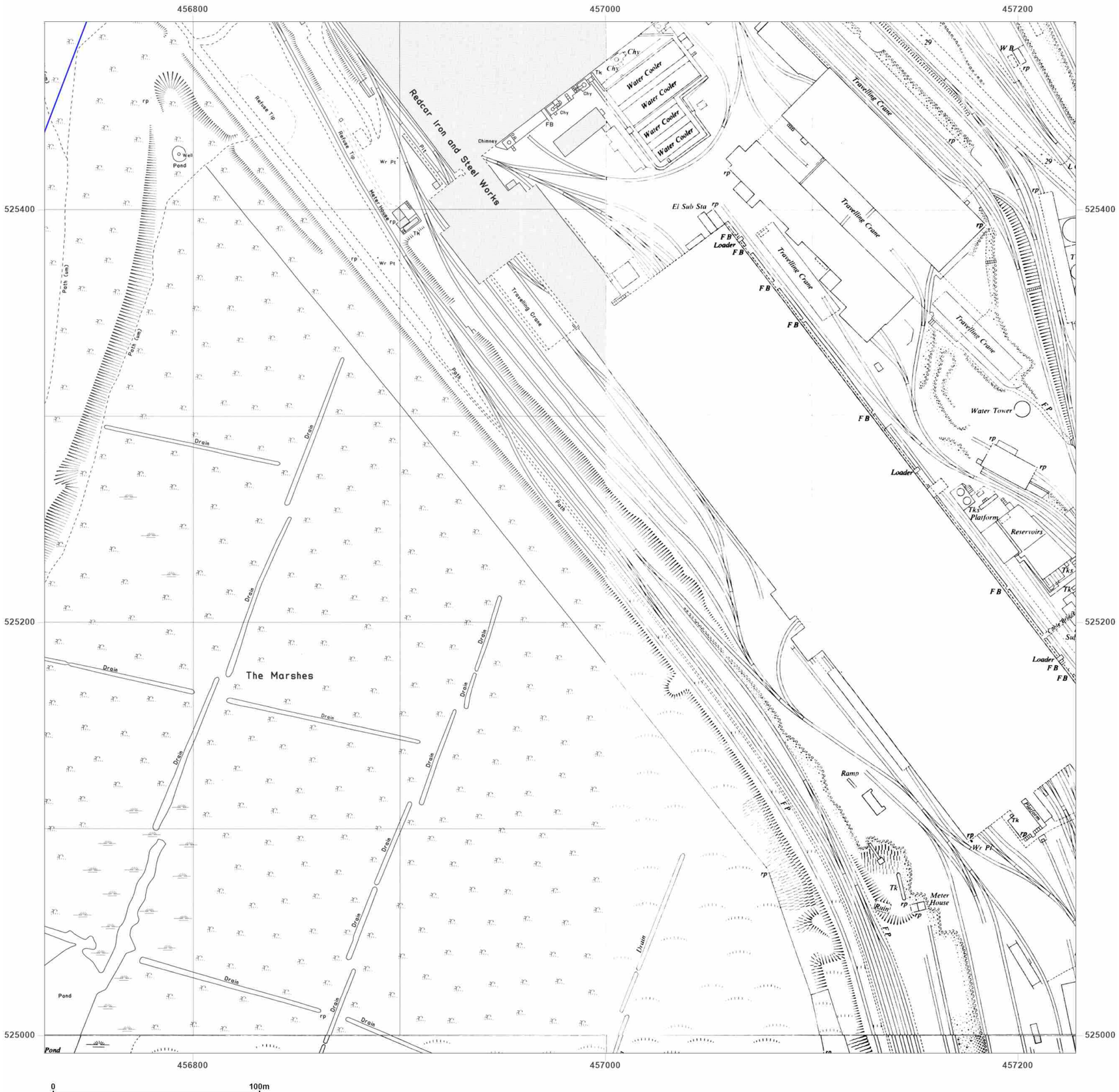

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_2
Grid Ref: 456978, 525241

Map Name: National Grid

Map date: **1953-1954**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1952 Revised 1952 Edition N/A Copyright 1953 Levelled 1948	Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A
Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A	Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A

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Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_2
Grid Ref: 456978, 525241

Map Name: National Grid

Map date: **1973-1978**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A	Surveyed 1952 Revised 1972 Edition N/A Copyright 1973 Levelled 1959

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Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_2
Grid Ref: 456978, 525241

Map Name: National Grid

Map date: **1976-1981**

Scale: 1:1,250

Printed at: 1:2,000

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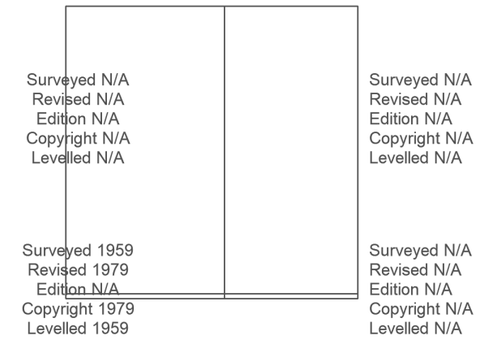

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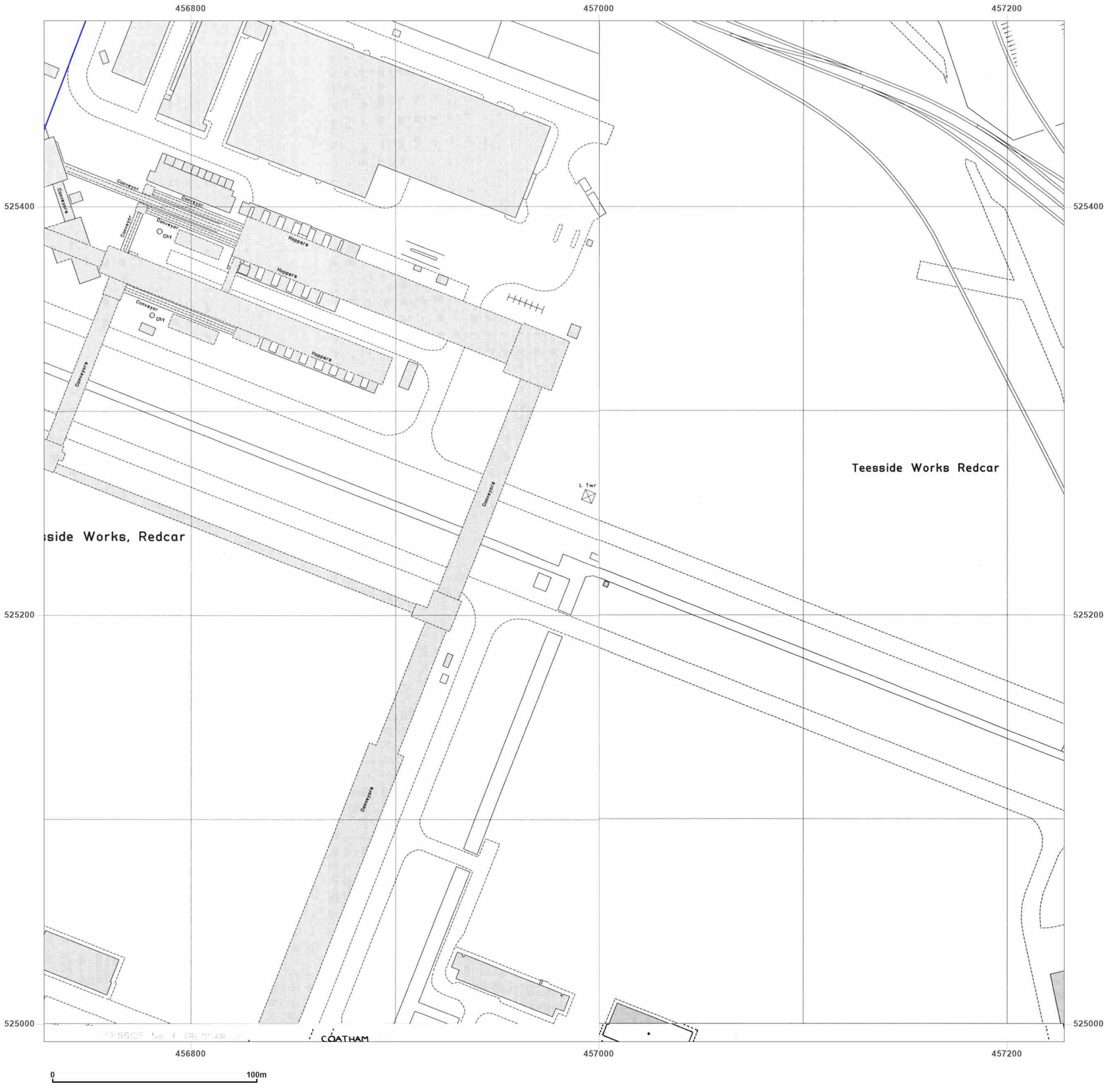

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_2
Grid Ref: 456978, 525241

Map Name: National Grid

Map date: **1980-1983**

Scale: 1:1,250

Printed at: 1:2,000

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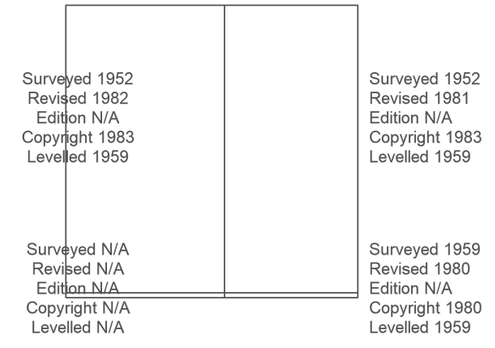

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Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_2
Grid Ref: 456978, 525241

Map Name: National Grid

Map date: **1993**

Scale: 1:1,250

Printed at: 1:2,000

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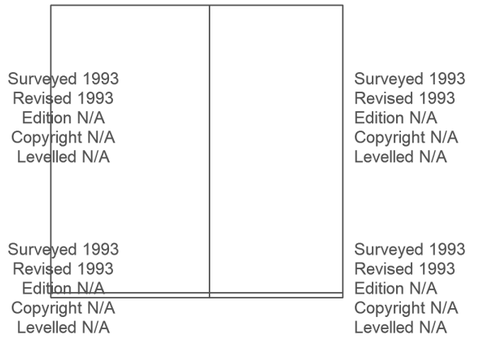

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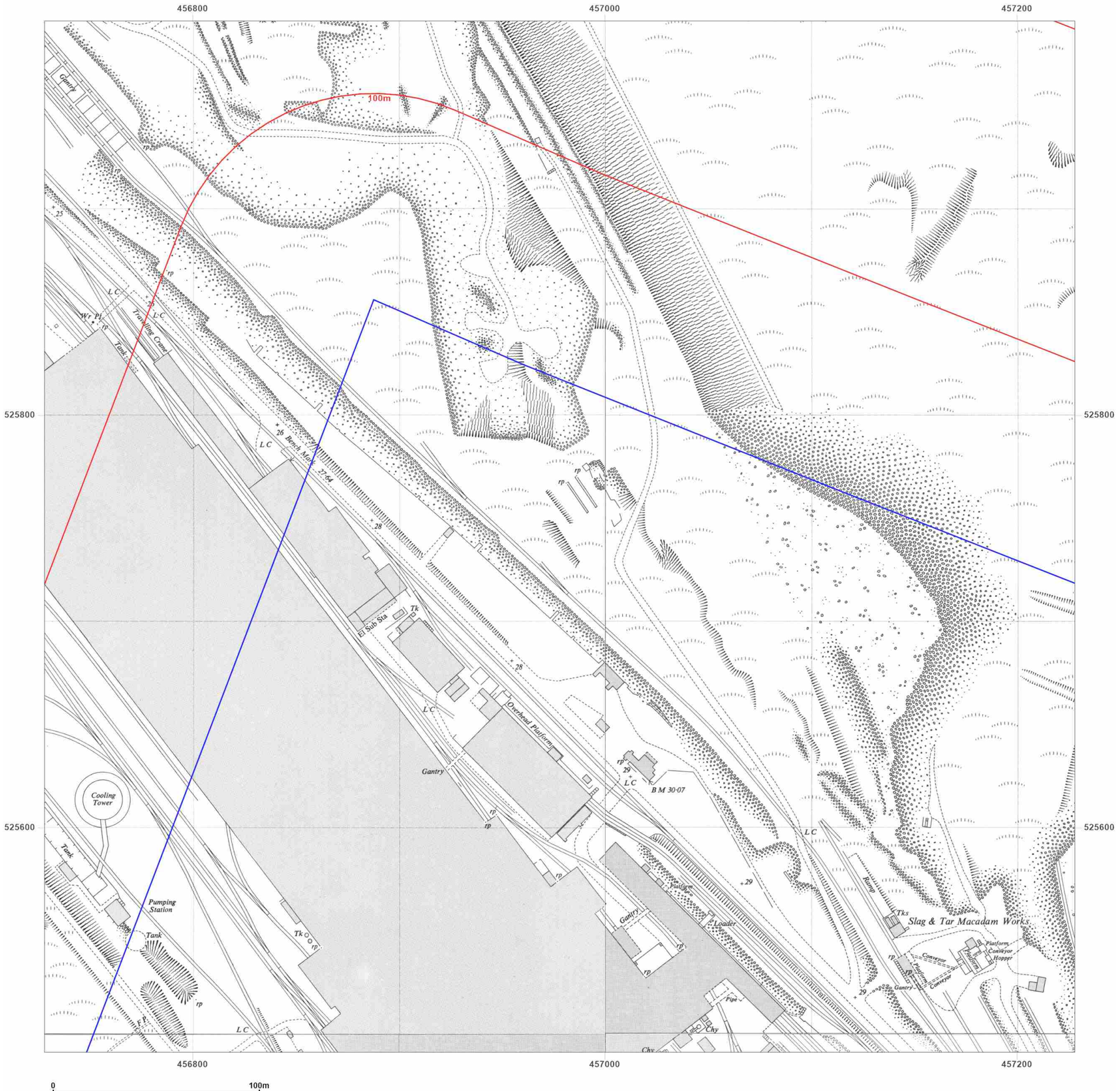

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_3
Grid Ref: 456978, 525741

Map Name: National Grid

Map date: **1952**

Scale: 1:1,250

Printed at: 1:2,000

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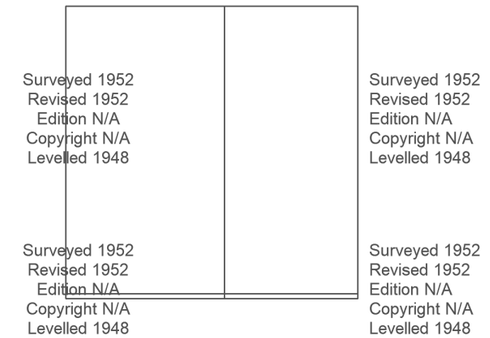

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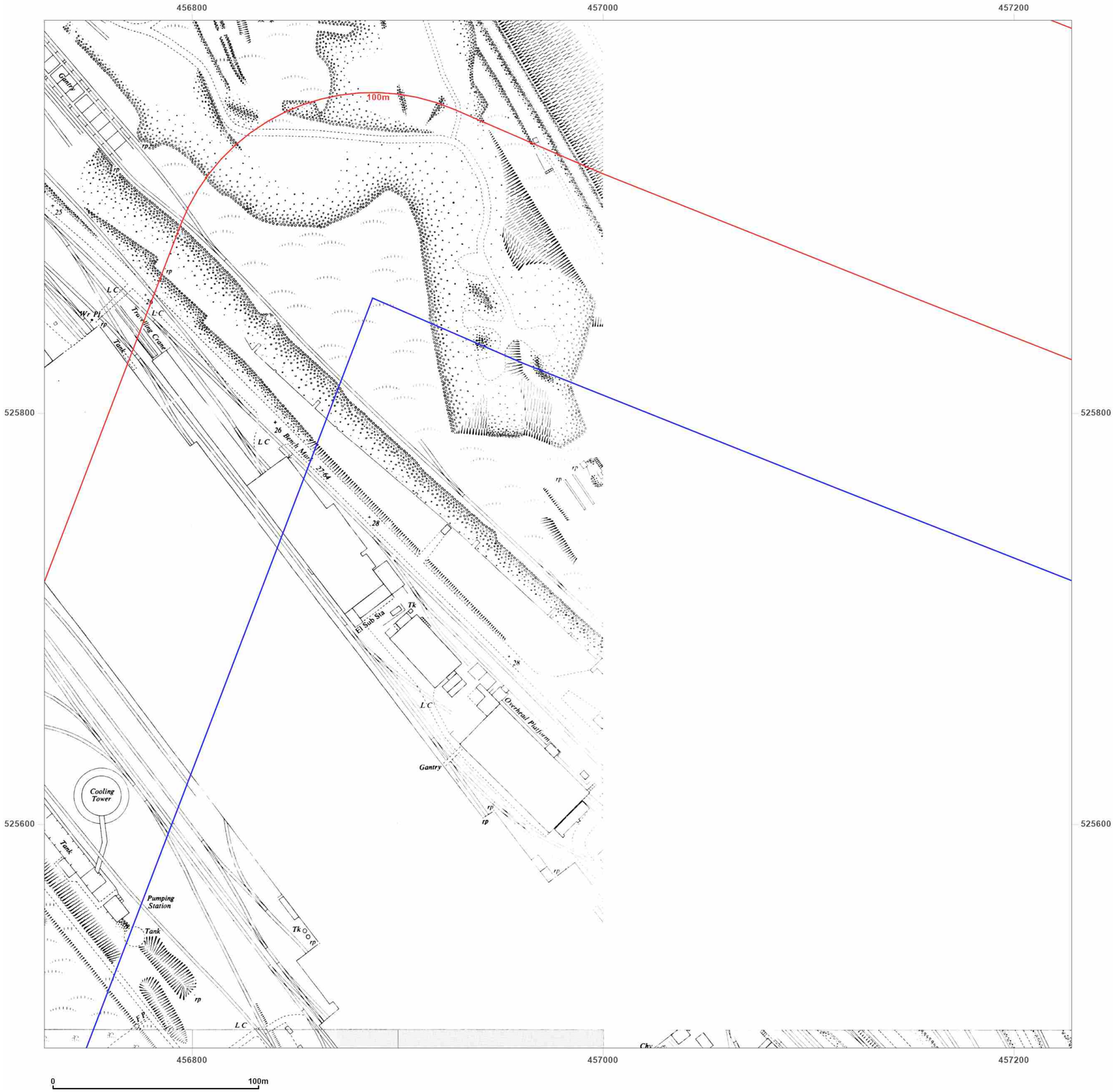

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_3
Grid Ref: 456978, 525741

Map Name: National Grid

Map date: **1953**

Scale: 1:1,250

Printed at: 1:2,000

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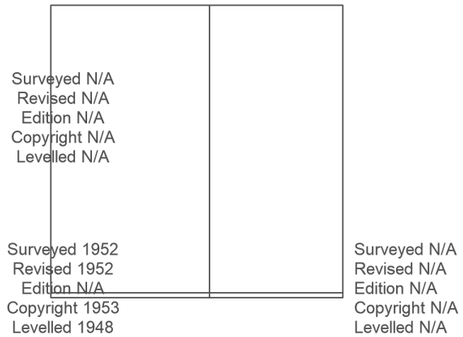

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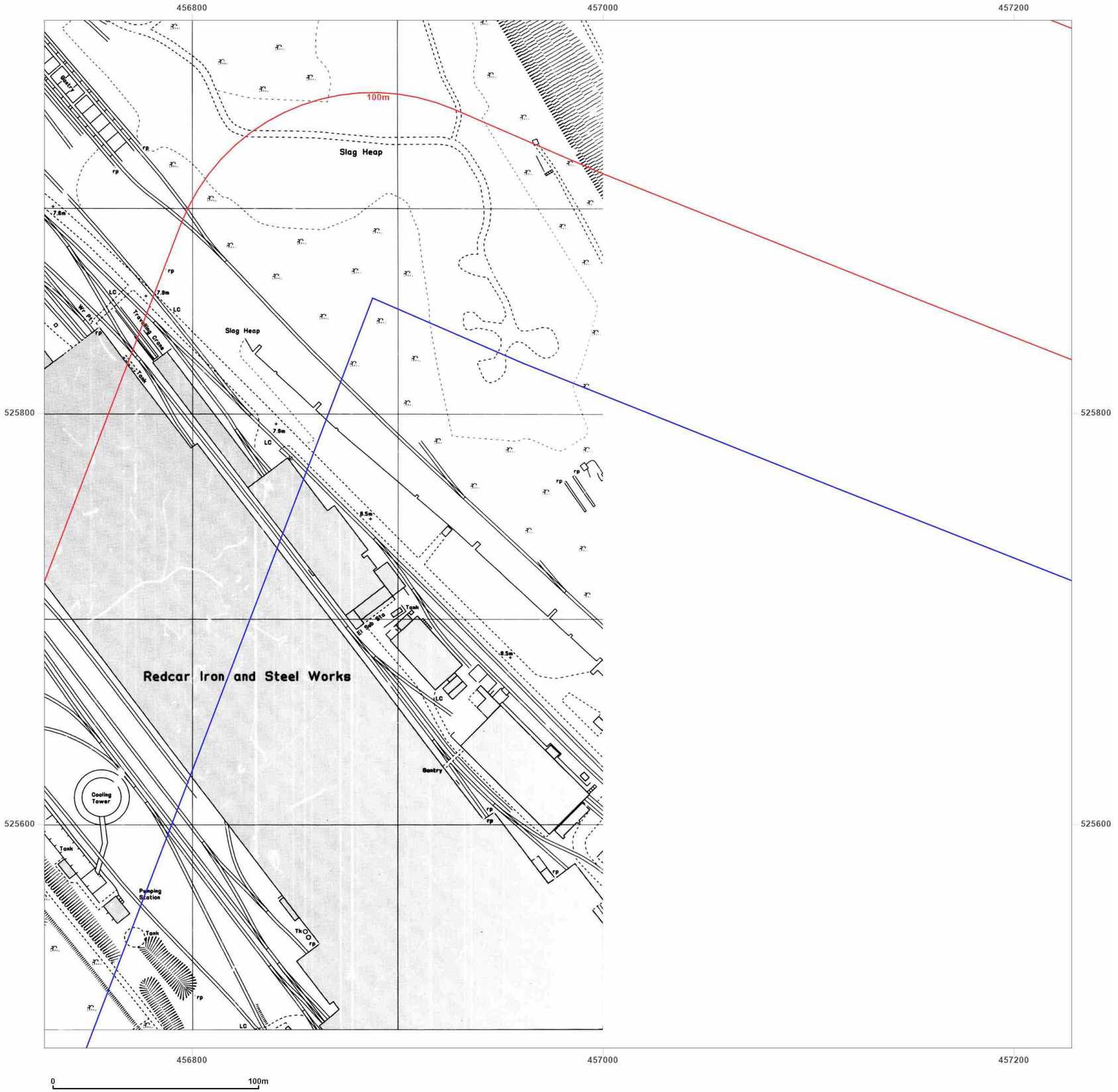

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_3
Grid Ref: 456978, 525741

Map Name: National Grid

Map date: **1953**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A
Revised N/A
Edition N/A
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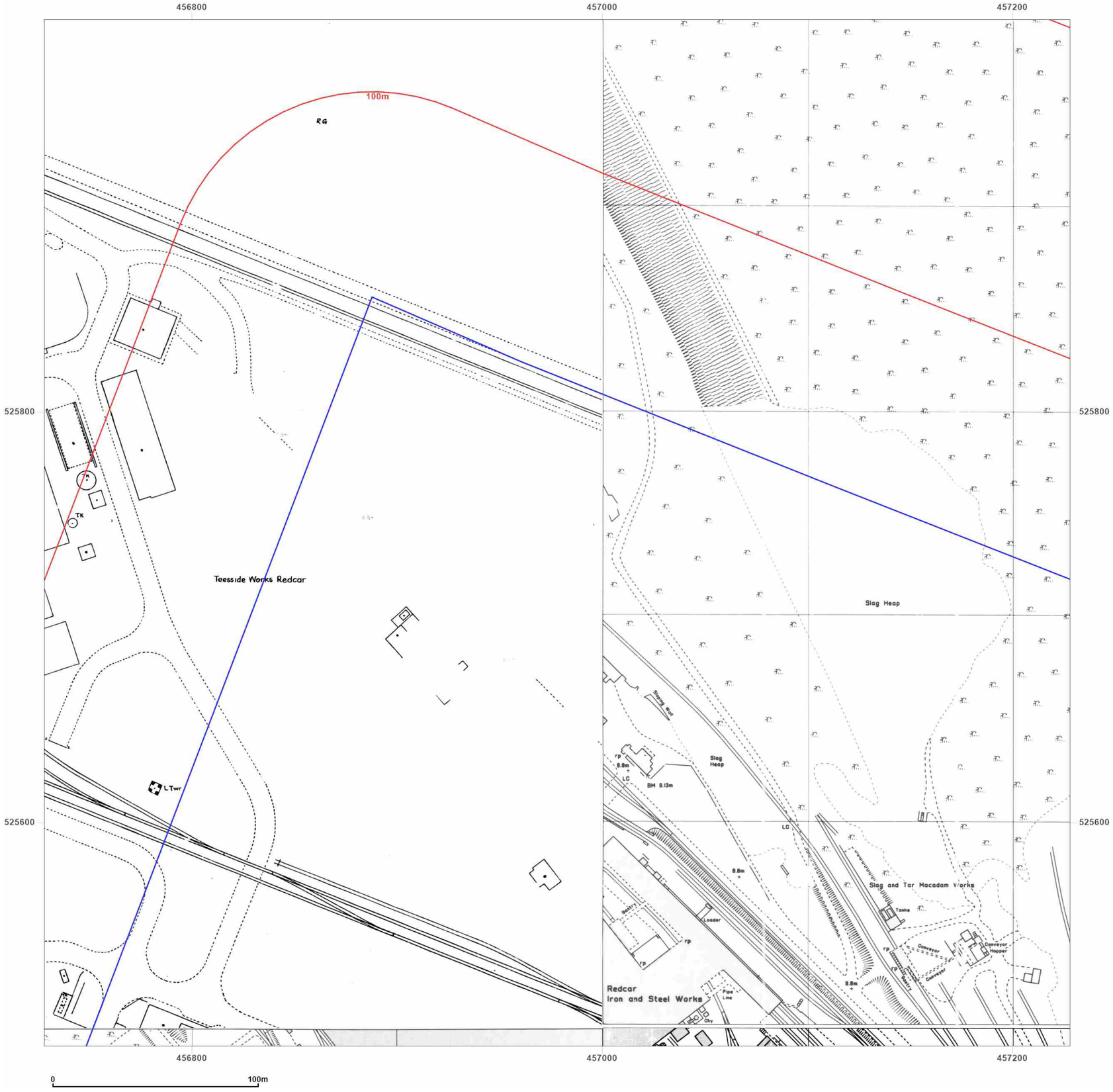

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_3
Grid Ref: 456978, 525741

Map Name: National Grid

Map date: **1977-1981**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A
Revised N/A
Edition N/A
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Levelled N/A

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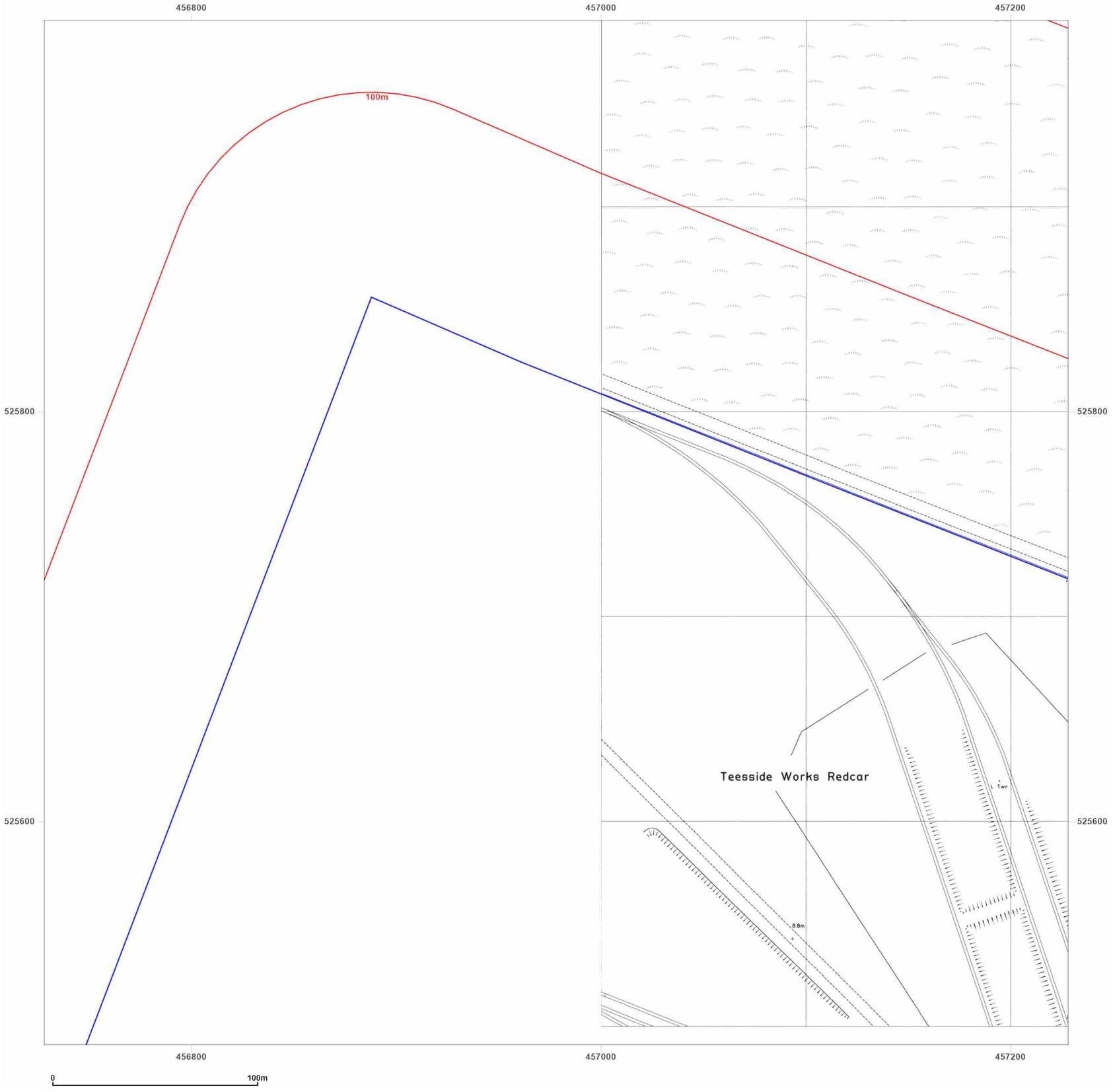

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_3
Grid Ref: 456978, 525741

Map Name: National Grid

Map date: **1982**

Scale: 1:1,250

Printed at: 1:2,000

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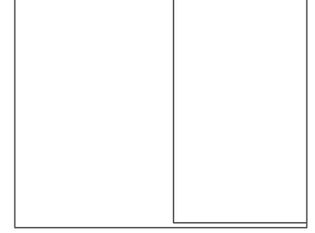

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Revised 1981
Edition N/A
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Levelled 1959

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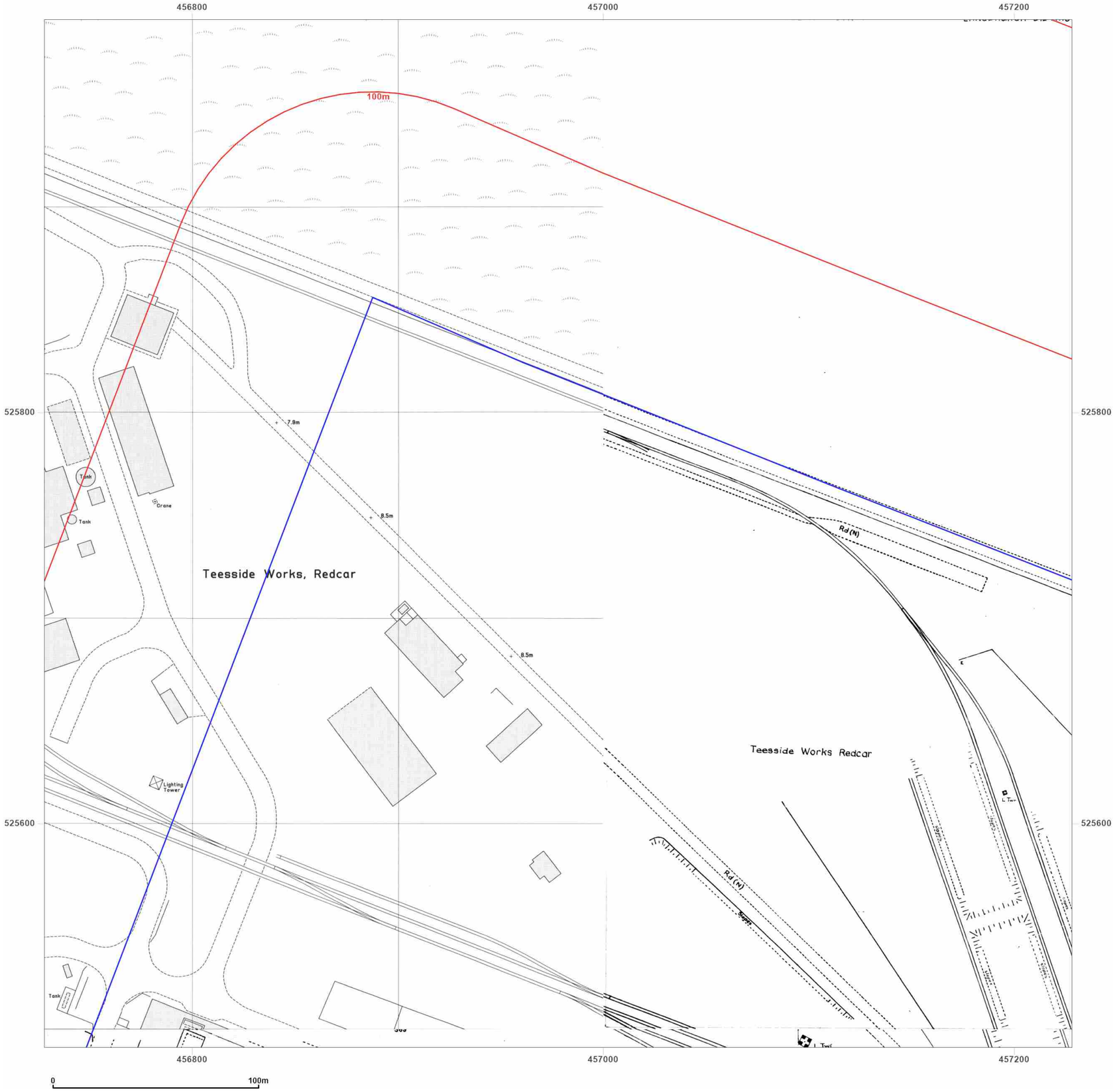

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_3
Grid Ref: 456978, 525741

Map Name: National Grid

Map date: **1981-1983**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1952 Revised 1982 Edition N/A Copyright 1983 Levelled 1959	Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A
Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A	Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A

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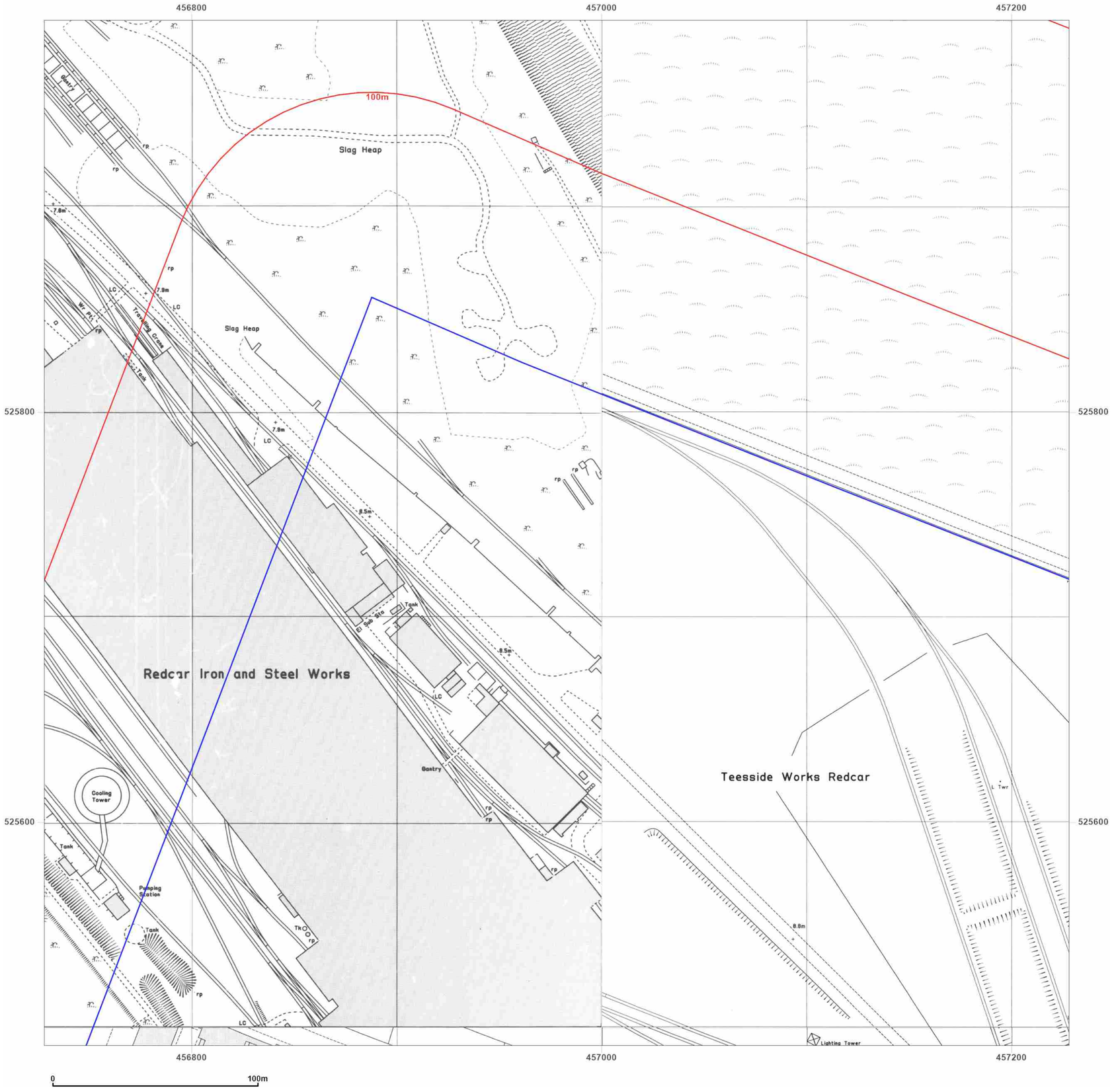

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_3
Grid Ref: 456978, 525741

Map Name: National Grid

Map date: **1977-1983**

Scale: 1:1,250

Printed at: 1:2,000

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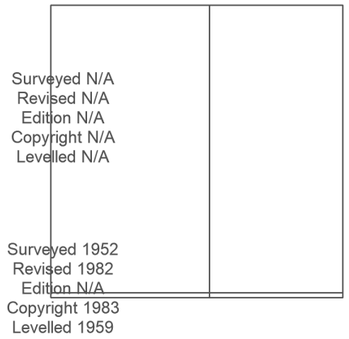

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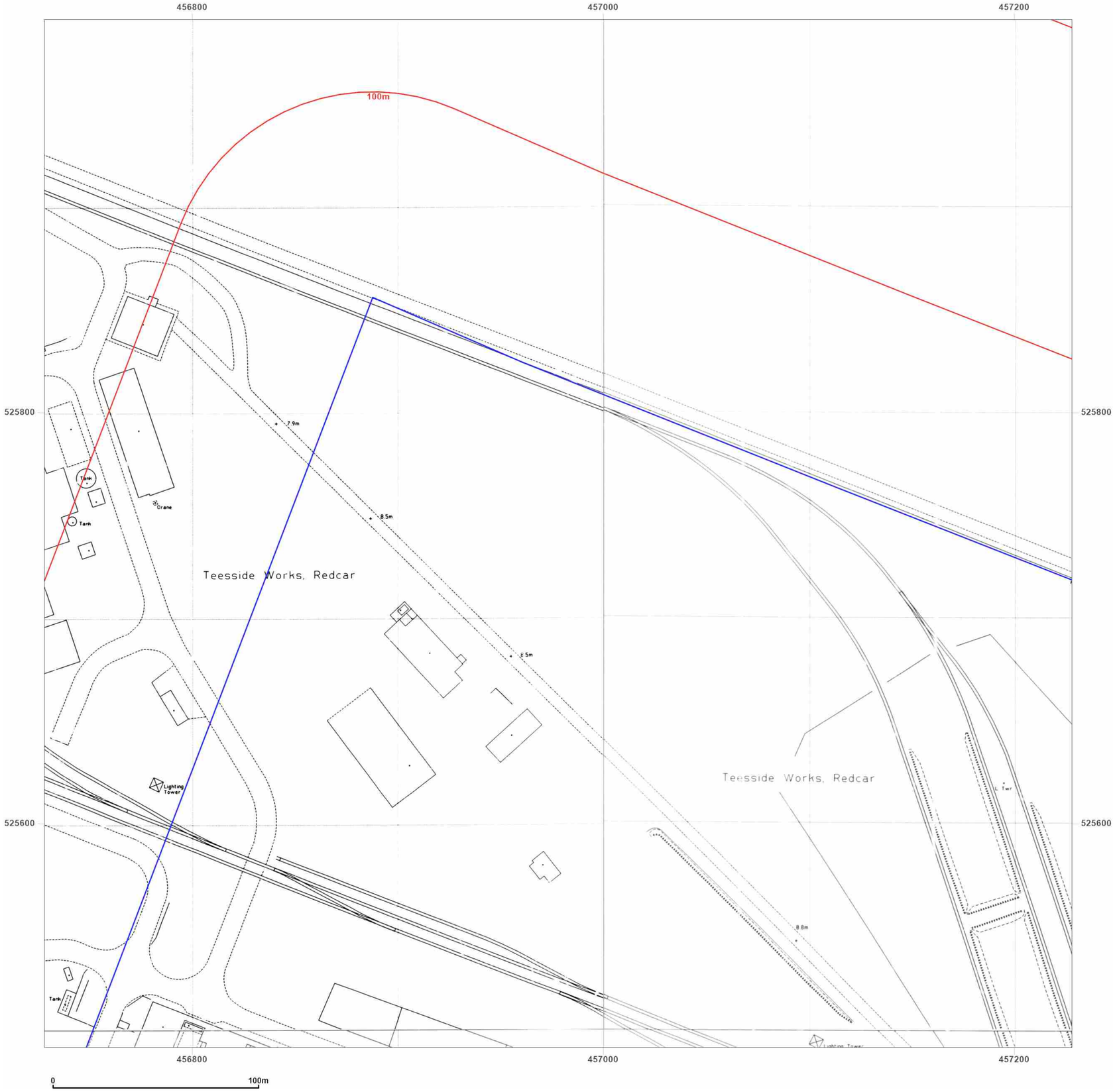

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_2_3
Grid Ref: 456978, 525741

Map Name: National Grid

Map date: **1993**

Scale: 1:1,250

Printed at: 1:2,000

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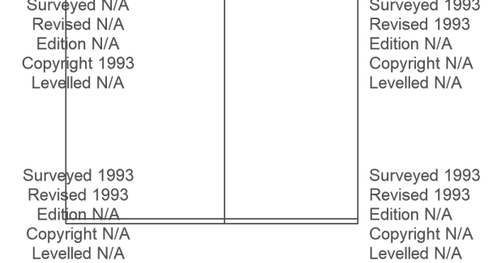

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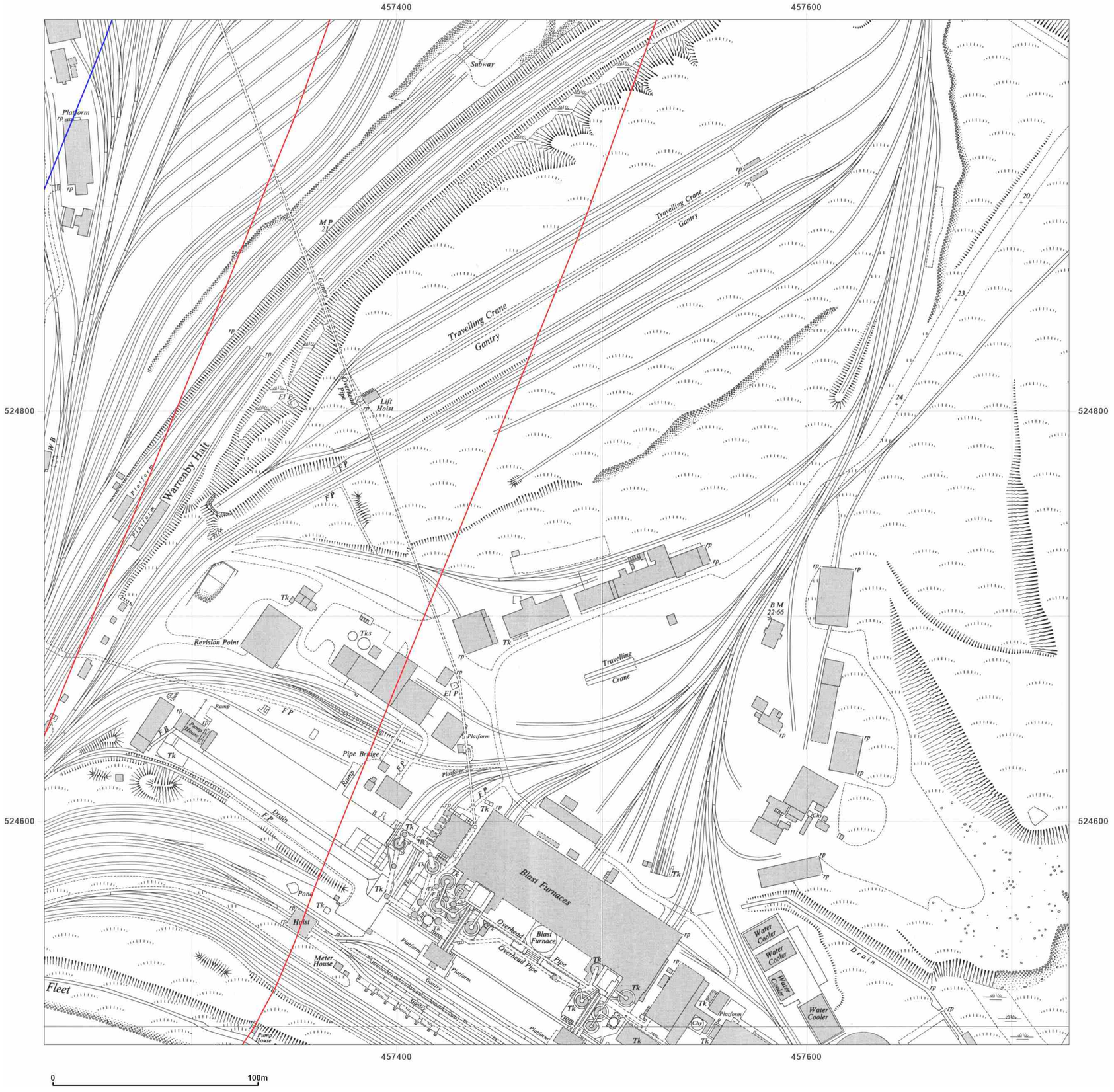

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_1
Grid Ref: 457478, 524741

Map Name: National Grid

Map date: **1952-1953**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1952 Revised 1952 Edition N/A Copyright N/A Levelled 1948	Surveyed 1952 Revised 1952 Edition N/A Copyright N/A Levelled 1948

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Production date: 05 April 2022

Map legend available at:
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Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_1
Grid Ref: 457478, 524741

Map Name: National Grid

Map date: **1954**

Scale: 1:1,250

Printed at: 1:2,000

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

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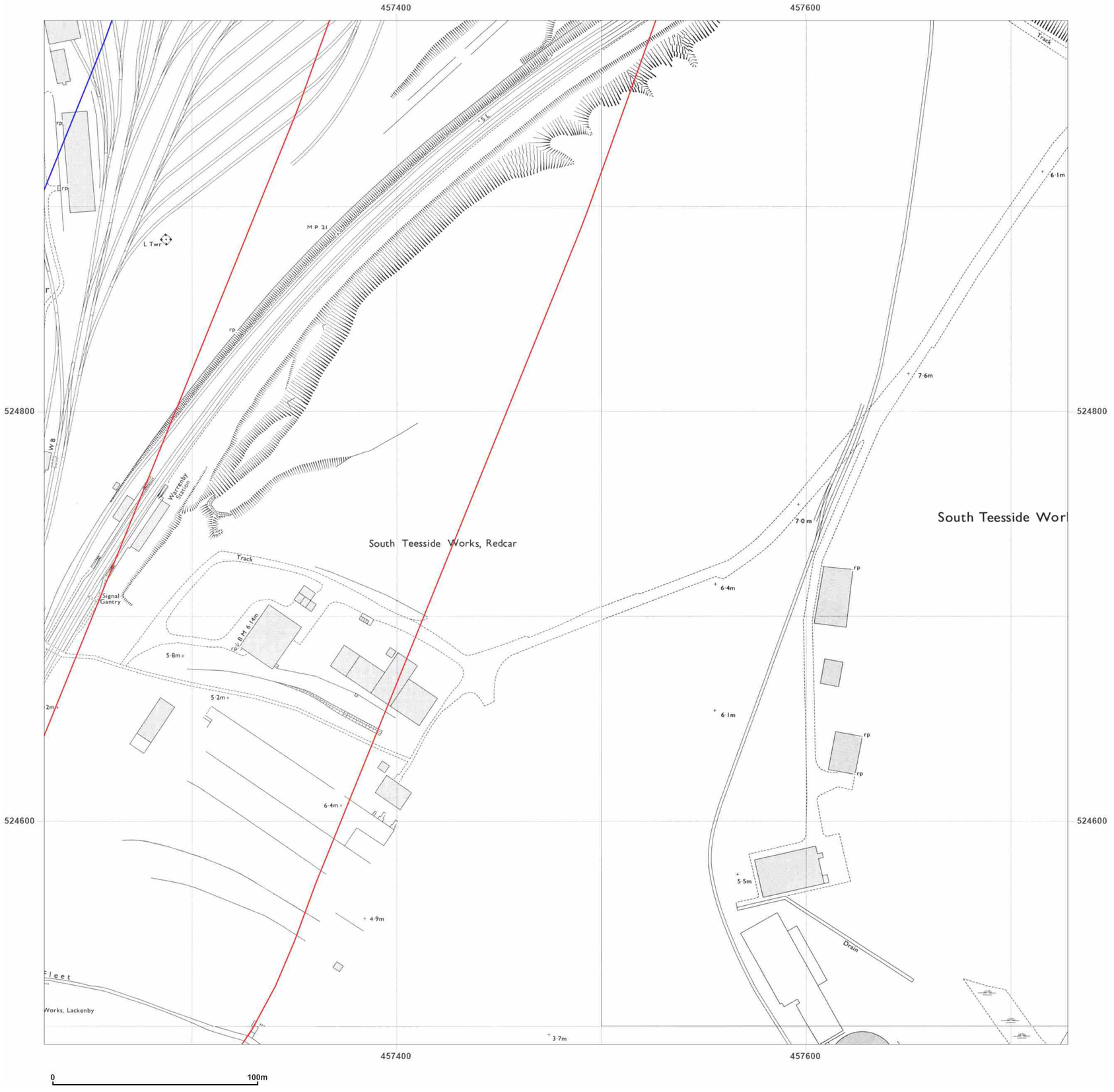

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_1
Grid Ref: 457478, 524741

Map Name: National Grid

Map date: **1973**

Scale: 1:1,250

Printed at: 1:2,000

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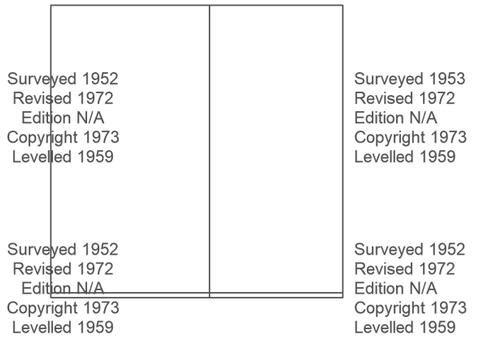

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Production date: 05 April 2022

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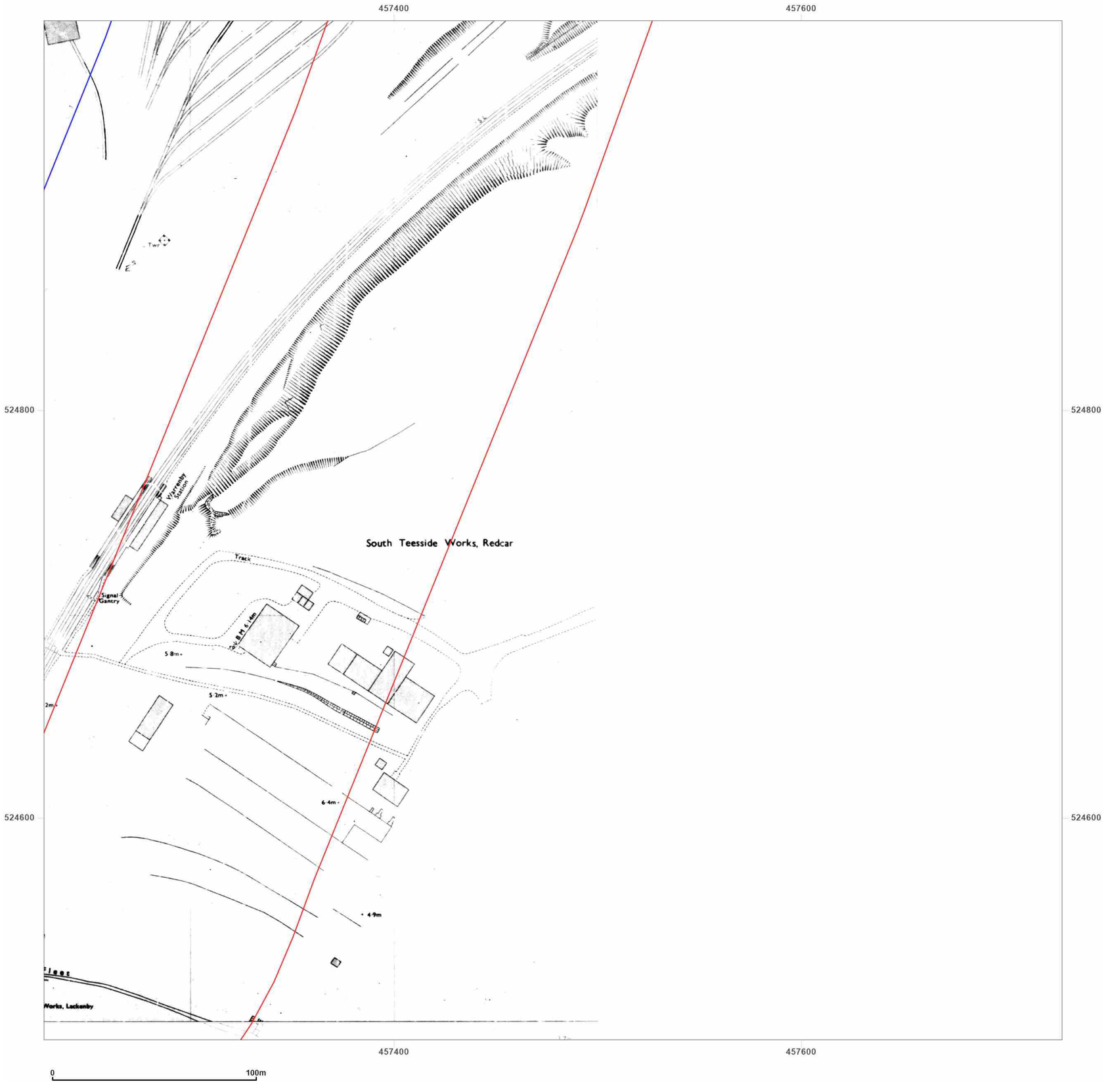

