



Loch Ryan Habitat Restoration

EIA Screening Request

On behalf of



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1 Introduction

1.1 Overview

- 1.1.1 Equinor (the ‘Applicant’) have developed a design option for a seabird habitat creation measure on the west coast of Scotland to deliver compensation as part of a Habitats Regulations Assessment (HRA) derogation case for the proposed Sheringham Shoal Offshore Wind Farm Extension Project (SEP) and Dudgeon Offshore Wind Farm Extension Project (DEP) located off the north Norfolk coast. This compensation measure includes the creation of an inland pool on the western shore of Loch Ryan, (a sea loch) with islands for seabirds (notably Sandwich tern) to nest.
- 1.1.2 This Environmental Impact Assessment (EIA) Screening Request has been prepared by Stantec UK Ltd (Stantec), Institute of Environmental Management and Assessment (IEMA) qualified assessors and EIA Quality Mark registrants, on behalf of the Applicant. It seeks an opinion from Dumfries and Galloway Council, as the relevant Local Planning Authority, and Marine Scotland (in relation to works below the mean high water springs mark) as to whether the proposal constitutes an EIA development. The request will be submitted in accordance with Regulation 8 of the Town and Country Planning (Scotland) (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) for works on land and to the mean low water springs mark, and The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended), for the marine Scotland Act 2010 (Marine Licences) to be consented by Marine Scotland for works below the mean high water springs mark.
- 1.1.3 This request outlines the proposed development and environmental conditions at and surrounding the site. It will briefly review the potential environmental effects of the development and outline how they will be considered through the design process and documented within the planning application documents. In doing so we have arrived at the conclusion that EIA is not required in this instance and the remainder of the report sets out our findings.

1.2 EIA Screening Request Structure

- 1.2.1 In accordance with the EIA Regulations, this screening request provides the information listed in **Table 1.1**.

Table 1.1 – Screening Request Schedule of Information

EIA Information Request	Section Reference(s)
Confirmation that the proposed development work constitutes a Schedule 2 Development under the EIA Regulations.	Section 1.3 Consideration of EIA Screening Requirements Section 5: Summary and Conclusions
A description of the location of the development, including a plan sufficient to identify the land.	Section 2 The Site and Surrounding Area
A description of the location of the proposed development, with particular regard to the environmental sensitivity of the geographical area likely to be affected.	
A description of the proposed development including its locations, physical and operational characteristics.	Section 3 The Proposed Development
A description of any features of the proposed development, or proposed measures, envisaged to avoid or prevent significant adverse effects on the environment.	
A description of the aspects of the environment likely to be significantly affected by the proposed development.	Table 2.1: Assessment of Locational Sensitivity Table 3.1: Assessment of Development Characteristics Section 4 Potential and Likely Significant Environmental Effects
A description of any likely significant effects, to the extent of the information available on such effects, of the proposed development on the environment	

EIA Information Request	Section Reference(s)
Consideration of the selection criteria set out in Schedule 3 of the EIA Regulations and the available results of any “relevant assessment”, as defined by the EIA Regulations.	Sections 2 and 4

1.3 Consideration of EIA Screening Requirements

- 1.3.1 Under the EIA Regulations, certain developments should be screened to determine whether a statutory EIA should be carried out. Criteria and guidance thresholds are provided. Schedule 1 developments are mandatory EIA developments, whilst Schedule 2 developments require assessment of their circumstances by the consenting authority.
- 1.3.2 The proposed development does not fall within the developments identified as Schedule 1 development in the EIA Regulations that automatically requires an EIA.
- 1.3.3 The proposed development is classified as ‘Infrastructure Projects’ under Schedule 2 of the EIA Regulations. The proposed development falls under Section 10 of Schedule 2 as it is considered to be:
- “(i) Dams and other installations designed to hold water or store it on a long-term basis (unless included in Schedule 1)”.
- 1.3.4 Additionally, as the site boundary is 12.7 hectares (ha) in size, the proposed development exceeds the area threshold of 1 hectare, above which the planning authority is required to adopt a screening opinion, according to the EIA Regulations.
- 1.3.5 A Schedule 2 development is an EIA development only if it is likely to have significant effects on the environment by virtue of factors such as its size, characteristics or location. Scottish Government Planning Circular 1 2017: Environmental Impact Assessment Regulations 2017 confirms that the critical question to be addressed in EIA screening is therefore:
- “Would this particular development be likely to have significant effects on the environment?”.
- 1.3.6 To answer this question, it is necessary to provide the information detailed in Regulation 8 and screen the development against the criteria contained in Schedule 3 of the EIA Regulations.
- 1.3.7 The necessary information is provided below to solicit a formal EIA Screening Opinion from Dumfries and Galloway Council and Marine Scotland / Scottish Ministers. Section 4 of this report provides an appraisal of the proposed development in the context of the existing Site and surrounding area, considering criteria provided in Schedule 3 of the EIA Regulations. Schedule 3 of the EIA Regulations lists the selection criteria for the screening of a Schedule 2 development, based on the characteristics and location of the development and the types and characteristics of the potential impacts that could occur. The appraisal considers the characteristics of the proposed development, the environmental sensitivity of areas likely to be affected and the potential for significant effects.

2 The Site and Surrounding Area

2.1 Site Location and Surrounding Area

- 2.1.1 The site comprises 12.7 ha of existing agricultural land and woodland located on the western shore of Loch Ryan. The site includes:
- A triangular parcel of land at its northern extent which will be developed to accommodate the proposed pool. Excavated soil (approximately 22,000 m³) from the proposed pool will be placed in the land adjoining the pool to the west;
 - A strip of land running broadly from north to south (located to the west of an existing fence line) which will accommodate excavated material (41,000 m³) and form the internal access road, and
 - A section of woodland and grassland to the south which will be used as part of the access arrangements (exact arrangements TBC).
- 2.1.2 Access will be taken from the existing roadway serving the Scottish Water pumping station to the South of the Corsewall Burn, the public footpath in this location will be widened and a new bridge installed over the Corsewall Burn, either as a replacement or as an addition to the existing bridge. Public access will be maintained in this area but may involve some localised diversion during construction and / or operation. It is noted that this is a designated Core Path – part of Kirkcolm Circular.
- 2.1.3 The main focus of the development will be the creation of the inland pool in the northern triangular shaped land parcel, which is bounded to the north by a footpath, the west by a private footpath of the Corsewall Estate and trees (ancient woodland), an informal coastal footpath to the east, and agricultural land to the south.
- 2.1.4 The woodland located in the southeastern edge of the triangular land parcel is home to a number of Invasive Non-native Species (INNS) (knotweed, balsam and rhododendron), these will be removed, and an area of trees will be felled as part of the proposals.

Surrounding area

- 2.1.5 The wider lands of Corsewall Estate surround the proposed development and Corsewall House is located approximately 200m to the west of the site.
- 2.1.6 The former RAF Wig Bay airfield is located approximately 900m to the south of the site. This area was used for seaplane testing during World War 1 and became active again during World War 2. It is currently disused.
- 2.1.7 Scar Point, which was the focus of the Sandwich tern activity in Loch Ryan was home to a breeding colony (now lost) and is located approximately 850m to the southeast of the site adjacent to the former airfield.
- 2.1.8 The village and civil parish of Kirkcolm is located approximately 450m west of the Site, and the centre of Stranraer is approximately 8.5km south.
- 2.1.9 The ferry ports of Loch Ryan Port and Cairnryan Port are located on the eastern shores of Loch Ryan opposite the proposed development site.
- 2.1.10 The Site boundary is shown below in **Figure 2.1** below.



Figure 2.1 – Location Plan

Relevant Environmental Characteristics and Designations

- 2.1.11 Within the Site, there are no statutory designated sites or known areas of ecological interest. The closest designated site lies approximately 2.3km east across Loch Ryan and is the Glen App and Galloway Moors which is a Site of Special Scientific Interest (SSSI), a Special Protection Area (SPA) and a Biosphere Reserve. The area is mainly covered by heather moorland and rough grassland and is designated for supporting a breeding population of hen harrier, which are a species of European importance¹. Within a 10km radius of the site lies Corsewall Point to Milleur Point SSSI to the north (3.5km) and Salt Pans Bay SSSI to the south east (9.8km).
- 2.1.12 The site is not located within an Air Quality Management Area (AQMA). Belfast City Council AQMA is the closest which lies approximately 65km southwest of the site, designated for Annual mean Nitrogen dioxide in 2004.
- 2.1.13 SEPA flood maps show that a very small location along the Corsewell Burn has a medium likelihood of surface water flooding, meaning each year this area has a 0.5% chance of flooding. Additionally, another very small location along the western boundary of the site has a high likelihood of surface water flooding, meaning each year this area has a 10% chance of flooding. The eastern boundary of the site has a low to high likelihood of coastal flooding, meaning each year this area has a 0.1-10% chance of flooding.
- 2.1.14 On review of the baseline conditions the cultural heritage team have made a preliminary investigation of the RAF Wig Bay site, a World War 2 seaplane base is located at Scar point, approximately 450 metres south of the area of search for the inland pool. Further assessment may be required as this is part of an important group of WW2 sites which are under threat from deterioration.
- 2.1.15 The site is not subject to any historic statutory designations. There are listed buildings surrounding the site. Corsewall House (LB9922) is a Category B listed building located approximately 200m from the western site boundary. Corsewall, Dovecot (LB10175) is a

¹ [Glen App Citation – Nature Scot](#)

Category B Listed Building located approximately 350m from the site boundary. Kirkcolm Church Graveyard (LB13517) is a Category B Listed Building approximately 350m from the site boundary. Corsewall Farm House (LB9921) is a Category B Listed Building approximately 475m from the site boundary. There are other Category C listed buildings in the area of Corsewall. There is a Scheduled Monument designated for two enclosed settlements, roundhouses and associated remains approximately 1.1km south west of the site.

- 2.1.16 It is acknowledged that there will have been a historic, communal and visual connection between the region around Corsewall House (Category B itself but associated with Category B and C structures) / Dove Cot Plantation / Barn Park Plantation and Loch Ryan House (Category A itself, but associated with Category B and C structures) / Cairn Ryan Hill. The extent to which this is retained, or may be sensitive, is not defined at this stage.
- 2.1.17 A Bronze Age rock shelter is recorded 500m north of the site and may be associated with possible raised beaches located between the site and Corsewall Burn. The proposed access track may be located across these beaches and may be impacted by construction of the proposed (yet to be finalised) site access and enabling works.
- 2.1.18 A core path (Kirkcolm Circular) runs along Corsewall Burn at the southern end of the site, and leads out to the access road where it joins onto Main Street (B738). There is also a coastal path that runs along the eastern boundary of the northern section of the site (triangular land parcel). Please note that this is not a designated 'core path'. The burn has a catchment of 6.2km² and discharges directly into Loch Ryan.
- 2.1.19 The Site lies within Landscape Character Type (LCT) 156: Peninsula (NatureScot, 2019). The LCT broadly covers the entire area referred to as The Rhins on the western half of Dumfries and Galloway. Key characteristics associated with the LCT include:
- A medium scale landscape which rises from boggy hollows to rolling pastureland to gorse moorland;
 - Intimate sheltered bays with occasional narrow strips of exposed, flat land;
 - Medium-sized fields bounded by drystone dykes or hedgerows; and
 - A few, but well developed policy landscapes.
- 2.1.20 An area of ancient woodland, known as the Barn Park/Dove Cot Plantations lies immediately west of the site, and covers an area of approximately 45ha. Please note that no woodland within the site is designated as ancient woodland.
- 2.1.21 The site also lies within the Rhins Coast Regional Scenic Area (RSA), which broadly encompasses the coastal edge and southern part of the peninsula. The area is characterised by steep cliffs, raised beaches and rocky foreshores, with smaller rocky and sandy bays connected by low lying land (Regional Scenic Areas Technical Paper, Dumfries and Galloway Council, 2014).
- 2.1.22 The Site lies approximately 2.5km west of Lochryan Gardens and Designed Landscapes on the western shoreline of Loch Ryan. Cairnryan Conservation Area lies at a similar distance to the east of the site. Dumfries and Galloway Council record the area in which the Site is located as being within a Non-Inventory Designated Landscape (Corsewall House).
- 2.1.23 With regards to visibility, the Site is potentially visible from the A718, from individual settlements and from Kirkcolm Primary School looking east, but for the most part visibility is reduced by intervening woodland around Corsewall Estate and the natural topography of the site as it falls away towards the coastal edge. In the wider context, the site is partially visible for transient users of the Cairnryan ferry services, with distant views also possible from the eastern shores of the Loch around Cairnryan along the A77, coastal paths and picnic areas.

2.2 Selection of Site

- 2.2.1 An extensive site selection process has been undertaken to locate a suitable site for the proposed habitat creation measures aimed primarily at Sandwich terns.

- 2.2.2 Loch Ryan emerged as a preferred location following feedback during an Expert Topic Group meeting in January 2022. The Loch Ryan region was identified as it has the merits of being an historical breeding site for Sandwich Tern over many decades, and is known to have previously supported a breeding colony at Scar Point, some 1km to the South of the proposals.
- 2.2.3 Within Loch Ryan, the work to narrow the field of potential sites centred on the general area close to where the previous Sandwich Tern colony in Loch Ryan was known to be located, an island off the tip of Scar Point. It is understood that this colony site was vacated by the colony as a result of coastal erosion.
- 2.2.4 The Applicant carried out a desktop review of potential locations for an inland pool around Loch Ryan and undertook site visits in August 2022 to further appraise potential locations and to confirm constraints or opportunities that might influence site selection and the eventual implementation of the works.
- 2.2.5 The proposed site was identified from a shortlist of 8 potential locations as being the most suitable location for the development, primarily having regard to topography, hydrological conditions, proximity to the former colony at Scar Point and surroundings being sympathetic to the establishment of a new colony. The proposed site at Corsewall Estate had the added advantages of low likelihood of disturbance from humans and predators, which can be further minimised (through design measures).

2.3 Application of Schedule 3 Locational Sensitivity Screening Criteria

- 2.3.1 Schedule 3 of the EIA Regulations screening criteria relates to environmental sensitivity of the geographical area likely to be affected by a proposed development. The site and the surrounding area are considered against these criteria in **Table 2.1** below.

Table 2.1 – Assessment of Locational Sensitivity

Screening Criteria	Assessment
Existing and approved land use	<p>Land use at the Site consists of agricultural land and broad-leaved wet woodland. According to the James Hutton Institute Land Capability for Agriculture (LCA), the majority of the site is Class 3.1 (land capable of producing consistently high yields of a narrow range of crops and/ or moderate yields of a wider range). The Site where the inland pool is proposed is currently used as grazing land for cattle and as woodland. Furthermore, it is important to note that a high proportion of the landowner's landholding also falls under Class 3.1, and therefore the loss of 13 ha for the proposed uses is considered to be insignificant in this context.</p> <p>The proposed development is compatible with existing and approved land uses on site. The land use is therefore not considered sensitive in this respect.</p>
The relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity)	<p>The proposed development will use localised materials, where possible, such that it will not be a major user of natural resources within the site area itself and it is not considered likely to affect their relative abundance or availability.</p> <p>There are the no Biodiversity designations within the site boundary, the closest designated site lies approximately 2.3km east and is the Glen App and Galloway Moors which is a Site of Special Scientific Interest (SSSI), a Special Protection Area (SPA) and a Biosphere Reserve.</p> <p>At the southern end of the site is a core path that runs alongside the Corsewall Burn, out to the access road where it joins Main Street (B738). There are no other recreational assets however it is of note that it is a busy route especially with dog walkers.</p> <p>The proximity of identified environmental sensitivities to the site and potential areas of works therein means that the characteristics of the proposed works and any associated likely environmental effects must be considered further in this screening request (see Sections 3 and 4).</p>
<p>The absorption capacity of the natural environment, paying particular attention to the following areas:</p> <ul style="list-style-type: none"> ▪ wetlands, riparian areas, river mouths; ▪ coastal zones and the marine environment; ▪ mountain and forest areas; ▪ nature reserves and parks; ▪ European sites and other areas classified or protected under national legislation; ▪ Areas in which there has already been a failure to meet the environmental quality standards...or in which it is considered that there is such a failure; ▪ Densely populated areas; ▪ Landscapes and sites of historical, cultural or archaeological significance. 	<p>There are no listed buildings within the site. The closest listed building is Corsewall House (LB9922) which is a Category B listed building located approximately 200m from the site boundary.</p> <p>With regards to absorption capacity within the surrounding area, it is acknowledged that designated ecological features and protected species may be susceptible to adverse effects from potential construction and operational phase impacts (in particular disturbance effects). Key mitigation parameters identified in Section 3 will be deployed to minimise potential ecological impacts during the construction of the proposed development.</p>

3 Proposed Development

3.1 Key Elements

- 3.1.1 The seabird habitat creation measure is intended to deliver compensation as part of a Habitats Regulations Assessment (HRA) derogation case for the proposed Sheringham Shoal Offshore Wind Farm Extension Project (SEP) and Dudgeon Offshore Wind Farm Extension Project (DEP) located off the north Norfolk coast. The measure is intended to compensate for predicted impacts to North Norfolk Coast Special Protection Area (SPA) / Greater Wash SPA Sandwich tern.
- 3.1.2 The paragraphs below provide an overview of the initial outline design and installation information for the compensatory measure; however, development of these details is ongoing.

