

Ennor Farm, Old Town, St Marys

**Phase I Geoenvironmental and Geotechnical
Desk Study**

For

Isles of Scilly Council

Project Number:

13394

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EXECUTIVE SUMMARY

SITE LOCATION	<p>The site comprises a field located off Old Town Lane, North of Ennor Farm, Old Town, St Marys, Isles of Scilly with an approximate post code of TR21 0NL 2QU. The National Grid Reference for the approximate centre of the site is 91442 E and 10457 N.</p> <p>It is proposed to redevelop the site with up to fourteen semi-detached and two detached dwellings arranged around a courtyard with access from Old Town Road. The concept drawing also includes an area of orchard, reed beds and allotments. The proposed development is considered to have a High end user sensitivity to contamination that may be found on site.</p>
ENVIRONMENTAL SETTING	<p>Geological maps indicate the site to be underlain by granite bedrock which may be weathered at the surface and include superficial head material. The environmental sensitivity of the site is considered to be High based on the following classifications:</p> <ol style="list-style-type: none"> 1. Hydrogeology: High 2. Hydrology: Very High <p>It is noted that the Lower Moor SSSI is located adjacent the NW corner of the site.</p>
CURRENT USE AND HISTORY	<p>Map records show the site has been used as a field since 1890 with open land to the north, west and east and the village of Old Town to the south.</p> <p>Current and historic agricultural uses and a potential soakaway / cess pit in the SE corner of the site represent potential sources of onsite contamination. Offsite sources include small tanks (c. 100m SW) a quarry (c.70m NE) and modifications to the Lower Moors wetland's drainage which may include unrecorded infill (c.50m NW).</p>
GEOTECHNICAL HAZARDS	<p>Based on a review of available information the following risks and considerations are adjudged in relation to potential geotechnical hazards:</p> <ul style="list-style-type: none"> • Variable weathering of granite bedrock which may vary foundation depth and have the potential to make excavation difficult. • Limited potential for weak, compressible ground such as superficial deposits to varying depths. These are unsuitable for traditional foundations and subject to depth can cause piled foundations to become more appropriate. • The site is sloping and the development will need to accommodate changes in level. • Limited potential for shrinking and swelling of near surface clay rich soils (weathered granite / superficial deposits where present). • Buried services. • Assumed aggressive ground conditions to buried building materials e.g. concrete and steel. • UXO – a low risk has been identified. • Radon, full measures will be required.
CONTAMINATION ISSUES	<p>Based on the history of the area there is considered to be potential for contamination and other ground based risks to be present beneath some of the study area. As such it is considered that this represent a Low-Moderate risk to end users and construction workers from exposure to contamination in soil and groundwater from current/previous use of the site. The potential risk to Controlled Waters from the soakaway / cess pit requires confirmation and is assessed a Moderate-High risk given the proximity to the SSSI. The character of the ground, groundwater and any potential contamination from previous uses of the site across other areas of the site is also unknown.</p>
RECOMMENDATIONS	<p>A ground investigation should be designed by a competent person, implemented in accordance with BS 10175:2011+A2:2017 and BS 5930+A3:2015 and reported in accordance with current technical guidance. This should provide information on the general ground conditions and also target identified potential pollutant linkages. In addition, it should consider potential geotechnical hazards in accordance</p>

with the above BS guidance and Eurocode 7 to provide information for desiccation assessment, buried concrete classification and the design of foundations, floor slabs, external areas, excavations and drainage. Issues such as soil reuse and waste classification should also be considered.

Land quality assessment is an iterative process and likely to be a condition of planning consent for the redevelopment. It is recommended that this report is submitted to the Local Authority as part of the Planning Process.

1.0 INTRODUCTION

1.1. Appointment and Scope

- 1.1.1. This report has been produced by Campbell Reith Hill LLP (CampbellReith) on behalf of Isles of Scilly Council (the Client) to summarise environmental and geotechnical information relating to Ennor Farm, Old Town, St Marys (hereafter referred to as the Site). The references and limitations associated with this report follow the main text. Figures showing the location of the site and the development proposals are presented in Appendix A.

1.2. Policy and guidance

- 1.2.1. The report has been produced in general accordance with the procedures for ground investigation, interpretation and reporting set out in Defra Contaminated Land Report (CLR) 11, BS 5930:2015, BS 10175:2011 (+A2:2017) and BS EN 1997 (Eurocode 7). The objective of the report is to collate and interpret Phase 1 Desk Study information and Phase 2 exploratory data in order to provide:
- a) a conceptual model for the site ground conditions (soil, water and gas);
 - b) a generic quantitative risk assessment (human health, controlled waters and gas);
 - c) outline recommendations for land contamination issues;
 - d) a geotechnical evaluation; and,
 - e) geotechnical design recommendations.
- 1.2.2. The study report is intended to identify further investigation and or remedial requirements necessary to permit the redevelopment of the site with a scheme that will provide 16 new residential units on the site. The scheme will also include gardens, roads and some soft landscaping.
- 1.2.3. This assessment considers the objectives of the National Planning Policy Framework which requires information to demonstrate that a site is suitable for its new use (taking account of ground conditions and land instability) and not capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990 (after remediation). The NPPF requires adequate site investigation information, prepared by a competent person, with the minimum requirement comprising a desk study and site reconnaissance.
- 1.2.4. The geotechnical appraisal has been carried out in accordance with Eurocode 7.
- 1.2.5. It should be recognised that further appraisals, investigations, specification and validation may be required to accord with the recommendations stated herein. It is noted that these appraisals do not consider wider development issues, with cost implications, such as waste classification.
- 1.2.6. The report is based on a review of readily available information as referenced. The desk study information is presented in Appendix B. A site walk over was undertaken by a representative of CampbellReith on 19th December 2019 and images of the site taken during the site visit are presented in Appendix C.

2.0 SITE DESCRIPTION

2.1. Site Location

- 2.1.1. The site location is presented in Figure 1. The site is located just north of Ennor Farm, Old Town, St Marys, Isles of Scilly with an approximate post code of TR21 0NL. The Grid Reference for the approximate centre of the site is 91442 E and 10457 N.

2.2. Site Layout

- 2.2.1. A visit and inspection of the site was undertaken by a representative of CampbellReith on 19th December 2019. Photos from the site walk over are set out in Appendix C. Specific relevant photos are referenced below. A site layout plan is presented in Figure 2, in Appendix A.
- 2.2.2. The site is broadly rectangular with an area of around 0.5ha. The site is a grass field that is currently used for grazing. An access to the field from Old Town Road is located in the south-eastern corner of the site [Photo 6] and the access track continues along the southern boundary of the site [Photo 1] providing access to a residential property in a converted barn (Ennor Castle Barn [Photo 9]). Low stone hedges (drystone) mark the boundaries of the site. The northern and western boundaries have semi-mature trees growing on them [Photos 3, 4 and 11].
- 2.2.3. The site is at an elevation of between c. 3.3m to c. 7.5m AOD and land falls from the east, south east and south toward the northwest corner. The north-western corner is low lying (c.3.3m AOD) and at the time of the site visit had some small localised areas of standing water [Photo 12]. The site is at a slightly higher level than the field and land to the north (c.2.9m AOD). No permanent surface water features were observed on the site.
- 2.2.4. An overhead power cable follows the southern part of the western boundary and then at the halfway point along the western boundary [Photo 3] passes diagonally across the field to the middle part of the northern boundary.
- 2.2.5. A small pile of stones and a manhole are located in the south-eastern corner of the site [Photo 5] and are reportedly part of a drainage feature (manhole to soakaway or septic tank) for the dwellings to the east of the site. The route of the overhead cable and drainage feature is shown in Figure 2 (Appendix A).

2.3. Invasive Plant Species

- 2.3.1. While no suspected invasive plant species were observed during the site visit, the potential presence of invasive plant species, such as Japanese Knotweed, has not been assessed in this study.

2.4. Surrounding Land Use

- 2.4.1. Land to the west and north are also fields. Old Town Inn, a public house with garden [Photo 7], is located on the southern boundary of the site. Old Town Road (A3112) lies immediately adjacent and runs along the eastern boundary of the site. Two residential dwellings [Photos 5 and 6] lie approximately 25m to the east and southeast of the site (on the eastern side of Old Town Road: Ennor, Orchard Cottage and The Old Chapel).

- 2.4.2. A significant area of natural wetland was observed c.30m SW of the site [Photos 12 and 13]. A pumping station and potential well (Castle Rocks Well) are located c.25m WSW of the site [Photos 14 and 15].