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_1
Grid Ref: 457478, 524741

Map Name: National Grid

Map date: **1974**

Scale: 1:1,250

Printed at: 1:2,000

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Edition N/A
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Levelled N/A

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Revised N/A
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Levelled N/A

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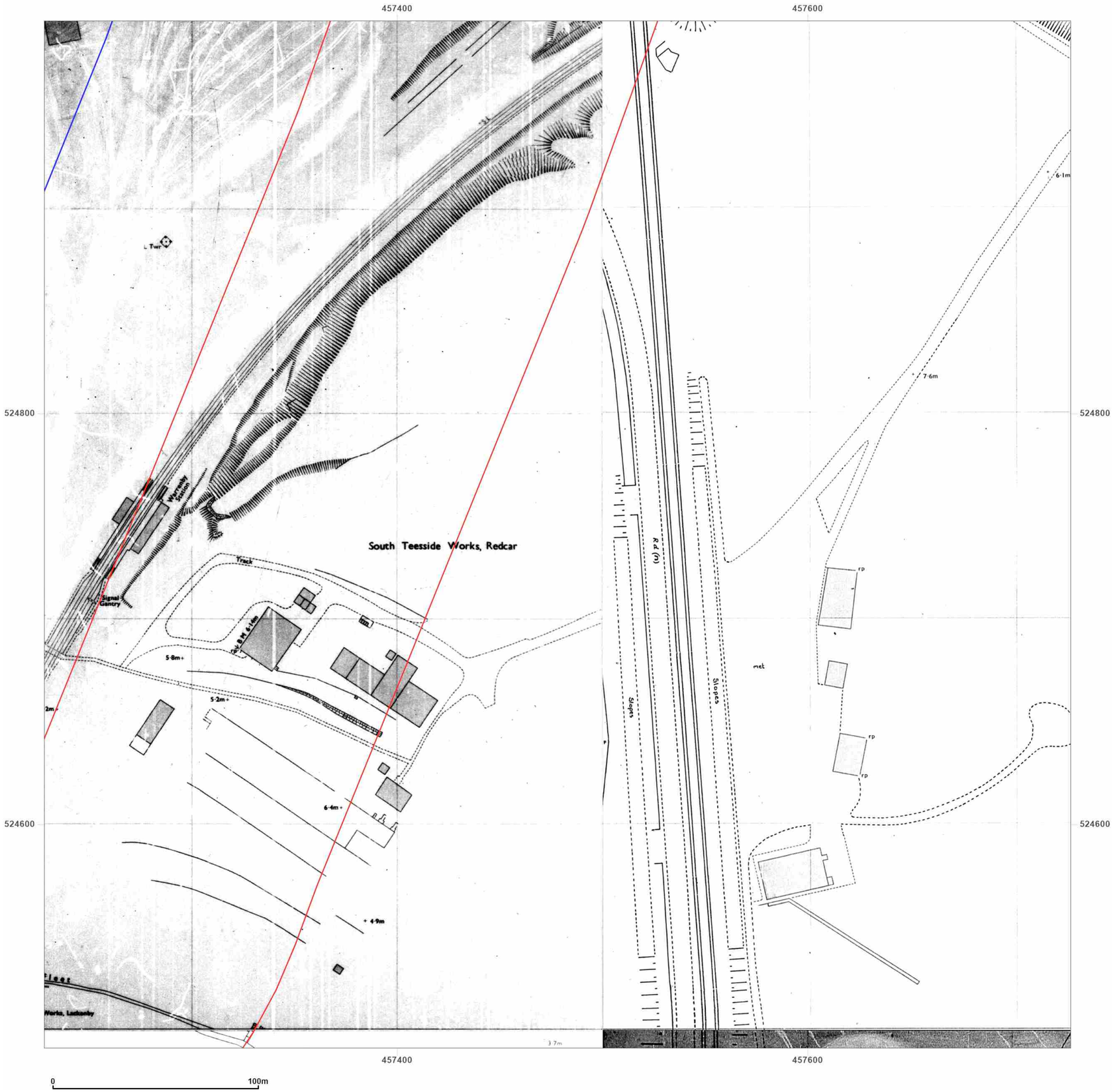

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_1
Grid Ref: 457478, 524741

Map Name: National Grid

Map date: **1976-1980**

Scale: 1:1,250

Printed at: 1:2,000

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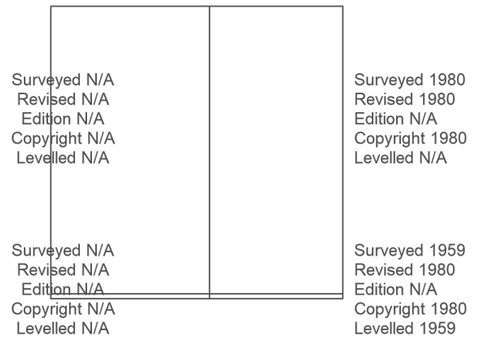

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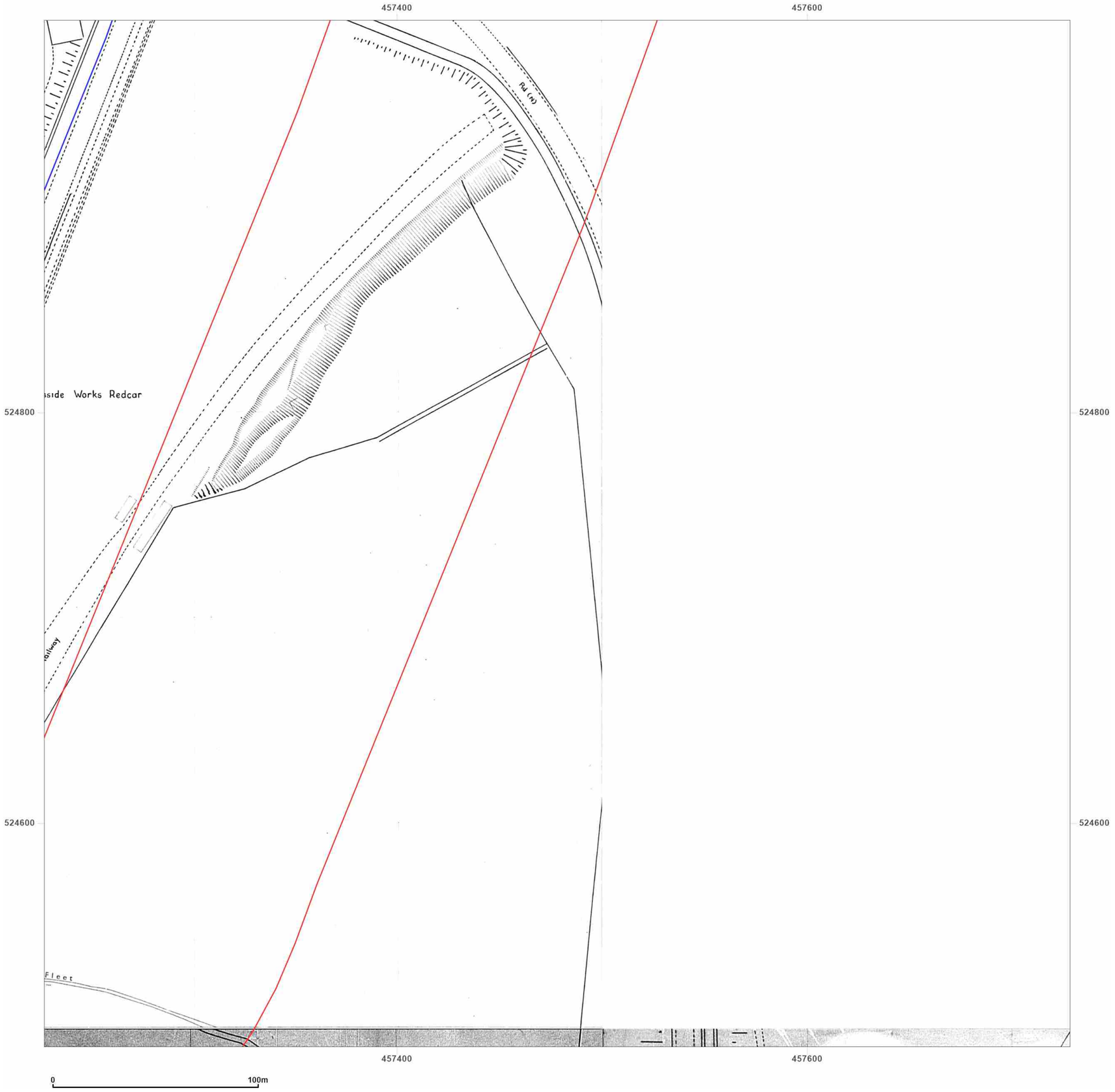

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_1
Grid Ref: 457478, 524741

Map Name: National Grid

Map date: **1980**

Scale: 1:1,250

Printed at: 1:2,000

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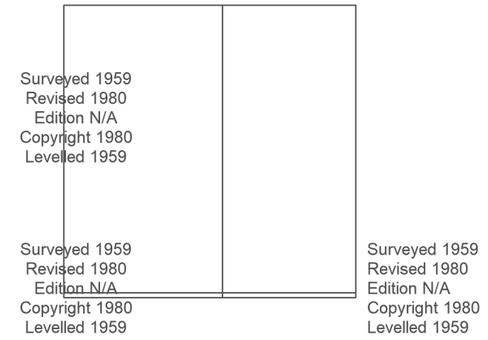

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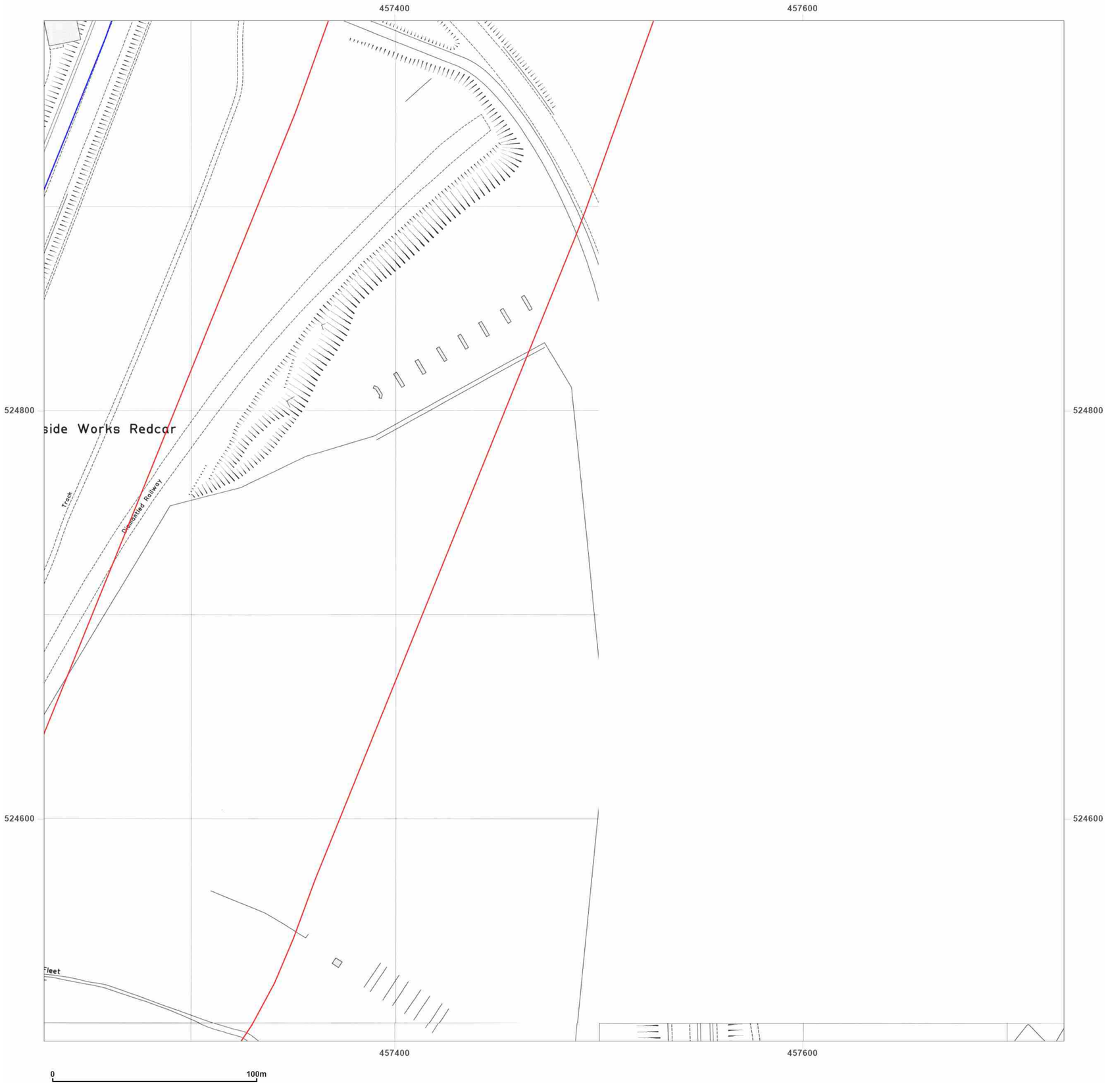

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_1
Grid Ref: 457478, 524741

Map Name: National Grid

Map date: **1986**

Scale: 1:1,250

Printed at: 1:2,000

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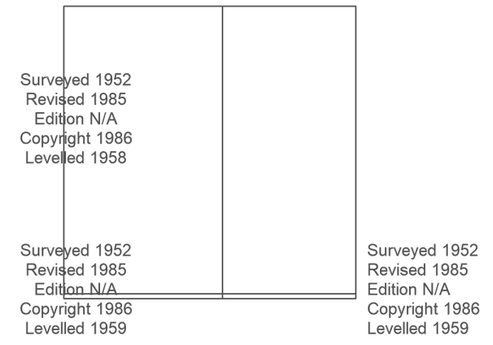

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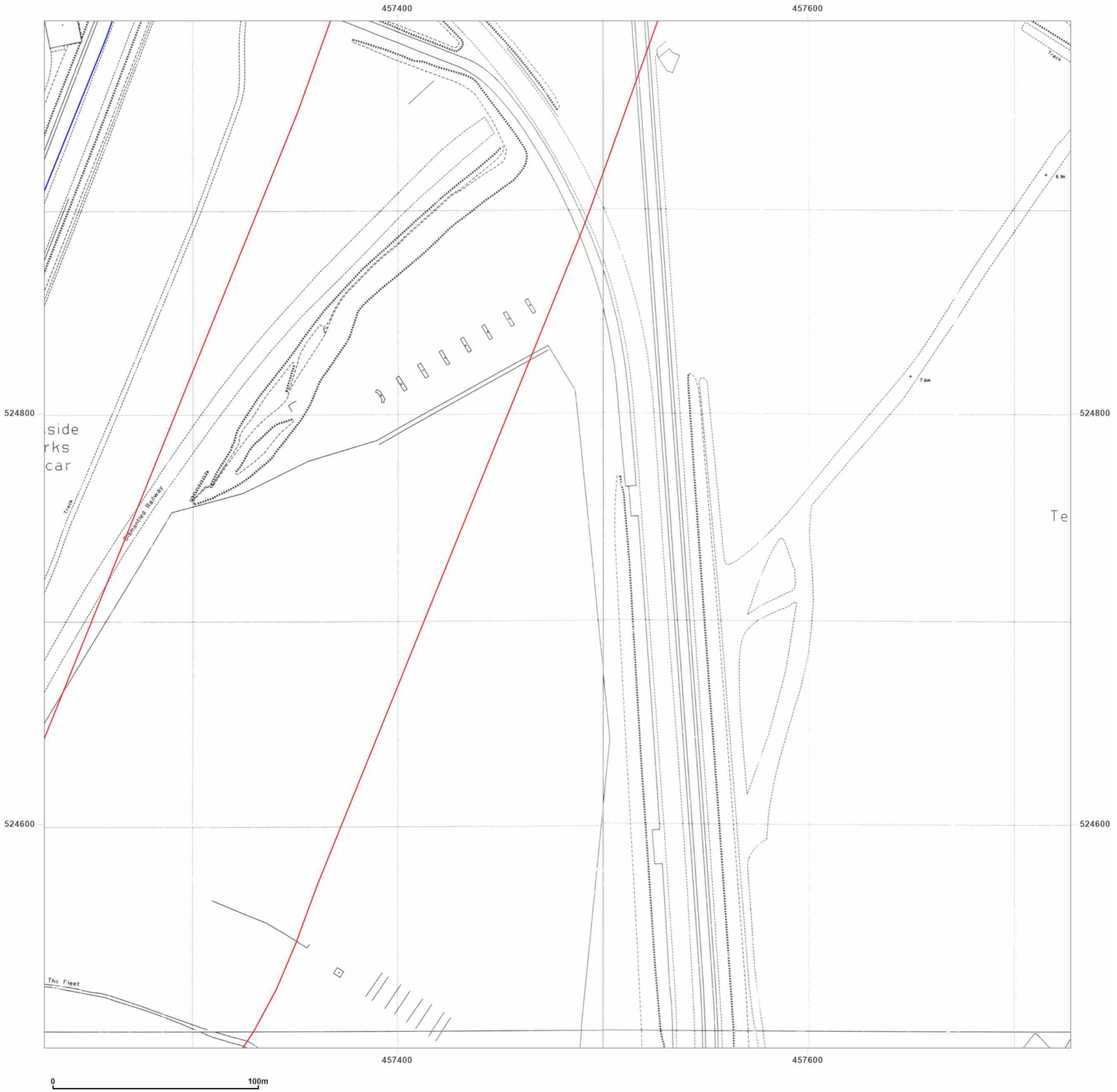

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_1
Grid Ref: 457478, 524741

Map Name: National Grid

Map date: **1993**

Scale: 1:1,250

Printed at: 1:2,000

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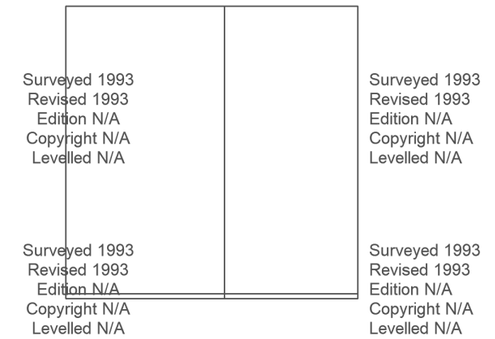

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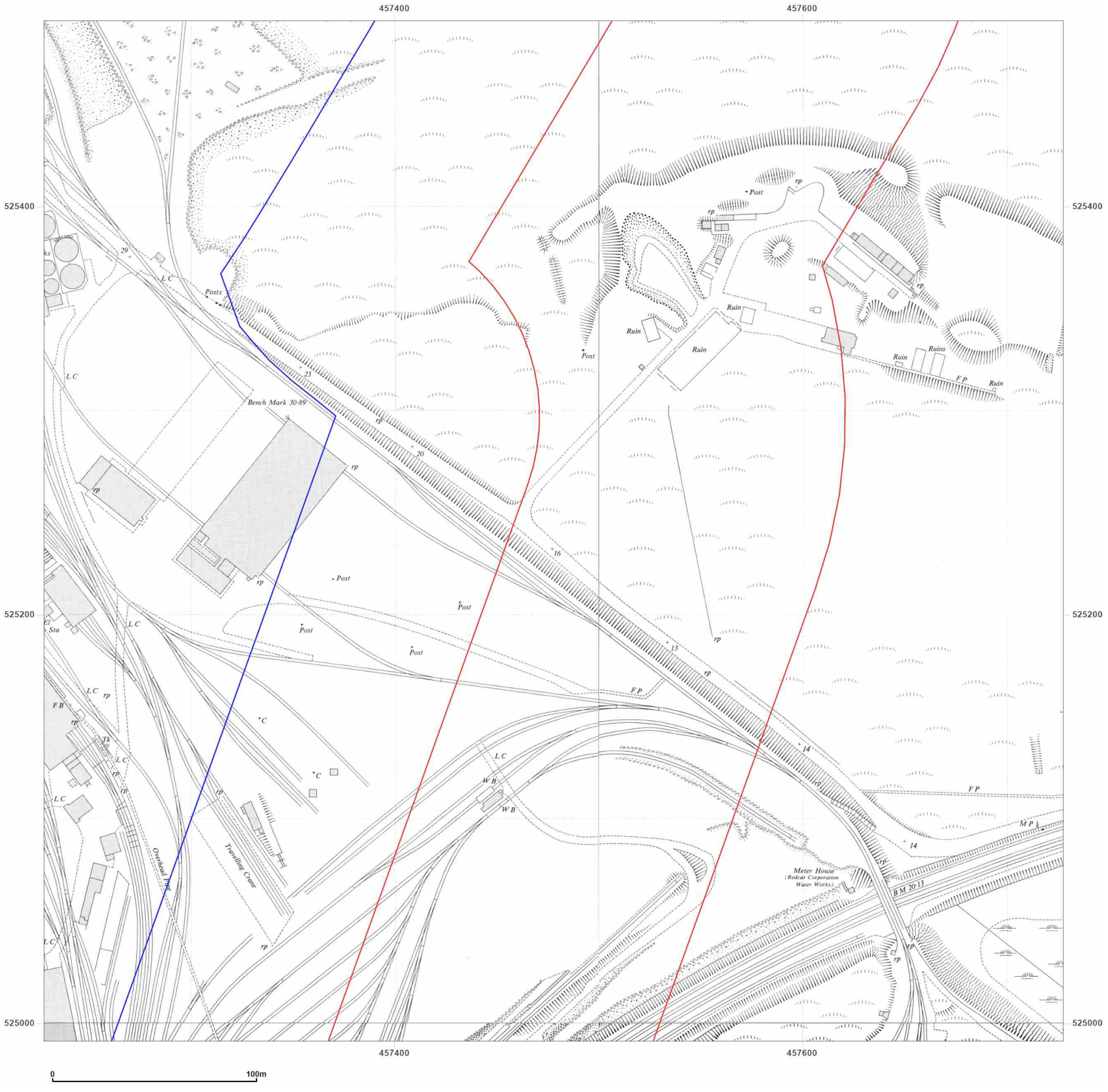

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_2
Grid Ref: 457478, 525241

Map Name: National Grid

Map date: **1952-1953**

Scale: 1:1,250

Printed at: 1:2,000

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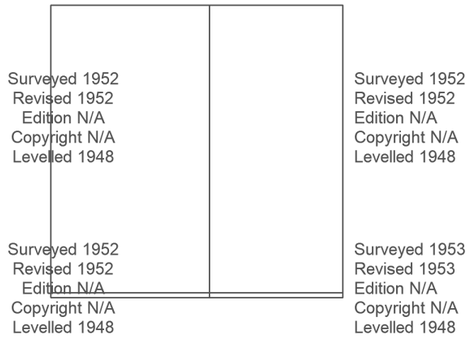

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Production date: 05 April 2022

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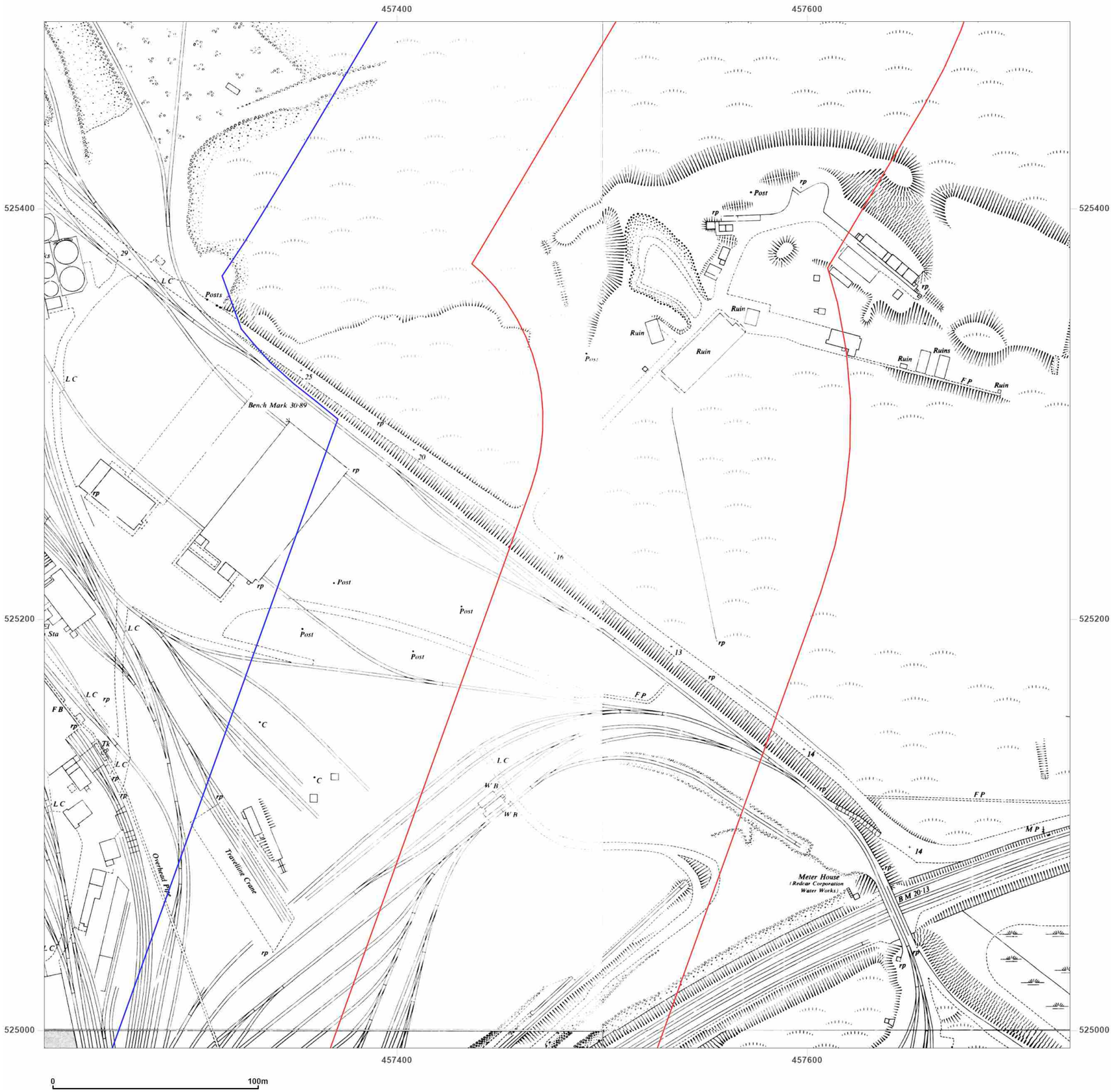

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_2
Grid Ref: 457478, 525241

Map Name: National Grid

Map date: **1953-1954**

Scale: 1:1,250

Printed at: 1:2,000

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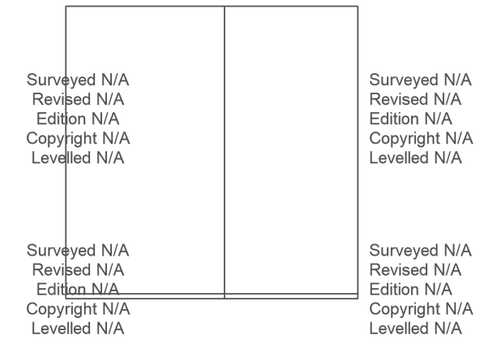

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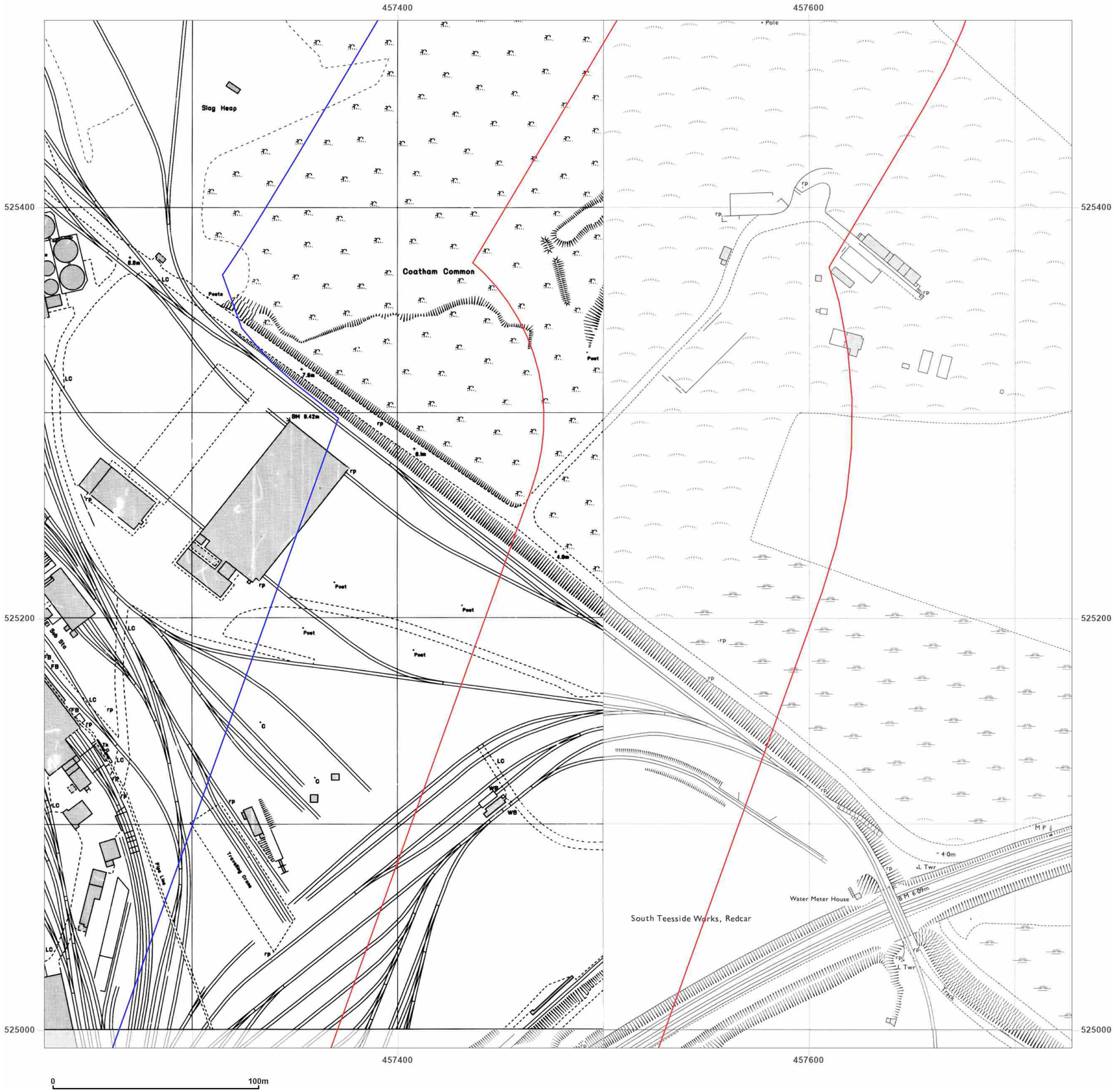

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_2
Grid Ref: 457478, 525241

Map Name: National Grid

Map date: **1973-1978**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A	Surveyed 1952 Revised 1973 Edition N/A Copyright 1973 Levelled 1959
Surveyed 1952 Revised 1972 Edition N/A Copyright 1973 Levelled 1959	Surveyed 1953 Revised 1972 Edition N/A Copyright 1973 Levelled 1959

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Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_2
Grid Ref: 457478, 525241

Map Name: National Grid

Map date: **1976-1981**

Scale: 1:1,250

Printed at: 1:2,000

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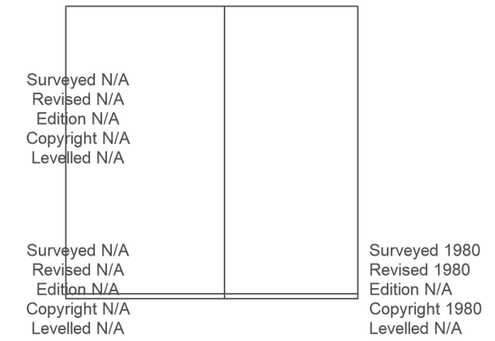

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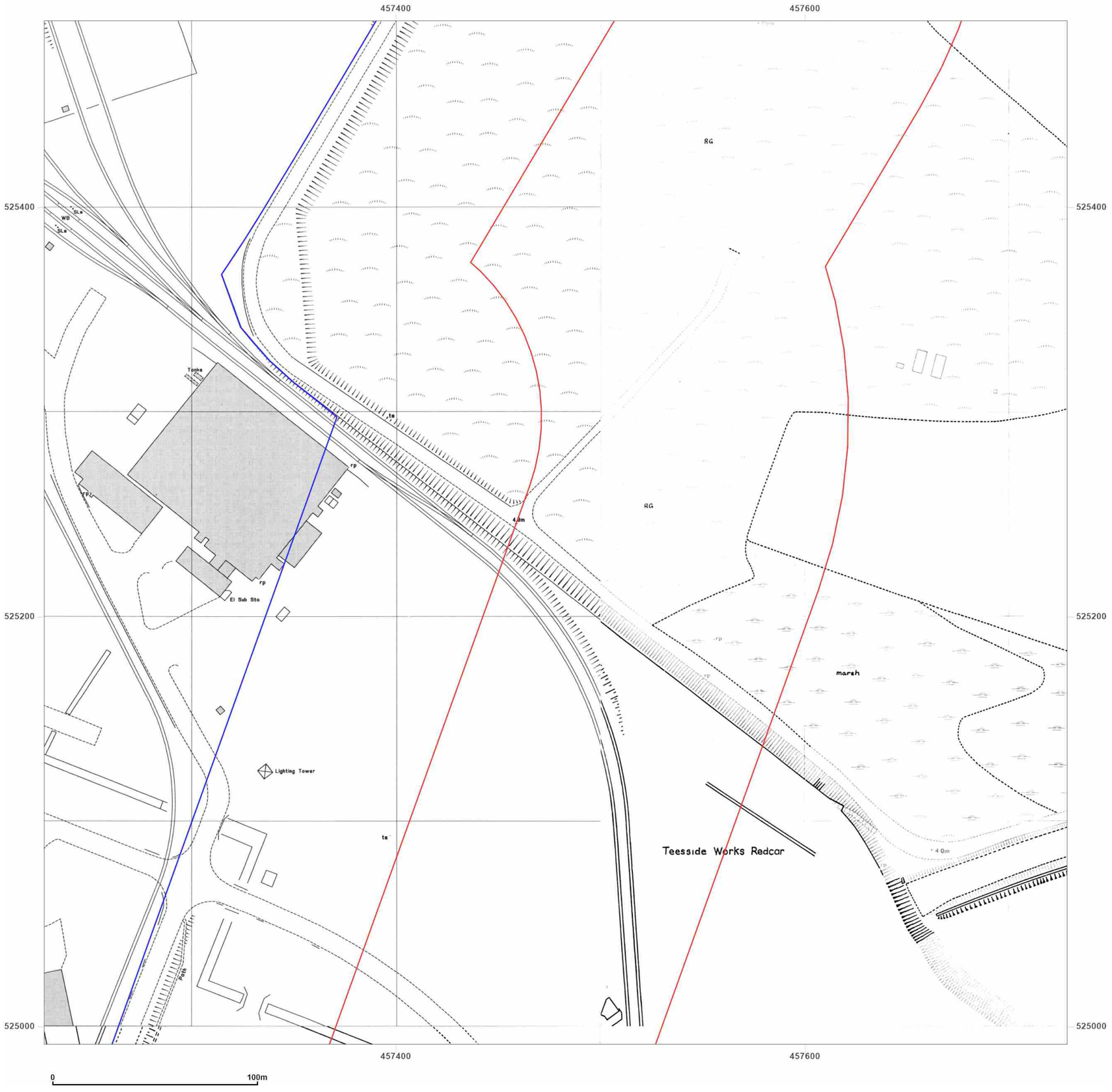

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_2
Grid Ref: 457478, 525241

Map Name: National Grid

Map date: **1980-1983**

Scale: 1:1,250

Printed at: 1:2,000

N
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Surveyed 1952
Revised 1981
Edition N/A
Copyright 1983
Levelled 1959

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1983
Levelled 1959

Surveyed 1959
Revised 1980
Edition N/A
Copyright 1980
Levelled 1959

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Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_2
Grid Ref: 457478, 525241

Map Name: National Grid

Map date: **1993**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1993
Revised 1993
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1993
Revised 1993
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1993
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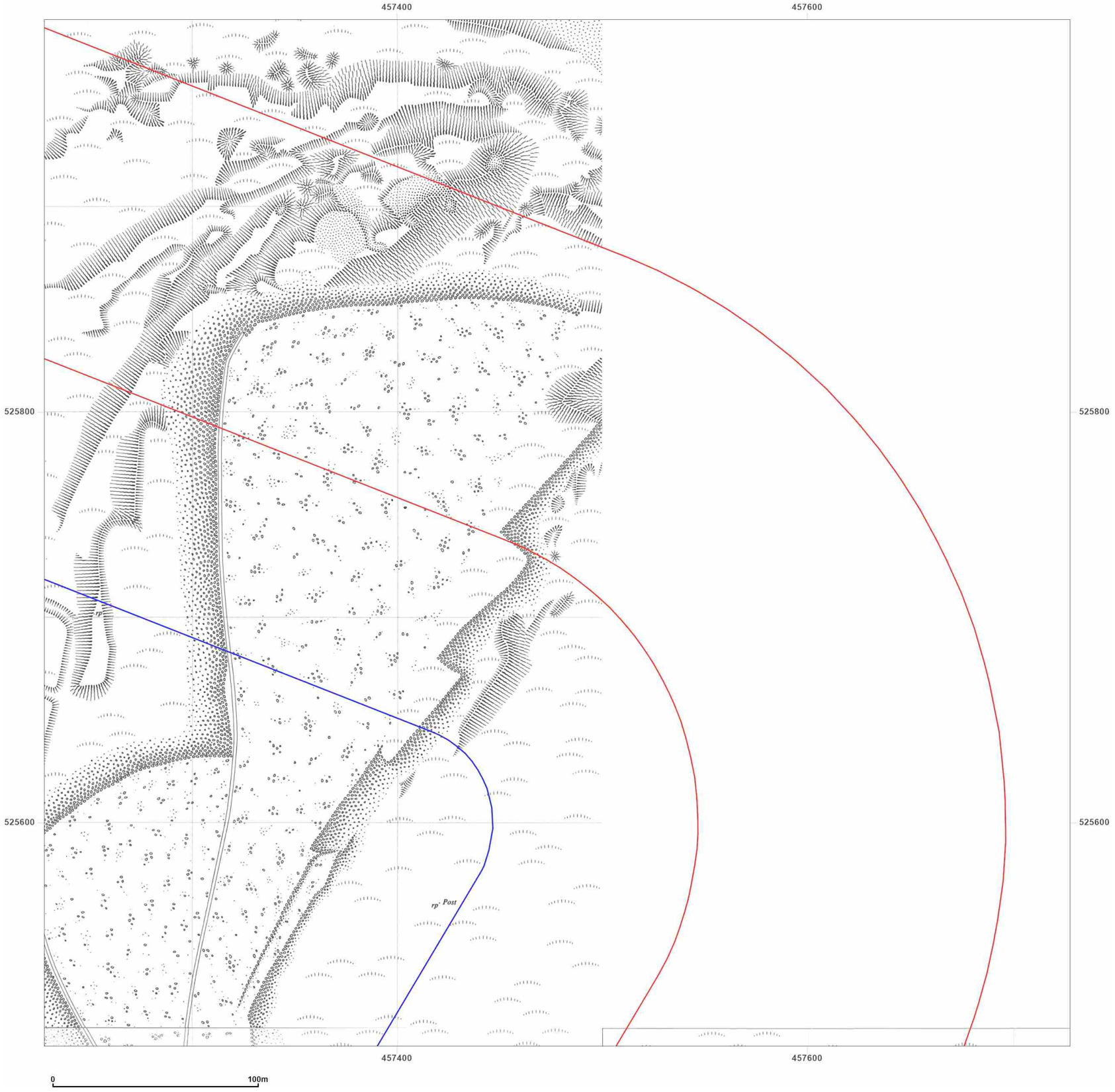

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_3
Grid Ref: 457478, 525741

Map Name: National Grid

Map date: **1952**

Scale: 1:1,250

Printed at: 1:2,000

N
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Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1948

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1948

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1948

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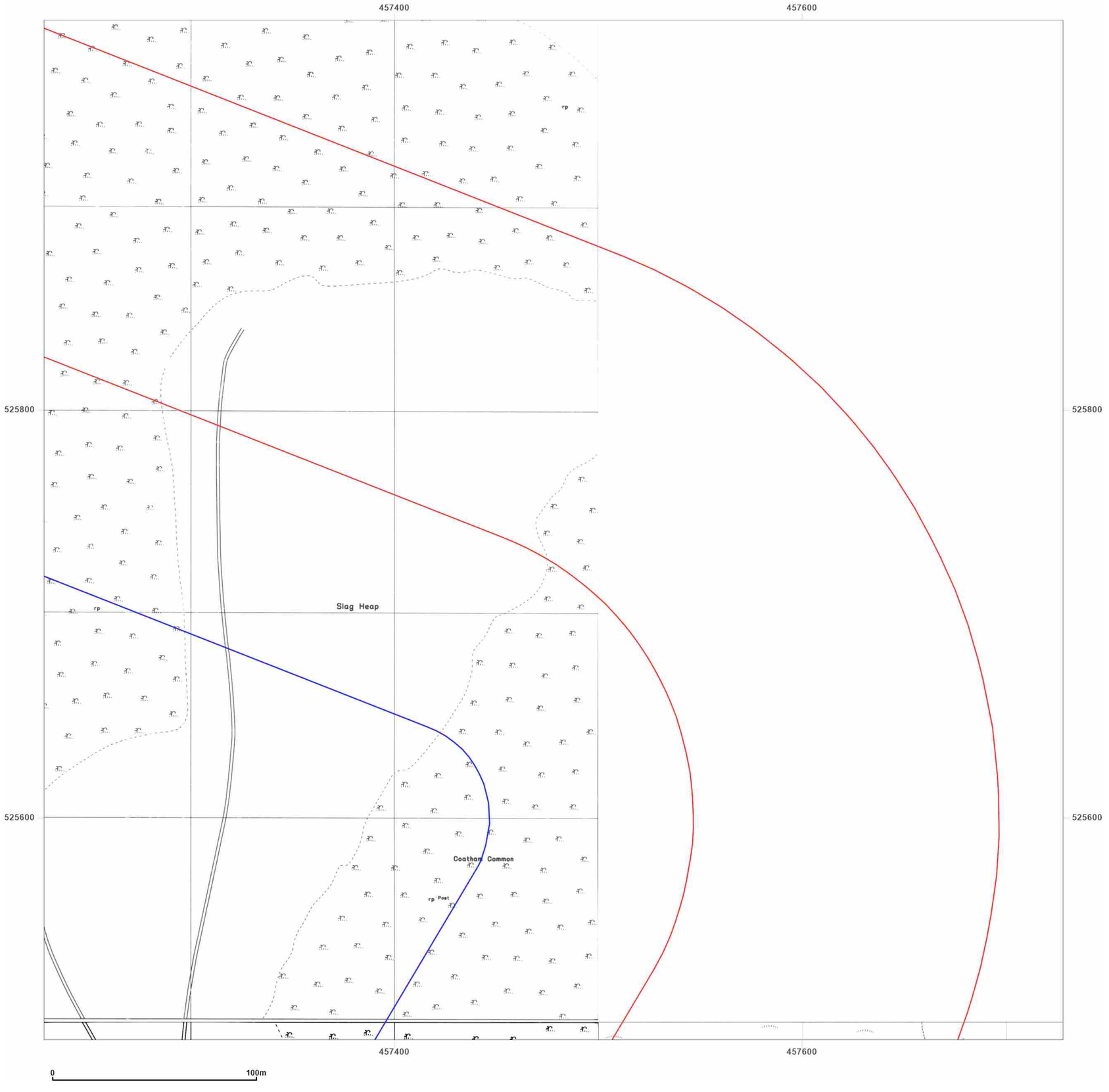

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_3
Grid Ref: 457478, 525741

Map Name: National Grid

Map date: **1973-1978**

Scale: 1:1,250

Printed at: 1:2,000

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

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

Surveyed 1952
Revised 1973
Edition N/A
Copyright 1973
Levelled 1959

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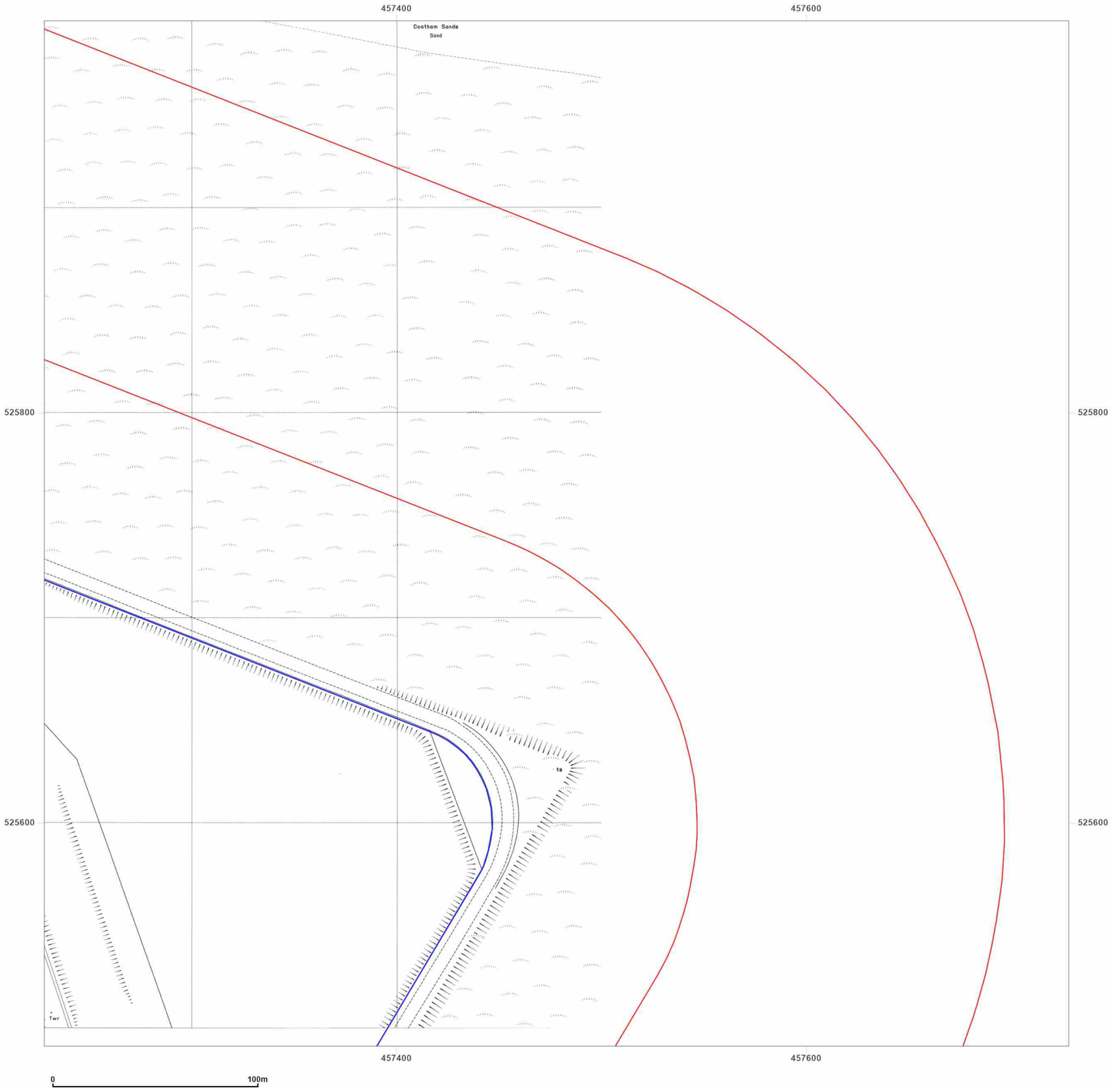

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_3
Grid Ref: 457478, 525741

Map Name: National Grid

Map date: **1982**

Scale: 1:1,250

Printed at: 1:2,000

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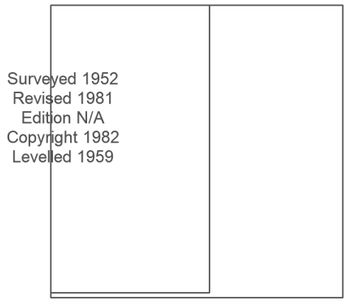

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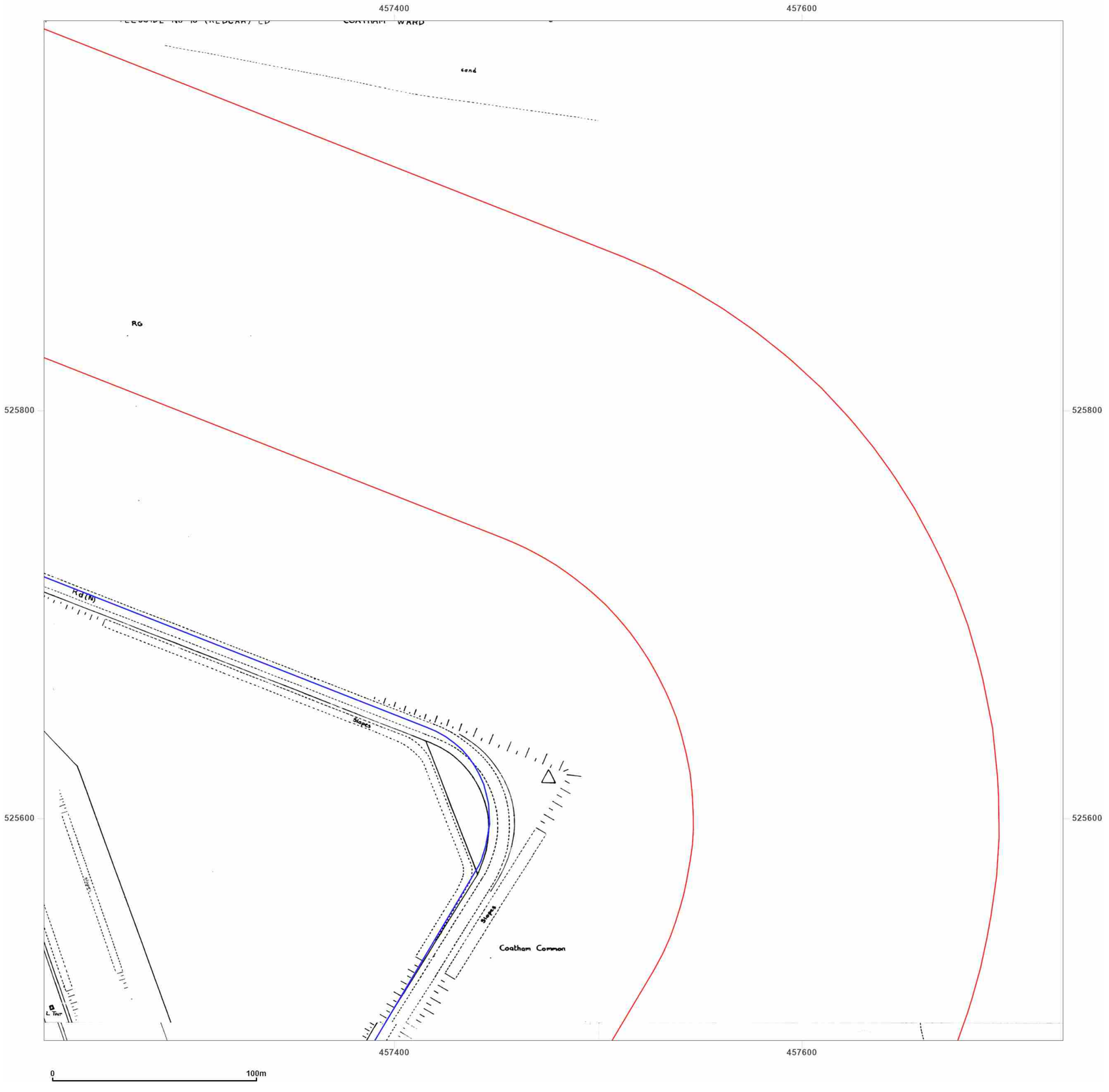