3.2 Inland Pool

- 3.2.1 A draft proposed plan for the pool has been prepared in support of the pre-application advice request (Indicative Site Option for Sandwich Tern Inland Pool, reference: SK-002).
- 3.2.2 The draft design involves the creation of a 1.55 ha inland pool containing up to four islands, measuring approximately 10m diameter and amounting to a total combined island area of 0.06 ha. The islands will be finished with suitable substrate in order to create favourable conditions for nesting terns and these will be positioned close to the centre of the pool in order to maximise the distance from the edge and reduce the potential of terrestrial predation. The maximum water depth between the islands is to be confirmed, but is likely to be between 1m and 1.5m.
- 3.2.3 Two inlet headwalls are proposed at the northern and southern ends of the pool (eastern side into Loch Ryan) each with a non-return valve and approximately 0.45m \varnothing PVC inlet pipes notionally set at a level to accommodate normal mid-to-high tides. This will bring water into the pool during each tidal cycle. In the mid-section of the pool is an outlet structure with non-return valve and another 0.45m \varnothing PVC outlet pipe set at a similar mid-to-high tide level. This is where water will leave the pool. Exact levels will be confirmed at detailed design stage and will include a means to adjust and control the level at the outlet. This whole arrangement will see a purging of water within the pool to avoid stagnation and provide good water quality.
- 3.2.4 To reduce predation, the entirety of the inland pool will be protected by a predator proof fence. Additionally, a 2m high bund with 1:1 side slopes will surround the pool to reduce human disturbance caused by users of the coastal path. The design will be sympathetic to the local area. Bird viewing stands, measuring approximately 6m x 4.5m will be built at the south-eastern and north eastern edge of the pool to allow walkers to view the pool without disturbance. These will be accessed from a gravel path taken from the coastal path.
- 3.2.5 As is shown on the 'Indicative Site Option for Sandwich Tern Inland Pool' (reference: SK-002) plan, the excavated soil (approximately 22,000 m³) from the proposed pool area will be placed in the land adjoining the pool to the west. This area will be surrounded by a 2m high bund. The remainder of the excavated material (approximately 41,000m³) will be spread across the fields to the south up to the Coursewall Burn (reference SK-001).
- 3.2.6 The existing informal coastal path will need to be relocated approximately 1.5 to the east to accommodate the proposal.

3.3 Access

- 3.3.1 Site access for construction purposes will be taken from the existing core path at the southern end of the site adjacent to the Scottish Water pumping station and the Coursewall Burn.
- 3.3.2 The following two options are currently being considered with regard to the access arrangements, and will be confirmed following discussions with the relevant landowner(s), and Council:

- Enter the site through the woodland to the north of the core path (opposite the Scottish Water Waste Water Pumping Station), travel eastwards, crossing a new bridge over the Corsewall Burn and then northwards along the western side of the existing fence line; or
- Continue along to the eastern end of the core path via an upgrade of the existing bridge over the Corsewall Burn and then enter the field via the existing gate and travel northwards along the western side of the existing fence line.

- 3.3.3 The site location plan includes the areas required for both options and will be refined for the planning application.
- 3.3.4 With regard to the first access option, some tree felling within the woodland may also be necessary.
- 3.3.5 The access road will be retained following completion of the construction works, primarily in order to facilitate site maintenance.
- 3.3.6 The proposed road design and surfacing options are currently being considered, and will be confirmed as part of the planning application submission.

3.4 Public Access

- 3.4.1 The temporary closure or re-routing of the coastal path during construction works may be necessary, but this is to be confirmed. The coastal path is currently used by walkers and dog walkers. Walkers tend to park at the 'Rest Stop' located approximately 1.1km south west of the Site and can walk along the Core Path (Kirkcolm Circular) or the coastal path.
- 3.4.2 The proposed development aims to minimise disruption by including viewing stands for walkers to view the pool, as of which will be located to the south and north of the proposed pool. Furthermore, the 2m high bund will prevent disturbance from walkers.

3.5 Project Timescales

- 3.5.1 The following indicative programme is proposed:
- Planning Application Submission (if an EIA is not required): February 2024
 - Planning Application Submission (if an EIA is required): April 2024
- 3.5.2 Upon the granting of planning permission, a tender process would follow with development of the proposal expected in 2025, with a construction programme of up to 6 months anticipated. The proposal would be implemented upon the completion of the construction works.

3.6 Embedded Mitigation Measures

- 3.6.1 As detailed in Section 2, the site and surrounding area contain a number of environmental sensitivities which have the potential to interact with the proposed development. However, the proposed development will be sited and designed to minimise the potential for adverse effects on sensitive receptors. The proposed site is large enough to provide flexibility in design to incorporate mitigation. In accordance with Regulation 8(3) of the EIA Regulations, a framework of design principles and environmental mitigation measures is being applied to guide the detailed design and construction of the proposed development in order to avoid or prevent any likely significant environmental effects.
- 3.6.2 The design principles adopted for the proposed development are:
- **Avoidance** of the loss of sensitive environmental (including but not limited to ecological) features and assets through careful siting decisions and options appraisals;
 - **Minimisation** through siting and design of likely direct and indirect adverse environmental effects where these cannot be avoided;
 - **Mitigation** through the incorporation of appropriate measures into the construction and operation of the proposed development to address likely direct and indirect

adverse environmental effects where these cannot be reduced to an acceptable level through siting or design; and

- **Effectiveness** in satisfying the requirements to provide new inland pools.

3.6.3 The implementation of all embedded mitigation measures requires to be confirmed through the content of the planning application and marine licence and any subsequent permissions granted for the proposed development. Standard environmental mitigation measures could include:

- Provision of spill kits and training on how to use;
- Limits on working hours;
- Dampening down any stockpiled materials;
- Refuelling over bunded areas;
- Wheel washing;
- Well maintained and serviced plant and equipment;
- Designated waste management procedures / segregation of waste;
- Adherence with relevant SEPA GPPs (guidance for pollution prevention) [Guidance for Pollution Prevention \(GPP\) documents | NetRegs | Environmental guidance for your business in Northern Ireland & Scotland](#); and
- Employment of a suitably experienced and qualified Ecological Clerk of Works (ECoW).

3.6.4 Following detailed design, a Construction Environmental Management Plan (CEMP) will be prepared and agreed with Dumfries and Galloway Council and Marine Scotland prior to any construction works commencing.

3.6.5 In accordance with Regulation 8(3) of the 2017 EIA Regulations, any measures proposed at this stage to avoid or prevent significant adverse effects on the environment must be taken account of when determining this EIA screening request.

3.7 Application of Schedule 3 Characteristics of Development Screening Criteria

3.7.1 Schedule 3 to the EIA Regulations identifies screening criteria relating specifically to the characteristics of a development proposal. The proposed development is considered against these criteria in **Table 3.1** below. Of note, this screening table relates only to development characteristics; separate criteria regarding the site and likely interactions between the proposed development and the site are addressed in other sections of this report.

Table 3.1 – Assessment of Development Characteristics

Screening Criteria	Assessment
The size and design of the development.	The proposed development involves the creation of an inland pool of 1.55 ha within a site boundary of 12.7 ha. This would require only relatively limited land-take. On this basis, the scale of the proposed development is not itself considered likely to result in significant environmental effects as the design will be undertaken sympathetic to the surrounding environment.
Accumulation with other existing development and/or approved development.	<p>All elements of the proposed development requiring authorisation from the local planning authority / Marine Scotland will be contained within the site. No development further to that listed above is required or proposed as part of the proposed development.</p> <p>The site does not benefit from any relevant and extant planning permissions and there are also no known approved developments within the vicinity of the site which would interact with the proposed development.</p> <p>Following adoption of appropriate mitigation measures, no significant effects are considered likely in relation to the cumulative impact with other development.</p>
The use of natural resources, in particular land, soil, water and biodiversity.	<p>A marine licence under the Marine (Scotland) Act 2010 will be required and sought for works below the mean high water springs mark in relation to construction of the inlet and outlet pipes and headwall structures. This activity is strictly regulated through marine licence conditions.</p> <p>Based on the absence of sources of potential contamination or sensitive human health receptors, and that a Construction Environmental Management Plan (CEMP) will be prepared to accompany the applications and will set out the above to protect the environment, it is considered that there will be no potentially significant effects from ground conditions, including instability, and contamination. Biodiversity and hydrological effects are considered in more detail within section 4.2-4.4.</p>
The production of waste.	All waste management practices during construction will comply with appropriate regulations. There are invasives species on Site, Japanese Knotweed and Himalayan Balsam, which will be dealt with appropriately, such as pre-removal herbicide and banded on site. Any unsuitable or contaminated materials encountered during the construction process would be extracted and subject to appropriate disposal in accordance with all regulatory requirements, including through obtaining appropriate SEPA licences, if required. No significant environmental effects related to waste production are considered likely.
Pollution and nuisances.	<p>Machinery/plant used in the construction of the proposed development would adhere to best practice techniques to ensure that air based pollutants are minimised and appropriately mitigated where possible. Exhaust gas emissions and adverse noise effects on sensitive receptors from machinery/plant are likely to be minimal given the nature and scale of the proposed development and the rural location of the site.</p> <p>Notwithstanding this, any likely adverse effects on air quality, soundscapes and vibration will be controlled to an acceptable level through standard site management and construction practices. During construction, materials and plant would be stored in dedicated construction compounds within the site area. Appropriate mitigation measures and construction management best practice techniques would be utilised to minimise the risk of any environmental effects occurring, e.g., as a result of localised fuel spillages. The use of machinery and plant, including mechanical excavators, generators and pumps will adhere to best practice techniques</p>

Screening Criteria	Assessment
	<p>and will be undertaken within standard construction hours to reduce risks associated with noise and air based pollutants.</p> <p>Standard ecological and pollution control mitigation measures and procedures will be deployed during the construction phase of the proposed development, in particular to avoid accidental pollution of the water environment. A Preliminary Ecological Appraisal (PEA) was undertaken in February 2023. Further surveys were recommended and included: NVC surveys, badger, otter, water vole, breeding bird and preliminary bat roost assessment of trees. These surveys have been undertaken and completed in 2023. Additionally, an Ecological Impact Assessment will be submitted in support of the planning application. Thereafter, subject to any conditions attached to any planning permission granted by Dumfries and Galloway Council as planning authority and Marine Scotland, it is expected that appropriate environmental mitigation measures will be specified in and implemented through a Construction Environmental Management Plan (CEMP).</p> <p>No significant environmental effects are therefore considered likely in relation to pollution and nuisances on account of the characteristics of the design and construction characteristics of the proposed development.</p>
<p>The risk of major accident and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge.</p>	<p>If not properly managed, potential construction and operational phase risks could result in amenity disturbance, injuries and/or fatalities to construction workers, road users and members of the public within and surrounding the site, as well as pollution migration to ground and watercourses resulting in potential adverse effects on soil, land, water and biodiversity resources. However, with the implementation of the CEMP which will include standard construction mitigation measures, construction management best practice techniques and adherence of all applicable regulations, no significant environmental effects are considered likely.</p> <p>As with any construction project, there are potential risks in relation to the use of plant and machinery, movement and placement of construction materials (including earthworks) working at height, accidental spillage of hazardous substances, fires and explosions. Given the nature of the proposed development significant effects on human health are considered unlikely.</p>
<p>The risk to human health (for examples, due to water contamination or air pollution).</p>	<p>The primary potential impact on air quality is windblown dust during the construction phase. However, the site is not in proximity to any Air Quality Management Area (AQMA) under the Local Air Quality Management (LAQM) regime. The implementation of standard construction mitigation measures, construction management best practice techniques and adherence of all applicable regulations will mean that no significant environmental effects are considered likely</p>

4 Potential and Likely Significant Environmental Effects

4.1 Introduction

- 4.1.1 The over-riding issue in determining whether EIA is required is whether a development is likely to result in significant effects on the environment, taking account of any mitigation measures proposed at this stage. Sections 2 and 3 above considered the potential for environmental impacts to occur as a result of either the environmental sensitivity of the site or the characteristics of the proposed development.
- 4.1.2 To confirm the presence or absence of likely significant environmental effects and thus confirm that the proposed development does or does not require a formal EIA, **Table 4.1** below provides a high-level assessment of environmental effects anticipated to occur due to the interaction of the proposed development with identified environmental sensitivities of the site and surrounding area, taking account of all mitigation measures identified at this stage. Due to ecological sensitivities at the site, **Sections 4.2 – 4.5** discuss impacts in additional detail. This assessment is made with reference to the environmental factors prescribed in Regulation 4(3) of the EIA Regulations and identifies the proposed approach to appropriately managing potential environmental effects.

4.2 Ecology

Habitat and Species Surveys

- 4.2.1 In 2023 a Preliminary Ecological Appraisal (PEA) was carried out within the triangular land parcel where the pool is proposed. The appraisal also incorporated adjacent fields to the south, as far as the Corsewall Burn, and east to the shores of Loch Ryan.
- 4.2.2 The PEA included a desk study using online resources and details of non-statutory sites available for Dumfries and Galloway Council's Local Development Plan (LDP) Local Nature Conservation Sites Technical Paper. Further, a survey was carried out to identify the presence of habitats of conservation concern using the European Nature Information System (EUNIS) which is adopted by Nature Scot. The survey also identified the potential for the Site and the land to the east closer to Loch Ryan to support protected and notable species.
- 4.2.3 The PEA was carried out in line with the Chartered Institute's Ecology and Environmental Management (CIEEM) Code of Professional Conduct (CIEEM, 2022) and British Standards (BS) Code of Practice for Planning and Development (42020) on Biodiversity (BS, 2013).
- 4.2.4 The desk study confirmed that there was no statutory designated site within 2km of the Site. A non-statutory site lay approximately 1.3km to the west, while areas of ancient woodland existed further west outside the Site boundary. Ancient Woodland is listed as a priority habitat within the Dumfries and Galloway Local Biodiversity Action Plan (LBAP).
- 4.2.5 The habitat in the north-western half of the Site was semi-improved grassland dominated by a mix of perennial rye-grass *Lolium perenne* and crested dog's tail *Cynosurus cristatus*. The north-eastern half of the Site was a stand of broad-leaved wet woodland dominated by alder *Alnus glutinosa* and sycamore *Acer pseudoplatanus*. At the very edge of the north-east corner of the Site was a coastal path which bordered the shingle shore of Loch Ryan. Both the woodland and shingle shore are listed as habitats of principal importance on the Scottish Biodiversity List. However, the small footprint of these habitats, when considered against the wider extent of both habitats in the surrounding landscape, would suggest they are only of a local level of importance.
- 4.2.6 Habitats to the south of the field in which the pool would be located, included semi-improved grassland, mire/fen habitats, bracken, scrub, ponds and mixed, broad-leaved woodland. The extensive wetland habitat outside the eastern boundary of the Site represented a mosaic of *Juncus acutiflorus* meadow and *Phalaris arundinacea* swamp. This habitat had formed along historic ditch systems in low lying areas and had an exceptionally high botanical diversity. It

was also considered likely to have some reliance on ground-water and be classed as a ground-water dependent terrestrial ecosystem. Based on the diversity of the habitat it was considered as being of Council Level importance.