2.5. Redevelopment Proposal

- 2.5.1. The proposed site redevelopment is shown in Figure 3. The concept illustrates fourteen semi-detached and two detached dwellings arranged around a courtyard with access from Old Town Road in the southeast. The dwellings are not shown to include parking on plot. The concept includes a proposed area of orchard or reed bed in the northwest corner with a strip of allotments along the western boundary. It is understood that the site is intended to be developed by self-builders (eligible islanders) and will not include any holiday accommodation.
- 2.5.2. It is likely that the dwellings will be of traditional construction.
- 2.5.3. As the proposals include new residential uses with private domestic gardens and allotments, the overall end user sensitivity to any potential contamination that may be present on the site is considered to be **High**.

3.0 ENVIRONMENTAL SETTING

3.1. Geology

- 3.1.1. This section reviews available information regarding the geology of the site. The associated references are listed at the rear of the report. Information has also been taken from the available Groundsure Insight Report [1] enclosed in Appendix B.
- 3.1.2. BGS mapping [2, 3] shows the site positioned on bedrock geology of the coarse grained Outer Granite from the Isles Of Scilly Intrusion and potentially the presence of superficial (drift) weathered Head material (Clay, Silt, Sand And Gravel – down slope detrital weathering). An area of Alluvium is indicated to the north / west of the site.
- 3.1.3. No areas of infilled ground are indicated on the geological extracts on the site.
- 3.1.4. A BGS borehole record is available [2.] for a well adjacent the NW corner of the site as well as two others within 250m of the site:
- SV91SW35 (IoS 12) — CASTLE WELL, ST MARY'S, 91340, 10490 Depth: 2.74m. The logs record that the well is 9ft deep and yielded 4,000 to 5,000 gallons in 9hr to 10hrs and was constant all year. It was noted that pumping 1,500 gallons almost emptied the well. In the summer it filled up within 3hr to 4 hrs and was used by the RAF in the war. Reportedly ¼ million gallons were abstracted in 4 years. Details of Strata not available.
 - SV91/40 (NGR SV9154 1064). Log from Binnie and Partners in 1974. Dug well 3' x 4' to 1.22m depth. Details of Strata not available. Well c.250m NE of site.
 - SV91/35 (IoS 43. NGR SV9149 1020). Old Town Well, c.250m SE of the site. The log records 40ft of Sand and Clay followed by 80ft of "Brown Rock" (=Granite). The total depth of the well is 36.6m depth (120ft) with a 5' diameter of bore. Forty feet of galvanised pipe was placed in the borehole. Resting water was 20ft below the top of the installation which was put in place in 1965.

3.2. Geological Hazards

- 3.2.1. Table 3.1 available information regarding potential geotechnical hazards at the site. The associated references are listed at the rear of the report. Information has also been taken from the available report [1].

TABLE 3.1: Summary of Geotechnical Hazards

Hazard	Distance	Description
Former structures	On site	Very Low, as site currently used as grass field.
Made ground		
Buried concrete		
Coal mining affected areas [4]	On site	No hazard
Mining instability [4]	On site	Very low
Non-coal mining areas of Great Britain [4]	On site	No hazard, some small scale surface mining observed on historic maps.
Collapsible ground [4]	On site	Very low

Compressible ground [4]	Onsite	Very low (becoming moderate toward NW of site)
Ground dissolution [4]	On site	No hazard / very low
Landslide [4]	On site	Very Low
Running sand [4]	On site	No Hazard
Shrinking or swelling clay [4]	On site	Very low (becoming low toward NW of site)

3.3. Coal and Non-Coal Mining

- 3.3.1. The site is not located in a Coal Mining area. There is no recorded mining at this location [1].

3.4. Seismicity

The national forward to BS EN 1998-1:2004+A1:2013 'Eurocode 8: Design of Structures for Earthquake Resistance – Part 1' states there are no requirements in the UK to consider seismic loading, and the whole of the UK may be considered an area of very low seismicity in which the provisions of EN 1998 need not apply.

3.5. Hydrogeology

- 3.5.1. The site hydrogeology is summarised in Table 3.3 and the associated references listed at the rear of the report.

TABLE 3.3: Summary of Hydrogeology

Type	Description	Reference
Superficial/Drift Deposits (Head)	Superficial deposits are a Secondary Aquifer A. It is likely that Head material is present across the site with a greater thickness in lower lying areas. It is likely that it may have low and variable vertical permeability to aquifer units below, yet with potential for lateral run off and localised ponding.	[1]
Soil/Bedrock Deposits (Granite)	Bedrock to the site is a Secondary Aquifer A. The aquifer is likely to be dominated by fracture flow and also more highly weathered near surface with flow likely through the line of weathered joints. It is likely that groundwater storage is low and there is also possibility given proximity to the sea for saline intrusion – especially with periods of high drawdown and low recharge.	[1]
Soil Leaching Potential	The soils are of High Leaching Potential as it is an urban area ("U") with a worst case vulnerability classification ("H").	[1]
Source Protection Zone	The site is within a Zone II Source Protection Zones (Outer Zone) and c.200m from Zone I, Inner Zone.	[1]
Groundwater Abstractions	Available mapping indicates number of groundwater abstractions lie immediately adjacent the northern edge of the site including Castle Rocks Well and pumping station (c 30m NW). Historic maps also indicate the position of wells to the NE of the site (c.20m).	[1]

- 3.5.2. The site is considered to have a **High** sensitivity with respect to hydrogeology. The sensitivity is based upon the definitions provided in NHBC R&D66¹, as amended to include the requirements of the Water Framework Directive and the Environment Agency's River Basin Management Plans. This considers that underlying aquifers are both classified as secondary aquifer A, the site is within an outer source protection zone (Zone II), and there is likely to be very good hydraulic connectivity (via shallow groundwater) to the adjacent sensitive watercourse which part of a SSSI.

3.6. Hydrology

- 3.6.1. The site hydrology is summarised in Table 4.4 and the associated references listed at the rear of the report.

TABLE 3.4: Summary of Hydrology

Type	Distance	Description	Reference
Surface Waters	c. 30m NW	Springs and drains emanating from the area of Castle Rock Well flow northwards and contribute to the Lower Moors SSSI Wetland.	[1]
Surface Water Abstractions		No records of surface water abstractions are available.	
Flooding	>500m S	The Groundsure report [1] indicates the northern part of the Site is located in an area where there may be a potential risk from groundwater flooding to occur at the surface as well as a potential for groundwater flooding of properties below ground level. Environment Agency data [6] shows the site is not located in flood zone 1, suggesting there is limited potential for flooding from rivers or sea. However, a review by the Council of the Isles of Scilly [4] highlights the potential for coastal storm surges to affect areas of the Lower Moors which may back up or surges from the direction of Old Town beach.	[1,4,6]

- 3.6.2. Information from the Environment Agency's Catchment Data Explorer [5] indicates that the Site is not located in proximity to any main rivers.
- 3.6.3. The site is considered to have a **Very High** sensitivity with respect to hydrology. The sensitivity is based upon the guidance detailed for the hydrogeological assessment above and that the site is within close proximity (less than 30m) of a sensitive watercourse associated with a SSSI with potential for rapid transmission of pollutants to that watercourse via a shallow fissured aquifer.

3.7. Radon

- 3.7.1. Part of the site is indicated to be in an high probability radon area (Maximum radon potential is greater than 30 %) [1] and as such a **High** risk is adjudged and full radon protection measures are required for development.

¹ Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66: 2008 Volume 1 (Environment Agency, NHBC and CIEH)

- 3.7.2. BRE 211: Radon – Guidance on Protective Measures for New Buildings (2015) notes that all basements are at increased risk of elevated levels of radon regardless of geographic location, because more walls are in contact with the ground as well as the floor, and reduced natural ventilation below ground level increases the risk of elevated radon levels. In addition, the Management of Health and Safety at Work Regulations (1999) require the assessment of health and safety risks and both the Health and Safety Executive (HSE) and Public Health England (PHE) state that this should include the measurement of radon for occupied below ground workplaces (occupied for more than 1 hour per week/52 hours of the year), irrespective of whether a site is situated in a radon affected area. This is the responsibility of the Employer. For residential developments Public Health England advise that consideration should be given to testing for radon if the basement includes a room that is used regularly.
- 3.7.3. As such, because the proposed development includes construction of a basement, consideration should be given to the incorporation of radon protection measures or site specific assessment to determine whether protective measures are actually required. The form of assessment should be agreed in advance with Building Control and/or the Contaminated Land Department of the Local Planning Authority but may include passive radon monitoring during ground investigation together with a more detailed assessment of the site geology to determine the likelihood for radon-emitting strata to be present at the site.