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_3
Grid Ref: 457478, 525741

Map Name: National Grid

Map date: **1981-1983**

Scale: 1:1,250

Printed at: 1:2,000

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

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

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1983
Levelled 1959

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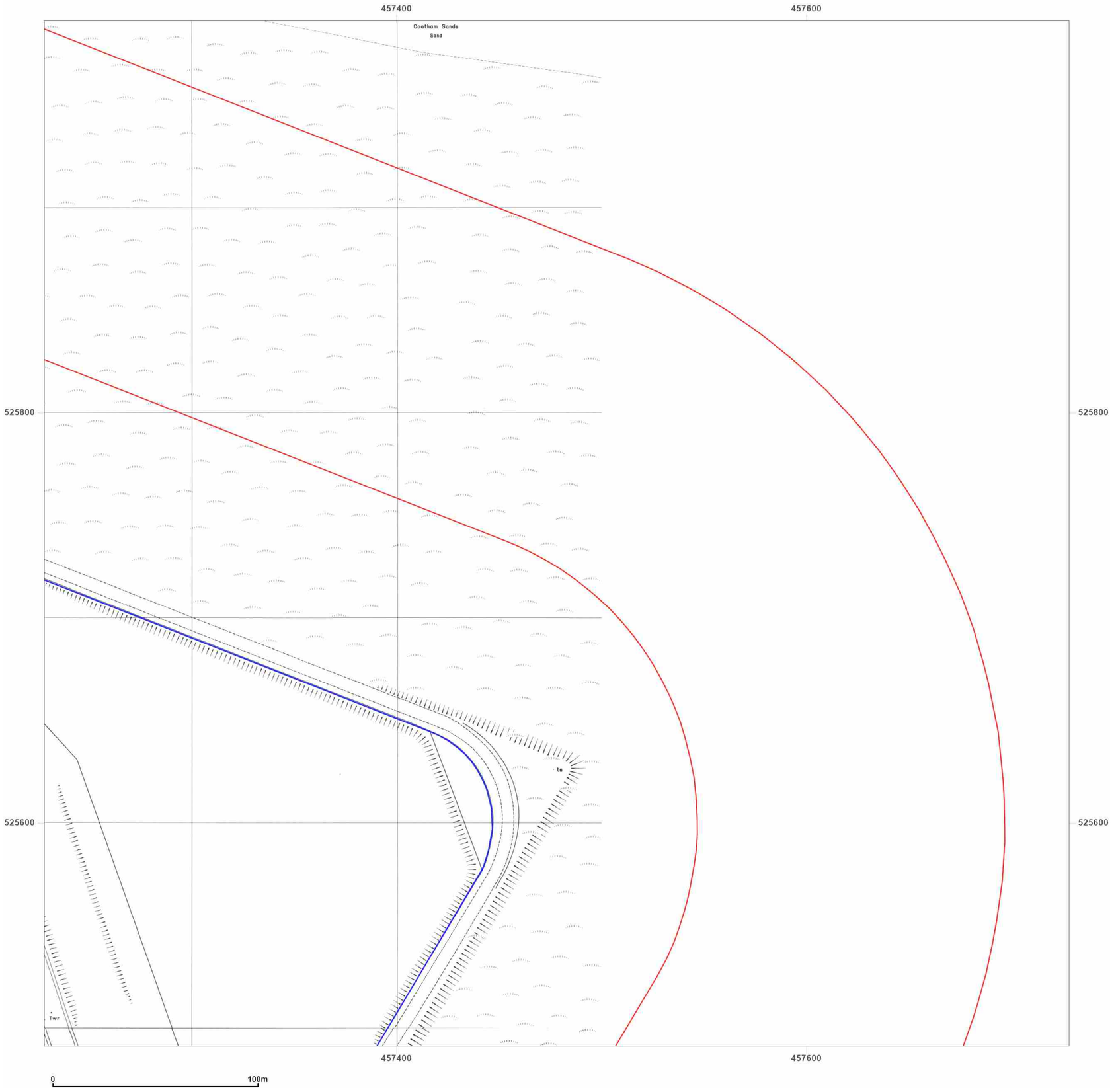

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_3
Grid Ref: 457478, 525741

Map Name: National Grid

Map date: **1982-1983**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1952
Revised 1981
Edition N/A
Copyright 1982
Levelled 1959

Surveyed 1952
Revised 1981
Edition N/A
Copyright 1983
Levelled 1959

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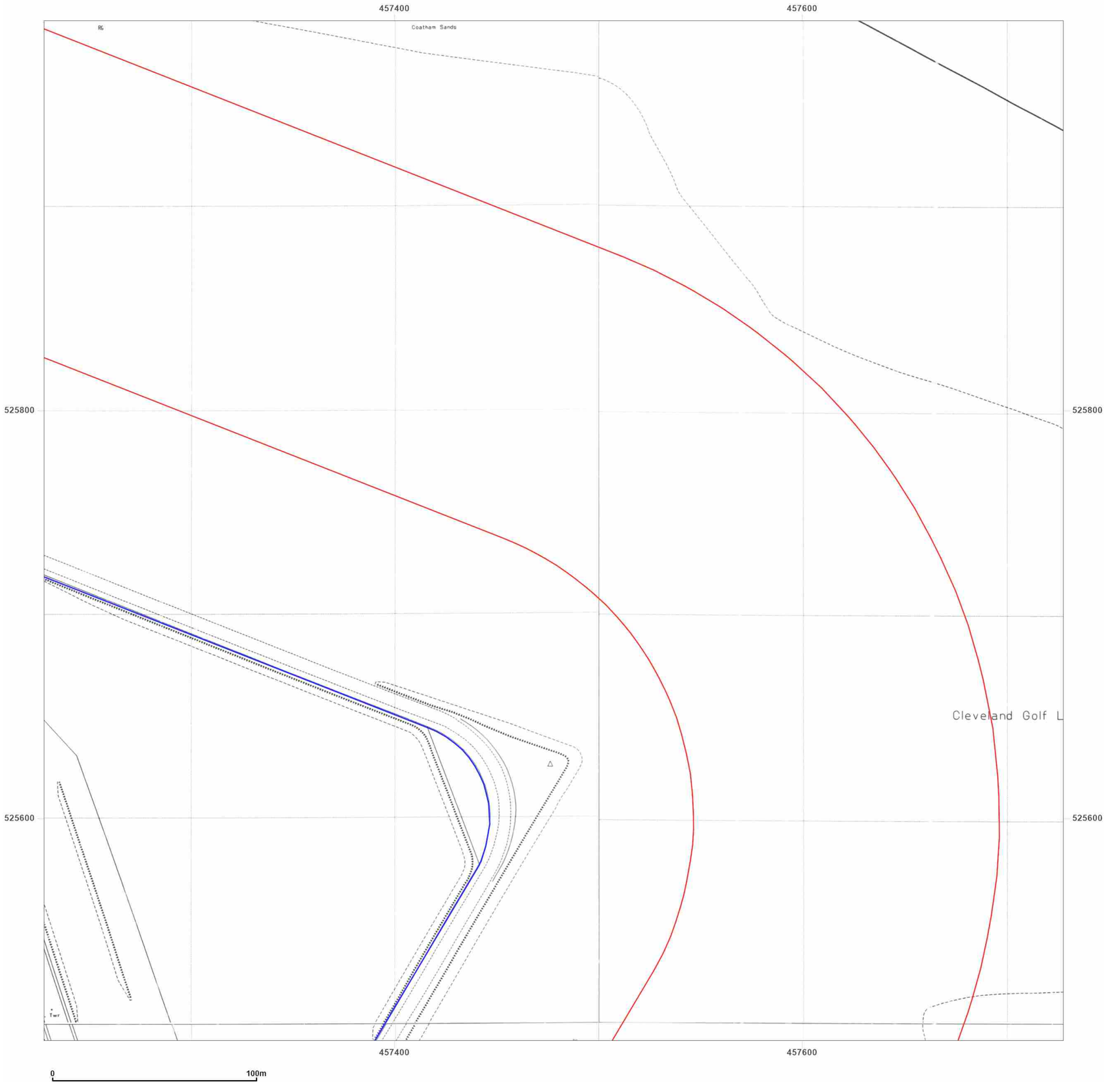

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_1250_3_3
Grid Ref: 457478, 525741

Map Name: National Grid

Map date: **1993**

Scale: 1:1,250

Printed at: 1:2,000

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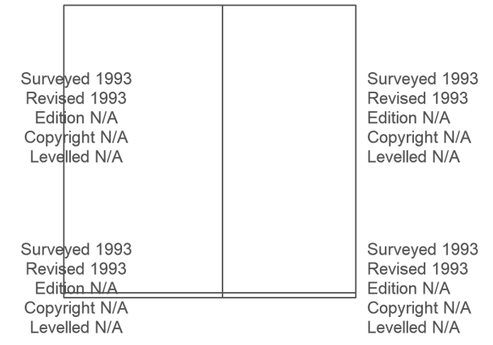

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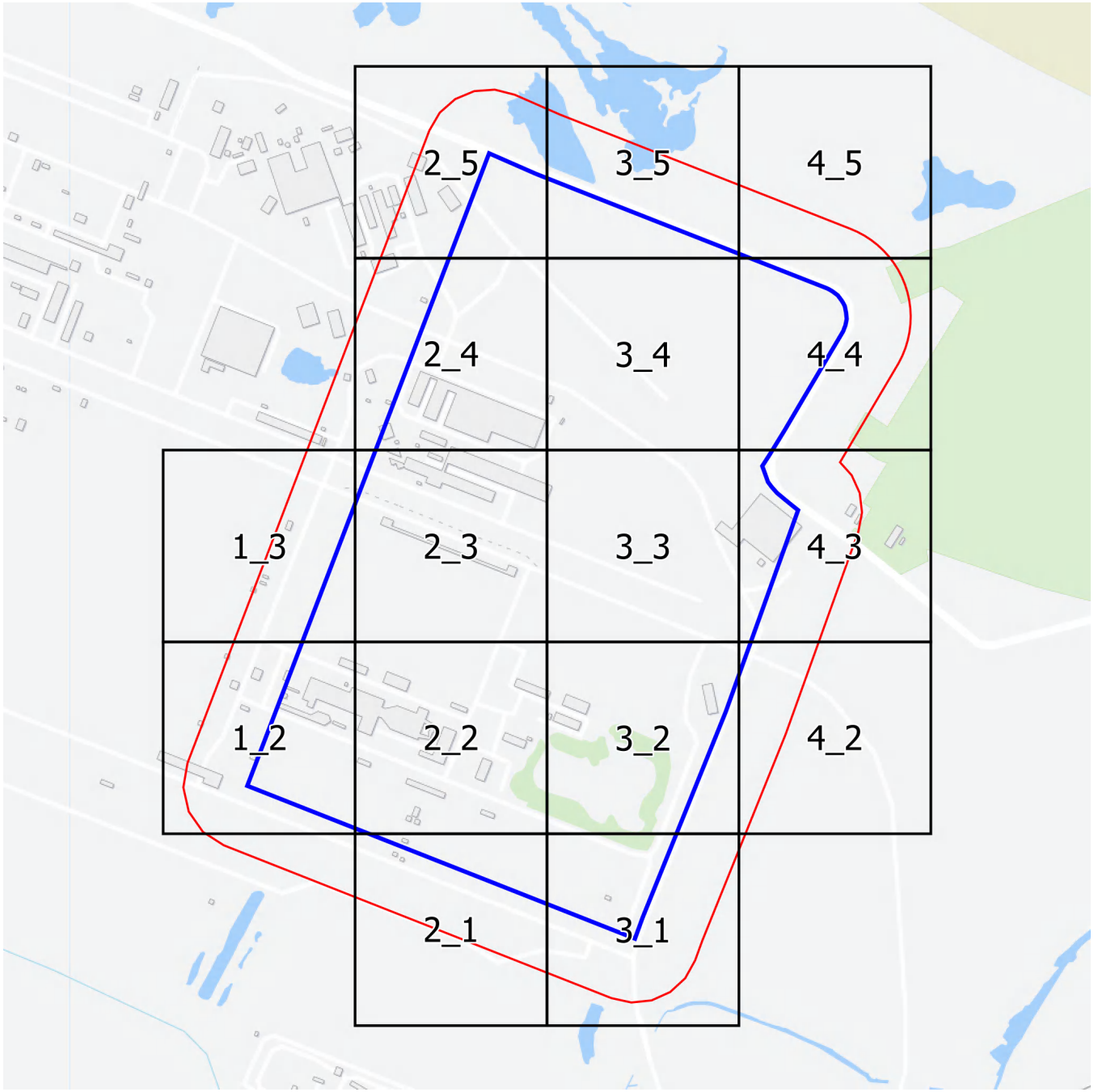
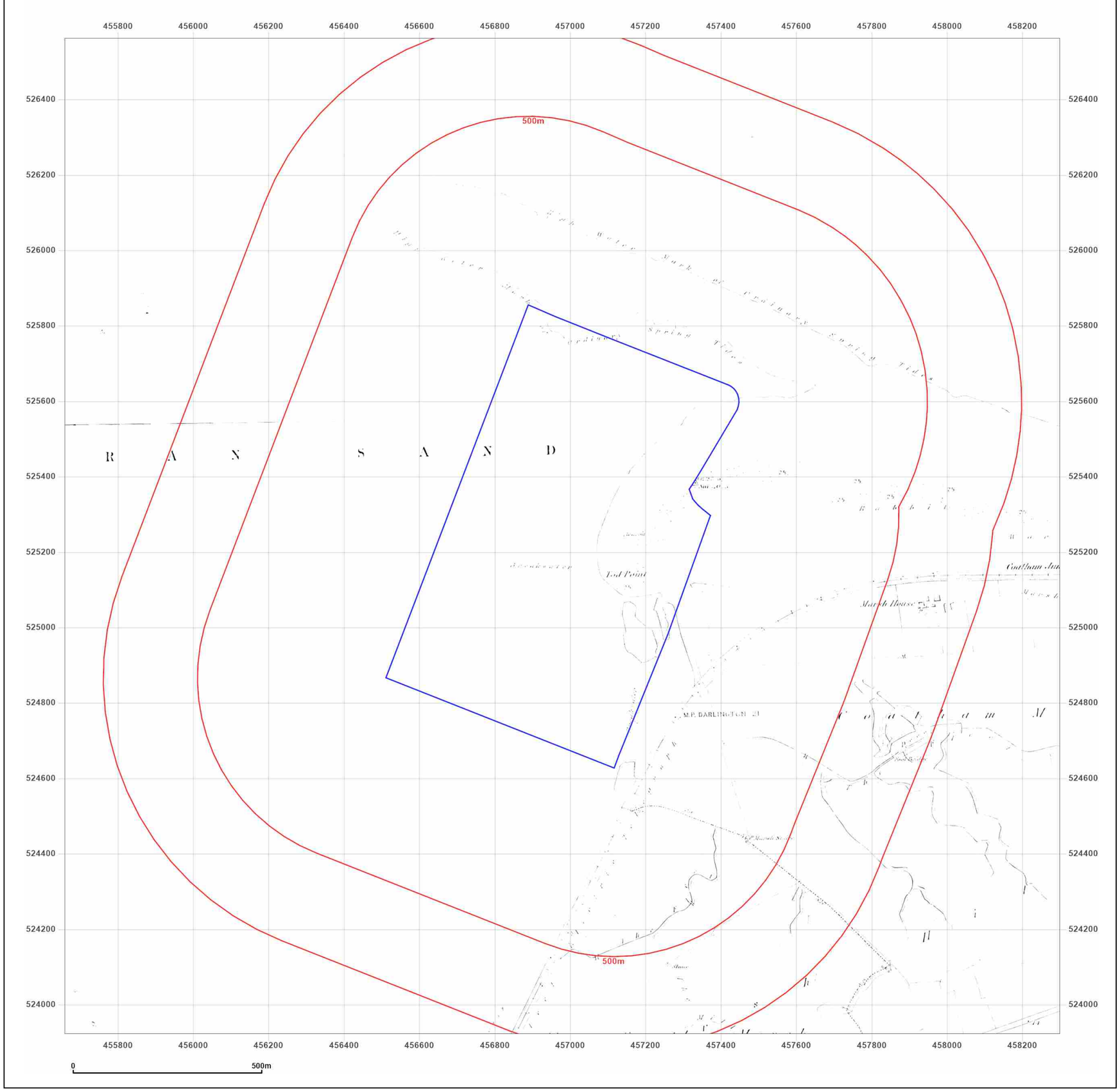


Groundsure INSIGHTS

Landline Scale Grid Index



Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718
Grid Ref: 456978, 525242

Map Name: County Series

Map date: **1856-1857**

Scale: 1:10,560

Printed at: 1:10,560

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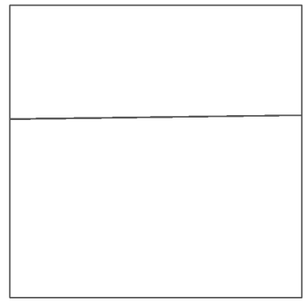
Surveyed 1853
Revised N/A
Edition 1856
Copyright N/A
Levelled N/A



Surveyed 1855
Revised N/A
Edition 1857
Copyright N/A
Levelled N/A

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Map legend available at:
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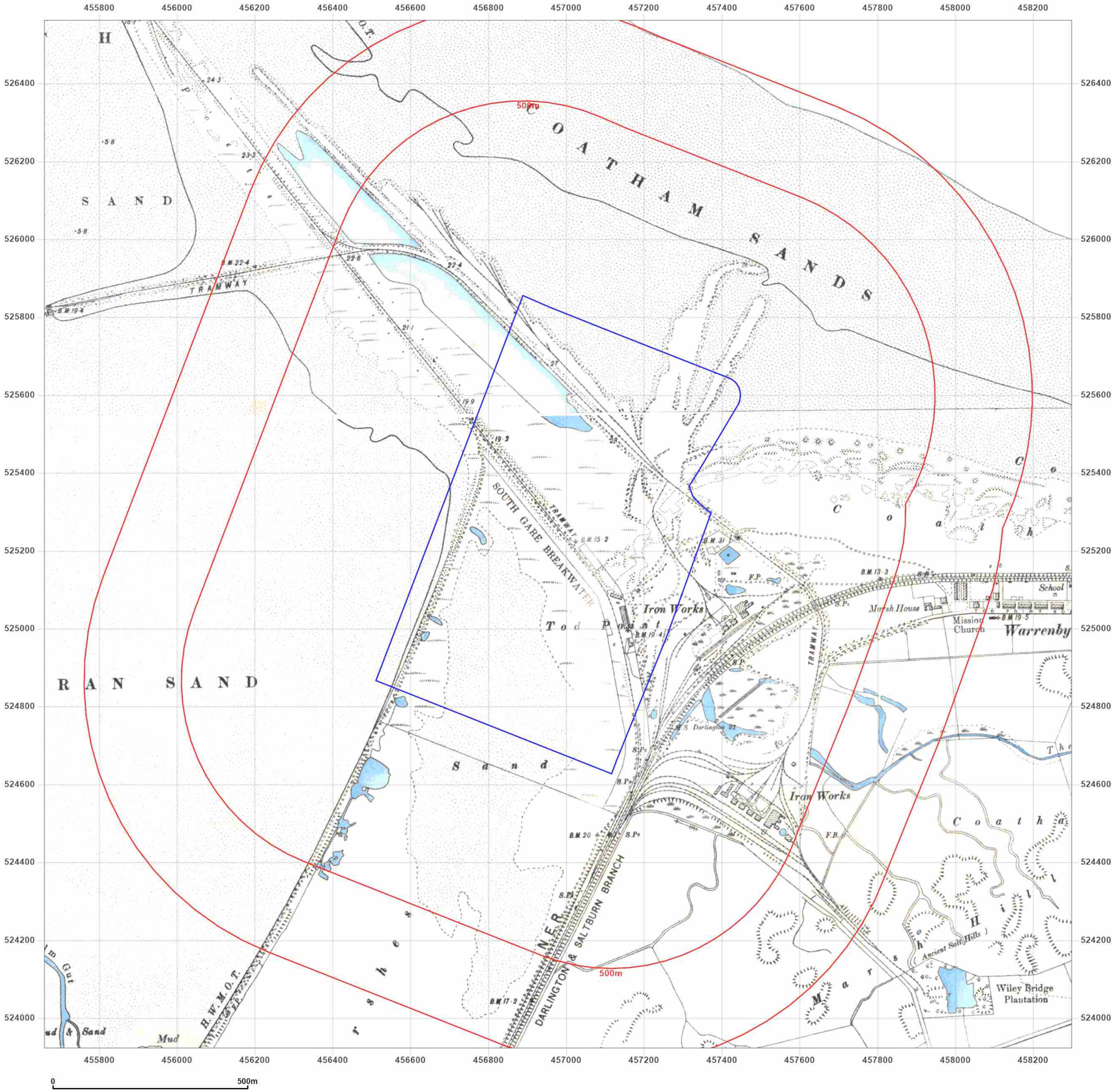

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718
Grid Ref: 456978, 525242

Map Name: County Series

Map date: **1893**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1893
Revised 1893
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1893
Revised 1893
Edition N/A
Copyright N/A
Levelled N/A

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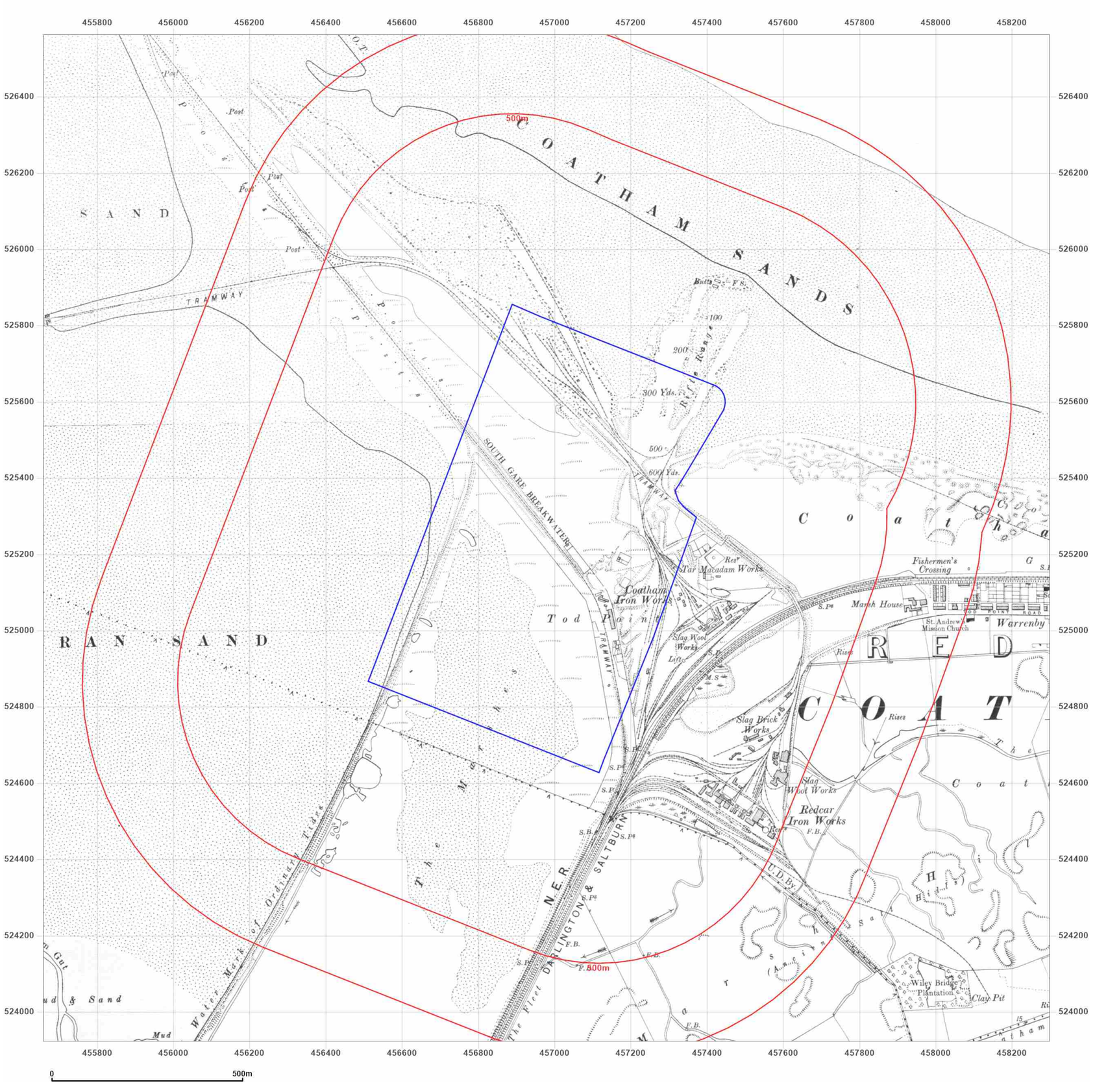

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718
Grid Ref: 456978, 525242

Map Name: County Series

Map date: **1913**

Scale: 1:10,560

Printed at: 1:10,560

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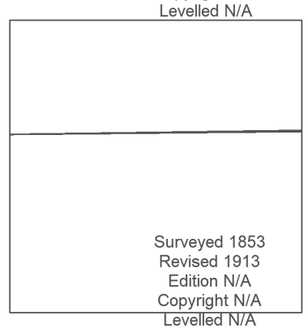
Surveyed 1853
Revised 1913
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1853
Revised 1913
Edition N/A
Copyright N/A
Levelled N/A

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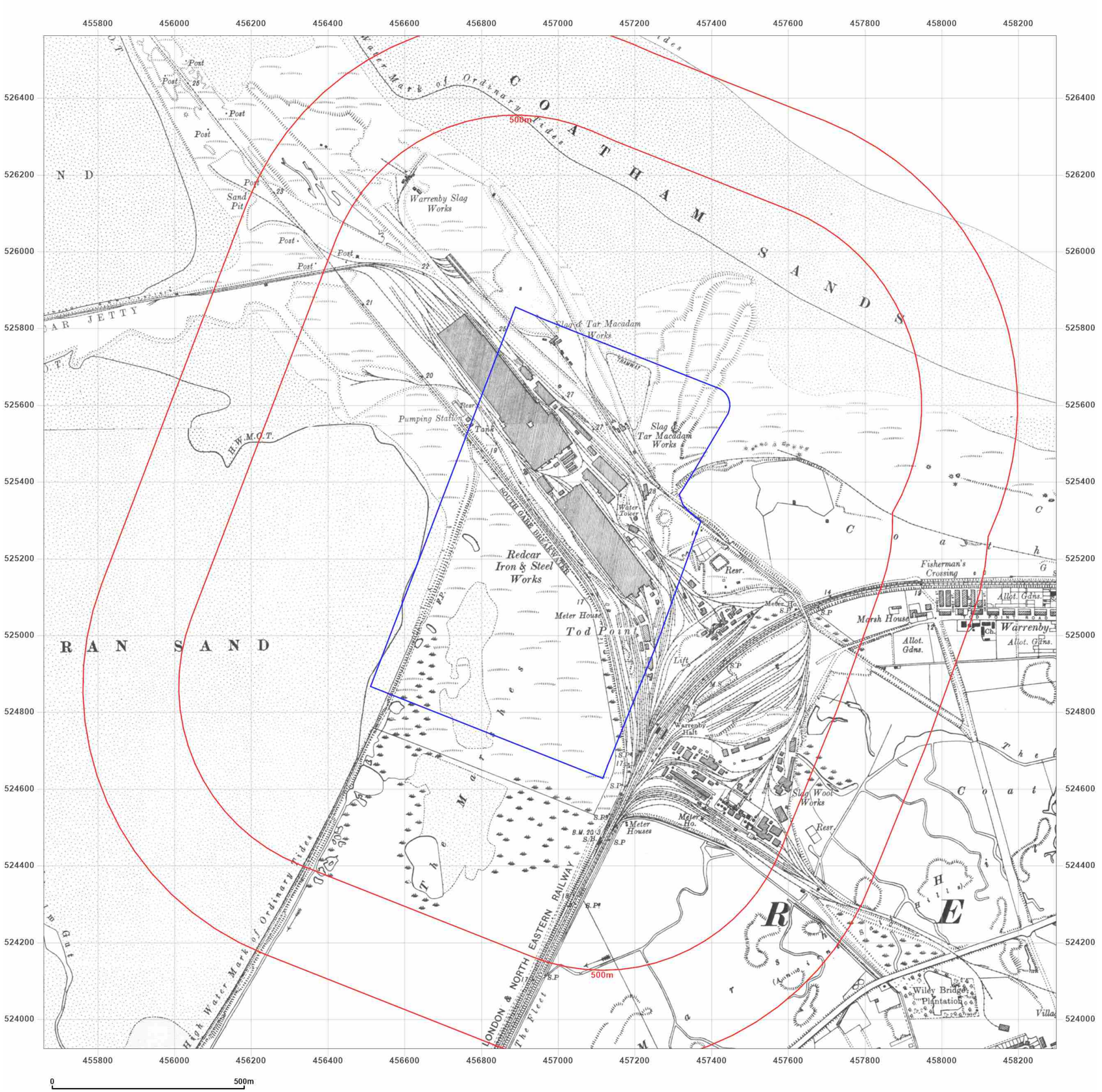

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718
Grid Ref: 456978, 525242

Map Name: County Series

Map date: **1927**

Scale: 1:10,560

Printed at: 1:10,560

N
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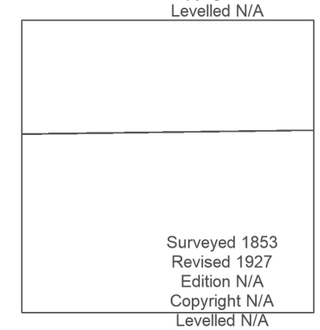
Surveyed 1853
Revised 1927
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1853
Revised 1927
Edition N/A
Copyright N/A
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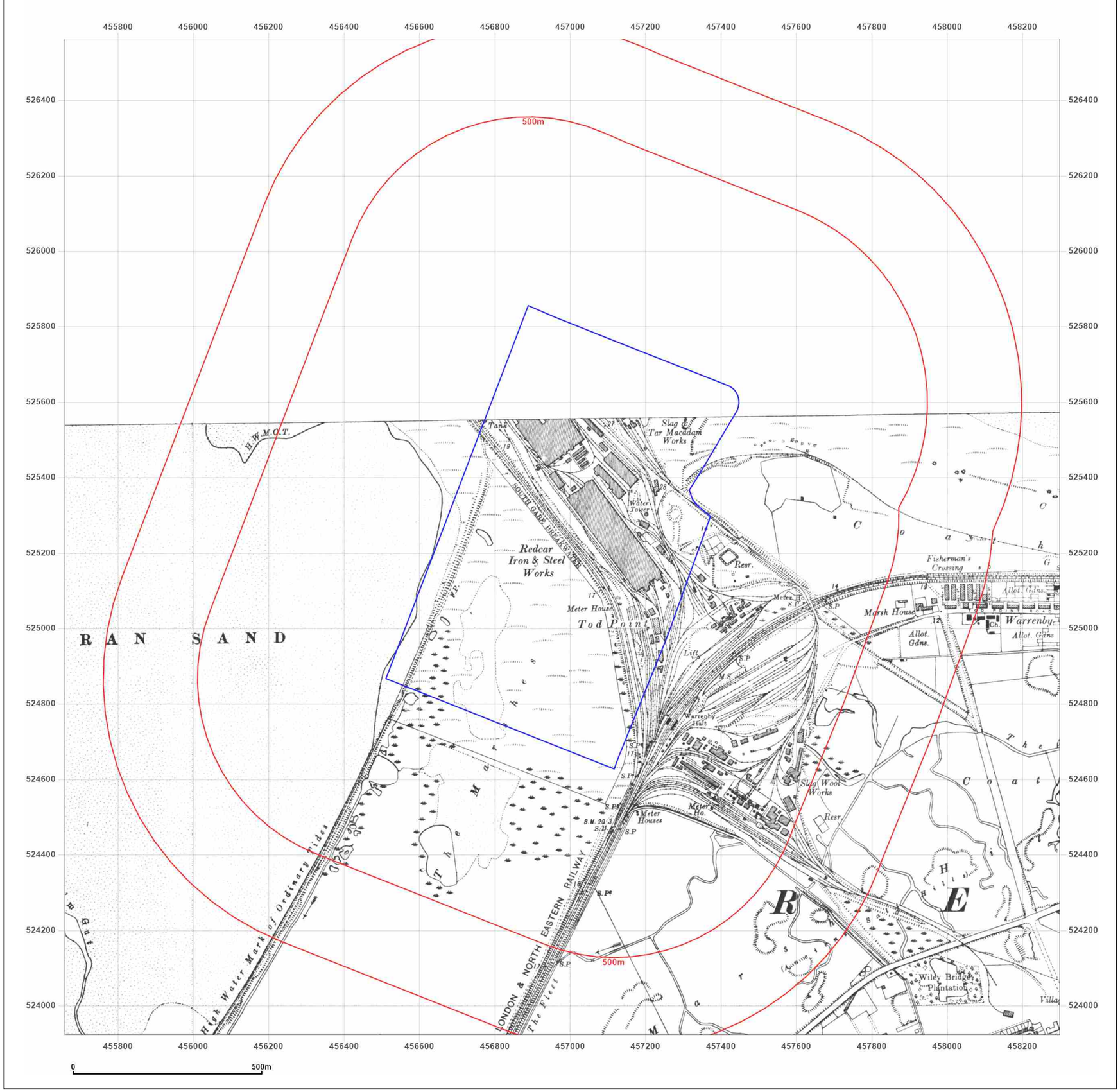

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718
Grid Ref: 456978, 525242

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1853
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

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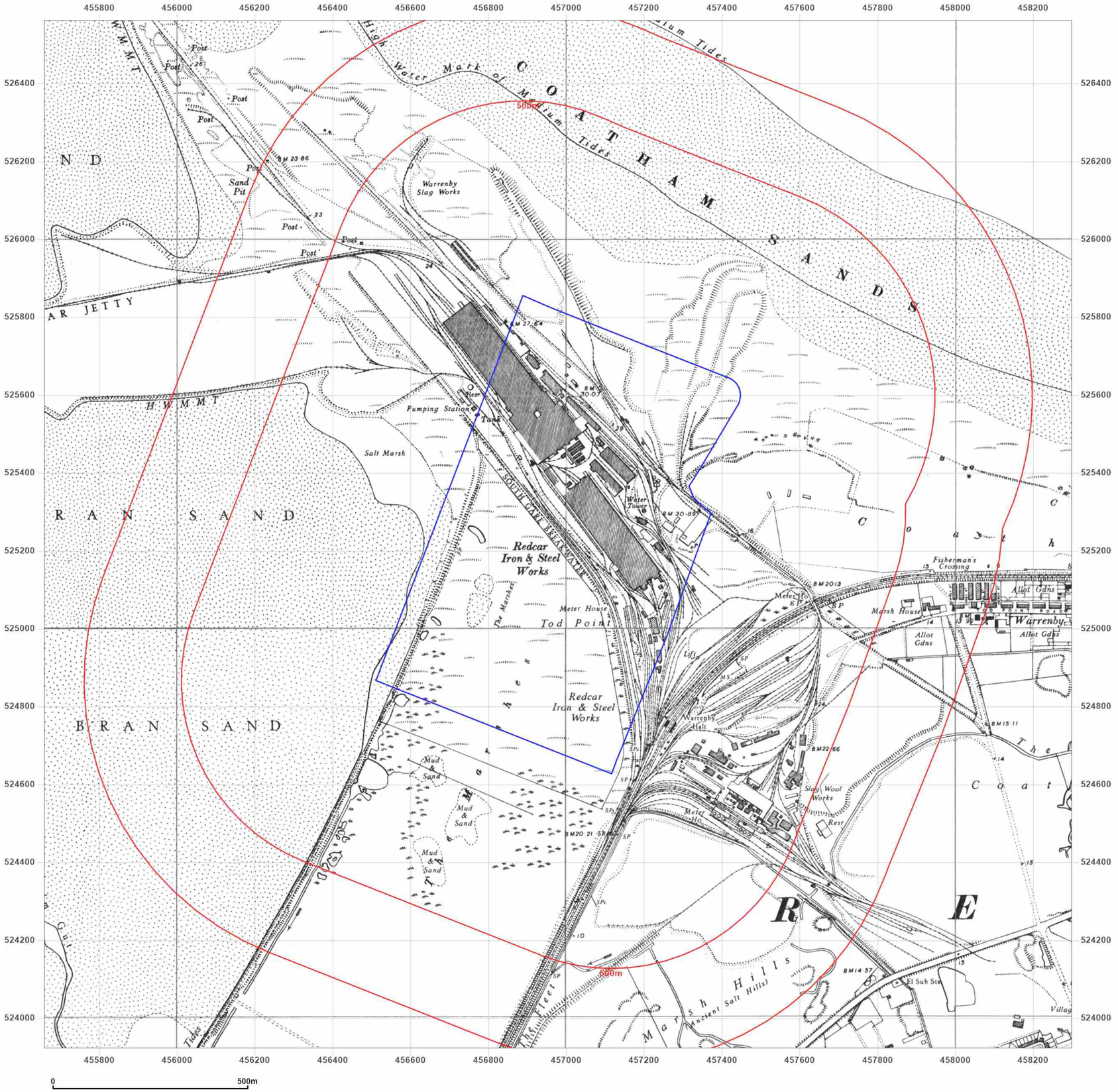

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718
Grid Ref: 456978, 525242

Map Name: Provisional

Map date: **1952-1953**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed N/A
Revised 1952
Edition 1953
Copyright N/A
Levelled N/A

Surveyed N/A
Revised 1952
Edition N/A
Copyright 1952
Levelled N/A

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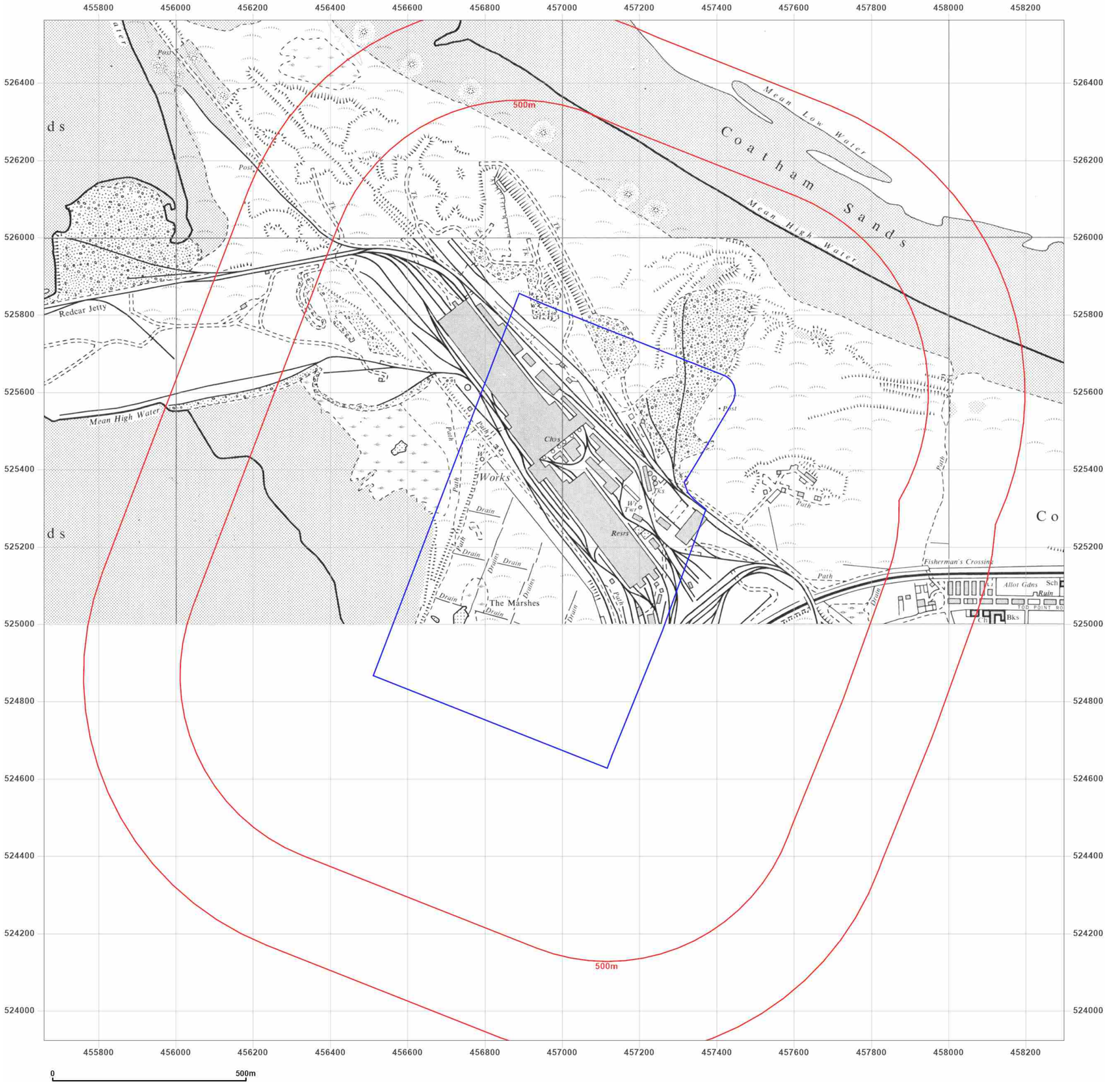

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718
Grid Ref: 456978, 525242

Map Name: Provisional

Map date: **1969**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1969
Revised 1969
Edition N/A
Copyright N/A
Levelled N/A

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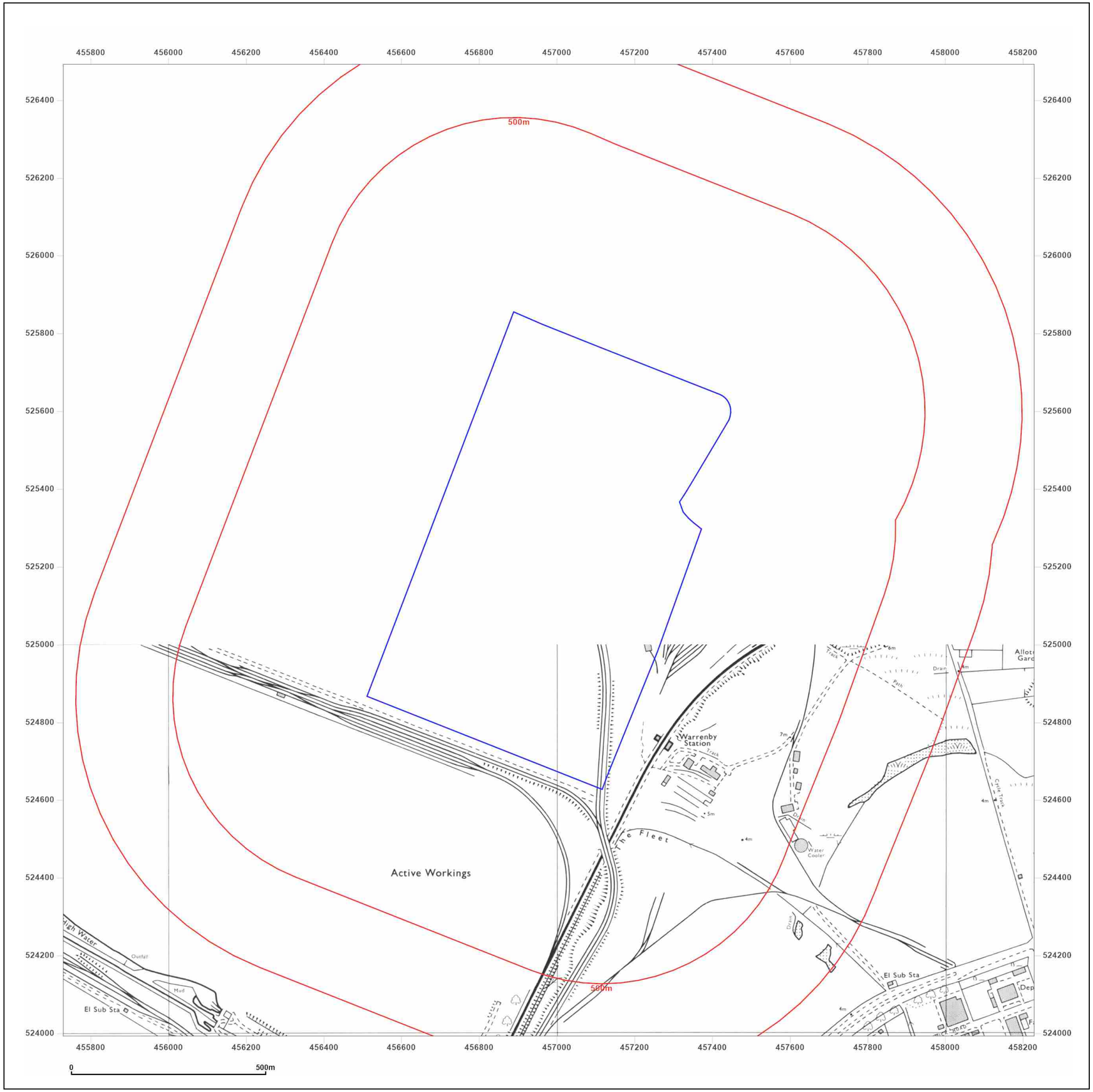

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718
Grid Ref: 456978, 525242

Map Name: National Grid

Map date: **1974**

Scale: 1:10,000

Printed at: 1:10,000

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

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Production date: 05 April 2022

Map legend available at:
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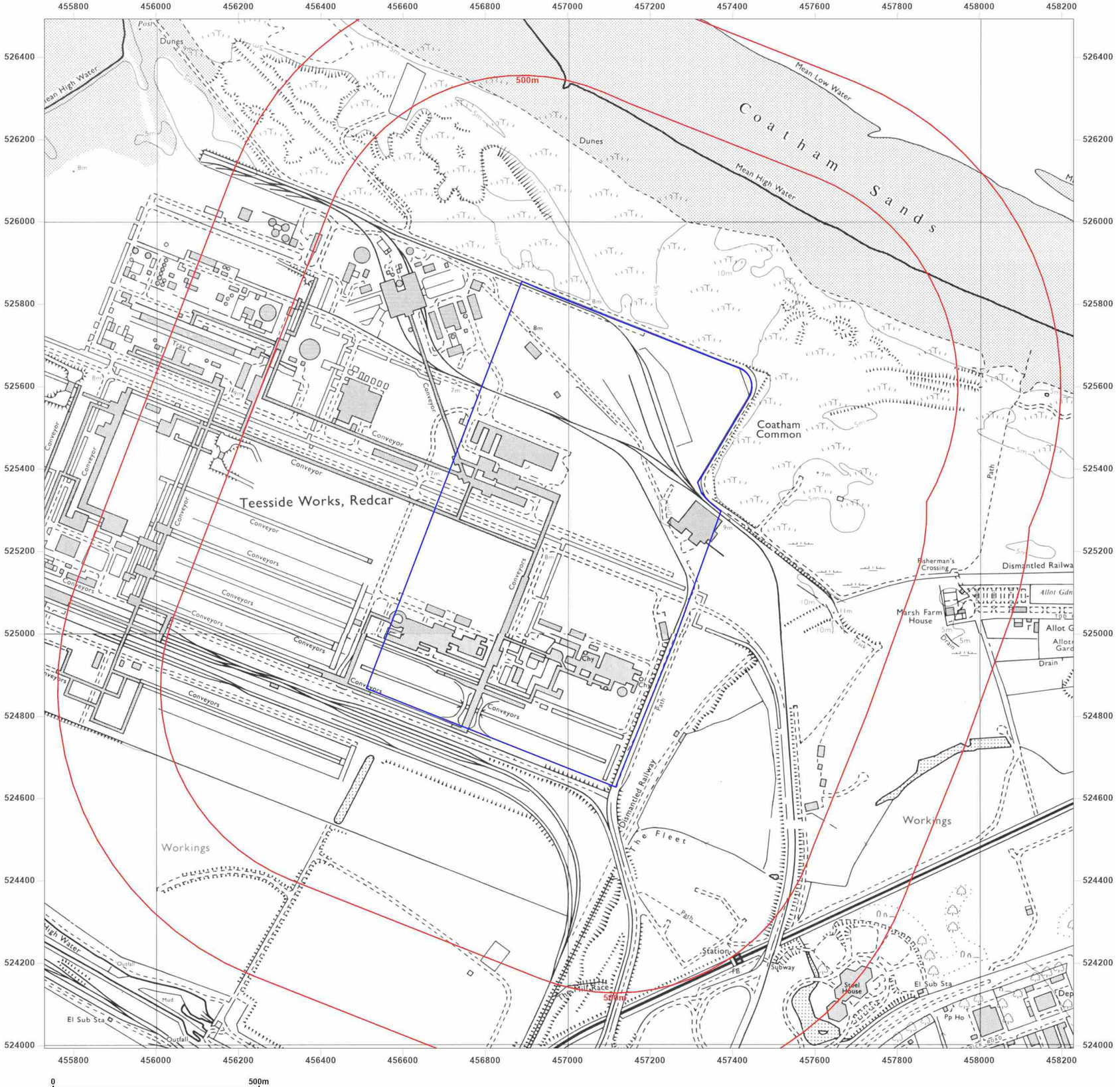

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718
Grid Ref: 456978, 525242

Map Name: National Grid

Map date: **1980-1983**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1980
Revised 1980
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1983
Revised 1983
Edition N/A
Copyright N/A
Levelled N/A

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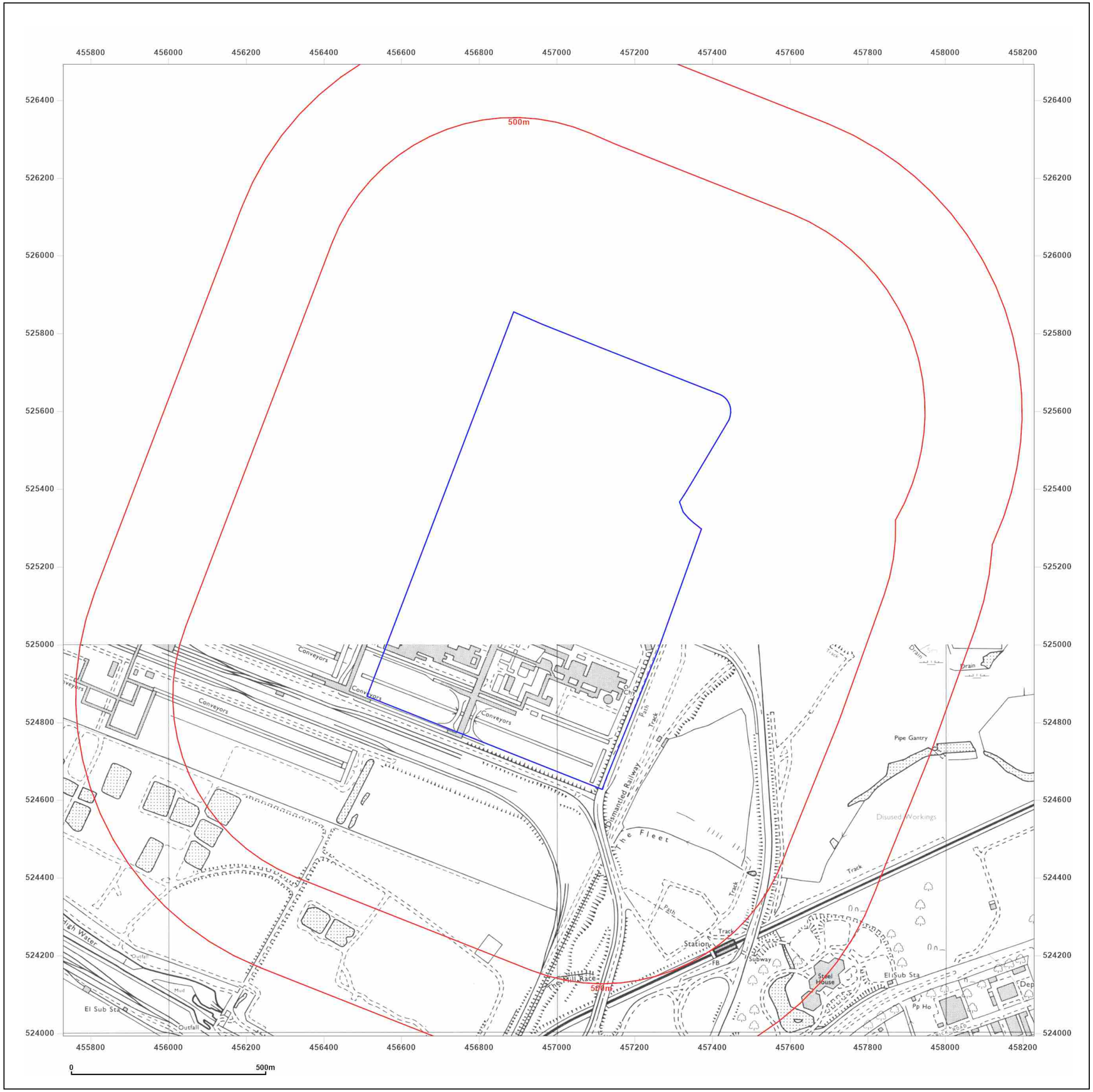

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718
Grid Ref: 456978, 525242

Map Name: National Grid

Map date: **1991**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1989
Revised 1991
Edition N/A
Copyright N/A
Levelled N/A

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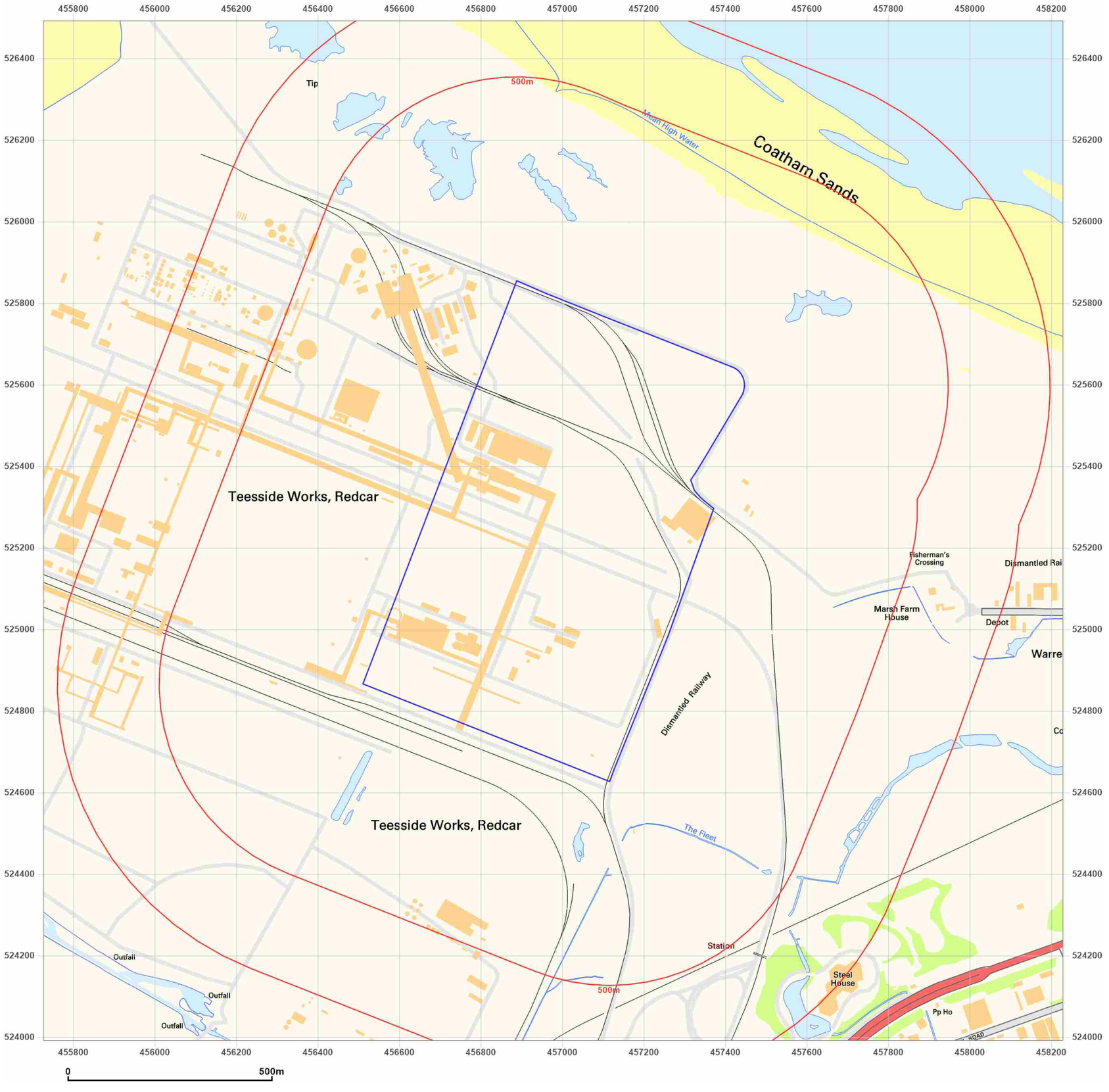