- 4.2.7 Several stands of invasive non-native plants, notably Japanese knotweed and Himalayan balsam were present within the broad-leaved wet woodland which occurred in the north-eastern half of the Site. Occasional stands occurred in habitats outside the Site boundary and closer to Loch Ryan. Rhododendron was present outside the western boundary of the Site and in habitats outside the Site boundary just north of the Corsewall Burn.
- 4.2.8 The survey identified that the Site and adjacent areas had the potential to support several protected and notable species owing to the diversity of habitats present. Therefore, additional surveys were commissioned and were either complete or underway at the time of writing this screening report. The likelihood of the wetland habitats being ground water dependent was also determined by more detailed botanical surveys. Surveys were as follows:
- Botany using National Vegetation Classification (NVC)
 - Breeding birds
 - Otters
 - Water voles
 - Badgers
 - Reptile
 - Aerial inspection of trees for bats
- 4.2.9 All Phase 2 surveys followed best practice guidance (where available) and were carried out during suitable weather and by suitable qualified ecologists who were members of CIEEM.
- 4.2.10 Results of the NVC survey confirmed that the broad-leaved wet woodland within the north-eastern part of the Site was moderately dependent on ground water based on guidance provided by SEPA. However, the understorey was limited owing to the presence of the invasive plants, although weedy species such as cleavers *Galium aparine*, nettle *Urtica dioica* and bittersweet *Solanum dulcamara* were also present. The limited understorey and presence of invasive species confirms the woodland is of Local importance.
- 4.2.11 The NVC survey was extended to include the habitats east of the Site and towards Loch Ryan. It confirmed that the mire/fen habitats were also moderately ground water dependent. Plant diversity was high and a number of communities existed, including M23b *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus effusus* sub-community, M27 *Filipendula ulmaria-Angelica sylvestris* mire, M28 (a, b and c) *Iris pseudacorus-Filipendula ulmaria* mire, S27a *Carex rostrata-Potentilla palustris* tall-herb fen and S28a *Phalaris arundinacea* tall-herb fen, *Phalaris arundinacea* sub-community.
- 4.2.12 Breeding bird surveys confirmed the presence of several species on Site. No Schedule 1 species were identified, while just under half of all species recorded were included on the red and amber lists of species of conservation concern². Red list species included grasshopper warbler *Locustella naevia*, house martin *Delichon urbicum*, house sparrow *Passer domesticus*, linnet *Linaria cannabina*, spotted flycatcher *Muscicapa striata* and starling *Sturnus vulgaris*.
- 4.2.13 No otter *Lutra lutra* holts or shelters were identified on Site. Only a single spraint was found along the Corsewall Burn. The burn was considered to have some potential for commuting otters.

² Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, D., Douse, A., Lindley, P., McCulloch, N., Noble, D. and Win, I. (2021) The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 723-747.

- 4.2.14 A single water vole *Arvicola amphibius* and a burrow was also identified along the Corsewall Burn but outside the Site boundary. The wet woodland on the Site has some potential to support this species.
- 4.2.15 No badger *Meles meles* setts or foraging signs were identified on Site, although some foraging signs and a latrine [Redacted]
- 4.2.16 A preliminary roost assessment identified three trees within the broad-leaved wet woodland on Site with low potential to support roosting bats. There are no buildings on Site which required preliminary roost assessments.
- 4.2.17 At the time of writing this screening report reptile surveys were underway.

Assessment of Ground-Water Dependent Terrestrial Ecosystems

- 4.2.18 On completion of the NVC surveys within the woodland on Site and the mire/fen habitats outside the boundary of the Site, further surveys were carried out to identify water sources which may account for the botanical diversity. This was supported by water quality monitoring and topographical surveys using GIS software to determine routes of surface flow and identify where water may pool in low lying areas.
- 4.2.19 Three water quality data loggers were installed at a suitable location outside the north-eastern boundary of the Site and north of the Corsewall Burn to monitor water quality and determine if there was sea water intrusion. These loggers measured electrical conductivity and salinity every five minutes for a period of five days from 5th July to 10th July to coincide with lunar cycle high tides. Results of the water quality monitoring confirmed that sea water intrusion was not a factor.
- 4.2.20 A survey identified blocked and broken field drains within the Site boundary which were preventing surface water release directly into Loch Ryan. Surface water was backing up and being expelled in the mire/fen habitats, with pooled water being evident in some areas. GIS based topographical assessments indicated that surface water was naturally flowing into these habitats and occupying existing ditches and being retained in the lowest lying areas. The distribution of NVC communities outside the southern boundary of the Site reflected the location of low lying areas where surface water was pooling, and which remained wet for much of the year.

Consultation to Inform Assessment of Ground-Water Dependency

- 4.2.21 On completion of the NVC surveys which suggested that the broad-leaved wet woodland on the Site and plant communities outside the southern boundary of the Site may be moderately ground-water dependent, consultation with SEPA was carried out on 25th July 2023. The results of the additional surveys, water quality monitoring and GIS topographical assessments were presented. SEPA did not propose an objection to the removal of the broad-leaved wet-woodland provided it was compensated for. They also requested that consideration be given to the protection of other moderately dependent groundwater ecosystems outside the Site boundary, such as the mire/fen wetland mosaic to the east and closer to Loch Ryan which had high botanical diversity.

Likely Significant Effects of Development

- 4.2.22 Surveys have confirmed that the Site has some local level ecological value given the presence of the shingle beach and the broad-leaved wet woodland. Impacts to the beach to install pipework which is needed to allow ingress of sea water to fill the inland pool will be limited in duration, scope and only temporary. This habitat is also extensive and borders much of Loch Ryan so impacts will local, short-term and there will be no likely significant effects.
- 4.2.23 The broad-leaved wet woodland, which also has some degree of ground-water dependency, will be lost in its entirety. Whilst this habitat is also listed on the Scottish Biodiversity List, it has an understorey dominated by Himalayan balsam and Japanese knotweed. The water dependency is also derived from pooling surface water flows and disrupted flows from broken land drains. Larger stands of broad-leaved woodland, and which are included on the ancient woodland inventory, occur outside the western boundary of the Site.

- 4.2.24 The loss of the woodland will have a negative impact, primarily through the loss of nesting habitat for birds. None of the trees had moderate or high potential to support roosting bats and no signs of other protected species were recorded. The loss of woodland will be offset by the removal of the invasive plants and the compensatory planting of trees to cover an equivalent area in the local environment. The removal of woodland would not result in long-term likely significant effects. Indeed, the removal of the invasive plants will have a long-term benefit on adjacent habitats outside the Site boundary, especially those with moderate ground-water dependency.
- 4.2.25 The grassland within the Site has some value to breeding birds but this is likely to be negated by the presence of livestock during the breeding season or any hay or silage cuts. Again, signs of otter, water vole and badger were absent. As other areas of grassland exist in the wider landscape, the loss of a small area of grassland will not cause likely significant impacts.
- 4.2.26 By locating the inland pool within the proposed Site and protecting more sensitive habitats outside the eastern boundary, the development is not considered to have a long-term impact on the Site's ecology. Benefits will also not be confined to Sandwich terns and other species of wader and waterfowl are likely to benefit from the provision of additional nesting and roosting habitat. Further, the development of a long-term management plan to control and eradicate non-native invasive plants in habitats to the east of the Site will have wider benefits to flora and fauna.
- 4.2.27 Timing construction works to avoid the breeding bird season, generally taken as March to August inclusive, and undertaking vegetation clearance and tree felling under the supervision of a suitably experienced and qualified Ecological Clerk of Works (ECoW) will negate any impacts to protected species. Additional pollution, prevention and control measures during construction and operation phases will avoid any impacts such that there will be no likely significant effects.
- 4.2.28 Construction traffic will be through the semi-improved grassland habitats to the south which are only of local value. Should access be required through the woodland to the south, and just north of the Corsewall Burn, an alignment will be chosen so as to avoid any tree felling. Appropriate tree and root protection zones will be implemented for all works as necessary. Construction will be short term and the access temporary so no long term likely significant effects will occur.
- 4.2.29 In summary, the development of the inland pool to support breeding Sandwich tern will not have any long-term likely significant effects on habitats of conservation concern or protected species. Although there will be benefits to terns and likely other wetland bird species, the loss of the broad-leaved wet woodland will have a short-term negative impact on common species of breeding birds until compensatory woodland planting has become established.

4.3 Hydrology

- 4.3.1 Sustaining a frequent and reliable exchange of water to the pool is necessary to ensure good water quality. Freshwater supply, whether from the Corsewall Burn, or perhaps field and other land drainage arrangements that are apparent north of the line of the Corsewall, have a finite capacity and will be prone to reduced flows or complete dry up during times of drought.
- 4.3.2 No analysis of hydrology catchments to generate fluvial (watercourse) peak and low flows has been performed, but it is anticipated that field drains and other land drainage arrangements alone would not be enough to ensure good water quality throughout all seasons. The Corsewall Burn has a larger catchment and capable of sustaining higher flows, but only part of the flow is considered to be available to supply any pool as the existing route of the watercourse would need to be retained with reasonable flows to maintain the existing hydrological conditions. A low flow analysis may be necessary to prove suitable flow capacity during dry periods that would provide a suitable turnover of water within the pool to sustain good water quality.
- 4.3.3 The proximity of Loch Ryan to the site and the above noted arrangement with inlet and outlet pipes and non-return valves, is considered a more viable and robust means to ensure hydraulic turnover of the pool and thereby good water quality, than relying solely on freshwater supply from other fluvial opportunities.

4.4 Landscape and Visual

- 4.4.1 With regards to landscape and visual effects it is considered that any adverse effects would be limited to the construction phase of operations, but these are unlikely to be significant and largely confined to land within the site itself, including the proposed access areas. There will be some limited loss of woodland within the site, but this is proposed to be offset by compensatory planting. There are no significant adverse effects predicted during the operational phase of the project given the nature of the proposals, and the bund, which will be sympathetic to its surroundings, will limit western views from the coastal path. The proposed development is expected to integrate fully with existing baseline conditions, and would therefore not cause any noticeable change to either the key characteristics of LCT 156: Peninsula, or the characteristics associated with the Rhins Coast RSA. From a visual perspective, there are not predicted to be any noticeable significant adverse changes to views for receptors identified within **Paragraph 2.1.17** and **2.1.22**.

4.5 Ground Conditions

- 4.5.1 A desk-based ground conditions assessment (the desk study, Stantec, 2023) has been undertaken. This included the review of information the site history, geology, hydrology, hydrogeology and environmental setting. The desk study assessment did not identify any potentially significant sources of potential contamination within the area proposed for the inland pool.
- 4.5.2 A limited ground investigation is likely to be required to facilitate the construction of the wetland feature and will include some environmental screening to confirm the absence of contamination. During construction, the adoption of relevant SEPA Guidance for Pollution Prevention (GPPs) including GPP 5: Works and maintenance in or near water and GPP 21: Pollution incident response planning. Contractors will be informed of conditions on site and will develop Risk Assessment Method Statements (RAMS) accordingly.

4.6 Summary

- 4.6.1 **Table 4.1** below provides a high-level assessment of environmental effects anticipated to occur due to the interaction of the proposed development with identified environmental sensitivities of the site and surrounding area, taking account of all mitigation measures identified at this stage.

Table 4.1 – Assessment of Potential Effects

Environmental Aspects (Regulation 4(3))	Relevant Environmental Topic	Potential Construction and Operation Effect	Proposed Approach and Mitigation	Significance of Likely Effects
Air and Climate	Air Quality, Noise, Vibration and Climate Change	Construction: Noise and potential vibration from construction activities. Operation: Once operational, noise and vibration is not expected to be an issue as it will be similar to existing noise levels.	There are no sensitive receptors close to the site and the dominant noise source is from the ferry activity on the far side of the loch. During construction, a CEMP will be agreed, approved and implemented to ensure that appropriate noise management practices are followed.	Not Significant
		Construction: Dust emissions from construction activities. Operation: There will be no additional dust emissions during operation.	During construction, dust from on-site activities and off-site trackout by construction vehicles has the potential to generate dust, within the study area; the main potential impacts are loss of amenity (as a result of dust soiling) and deterioration of human health (as a result of concentrations of PM10 (Particulate matter 10 micrometers or less in diameter)), however with appropriate dust mitigation measures in place and the fact that there are no receptors in close proximity to the site, the effects of construction dust will not be significant (IAQM 2014).	Not Significant
		Construction: embedded carbon from materials used and construction machinery.	Use local contractors, local materials where possible.	Not Significant
Biodiversity, flora, fauna, land, and soil	Ground Conditions, Land Use	Construction and Operation: Disturbance to ground conditions / land use during construction or operation.	There is an unlikelihood of significant effects arising in relation to land use, ground conditions and geology as a result of the works, as a CEMP will be prepared to provide detailed mitigation measures during construction and operation phase of the project.	Not Significant
	Ecology and Ornithology	Construction: Loss and disturbance of existing habitat, Noise disturbance, Felling of trees, Eradication of invasive, non-native plant species.	Construction: Best practice techniques to reduce noise, and timing of works to reduce impact on any species using the site. Supervision of works by an experienced Ecological Clerk of Works (ECoW). Invasive species	Not Significant

Environmental Aspects (Regulation 4(3))	Relevant Environmental Topic	Potential Construction and Operation Effect	Proposed Approach and Mitigation	Significance of Likely Effects
		Operation: provision of new nesting and breeding site for Sandwich tern. Removal on non-native invasive plants under footprint of new nesting site. Further detailed within Section 4.2.	eradication management plan implemented as part of works. Operation: Provides a benefit to Sandwich tern population through provision of breeding opportunities. New nest site to incorporate features of value to other waterfowl and wading species. Long term management of Site to monitor Sandwich terns and other ornithological interest. Ongoing monitoring and management of invasive plant species. Further detailed within Section 4.2.	
Water	Hydrology and Flood Risk	Additional flood risk as a result of the scheme or pollution to water quality.	The design and construction methodology to be adopted for the proposed development will incorporate appropriate physical mitigation measures and procedures to protect against flood risk or pollution release into Loch Ryan.	Not Significant
Traffic and Transport	Traffic, Transport and Access	Construction: Potential for significant lorry movements. Final numbers will be discussed with the Local Authority. Operation: there is no expected to be an increase in traffic and transport during operation.	A Construction Traffic Management Plan (CTMP) will be submitted.	Not Significant
Socioeconomics	Population and Human Health	Disturbance to users of core path located along southern site boundary. Disturbance to users of local primary school.	No mitigation or enhancement measures are considered to be necessary in relation to economic, employment or land use effects. Opportunity to provide educational information to local community and recreational users of the core path along southern site boundary.	Not Significant
Cultural heritage	Cultural Heritage	Our current understanding is that R AF Wig Bay, a World War 2 seaplane base, is situated to the south of the site, south of Corsewall Burn and will not be affected by the proposals. Corsewall House policies and associated listed buildings will need to be reviewed to understand how the proposals will impact upon them.	An early preparation of an Historic Environment Desk Based Assessment (HEDBA) is recommended to ensure that the cultural heritage of this site is protected where possible and to identify if any further assessment is required. In principle, there is an unlikelihood of significant effects arising in relation to cultural heritage as a result of the works, as the HEDBA will provide a platform for discussion with respect to evaluation and/or mitigation measures (particularly the avoidance of impact) in consultation with	Not Significant

Environmental Aspects (Regulation 4(3))	Relevant Environmental Topic	Potential Construction and Operation Effect	Proposed Approach and Mitigation	Significance of Likely Effects
		Evidence for Bronze Age activity associated with the rock shelter north of the site and the possibility of Bronze Age activity and the potential for other periods of human activity within the site need to be better understood.	the Dumfries and Galloway Archaeological Service. If appropriate, the CEMP will define detailed mitigation measures during construction and operation phase of the project.	
Landscape	Landscape Design	Localised changes in landform and land use for the creation of the inland pool area and associated access. Access will be temporary. Loss of small stand of broad-leaved wet-woodland which is on current footprint of proposed lagoon. Temporary re-routing of the core path, offsetting of coastal path.	Design in keeping with local landscape character. Limited effects on recreational routes.	Not Significant
	Visual Effects	Creation of inland pools in existing broad-leaved wet woodland and semi-improved grassland. Creation of landscape bund at the western edge of the site. Creation of viewing stands.	Design in keeping with/sympathetic to local landscape character.	Not Significant
Material Assets	Waste	Construction: Waste from construction activities.	The construction phase of the proposed development will result in the generation of construction waste (e.g., groundworks). All waste management practices during construction will comply with appropriate regulations. Any unsuitable or contaminated materials encountered during the construction process would be extracted and subject to offsite disposal in accordance with all regulatory requirements, including through obtaining appropriate SEPA licences, if required. Additionally, any Japanese Knotweed or Himalayan Balsam encountered may be disposed of on site by encapsulating in a sealed bund.	Not Significant

- 4.6.2 **Table 4.1** above indicates that, taking account of all proposed mitigation measures, the interaction of the proposed development with the identified environmental sensitivities of the site and surrounding area, any potential adverse environmental effects will be 'designed out' or otherwise minimised during the construction and operational phases.
- 4.6.3 Where relevant and required by Dumfries and Galloway Council as the applicable local planning authority, and Marine Scotland technical studies (non-EIA) and other supporting documentation will be submitted in support of the planning application to:
- Explain how relevant design principles and mitigation measures have been applied to ensure the avoidance of any likely significant adverse effects; and,
 - Demonstrate the accordence of the proposed development with the applicable statutory Development Plan and other relevant material considerations.