3.8. Sensitive Land Uses

- 3.8.1. A review has been made of Designated Ecological and Heritage sites and these are summarised below:

TABLE 3.5: Summary of Designated Sites

Type	Description	Reference
Ecological	St Marys Island is designated as an Area of Outstanding Natural Beauty (ANOB). The Lower Moor Site of Special Scientific Interest (SSSI) reference SV912106 is located c.30m to the NW of the site. The site is located in a SSSI Impact Risk Zone and the LPA would need to consult with Natural England on likely risks from all types of planning applications (including residential) except specific householder applications.	[1]
Heritage	The entire island of St Marys is designated as a conservation area and as heritage coast. There are no listed buildings in proximity to this site (<100m).	[1, 11]
Archaeological	ENNOR CASTLE, OLD TOWN, ST MARY'S is a Scheduled Monument, c.50m SW of the site. The site has been the subject of an Archaeological Desktop Study [6] and follow on Geophysical (non-intrusive) Investigation [7]. The site has been identified as having a potential for buried archaeology in these reports associated with activity relating to Old Town Castle and other activity and proposes mitigation including evaluation trenching and a watching brief during construction.	[1, 7, 8]

- 3.8.2. Otherwise the available data [4, 9] indicates that the site is not within 2km of any of the following sensitive land uses:

- Ancient Woodland
- Areas of Adopted Green Belt
- Areas of Unadopted Green Belt
- Forest Parks
- Local Nature Reserves
- County Wildlife Sites
- Marine Nature Reserves
- National Nature Reserves
- National Parks
- Nitrate Sensitive Areas
- Nitrate Vulnerable Zones
- Ramsar Sites
- Special Protection Areas
- World Heritage Sites

4.0 SITE HISTORY AND INDUSTRIAL SETTING

4.1. Site History

- 4.1.1. Information relating to the site history has been obtained by reference to the historic mapping provided with the Groundsure Report [1] and is summarised for the site and its surroundings in Tables 4.1.

TABLE 4.1: History of Site and Adjacent Area

Date	Site	Adjacent Land Area (within 250m of site)
1890	The layout of the site is similar to present time – a field.	<p>Lower Moor, an area of wetland, includes drains, springs and marshy land c.30m SW of the site.</p> <p>Site surrounded by fields on all sides, Old Town Road in current alignment running along eastern side of site.</p> <p>Small buildings and enclosed / wooded area to immediate NW of site.</p> <p>Castle Rocks Well shown c.30m WNW of site. Number of other wells shown 200m NWN and 250m N.</p> <p>Nearest building is Methodist Chapel c.10m E</p> <p>Old Town lies to the south of the site with Old Town Castle (remains) c.70m SWS.</p> <p>Fields to E of Old Town Road reflect historic strip boundaries.</p>
1908	No significant change other than the field subdivided in to two with a broadly N-S fence line down the middle.	<p>Little significant change other than a new building appearing 20m W</p> <p>A Windpump shown adjacent NW corner of site</p> <p>Glasshouses c.25mSW of site behind Chapel.</p> <p>Some areas of Lower Moor to the north have been drained and now shown as fields. Some modification to water ways in the Lower Moor area.</p>
1978	No significant change. Fence down middle of site removed.	<p>Little significant change other than area of new buildings 100m NE of site about the junction of Old Town Lane and High Cross Lane. Small area of excavation / quarrying shown 70m NE of site.</p> <p>Buildings about remains of Castle Farm have a tank structure c.85m SWS of site. Another tank shown c.120m SW of the site.</p> <p>Castle Rocks Well now has a pump house erected next to it c.30m WSW of the site.</p> <p>Further changes to Lower Moor wet land with some ponds shifted and some new created (c.120m SW).</p>
1980	No significant change	No significant change
1995	No significant change	<p>Buildings to immediate S of site described as Old Town Stores.</p> <p>Area of excavation / quarrying still shown 70m NE of site.</p> <p>No other significant changes</p>
2003	No significant change.	<p>Boundary to south part of field formed and is boundary with buildings now named Old Town Inn (formerly Old Town Stores).</p> <p>No other significant changes.</p>

4.1.2. Available historical map records show that the site has been used as a field since 1890 with open land to north, west and east and the village of Old Town to the south. There are very few potentially contaminative uses in the surrounding area identified in historic mapping other than:

- General agricultural uses (mainly grazing) including use of some horticultural glasshouses;
- Small tank structures c.85m SWS and c.120m SW of the site, most likely for agricultural uses (e.g. storing fuel, water, feed);
- Area of excavation / quarrying (not infilled) 70m NE of site; and
- Modification to drainage and ponds within Lower Moors wetland area that might have included infilling.

4.2. Regulatory Consultation

4.2.1. No specific regulatory consultation has been undertaken as part of this study.

4.3. Unexploded Ordnance (UXO)

4.3.1. A preliminary review has been made of the UXO risk presented by the site based upon CIRIA C681 ('Unexploded Ordnance (UXO) – A guide for the construction industry') and the assessment matrices presented in Tables 5.1-5.3 therein. A review of the ZeticaUXO mapping available for the site [10] indicates a low risk area for UXOs. However the site is close to a historic Luftwaffe target at the location of the current St Marys Airport and there has been little to no development on site which may preserve buried UXOs. The archaeological survey [7,8] did not identify any significant risks.

4.3.2. The potential for unexploded ordnance to be present beneath the site is therefore considered to be **Low**.

4.4. Current Industrial Setting

4.4.1. Table 4.2 summarises identified industrial features which may present a potential source of contamination to the site based upon the Groundsure Report [1] or other sources as referenced. These sources should be consulted for further details. Unless otherwise stated, only those features that are within the stated review distances have been included.

TABLE 4.2: Industrial Setting

Type	Distance Reviewed	Distance from Site	Description
Contaminated land register entries and notices	<500m		None [11]
Landfills	<250m		The site of the former Lower Moors Landfill is >250m West of the site [1]
Waste Transfer/Treatment Stations	<100m		None (nearest c.400m west: Porthmellon Waste Management Site, Porth Mellon, St. Mary's, TR21 0JY) [11]
Potentially Infilled Land	<250m		Area of excavation / quarrying (not infilled) 70m NE of site identified on available mapping [1]
Pollution Incidents	<50m		No information available
Discharge Consents	<100m		No information available
Environmental Permits	<150m		No information available
Abstractions	<250m		No information available
Fuel Stations	<200m		No information available
Contemporary trade directory entries- <u>non active</u>	<100m		No information available
Control of Major Accident Hazards (COMAH) Sites	<500m		None

5.0 PRELIMINARY CONCEPTUAL SITE MODEL AND QUALITATIVE RISK ASSESSMENT

5.1. Introduction

- 5.1.1. Current practice for land contamination evaluation involves classification of risk for each of the identified contaminant source-pathway-receptor pollutant linkages. These are summarised below, considering the desk study information obtained. This information has been utilised to design the site investigation considering the proposed end use.

5.2. Classification of Risk

- 5.2.1. Risk is defined by the combination of two factors: i) the probability of an occurrence (expressed as a likelihood); and ii) the consequence of it happening (expressed as a severity). The procedure for classifying risk is summarised in Table 5.1. The categories of risk have been based upon those defined in the Guidance for the Safe Development of Housing on Land Affected by Contamination, R&D66: 2008 Volume 1 (Environment Agency, NHBC and CIEH). The categories are defined in the Environmental Risk Assessment Supporting Information section to the rear of this report, together with definitions of the classifications of probability and consequence.

TABLE 5.1: Classification of Risk

		Consequence			
		Severe	Medium	Mild	Minor
Probability (Likelihood)	High likelihood	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

5.3. Potential Sources of Contamination

- 5.3.1. Table 5.2 summarises the potential contamination sources that have been identified on or near the site. The potential contaminant types associated with these is then given based upon a review of CLR 11, industry profiles and anecdotal information:

TABLE 6.2: Potential Sources of Contamination

Feature on or near site	Potential Contaminant
Onsite: Agricultural land.	M, Pesticides
Onsite: Potentially a soakaway or cesspit in SE corner of site	GG, biological hazards, H, VOC, M, Phosphate
Offsite: Small tank structures c.85m SWS and c.120m SW of the site, most likely for agricultural uses (e.g. storing fuel, water, feed).	H, VOC, Pesticides
Offsite: Area of excavation / quarrying (not infilled) 70m NE of site.	GG
Offsite: Modification to drainage and ponds within Lower Moors wetland area that might have included infilling.	GG

Feature on or near site	Potential Contaminant
Notes: M – Metals. H – Hydrocarbons. VOC – Volatile Organic Compounds. ACM – Asbestos containing Materials. PCB – Polychlorinated biphenyls. GG – Ground Gases	

5.4. Receptors and Exposure Pathways

5.4.1. Potential risks have been identified based on the proposed site use, the receptors and potential pathways by which the receptor/s may be exposed to the contaminant source/s. These are presented in Table 6.3 and have been used to inform the site investigation.