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718
Grid Ref: 456978, 525242

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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2001

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Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718
Grid Ref: 456978, 525242

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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2010

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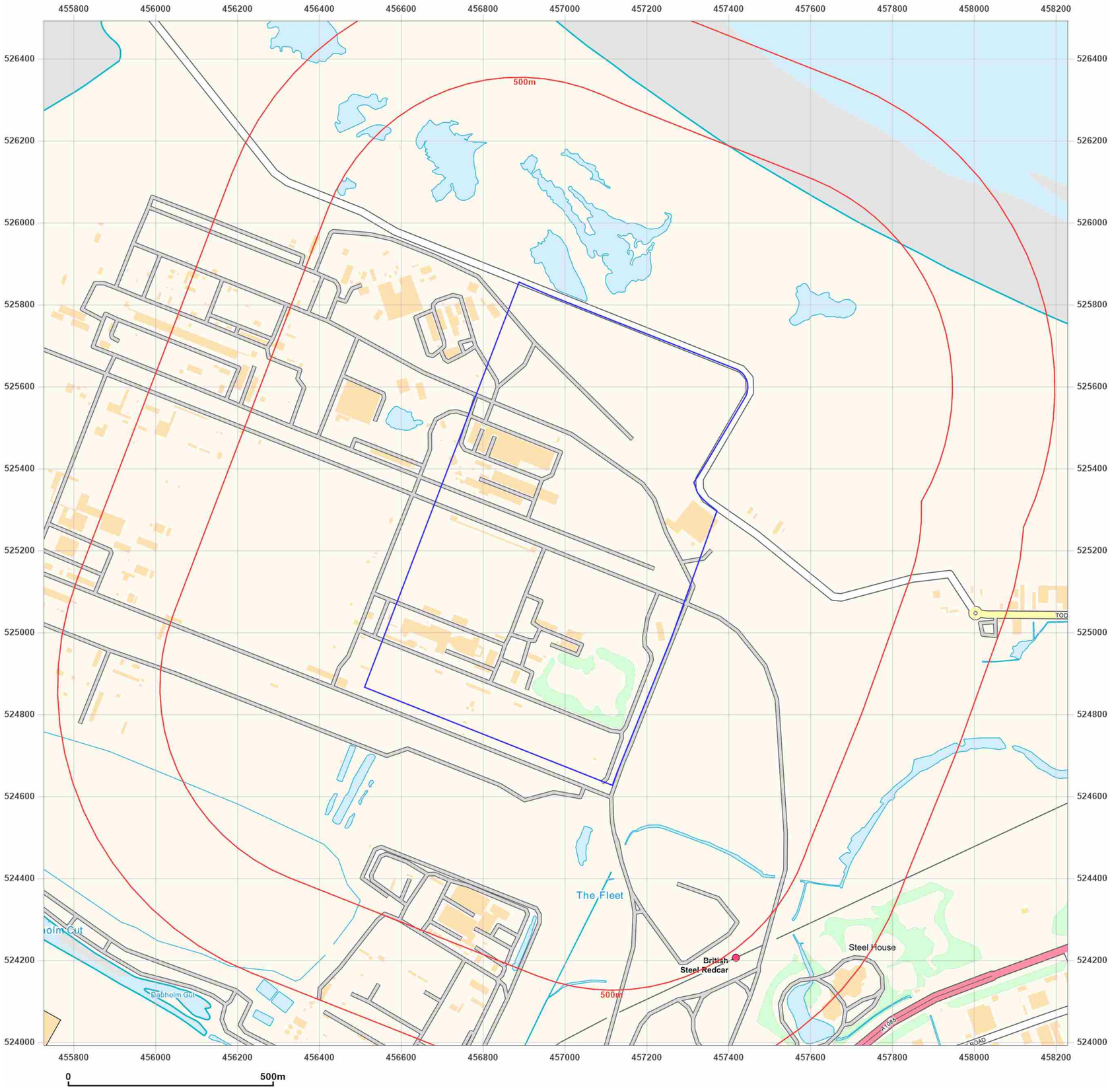

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718
Grid Ref: 456978, 525242

Map Name: National Grid

Map date: **2022**

Scale: 1:10,000

Printed at: 1:10,000

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2022

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Production date: 05 April 2022

Map legend available at:
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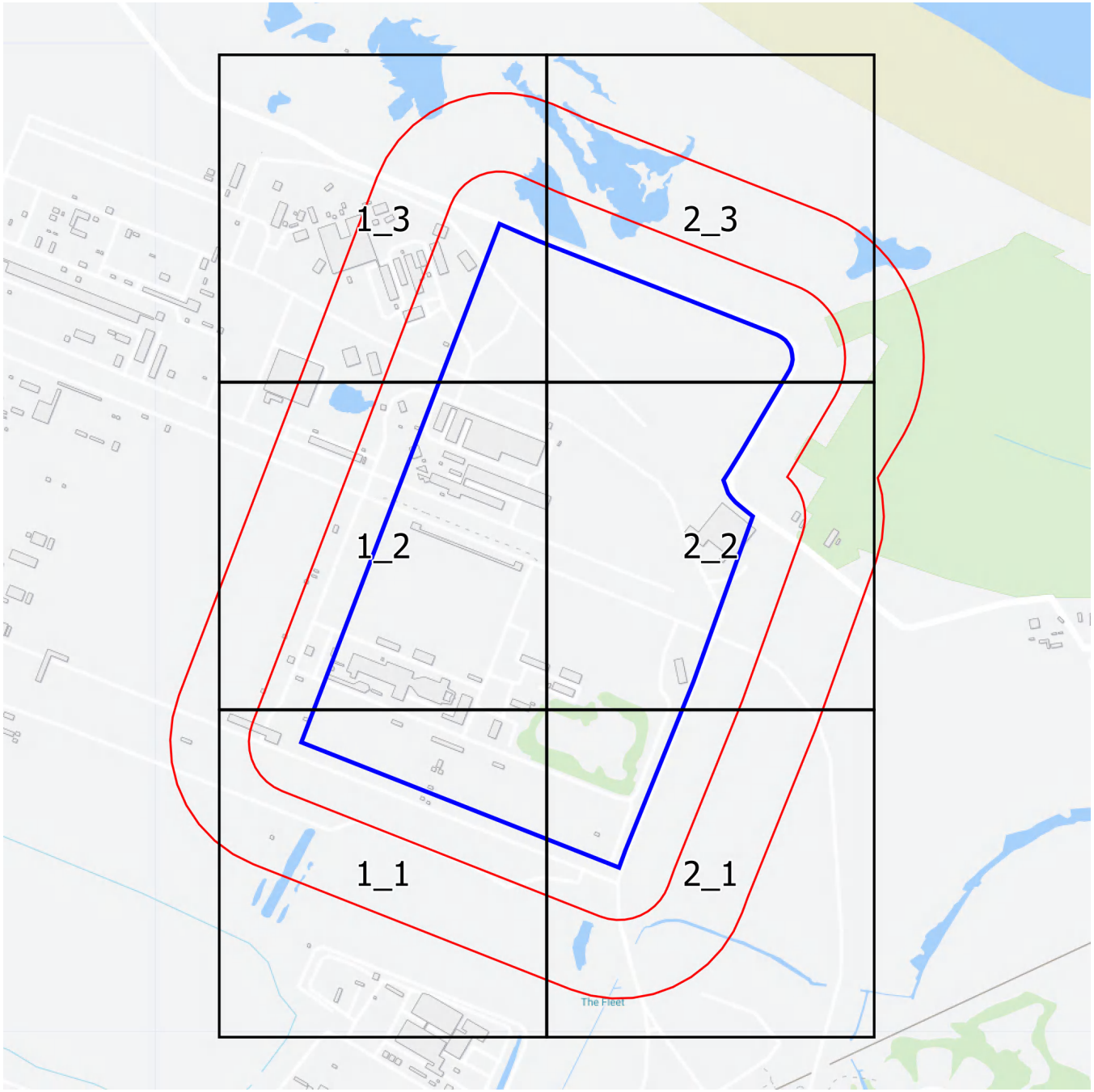

Groundsure INSIGHTS

1:2,500 Scale Grid Index

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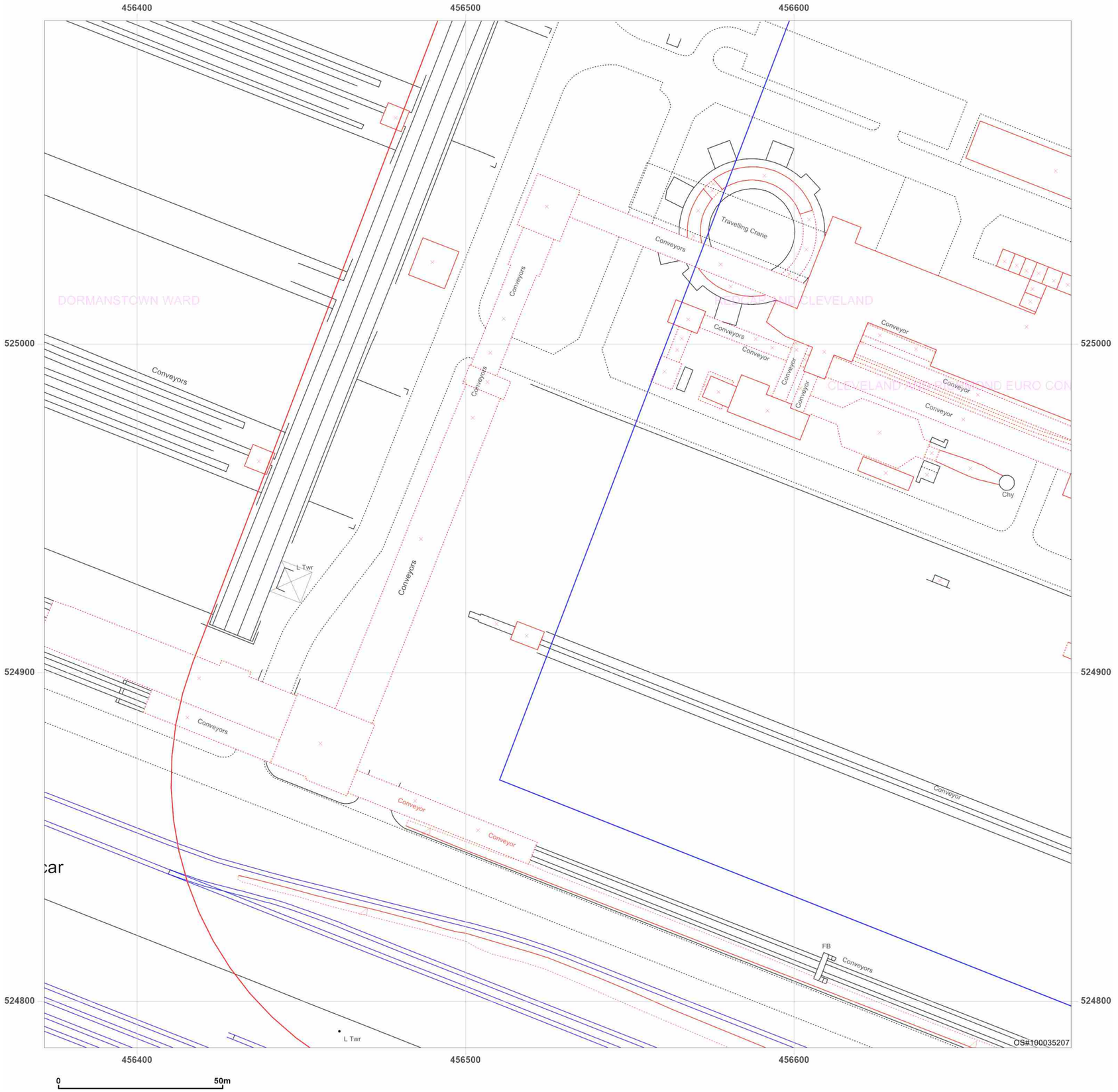

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718_Landline_1_2
Grid Ref: 456528, 524942

Map Name: LandLine

Map date: **2003**

Scale: 1:1,250

Printed at: 1:1,250

N
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2003

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Production date: 05 April 2022

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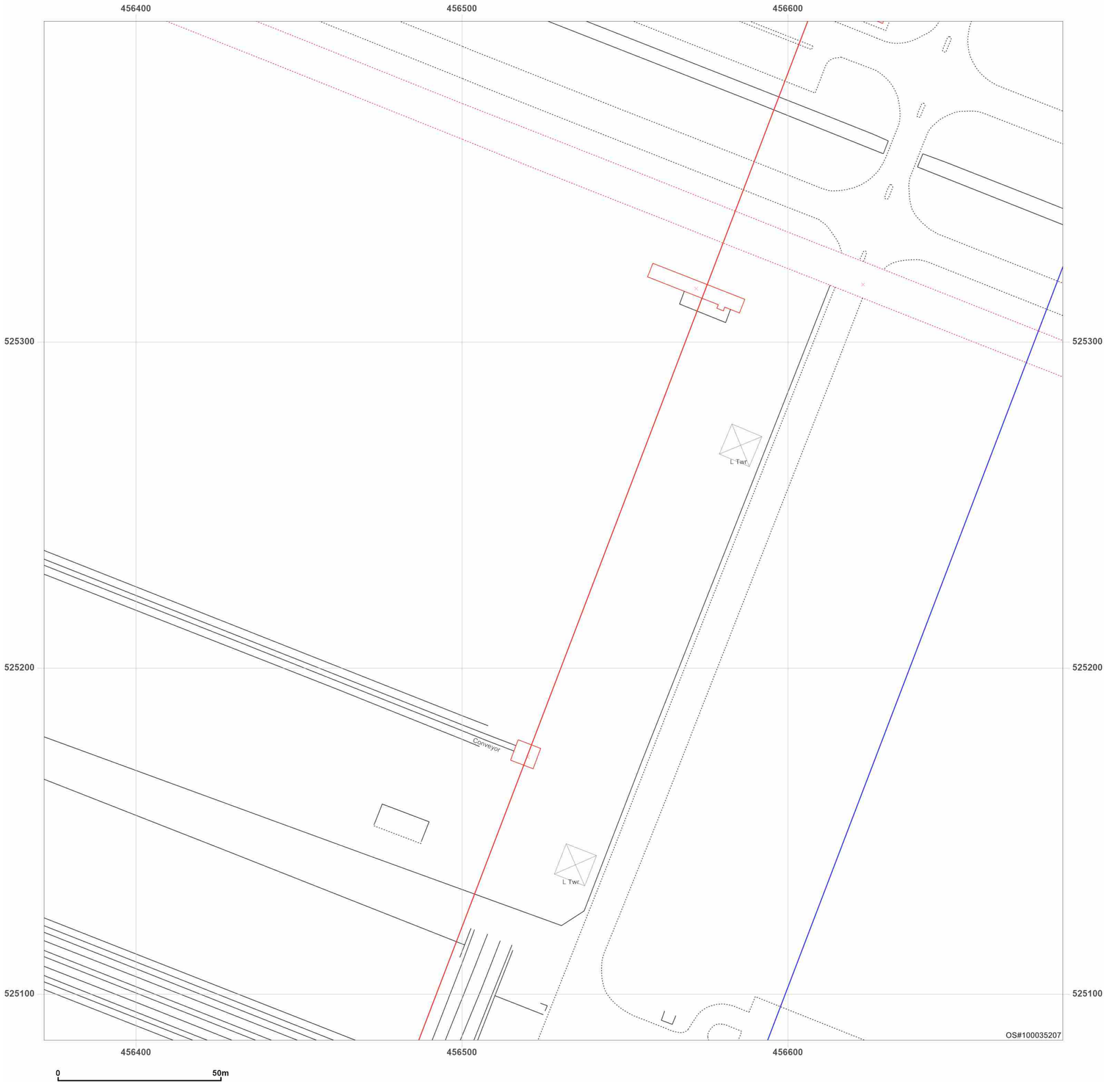

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_Landline_1_3
Grid Ref: 456528, 525242

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

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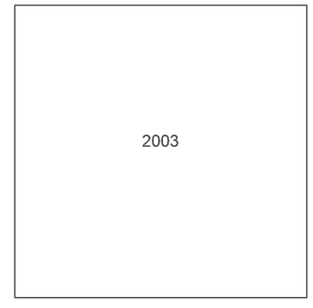

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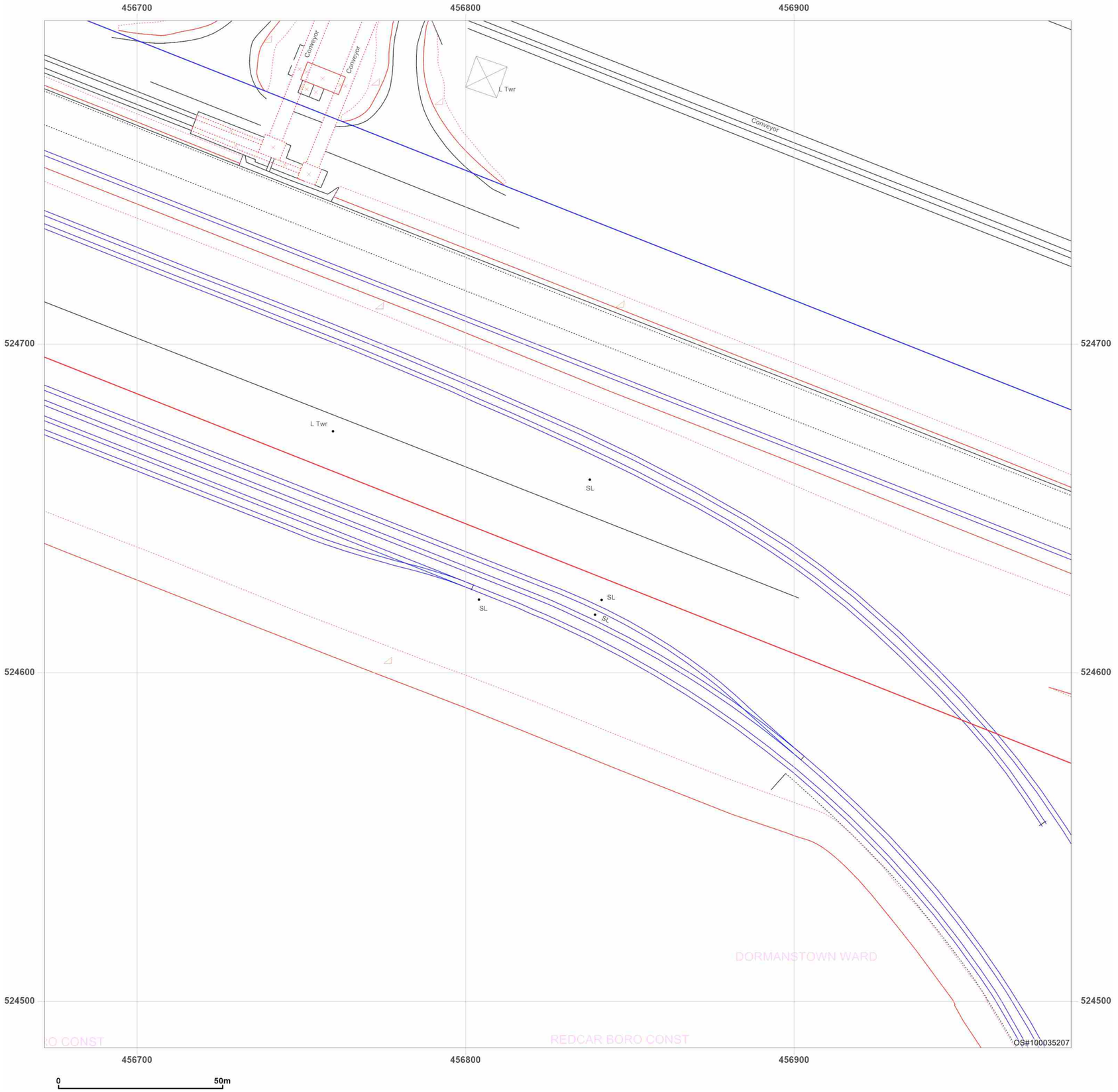

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_Landline_2_1
Grid Ref: 456828, 524642

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

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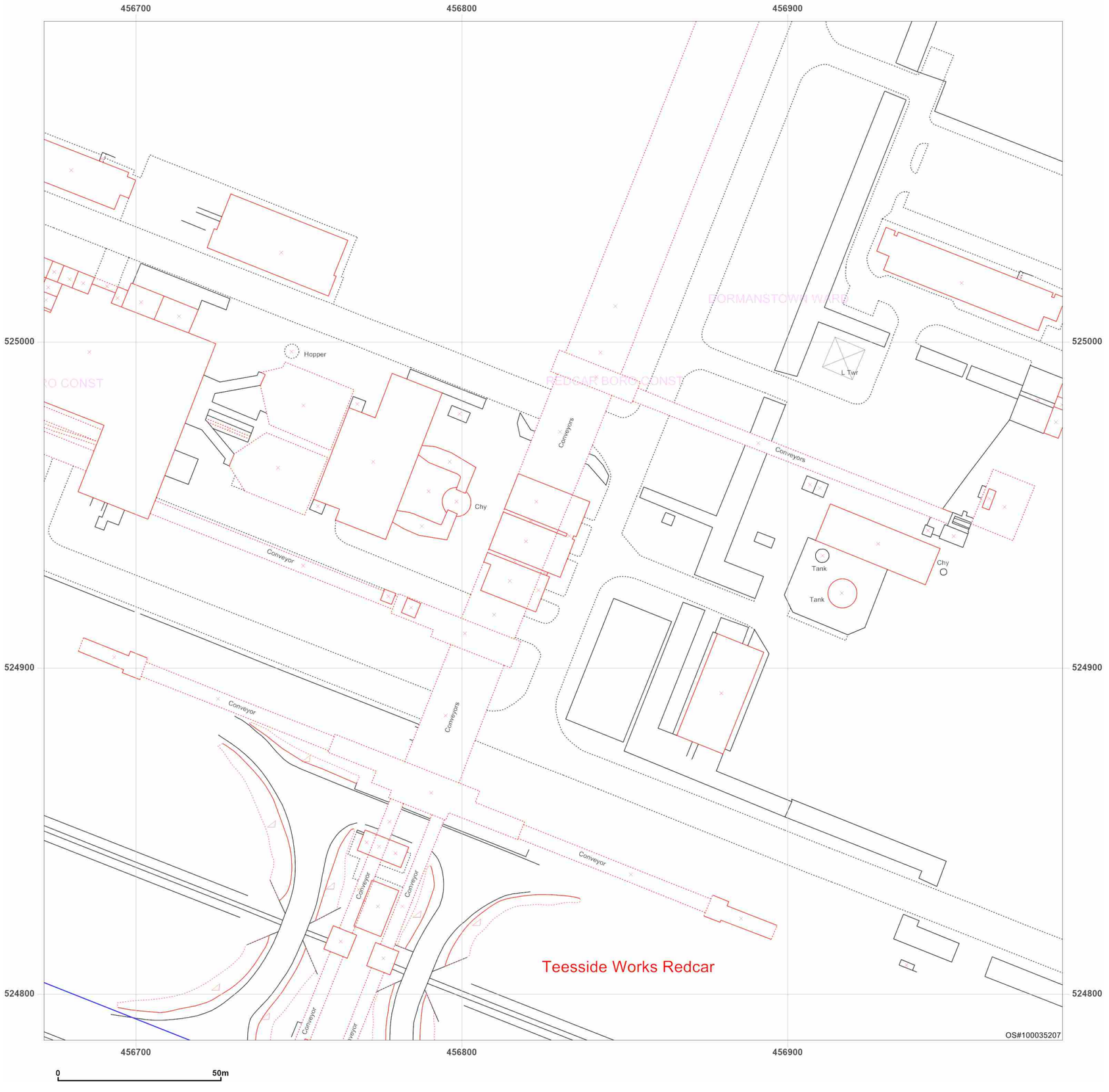

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_Landline_2_2
Grid Ref: 456828, 524942

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

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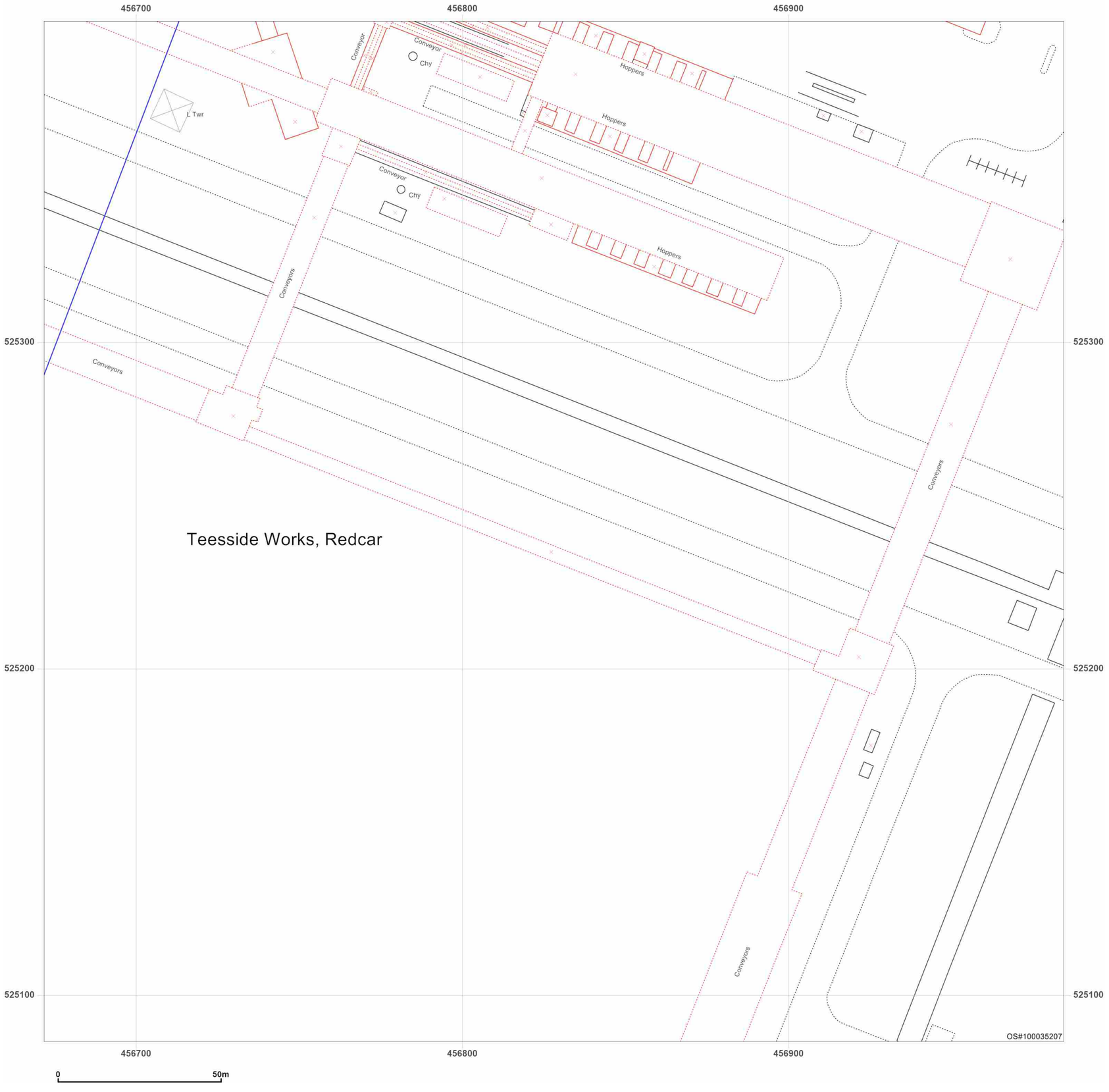

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_Landline_2_3
Grid Ref: 456828, 525242

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

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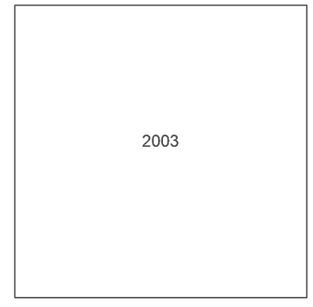

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Production date: 05 April 2022

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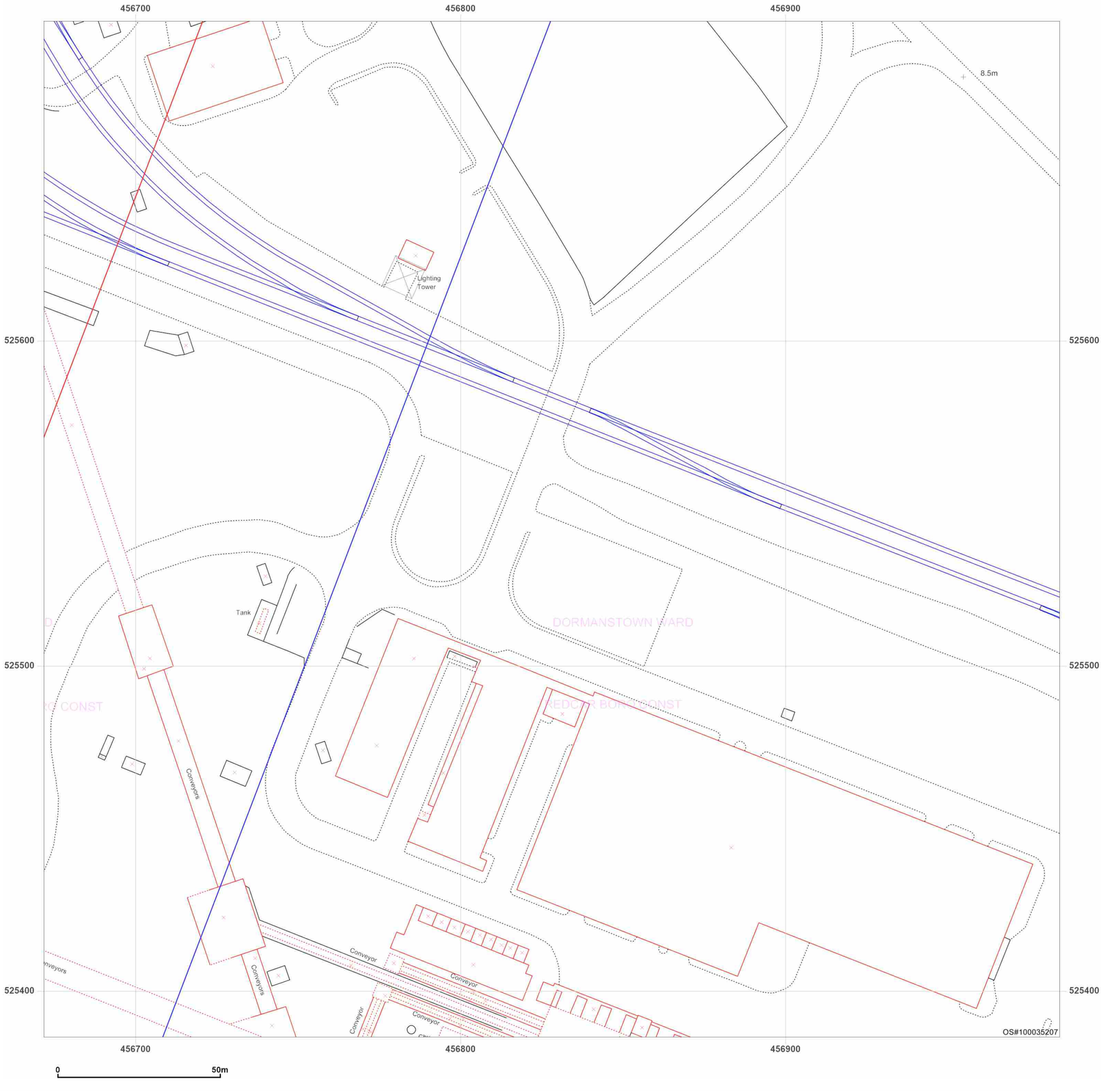

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_Landline_2_4
Grid Ref: 456828, 525542

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

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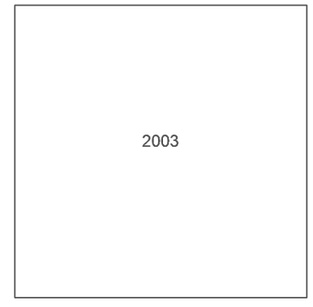

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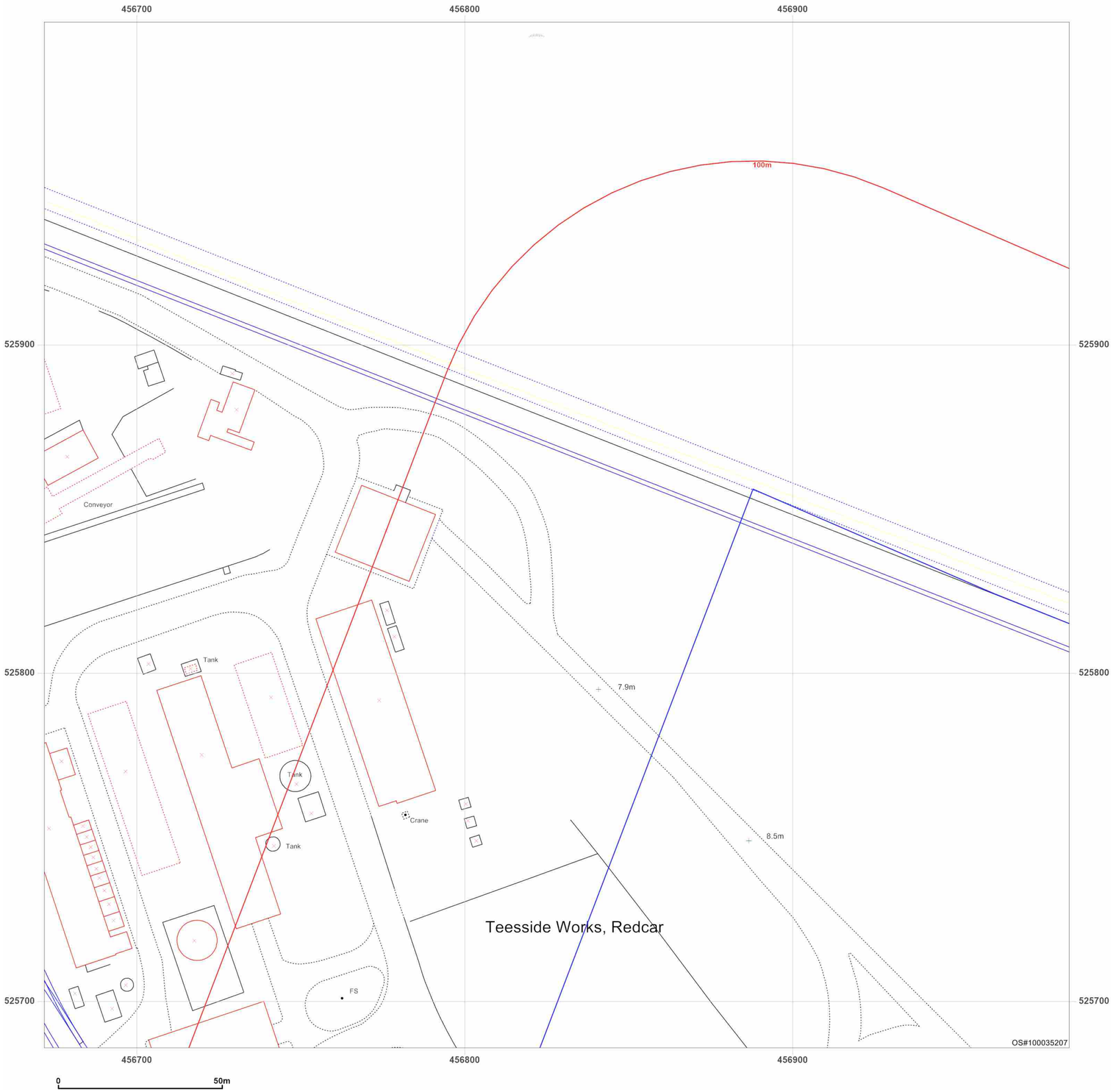

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_Landline_2_5
Grid Ref: 456828, 525842

Map Name: LandLine

Map date: **2003**

Scale: 1:1,250

Printed at: 1:1,250

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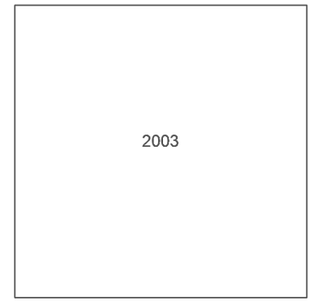

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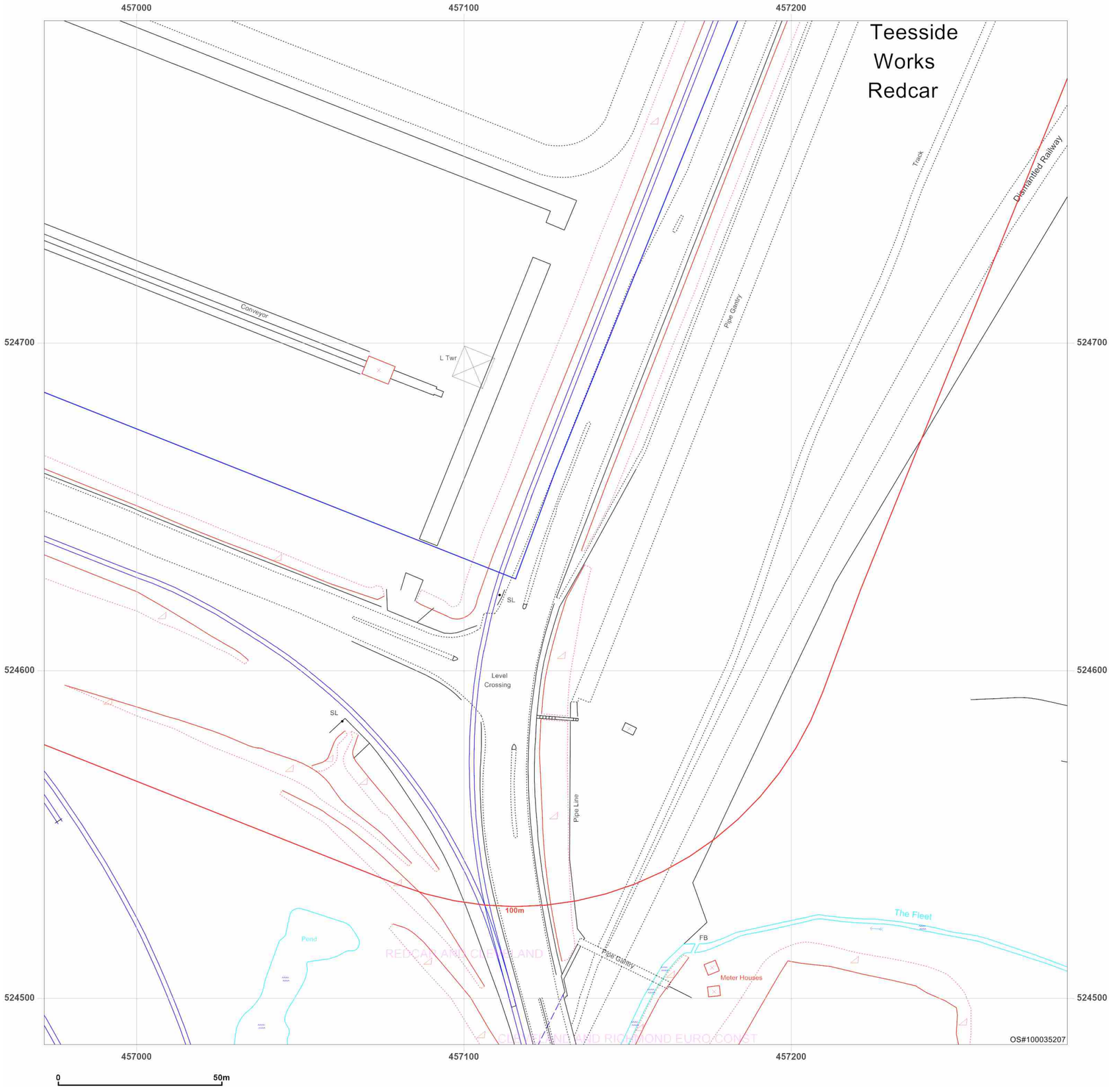

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_Landline_3_1
Grid Ref: 457128, 524642

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

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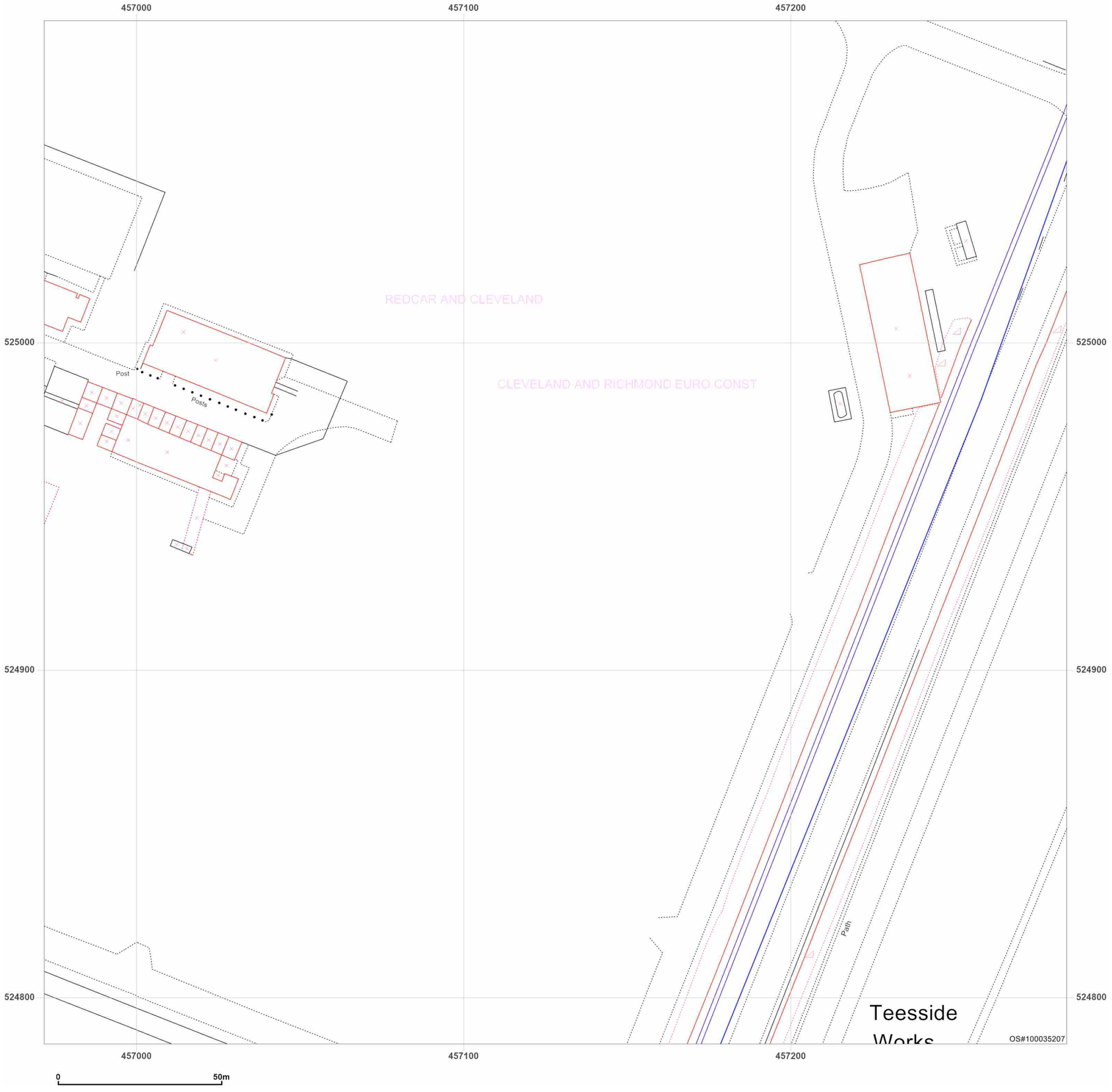

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_Landline_3_2
Grid Ref: 457128, 524942

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

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Production date: 05 April 2022

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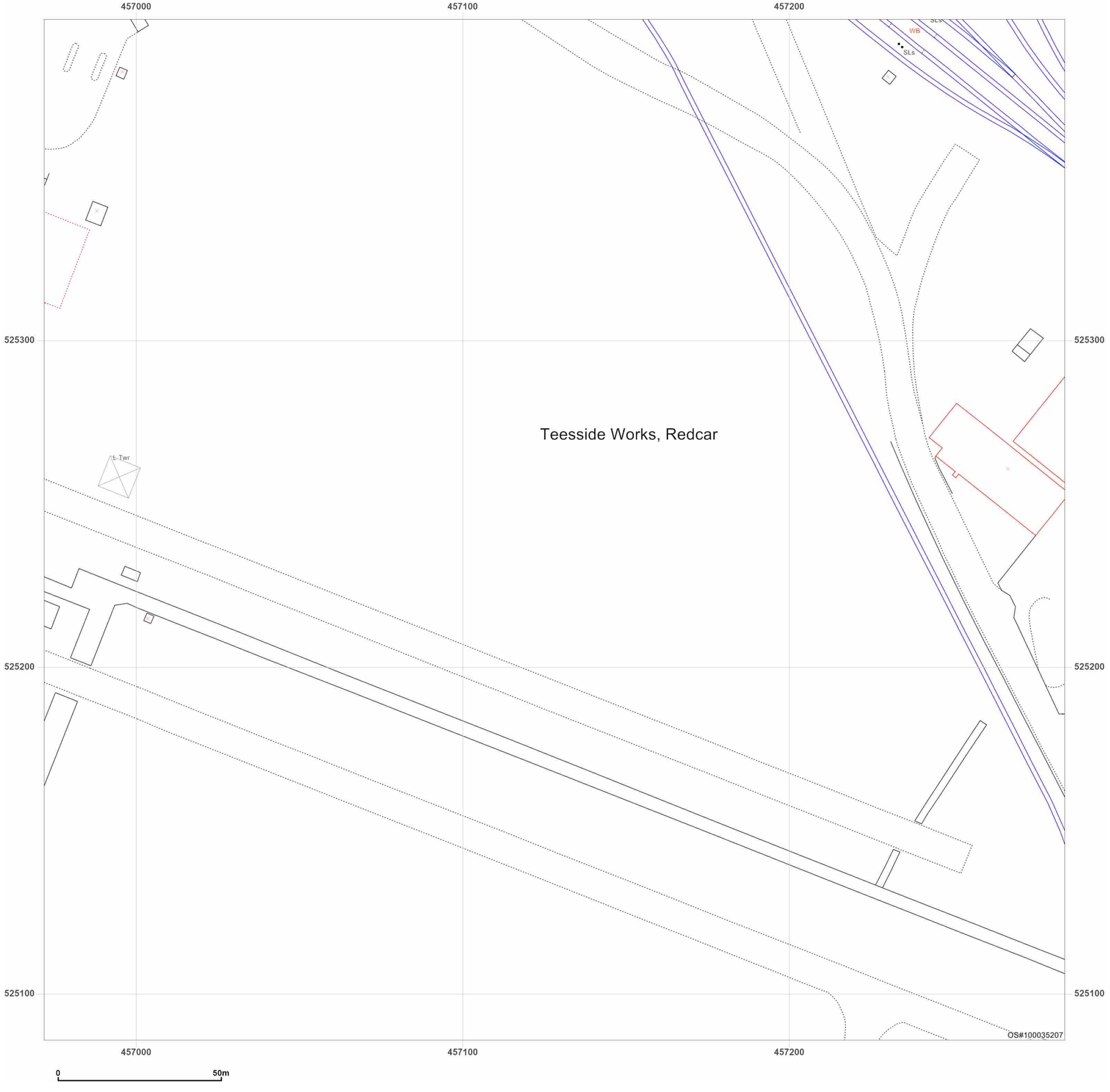

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_Landline_3_3
Grid Ref: 457128, 525242

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

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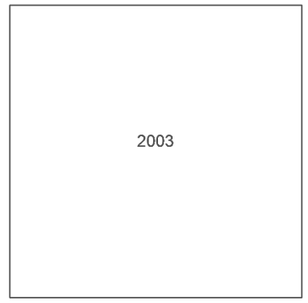

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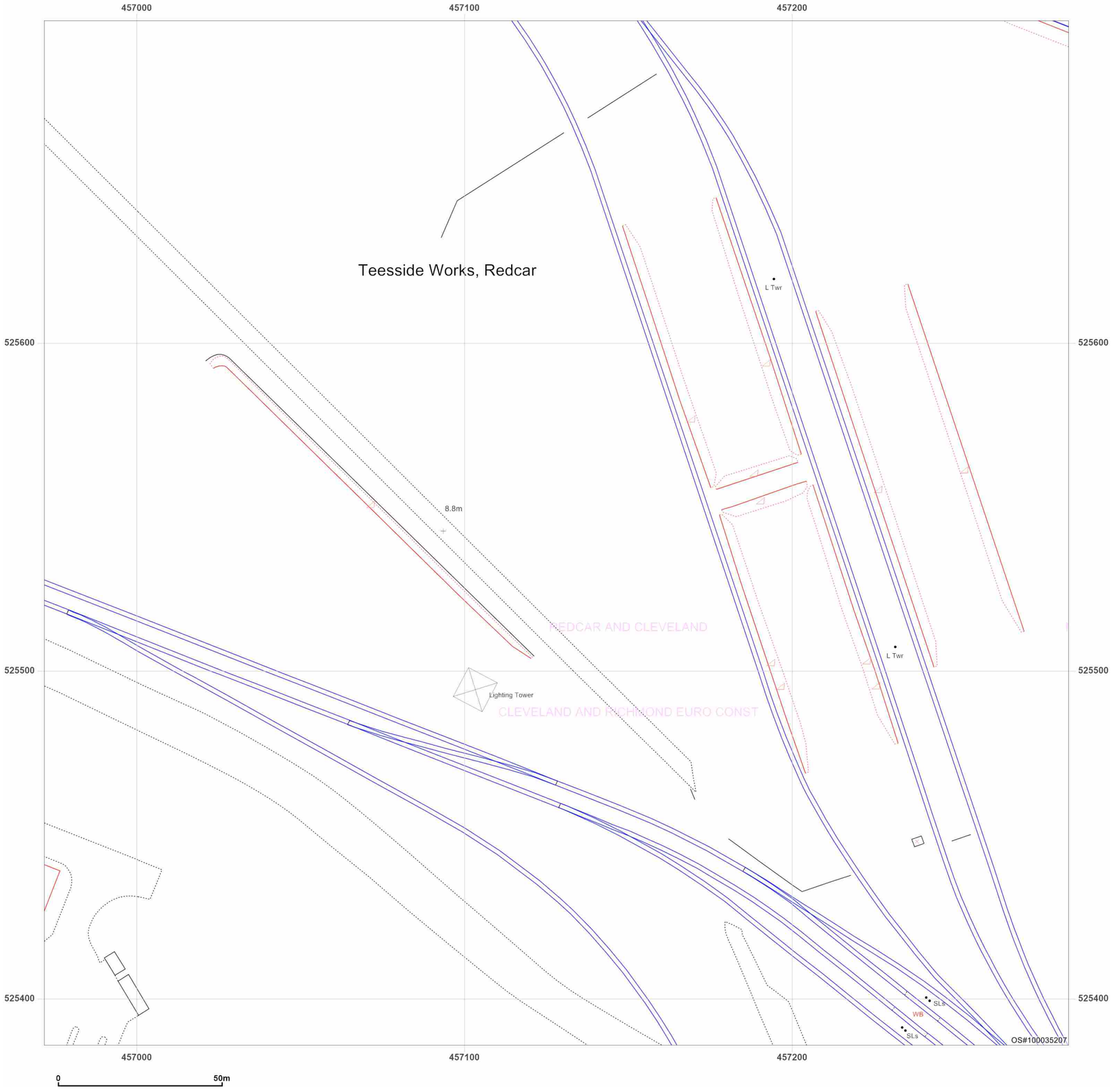

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_Landline_3_4
Grid Ref: 457128, 525542