5 Summary and Conclusion

- 5.1.1 This report provides the information necessary to solicit a formal EIA Screening Opinion from the Dumfries and Galloway Council and Marine Scotland in accordance with Regulation 8 of the EIA Regulations.
- 5.1.2 The environmental information provided within this EIA screening request demonstrates that whilst the proposed development constitutes a Schedule 2 Development under the EIA Regulations, taking account of proposed mitigation measures, it is not likely to result in any significant environmental effects. It is therefore respectfully submitted that the proposed development does not constitute an EIA Development under the EIA Regulations and in consequence, any planning application submitted for the proposed development should not require a formal EIA to be undertaken.
- 5.1.3 In responding to this EIA screening request, Dumfries and Galloway Council and Marine Scotland are invited to consider all relevant environmental information and adopt the conclusion of this report as their own for the purposes of issuing an EIA Screening Opinion.
- 5.1.4 Where relevant and required by Dumfries and Galloway Council and as the applicable local planning authority, and Marine Scotland, technical studies (non-EIA) and other supporting documents will be submitted in support of the planning application to explain how relevant design principles and mitigation measures have been applied to ensure the avoidance of any likely significant adverse effects.
- 5.1.5 Subject to any views expressed by Dumfries and Galloway Council and Marine Scotland, if the project is confirmed as a non-EIA development, the prospective applicant intends to submit the following studies and supporting documents with the planning application:
- Ecological Appraisal Report (incorporating Baseline Ecological Surveys);
 - Invasive Non-Native Species Management Plan;
 - Historic Environment Desk Based Assessment (HEDBA);
 - Outline Landscape Design Strategy;
 - Construction Environmental Management Plan (CEMP);
 - Including a Construction Management Plan (CTMP);
 - Planning Statement;
 - Planning Application Drawings; and
 - Completed Planning Application and Landownership Certificate.
- 5.1.6 In responding to this EIA screening request, Dumfries and Galloway Council and Marine Scotland are invited to confirm that the above list of documents will be sufficient to address environmental and planning issues associated with the proposed development.

Appendix A Site Location Plan



Site Boundary (12.7 ha)

Corsewall

B738

Main Street

B738

Corsewall Burn

Corsewall Burn

Corsewall Burn

St. Kirkcolm
Catholic Church

Main Street

	Client	LOCH RYAN HABITAT RESTORATION Site Location		1:4,000 @ A3	Date: 12/10/2023
	Equinor		<small>Maxar, Microsoft, Esri Community Maps Contributors, Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc., METI/NASA, USGS</small>	Drawn: SJ	Checked: RM
				Figure: 001	Rev: A

Appendix B Site Location Plan Zoomed Out



Site Boundary (12.7 ha)



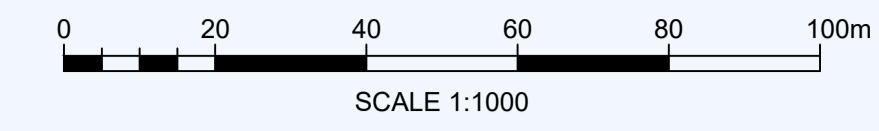
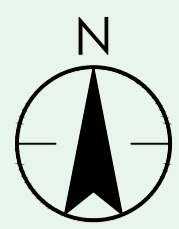
Client
Equinor

LOCH RYAN HABITAT RESTORATION
Site Location - zoomed out

0 200 400
m
Maxar, Microsoft, Esri Community Maps Contributors, Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

1:7,500 @ A3	Date: 12/10/2023
Drawn: SJ	Checked: RM
Figure: 001.1	Rev: A

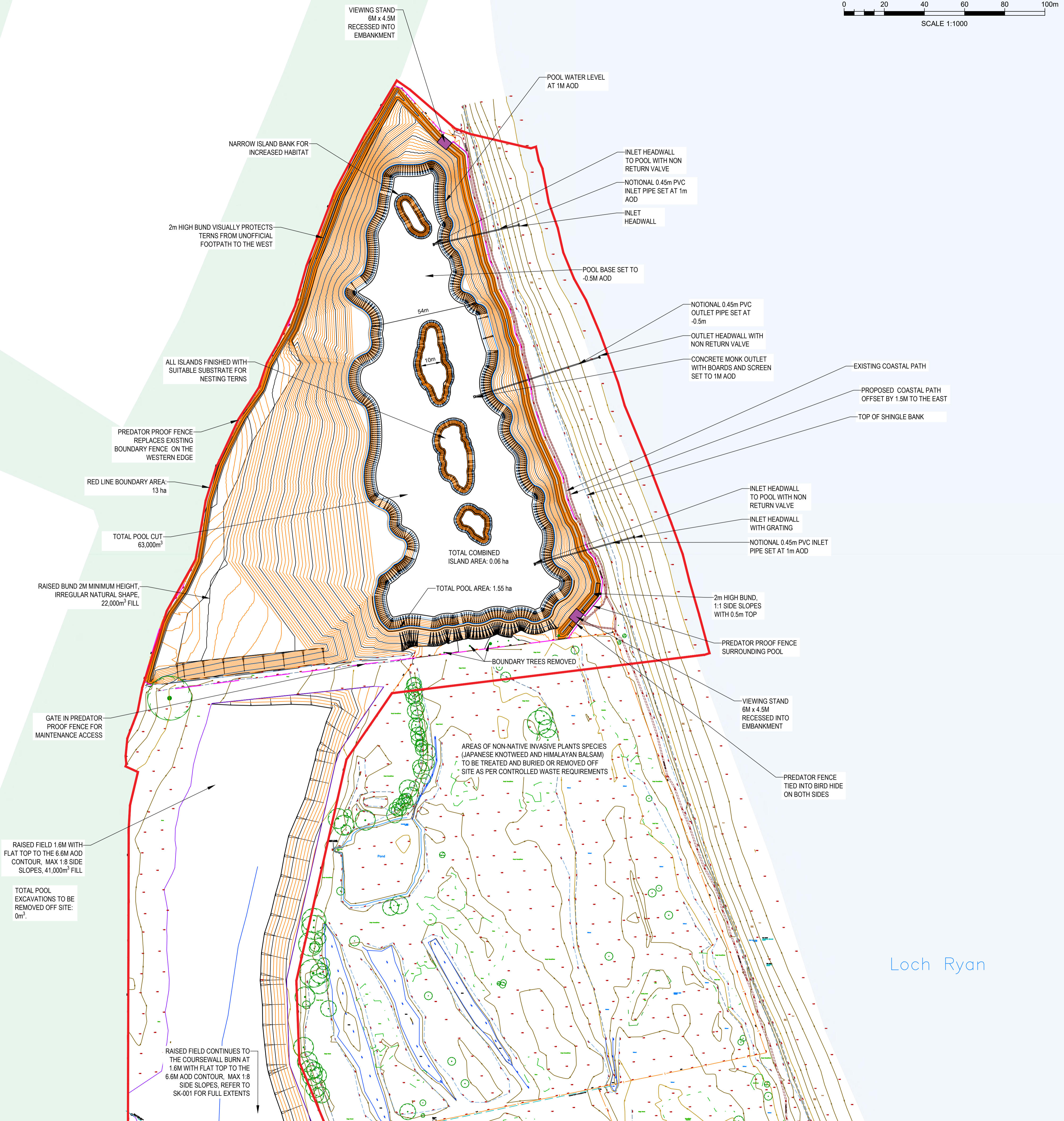
Appendix C Indicative Site Option for Sandwich Tern Inland Pool



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NOTES
UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake their own investigation where the presence of any existing sewers, services, plant or apparatus may affect their operations.

D
C
B
A



ANCIENT WOODLAND

Loch Ryan

SA	SA	NM	2023.09.20
Dwn.	Dgn.	Chkt.	YYYY.MM.DD

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Title
Indicative Site Option for Sandwich Tern Inland Pool

Project No. 300006	Scale 1:1000 @A1
Revision	Drawing No.

Reference: 11.10.2023/2023/10.11.002/24-PA-Ry-Addm-50m.mxd
Project: 300006/PA-Ry-Addm-50m.mxd
Drawing: SK-002

Appendix D Preliminary Investigation Report on Ground Conditions



Loch Ryan Habitat Restoration, Stranraer, Dumfries & Galloway

**Preliminary Investigation Report on Ground Conditions
(Contamination and Stability)**

On behalf of **Equinor**

Project Ref: 332010846/ 500.001-PH1-Geo | Rev: 00 | Date: September 2023

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Document Control Sheet

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For and on behalf of Stantec UK Limited				

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1 Introduction

1.1 Preamble

- 1.1.1 Stantec UK Limited (Stantec) has been commissioned by Equinor (the Client), to undertake a Preliminary Investigation Report on ground conditions (previously known as a Phase 1 Report) in support of the proposed development of a site at near Corsewall, Stranraer. The proposed development is the creation of a wetland area as a compensation for impairment to bird habitat in East Anglia/Wash area from offshore wind farm extensions.
- 1.1.2 The Site is located north of Stranraer on the western coastline of Loch Ryan and to the east of Corsewall (hereafter referred to as “the Site”). The Site is broadly triangular in shape, covers approximately 30 hectares (ha) and is currently grassy agricultural fields with areas of trees and wetlands including occasional ponds. The Site location is illustrated on **Figure 1** and a Site description is provided in **Section 2.2** below.
- 1.1.3 This report presents the findings of the desk study research carried out, together with the observations from a Site walkover and preliminary information on Tier 1 (preliminary/qualitative) contamination risk and ground stability.
- 1.1.4 At the outset of the study, Stantec understands that the site has not been subject to desk-based or intrusive ground investigations previously.
- 1.1.5 This is a Preliminary Investigation Report on Ground Conditions and does not purport to be an ecological, flood risk, archaeological, or any other survey which may have been instructed separately.

1.2 Objective

- 1.2.1 The objective of this report is to review readily available information in the public domain to identify and assess the existing ground conditions on the Site and in the immediate surrounding area. It also aims to identify potential geoenvironmental and land stability hazards that may require management as well as potential constraints to the proposed wetland habitat development.
- 1.2.2 The report includes preliminary advice on the ground and groundwater conditions at the Site. Guidance on the use of this report is presented in a note after the text of this report.
- 1.2.3 The principle planning objective is to identify unacceptable risks to human health, buildings and other property and the natural and historical environment from the potential contaminated condition of the land so that appropriate action can be considered and taken to address those risks.
- 1.2.4 Further information on the requirements the Scottish Government and the current National Planning Framework (NPF) in respect of ground conditions is presented in our guide entitled Stantec Guide: Methodology for Assessment of Land Contamination (Scotland), a copy of which is presented in **Appendix A**.

1.3 Proposed Development

- 1.3.1 The site is proposed for the creation of a wetland habitat for sandwich terns. The proposed development is likely to comprise the construction of one or more lagoons via deepening of the existing wetland area(s), the formation of islands with associated landscaping, installation of a temporary construction road and a possible new bridge structure.

- 1.3.2 It should be noted that a site layout plan and details around what is proposed are not available at the time of writing, however, it is anticipated that the actual area of development will be a smaller area in the northern tip of the total area included in this study.

1.4 Report Contents

- 1.4.1 This report presents a desk study, which comprises the following:

- A preliminary investigation in general accordance with Land Contamination Risk Management (LC:RM, which superseded CLR11 sharing the same general principles albeit LC:RM has yet to be formally adopted in Scotland) and BS 10175:2011+A2:2017 comprising a desk-based study of published and readily available public information (see below for sources of information accessed) and site reconnaissance (a Site walkover).
- A Tier 1 Preliminary Risk Assessment (PRA), which is a qualitative assessment of data to develop an outline conceptual model.
- A preliminary ground stability appraisal.
- The report includes preliminary advice on the ground and groundwater conditions at the Site.

- 1.4.2 Information on the methodology adopted by Stantec is presented below and guidance on the use of this report is provided in **Section 8**.

1.5 Methodology

Ground Conditions – Contamination

- 1.5.1 The underlying principle is the evaluation of pollutant linkages to assess whether the presence of a source of contamination could potentially lead to harmful consequences. A pollutant linkage consists of the following three elements:

- A source of contamination or hazard that has the potential to cause harm or pollution;
- A pathway for the hazard to move along / generate exposure; and
- A receptor which has the potential to be affected by the hazard.

- 1.5.2 For each potential pollutant linkage identified the risk is estimated through consideration of the magnitude of the potential consequences and the likelihood or probability of an event occurring.

Ground Conditions – Ground Stability

- 1.5.3 A preliminary assessment of potential ground instability issues has been undertaken based on research and walkover information. This study utilises the guidance given in NHBC Standards Chapter 4.1 Land Quality – Managing Ground Conditions (NHBC 2023). Available published geological information has been obtained and reviewed, together with data acquired from public databases.

- 1.5.4 A Site walkover with direct visual inspection of the Site and surrounding land was also carried out in conjunction with the desk-based research. This report presents a review of the acquired information and gives comments with respect to potential constraints on foundations, general site infrastructure design and construction of the proposed wetland area. Further information on the approach adopted by Stantec in the Stantec Guide: Methodology for Assessing Land Contamination, a copy of which is presented in **Appendix A**.

1.6 Sources of Information

1.6.1 The following publicly available sources of information were used in the preparation of this report:

- A walkover survey was undertaken by a Stantec Geoenvironmental Scientist on 02 February 2023 to observe existing conditions both on the site and surrounding the land. Photographs are presented in **Appendix B**;
- Groundsure Ltd was commissioned to provide an Enviro+Geo Insight report (ref. GS-9313439) including historical maps and environmental data searches, and this information is presented in its entirety in **Appendix C**;
- Geology maps and borehole records held by the British Geological Survey (BGS) accessed via their website and Geological Survey of Scotland 1:63,360/1:50,000 geological map series;
- Scottish Environment Protection Agency (SEPA) Water Environment Hub and Water Classification Hub was reviewed for surface and groundwater quality;
- A review of the BRE Report BR211 (2015) Radon: Guidance on protective measures for new buildings (including supplementary advice for extensions, conversions and refurbishment projects);
- Review of the Natural Cavity and Artificial non-coal (underground) mining cavity databases managed and enhanced by Stantec;
- Review of risk map records of Regional Unexploded Bomb Risk held by Zetica UXO;
- Review of historical planning records on Dumfries & Galloway Council online planning portal;
- Review of historical aerial photography accessed via Google Earth Pro;
- Scotland's Environment was consulted regarding significant environmental features and historical structures; and
- Communication and requests for environmental information pertinent to the Site were made to Dumfries & Galloway Council and SEPA. Regulator responses are still awaited with correspondence presented in **Appendix D**.

1.7 Previous Investigations

1.7.1 Stantec were not made aware of any desk-based or ground investigations having been carried out at the site previously. The Client has not provided any reports relating to the study area.

2 Site Setting

2.1 Site Location

2.1.1 The site is centred at National Grid Reference (NGR) NX 03435 68893, and the nearest postcode is DG9 0NX. A location plan is presented as **Figure 1**.

2.2 General Description

2.2.1 The site is located on the western coastline of Loch Ryan and is bounded by the Corsewall Estate to the north and west. To the south are grassy fields and the former Royal Airforce (RAF) Wig Bay Seaplane Base, and to the east the Loch Ryan sea Loch. The Corsewall Burn flows eastwards along the southern boundary and there appears to be a field drain/ ditch located in the central eastern portion of the study area, running parallel with the coastline.

2.2.2 A triangular shaped piece of woodland located in the northern part of the study area is labelled as 'Shell Home Plantation'. This covers about 1ha. A small broadly circular shaped pond is shown nearby the plantation, approximately 0.14ha.

2.3 Topography

2.3.1 No topographic survey was available. During the site walkover, it was observed that a topographic survey was underway, the results of which were not available at the time of writing.

2.3.2 The ground levels across the study area are generally gently sloping from west to east, and slightly north to south. A drop in elevation occurs in the central part of the site from the elevated western ground to the lower lying and wetter ground in the east. There are large areas of wetland with ponding in low lying areas throughout the eastern zone. During the site walkover the lowest lying areas appeared to be at or slightly below ordnance datum.

2.3.3 The neighbouring land to the immediate west is at a much higher elevation than the site and rises steeply adjacent to the northern point of the study area.

2.3.4 Ground levels are recorded at approximately 10.0 metres ordnance datum (m OD) along the northern edge of the western boundary falling to approximately 6.0 m OD (BGS, 2023) along the southern edge of the western boundary, close to the Corsewall Burn. Ground levels are lowest along the eastern boundary at approximately 1.5 metres OD (BGS, 2023).

3 Environmental Setting

3.1 Introduction

- 3.1.1 The information from published and publicly available information sources is summarised below and is used to provide context for the ground stability appraisal in **Section 4** and identify potential receptors in the Tier 1 PRA presented in **Section 5**.

3.2 Geological Setting

- 3.2.1 The following sources have been reviewed to provide information on the geological setting.

Review of Published Geology

- 3.2.2 The 1:50,000 scale geological series Scotland, Stranraer, Sheet 3 Drift (BGS, 1982) and Stranraer, Sheet 3 and Solid (BGS, 1982) indicate the following geological sequence underlying the Site:
- **Superficial Deposits:** the entire site is indicated to be underlain by Raised Marine Beach Deposits (RMBDF) comprising gravel, sand and silts deposits with a lithological description of gravel and sand, commonly shelly. Gravel typically cobble grade and well sorted. Sand described mainly as medium-grained and shelly. The western point is shown to be underlain by Glacial Till.
 - **Solid Geology:** the entire site is indicated to be underlain by the Loch Ryan Formation (LRN) comprising sedimentary sandstone of the Holocene Epoch. The BGS describes this Formation to comprise conglomerate of greywacke clasts in a red sandstone matrix. Thin, discontinuous interbeds of sandstone. The BGS indicate its thickness to be >134m. No faults are indicated below the Site.