TABLE 6.3: Receptors and Exposure Pathways

Receptor	Pathway	Risk
End Users	Ingestion of soil/dust	Low. Limited potential for presence of pesticides associated from current use (onsite source). Potential for migration of contamination from offsite sources to also low as ground conditions unlikely to provide suitable pathway. Use of part of site for soakaway or cesspit requires confirmation.
Neighbours		
Construction Workers		
End Users	Inhalation of soil/dust	Low. Limited potential for presence of pesticides associated from current use (onsite source). Potential for migration of contamination from offsite sources to also low as ground conditions unlikely to provide suitable pathway. Use of part of site for soakaway or cesspit requires confirmation.
Neighbours		
Construction Workers		
End Users	Dermal contact with soil/dust/water	Low. Limited potential for presence of pesticides associated from current use (onsite source). Potential for migration of contamination from offsite sources to also low as ground conditions unlikely to provide suitable pathway. Use of part of site for soakaway or cesspit requires confirmation.
Neighbours		
Construction Workers		
End Users	Inhalation of vapour from soil/dust	Low. Limited potential for presence of pesticides associated from current use (onsite source). Potential for migration of contamination from offsite sources to also low as ground conditions unlikely to provide suitable pathway.
Neighbours		
Construction Workers		
End Users	Consumption of vegetables/plants	Low. Limited potential for presence of pesticides associated from current use (onsite source). Potential for migration of contamination from offsite sources to also low as ground conditions unlikely to provide suitable pathway. Use of part of site for soakaway or cesspit requires confirmation.
End Users	Migration of soil gases to confined spaces/structures	Low – Moderate. Modifications to infill ditches and ponds in Lower Moor area may have used material that may produce GG. However, area mostly saturated precluding fracture flow through underlying rock to site (no pathway). Area of former excavation c.70m to NE not shown to be backfilled (no source). Use of part of site for soakaway or cesspit requires confirmation.
Construction Workers		
Building		

Receptor	Pathway	Risk
End Users	Inhalation of vapour from groundwater	Low. Limited potential for presence of pesticides associated from current use (onsite source). Potential for migration of contamination from offsite sources to also low as ground conditions unlikely to provide suitable pathway. Use of part of site for soakaway or cesspit requires confirmation.
Neighbours		
Construction Workers		
Surface Waters	Migration of water borne contaminants from on site.	Low. The potential for the proposed use to impact the adjacent SSSI requires consideration. Use of part of site for soakaway or cesspit requires confirmation.
Groundwater Aquifer	Migration of contamination from surface and/or subsurface to groundwater	Low. Use of part of site for soakaway or cesspit requires confirmation.
Groundwater Aquifer	Migration of water borne contamination from off-site.	Potential for migration of contamination from offsite sources low as ground conditions unlikely to provide suitable pathway.
Building / structures	Movement of contaminants to engineered structures (water pipes).	Low. Use of part of site for soakaway or cesspit requires confirmation.
Sensitive Land Use (SSSI etc.) – trees adjacent boundary of site.	Uptake by flora/fauna associated with sensitive land use	High - The potential for the proposed use to impact the adjacent SSSI requires consideration. Use of part of site for soakaway or cesspit requires confirmation.

* Assumes basic PPE

- 5.4.2. Based on a preliminary conceptual site model, generally a **Low** risk has been identified from potential contamination at the site. Use of part of site for soakaway or cesspit requires confirmation.
- 5.4.3. Considering the past and current uses of the site, a ground investigation is required in order to appraise the potential issues of land contamination (previous use as agricultural land and soakaway/cesspit), as well as geotechnical matters.

6.0 GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS

6.1. Summary

- 6.1.1. The site is expected lie upon a layer of Topsoil and/or Superficial Deposits, underlain by the Granite Bedrock. The site is to be developed with a residential units, basements, soft landscaping and car parking areas.
- 6.1.2. The anticipated geotechnical hazards associated with the proposed developments are summarised in Table 6.1.

Table 6.1: Summary of Onsite Geotechnical Hazards

Hazard	Description
Made Ground and Obstructions	Made Ground, associated with past and present developments, is unlikely to be present.
Compressible Ground	Weak, compressible made ground and potentially superficial deposits may be encountered to the north and west of the site to be encountered to varying depths. Such strata (alluvial deposits or head) are unsuitable for standard foundations and exhibit large total and differential settlements under relatively light loads such as that imparted by pavements or low rise residential buildings. Subject to depth, they can cause piled foundations to become more appropriate.
Foundations and Uneven depth of weathering	Typically there are very good foundation conditions within Bedrock (granite) when fresh or slightly weathered. However, weathered zones of bedrock of significant thickness containing large core stones in a finer sandy clay matrix may give rise to irregular engineering rock head levels and variable foundation conditions.
Sloping Topography	The site is sloping and the development will need to accommodate changes in level.
Excavation	Superficial deposits will be easy to excavate. Highly weathered and altered bedrock may be excavatable by hard digging with excavations requiring immediate support. Ripping or blasting will be required in fresher bedrock depending on spacing and orientation of joint sets.
Shrinking and Swelling Clay	The geotechnical properties of the Superficial Deposits and upper weathered horizons of the bedrock may exhibit limited volume change potential. Foundations within materials of large volume change potential should be designed to relevant guidance. The designer should account for this at an early stage particularly where structures are in proximity to existing/proposed trees.
Services	The Site is likely underlain by a number of redundant and active services which may conflict with the proposed development or future intrusive ground investigation works.
Aggressive Ground Conditions	At this stage it should be assumed that the underlying materials could be aggressive to buried construction products (such as concrete and steel).
Reuse of Bedrock as Engineered Fill	Fresh rock is often suitable as selected granular fill.
Site Investigations	Important to determine depth and nature of superficial deposits as well as the weathered/altered zone and spacing and orientation of discontinuities (were identified) within bedrock.

6.2. Ground Investigation

- 6.2.1. Due to the lack of available information and potential hazards identified, a ground investigation is required which should be designed based on the requirements of Eurocode 7 Part 2 (and the associated national annex) to confirm the underlying geology and engineering properties of the soils. The investigation should be tailored to ensure the geotechnical hazards discussed in Section 6.1 are addressed. This should include, but not be limited to; boreholes/trialpits, laboratory geotechnical testing, in-situ geotechnical testing (including SPT testing), soakage testing and groundwater monitoring.

The geotechnical objectives of the ground investigation are to:

- Provide a detailed geological model;
 - Assess design parameters for the soil properties (both physical and chemical);
 - Investigate geotechnical hazards;
 - Provide groundwater and hydrogeological data; and,
 - Provide adequate design information for the proposed development.
- 6.2.2. The ground investigation should be designed by a 'competent person' in accordance with BS 5930:2015 and Eurocode EN 1997 (Eurocode 7).
- 6.2.3. It should be noted that the nature of the site and the anticipated ground conditions present a number of practical issues that would need to be considered in the design and implementation of the recommended ground investigation.
- This site is currently in active use (grazed), which may place constraints on the areas that can be investigated and will have bearing on the nature of equipment that can be deployed (works to minimise impact on field).
 - As the site is in active use, live services will be present onsite. A detailed service survey should be undertaken and safe digging best practice applied during ground investigation.
 - Historical / buried archaeology may provide obstructions to ground investigation works.
- 6.2.4. A Geotechnical Design/Interpretative Geotechnical Report should be prepared in accordance with Eurocode 7, once the ground investigation has been completed and the final scheme details are known.

7.0 ENVIRONMENTAL CONCLUSIONS AND RECOMMENDATIONS

7.1. Summary

- 7.1.1. The site is considered to lie in area of **High** environmental sensitivity with respect to Hydrogeology and a **Very High** environmental sensitivity with respect to Hydrology. Lower Moor SSSI adjacent the site is adjudged to have a **High** sensitivity. The proposed residential with gardens/allotments and soft landscaped areas is considered to be of **High** end user sensitivity.