Map Name: LandLine

Map date: **2003**

Scale: 1:1,250

Printed at: 1:1,250

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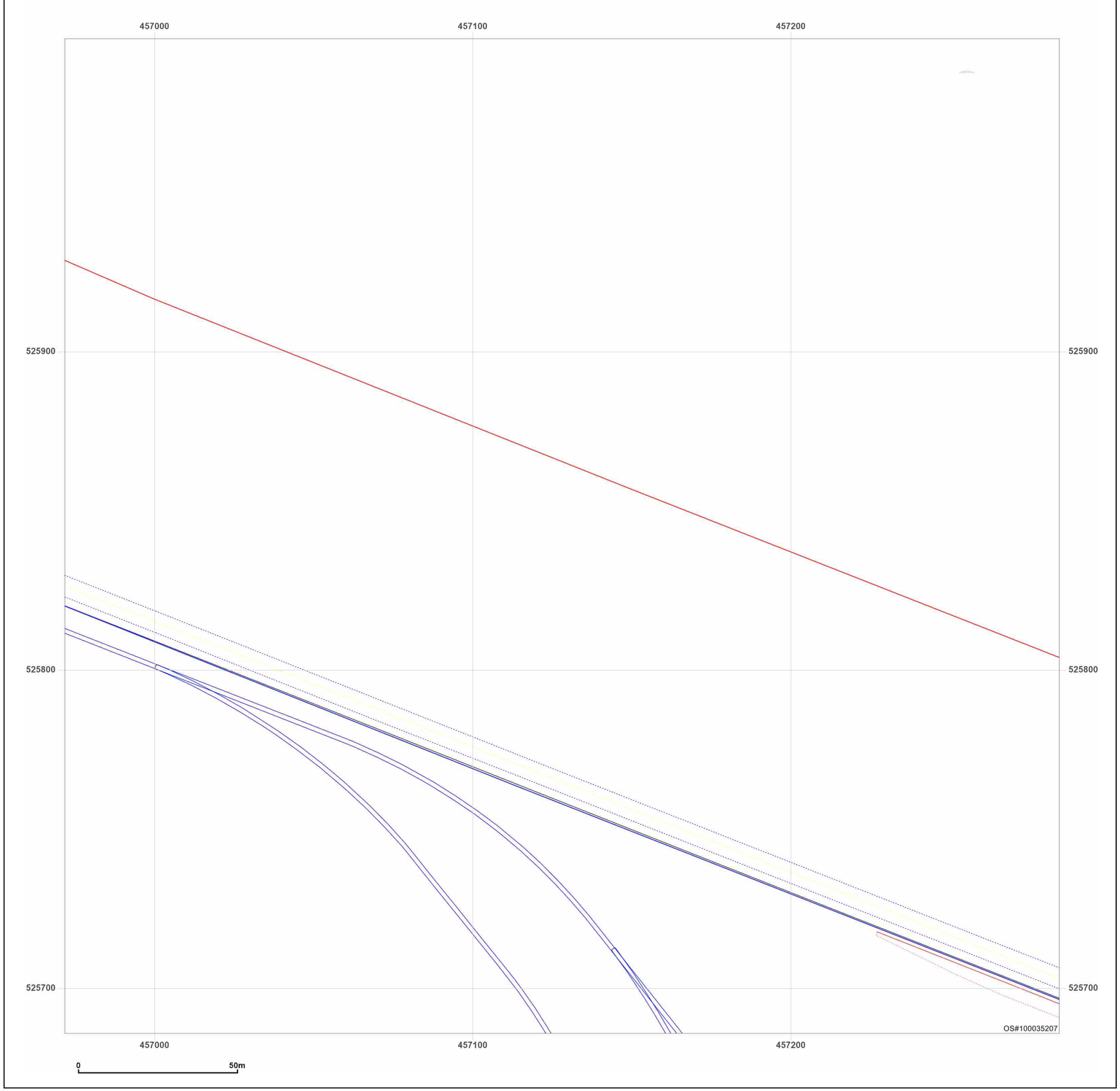

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_Landline_3_5
Grid Ref: 457128, 525842

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

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Map legend available at:
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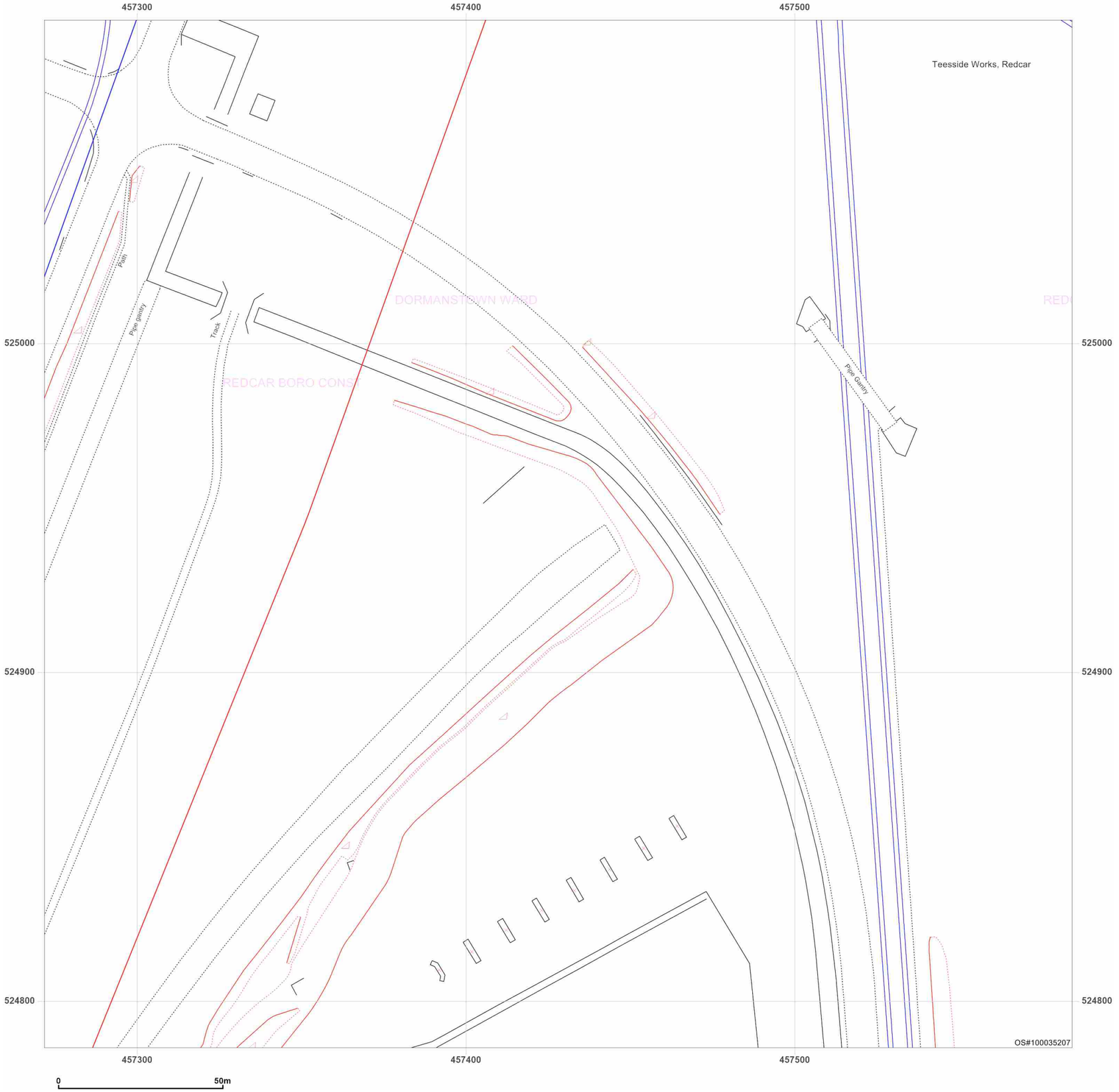

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718_Landline_4_2
Grid Ref: 457428, 524942

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

N
W E
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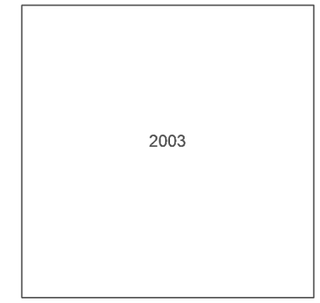

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Production date: 05 April 2022

Map legend available at:
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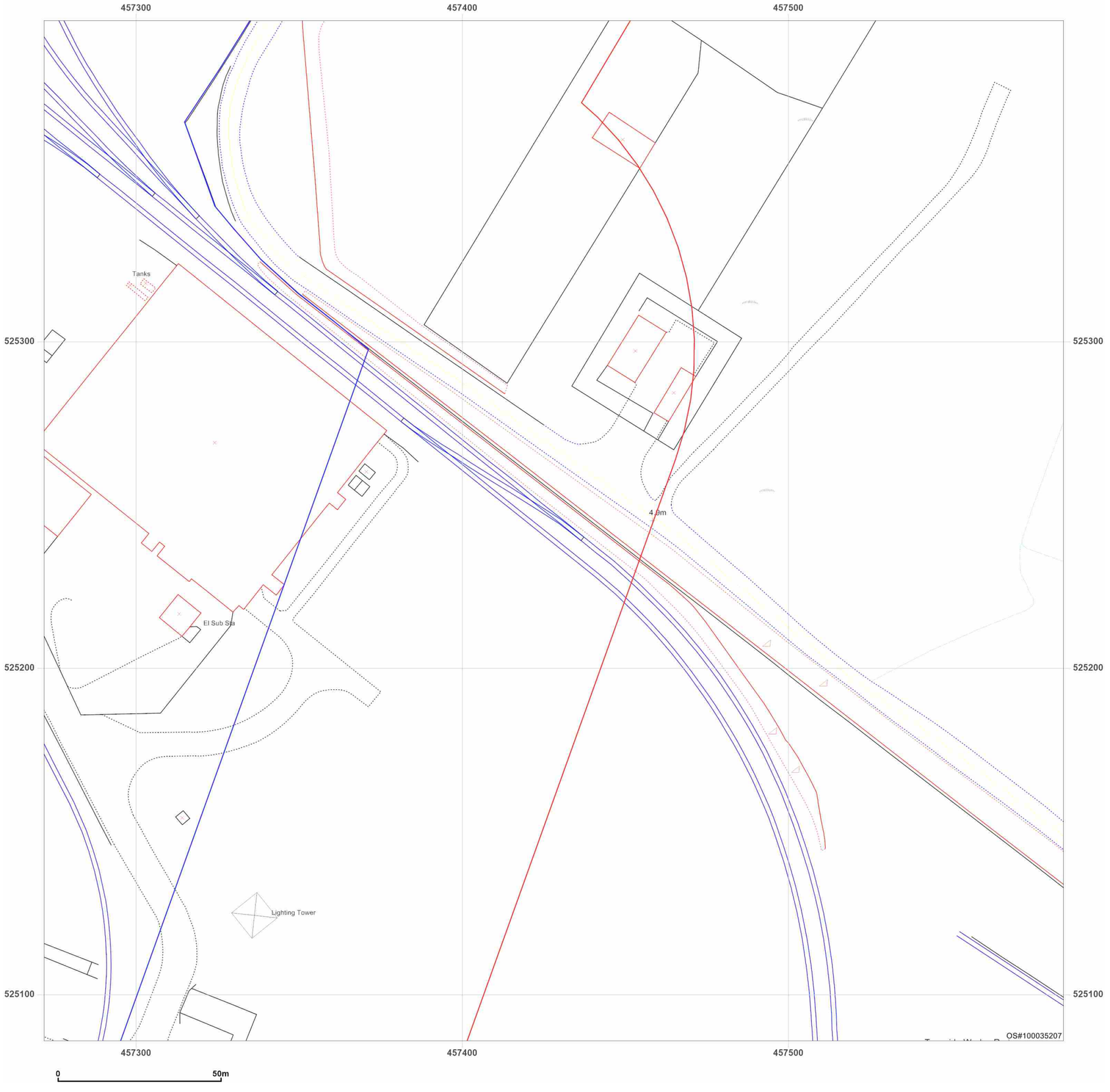


Groundsure INSIGHTS

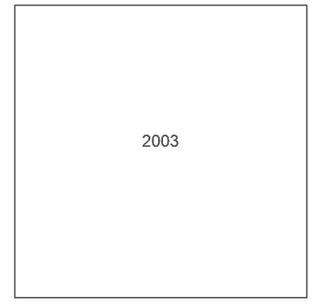
Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_Landline_4_3
Grid Ref: 457428, 525242

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

N
W E
S



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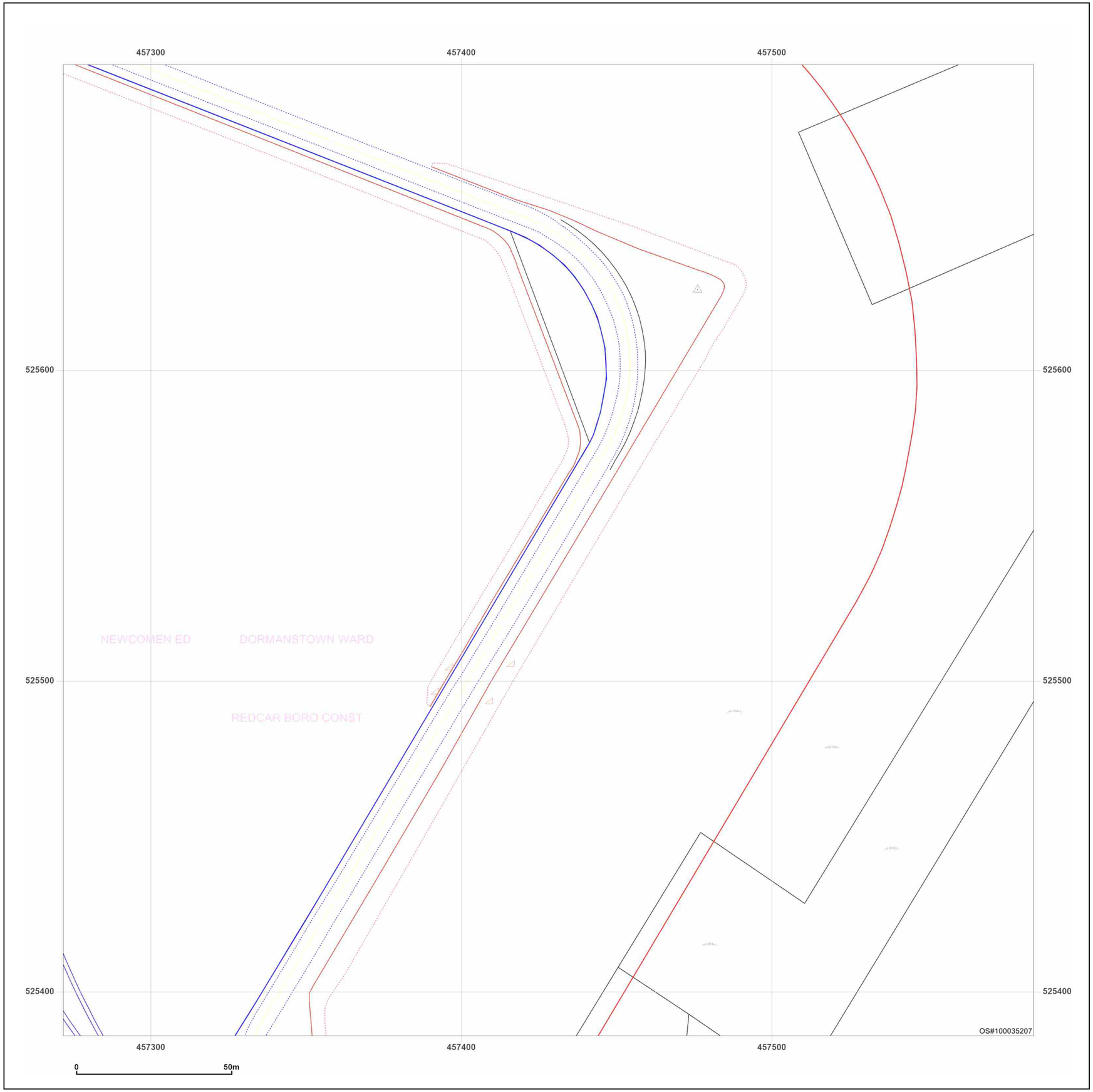

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_Landline_4_4
Grid Ref: 457428, 525542

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

N
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2003

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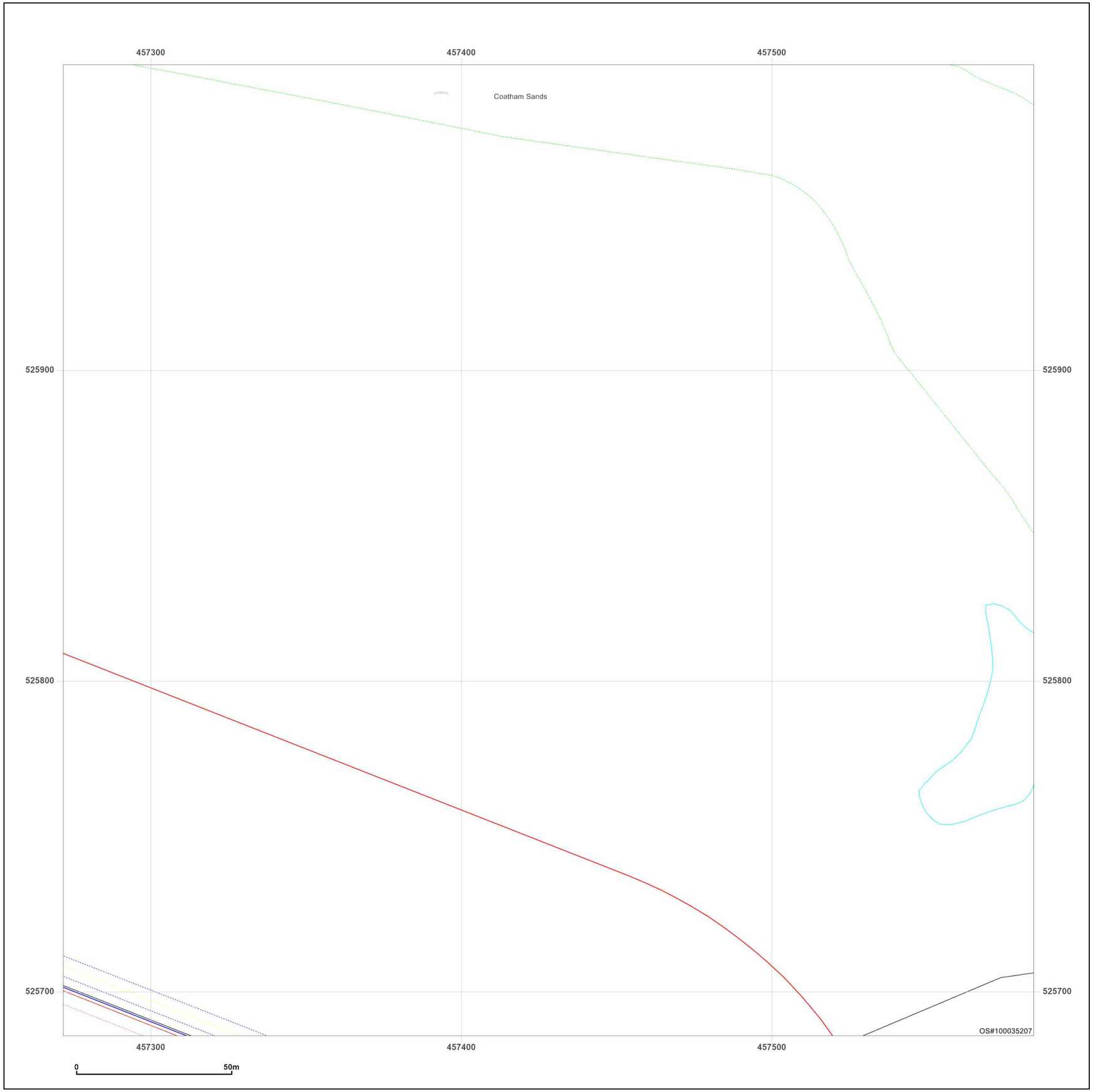


Groundsure INSIGHTS

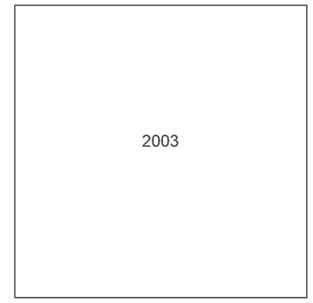
Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_Landline_4_5
Grid Ref: 457428, 525842

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

N
W E
S



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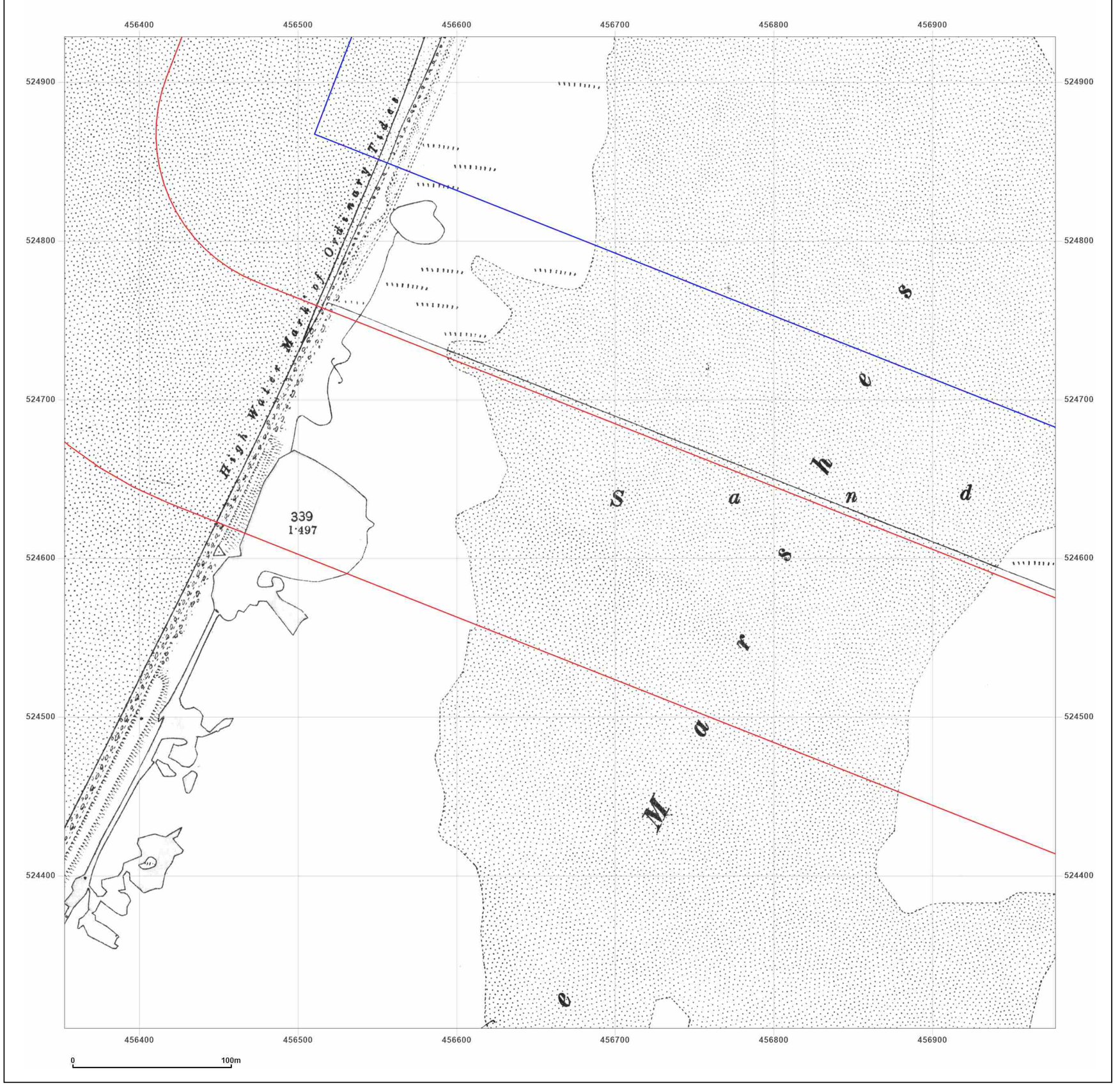

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_LS_1_1
Grid Ref: 456665, 524616

Map Name: County Series

Map date: **1894**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1894
Revised 1894
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 05 April 2022

Map legend available at:
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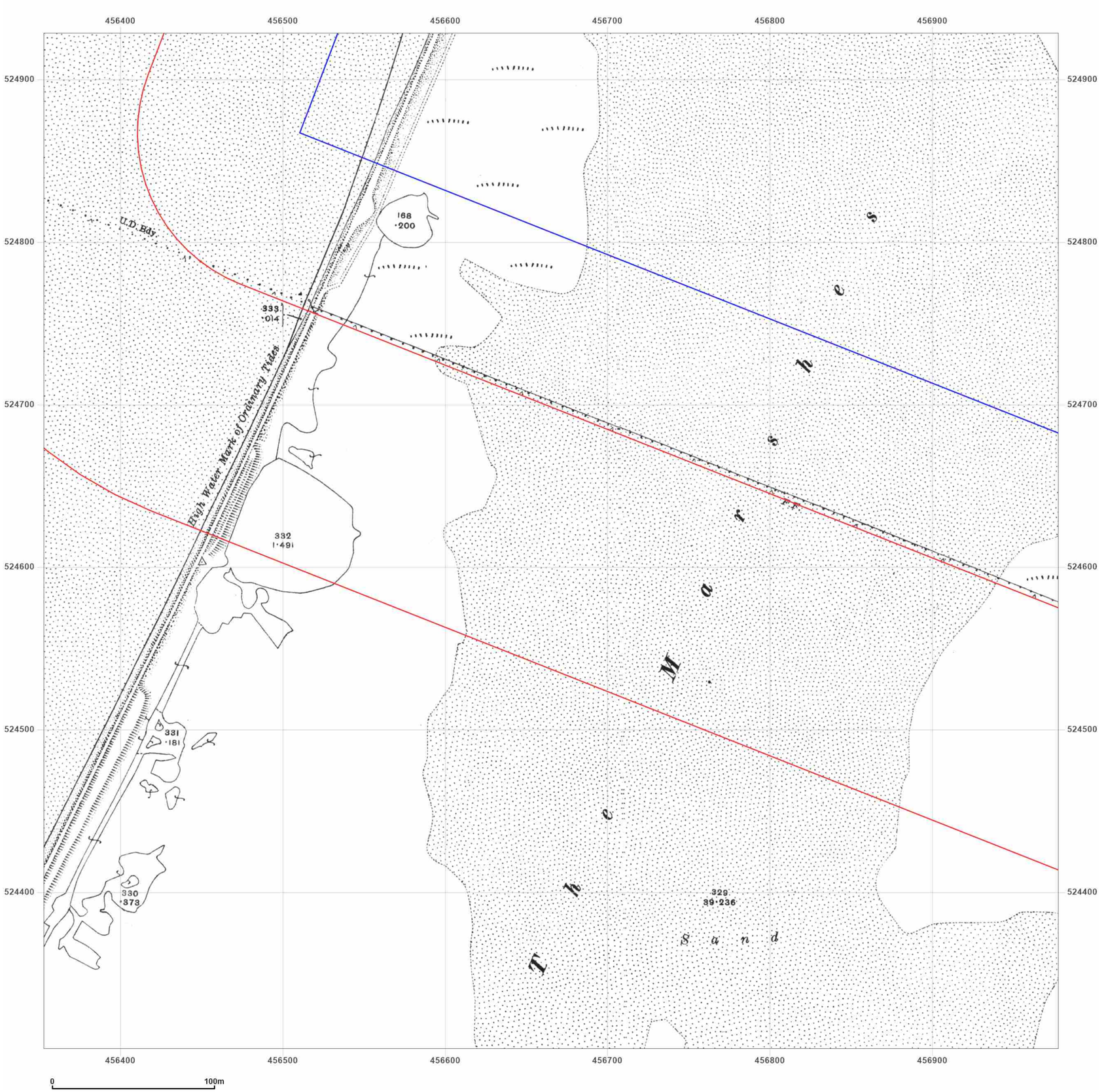

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_LS_1_1
Grid Ref: 456665, 524616

Map Name: County Series

Map date: **1915**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1915
Revised 1915
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 05 April 2022

Map legend available at:
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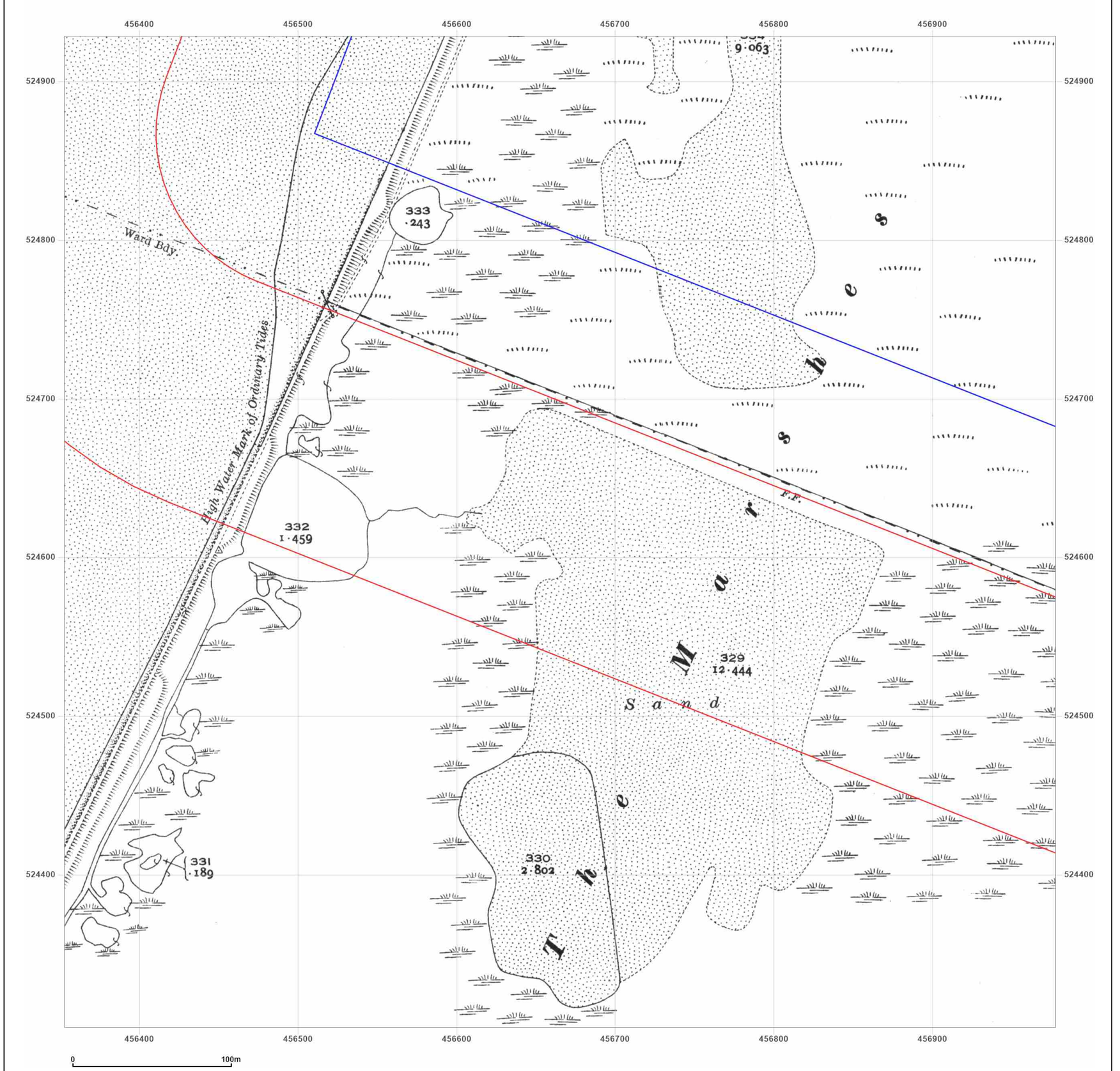

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_LS_1_1
Grid Ref: 456665, 524616

Map Name: County Series

Map date: **1929**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1929
Revised 1929
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 05 April 2022

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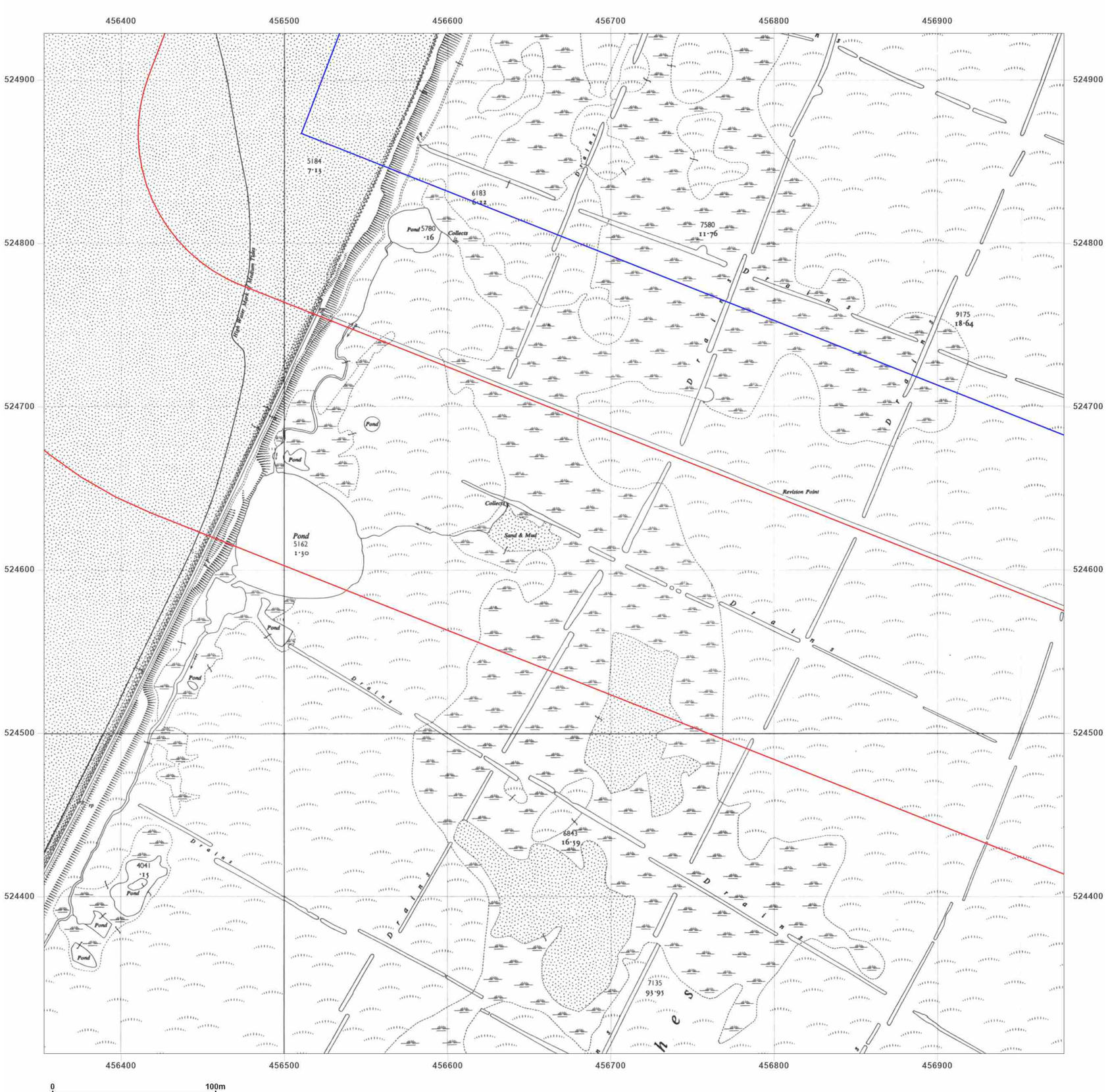

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_LS_1_1
Grid Ref: 456665, 524616

Map Name: National Grid

Map date: **1954**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1952
Revised 1952
Edition 1954
Copyright N/A
Levelled 1948

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Production date: 05 April 2022

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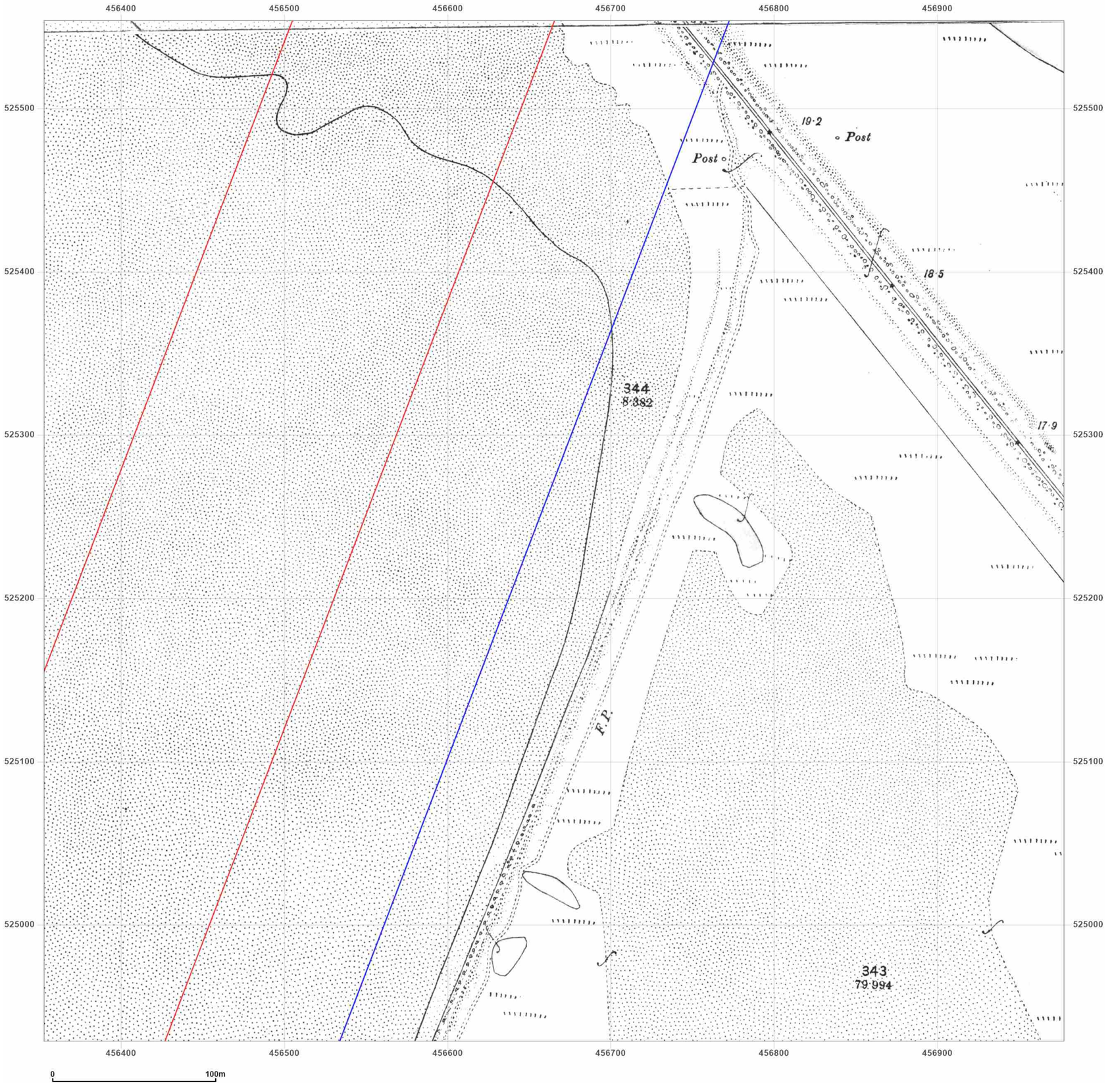

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718_LS_1_2
Grid Ref: 456665, 525241

Map Name: County Series

Map date: **1894**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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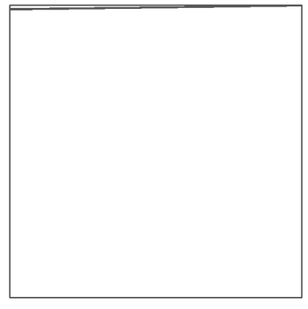
Surveyed 1894
Revised 1894
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1894
Revised 1894
Edition N/A
Copyright N/A
Levelled N/A

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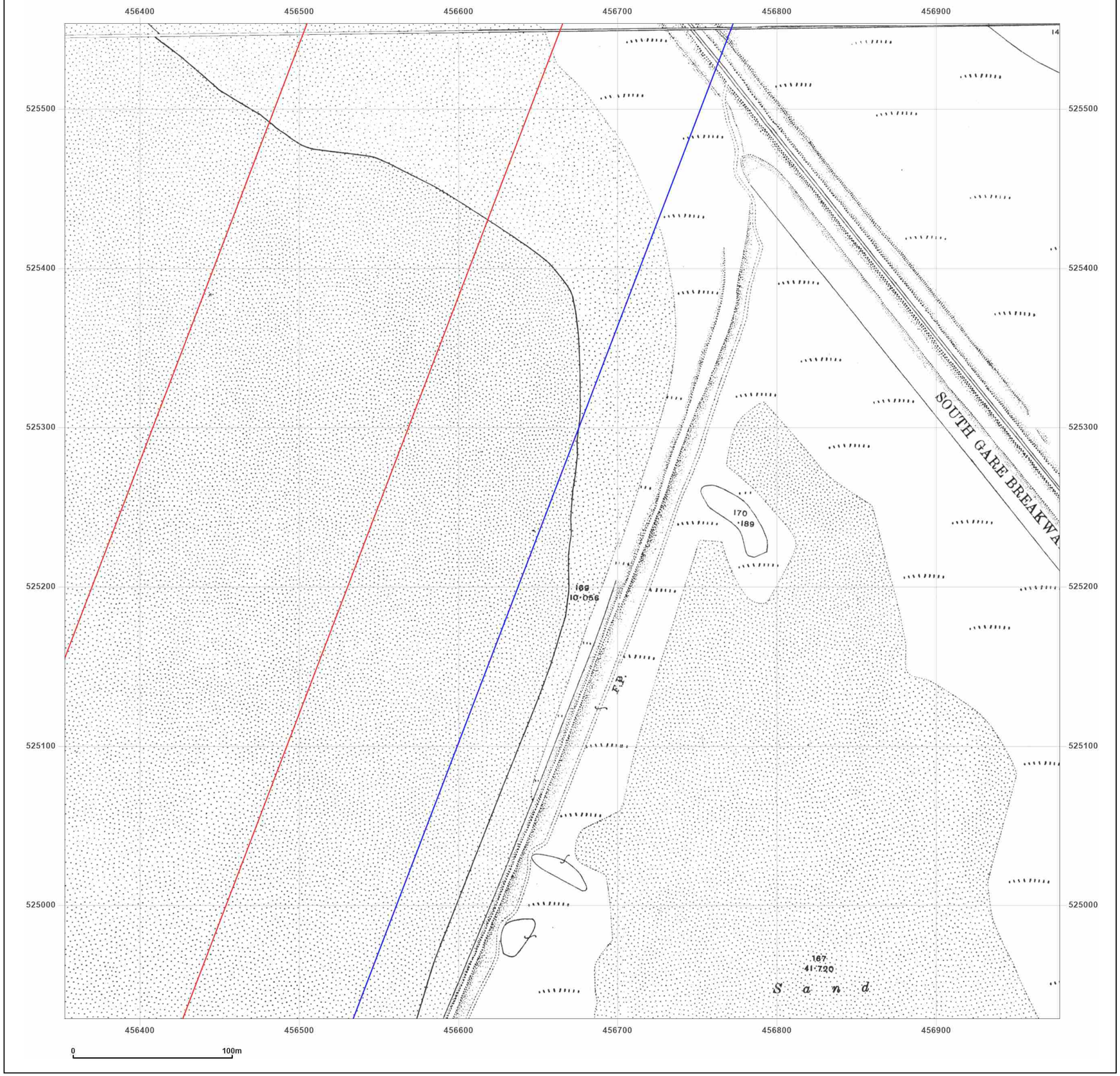

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_LS_1_2
Grid Ref: 456665, 525241

Map Name: County Series

Map date: **1915**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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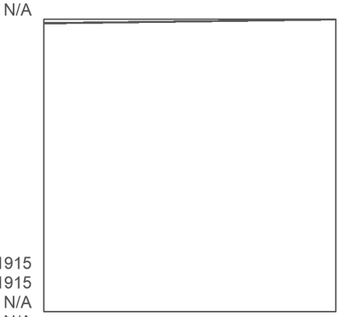
Surveyed 1915
Revised 1915
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1915
Revised 1915
Edition N/A
Copyright N/A
Levelled N/A

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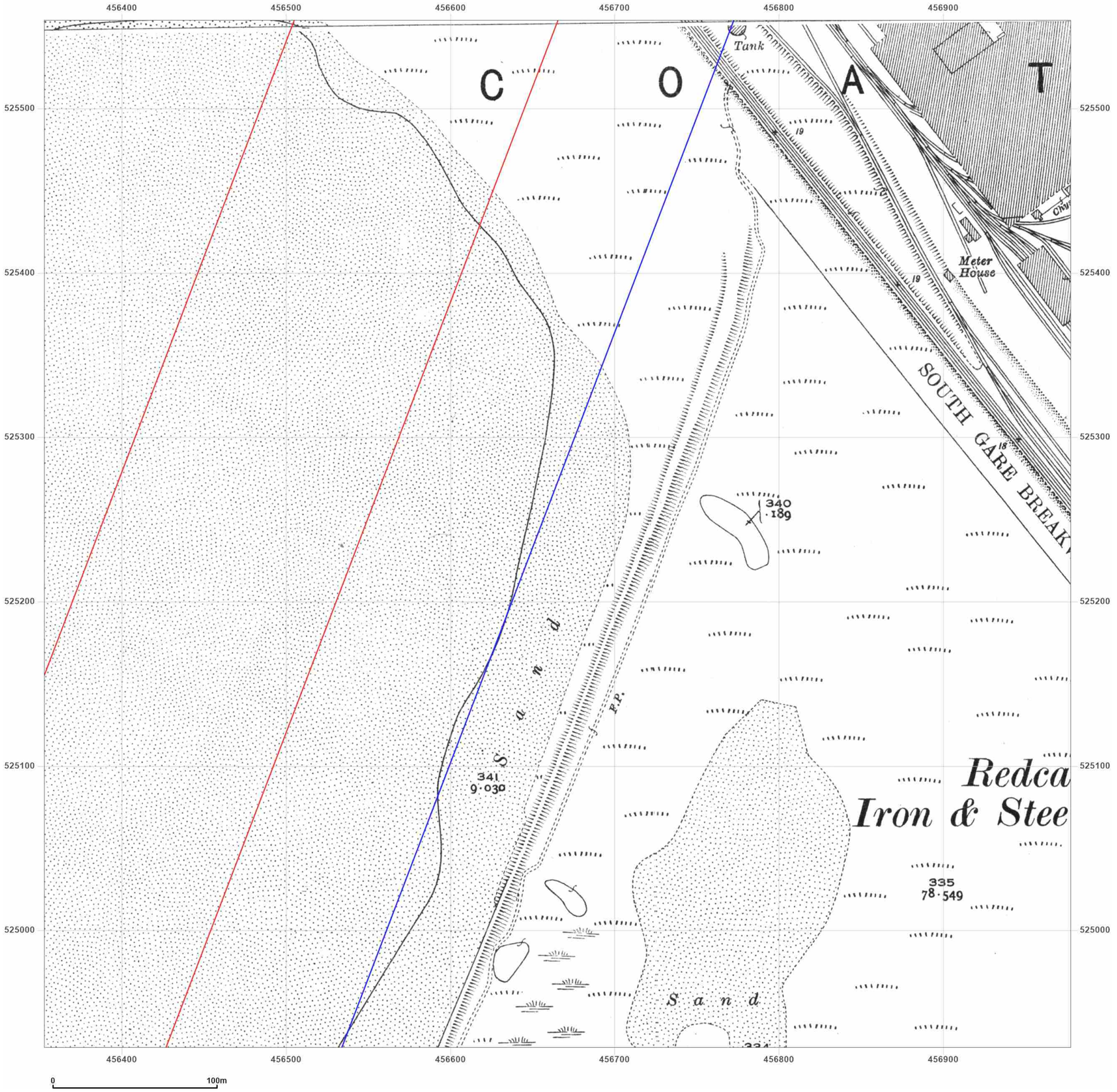


Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718_LS_1_2
Grid Ref: 456665, 525241

Map Name: County Series

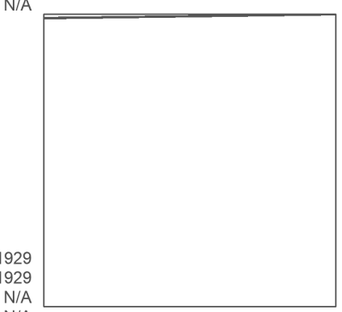
Map date: **1929**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

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



Surveyed 1929
Revised 1929
Edition N/A
Copyright N/A
Levelled N/A

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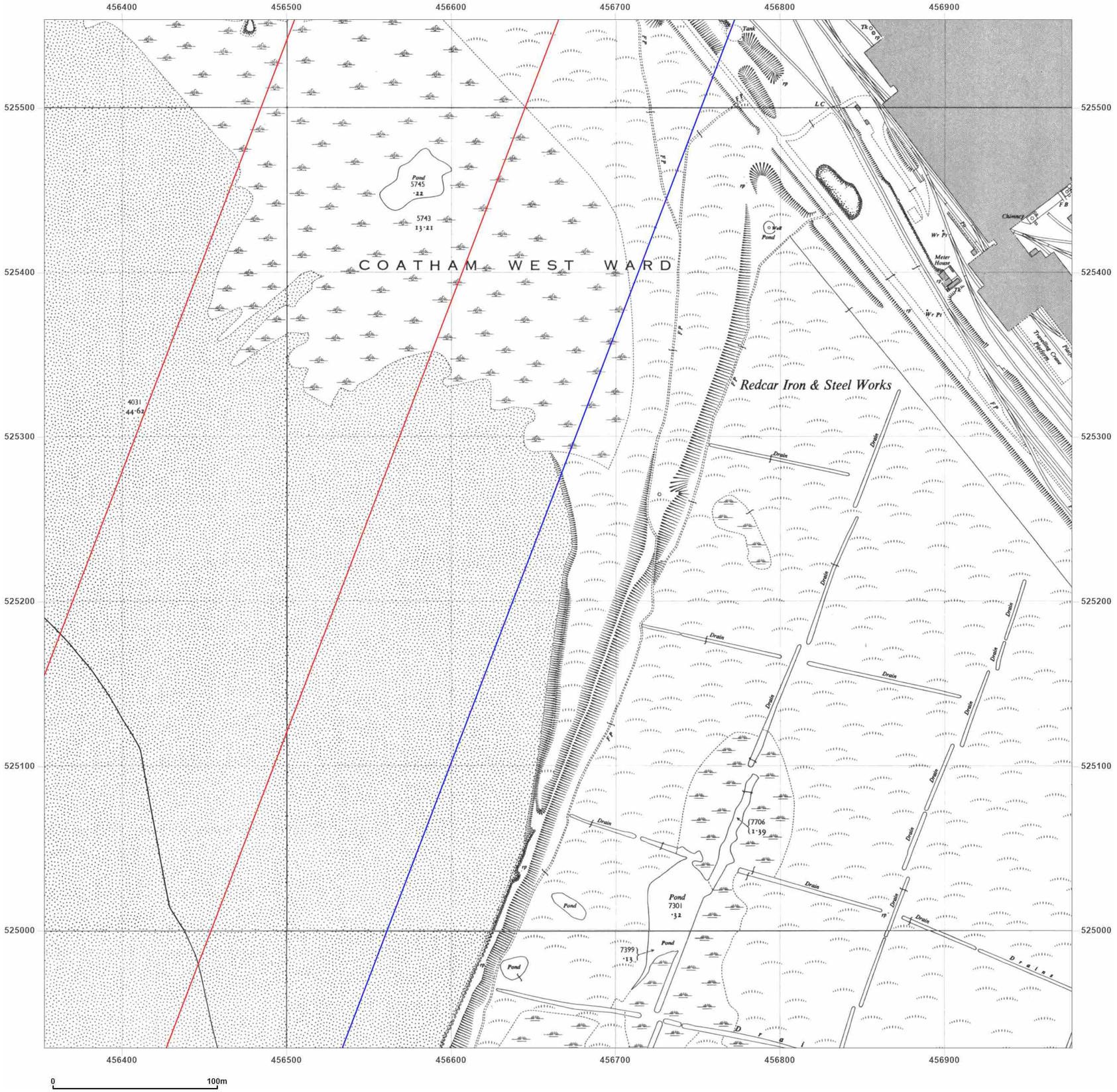

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718_LS_1_2
Grid Ref: 456665, 525241

Map Name: National Grid

Map date: **1952-1954**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1948

Surveyed 1952
Revised 1952
Edition 1954
Copyright N/A
Levelled 1948

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Production date: 05 April 2022

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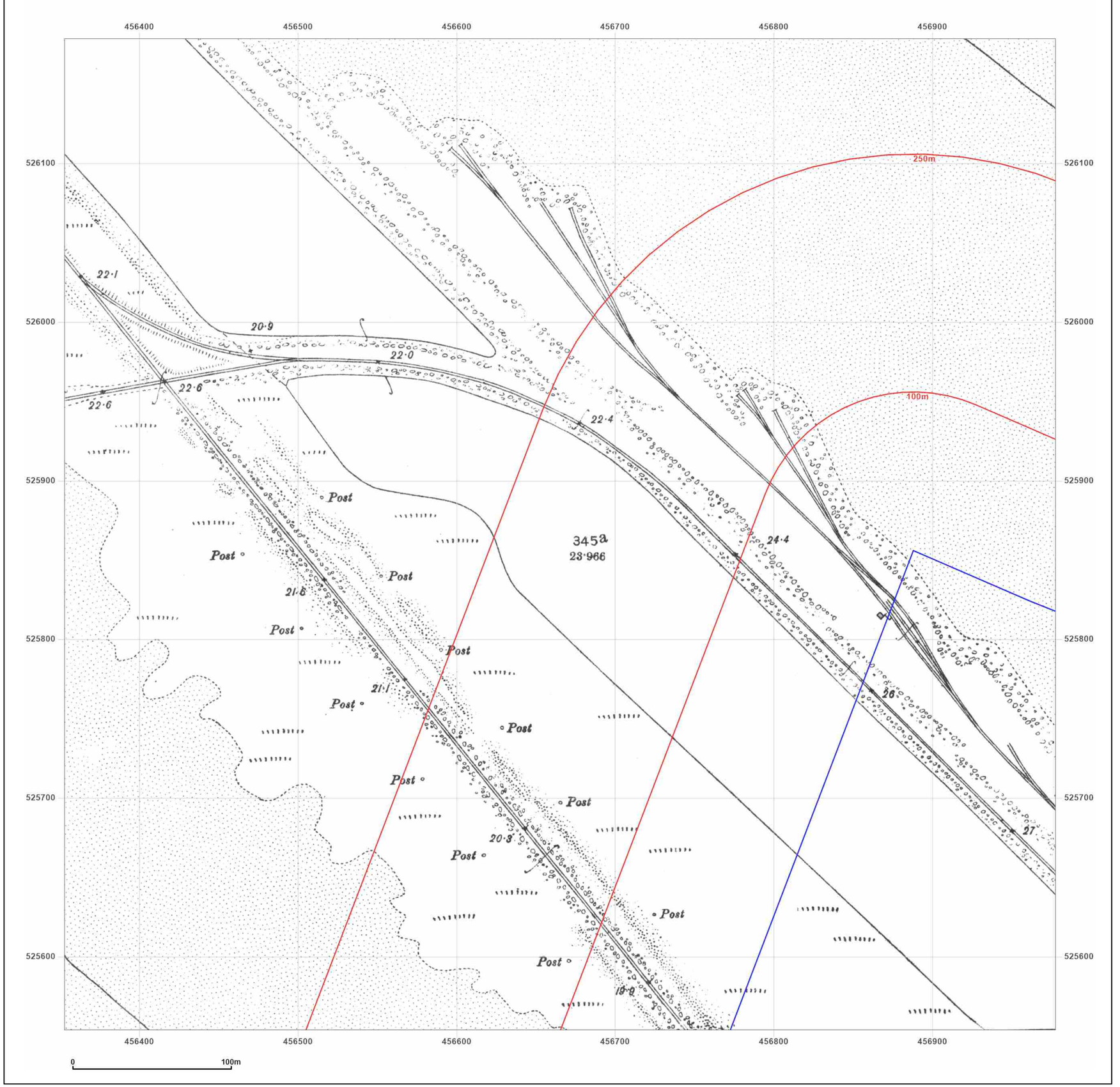