Historical BGS Boreholes

- 3.2.3 The BGS borehole record viewer (BGS, 2023) was reviewed. The borehole scans are delivered under the Open Government Licence, subject to the following acknowledgement accompanying any reproduced BGS materials: "Contains British Geological Survey materials © UKRI [2020]".
- 3.2.4 The BGS archive does not contain borehole records on or within the Site boundaries. The nearest publicly available log is located offsite at approximately 50 m to the west. This offsite log relates to borehole information, which is summarised in the **Table 3.1** below. The well was sunk in 1934 by Andrew Kyle Limited, Mineral Borers, Airyknowe, Galston for John Sinclair, Esq., Coatbridge. The borehole was terminated at 19m bgl. A log note records "Practically no water" was struck.
- 3.2.5 The ground conditions summarised in **Table 3.1** may refer to other superficial deposits shown in the offsite area to the west, i.e., Glacial Till, and may not bear resemblance to the conditions at the site.

Table 3.1 Summary of ground conditions based on an offsite nearby BGS borehole record

Strata ⁽¹⁾	Approximate Base (m bgl)
Hard reddish marl & stones	0.0 to ~0.3
Ashy conglomerate, becoming stronger with depth	~0.3 to ~16.8
Whin	~16.8 to 19.0
Notes (1) Based on BGS publicly available borehole record (NX06NW3) situated offsite about 50 m to the west of the Site boundary.	

3.3 Geomorphological Setting

- 3.3.1 Geodiversity can be defined as “*The natural range (diversity) of geological (rocks, minerals, fossils), geomorphological (landforms, topography, physical processes), soil and hydrological features. It includes their assemblages, structures, systems and contributions to landscapes*” (Gray, 2013).
- 3.3.2 These protected sites include geological Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Geology Sites (formerly known as RIGS - Regionally Important Geological and Geomorphological Sites). No such features have been identified onsite or within 100m, which is generally considered the likely extent of influence.

3.4 Geochemical Setting

Ground Gases

Natural Soil Gas – Radon

- 3.4.1 The Groundsure Report and HPA/ BGS Indicative Atlas of Radon in Scotland (BGS, 2023a) indicates the Site is in an area where the property is in a low probability radon area, as less than 1% of homes are above the action level. Radon protection measures are not required for the construction of new dwellings or extensions.
- 3.4.2 According to Map 1 of the BRE report on Radon regarding guidance on protective measures for new buildings, the Site is shown to require basic protection measures (BRE, 2015). No buildings are proposed as part of the new development. Therefore, radon is not identified as a potential human health hazard and is not considered further in this preliminary site study.

Made Ground and Landfills

- 3.4.3 The Groundsure dataset does not identify any recorded landfill sites onsite. However, a landfill (licence number: WML/W/00263) is recorded offsite about 500 m to the south west. The type of waste is unspecified. The Groundsure report records no active or recently closed licenced wastes sites nor historical landfill sites within at least 500 m of the study area (GLI, 2023). Further review of the offsite landfill is contained within **Section 4.5**.
- 3.4.4 Made Ground, including infilled ground, has the potential to generate ground gases depending on the nature, composition and thickness of the material. The BGS records no artificial ground on or neighbouring the Site. The land bounding the site’s south boundary i.e., the offsite former RAF Wig Bay Sea Plane base is likely to contain some Made Ground.

Historical Structures

- 3.4.5 Old buildings are shown on old maps in the south eastern corner and on the western boundary of the Site, these were confirmed during the Site walkover.
- 3.4.6 The small ruined building in the south eastern corner appears to be a former residential cottage with walled garden area. The second ruined building on the western boundary appears to be a former residential property. Localised Made Ground associated with these may still be present and there may also still be foundations remaining. The localised potential presence of Made Ground (and implications in terms of contamination and ground stability) would need to be confirmed through ground investigation, however it is unlikely that the proposed pond development will take place within these areas.

Mine Gas

- 3.4.7 There are no records of coal mines onsite or within 500m of the Site.
- 3.4.8 The Site lies within a lead mine plan (ID 21005, series number: 1950) area owned by Lowland and Lead Mines Limited. This plan covers a large geographic area, mainly that of the entirety of Dumfries & Galloway. The record availability is listed as 'Unknown' by the BGS.

BGS Estimated Soil Chemistry

- 3.4.9 The Groundsure Report (GLI, 2023) indicates the estimated soil chemistry on the Site (based on BGS Estimated Soil Chemistry values) to be:
- Arsenic: <15 mg/kg
 - Cadmium: <1.8 mg/kg
 - Chromium: 120 - 180 mg/kg
 - Lead: <100 mg/kg
 - Nickel: 15 - 30 mg/kg
- 3.4.10 None of the estimated metal concentrations noted above have the potential to exceed published evaluation criteria for the most conservative land use scenario (residential with the consumption of home grown produce). Note that the BGS estimated soil chemistry data assume that the soils present are 'natural'.

3.5 Hydrogeological Setting

- 3.5.1 The following table summarises information regarding hydrogeology and groundwater vulnerability based on available information.

Table 3.1 Summary of Hydrogeology and Groundwater Vulnerability Related Information

Item and Source	Details
Aquifer Classification Groundsure Report, SEPA, Scotland's Environment, BGS Hydrogeological Map of Scotland (1:625,000 scale)	The Groundsure report lists no underlying superficial aquifer. However, according to SEPA's water classification hub for groundwaters, the Site is underlain by the Stranraer Sand and Gravel groundwater (ID 150736). This aquifer has been classified by SEPA in 2020 as Good in terms of overall status. The Groundsure report records the underlying bedrock aquifer as Moderately productive aquifer summarised as unfractured, low

Item and Source	Details
	permeability breccias of the Stewartry Group with flow virtually all through fractures and other discontinuities (the original source of this data is the BGS Hydrogeological Map of Scotland, 1:625k scale (BGS, 1988)). The BGS Hydrogeological Map also indicates the underlying bedrock to be a concealed aquifer i.e., aquifers of limited potential, regions without significant groundwater. According to SEPA's water classification hub for groundwaters, this deeper aquifer is named Stranraer (ID 150577) and is classified by SEPA in 2020 as Poor in terms of overall status.
Depth to Groundwater	Unknown.
Groundwater Flow Direction Judgement	Generally anticipated to follow local topography, with flow expected eastwards towards Loch Ryan.
Groundwater Abstraction Groundsure Report, Local Authority, SEPA	The Groundsure Report does not reference abstractions. Information from SEPA and the Council has been requested, however, their responses are still pending at the time of writing.
Groundwater Vulnerability BGS, Judgement	Underlying soils are indicated by the BGS to comprise gravel, sand and silts with cobbles. These are considered to be of a high leaching potential i.e., little ability to attenuate diffuse pollution and in which non-absorbed diffuse source pollutants and liquid discharges will percolate rapidly. The underlying deeper rock aquifer is of low permeability i.e., the likely ability to attenuate diffuse pollution.
Groundwater Flood Risk* Groundsure Report	The Groundsure Report suggests that the highest risk for groundwater flooding to occur onsite is Moderate (mainly in the very northern point of the study area) based on a 1 in 100 yr return period and a 5m Digital Terrain Model. The majority of the Site is shown to be Low risk for groundwater flooding.
Nitrate Vulnerable Zones (NVZ) Groundsure Report	There are no NVZs onsite or in the vicinity of the Site (NVZ, 2015).
Drinking Water Protected Area (groundwater) https://www.gov.scot/publications/drinking-water-protected-areas-scotland-river-basin-district-maps/	The Site is not located in a groundwater drinking water protected area.
* The scope of this report does not include a flood risk assessment.	

3.6 Hydrological Setting

3.6.1 The following table summarises the information regarding hydrology.

Table 3.2 Summary of Surface Water Related Information

Item and Provenance	Description
Features Groundsure Report and SEPA (https://www.sepa.org.uk/data-visualisation/water-environment-hub/)	The Corsewall Burn is located along the southern boundary of the Site. The water quality of this water feature is not classified by SEPA. This burn flows west to east terminating in Loch Ryan and is therefore partially tidally influenced. The Site is bounded by the sea loch named Loch Ryan to the east. This coastal water body (ID: 200011) was classified by SEPA in 2021 as having Good overall status.

Item and Provenance	Description
	<p>There is a small, apparently discontinuous watercourse on the central eastern part of the study area. This feature trends north to south, parallel with the shoreline, however Groundsure state it is not influenced by normal tidal action.</p> <p>A small onsite pond feature is shown. A small broadly square shaped pond is shown towards the centre of the Site measuring about 0.14ha in area.</p>
<p>Abstractions Groundsure Report, SEPA, Local Authority</p>	<p>The Groundsure Report does not reference abstractions. Information from SEPA and the Council has been requested, however, their responses are still pending at the time of writing.</p>
<p>Discharge Consents Groundsure Report</p>	<p>The Groundsure report does not reference discharge consents. The Groundsure report records a sewage pumping station about 20 m south of the Site, however, no further details are given.</p> <p>Information from the Council is still awaited at the time of writing.</p>
<p>Drinking Water Protected Area (Surface Water) https://www.gov.scot/publications/drinking-water-protected-areas-scotland-river-basin-district-maps/</p>	<p>The Site is not located in a surface water drinking water protected area.</p>
<p>River Flood Risk* Groundsure Report, SEPA</p>	<p>The Groundsure Report indicates that the highest risk onsite of river (Corsewall Burn) flooding is a 1 in 30 year, 0.3 m – 1.0 m flood. The online SEPA flood hazard map indicates there might be some localised surface water flooding along the southern boundary of the Site i.e., either side of the Corsewall Burn as well as along part of the eastern boundary of the Site. These are lower lying areas of ground.</p>
<p>Coastal Flooding Groundsure Report, SEPA</p>	<p>The Groundsure Report indicates that the highest risk onsite is a 1 in 30 year, greater than 1.0 m coastal flood generally effecting the entirety of the eastern boundary. Coastal flooding has been modelled to show about one third of the Site (the eastern most third) is covered during a 1 in 1000 return period to a depth of between 0.1 m – 0.3 m (see page 30 of Groundsure Report for diagram of modelling results). The online SEPA coastal flooding hazard map indicates that about one third (the eastern most third) of the study area has a 10% chance of flooding.</p>
<p>* The scope of this report does not include a flood risk assessment.</p>	

3.6.2 Given the close proximity of the Corsewall Burn and Loch Ryan to the Site, the risk assessment will consider surface waters as a receptor.

3.7 Archaeological Setting and Property – Building Effect

3.7.1 A preliminary appraisal of readily available sources of information has been undertaken to determine whether archaeological settings and property requires consideration within the ground condition assessment. The statement regarding the archaeological setting does not purport to be an archaeological risk assessment which might require a separate commission.

3.7.2 There are no listed buildings nor scheduled monuments onsite (HES (2023)). The study area does not lie within a Conservation Area nor within a Battlefield boundary (HES, 2023). There are two residential properties onsite, however, these are overgrown and in a state of despair. Both are not listed.

3.7.3 An offsite record exists for RAF Wig Bay Seaplane Base (Canmore, 2023) located approximately 250 m to the south. The base was used to store Seaplanes during WWII and Zetica list it as a Luftwaffe target. The maximum northerly extent of the former Seaplane Base is not clear, however, following a review of the publically available satellite imagery and considering the Corsewall Burn passes between the site and the former Seaplane Base, it is unlikely the former Seaplane Base extended northwards across the burn and onto the site.

3.8 Ecological Setting and Property – Animal or Crop Effect

3.8.1 A preliminary appraisal of readily available sources of information has been undertaken to determine whether ecology as a resource requires consideration within a ground condition assessment. The statement regarding ecological systems does not purport to be an ecological risk assessment, which might require a separate commission.

3.8.2 Information on the ecological setting and areas of environmental sensitivity has been obtained from the Groundsure Report (GLI, 2023) and the Scotland's Environment map. There are no statutory designated sites such as Special Protection Areas or Special Area of Conservation (SAC) nor Sites of Special Scientific Interest (SSSI) onsite or in the vicinity of the Site. There are no non-statutory designated sites (such as local nature reserves or wildlife sites) onsite or in the vicinity of the Site.

3.8.3 The western area of the Site is Designated Ancient Woodland i.e., old woodlands which have been wooded continuously since at least 1600 AD. The name of this ancient woodland is Barn Park/ Dove Cot Plantations, and it bounds the majority of the Site's western border.

3.8.4 During the site walkover it was clear that the wetland area is providing a natural habitat area for a range of bird species and other wildlife.

3.8.5 Based on the above information, ecology is identified as a receptor and is taken forward for further consideration in this assessment.

3.9 Invasive Plant Species

3.9.1 During the Site walkover suspected Japanese Knotweed was observed marginally offsite a point close to the southern bank of the Corsewall Burn. The potential exists for this to spread along the bank(s) of the burn, and thus, potentially effect areas of the southern site boundary.

3.9.2 Stantec have commissioned an independent Ecological survey of the study area which will confirm the presence or absence of invasive species, however, the results of which were not available at the time of writing.

4 Land Use Information (Hazard Identification)

4.1 Introduction

- 4.1.1 Land use records are used to inform the hazard identification element of the Tier 1 PRA (contamination). This section presents a summary of the current and historical land uses on the Site and in the immediate surrounding area as identified from historical Ordnance Survey (OS) mapping records and aerial images provided by Groundsure (GLI, 2023) and during the Site walkover. Copies of the extracts from the current and historical OS maps are presented in **Appendix C**.
- 4.1.2 The historical review of the Site was supplemented by Google Earth historical aerial imagery available for the area. No comment was made on maps or aerial photographs that provide no additional information compared to the ones discussed in the section below.

4.2 Walkover Inspection

- 4.2.1 A Site walkover inspection was undertaken by Stantec on 02 February 2023, the salient points are summarised below. Photographs taken during the walkover are presented in **Appendix B**.

Onsite

- 4.2.2 The site is currently agricultural grassy fields on the western side and low lying wetland with occasional areas of deciduous woodlands on the eastern side (**Photograph 1**). Designated Ancient Woodland is located onsite and along some of the western boundary (**Photograph 2**). Within the western woodlands, an overgrown ruined historical residential property exists onsite (**Photograph 3**). The south western corner comprises grassy fields and further woodland (**Photograph 4**), which is not designated.
- 4.2.3 A path runs along the southern boundary (**Photograph 5**), which is frequented by the general public. Land use in the southern area is mixed from woodland in south western corner to grassy fields (**Photograph 6**) and reeded wetland in the south eastern corner. The central portion of the site has a defined fence line through it along a distinct drop in site levels from the elevated western ground, down to the lower lying eastern ground (**Photograph 7**).
- 4.2.4 The south eastern corner generally comprises wetland and a ruined historical residential property with wall garden, both of which are fully overgrown (**Photograph 8**), rising up to a raised shingle beach boundary (see **Photograph 9**) with Loch Ryan.
- 4.2.5 Ponding was observed within lower lying ground on the eastern side of the site (**Photograph 10**). Shell Home Plantation is situated onsite, close to the eastern boundary and north point of the site. It comprises mainly deciduous trees in further low lying wet ground (**Photograph 11**). What appeared to be a wide overgrown drainage channel running north to south exists parallel with the eastern boundary and situated just south of the Shell Home Plantation (**Photograph 12**).

Offsite

- 4.2.6 The northern point and western edges are bounded generally by woodlands and land that slopes east and downwards towards the site (**Photograph 13**). The garden/ grounds of Corsewall Estate also forms the western offsite land use.
- 4.2.7 A sewage pumping station is located offsite close to the site's southern boundary. The station is situated on the south bank of the Corsewall Burn and has some sort of apparent discharge pipe leading into the Burn (**Photograph 14**). A patch of suspected Japanese Knotweed was identified close to the southern bank of the Corsewall Burn (**Photograph 15**).

4.2.8 Loch Ryan forms the eastern offsite land use. A nearby signpost indicates that small to medium sized waves infrequently break on the shingle beach propagating from the nearby ferry terminal (**Photograph 16**).

4.3 Review of Historical Mapping

4.3.1 The historical land use of the Site and surrounding area has been obtained from reviewing historical Ordnance Survey (OS) maps and historical building plans supplied by Groundsure (GLI, 2023), which is presented in **Appendix C**.