7.2. Summary of Contamination

- 7.2.1. The potential sources of contamination identified at the site include:
- Onsite current agricultural use of the site. Potential for previous treatments to have been applied to the soils to improve fertility (if used for floriculture) or reduce potential pests (metals, hydrocarbons, pesticides and other inorganic chemicals); and
 - Onsite use of part of the site as soakaway or cesspit (buried in SE corner of site).
- 7.2.2. The potential sources of contamination on the site are considered to present a potential **Low to Moderate** risk to future end users and other receptors such as construction workers and a potential **Moderate to High** risk to Controlled Waters. This assessment anticipates that potential harm may be likely to arise from the identified hazards without remediation action and that further investigation and assessment are required to establish the risk to future end users and receptors and to enable the design of remedial measures to mitigate the risk to an acceptable level if required.

7.3. Ground Investigation

- 7.3.1. A ground investigation is required in order to appraise the potential land contamination identified. This should be designed by a 'competent person' in accordance with BS10175:2011+A2:2017. The investigation should provide general site coverage, target the potential sources of identified contamination and assess the underlying soil quality, groundwater quality and ground gas conditions. Provision should be made for between four to six visits to monitor ground gas and vapours. The investigation should also consider waste issues, as these can affect the development costs, and options for soil recycling at the site.
- 7.3.2. A contamination analysis suite should be applied that considers metals, semi-metals, inorganic chemicals, speciated petroleum hydrocarbons and polyaromatic hydrocarbons, phenols, and pesticides, in order to provide data for human health and groundwater risk assessments. Such testing should be completed in accordance with UKAS and MCERTs standards. Subject to the determination of the final objectives of the ground investigation, the test suite may also be modified to facilitate the classification of waste soil arisings and also to consider the suitability of soils on site for reuse as a growing medium (BS 3882).
- 7.3.3. The desk study is considered sufficient to satisfy planning conditions relating to former site uses and provision of a preliminary risk assessment. It is likely that site investigation and reporting will be required in order to satisfy further planning condition(s) relating to land contamination.
- 7.3.4. The results of any intrusive investigation should be reported within a Land Quality Statement (LQS) for the site considering the requirements of current technical guidance (publications by the

Environment Agency, NHBC and Eurocode 7) and the requirements of the NPPF or associated planning conditions. This report should include: a Generic Quantitative (Tier 2) Environmental Risk Assessment; revised Conceptual Site Model; recommendations for further assessments (if required); and, outline remedial and geotechnical recommendations. Land quality assessment is a phased process and it should be noted that further investigation, assessment and reporting may be required, dependent upon the findings of the Land Quality Statement.

7.4. Additional Work

7.4.1. None identified.

TECHNICAL REFERENCES

Reference*	Reference Title	Type
[1]	Groundsure Insight Report (Maps). Report Ref: GS-6582079. See Appendix B.	Website / Map
[2]	BGS Geology of Britain viewer (Publicly available record) (http://mapapps.bgs.ac.uk/geologyofbritain/home.html) Accessed 28 th January 2020	Website / Map
[3]	BGS 1:50,000 scale map of England and Wales: Isles of Scilly (sheet 357 & 360 – published 1975) Solid and Drift geology (Publicly available record) (http://www.largeimages.bgs.ac.uk/iip/mapsportal.html?id=1001759) Accessed 28 th January 2020	Website / Map
[4]	Council of Isles of Scilly (2017) Isles of Scilly Local Flood Risk Management Strategy, March 2017, Final.	
[5]	Environment Agency Catchment Data (Publicly available record) (http://environment.data.gov.uk/catchment-planning/) Accessed 28 th January 2020	Website / Map
[6]	Environment Agency Flood Map for Planning (Publicly available record) (https://flood-map-for-planning.service.gov.uk/) Accessed 28 th January 2020	Website / Map
[7]	Parkes, C, 2018. Land north of Ennor Castle, St Mary's, Isles of Scilly; Heritage Impact Assessment Cornwall Archaeological Unit, Cornwall Council: Truro (CAU report no. 2018RR046)	Report
[8]	Parkes, C, 2019. Land north of Ennor Castle, Old Town, St Mary's, Isles of Scilly; geophysical survey statement, Cornwall Archaeological Unit, Cornwall Council: Truro (CAU reference: 2019R040)	Report
[9]	MAGiC Website - Natural England (Publicly available record) (http://magic.gov.uk/MagicMap.aspx) Accessed 28 th August 2018	Website / Map
[10]	Zetic UXO Bomb Risk Map (https://zeticauxo.com/downloads-and-resources/risk-maps/) accessed 28 th January 2020.	Website / Map
[11]	www.scilly.gov.uk	Website /

* Note reference numbers continue from Table 1.1 if presented in Section 1 of the report

ENVIRONMENTAL RISK ASSESSMENT SUPPORTING INFORMATION

Definitions of Consequence, Probability and Risk

The following classification has been taken from Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66: 2008 Volume 1 (Environment Agency, NHBC and CIEH).

The key to the classification is that the designation of risk is based upon the consideration of both:

a) **the magnitude of the potential consequence (i.e. severity).**

[takes into account both the potential severity of the hazard and the sensitivity of the receptor]

b) **the magnitude of probability (i.e. likelihood).**

[takes into account both the presence of the hazard and receptor and the integrity of the pathway]

Classification of Consequence

Classification	Definition	Examples
Severe	<p>Highly elevated concentrations likely to result in "significant harm" to human health as defined by the EPA 1990, Part 2A, if exposure occurs.</p> <p>Equivalent to EA Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce.</p> <p>Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population.</p> <p>Catastrophic damage to crops, buildings or property.</p>	<p>Significant harm to humans is defined in circular 01.2006 as death, disease*, serious injury, genetic mutation, birth defects or the impairment of reproductive functions.</p> <p>Major fish kill in surface water from large spillage of contaminants from site.</p> <p>Highly elevated concentrations of List I and II substances present in groundwater close to small potable abstraction (high sensitivity).</p> <p>Explosion, causing building collapse (can also equate to immediate human health risk if buildings are occupied).</p>
Medium	<p>Elevated concentrations which could result in "significant harm" to human health as defined by the EPA 1990, Part 2A if exposure occurs.</p> <p>Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce.</p> <p>Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population.</p> <p>Significant damage to crops, buildings or property.</p>	<p>Significant harm to humans is defined in circular 01/2006 as death, disease*, serious injury, genetic mutation, birth defects or the impairment of reproductive functions.</p> <p>Damage to building rendering it unsafe to occupy e.g. foundation damage resulting in instability.</p> <p>Ingress of contaminants through plastic potable water pipes.</p>

Classification	Definition	Examples
Mild	<p>Exposure to human health unlikely to lead to "significant harm".</p> <p>Equivalent to EA Category 3 pollution incident including minimal or short lived effect on water quality; marginal effect on amenity value, agriculture or commerce.</p> <p>Minor or short lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that would endanger the long-term maintenance of the population.</p> <p>Minor damage to crops, buildings or property.</p>	<p>Exposure could lead to slight short-term effects (e.g. mild skin rash).</p> <p>Surface spalling of concrete.</p>
Minor	<p>No measurable effect on humans.</p> <p>Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems.</p> <p>Repairable effects of damage to buildings, structures and services.</p>	<p>The loss of plants in a landscaping scheme.</p> <p>Discoloration of concrete.</p>

Classification of Probability

Classification	Definition	Examples
High likelihood	There is pollutant linkage and an event would appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution.	<p>a) <i>Elevated concentrations of toxic contaminants are present in soils in the top 0.5m in a residential garden.</i></p> <p>b) <i>Ground/groundwater contamination could be present from chemical works, containing a number of USTs, having been in operation on the same site for over 50 years.</i></p>
Likely	There is pollutant linkage and all the elements are present and in the right place which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.	<p>a) <i>Elevated concentrations of toxic contaminants are present in soils at depths of 0.5-1.0m in a residential garden, or the top 0.5m in public open space.</i></p> <p>b) <i>Ground/groundwater contamination could be present from an industrial site containing a UST present between 1970 and 1990. The tank is known to be single skin. There is no evidence of leakage although there are no records of integrity tests.</i></p>
Low likelihood	There is pollutant linkage and circumstances are possible under which an event could occur.	<p>a) <i>Elevated concentrations of toxic contaminants are present in soils at</i></p>

Classification	Definition	Examples
	However, it is by no means certain that even over a long period such an event would take place, and is less likely in the shorter term.	<i>depths >1m in a residential garden, or 0.5-1.0m in public open space.</i> <i>b) Ground/groundwater contamination could be present on a light industrial unit constructed in the 1990s containing a UST in operation over the last 10 years – the tank is double skinned but there is no integrity testing or evidence of leakage.</i>
Unlikely	There is pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long-term.	<i>a) Elevated concentrations of toxic contaminants are present below hardstanding.</i> <i>b) Light industrial units <10 yrs old containing a double-skinned UST with annual integrity testing results available.</i>

Note: A pollution linkage must first be established before probability is classified. If there is no pollution linkage then there is no potential risk. If there is no pollution linkage then there is no need to apply tests for probability and consequence.