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_LS_1_3
Grid Ref: 456665, 525866

Map Name: County Series

Map date: **1894**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1894
Revised 1894
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 05 April 2022

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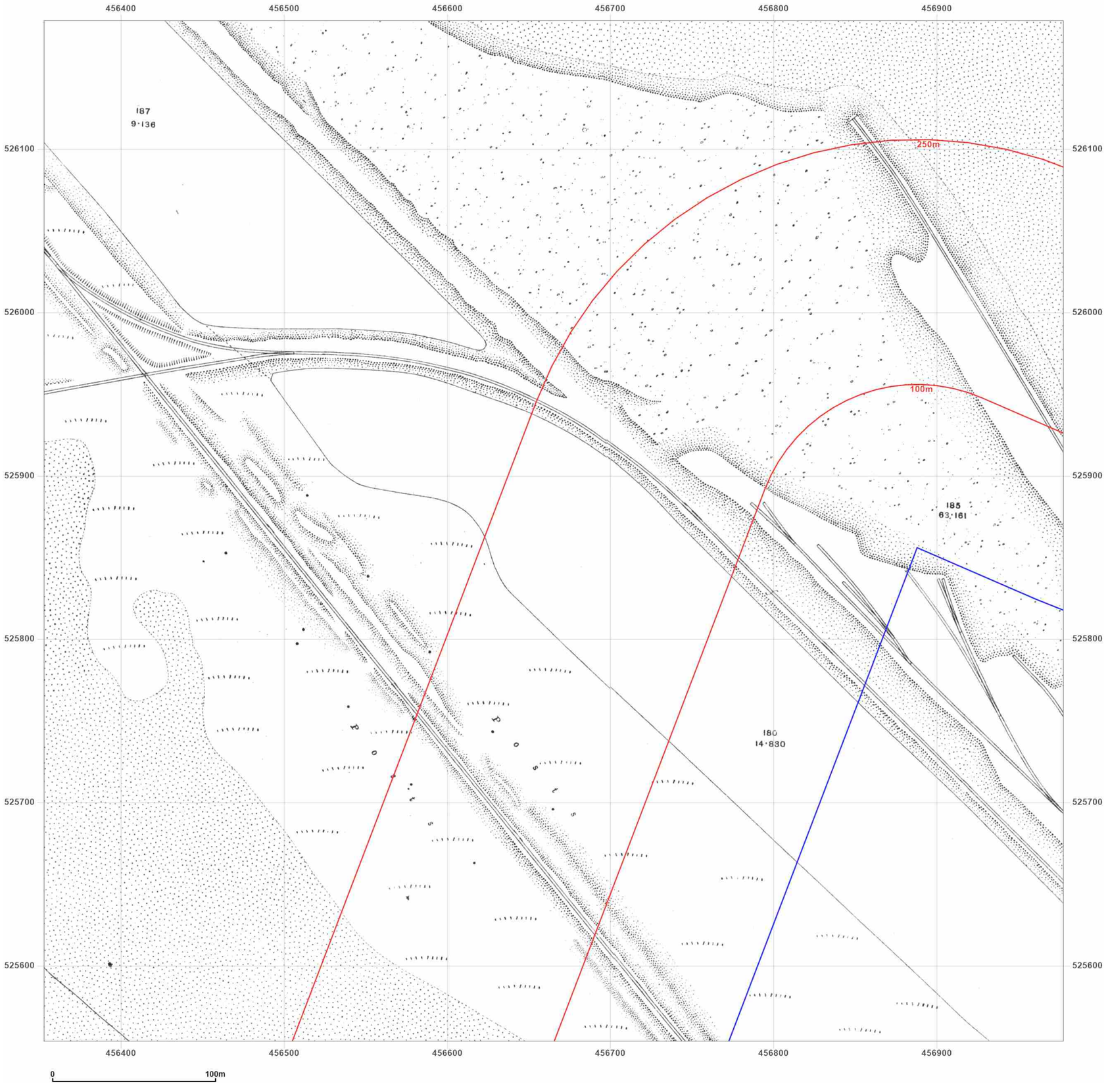

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_LS_1_3
Grid Ref: 456665, 525866

Map Name: County Series

Map date: **1915**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1915
Revised 1915
Edition N/A
Copyright N/A
Levelled N/A

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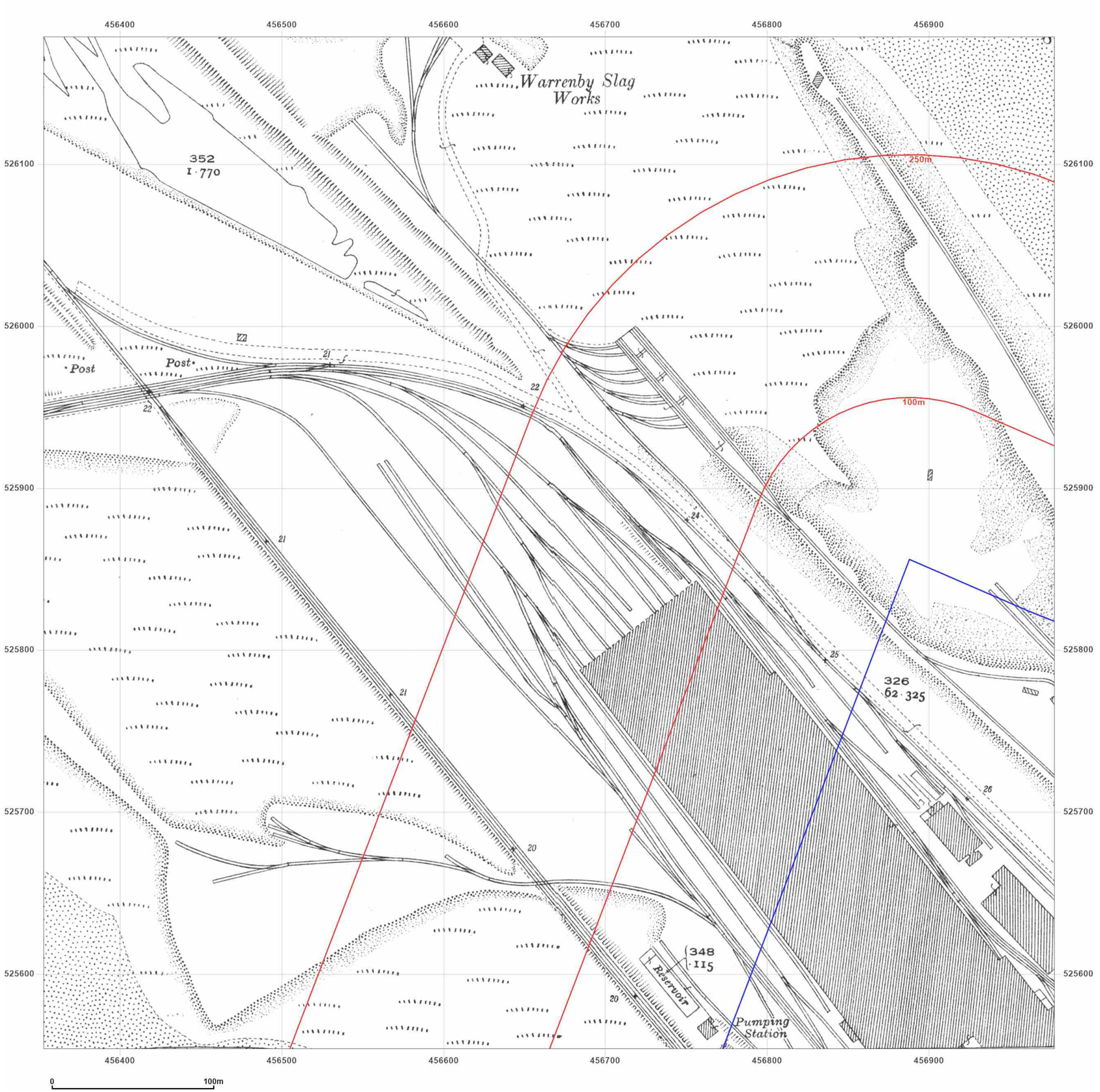

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718_LS_1_3
Grid Ref: 456665, 525866

Map Name: County Series

Map date: **1929**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

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

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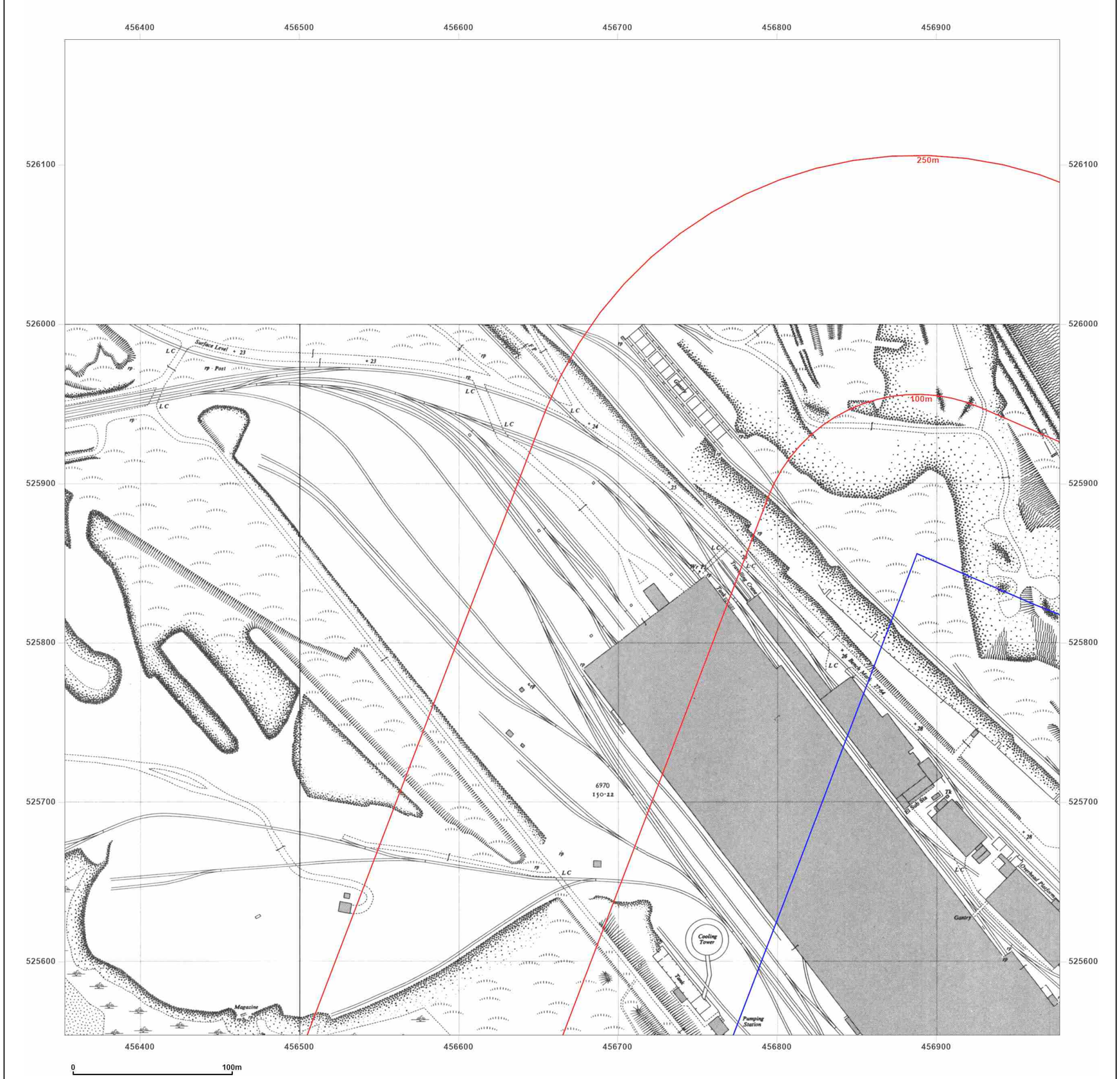

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718_LS_1_3
Grid Ref: 456665, 525866

Map Name: National Grid

Map date: **1952**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1948

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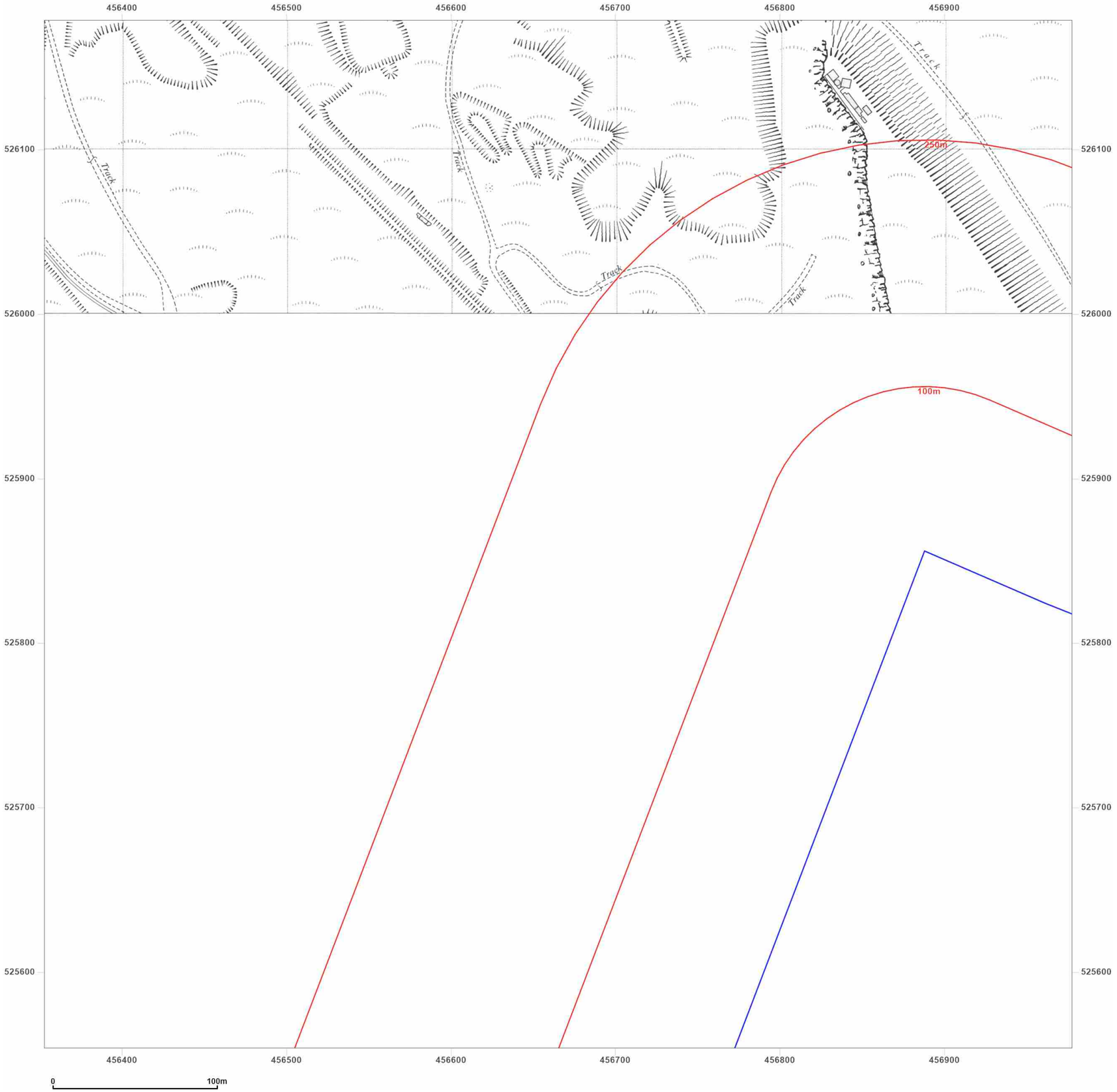

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718_LS_1_3
Grid Ref: 456665, 525866

Map Name: National Grid

Map date: **1968**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1967
Revised 1967
Edition N/A
Copyright 1968
Levelled 1959

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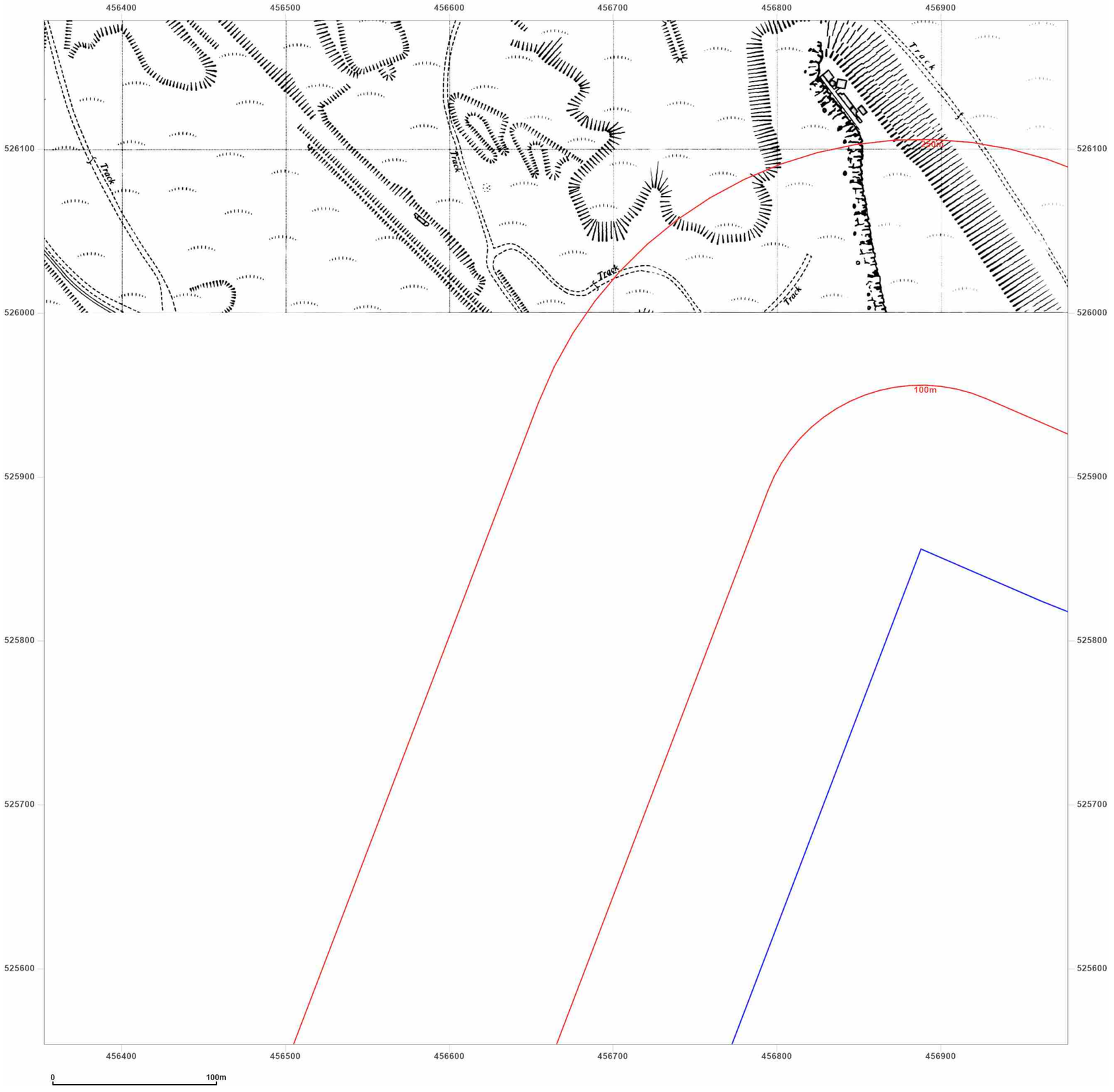

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718_LS_1_3
Grid Ref: 456665, 525866

Map Name: National Grid

Map date: **1969**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

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

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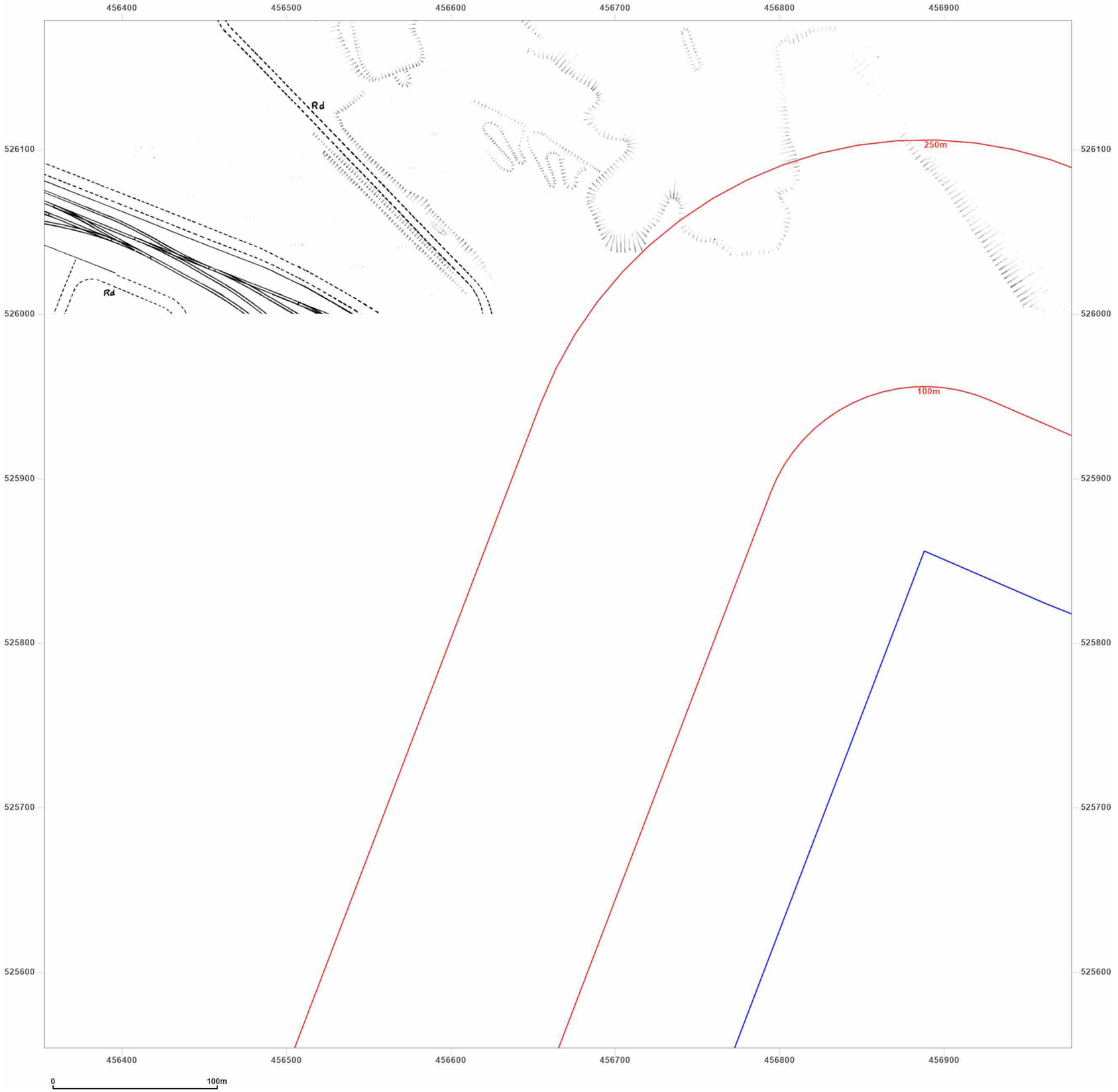

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718_LS_1_3
Grid Ref: 456665, 525866

Map Name: National Grid

Map date: **1984**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1984
Levelled 1959

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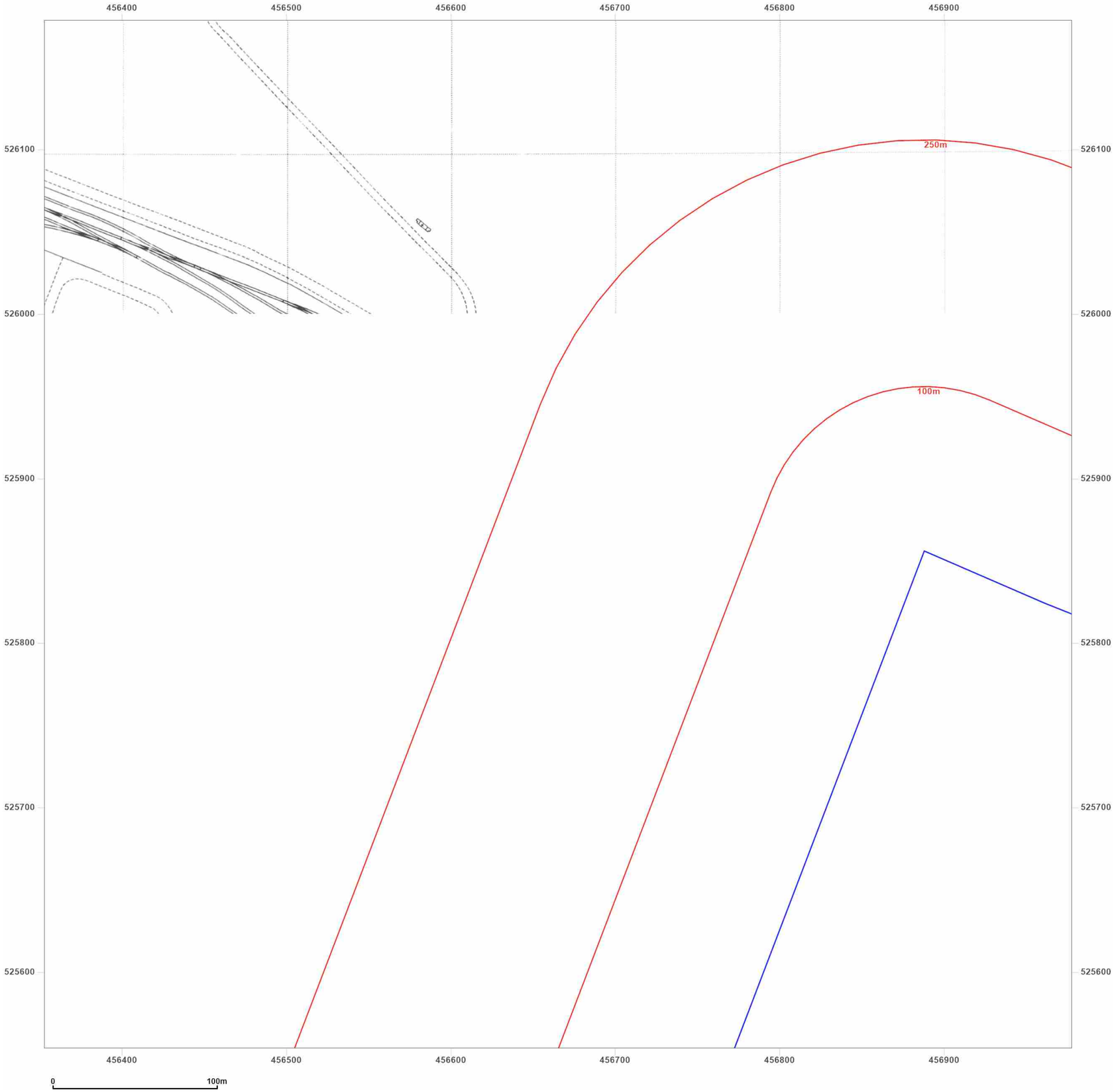

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707____NZT
Report Ref: GS-8650718_LS_1_3
Grid Ref: 456665, 525866

Map Name: National Grid

Map date: **1993**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1993
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

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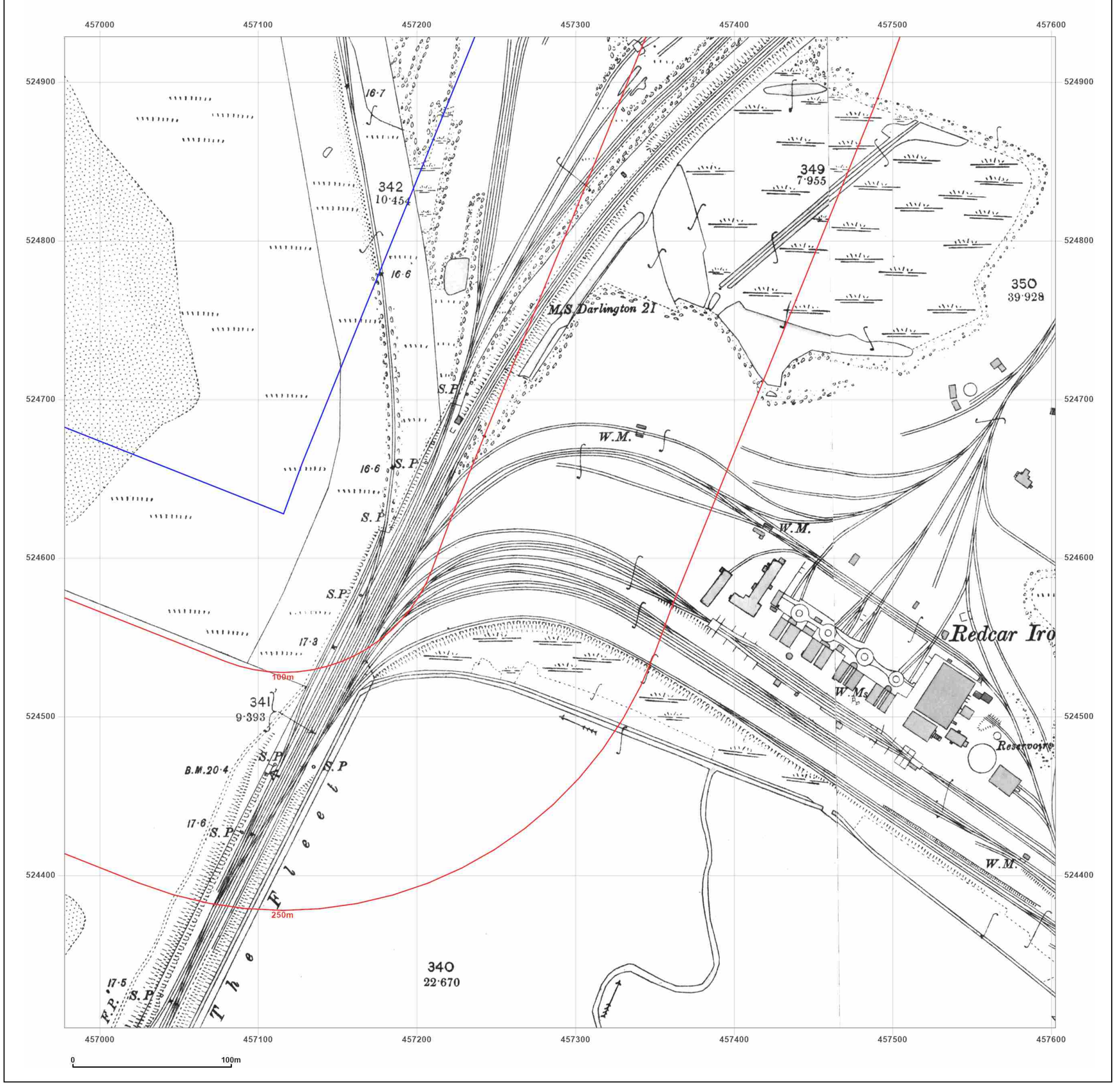

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_LS_2_1
Grid Ref: 457290, 524616

Map Name: County Series

Map date: **1894**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1894
Revised 1894
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1894
Revised 1894
Edition N/A
Copyright N/A
Levelled N/A

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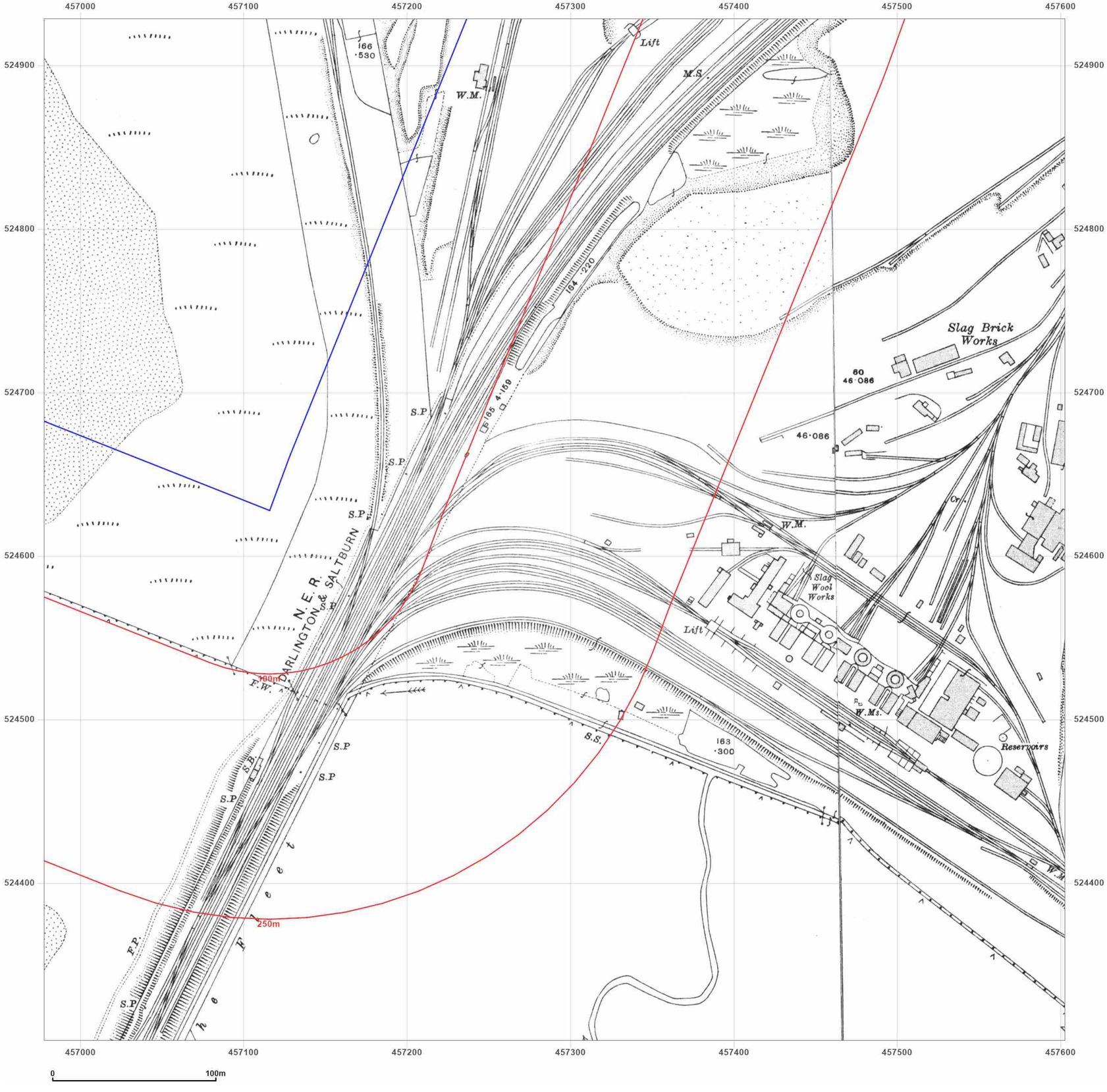

Groundsure INSIGHTS

Site Details:

456854, 525331

Client Ref: 14061707_____NZT
Report Ref: GS-8650718_LS_2_1
Grid Ref: 457290, 524616

Map Name: County Series

Map date: **1914-1915**

Scale: 1:2,500

Printed at: 1:2,500

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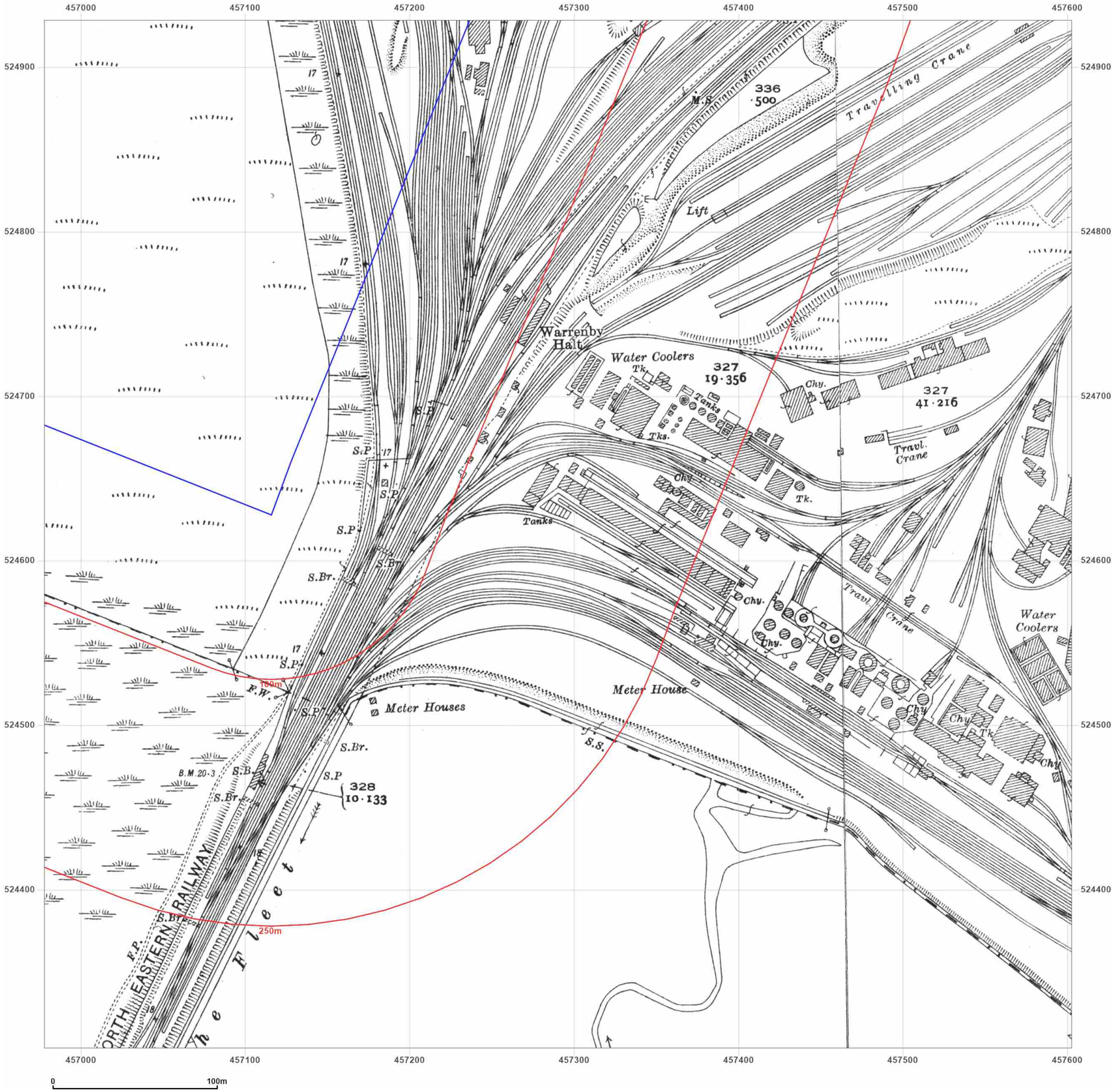

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Grid Ref: 457290, 524616

Map Name: County Series

Map date: **1929**

Scale: 1:2,500

Printed at: 1:2,500

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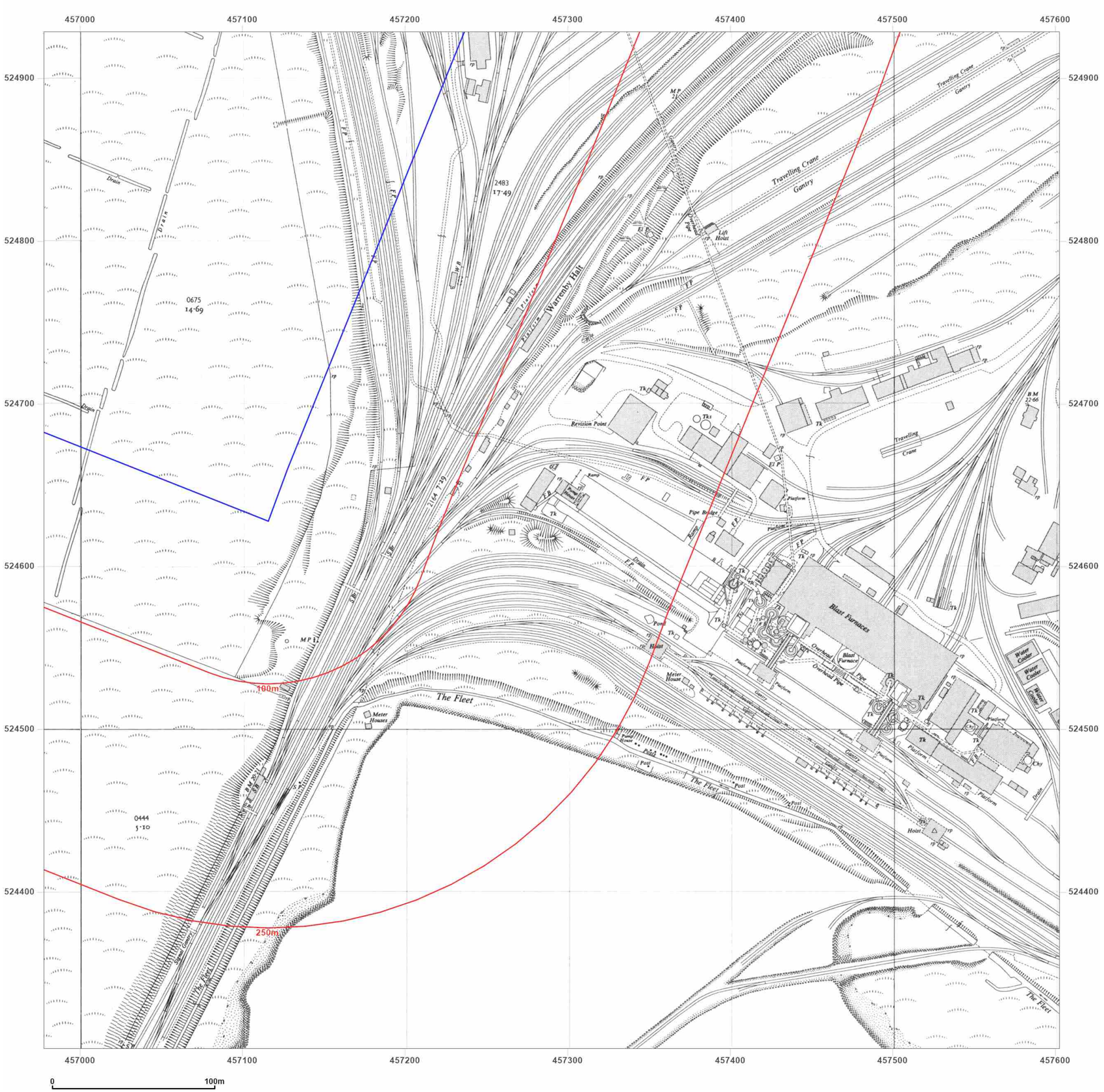

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Grid Ref: 457290, 524616

Map Name: National Grid

Map date: **1954**

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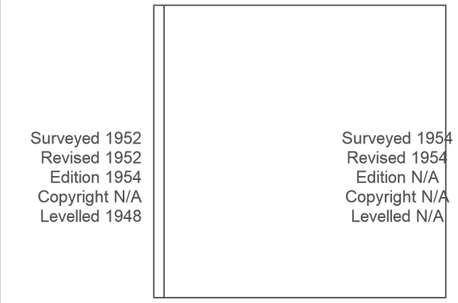

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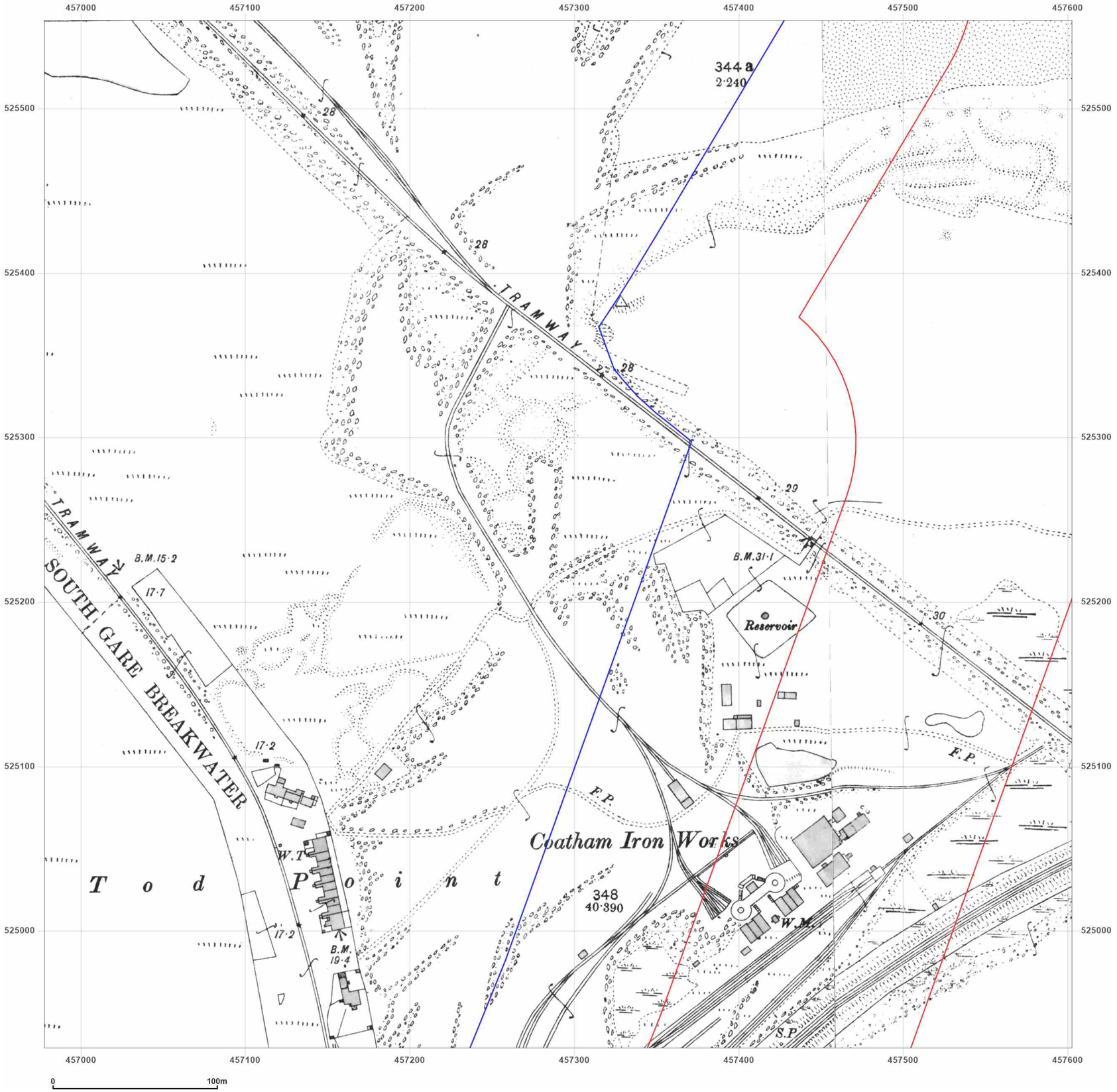

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Map Name: County Series

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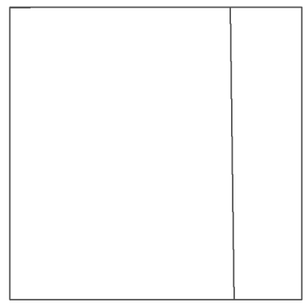

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Client Ref: 14061707_____NZT
Report Ref: GS-8650718_LS_2_2
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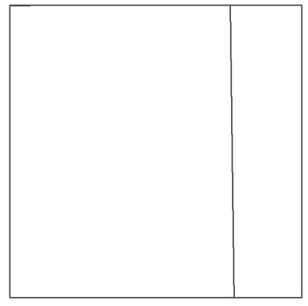

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Site Details:

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Client Ref: 14061707_____NZT
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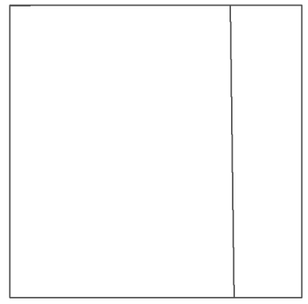

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Edition N/A
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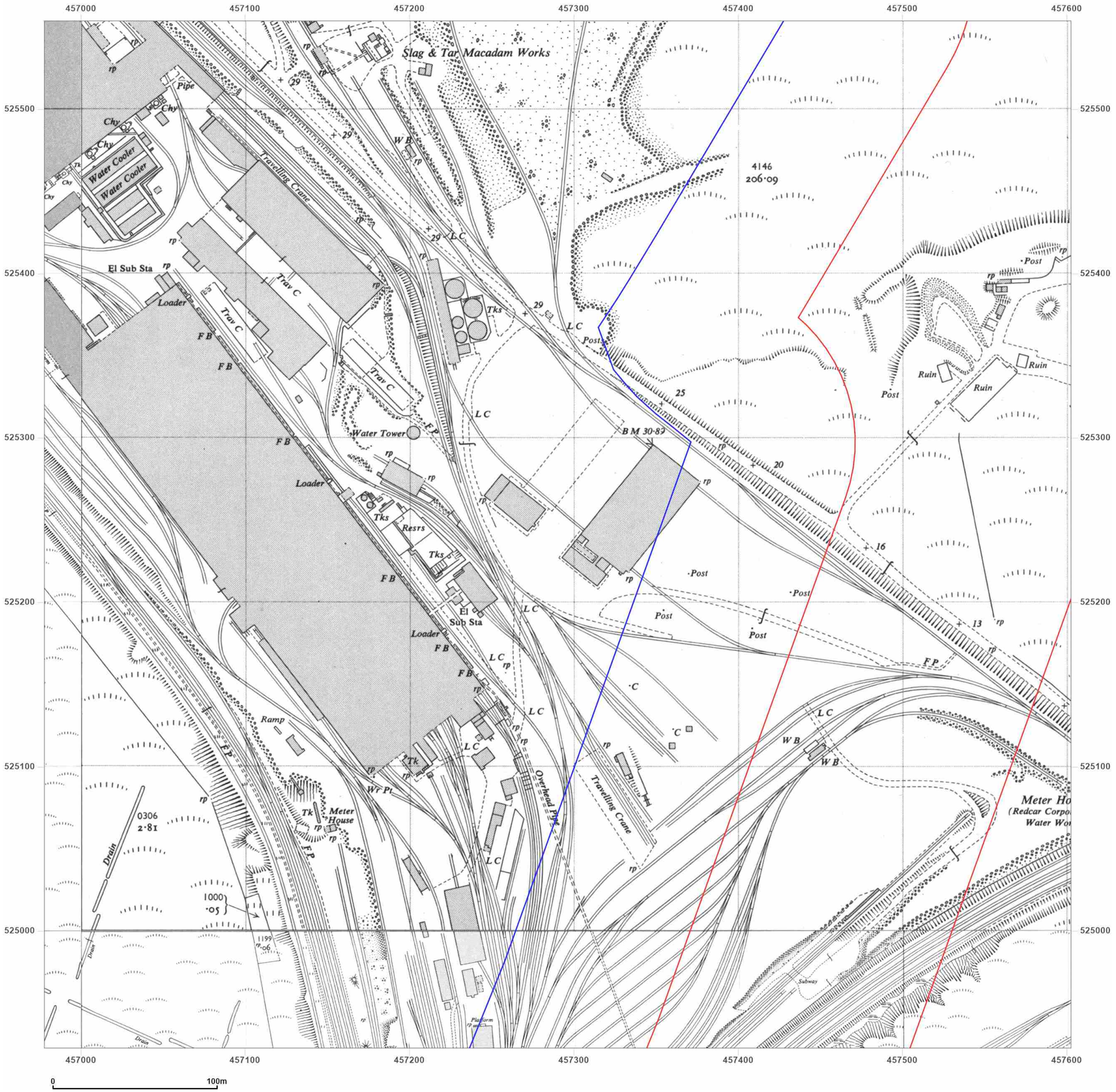