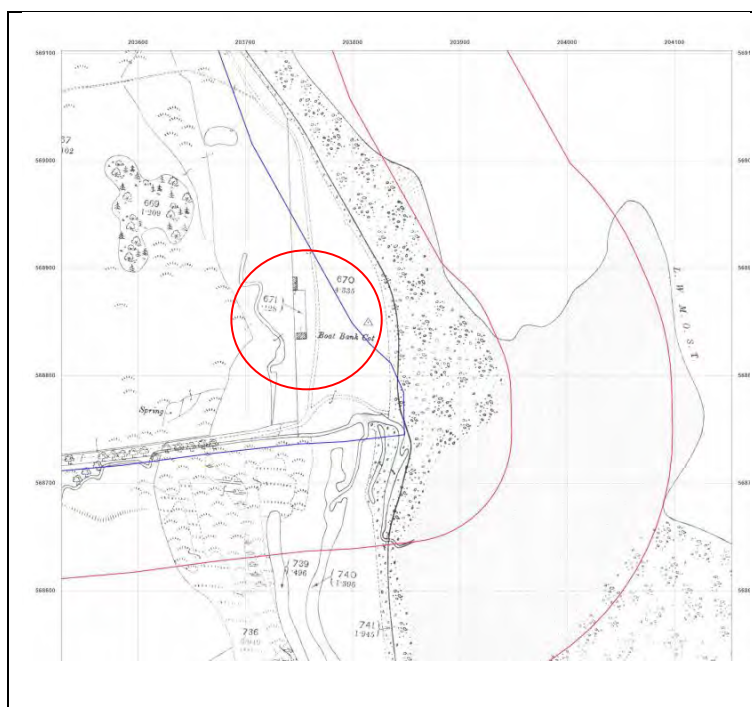
4.3.2 The available historical OS map editions supplied by the Groundsure report cover the period between 1894 and 2003, inclusive. Extracts of relevant mapping are in **Extract 1** below. A summarised review from available mapping and aerial photography of the historical features both onsite and in the vicinity follows within **Table 4.1** below.

Table 4.1 Summary of Salient Historical Land Uses

Dates/ Sources	Onsite	Offsite
Roy Military Survey of Scotland, 1747 – 1755 (Lowlands)	Shown as fields and a large wetland area close to the coastline	Small village to the west comprising a Manse, Kirk of Kirkcolm and small residential dwellings. To the north fields and some woodland. To the east, Loch Ryan and to the south Corsewall Burn and fields.
1:2,500 1894 Groundsure	Generally shown as a mosaic of grassy areas with mixed woodlands. The Shell Home Plantation is shown in the northern area. A Sun Dial (small point) is shown close to the western boundary. Tunnock's Bridge is shown spanning the Corsewall Burn.	Bounded to the west by a strip of mixed trees belonging to the Barn Park Plantation. An 'Old Gravel Pit' is marked offsite to the north west at about 240 m. A small building is shown marginally offsite adjacent the western boundary, the garden of which appears to extend onsite. Corsewall house with its gardens is shown neighbouring the Site to the west. Kirkcolm Church and graveyard are shown about 180 m west. A small Saw Mill is shown about 270 m west. Boat Bank Cot., indicated to be at least three small buildings is shown in the south eastern corner, see Extract 1 , about 40 m inland from the high tide mark.
1:2,500 – 1908 Groundsure	No significant changes observed.	No significant changes observed.
1:2,500 – 1971 Groundsure	Cross Slab (removed from NX 03396583). No significant changes observed.	No significant changes observed.
1:2,500 – 1995 Groundsure	No significant changes observed.	No significant changes observed.
1:1,250 – 2003 Groundsure	No significant changes observed.	No significant changes observed.
Aerial Photography 2005 Google Earth	No significant changes observed.	No significant changes observed.

Dates/ Sources	Onsite	Offsite
Aerial Photography 2009 Google Earth	No significant changes observed.	No significant changes observed.
Aerial Photography 2014 Google Earth	No significant changes observed.	No significant changes observed.
Aerial Photography 2017 Google Earth	No significant changes observed.	No significant changes observed.
Aerial Photography 2020 Google Earth	No significant changes observed.	No significant changes observed.

- 4.3.3 The Groundsure report listed 'Unspecified Ground Workings' located offsite about 30 m to the south, which was present on mapping dated 1893. The nature and extend of these workings is unclear.
- 4.3.4 In summary, the majority of the study has remained undeveloped according to the available historical maps and publicly available satellite imagery. However, there are two localised points that appear to have been developed onsite. A ruined historical residential building with walled garden in the south eastern corner of the study area and a second ruined historical residential building situated close to the western boundary. Both former residential properties are overgrown and in a current state of ruin.



Extract 1: Location of Boat Bank Cot. building(s) with walled garden area (see red circle) of historical Ordnance Survey plan published in 1894, source map scale 1:2,500 (source: GLI, 2023)

4.4 Review of Historical Imagery on Google Earth

4.4.1 Google Earth aerial imagery available from 2005 to 2021 has been reviewed. There is no additional information relating to onsite land use.

4.5 Review of Database Searches

4.5.1 Information on the industrial setting of the Site is presented in the Groundsure Report (GLI, 2023) and reproduced in **Appendix C**. The results of the database searches provided in the Groundsure report relating to land-use are summarised in the following table and discussed in the following sections.

Table 4.2 Summary of Environmental Database Searches

Data Type	Number on Site ⁽¹⁾	Number within 250 m of Site ⁽¹⁾
Waste Regulation		
Landfill Sites	0 (0)	0 (0)
Licensed Waste Management Facilities	0 (0)	0 (0)
Statutory Permits/Authorisations		
Pollution Prevention and Control ⁽²⁾	0 (0)	0 (0)
Radioactive Substance Authorisations	0 (0)	0 (0)
Planning Hazardous Substances	0 (0)	0 (0)
COMAH Sites ⁽³⁾	0	0
NIHHS Sites ⁽⁴⁾	0	0
Recorded Pollution / Potential Pollution		
Substantiated Pollution Incidents	0	0
Contaminated Land ⁽⁵⁾	0	0
Potential Contaminative Uses		
Fuel Stations	0	0

Data Type	Number on Site ⁽¹⁾	Number within 250 m of Site ⁽¹⁾
Trade Directory	Not supplied in Groundsure Report	Not supplied in Groundsure Report
Note: 1) Numbers in brackets denotes number of authorisations, licenses or permits that are lapsed, revoked, cancelled, superseded, defunct, surrendered, not applicable, inactive, withdrawn or not yet started. 2) Includes Integrated Pollution Controls, Integrated Pollution Prevention and Control, Local Authority Integrated Pollution Prevention and Control and Local Authority Pollution Prevention and Control permits. 3) COMAH denotes Control of Major Accident Hazards 4) NIHHS denotes Notification of Installations Handling Hazardous Substances 5) Sites determined as Contaminated Land under Part 2A of the Environmental Protection Act		

Sewage Pumping Station

- 4.5.2 A sewage pumping station is shown approximately 20 m to the south on the southern bank of the Corsewall Burn. Details on the type of effluents received at this Scottish Water operated pumping station are unknown as is information on any discharge consents. FOI requests have been issued to SEPA and the Local Authority, however, their responses are pending at the time of writing.

Historical Landfill Sites

- 4.5.3 The Groundsure Report notes no registered landfill sites onsite. The nearest Local Authority Record landfill is located offsite at Kirranrae, Kirkcolm about 490 m to the south west of the Site. The type of waste it received is not supplied. No further details were given. Present day Google Earth aerial imagery shows the area close to offsite farm buildings. Given the distance from the Site, this historical landfill is not considered to present a contamination risk to the Site.

Historic Petrol Station

- 4.5.4 The Groundsure report indicates an offsite historic petrol station located about 460 m south west present during 1970. No further details were given. Given the location and distance from the Site, this petrol station is not considered to present a contamination risk to the Site.

4.6 Planning Portal

- 4.6.1 A review of planning records pertinent to the Site held by Dumfries & Galloway Council (D&G, 2023) was undertaken via their online planning portal on 06 February 2023. The search returned the following planning application records for the Site.
- 4.6.2 **Formation of Wildlife Pond – Ref. 19/0272/FUL:** A planning application was submitted for the proposed formation of a wildlife pond at Corsewall House, Corsewell Estate, Stranraer, DG9 0NX. The application status is listed as unknown and the decision as ‘Grant Unconditionally’ on 12 April 2019. The proposed pond is located south of the existing pond, see **Extract 2** below.



Extract 2: Location of proposed wildlife pond, not to scale (source Dumfries & Galloway Planning – Application Map: <https://eaccess.dumgal.gov.uk/online-applications/applicationDetails.do?activeTab=map&keyVal=PN8IZDGBFK300>)

- 4.6.3 **Formation of Footpaths – Ref. 19/0362/FUL:** A planning application was submitted for the proposed formation of footpaths at Corsewall House, Stranraer, DG9 0NX. The decision to ‘Grant Unconditionally’ was made on 24 April 2019. This footpath forms part of the western boundary and the north point boundary of the study area, see **Extract 3**. Following the Site walkover, it was clear that this bounding public footpath had been constructed and is in use.



Extract 3: Location of footpath along western and northern boundaries (source Dumfries & Galloway Planning – https://eaccess.dumgal.gov.uk/online-applications/files/B301B027FB6F4422145BBA52A10B0BEC/pdf/19_0362_FUL-Location_Plan-848209.pdf).

4.7 Review of Unexploded Bomb Risk Map

- 4.7.1 A preliminary unexploded ordnance (UXO) identification has been undertaken through review of the Unexploded Bomb (UXB) risk map (Zetica, 2023). The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) aerial bombing. The map shows the Site to be in an area designated as ‘Low’ where Low is defined as “Areas

indicated as having a bombing density of less than 15 bombs per 1000 acre". UXOs are unlikely to be a hazard during ground investigations and/or future development.

- 4.7.2 The historical land use bounding the Site to the south was the former RAF Wig Bay Seaplane Base (Canmore, 2023). During WWII era this offsite land use was a Luftwaffe Target. RAF Wig Bay Seaplane Base did not have a runway and was primarily used to store sea planes. The former Base is marked as 'Low' risk by Zetica. Given the proximity to the former Base, risks of UXO cannot be ruled out.

4.8 Consultation with Regulators

- 4.8.1 A request for environmental information has been submitted to Dumfries & Galloway Council and SEPA relating to the Site. Both enquiries have been acknowledged, however responses are still awaited.
- 4.8.2 Requests for information and responses from the regulators are included in **Appendix E**.

4.9 Internet Searches Using Site Address and Postcode

- 4.9.1 Internet searches using the postcode did not reveal additional information relating to ground conditions.

5 Ground Stability Appraisal

5.1 Introduction

- 5.1.1 It is noted that the proposed development pertains to a wetland and does not include any buildings, although an access road and bridge may be included. This section therefore reports a relatively generic summary of potential ground stability issues, which may require more targeted investigations once the proposal is more clearly defined.
- 5.1.2 This study utilises the guidance given in NHBC Standards Chapter 4.1 Land Quality – Managing Ground Conditions. A preliminary assessment of potential ground instability issues has been undertaken based on walkover information and readily available published geological information together with data acquired from public databases, which equate to the NHBC Initial Assessment (desk study).
- 5.1.3 An assessment of potential geological hazards that may give rise to instability or adverse foundation or construction conditions as supplied by the British Geological Survey (BGS) from their National Geoscience Information Service (NGIS) is presented in the Groundsure Report reproduced in **Appendix C**.
- 5.1.4 The generic assessment in the Groundsure report is generated automatically based on digital geological maps and the scope and the accuracy is limited by the methods used to create the dataset and is therefore only indicative for the search area. The information contained in the Groundsure Report has been reviewed and, where considered necessary, reassessed considering the specific information available for the Site.

5.2 Mining (Past, Present and Proposed)

Preliminary Coal Mining Assessment

- 5.2.1 The Site is not located within a Coal Mining Affected Area (CA, 2023) and therefore review and assessment of risks from such past activities has not been undertaken.

Preliminary Non-coal Mining Assessment

- 5.2.2 According to the BGS Geo Index, the site within the Dumfries and Galloway Lead Mine Plan owned by Lowland Lead Mines Ltd. However, the record availability was listed as 'Unknown' on the BGS Geo Index. This plan essentially covers the entire area of Dumfries and Galloway. Given the nature of deposits indicated to underly the site, Stantec considers it unlikely that non-coal mining activities have taken place onsite or in the surrounding nearby area.

5.3 Natural and Mining Cavities

- 5.3.1 The National Natural and Mining (non-coal) Cavities Databases, maintained and updated by Stantec, have been searched for relevant natural and mining cavity records.

Natural Cavities

- 5.3.2 The Stantec Natural Cavities Database does not contain any records of natural cavities within at least 1 km of the Site.

Mining Cavities

- 5.3.3 The Groundsure Report (GLI, 2023) indicates no man-made mine cavities within at least 1 km. The Stantec Mining Cavities Database does not include any records on the Site or in close proximity.
- 5.3.4 According to the Groundsure Report, there are no BritPits onsite. The nearest BritPit named 'Dove Cot Plantation Gravel Pit' is located offsite approximately 270 m north west of the Site (GLI, 2023). The record states that it was a surface mineral working for the commodity of 'Sand & Gravel' and its status is listed as 'Ceased'.
- 5.3.5 The lack of records by itself does not disqualify their existence entirely, however, based on the expected ground conditions, historical records and Site settings, it is considered that the presence of natural and / or mining cavities is unlikely.

5.4 Surface Ground Workings

- 5.4.1 According to the Groundsure Report, there are no records of surface ground workings onsite. The nearest surface ground workings record is 'Unspecified Ground Workings' approximately 30 m south of the Site (GIL, 2023). This was taken from Ordnance Survey mapping dated 1893 (scale 1:10,560) and no further record details are available. Review of mapping dated 1894 scale 1:2,500 reveals no further information. Given this features size, offsite location and distance from the study area, it is not anticipated to affect the Site.
- 5.4.2 Another offsite record exists located approximately 60 m south east (GIL, 2023). The record shows the land use as 'Water body' taken from Ordnance Survey mapping dated 1893 and 1909, both at 1:10,560 scale. No further record details are available. The water body may be an old channel associated with a possible former course of the Corsewall Burn or a low lying wetland feature. Groundsure state that these features may or may not have been subsequently backfilled. Given its offsite location and distance from Site, this feature is not anticipated to affect the Site.
- 5.4.3 The remaining offsite nearby record is for a graveyard associated with the church. These are located offsite to the west at approximately 180 m and are not considered to affect the Site.

5.5 Potential for Compressible Ground Stability Hazards

- 5.5.1 The Groundsure report records that, presuming natural materials are present, the onsite compressible ground stability hazard potential will be **Low** for the majority of the Site (approximately two thirds of the Site). However, the hazard potential rises to **Moderate** for the eastern portion of the Site (about one third) along the coastline. A **Negligible** hazard potential exists on the western point of the study area.
- 5.5.2 Stantec generally agrees, however, localised pockets of possible Made Ground deposits may underly or surround the ruined historical residential buildings situated on the south eastern corner and on the western site boundary. These possible areas of localised Made Ground have the potential to be compressible in nature and on this basis Stantec recommends a **Moderate** hazard potential for compressible Made Ground is adopted for these localised areas.
- 5.5.3 Stantec concurs with the **Negligible** potential for compressible natural ground on the western point of the study area.

5.6 Potential for Running Sand Stability Hazards

- 5.6.1 The Groundsure report records the onsite potential for running sands stability hazards to be **Very Low** for the majority (about two thirds) of the study area. The eastern portion of the Site (about one third) along the coastline carries a **Moderate** hazard potential.
- 5.6.2 Stantec disagrees with the **Very Low** potential for running sands stability hazard as the underlying soils are indicated to be Raised Marine Beach Deposits (RMBDF) comprising gravel, sand and silts deposits i.e., gravel and sand according to the BGS. Should these deposits be encountered, then the possibility of sandier layers cannot be ruled. Moreover, groundwater has the potential to be shallow, therefore, Stantec consider that a **Low** to **Moderate** potential for running sands be adopted for the remaining two thirds of the Site.

5.7 Potential Shrinking or Swelling Clay Stability Hazards

- 5.7.1 The Groundsure report records the onsite shrink swell of clays stability hazard potential as **Negligible**. On the assumption that this relates to the natural anticipated Raised Marine Beach Deposits, Stantec concurs with this assessment. Depending on the presence, composition and/ or thickness of any possible Made Ground onsite, the above hazard assessment may not be applicable.
- 5.7.2 The western point of the Site carries a **Very Low** shrink swell of clays stability hazard potential. On the assumption that this relates to the natural anticipated Glacial Till deposits, Stantec concurs with this assessment.

5.8 Potential for Ground Dissolution Stability Hazards

- 5.8.1 The Groundsure report records the onsite ground dissolution of soluble rocks hazard potential as **Negligible**. Stantec concurs with this assessment.

5.9 Potential for Landslide Ground Stability Hazards

- 5.9.1 The Groundsure report records the onsite landslide ground stability hazard potential as **Very Low** for the majority of the Site. The very northern and western points of the Site are indicated to carry a **Low** hazard. Stantec concurs with this assessment, based on the current site topography and geological setting.