For example if there is surface contamination and a principal aquifer is present at depth, but this principal aquifer is overlain by an aquiclude of significant thickness then there is no pollution linkage and the risks to the principal aquifer are not assessed. The report should identify both the source and the receptor but state that because there is no linkage there are no potential risks.

Description of the classified risks

Very high risk

There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to be site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.

High risk

Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.

Moderate risk

It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.

Low risk

It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised would normally be mild. It is unlikely that the site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.

Very low risk

It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that the harm if realised would normally be mild or minor.

No potential risk

There is no potential risk if no pollution linkage has been established.

DRAFT

LIMITATIONS

Environmental & Geotechnical Interpretative Reports

1. This report provides available factual data for the site obtained only from the sources described in the text and related to the site on the basis of the location information provided by the client.
2. Where any data or information supplied by the client or other external source, including that from previous studies, has been used, it has been assumed that the information is correct. No responsibility can be accepted by CampbellReith for inaccuracies within this data or information. In relation to historical maps the accuracy of maps cannot be guaranteed and it should be recognized that different conditions on site may have existed between and subsequent to the various map surveys.
3. This report is limited to those aspects of historical land use and enquiries related to environmental matters reported on and no liability is accepted for any other aspects. The opinions expressed cannot be absolute due to the limit of time and resources implicit within the agreed brief and the possibility of unrecorded previous uses of the site and adjacent land.
4. The material encountered and samples obtained during on-site investigations represent only a small proportion of the materials present on the site. There may be other conditions prevailing at the site which have not been revealed and which have therefore not been taken into account in this report. These risks can be minimised and reduced by additional investigations. If significant variations become evident, additional specialist advice should be sought to assess the implications of these few findings.
5. The generalised soil conditions described in the text are intended to convey trends in subsurface conditions. The boundaries between strata are approximate and have been developed on interpretations of the exploration locations and samples collected.
6. Water level and gas readings have been taken at times and under conditions stated on the exploration logs. It must be noted that fluctuations in the level of groundwater or gas may occur due to a variety of factors which may differ from those prevailing at the time the measurements were taken.
7. Please note that CampbellReith cannot accept any liability for observations or opinions expressed regarding the absence or presence of asbestos or on any product or waste that may contain asbestos. We recommend that an asbestos specialist, with appropriate professional indemnity insurance, is employed directly by the client in every case where asbestos may be present on the site or within the buildings or installations. Any comments made in this report with respect to asbestos, or asbestos containing materials, are only included to assist the client with the initial appraisal of the project and should not be relied upon in any way.
8. The findings and opinions expressed are relevant to those dates of the reported site work and should not be relied upon to represent conditions at substantially later dates.
9. This report is produced solely for the benefit of the client, and no liability is accepted for any reliance placed upon it by any other party unless specifically agreed in writing.

Appendix A: Figures

Figure 1: Site Location

Figure 2: Annotated Site Layout

Figure 3: Proposed Development

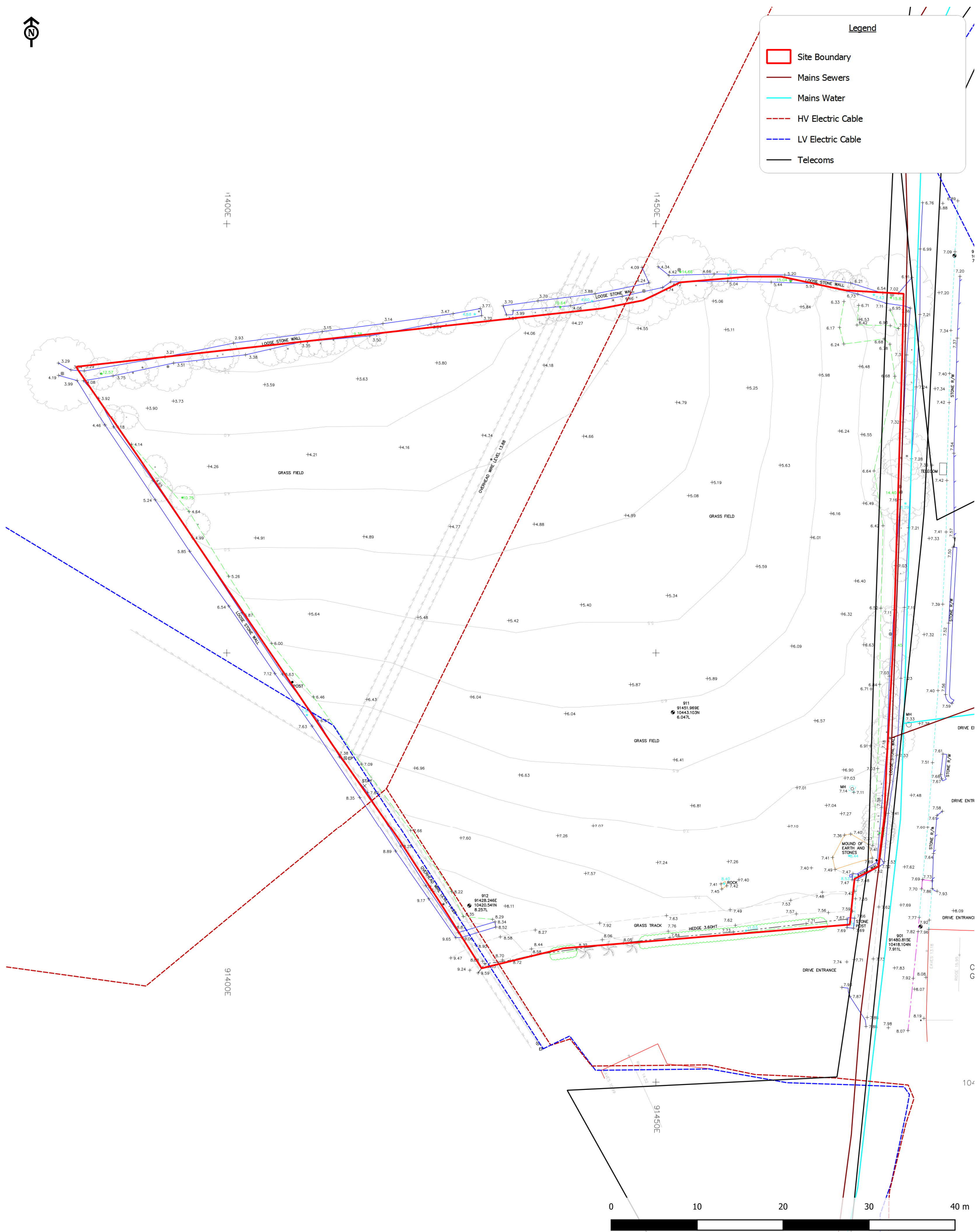


Ennor Farm, St Mary's
Client: Council of Isle of Scilly

Figure 1:
Site Location Plan

Scale: 1:10000@A4
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Contains Ordnance Survey data © Crown copyright and database right 2020.
Job Number: 13394
Drawn by - Checked by: RP - AD
Drg No - Status/Revision: 13394-CRH-XX-XX-FG-G-7000 - P1
File location: N:\13250 - 13499\13394 B - Ennor Farm St Marys\Project_Workspaces\DTs (pdf in Outputs)
Date (Revision History): 24/01/2020 (P1, First Issue, 24/01/20, RP)