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Revised 1952
Edition N/A
Copyright N/A
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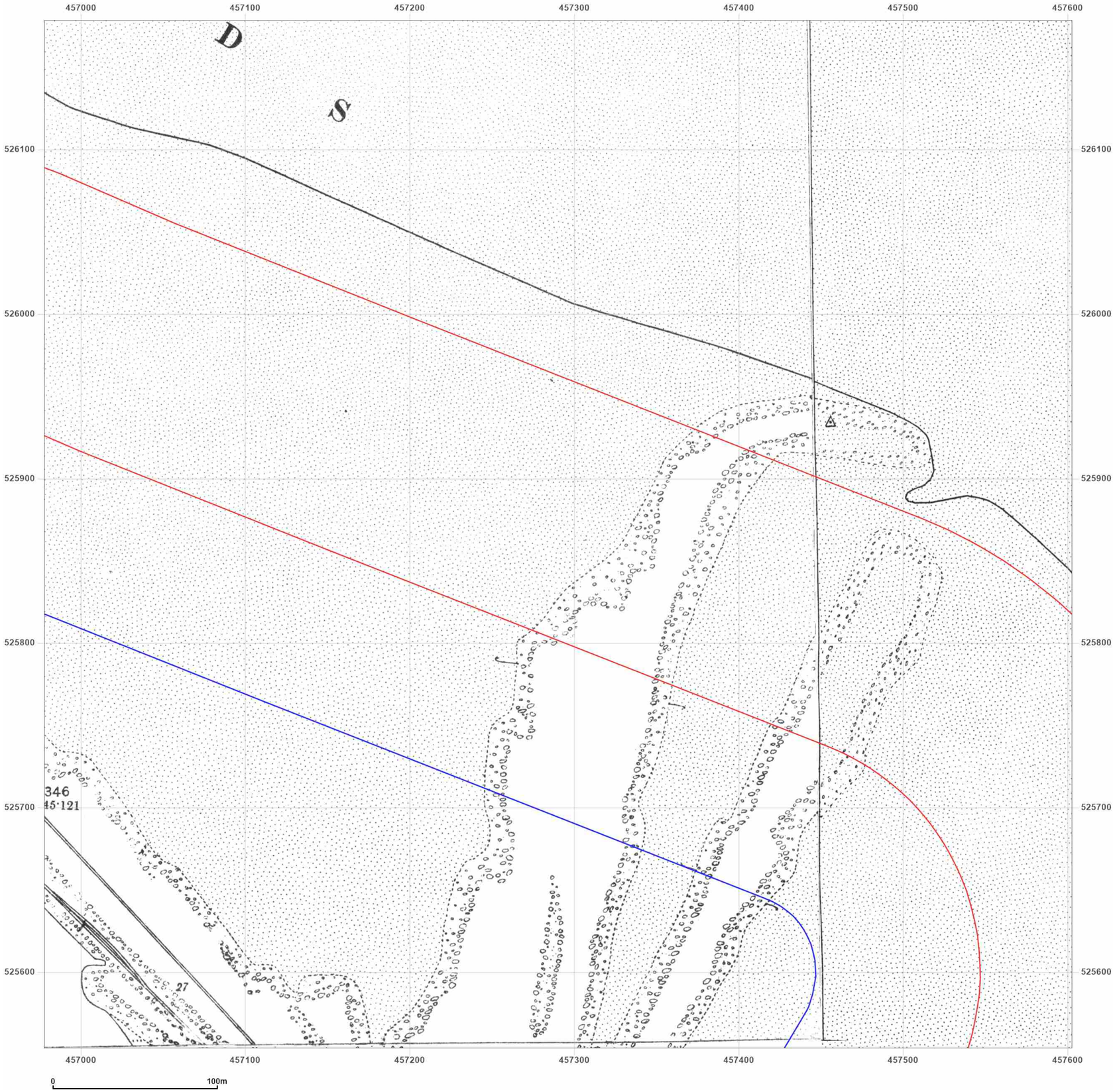

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Map Name: County Series

Map date: **1894**

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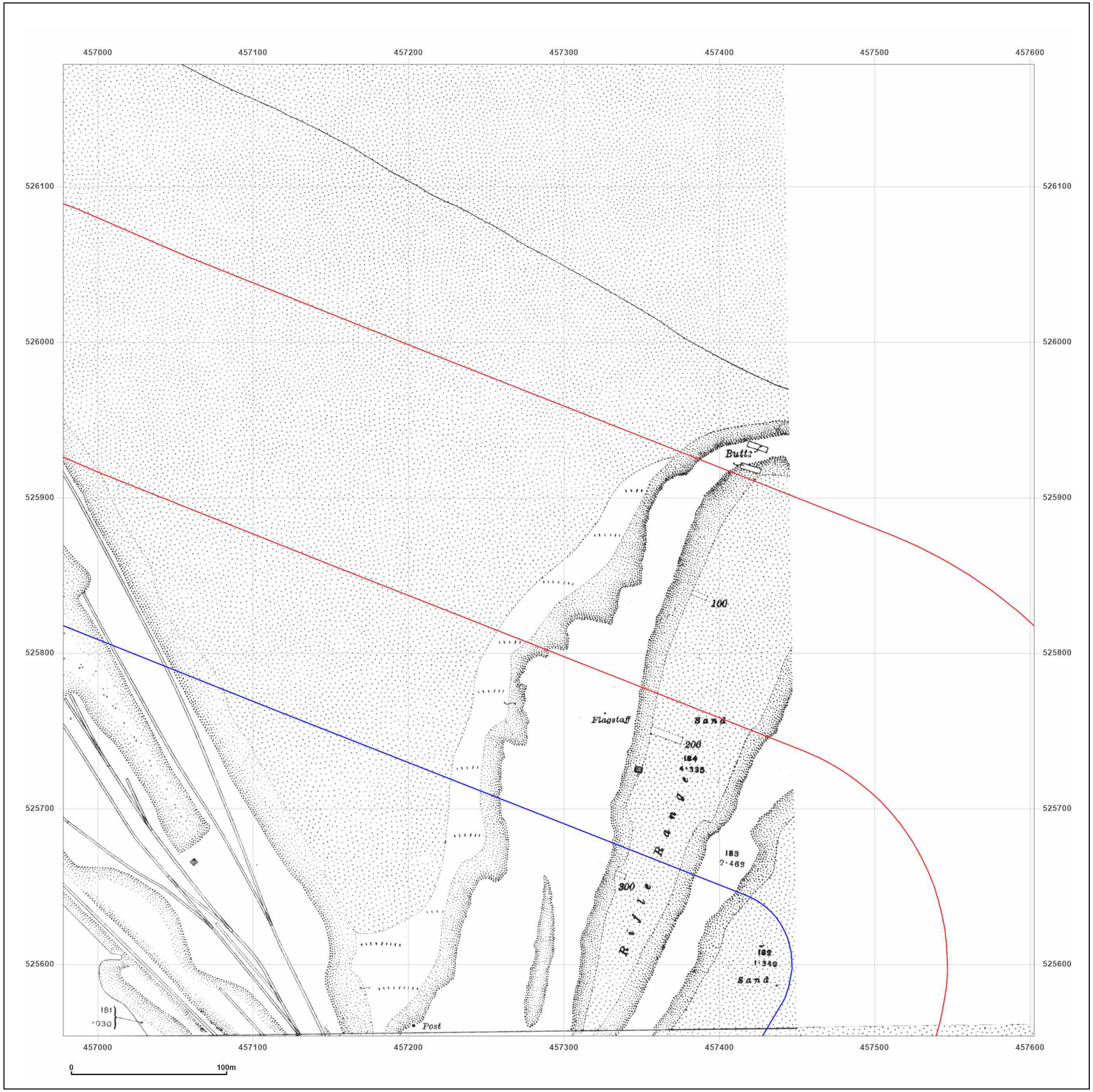

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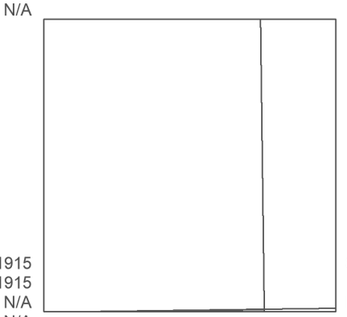

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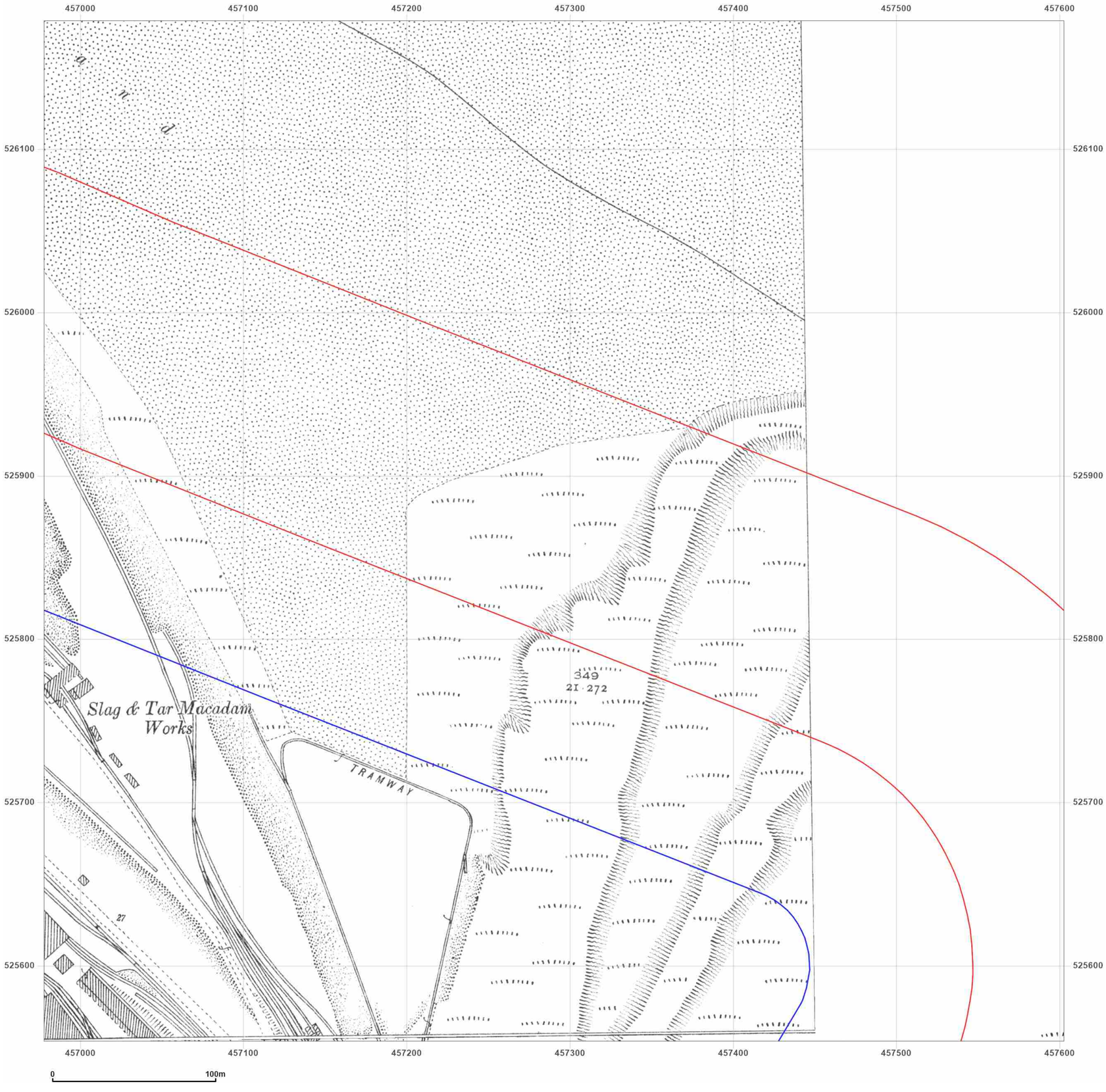

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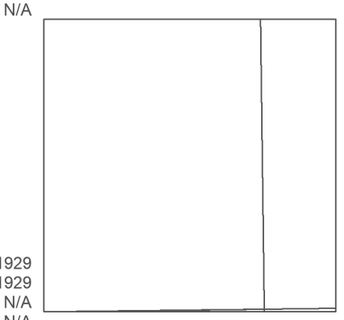

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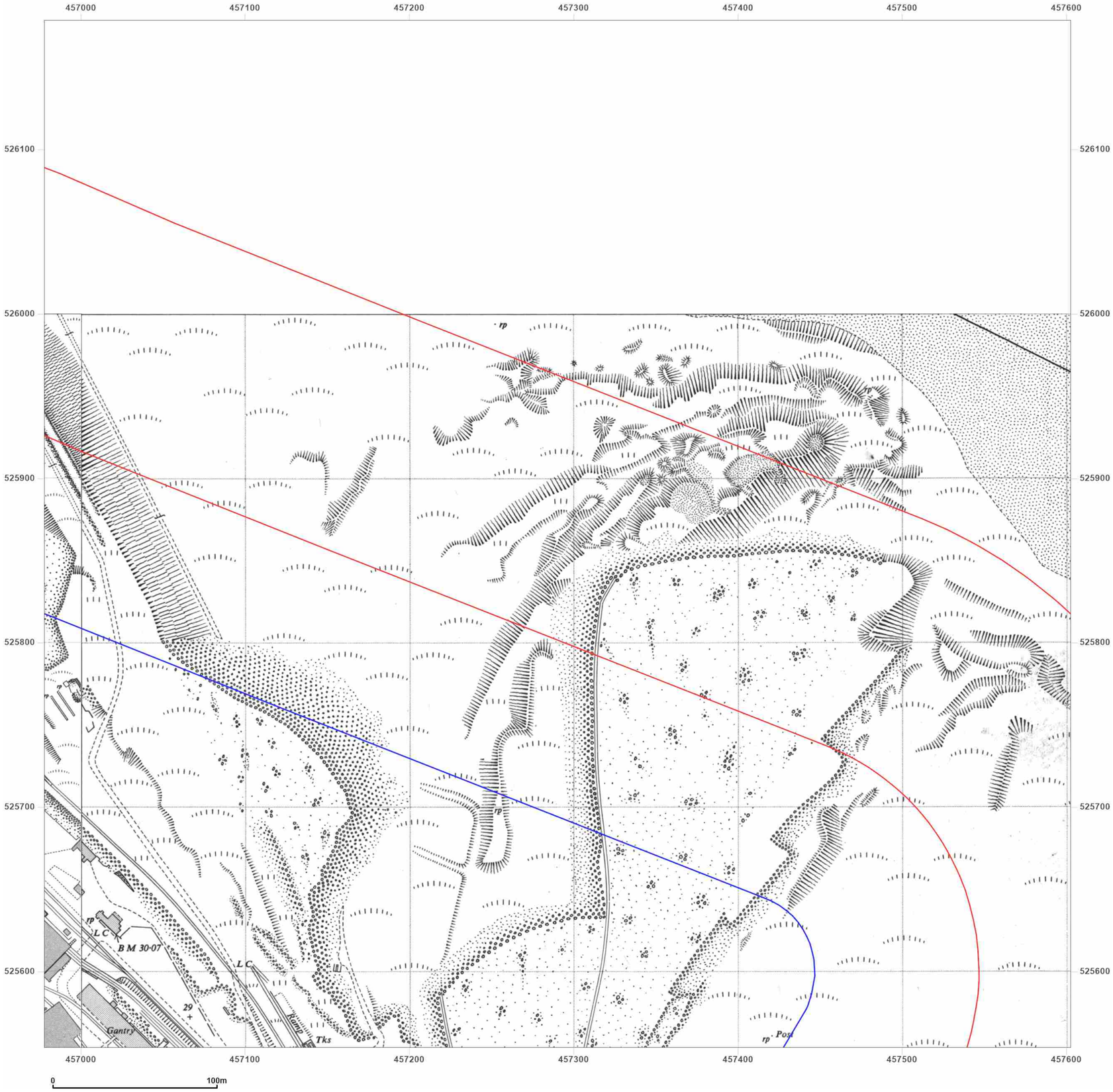

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Map Name: National Grid

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Edition N/A
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Revised 1952
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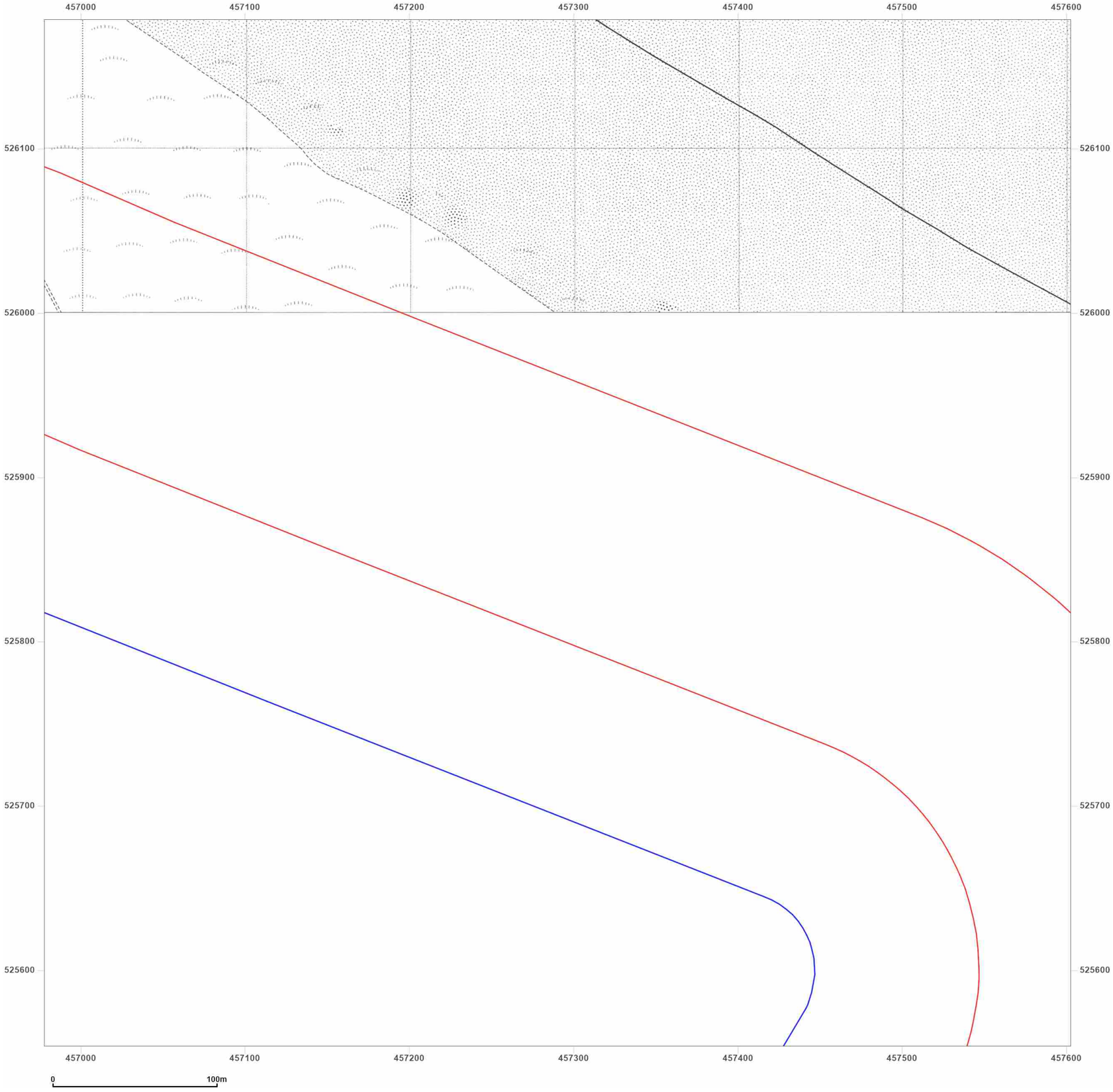

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Map Name: National Grid

Map date: **1968**

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Revised 1967
Edition N/A
Copyright 1968
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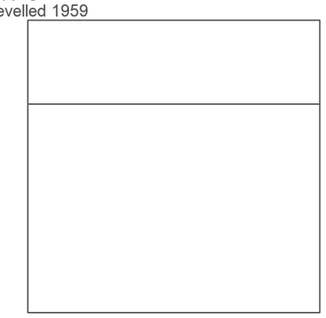

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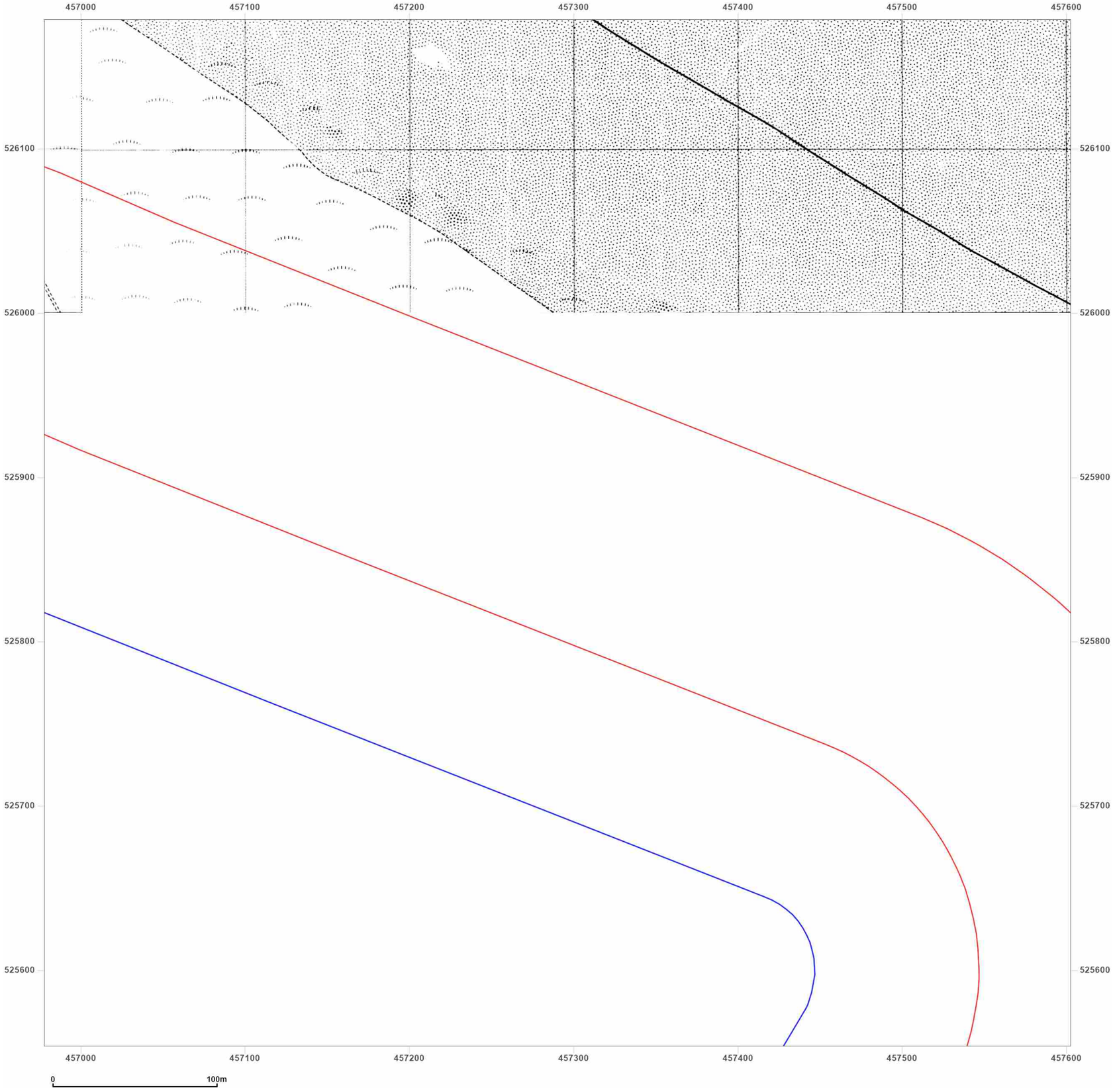

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Map Name: National Grid

Map date: **1969**

Scale: 1:2,500

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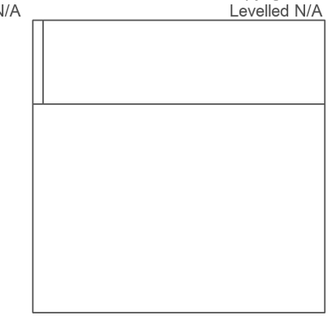

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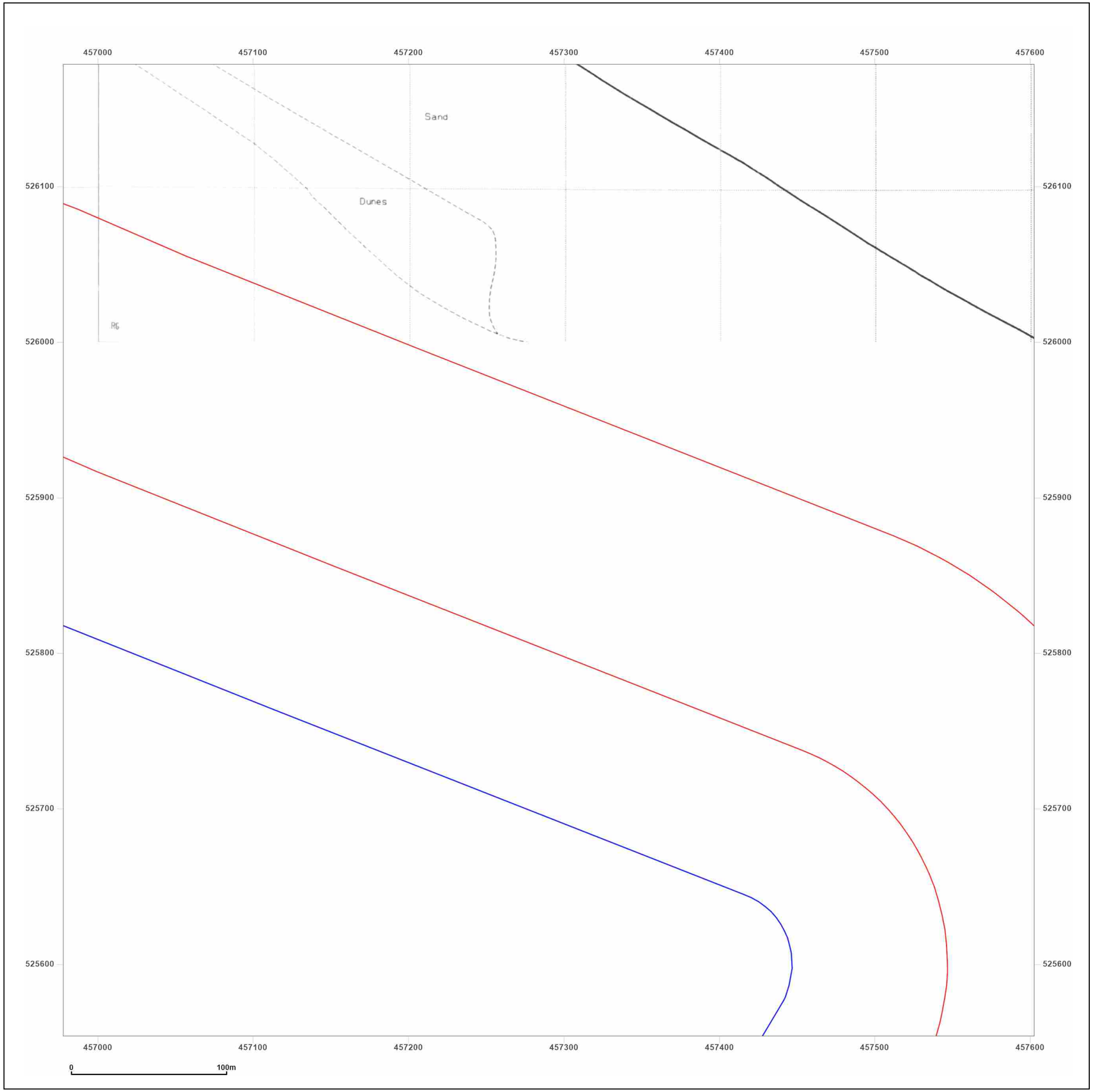

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Report Ref: GS-8650718_LS_2_3
Grid Ref: 457290, 525866

Map Name: National Grid

Map date: **1993**

Scale: 1:2,500

Printed at: 1:2,500

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APPENDIX E

Site Photos April 2022

CLIENT:	South Tees Development Corporation		
Project:	10035117	**Site Name:**	Teesworks – Land West of Warrenby

ARCADIS Design & Consultancy for natural and built assets
1 Whitehall Riverside
Leeds
LS1 4BN

Plate 1

South End of site- former materials storage area with sinter plant in distance.

April 2022.

Plate 2

Former materials storage area with sinter plant and pellet tunnel in middle distance, Redcar blast furnace and coke oven complexes (off site) in far distance.

April 2022.

CLIENT:	South Tees Development Corporation		
Project:	10035117	**Site Name:**	Teesworks – Land West of Warrenby

ARCADIS Design & Consultancy for natural and built assets
1 Whitehall Riverside
Leeds
LS1 4BN

Plate 3

View along eastern site boundary from SE corner. Note windfarm (offsite) in North Sea.

April 2022.

Plate 4

Sinter Plant- currently being demolished.

April 2022.

CLIENT:	South Tees Development Corporation		
Project:	10035117	**Site Name:**	Teesworks – Land West of Warrenby

ARCADIS Design & Consultancy for natural and built assets
1 Whitehall Riverside
Leeds
LS1 4BN

Plate 5

Undeveloped area north of sinter plant.

April 2022.

Plate 6

Area of disused hardstanding north of TMO.

Note disused overhead gantry in distance.

April 2022.

CLIENT:	South Tees Development Corporation		
Project:	10035117	**Site Name:**	Teesworks – Land West of Warrenby

ARCADIS Design & Consultancy for natural and built assets
1 Whitehall Riverside
Leeds
LS1 4BN

Plate 7

Disused overhead gantry and partially demolished conveyor. Central area.

April 2022.

Plate 8

Disused diesel tank and pellet tunnel. Central area of site.

April 2022.

CLIENT:	South Tees Development Corporation		ARCADIS Design & Consultancy for natural and built assets 1 Whitehall Riverside Leeds LS1 4BN
Project:	10035117	**Site Name:**	Teesworks – Land West of Warrenby

Plate 9

North-west corner of site. Demolition works at former blast furnace stockhouse and RDL stores. Overhead pipeline in foreground is also being demolished.

(Note blast furnace in distance is off site).

April 2022.

Plate 10

North east corner of site. Former rail tracks in foreground and hummocky area in mid ground.

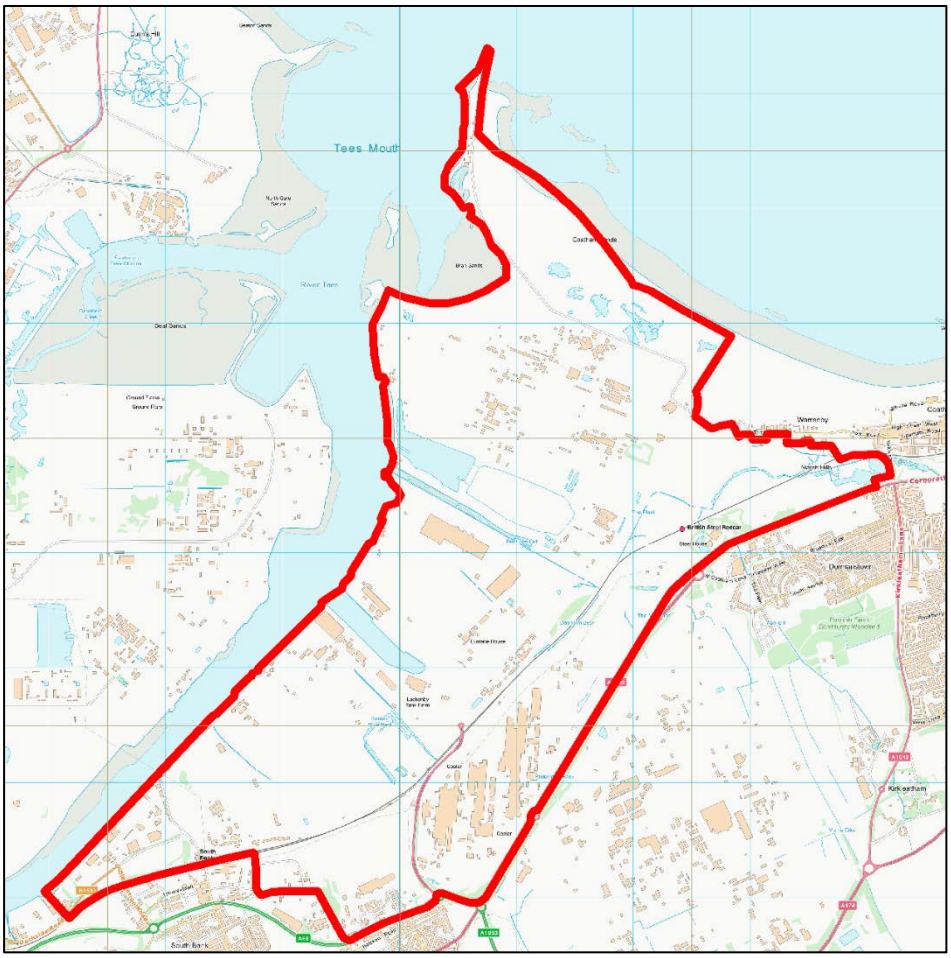
April 2022.

APPENDIX F

UXO Risk Assessment

Detailed Unexploded Ordnance (UXO) Threat & Risk Assessment

Meeting the requirements of *CIRIA* C681 'Unexploded Ordnance (UXO) A Guide for the Construction Industry' Risk Management Framework



PROJECT NUMBER	8588	**ORIGINATOR**	D. Barrett
PROJECT	Redcar Steelworks	**REVIEWED BY**	B. Wilkinson
CLIENT	South Tees Development Corporation	**RELEASED BY**	L. Gregory
VERSION	1.0	**DATE**	30th March 2022
UXO RISK RATING	**VERY HIGH/HIGH** - This Study Site requires further action in all previously undisturbed ground to reduce risk to ALARP during intrusive activities.		

alpha ASSOCIATES
special risks consultancy

6 Alpha Associates Limited, Unit 2A Woolpit Business Park, Bury St Edmunds, IP30 9UP, United Kingdom
T: +44 (0)2033 713 900 | W: www.6alpha.com

Contents

FIGURES

Acronyms and Abbreviations

AA	Anti-Aircraft
AAA	Anti-Aircraft Ammunition
ALARP	As Low As Reasonably Practicable
AOD	Above Ordnance Datum
ARP	Air Raid Precaution
AXO	Abandoned Explosive Ordnance
BD	Bomb Disposal
BDO	Bomb Disposal Officer
bgl	Below Ground Level
BGS	British Geological Survey
BH	Borehole
BPD	Bomb Penetration Depth
CDP	Cast Driven Piles
CFA	Continuous Flight Auger
CIRIA	Construction Industry Research and Information Association
CPT	Cone Penetration Testing
CS	County Series
EO	Explosive Ordnance
EOC	Explosive Ordnance Clearance
EOD	Explosive Ordnance Disposal
GI	Ground Investigation
GIS	Geographic Information Systems
GL	Ground Level
GP	General Purpose
GPS	Global Positioning Systems
HAA	Heavy Anti-Aircraft
HE	High Explosive
HO	Home Office
HSE	Health and Safety Executive
IB	Incendiary Bomb
kg	Kilograms
km	Kilometres
LAA	Light Anti-Aircraft
LCC	London County Council
LE	Low Explosive
LSA	Land Service Ammunition
m	Metres
MoD	Ministry of Defence
mm	Millimetres
NEQ	Net Explosive Quantity
NFF	National Filling Factory
NGR	National Grid Reference
OD	Ordnance Datum
OS	Ordnance Survey
PM	Parachute Mine
PoW	Prisoner of War
RADAR	Radio Detection And Ranging
RAF	Royal Air Force
RN	Royal Navy
RNAS	Royal Naval Air Service
ROF	Royal Ordnance Factory
SAA	Small Arms Ammunition
TA	Territorial Army
TNT	Trinitrotoluene
UK	United Kingdom
UN	United Nations
USAAF	United States Army Air Force
UXB	Unexploded Bomb
UXO	Unexploded Ordnance
V Weapons	*Vergeltungswaffen* – Vengeance Weapons
WD	War Department
WWI	World War One
WWII	World War Two

EXECUTIVE SUMMARY

Study Site

The Client has defined the Study Site as "Redcar Steelworks, Redcar" and it is centred on NGR 455655, 523772.

Risk Level

VERY HIGH	HIGH
The VERY HIGH risk zones are located in a 50m radius around the abandoned WWII bombs	**The HIGH risk zone encompasses the remainder of the Site**

Potential Threat Sources

The most probable UXO threat is posed by WWII-era *German* HE bombs, *British* AXO/LSA/SAA, IBs, and *British* AAA projectiles (which were used to defend against *German* bombing raids).

Risk Pathway

Given the types of UXO that might be present on-site, all types of aggressive intrusive engineering activities may generate a significant risk pathway.

Key Findings

During WWII, the Study Site was situated within *Guisborough* and *Eston Urban Districts, Redcar Municipal Borough* and *Middlesborough County Borough,* which recorded two, six, three and four HE bomb strikes per 100 hectares, all "very low" levels of bombing.

Luftwaffe aerial reconnaissance photography associated with the Study Site identified five primary bombing targets on-site and these were the *Cleveland Iron Works, Redcar Iron Works, River Tees Dockyard, Tar Distillation Chemical Works* and *South Bank Station*.

ARP records associated with the Study Site were not available. Nonetheless, a number of "abandoned bombs" were recorded on-site, with further research of historical records identifying evidence of bombing across the Study Site generally. Specifically, the *Redcar Iron Works, Southbank (Cleveland) Steel Works, Stapylton Street, West Coatham Grange* were all recorded as being bombed during WWII to varying degrees.

Official bomb damage mapping associated with the Study Site was not available. Nonetheless, an analysis of post-war mapping identified numerous *"Ruins"* across the Study Site, which may be indicative of bomb damage given the extensive bombing in the area. Further research of historical records also identified bomb damage at the *Redcar Iron Works* located on-site and around *Southbank* and *Grangetown.*

Extensive military activity has also been documented on-site previously. For example, a bombing decoy site was constructed at *Bran Sands,* with two historic artillery firing ranges also located on-site. During WWII, numerous anti-invasion installations were also built within the Site including beach minefields, pillboxes and AAA gun batteries. In addition, the Client has informed *6 Alpha* that multiple UXO encounters have occurred within the Site previously that appear to be as a result of the extensive military use of the Site previously.

Pre-WWII mapping (1938) associated with the Study Site shows that it was located within a densely developed and industrialised urban area during WWII. The Study Site itself consisted of numerous structures - mainly located in the southern and northern sectors - with large areas of undeveloped ground also present around the central sector. Notwithstanding the high levels of footfall expected in all developed areas of the Site, in any areas that were damaged by bombing during WWII, it is plausible bomb damage debris may have masked a UXB entry hole and caused it to go unnoticed. In all undeveloped areas of the Site there is a higher likelihood that any UXBs impacting within the Site would have done so unnoticed due to the generally lower level of expected footfall.

In the 1970s and 1980s, extensive development occurred on-site, mostly notably with the construction of the *Teesside Works,* which covered large swathes of the Study Site. More generally, it is considered likely that any UXO within post-war disturbed and developed ground would potentially have been discovered and removed. However, some areas of the Site have not undergone extensive redevelopment work and the potential for buried UXO to be present within any remaining areas of undisturbed ground is assessed to be extant.

EXECUTIVE SUMMARY (…continued)

Given that large areas across the Study Site were subjected to extensive bombing during WWII, combined with the extensive military occupation previously and the quantity of potential UXO encounters, the following risk mitigation measures are recommended as a minimum in order to reduce risks ALARP during intrusive works in **all previously undisturbed ground** (i.e., that which has not previously been excavated, probed, drilled or otherwise intrusively disturbed since it was potentially contaminated with UXO)

Recommended Risk Mitigation Measures Overview – All Areas

"Open" Intrusive Works

Engineering Methodology	UXO Emergency Response Plan	UXO Safety and Awareness Briefing	On-Call EOD Engineer	Non-Intrusive Magnetometer Survey	EODE Watching Brief	Intrusive Magnetometer Survey	UXO Risk Rating (Post-Mitigation)
Trial Pits	✔	✔	✘	✔	✔	✘	ALARP
Excavations	✔	✔	✘	✔	✔	✘	
Trenching	✔	✔	✘	✔	✔	✘	

"Blind" Intrusive Works

Engineering Methodology	UXO Emergency Response Plan	UXO Safety and Awareness Briefing	On-Call EOD Engineer	Non-Intrusive Magnetometer Survey	EODE Watching Brief	Intrusive Magnetometer Survey	UXO Risk Rating (Post-Mitigation)
Boreholes	✔	✔	✘	✘	✘	✔	ALARP
Window Sampling	✔	✔	✘	✘	✘	✔	
Piling	✔	✔	✘	✘	✘	✔	

A full and detailed guide to the recommended risk mitigation measures is presented at Section 5 of this report.

For further information, please contact *6 Alpha Associates*:

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ASSESSMENT METHODOLOGY

Approach

6 Alpha Associates is an independent, specialist risk management consultancy practice, which has assessed the prospective UXO risk at this Study Site by employing a process advocated by *CIRIA*. The *CIRIA* guide for managing UXO risks in the construction industry (C681) not only represents industry best practice but has also been endorsed by the UK's *HSE*. *6 Alpha* were the lead technical author of the CIRIA C681 guide.

UXO hazards can be identified through the investigation of local and national archives associated with the Study Site, *MoD* archives, local historical sources, historical mapping as well as contemporary aerial photography (where it is available). Prospective hazards will have only been recorded if there is specific information that could reasonably place them within the boundaries of the Study Site. The amalgamation of information is then assessed within a Semi-Quantitative Risk Assessment (as per industry best practice outlined in CIRIA C681) in order to form the basis of a proportional UXO risk mitigation strategy in circumstances where the SQRA evidences that further action is necessary in order to reduce the UXO risk at the Study Site.

The assessment of UXO risk is a measure of the probability of UXO encounter and initiation and the consequence of an inadvertent UXO initiation; the former being a function of the identified hazard and proposed development methodology and the latter being a function of the type of hazard and the proximity of personnel (and/or other 'sensitive receptors', such as equipment) to the hazard. UXO risk is thus calculated using the following formula:

Risk (R) = Probability (P) x Consequence (C)

If intolerable UXO risks are identified, the methods of mitigation we have recommended are considered reasonable and sufficiently robust to reduce them to ALARP. We advocate the adoption of the ALARP legal principle because it is a key factor in efficiently and effectively ameliorating UXO risks. It also provides a ready means for assessing the Client's tolerability of UXO risk. In essence, the principle states that if the cost of reducing a risk significantly outweighs the benefit, then the risk may be considered tolerable. This does not mean that there is never a requirement for UXO risk mitigation, but that any mitigation must demonstrate that it is beneficial. Any additional mitigation that delivers diminishing benefits and that consume disproportionate time, money and effort are considered *de minimis* and thus unnecessary. Because of this principle, UXB and UXO risks will rarely be reduced to zero (nor need they be).

Important Notes

Although this report is up to date and accurate at the time of writing, *6 Alpha's* UXO threat databases are continually being populated and updated as and when additional information becomes available. Nonetheless, *6 Alpha* have exercised all reasonable care, skill and due diligence in providing this service and producing this report.

The assessment levels are also based upon our professional opinion and have been supported by our interpretation of historical records and third-party data sources. Wherever possible, *6 Alpha* has sought to corroborate and to verify the accuracy of all data we have employed, but we are not accountable for any inherent errors that may be contained in third party data sets (e.g., *National Archive* or other library sources), and over which *6 Alpha* cannot exercise control.

STAGE ONE – STUDY SITE LOCATION AND DESCRIPTION

Study Site

The Client has defined the Study Site as "Redcar Steelworks, Redcar". The Study Site is centred at NGR 455655, 523772 as presented at *Figures 1* and *2,* respectively.

Location Description

The Study Site is situated north-east of the *Town of Middlesborough,* within *Teesside* and totals an area of 1,819 hectares (ha).

Furthermore, the Study Site is bounded by:

- North: The *River Tees* and *Tees Bay;*
- East: Numerous structures and roads as part of *Redcar, Coatham* and *Lazenby;*
- South: Numerous structures and roads as part of *South Bank, Grangetown* and *Dormanstown;*
- West: The *River Tees* and *Tees Bay*.

Aerial Photography (2020) (*Figure 3*)

Current aerial photography corroborates the information above and shows that the Study Site is situated within a heavily developed and industrialised urban area. The Study Site itself consists of numerous structures (some of which are disused structures associated with the former *Redcar* steel works in the north of the Site), areas of hardstanding and areas of undeveloped ground.

Proposed Works

The Client has provided *6 Alpha* with the document *"10035117-AUK-XX-XX-CO-ZZ-0497-01-Site Wide UXO"* which described the following scope of works:

- *"Potential ground investigation works- all areas, including trial pits and boreholes up to 25m bgl.*
- *Bulk Excavation- all areas- typically 5m below current ground level- but may be deeper where large strictures encountered.*
- *Removal of late 20th Century landfill for processing Warrenby 3A area.*
- *Removal of late 20th Century landfill for stabilisation/disposal SLEMs area.*
- *Removal of late 20th Century landscape mounds east of Steel House.*
- *Future foundations are not known, but may include CFA or driven piles- all areas."*

Ground Conditions

It is important to establish the specific ground conditions in order to determine the maximum *German* UXB penetration depth as well as the potential for other types of munitions to be buried.

If the site investigations and/or construction methodologies change, and/or if a specific methodology is to be employed, and/or if the scope of work is focused upon a specific part of the Study Site, then *6 Alpha* are to be informed so that the prospective UXO risks and the associated risk mitigation methodology might be re-assessed. Certain ground conditions may also constrain certain types of UXO risk mitigative works e.g., magnetometer survey is adversely affected in mineralised and made ground.

The Client has provided *6 Alpha* with the document *"10035117-AUK-XX-XX-CO-ZZ-0497-01-Site Wide UXO"* which described the ground conditions as follows:

"Ground conditions vary widely across the site, however in many areas these are dominated by significant thicknesses of iron and steel making slag- particularly those areas reclaimed from the Tees."

It is important to establish the provenance of made ground, where this is recorded as being part of the ground make-up, in order to accurately determine the ground levels at the time when UXO contamination may have occurred so as to accurately determine the average/maximum bomb penetration depths and subsequently to make appropriate recommendations aimed at reducing the risk to ALARP.

STAGE ONE – STUDY SITE LOCATION AND DESCRIPTION (…continued)

Ground Conditions

The Client has provided *6 Alpha* with the document "*4153 & 4154 Area A Former Steelworks Redcar Contract 1 & 2 (Area A) (Final report)"* which includes the borehole log "*S1-BH05"* (located in the Study Site's north-eastern sector) which recorded the following strata:

Depth bgl (m)	Strata	Description
0.00m to 0.10m	Made Ground	(Brown sandy clay with some rootlets)
0.10m to 2.90m	Made Ground	(Brown slightly sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular and includes slag, concrete and brick).
2.90m to 4.80m	Made Ground	(Brown grey sandy gravel and cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular and includes slag, concrete and brick. Cobbles are subangular to rounded and includes concrete and slag).
4.80m to 7.00m	Clay	Soft black brown sandy CLAY/SILT. Sand is fine to medium.(Driller notes slag fallen in from strata above).
7.00m to 11.30m	Sand	Medium dense grey brown clayey SAND. Sand is fine to medium
11.30m to 12.80m	Clay	Firm (faintly fissured) brown slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium angular and includes sandstone, mudstone and coal.
12.80m to 15.10m	Clay	Firm to stiff faintly laminated/fissured sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular and includes sandstone, mudstone and coal.
15.10m to 15.80m	Clay	Stiff to hard red brown slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular and includes sandstone, mudstone and coal.
15.80m to 16.80m	Mudstone	Extremely weak grey MUDSTONE highly weathered.

Ground Conditions

In addition, the borehole log "*BH-2002"* (located in the Study Site's south-western sector) recorded the following strata:

Depth bgl (m)	Strata	Description
0.00m to 0.10m	Made Ground	(Light grey gravelly sand. Sand is fine to coarse. Gravel is fine to coarse angular and includes slag and ironstone. Slag is grey vesicular. Slag content is 0-25%).
0.10m to 8.70m	Sand	Loose to medium dense grey silty SAND with interbeds of dark grey sandy silt and fragments of shell.
8.70m to 14.70m	Clay	Firm brown red slightly sandy gravelly CLAY. Gravel is fine to coarse and includes sandstone and limestone.

STAGE TWO – REVIEW OF HISTORICAL DATASETS

Sources of Information Consulted

The following information sources have been employed in order to establish the nature and scope of the UXO threat:

1. *6 Alpha*'s *Azimuth* Database;
2. *Home Office* WWII Bomb Census Maps;
3. WWII and post-WWII aerial photography;
4. Official Abandoned Bomb Register;
5. Information gathered from the *National Archives* at *Kew*;
6. Historic UXO information provided by *33 Engineer Regiment* (Explosive Ordnance Disposal) at *Carver Barracks, Wimbish*.

Potential Sources of UXO Contamination - Overview

In general, there are several activities that might have contaminated a site with UXO, but the three most common ways are: legacy munitions from military training/exercises; deliberate or accidental dumping (AXO) and ordnance resulting from war fighting activities (also known as the Explosive Remnants of War (ERW)).

During WWII, the *Luftwaffe* undertook bombing campaigns all over the *UK* and although the *Luftwaffe* had designated primary bombing targets across the *UK*, their high-altitude night bombing was not accurate. There was also a period of indiscriminate bombing of civilian and industrial areas alike in *British* cities in an attempt to cripple the morale of the *British* people. As a result, thousands of buildings were damaged across industrial and residential areas and civilian fatalities were common. Bombs were also jettisoned over opportunistic targets and more rural locations were also attacked in this manner.

As the threat of invasion lingered over *Britain* during WWII, defensive actions were undertaken. The *British* and *Allied Forces* requisitioned large areas of land for military training and bomb storage (including HE bombs, naval shells, artillery and tank projectiles, explosives, LSA and SAA). Thousands of tonnes of these munitions were used for the *Allied Forces* weapon testing and military training alone. It has been estimated that at least 20 per cent of the *UK*'s land has been used for military training at some point.

The most common type of UXO discovered today in the *UK* is the aerially delivered high explosive (HE) bomb, which are comparatively thick-skinned and were dropped from *Luftwaffe* aircraft. If the bomb did not detonate when it was dropped, the force of impact enabled the UXO to penetrate the ground, often leaving behind it a UXB entry hole. These entry holes were not always apparent, and some went unreported, leaving the bomb buried and unrecorded. *British* AXO/LSA/SAA is also commonly encountered in areas that were formerly occupied by military forces (such as RAF airfields, military camps and/or military training areas). More rarely, additional forms of *German* UXO are occasionally discovered including *inter alia* Incendiary Bombs (IBs), and Anti-personnel (AP) bomblets and fragments of *V1* and *V2* rockets.

"The best practice guide for dealing with your UXO risks on land" (CIRIA publication C681) suggests that approximately 10 per cent of all munitions deployed during WWII failed to function as designed. ERW are therefore, still commonly encountered, especially whist undertaking construction and civil engineering groundwork.

Furthermore, in exceptional circumstances, UXO is discovered unexpectedly and without apparent rational explanation. There are several ways this might occur:

- When *Luftwaffe* aircraft wished to swiftly escape e.g., from an aerial attack, they would jettison some or all of their bombs and flee. This is commonly referred to as *tip and run* and it has resulted in bombs being found in unexpected locations;
- Transportation of aggregate containing munitions to an area that was previously free of UXO, usually related to construction activities employing material dredged from a contaminated offshore borrow site;
- *British* decoy sites were also constructed to deliberately cause incorrect targeting. For obvious reasons, such sites were often built in remote and uninhabited areas – few historical records concerning these sites are available.

WWII Bombing of *Teesside*

Teesside, so named after the *River Tees* that runs through the heart of the area, was considered a highly important industrial area even before the mass mobilisation of *Britain's* industry at the outset of WWI and WWII. It encompassed *Middlesbrough, Billingham, Redcar* and other important manufacturing hubs. Much of the local industry was repurposed for the war effort, and so it became one of the major industrial areas to be targeted by the *Luftwaffe* in their attempts to cripple the *British* war effort.

The first bombs landed on *Middlesbrough* and the surrounding areas on the 25th May 1940 when a *Luftwaffe* bomber targeted the *South Steel Plant*. Further bombing occurred across much of the area, with the town of *Redcar* attacked on numerous occasions. In total, over 200 buildings had been destroyed by the bombing of the *Middlesbrough* area by the end of the war.

WWII HE Bomb Density (*Figure 4*)

The Study Site was located within *Guisborough* and *Eston Urban Districts, Redcar Municipal Borough* and *Middlesborough County Borough,* which recorded two, six, three and four HE bomb strikes per 100 hectares, all "very low" levels of bombing.

WWII Luftwaffe Bombing Targets (*Figure 5)*

Prior to WWII, the *Luftwaffe* conducted numerous aerial photographic reconnaissance missions over *Britain*, recording key military, industrial and commercial targets for attack, in the event of war. In addition, logistics infrastructure and public services, such as railways, canals, power stations, reservoirs, water and gas works were also considered viable bombing targets.

Luftwaffe aerial reconnaissance photography associated with the Study Site identified *Cleveland Iron Works, Redcar Iron Works, River Tees Dockyard, Tar Distillation Chemical Works* and *South Bank Station* – all of which were located on-site – as primary bombing targets.

WWII HE Bomb Strikes

During WWII, ARP wardens compiled detailed logs of bomb strikes across their respective districts. ARP records associated with the Study Site were not available. Nonetheless, further research of historical records noted evidence of significant bombing across large areas of the Site and in close proximity to it. In the north of the Site, the *Redcar Iron Works,* the *Bran Sands Bombing Decoy* and *Warrenby Marshes* were both bombed during WWII, with the iron works bombed on multiple occasions. In the centre of the Site, HE bombs were dropped in the fields near *West Coatham Grange* and on the marshes near *Lackenby* – both of which likely resulted from poor bombing accuracy rather than deliberate targeting. In the south of the Site, multiple bombs were dropped on the *Southbank (Cleveland) Steel Works*.

In addition to IBs and HE bomb strikes, during the latter part of the war when aerial bombing had significantly declined, the main threat came from *V* type weapons. *V1* and *V2* rockets were thin-skinned, unmanned and inaccurate weapons. Despite this, there is no evidence to suggest that the Study Site (or its immediate vicinity) was subjected to rockets strikes during WWII.

The potential penetration depth of an UXB was dependent on a number of factors including but not restricted to those prior to striking the ground e.g. velocity and orientation of the UXB which in turn will be influenced on factors such as the release altitude from the aircraft and encounters with infrastructure during its fall; those encountered at the point of impact i.e. was the impact on concrete, grass, water etc. and finally, the below ground level conditions which were encountered such as infrastructure e.g. services, basements, foundations, and geology e.g. made ground, clay, sand, etc. Further, as the UXB penetrated the ground, it's velocity naturally slowed where, it either came to an abrupt stop e.g., against foundations or would continue for 10's of feet along a route of least resistance which often resulted in a curving of the trajectory back towards the surface. This is known as the "J Curve" effect and often resulted in a considerable horizontal off-set from the point of entry. This is often the reason why UXBs have been discovered against or under the foundations of buildings, which were present during WWII, or many meters from the point of impact.

WWII Bomb Damage

Official bomb damage mapping associated with the Study Site was not available. Nonetheless, an analysis of post-war mapping identified numerous *"Ruins"* across the Study Site, the majority of which are highly likely to be indicative of bomb damage, given the extensive bombing in the area. Further research of historical records also identified bomb damage at the *Redcar Iron Works* (located on-site) and more generally around *Southbank* and *Grangetown* which is unsurprising given the aforementioned concentration of bombing in those areas.

Bomb damage was also documented in the wider area: on *Tod Point Road* (located immediately to the north of the north-eastern sector of the Site), on *Coatham Road* (approximately 435m to the north-east) and *Aire Street* (630m to the south-west of the south-eastern sector). Bomb craters were also recorded in *Locke Park* (30m east at its closest point) and at *Southbank Football Ground* (approximately 330m to the south-east).