5.10 Potential Adverse Foundation Conditions

- 5.10.1 It is noted that the proposed development does not include any buildings, although an access road and bridge may be included. The assessment below therefore reflects a generic assessment of potential founding strata.
- 5.10.2 The ground stability assessment has identified that the potential for adverse foundation conditions is generally overall **Moderate**, especially in the eastern coastline area.
- 5.10.3 The site is indicated to be underlain by the Raised Marine Beach Deposits comprising generally sand and gravel deposits with some cobbles, which carries a **Moderate** running sands hazard potential. Possible localised areas of Made Ground may underly/ surround the existing ruined historical residential buildings onsite, and if so, carry a elevated **Moderate** risk in relation to foundations.
- 5.10.4 The potential risk of Compressible Ground Stability Hazards within the western and central areas of the site is estimated to be **Low**. This rises to **Moderate** in the site's eastern areas in relation to foundations. The nature and extent of the strata at the Site have not been determined at the current time. In due course a ground investigation will be required to inform detailed foundation and wetland design.

- 5.10.5 In order to minimise the **Moderate** potential risks, ground investigation and testing will be needed, and if necessary, foundations will need to be designed to accommodate the movement or be taken to a depth where the likelihood of damaging movement is low, especially around the newly proposed bridge.

5.11 Slope Stability

- 5.11.1 In general, the natural ground profile across the Site is relatively flat with gentle gradients. Overall, the natural soils onsite are thought to be stable at the existing slope gradients and the risk of major slope stability or landslide hazard being present is considered to be **Very Low**.

5.12 Infiltration Drainage Potential

- 5.12.1 The infiltration drainage characteristics at the Site will depend on the presence and thickness of a suitable stratum to receive water and existing groundwater levels beneath the Site. The expected near surface materials for the Raised Marine Beach Deposits are likely to comprise sands and gravels with a moderate to potentially high infiltration potential.
- 5.12.2 These characteristics will need to be accounted for in the design of the proposed pond.

6 Land Contamination Risk Assessment

6.1 Approach and Outline Conceptual Model

- 6.1.1 The land contamination risk assessment presented in this chapter is a Tier 1 PRA, which uses published information. A summary of the guidance for the assessment of land contamination and the approach developed and adopted by Stantec is presented in **Appendix A**.
- 6.1.2 A conceptual model identifies the types and locations of potential contamination sources, the identification of potential receptors and the identification of potential transport/migration pathways.
- 6.1.3 Guidance requires a risk assessment to include the following steps:
- Identify the hazard - establish contaminant sources.
 - Assess the hazard - use a source-pathway-receptor (S-P-R) pollutant linkage approach to find out if there is the potential for unacceptable risk.
 - Estimate the risk - predict what degree of harm or pollution might result and how likely it is to occur.
 - Evaluate the risk - decide whether a risk is unacceptable.
- 6.1.4 The findings for each step are summarised in the following subsections.

6.2 Hazard Identification (Sources of Contamination)

Naturally Occurring Geochemical Hazards

- 6.2.1 The estimated natural soil chemistry information (GLI, 2023) does not indicate the presence of elevated concentrations of metals.

Potential Sources of Contamination and Contaminants of Concern

- 6.2.2 The Site land use comprises principally undeveloped land with isolated and localised areas of possible Made Ground underlying/ surrounding the old ruined buildings onsite. The adjacent land uses currently comprise mainly open agricultural grassy fields, woodland, a sewage pumping station and occasional residential dwellings. The land bounding the Site to the south is the former RAF Wig Bay, Seaplane Base. If the proposed wetland is to be developed in the northern tip of this study area, these features will be of low relevance.
- 6.2.3 **Onsite:** The potential for significant contamination to be present associated with the historical and current onsite land uses is considered to be **Very Low**.
- 6.2.4 **Offsite:** The potential for offsite contamination to be present, based on the past and current land uses of the neighbouring land, is considered to be principally **Low** associated with the offsite former RAF Wig Bay Seaplane Base and nearby sewage pumping station.
- 6.2.5 The indicative criteria for classifying hazards from **Very Low** to **Very High** are presented in Table 1 of **Appendix A**.
- 6.2.6 The sources of potential contamination (SPCs) identified and associated contaminants of concern (COC) are presented in **Table 6.1** below.

Table 6.1 Sources of Potential Contamination

SPC Reference	Description and (Hazard Score)*	Contaminants of Concern (COC)
1	Onsite: Possible Made Ground associated with historical residential properties (1)	Generally, possible heavy metals, inorganics, sulphates and possible ground gases (carbon dioxide and methane)
2	Onsite: Agricultural land, grassy fields used for grassing sheep (1)	Generally, possible pesticides and fertilizers, isolated hydrocarbons, mineral oil (plant leaks and spills)
3	Offsite: Sewage Pumping Station (adjacent southern site boundary) (2)	Generally, metals, inorganic ions, organics, fuel oils, PCBs, micro-organisms and potential hazardous gases
4	Offsite: former RAF Wig Bay, Seaplane Base (neighbouring offsite land to the south) (3)	Possible lubricants and hydraulic fluids. Aviation kerosene, gasoline and diesel. De-icing chemicals including glycol, urea, and calcium and magnesium acetate-based products. Possible organic solvents including ketones e.g., acetone, methanol, esters and chlorinated compounds such as Polychlorinated Biphenyls (PCBs). Possible firefighting agents including fluorinated surfactants. Washing agents such as wheel cleaners e.g., potassium hydroxide. Weed killers/ herbicides. Corrosion inhibitors such as aluminium paints.

*hazard score from the methodology in **Appendix A**

6.2.7 The hazard scores used in the table above are based on the contaminative potential of these land uses as established in Table 1 of the Stantec Methodology in **Appendix A**.

6.3 Hazard Assessment

6.3.1 To determine whether the identified hazards pose a risk it is necessary to identify the presence of potential receptors and pathways by which these receptors can be exposed to the hazard.

Identification of Potential Pathways

6.3.2 Potential hazards require a pathway connecting the source (if present) to potential receptors to impact upon the receptors. These pathways are capable of conveying the potential contaminants identified. Pathways may be anthropogenic (artificial) or natural.

6.3.3 Anthropogenic pathways are artificial routes capable of conveying contaminants and include such routes as surface water drains, high permeability backfill materials, poorly consolidated Made Ground, foundations, and persons disturbing contamination sources in such a way as to liberate contaminants.

6.3.4 The potential for contamination (if present) associated with the onsite agricultural land and localised Made Ground to migrate via groundwater flow across the Site is considered to be of a low likelihood.

6.3.5 The potential for contamination (if present) associated with potential releases and/or leaks from the neighbouring offsite sewage pumping station to migrate via surface water flow along the southern Site boundary, ultimately potentially being deposited onto the eastern beach

boundary area of the Site is considered to be likely. However, given well maintained infrastructure, it is by no means certain that even over a longer period such a release and/or leak event would take place.

- 6.3.6 The potential for contamination (if present) associated with the offsite former RAF Wig Bay, Seaplane Base to migrate via groundwater flow and/or surface water runoff to the Site is considered to be unlikely. This is primarily due to the topography falling gently towards the former Base and that the hydraulic gradient is anticipated to be south eastwards towards Loch Ryan.
- 6.3.7 Table 3 of the methodology presented in **Appendix A** describes the possible pathways for each receptor type.

Receptor Identification

- 6.3.8 Potential receptors identified by this assessment and determination of the sensitivity/value are presented in **Table 6.2** below.

Table 6.2 Potential Receptors

Receptor	Comment	Receptor/Sensitivity
Human Health - Current Users	The Site is currently a vacant parcel of overgrown wetland with agricultural grasses fields and does not include a habitable residential property. Current human land use is likely to be restricted to walkers using footpaths.	4
Human Health – Future Users	Yes – potential for general public access via pathways for walkers	4
Human Health - Neighbours	Yes – neighbouring residents with private gardens, however properties to the west are well away from the likely wetland construction area	5
Human Health - Construction Workers	Yes – temporarily present during construction phase and future maintenance workers	4
Water Environment (Groundwater – Shallow and Deep)	Yes – Shallow groundwater onsite, the Stranraer Sand and Gravel groundwater (SEPA water quality Good) and the Stewartry Group sandstone aquifer, which is a moderately productive aquifer classified by SEPA as Poor	3 - Shallow 2 - Bedrock
Water Environment (Surface Water)	Yes – the Corsewall Burn and Loch Ryan	3
Property – Buildings onsite	Yes – ruined historical residential properties.	1
Property – Buildings offsite	Yes – residential properties with private gardens to the west	1
Property – Animals/Crop	Yes – part of the Site is agricultural land used for grazing livestock	1
Ecological Systems	Yes - Designated Ancient Woodland onsite	2

6.4 Risk Estimation

6.4.1 When there is a pollutant linkage (and therefore some measure of risk) it is necessary to determine whether the risk is significant and therefore whether further action is required. Risk estimation involves predicting the likely consequence (what degree of harm the receptor might suffer) and the probability that the consequences will arise (how likely the outcome is given the likely scale of contamination and the probability of exposure).

6.4.2 Preliminary risk estimation is based on the evaluation of available data, which has been summarised and presented in this report. Without actual data from physical site investigation work, there is always a degree of uncertainty regarding the actual presence of potentially harmful contamination. Based on the current and known historical land uses, the potential for the Site to be affected by contamination (if present) is considered overall to be **Very Low**.

6.4.3 The tables in **Appendix E** presents the classification of risk, which is a combination of consequence and probability for each potential pollutant linkage identified for the sources in **Table 6.2** above.

- Human health (onsite current users) – transient maintenance workers associated with the construction of the new wetland area and local residents/ general public walking

across the Site may come into direct contact with soils. The risk to current onsite current users is **Very Low**.

- Human health (onsite future users) – the anticipated development is a wetland area for sandwich terns. Future local residence/ general public walking across the Site may come into direct contact with soils. The risk to future users is estimated to be **Very Low**.
- Human health (neighbouring sites) – the risk to offsite users such as adjacent residential properties is estimated to be **Very Low**.
- Human health (construction workers) – although ground and construction workers are likely to disturb the ground and therefore come into direct contact with potential contamination in soils (either via inhalation, ingestion and dermal contacts), it is presumed that such work will be undertaken with an understanding of the potential for contamination with safe working practices put in place to mitigate risks. Furthermore, exposure to soils will likely be short term. On this basis, the risk to construction workers is estimated to be **Very Low to Low**.
- Groundwater – The underlying superficial groundwater is classified by SEPA as being of Good status. The bedrock aquifer is moderately productive, classified by SEPA as Poor. The risk to groundwaters is estimated to be **Very Low**.
- Surface Water – The Corsewall Burn and Loch Ryan bound the Site to the south and east, respectively. Direct runoff of discharges from pipes i.e., the sewage pumping station, is considered possible, however the risk is estimated to be **Very Low to Low**.
- Property (buildings onsite and offsite) – the risk to properties is estimated to be **Very Low**.
- Ecological Systems – the risk to ecological systems, particularly the onsite Designated Ancient Woodland, is estimated to be **Very Low**.
- Property (animal/crop) – the risk to animals and agricultural land is anticipated to be **Very Low**.

6.4.4 The definitions of probability and consequence are in Table 4 and Table 5 of **Appendix A** (respectively).

6.4.5 Possible pollutant linkages are determined using professional judgement. If a linkage is considered plausible with some associated risk, even if estimated to be low, it is considered that this represents a potentially 'unacceptable risk' and therefore requires further consideration. Risk reduction can be achieved through implementation of remediation or mitigation measures or through further tiers of assessment following collection of site-specific data.

6.5 Risk Evaluation

6.5.1 Possible pollutant linkages to receptors have been identified and the overall estimated geoenvironmental risks have been assessed as being **Very Low**. As such, there is a possibility that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.

6.5.2 The Contractor should still prepare documents (risk assessment and method statements (RAMS)) and implement measures to address the requirements of health and safety legislation, such as the Construction (Design and Management) Regulations (CDM 2015). The

following good practice and hygiene measures are typically implemented on development sites and assumed to be the minimum:

- Designated eating and drinking area(s) and these are kept clean (free of dirt / dust).
- Provision of hand washing facilities.
- Toolbox box talks, induction awareness and regular refresher talks.

6.5.3 Possible pollutant linkages are determined using professional judgement. If a linkage is considered possible, it is considered that this represents a potentially 'unacceptable risk' and therefore requires further consideration. This may be through remediation or mitigation or through further tiers of assessment.

7 Conclusions and Recommendations

7.1 Conclusions

- 7.1.1 The site is proposed for the creation of a wetland habitat for sandwich terns and is considered likely to be readily developable from a ground conditions perspective. The study area is broadly triangular in shape, covers approximately 30 ha and is currently grassy agricultural fields with areas of trees and wetlands including occasional ponds. The development of additional wetland area is likely to occupy only a small part of this wider study area, most likely at the northern tip.
- 7.1.2 The ground levels across the study area are generally gently sloping from west to east, and slightly north to south. The western side of the study area is at a higher elevation than the eastern side. Low lying areas of wetland exist in the eastern portion of the site.
- 7.1.3 On review of the historical mapping and aerial imagery, the majority of the Site appears to have remained undeveloped since the earliest available historical mapping records of the 1890s. Two ruined historical residential properties remain onsite. An offsite active sewage pumping station neighbours part of the Site to the south, beyond this to the south lies the former WWII RAF Wig Bay, Seaplane Base.
- 7.1.4 According to the BGS, the Site is underlain by Raised Marine Beach Deposits (sands and gravels with some cobbles) underlain by the Loch Ryan Formation (LRN) comprising sandstone, however, no site-specific ground investigation is known to have been undertaken at the Site and there are no local BGS borehole records, so the actual ground conditions are unknown.

Geotechnical

- 7.1.5 No buildings are proposed, so the summary below is relatively generic, albeit of potential relevance to the likely construction of a road, bridge and pond itself
- 7.1.6 The ground stability assessment has identified that the potential for adverse foundation conditions is generally overall **Moderate**, especially in the eastern coastline area. This relates to the potential risk of Compressible Ground Stability Hazards within eastern wetland ground in relation to foundations and the potential risk of Running Sands across the site.
- 7.1.7 In order to minimise this **Moderate** potential risk, ground investigation and testing will be needed. However, any requirement for ground investigations would be highly targeted to proposed structures such as a road and bridge for which foundations may need to be designed to accommodate some movement or be taken to a depth where the likelihood of damaging movement is low.
- 7.1.8 Groundwater levels should be investigated and monitored to establish possible fluctuations and how these may relate to possible based flow recharge and/or tide influences on the wetland area.
- 7.1.9 The ground conditions and soil chemistry are unknown. Therefore, prior to development the site should be subjected to an intrusive ground investigation to determine and assess the actual soil characteristics and characterise the geotechnical conditions for the wetland and construction road foundations, potential new access bridge foundations and drainage design. During the geotechnical ground investigation, it would be prudent to undertake an assessment of the geoenvironmental conditions to confirm the findings of this Desk Study.

Geoenvironmental

- 7.1.10 The Site as a whole is considered to have a **Very Low** geoenvironmental risk associated with potential contamination.
- 7.1.11 Given the study area history soils across the majority of the Site are not expected to be affected by significant contamination. Moreover, based on the **Very Low** geoenvironmental risks associated with the Site, it is considered that a ground investigation and Tier 2 geoenvironmental risk assessment are not required to support a planning application for the proposed development of the Site.
- 7.1.12 However, should Made Ground be encountered then a provision for a soil screening exercise is advised in conjunction with the geotechnical ground investigation across the site.
- 7.1.13 The type of effluent received, and any discharge consent information associated with the nearby Scottish Water pumping station and its emergency outfall is presently unknown. As the Corsewell Burn is potentially a feeder for the proposed wetland and lagoons, further information should be sought from Scottish Water. Ultimately, the outfall pipe may need to be moved downstream from where the Corsewell Burn is intercepted.
- 7.1.14 Furthermore, as the potential exists for the Corsewell burn to be partially diverted to feed the future wetland a provision for surface water quality environmental sampling, analysis and screening of the existing low lying ponds and Corsewall Burn is also recommended. This would be to gauge background concentrations of possible contaminants (if present) from possible agricultural runoff and runoff/ leaks from the upstream pumping station.
- 7.1.15 It is considered highly unlikely that the local planning authority will designate the Site as Contaminated Land under Part IIA of the Environmental Protection Act 1990.
- 7.1.16 The proximity to the former RAF Wig Bay Seaplane base, which was a Luftwaffe target during WWII, warrants further consideration as it may have been targeted.
- 7.1.17 Suspected Japanese Knotweed was identified growing close to the southern bank of the Corsewell Burn. The potential exists for this invasive plant species to spread onto the site. Therefore, further investigation is required to establish a) confirmation of the invasive species and quantify any other potential invasive plant species either onsite or nearby and b) provide a risk assessment with remedial measures (if required) before any breaking of ground.