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Figure 2:
Site Layout Plan

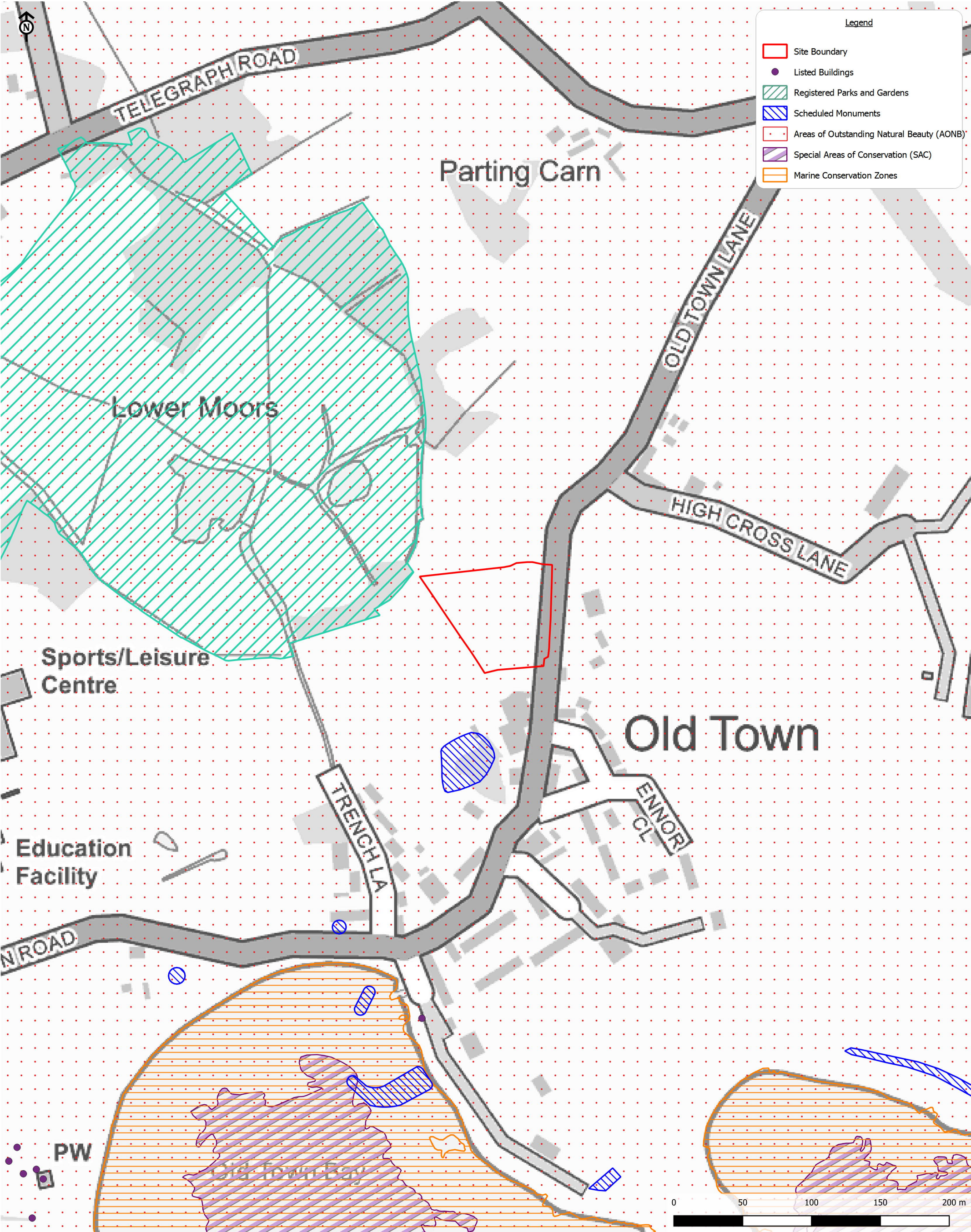
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Ennor Farm, St Mary's
Client: Council of Isle of Scilly

Figure 3:
Proposed Development Plan



Ennor Farm, St Mary's
Client: Council of Isle of Scilly

Figure 4:
Constraints Plan

Appendix B: Desk Study Information

Groundsure Insight Report (Maps). January 2020 Report Ref: GS-6582079

Site Details:

91440, 10457

Client Ref: 13394_AD
Report Ref: GS-6582079
Grid Ref: 91431, 10454

Map Name: County Series

Map date: 1889

Scale: 1:10,560

Printed at: 1:10,560



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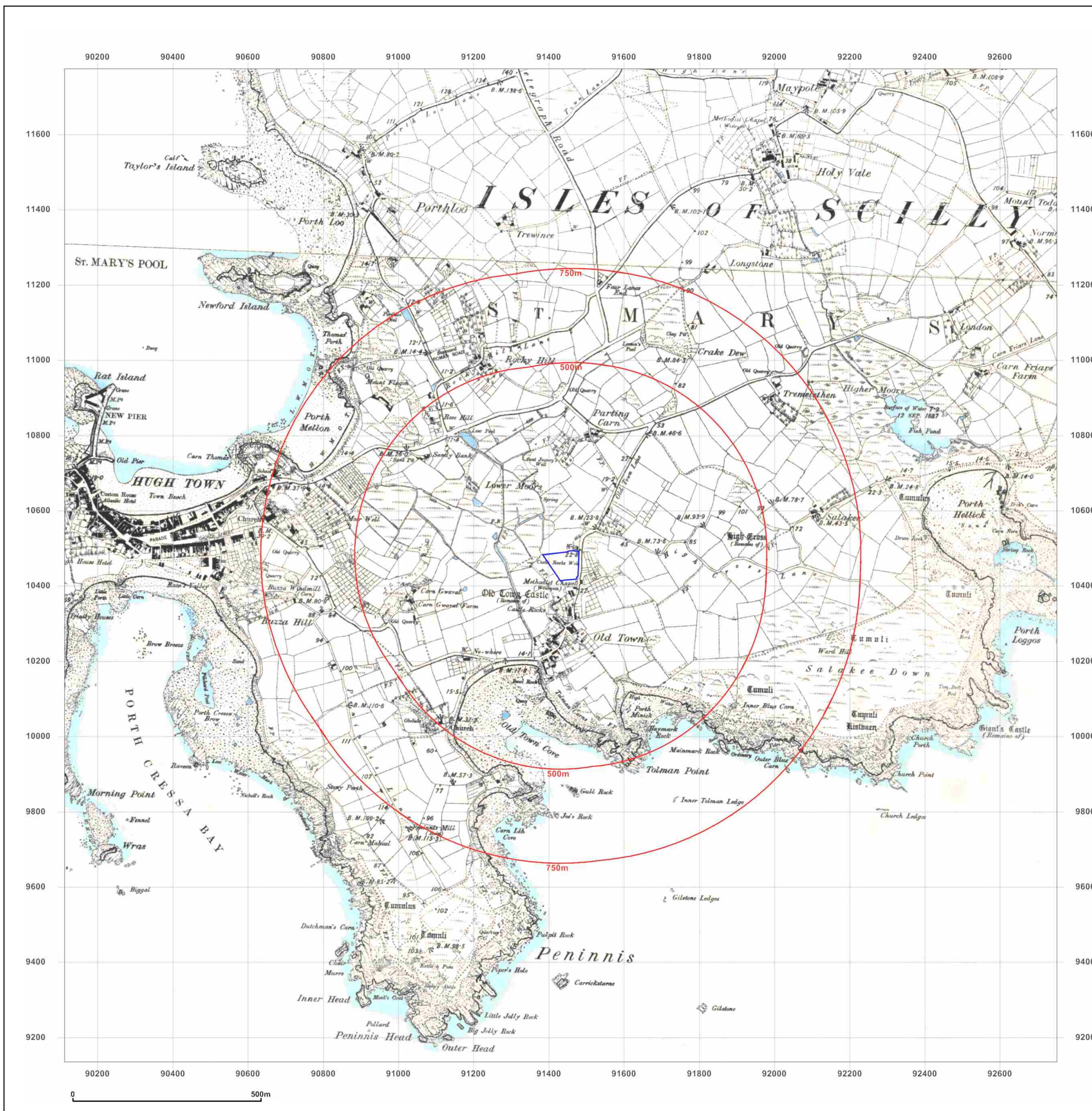


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E: info@groundsure.com
W: www.groundsure.com

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Production date: 29 January 2020

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



Site Details:

91440, 10457

Client Ref: 13394_AD
Report Ref: GS-6582079
Grid Ref: 91431, 10454

Map Name: County Series

Map date: 1909

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1888
Revised 1909
Edition N/A
Copyright N/A
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Surveyed 1888
Revised 1909
Edition 1909
Copyright N/A
Levelled N/A