Abandoned Bombs (*Figure 6*)

An examination of the official abandoned bomb records has identified the following abandoned bombs on-site/potentially on-site:

- Two abandoned 50kg incendiary bombs situated on *Warrenby Marshes;*
- One abandoned 50kg incendiary bomb situated on the *Foreshore, West of Redcar Works;*
- One abandoned bomb of an unknown size situated at *Grangetown, near Middlesbrough.*

Records of WWII UXB Disposal Tasks

Civil defence records did not identify any UXB disposal tasks within *Guisborough and Eston Urban Districts, Redcar Municipal Borough and Middlesborough County Borough* from 1940-45 within 1,000m of the Study Site. However, it is known that these records are incomplete, some having been destroyed by Luftwaffe action during WWII.

Nonetheless, further research of historical records identified numerous UXB encounters during WWII within the Study Site. Specifically, one UXB was removed from the blacksmith's shop within the *Redcar Iron Works,* one was removed from close to, or possibly on, the railway between *Grangetown* and *Redcar* and an unspecified number were encountered and removed near *Bessemer Street* (located in the southern sector of the Site).

Military Activity (Figure 7)

There is evidence to suggest that areas of the Site have been used previously for a variety of military purposes. For example, the area of the Site was seen as a potential amphibious invasion landing point in the early stages of WWII and so a number of defensive fortifications were built on-site to defend against such a possibility. Most of these fortifications were located in the northern sector of the Site and consisted of AAA gun batteries and infantry positions such as "pillboxes". However, 23 anti-invasion minefields comprising primarily mainly of *Mk II, Mk IV* and *Mk V B Type C Mines,* were also emplaced within the Site adjacent to the coastline. These minefields were a part of a larger anti-invasion minefield-belt, which was deployed along a 20km front from *Hartlepool* to *Saltburn-by-Sea*. There is evidence to suggest that these minefields were cleared after WWII (as was then, common practice), although an analysis of official *EOD* records neither corroborated such clearance nor provided evidence of the success rate of such clearance operations and so it is possible (though highly unlikely) that some may remain shallow buried.

In addition, to defend against aerial attacks, *Bran Sands Bombing Decoy* (designation *C2b)* was built in the north-western sector of the Site. It functioned as a series of controlled fires, which would be lit to simulate an urban area on fire, and also as a series of lights which were built to resemble a marshalling yard and furnace. This was done in an effort to trick *Luftwaffe* bombers into deploying their bombloads over the decoy area, instead of their real target. Further research indicates this decoy was bombed multiple times, and thus was at least partially successful in its aim.

Aside from defensive installations, two historic firing ranges were also documented extending on-site: these were *A.9 Pasley,* a *British Army* coast artillery range, and *N.6 South Gare,* a *Royal Naval* AAA range. It is likely the coastal and beach defence batteries located on-site were associated with this training activity.

The area was also involved in the production of munitions during WWII, with further research indicating that the *Southbank Steel Works* was potentially involved in the manufacture of artillery shells. Additionally, a *Royal Naval* depot located in *Teesport (*in the central sector of the Site) operated as a submarine base during WWI, with the submarines based there involved in numerous wartime activities, including minelaying.

WWII Site Use

The CS mapping prior to WWII (1938) shows that the Study Site was located within a densely developed and industrialised urban area during WWII. The Study Site itself consisted of numerous structures - mainly located in the southern and northern sectors - with large areas of undeveloped ground also present around the central sector.

Therefore, it is likely that footfall within the Site would have varied, with high levels of footfall expected in all developed areas of the Site. Consequently, in those areas of high footfall it is considered more likely that a local civilian, employee or any military personnel based at the Site would have observed and reported any UXB entry holes during WWII, which would have been dealt with at the time. Notwithstanding the high levels of footfall, in any areas that were damaged by bombing during WWII, it is plausible bomb damage debris may have masked a UXB entry hole and caused it to go unnoticed. In all undeveloped areas of the Site there is a higher likelihood that any UXBs impacting within the Site would have done so unnoticed due to the generally lower level of expected footfall.

Due to a combination of the above factors, there is a significant proportion of the Site where it is possible that a UXB entry hole may have been missed, or not observed in the first place.

Post-WWII UXO Encounters

The Client has provided *6 Alpha* with the following details of confirmed and/or suspected UXO encounters at the Site since WWII, which were dealt with by *EOD Catterick*:

- The removal of a "legacy artillery projectile" (potentially containing explosives), found in a scrap sorting area at *Lackenby* on the 26th April 2021;
- The removal of a "suspected device" found at the *Gas Booster House, Lackenby (British Steel's Footprint)* on the 11th May 2021;
- The removal of a "dud shell" (noted to be approximately 8" and 2' long) found at a "*scrape pile waiting to be loaded onto a ship on stocking ground at rear of RBT Wharf Offices (their footprint)"* on the 15th May 2021 (subsequently documented as non-explosive. It is considered likely to be an inert training munition);
- The removal and controlled detonation of a "suspected device" found at the *South Bank Area,* near the F*reeport Entrance,* on the 13th July 2021 (subsequently documented as non-explosive);
- The removal and controlled detonation of a "large device" (400mm x 200mm) found near *Torpedo Ladle Repair Shop footprint, Cleveland Praire* on the 24th February 2022;
- The Client has also provided *6 Alpha* with the borehole record *"S2-BHA5"* (located at the *Former SSI Steelworks, Redcar*) which indicates that a borehole was terminated at 11m bgl due to a possible UXO anomaly on the 23rd October 2017.

In addition, further research has also identified the following post-WWII BDO tasks on-site/in close proximity to the Study Site:

- The removal of one anti-tank mine close to the mouth of *River Tees* on the 20th February 1994;
- The removal of an unknown number of inert training artillery projectiles found on *Dockside Road,* near *Old's Smith's Dock* on the 21st August 2012;
- The controlled demolition of one projectile at *South Gare, Redcar* on the 25th June 2016;
- The controlled demolition of one *Royal Air Force* (*RAF*) flash-flare, found by a member of the public, at *Redcar Beach* (located approximately 720m to the north-east) on the 5th June 2016.

Sources of UXO Contamination

Given the historic military activity documented at the Study Site, the most likely source of UXO contamination is *German* aerially delivered ordnance, which ranges from small IBs through to large HE bombs (the latter forms the principal threat), *British* AXO/LSA/SAA and AAA projectiles (which were used to defend the UK against *German* bombing raids) associated with the military activity on-site.

Post-WWII Study Site Development

Generally, the probability of encountering UXO in ground that has been disturbed since it may have been contaminated with UXO is considered to be remote (up to the depth below ground level previously disturbed by any intrusive works). Therefore, an understanding of the Study Site's previous development history is crucial when assessing the likelihood that UXO might be encountered at the Study Site.

Study Site Development History

From an analysis of the CS and OS historical mapping associated with the Study Site, the following history can be deduced:

Year	Analysis
1893-1897 CS Map	The Study Site was located in a developing industrial area. The Study Site consisted mostly of large areas of undeveloped ground in the northern and central sectors, although the southern sector was heavily developed with railway lines and numerous structures.
1913 CS Map	Additional large structures had been built near *Cleveland Steel Works* in the south-western sector of the Site.
1927-1930 CS Map	*Redcar Iron & Steel Works* and railway lines had been built in the northern and north-eastern sector. *Teesport* was built in the central sector.
1938 CS Map	Changes were not recorded at the Study Site.
1953-1955 OS Map	Several structures near the *Redcar Iron & Steel Works* were demolished.
1970-1974 OS Map	Extensive construction activity occurred across the central and southern sectors, with the development of numerous large industrial structures as part of the *Teesside Works, Lackenby* and *Teesport Refinery,* along with the construction of *Tees Dock* and associated structures. Additional structures were built in the north-western sector near *South Gare Breakwater.*
1980-1985 OS Map	The *Redcar Iron & Steel Works* was demolished, and structures associated with *Teesside Works* had been built in its place. Additional structures were built as part of *Teesport Refinery. Cleveland Steel Works* was partially demolished, and additional structures built in the central sector and south-western sector near *Puddlers Road* as part of *Teesside Works.*
1990-1992 OS Map	Several structures associated with *Teesport Refinery* were demolished, as were several structures in the south-western sector.
2001-2002 OS Map	A *Sewage Works* was built in the northern sector near *Teeside Works, Redcar,* and several structures that were part of *Teesside Works, Redcar* were demolished. Additional structures were demolished in the southern sector near *Eston Road.*
2010 OS Map	Several structures near *Tees Dock* were demolished, and a structure built near *Dabholm Road* near *Tees Dock*.
2014-2020 OS Map	Several structures near *Tees Dock Road* in the southern sector was demolished, and a large structure labelled a *Port* had been built near *Dabholm Road*. Several additional structures that were part of *Teesside Works,* had been demolished

The Study Site history assessment is our best interpretation of the data available at the time of writing. Given that yearly revisions of neither CS and OS mapping, nor aerial photography, are available for analysis, there are gaps between the mapping revisions.

Consequently, it should not be assumed that any new structures and/or features that are labelled on a map revision were constructed, developed, installed or demolished in the exact year that the mapping illustrates the change. It is possible – and indeed likely – that the exact date of development occurred somewhere between the two closest mapping revisions. Specifically, this may be particularly relevant where there is a gap between pre and post-WWII mapping, as it may not be clear whether structures were present during WWII or if they were constructed in the post-WWII period.

STAGE THREE – DATA ANALYSIS

Variable	Result	Comment
Was the area considered to be a primary bombing target during WWII?	✔	Five primary bombing targets were identified on-site.
Was the Study Site or the immediate area bombed during WWII?	✔	Further research identified extensive bombing across large areas of the Study Site.
Did the Study Site or the immediate area experience bomb damage?	✔	Further research identified evidence of significant bomb damage on-site.
Would munitions have been manufactured, stored and/or fired from the Study Site previously?	✔	The Site has been used for various military activities since WWI. Most notably, a number of infantry positions, AAA gun batteries and military training areas have been located on-site.
Was the ground undeveloped during WWII?	✔	The nature of the Site varied significant during WWII. Some areas consisted of numerous structures and railway lines, whilst other large areas consisted of undeveloped ground
Would the footfall have been high in the area?	✘	The level of footfall would have varied depending on the level of development but in all undeveloped areas it is highly likely that footfall would have been generally low.
Would a UXB entry hole have been observed during WWII?	✘	In those areas of lower footfall, and/or those areas of significant bomb damage, it is plausible that a UXB entry hole could have gone unnoticed.
Has UXO been encountered previously at the Study Site?	✔	Numerous UXO encounters have been recorded on-site since WWII, with the most recent was discovered in February 2022.
Have previous intrusive works removed the potential for UXO to be present?	✘	The Study Site has been subjected to varying levels of redevelopment; therefore, it is likely that any UXO within post-war disturbed and developed ground would potentially have been discovered and removed. The potential for a UXO encounter in areas of undisturbed ground remains extant.
Are proposed intrusive works likely to extend into previously undisturbed ground?	✔	Areas of the Study Site have remained undeveloped since WWII and therefore the proposed works may extend into previously undisturbed ground.
Is there potential for an unplanned encounter with UXO to occur during proposed intrusive works?	✔	Given that large areas of the Study Site were subject to extensive bombing during WWII, combined with the history of significant military activity on-site, it is considered possible for an unplanned encounter with UXO to occur.
Does the probability of a UXO encounter vary across the Study Site?	✔	The probability of encountering UXO within post-war disturbed and developed ground is considered to be remote. However, the probability of a UXO encounter within all previously undisturbed areas of the Study Site is extant.

N.B. The ✔ / ✘ symbology is intended to act only as a succinct visual indicator as to whether the data analysis has returned a positive (i.e., ✔) or negative (✘) answer to each question concerning the potential for UXO contamination at the Study Site.

STAGE FOUR – RISK ASSESSMENT

Threat Items

The most probable UXO threat items are *German* HE bombs, IBs, *British* AXO/LSA/SAA and *British* AAA projectiles. The consequences of initiating *German* HE bombs are generally more severe than initiating AXO/LSA/SAA, IBs or AAA projectiles, and thus they pose the greatest prospective risk to intrusive works.

Bomb Penetration Depth

Considering the ground conditions (highlighted in Stage 1), the average BPD for a 250kg *German* HE bomb is assessed to be approximately 6m bgl, with the maximum BPD considered to be approximately 14m bgl. Although it is possible that the *Luftwaffe* deployed larger bombs in the area, their deployment was infrequent, and to use such larger (or the largest) bombs for BPD calculations are not justifiable on either technical or risk management grounds.

WWII *German* bombs have a greater penetration depth when compared to IBs and AAA projectiles, which are unlikely to be encountered at depths greater than 1m bgl. However, due to the "J Curve" and the potential for structures to impede the penetration into the ground, HE bombs have been discovered at much shallower depths than the average.

AXO/LSA/SAA Burial Depth

If present, AXO/LSA/SAA are generally likely to be encountered only in previously undisturbed ground to depths of ~2.0m below the WWII ground level.

Risk Pathway

Given the types of UXO that might be present on-site, all types of aggressive intrusive engineering activities (i.e., investigative groundworks and construction methodologies) may generate a significant risk pathway. Whilst not all UXO encountered aggressively will initiate upon contact, such a discovery could lead to serious impact on the project especially in terms of critical injury to personnel, damage to equipment and project delay.

Prospective Consequences

Consequences of UXO initiation include:

1. Fatally injure personnel;
2. Severe damage to plant and equipment;
3. Deliver blast and fragmentation damage to nearby buildings;
4. Rupture and damage underground utilities/services.

Consequences of UXO discovery include:

1. Delay to the project and blight;
2. Disruption to local community/infrastructure;
3. The expenditure of additional risk mitigation resources and EOD clearance;
4. Incurring additional time and cost.

UXO RISK CALCULATION

Site Activities

Although there is some variation in the probability of encountering and initiating items of UXO when conducting different types of intrusive activities, a number of ground intrusive methodologies have been described for analysis at this Study Site. The consequences of initiating UXO vary greatly, depending upon, *inter alia* the mass of HE in the UXO and how aggressively it might be encountered. For this reason, *6 Alpha* has conducted separate risk rating calculations for each intrusive methodology that might be employed.

Risk Rating Calculation

6 Alpha's Semi-Quantitative Risk Assessment assesses and rates the risks posed by the most probable threat items when conducting a number of different activities on the site. UXO risk is determined by calculating the probability of encountering and initiating UXO and the consequences of an inadvertent UXO detonation.

UXO Risk Zoning

Given the nature and juxtaposition of the identified prospective UXO threat sources in relation to the Site, the likelihood of encountering UXO during planned intrusive operations is considered to be variable across the Study Site. Therefore, it has been possible to zone the UXO risk at the initial strategic level and the Study Site been categorised into areas of HIGH and MEDIUM risk zones.

Site-Specific UXO Risk Zones (*Figure 8* AND *8b*)

VERY HIGH	HIGH
The VERY HIGH risk zones are located in a 50m radius around the abandoned WWII bombs	**The HIGH risk zone encompasses the remainder of the Site**

Implementation of Risk Mitigation in UXO Risk Zones

The UXO risk mitigation strategy has been refined to reflect the varying level of UXO risk across the Study Site and consequently, the recommended risk mitigation measures will be specific to the level of assessed UXO risk in each zone. The UXO risk mitigation strategy is outlined and presented at Stage 5.

Semi-Quantitative Risk Assessment

A Semi-Quantitative Risk Assessment has been performed and has been categorised separately for the HIGH and MEDIUM risk zones of the Site - the results are presented below.

UXO Risk Calculation Table – VERY HIGH Risk Zone				
Activity	**UXO Threat Items**	**Probability (SH+EM=P)**	**Consequence (D+PSR=C)**	**UXO Risk (PxC=R)**
Trial Pits (25m bgl)	HE Bombs	3+2=5	3+3=6	5x6=30
	AAA Projectiles	2+2=4	3+1=4	4x4=16
	IBs	2+2=4	3+1=4	4x4=16
	AXO/LSA/SAA	2+2=4	3+2=5	4x5=20
Window Sampling	HE Bombs	3+3=6	3+2=5	6x5=30
	AAA Projectiles	2+3=5	3+1=4	5x4=20
	IBs	2+3=5	3+1=4	5x4=20
	AXO/LSA/SAA	2+2=4	3+2=5	4x5=20
Boreholes (25m bgl)	HE Bombs	3+3=6	3+2=5	6x5=30
	AAA Projectiles	2+3=5	3+1=4	5x4=20
	IBs	2+3=5	3+1=4	5x4=20
	AXO/LSA/SAA	2+2=4	3+2=5	4x5=20
Excavations	HE Bombs	3+2=5	3+3=6	5x6=30
	AAA Projectiles	2+2=4	3+1=4	4x4=16
	IBs	2+2=4	3+1=4	4x4=16
	AXO/LSA/SAA	2+2=4	3+2=5	4x5=20
Trenching	HE Bombs	3+2=5	3+3=6	5x6=30
	AAA Projectiles	2+2=4	3+1=4	4x4=16
	IBs	2+2=4	3+1=4	4x4=16
	AXO/LSA/SAA	2+2=4	3+2=5	4x5=20
Piling	HE Bombs	3+3=6	3+2=5	5x5=30
	AAA Projectiles	2+3=5	3+1=4	5x4=20
	IBs	2+3=5	3+1=4	5x4=20
	AXO/LSA/SAA	2+2=4	3+2=5	4x5=20

Abbreviations – Site History (SH), Engineering Methodology (EM), Probability (P), Depth (D), Consequence (C), Proximity to Sensitive Receptors (PSR) and Risk Rating (RR).

UXO Risk Calculation Table – HIGH Risk Zone				
Activity	**UXO Threat Items**	**Probability (SH+EM=P)**	**Consequence (D+PSR=C)**	**UXO Risk (PxC=R)**
Trial Pits (25m bgl)	HE Bombs	2+2=4	3+3=6	4x6=24
	AAA Projectiles	2+2=4	3+1=4	4x4=16
	IBs	2+2=4	3+1=4	4x4=16
	AXO/LSA/SAA	2+2=4	3+2=5	4x5=20
Window Sampling	HE Bombs	2+3=5	3+2=5	5x5=25
	AAA Projectiles	2+3=5	3+1=4	5x4=20
	IBs	2+3=5	3+1=4	5x4=20
	AXO/LSA/SAA	2+2=4	3+2=5	4x5=20
Boreholes (25m bgl)	HE Bombs	2+3=5	3+2=5	5x5=25
	AAA Projectiles	2+3=5	3+1=4	5x4=20
	IBs	2+3=5	3+1=4	5x4=20
	AXO/LSA/SAA	2+2=4	3+2=5	4x5=20
Excavations	HE Bombs	2+2=4	3+3=6	4x6=24
	AAA Projectiles	2+2=4	3+1=4	4x4=16
	IBs	2+2=4	3+1=4	4x4=16
	AXO/LSA/SAA	2+2=4	3+2=5	4x5=20
Trenching	HE Bombs	2+2=4	3+3=6	4x6=24
	AAA Projectiles	2+2=4	3+1=4	4x4=16
	IBs	2+2=4	3+1=4	4x4=16
	AXO/LSA/SAA	2+2=4	3+2=5	4x5=20
Piling	HE Bombs	2+3=5	3+2=5	4x5=25
	AAA Projectiles	2+3=5	3+1=4	5x4=20
	IBs	2+3=5	3+1=4	5x4=20
	AXO/LSA/SAA	2+2=4	3+2=5	4x5=20

Abbreviations – Site History (SH), Engineering Methodology (EM), Probability (P), Depth (D), Consequence (C), Proximity to Sensitive Receptors (PSR) and Risk Rating (RR).

STAGE FIVE – RECOMMENDED RISK MITIGATION MEASURES

Do the ground conditions support a geophysical UXO survey?

Non-Intrusive Methods of Mitigation – Magnetometer results may be affected by ferro-magnetic contamination due to previous construction activities and made ground within the Study Site.

Intrusive Methods of Mitigation – Intrusive magnetometry may be effective on this Study Site, prior to boreholing and piling especially. However, any ferrous metal/red brick contamination in made ground/old foundations may affect the detection capability of the UXB survey equipment, as it passes through the contaminated layer especially. Nonetheless, beyond the contaminated strata such a survey should prove effective.

Mitigation Measures to Reduce Risk to 'ALARP'

Activity	Risk Mitigation Measures	Final Risk Rating
All Activities in All Areas	**1. Operational UXO Emergency Response Plan;** appropriate site management documentation should be held on-site to guide and plan for the actions which should be undertaken in the event of a suspected or real UXO discovery (this plan can be supplied by *6 Alpha*); **2. UXO Safety & Awareness Briefings;** the briefings are essential when there is a possibility of explosive ordnance encounter and are a vital part of the general safety requirement. All personnel working on the site should receive a briefing on the identification of a UXB, what actions they should take to keep people and equipment away from such a hazard and to alert site management. Information concerning the nature of the UXB threat should be held in the site office and displayed for general information on notice boards, both for reference and as a reminder for ground workers. The safety awareness briefing is an essential part of the *Health & Safety Plan* for the site and helps to evidence conformity with the principles laid down in the *CDM* regulations 2015 (this brief can be delivered directly, or in some cases remotely, by *6 Alpha*).	**ALARP**
Trial Pits, Excavations and Trenching into Previously Undisturbed Ground	**3. Non-intrusive UXO Survey and/or EOD Engineer in the Watching Brief Role;** Where "open" intrusive works into previously undisturbed ground are proposed and where the extent is considered to be within the capabilities of non-intrusive UXO survey equipment and implementation of this is assessed as likely to prove effective, a non-intrusive geophysical UXO survey should be trialled and, if it proves successful, should be employed to survey site-wide, or in specific areas where "open" intrusive works are to be implemented to identify for signs of sub-surface anomalies which may model as the target UXO in advance of said works. If the survey proves partially or wholly ineffective, an EOD Engineer should be present in the UXO Watching Brief role to monitor ongoing "open" intrusive works to identify any suspicious items that may be UXB or UXO related (this service can be provided by *6 Alpha*).	
Window Sampling, Piling and Boreholing into Previously Undisturbed Ground	**4. Intrusive UXO Survey;** Where 'blind' intrusive works into previously undisturbed ground are proposed, an intrusive UXO survey (employing down-hole magnetometer or MagCone techniques) is strongly recommended. Such a survey should extend to the *assessed average bomb penetration depth* or to the maximum depth of the works, whichever is encountered first, or until geology is encountered through which it is assessed a UXB would not penetrate, to identify for signs of sub-surface anomalies which may model as the target UXO in advance of said works. (This service can be provided by *6 Alpha*).	

This assessment has been conducted partially based on the information provided by the Client, should the proposed works change then *6 Alpha* should be re-engaged to refine this risk assessment

Report Figures

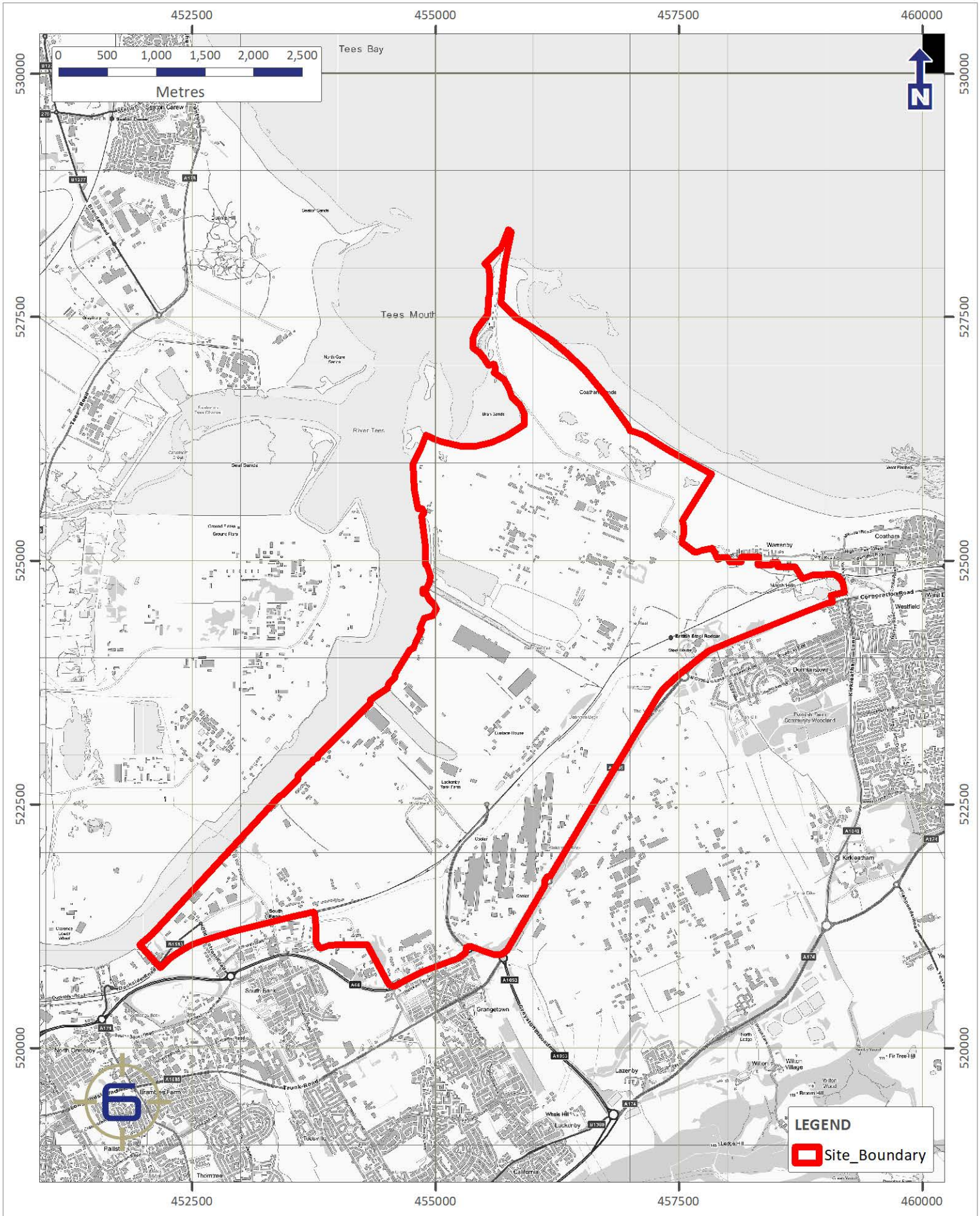
Figure One - Study Site Location

BRITISH NATIONAL GRID

REDCAR STEELWORKS, REDCAR

Site Location

BOMB SEARCH
WWW.6ALPHA.COM



PROJECT NO.	FIGURE	DRAWN	CHECKED	DATE
8588	1	LH	LG	24 March 2022

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Figure Two - Study Site Boundary

BRITISH NATIONAL GRID

REDCAR STEELWORKS, REDCAR

Site Boundary

BOMB SEARCH
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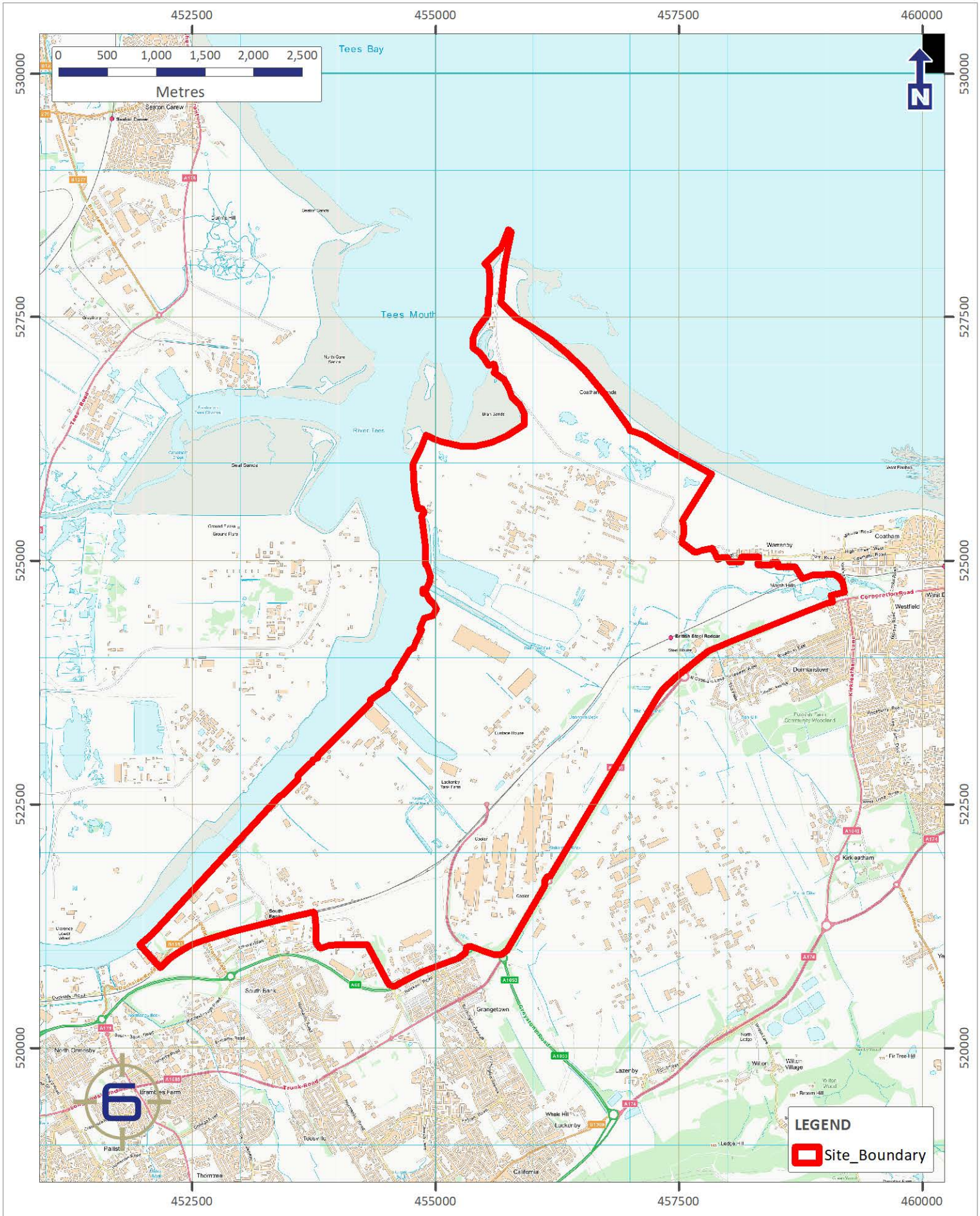

PROJECT NO.	FIGURE	DRAWN	CHECKED	DATE			
8588	2	LH	LG	24 March 2022	Contains Ordnance Survey data © Crown copyright and database right 2017	Produced by and Copyright to 6 Alpha Associates Ltd. Users noting any errors please notify 6 Alpha.	alpha ASSOCIATES

Figure Three - Aerial Photography (2020)

BRITISH NATIONAL GRID

REDCAR STEELWORKS, REDCAR

Aerial Photography (2020)

BOMB SEARCH
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PROJECT NO.	FIGURE	DRAWN	CHECKED	DATE		
8588	3	LH	LG	24 March 2022	Map data: Google	Produced by and Copyright to 6 Alpha Associates Ltd. Users noting any errors please notify 6 Alpha.

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Figure Four - WWII High Explosive Bomb Density

BRITISH NATIONAL GRID

REDCAR STEELWORKS, REDCAR

WWII High Explosive Bomb Density

BOMB SEARCH
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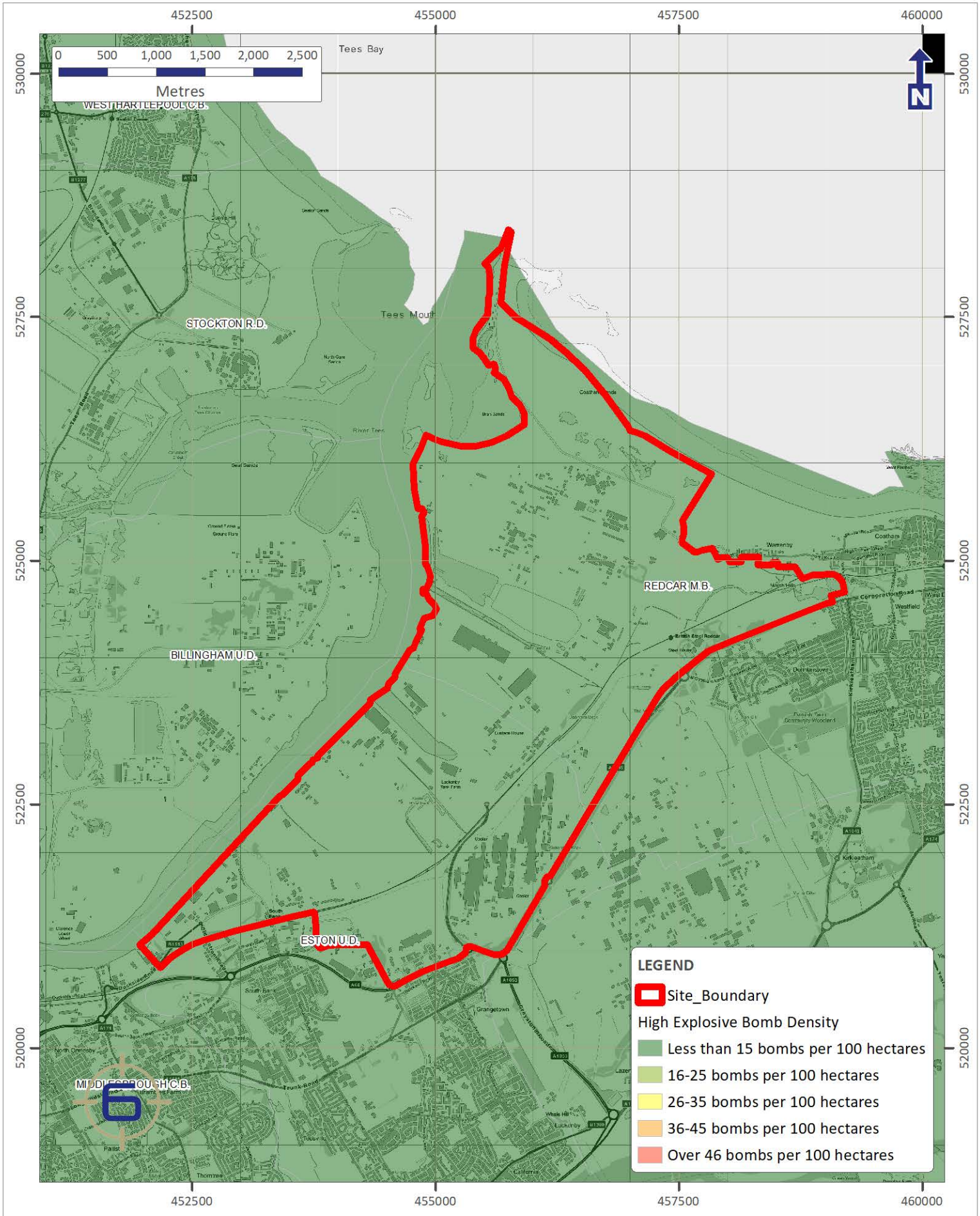

PROJECT NO.	FIGURE	DRAWN	CHECKED	DATE			
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Figure Five - WWII *Luftwaffe* Bombing Targets

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WWII Luftwaffe Bombing Targets

BOMB SEARCH
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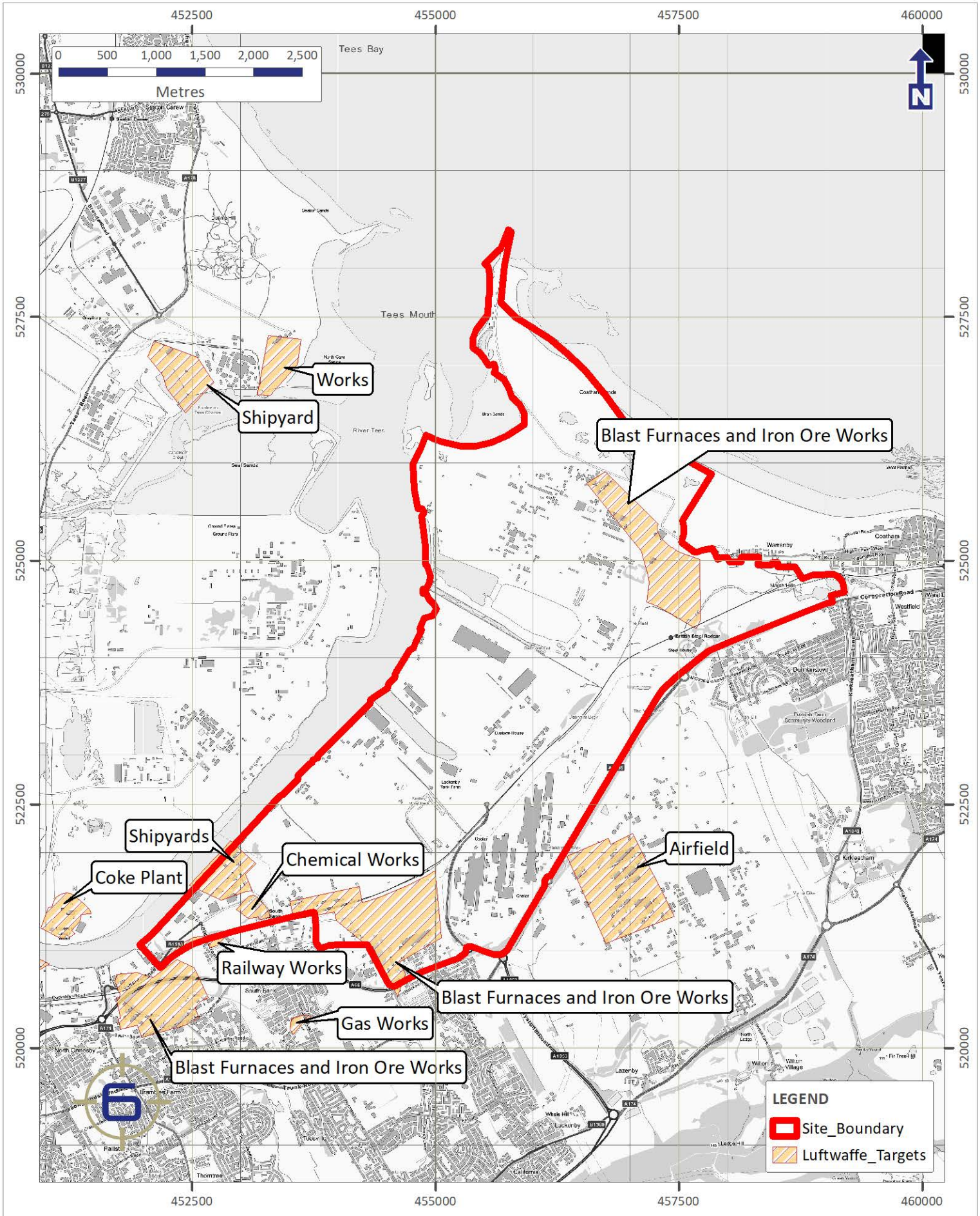

PROJECT NO.	FIGURE	DRAWN	CHECKED	DATE
8588	5	LH	LG	24 March 2022

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Figure Six - WWII Abandoned Bombs

BRITISH NATIONAL GRID

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WWII Abandoned Bombs

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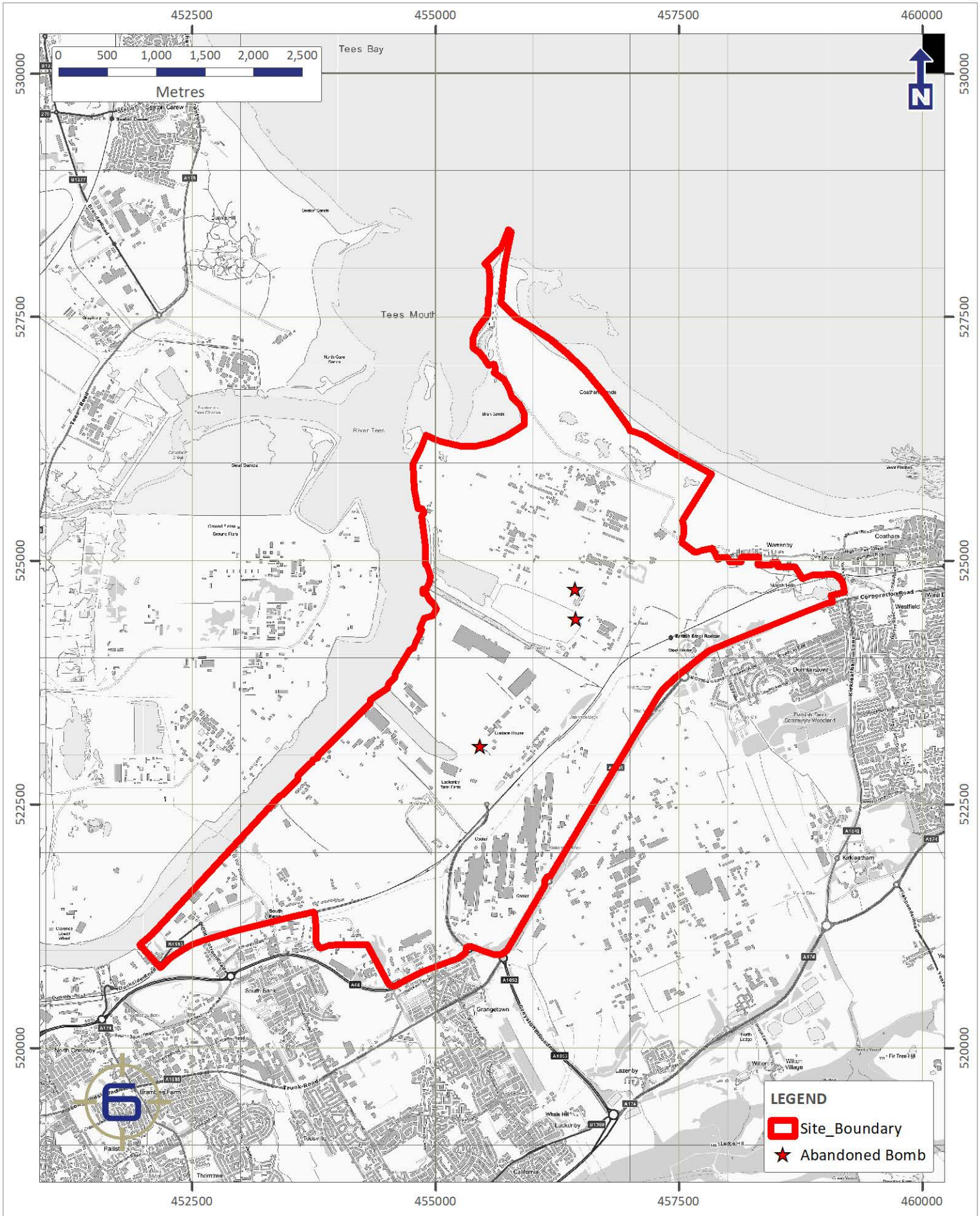

PROJECT NO.	FIGURE	DRAWN	CHECKED	DATE			
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Figure Seven - WWII Defensive Features

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WWII Defensive Features

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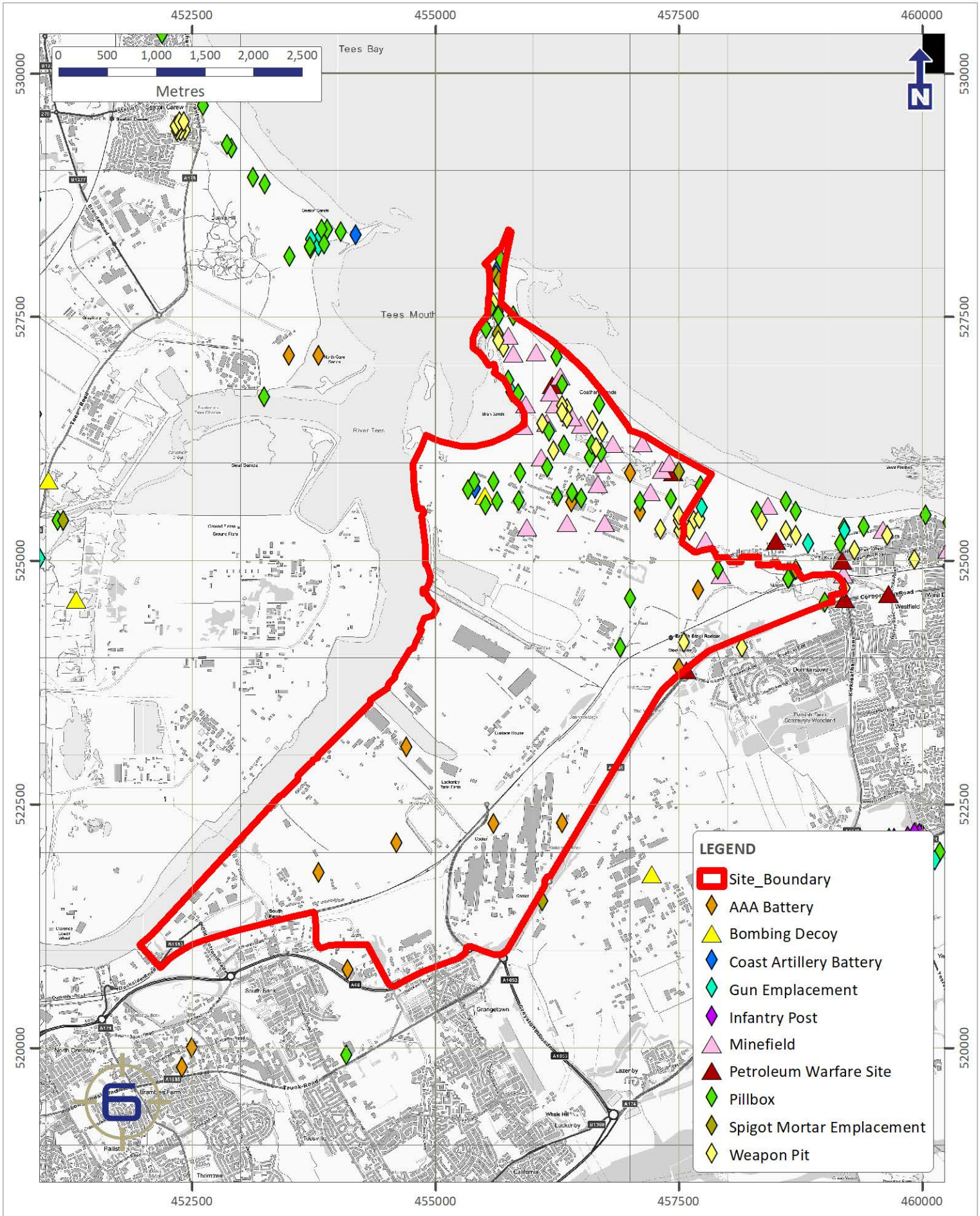

PROJECT NO.	FIGURE	DRAWN	CHECKED	DATE
8588	7	LH	LG	24 March 2022

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Figure Eight - WWII Risk Zones

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UXO Risk Zones

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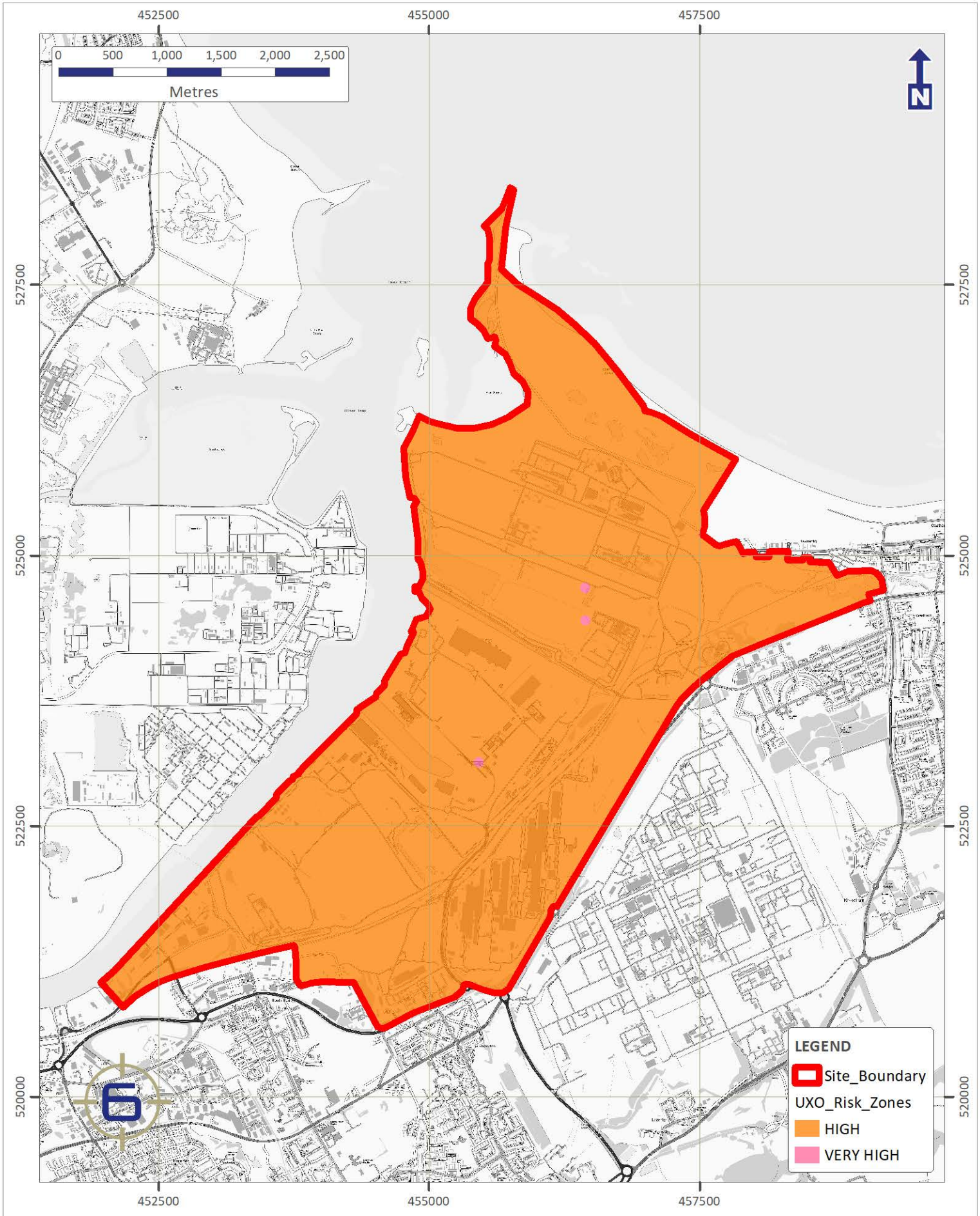

PROJECT NO.	FIGURE	DRAWN	CHECKED	DATE			
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Figure Eight b – UXO Risk Zones (Very High Risk Zones)

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UXO Risk Zones (Very High Risk Zones)

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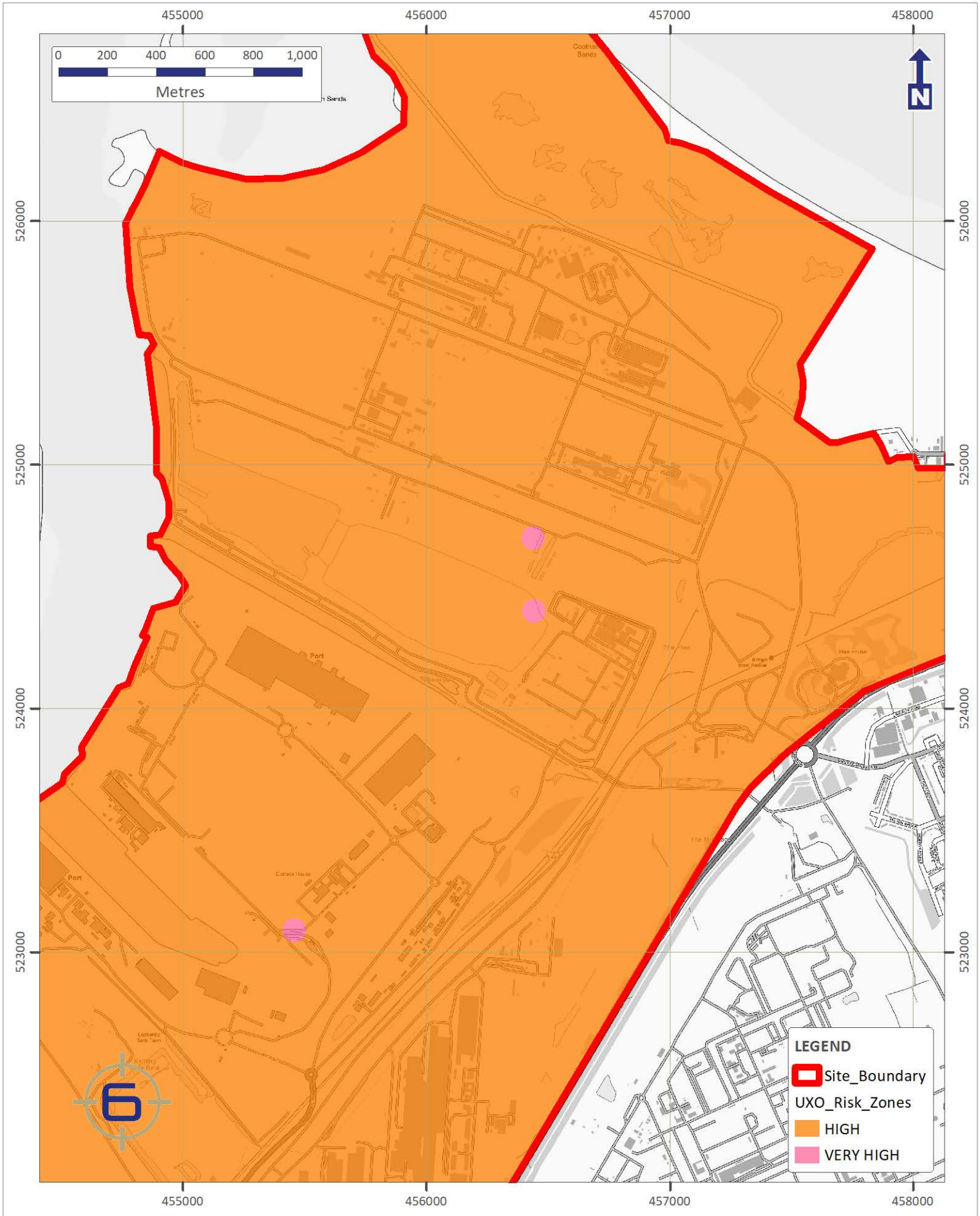

PROJECT NO.	FIGURE	DRAWN	CHECKED	DATE
8588	8b	LG	BW	30 March 2022

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