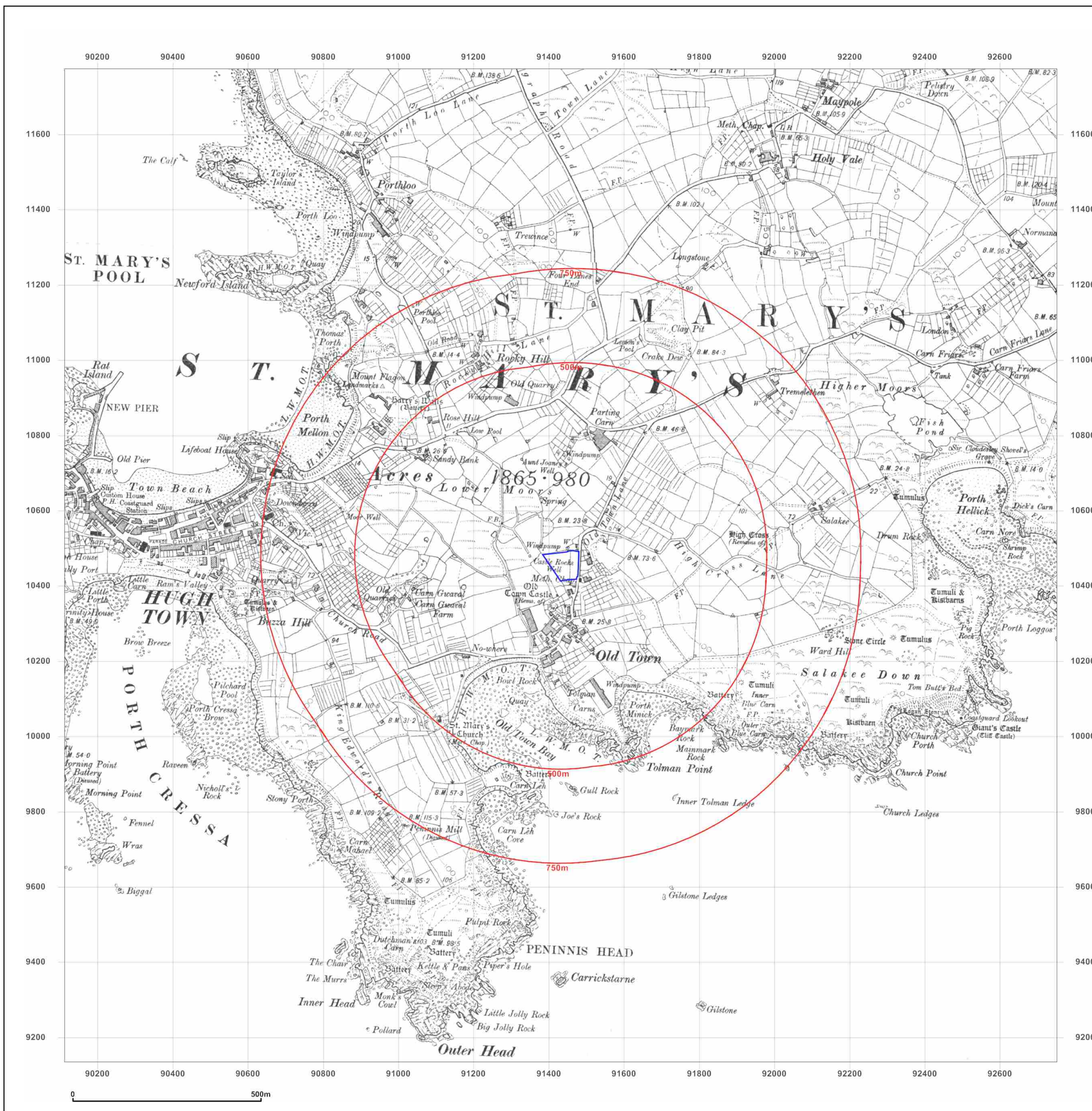


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Site Details:

91440, 10457

Client Ref: 13394_AD
Report Ref: GS-6582079
Grid Ref: 91431, 10454

Map Name: National Grid

Map date: 1980

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1978
Revised 1979
Edition N/A
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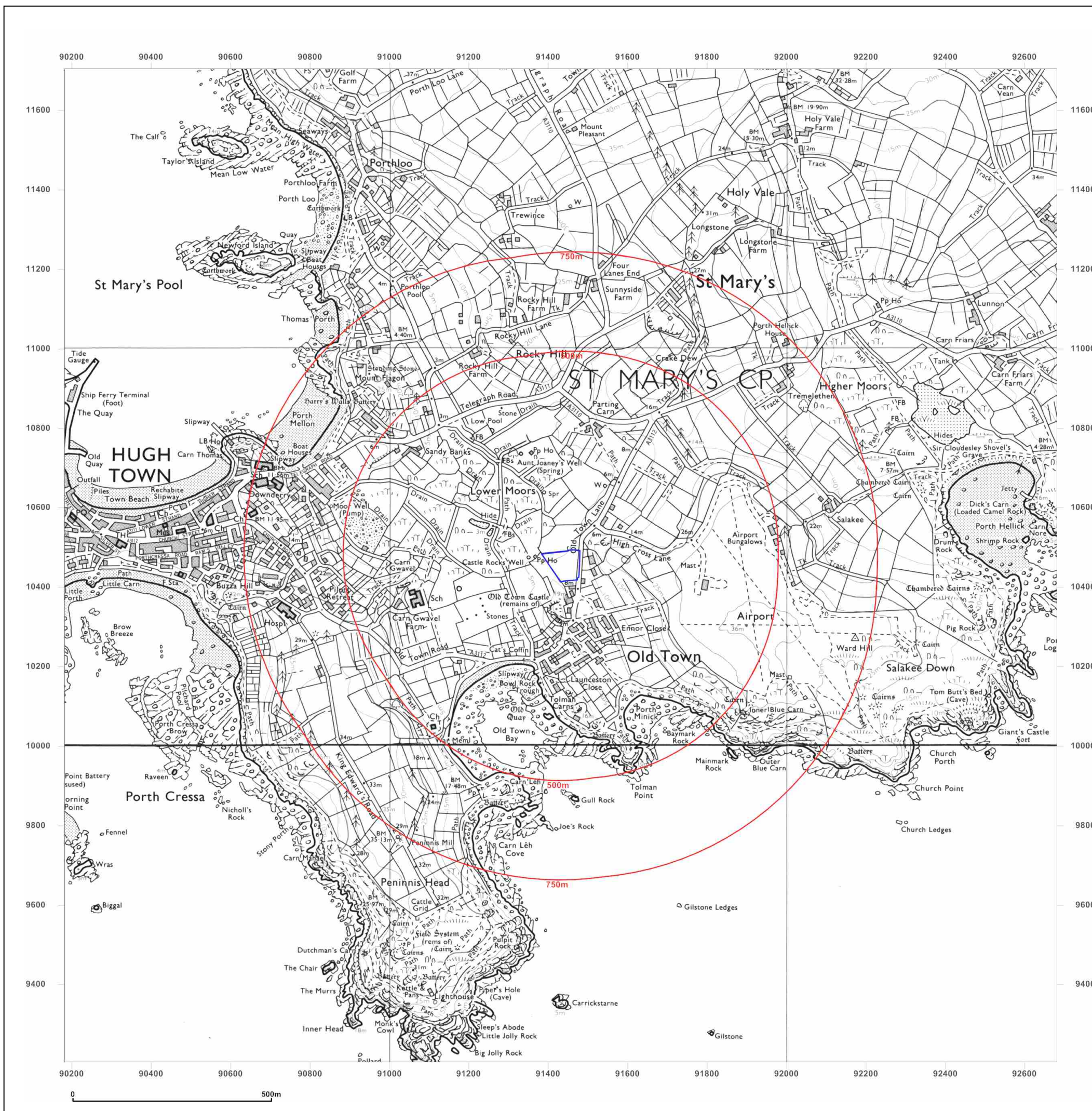


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Site Details:

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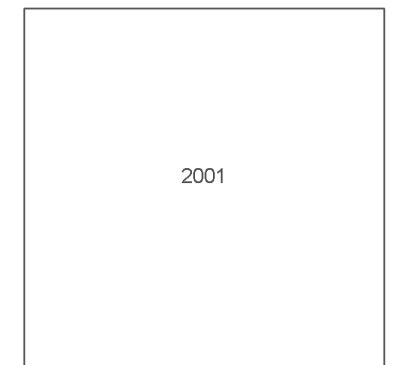
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Report Ref: GS-6582079
Grid Ref: 91431, 10454

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000



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