7.2 Uncertainties and Data Gaps

- 7.2.1 Whilst the information used in this assessment is considered robust and suitable for purpose, no recent or development specific ground investigation data is available, therefore the actual ground conditions beneath the Site are unknown at the time of writing. There is a reasonable level of confidence that the information presented in this report provides a good understanding of the likely ground conditions and enables identification of potential risks. However, further work is recommended to refine the Conceptual Model for the Site and reduce uncertainty.
- 7.2.1 There is no previous ground investigation information for Site and as such there is a degree of uncertainty regarding the actual ground conditions.
- 7.2.2 Precise details around the development layout are unknown at the time of writing as are future potential/ plans for any possible re-grading or cut and fill work for the Site.

7.3 Recommendations

- 7.3.1 It is recommended that a preliminary intrusive ground investigation is undertaken at the appropriate areas of the site prior to development of the Site to:
- Provide information on the ground conditions and inform the detailed design of the proposed road design and bridge foundations and drainage;

- Establish groundwater depths;
 - Provide information to assess geotechnical conditions, particularly the potential risk of Compressible Ground and possibility of Running Sands (if present);
 - To confirm the preliminary findings of the Desk Study.
- 7.3.2 It is possible that basic mitigation measures including such as health and safety for construction workers and removal of any impacted soils could be required as part of the redevelopment of the Site.
- 7.3.3 A ground investigation will be designed to facilitate design requirements and evaluate environmental risks. The investigation is likely to comprise:
- Machine excavated trial pits to enable appraisal of ground conditions, infiltration characteristics and collection of representative samples for geotechnical and geo-environmental (as appropriate) analysis;
 - Shallow boreholes advanced across the site with in-situ testing to assess ground conditions. Representative samples will be collected for geotechnical and geo-environmental (as appropriate) analysis. Selected boreholes will be installed with monitoring wells for groundwater monitoring.
 - The results of the investigation, laboratory analysis and monitoring will be assessed by geotechnical and geo-environmental consultants.
 - The design of the ground investigation outlined above will be dependent on the scale and nature of the proposed development once confirmed.
- 7.3.4 Given the proximity of the Site to the former WWII RAF Wig Bay, Seaplane Base, Stantec recommends that a UXO Desk Study & Risk Assessment be undertaken.
- 7.3.5 Stantec recommends that an Invasive Plant Species Survey and Risk Assessment be undertaken site wide including the marginal offsite areas to better understand the potential existence and distributions of possible further species. The survey should provide remedial measures (as required).

8 Essential Guidance for Report Readers

- 8.1.1 This report has been prepared within an agreed timeframe and to an agreed budget that will necessarily apply some constraints on its content and usage. The remarks below are presented to assist the reader in understanding the context of this report and any general limitations or constraints. If there are any specific limitations and constraints, they are described in the report text.
- 8.1.2 The opinions and recommendations expressed in this report are based on statute, guidance, and best practice current at the time of its publication. Stantec UK does not accept any liability whatsoever for the consequences of any future legislative changes or the release of subsequent guidance documentation, etc. Such changes may render some of the opinions and advice in this report inappropriate or incorrect and the report should be returned to us and reassessed if required for re-use after one year from date of publication. Following delivery of the report, Stantec has no obligation to advise the Client or any other party of such changes or their repercussions.
- 8.1.3 Some of the conclusions in this report may be based on third party data. No guarantee can be given for the accuracy or completeness of any of the third-party data used. Historical maps and aerial photographs provide a “snapshot” in time about conditions or activities at the site and cannot be relied upon as indicators of any events or activities that may have taken place at other times.
- 8.1.4 The conclusions and recommendations made in this report and the opinions expressed are based on the information reviewed and/or the ground conditions encountered in exploratory holes and the results of any field or laboratory testing undertaken. There may be ground conditions at the site that have not been disclosed by the information reviewed or by the investigative work undertaken. Such undisclosed conditions cannot be taken into account in any analysis and reporting.
- 8.1.5 It should be noted that this report is a land condition assessment and does not purport to be an ecological, flood risk or archaeological survey and additional specific surveys may be required.
- 8.1.6 This report has been written for the sole use of the Client stated at the front of the report in relation to a specific development or scheme. The conclusions and recommendations presented herein are only relevant to the scheme or the phase of project under consideration. This report shall not be relied upon or transferred to any other party without the expressed written authorisation of Stantec. Any such party relies upon the report at its own risk.
- 8.1.7 The interpretation carried out in this report is based on scientific and engineering appraisal carried out by suitably experienced and qualified technical consultants based on the scope of our engagement. We have not taken into account the perceptions of, for example, banks, insurers, other funders, lay people, etc., unless the report has been prepared specifically for that purpose. Advice from other specialists may be required such as the legal, planning and architecture professions, whether specifically recommended in our report or not.
- 8.1.8 Public or legal consultations or enquiries, or consultation with any Regulatory Bodies (such as the Scottish Environmental Protection Agency (SEPA) or Local Authority) have taken place only as part of this work where specifically stated.

9 References

- BGS (2023) British Geological Survey GeolIndex Onshore online interactive viewer, available at: <http://mapapps2.bgs.ac.uk/geoindex/home.html>, accessed 30 January 2023.
- BGS (2023a) British Geological Survey GeolIndex Onshore online Radon Interactive Atlas, available at: <https://mapapps2.bgs.ac.uk/geoindex/home.html?layer=BGSRadon>, accessed 07 February 2023.
- BGS (1982) Stranraer. Scotland Sheet 3 Drift 1:50,000, available at: <https://largeimages.bgs.ac.uk/iip/mapsportal.html?id=1002282>, accessed 08 February 2023
- BGS (1982) Stranraer. Scotland Sheet 3 Solid 1:50,000, available at: <https://largeimages.bgs.ac.uk/iip/mapsportal.html?id=1002923>, accessed 08 February 2023
- BGS (1988) Hydrogeological Map of Scotland 1:625,000 scale
- BRE (2015) Building Research Establishment (BRE) Report BR211 (2015) Radon: Guidance on protective measures for new buildings, Chris Scivyer, Map 1
- Coal Authority (2023), Online Interactive Map, available at: <https://nhbc-standards.co.uk/4-foundations/4-1-land-quality-managing-ground-conditions/> accessed 06 February 2023.
- Canmore (2023), Canmore National Record of the Historic Environment, RAF Wig Bay, Seaplane Base, Stranraer, available at: <https://canmore.org.uk/site/91781/stranraer-raf-wig-bay-seaplane-base?display=image>, accessed 01 February 2023
- HES (2023) Historic Environment Scotland, available at: <https://hesportal.maps.arcgis.com/apps/Viewer/index.html?appid=18d2608ac1284066ba3927312710d16d>, accessed 01 February 2023.
- Groundsure Location Intelligence (GLI, 2023), Enviro+Geo Insight Report for Site at Kirkcolm, Stranraer, ref no. GS-9313439, Groundsure Limited.
- NHBC (2023) Standards Chapter 4.1 Land Quality – Managing Ground Conditions, available at: <https://nhbc-standards.co.uk/4-foundations/4-1-land-quality-managing-ground-conditions/>, accessed 06 February 2023.
- Nitrate Vulnerable Zones Scotland (NVZ, 2015), Map 5, Stranraer Lowlands, available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/map/2018/08/nitrate-vulnerable-zones-maps/documents/stranraer-lowlands-nvz/stranraer-lowlands-nvz/govscot%3Adocument/Stranraer%2BLowlands%2BNVZ.pdf>, accessed 01 February 2023.
- Scotland's Environment (undated) Scotland's environment map, available at: <https://map.environment.gov.scot/sewebmap/>, accessed: 30 January 2023.
- SEPA (2018) Water Classification Hub, available at: <https://www.sepa.org.uk/data-visualisation/water-classification-hub/accessed> 08 February 2023
- Dumfries & Galloway planning portal (D&G, 2023), available at: <https://eaccess.dumgal.gov.uk/online-applications/>, accessed 06 February 2023.
- Zetica (undated) UXO Risk Maps, available at: <https://zeticauxo.com/downloads-and-resources/risk-maps/>, accessed 08 February 2023.

Figures

Figure 1 Site Location Plan

Appendix A Stantec Guide: Methodology for Assessment of Land Contamination (Scotland)

Stantec Guide: Methodology for Assessment of Land Contamination (Scotland)

1 INTRODUCTION

This document defines the approach adopted by Stantec in relation to the assessment of land contamination in Scotland. The aim is for the approach to (i) be systematic and objective, (ii) provide for the assessment of uncertainty and (iii) provide a rational, consistent, transparent framework.

When preparing our methodology we have made reference to various technical guidance documents and legislation referenced in Section 7 of which the principal documents are (i) Contaminated Land Statutory Guidance (Scottish Executive, 2006), (ii) online guidance Land Contamination: Risk Management (LCRM) accessed from GOV.UK which (in England) is expected to replace the Contaminated Land Research (CLR) Report 11: Model Procedures for the Management of Contamination CLR 11 (EA 2004)*, (iii) Contaminated land risk assessment: A guide to good practice (C552) (CIRIA 2001), (iv) Scottish Planning Policy (SPP 2014) and Planning Advice Note 33, Development of Contaminated Land (PAN 33), (v) BS 10175: 11+A2:2017 Investigation of potentially contaminated sites – Code of practice, and (vi) the series of British Standards on Soil Quality BS 18400.

***At the time of writing there has been no formal decision about the adoption of LCRM over CLR 11 in Scotland. Until such a time that a decision is made, Stantec has opted to work to LCRM in Scotland. It should be noted that LCRM is currently due to be revised following consultation and CLR 11 is achieved.**

2 DEALING WITH LAND CONTAMINATION

Government policy on land contamination aims to prevent new contaminated land from being created and promotes a risk-based approach to addressing historical contamination. With regard to historical contamination, regulatory intervention is held in reserve for land that meets the legal definition and cannot be dealt with through any other means, including through planning. Land is only considered to be “contaminated land” in the legal sense if it poses an unacceptable risk.

UK legislation on contaminated land is principally contained in Part 2A of the Environmental Protection Act, 1990 (which was inserted into the 1990 Act by section 57 of the Environment Act 1995). Part 2A was introduced in Scotland on 14 July 2000 and provides a risk-based approach to the identification and remediation of land where contamination poses an unacceptable risk to human health or the environment. The Model Procedures for the Management of Land Contamination (CLR 11), were developed to provide the technical framework for applying a risk management process when dealing with land affected by contamination. The process involves identifying, making decisions on, and taking appropriate action to deal with land contamination in a way that is consistent with government policies and legislation within the UK. The approach, concepts and principles for land contamination management promoted by LCRM are applied to the determination of planning applications. The guidance given in LC:RM follows the same principles.

Other legislative regimes may also provide a means of dealing with land contamination issues, such as the regimes for waste, water, environmental permitting, and environmental damage.

Further, the law of statutory nuisance may result in contaminants being unacceptable to third parties whilst not attracting action under Part 2A or other environmental legislation.

2.1 Part 2A

The Regulations and Statutory Guidance that accompanied the Act, include the Contaminated Land (Scotland) Regulations 2005 and the Contaminated Land Statutory Guidance (for Scotland) 2006.

Part 2A defines contaminated land as “*land which appears to the Local Authority in whose area it is situated to be in such a condition that, by reason of substances in, on or under the land that significant harm is being caused, or there is a significant possibility that such harm could be caused, or pollution of controlled waters (known as “the water environment” in Scotland) is being, or likely to be, caused (Significant Harm of other receptors including human health (SPOSH) and Significant Possibility of Significant Pollution (SPOSP))*”.

Harm is defined as “*harm to the health of living organisms or other interference with the ecological systems of which they form part, and in the case of man, includes harm to his property*”.

Part 2A provides a means of dealing with unacceptable risks posed by land contamination to human health and the environment, and under the guidance enforcing authorities should seek to find and deal with such land. It states that “*under Part 2A the starting point should be that land is not contaminated land unless there is reason to consider otherwise. Only land where unacceptable risks are clearly identified, after a risk assessment has been undertaken in accordance with the Guidance, should be considered as meeting the Part 2A definition of contaminated land*”. Further the guidance makes it clear that “*regulatory decisions should be based on what is reasonably likely, not what is hypothetically possible*”.

The overarching objectives of the Government’s policy on contaminated land and the Part 2A regime are:

- “(a) *To identify and remove unacceptable risks to human health and the environment.*
- (a) *To seek to ensure that contaminated land is made suitable for its current use.*
- (b) *To ensure that the burdens faced by individuals, companies and society as a whole are proportionate, manageable and compatible with the principles of sustainable development”.*

The enforcing authority may need to decide whether and how to act in situations where decisions are not straight forward, and where there is uncertainty. “*In so doing, the authority should use its judgement to strike a reasonable balance between: (a) dealing with risks raised by contaminants in land and the benefits of remediating land to remove or reduce those risks; and*

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(b) the potential impacts of regulatory intervention including financial costs to whoever will pay for remediation, health and environmental impacts of taking action, property blight, and burdens on affected people". The authority is required to "take a precautionary approach to the risks raised by contamination, whilst avoiding a disproportionate approach given the circumstances of each case". The aim is "that the regime produces net benefits, taking account of local circumstances".

The guidance recognises that "normal levels of contaminants in soils should not be considered to cause land to qualify as contaminated land, unless there is a particular reason to consider otherwise".

Normal levels are quoted as:

- "a) *natural presence of contaminants' such as from underlying geology 'that have not been shown to pose an unacceptable risk to health and the environment*
- b) *...low level diffuse pollution, and common human activity..."*

Similarly, the guidance states that significant pollution of the water environment is required for land to be considered contaminated and the "fact that substances are merely entering water" or "where discharge from land is not discernible at a location immediately downstream" does not constitute contaminated land.

To help achieve a more targeted approach to identifying and managing contaminated land in relation to the risk (or possibility) of harm to human health, the revised Statutory Guidance (in England and Wales) presented a new four category system for considering land under Part 2A, ranging from Category 4, where there is no risk that land poses a significant possibility of significant harm (SPOSH), or the level of risk is low, to Category 1, where the risk that land poses a SPOSH is unacceptably high.

For land that cannot be readily placed into Categories 1 or 4 further assessment is required. If there is a sufficiently strong case that the risks are of sufficient concern to cause significant harm/pollution or have the significant possibility of significant harm/pollution the land is to be placed into Category 2. If the concern is not met land is considered Category 3.

The technical guidance clearly states that the currently published Soil Guidance Value's (SGV's) and Generic Assessment Criteria (GAC's) represent "cautious estimates of level of contaminants in soils" which should be considered "no risk to health or, at most, a minimal risk". These values do not represent the boundary between categories 3 and 4 and "should be considered to be comfortably within Category 4".

At the end of 2013 technical guidance in support of Defra's revised Statutory Guidance (SG) was published and then revised in 2014 (CL:AIRE 2014) which provided:

- A methodology for deriving C4SLs for four generic land-uses comprising residential, commercial, allotments and public open space; and

- A demonstration of the methodology, via the derivation of C4SLs for six substances – arsenic, benzene, benzo(a)pyrene, cadmium, chromium (VI) and lead.

In addition to the C4SLs, CIEH/LQM published Suitable 4 Use Levels (S4ULs) for 82 substances in 2015.

At the time of writing, it is understood that the acceptance of C4SLs and S4ULs is at the discretion of Scottish Local Authorities, but that these criteria are likely to be accepted in Tier 2 screening providing adequately justified. For more detail on assessment criteria, please refer to the Stantec document entitled "Rationale for Selection of Evaluation Criteria Used in Tier 2 (Generic) Land Contamination Risk Assessment (Scotland)".

2.2 Planning

The Local Authority Planning Department is responsible for the control of development, and in doing so it has a duty to take account of all material considerations, including contamination. Government guidance is provided in Planning Advice Note 33, Development of Contaminated Land (PAN 33).

PAN 33 defines the potential characteristics of contaminated land and describes the 'Source, Pathway, Receptor' model (See Section 3, below for more detail).

The level at which contamination is deemed to be unacceptable, or, gives rise to adverse effects under a planning context has not been identified but is envisaged to be more precautionary than the level required to determine land as contaminated under Part 2A.

A site containing contaminants may not be likely to cause significant harm in its current use, but if a different use were proposed, then the potential for significant harm may be enhanced.

The principal planning objective is to ensure that any unacceptable risks to human health, buildings and other property and the natural and historical environment from the contaminated condition of the land are identified so that appropriate action can be considered and taken to address those risks. In order to grant planning permission, the Local Authority (LA) has to be satisfied that there is sufficient information about the condition of the land, its impacts and the availability of viable remedial options.

A key distinction between the Soil Guideline Values (SGVs) and the C4SLs is the level of risk that they describe. As described by the Environment Agency (2009a):

"SGVs are guidelines on the level of long-term human exposure to individual chemicals in soil that, unless stated otherwise, are tolerable or pose a minimal risk to human health."

Note that it is understood that the acceptance of C4SLs and S4ULs is at the discretion of Scottish Local Authorities (see the last paragraph in Section 2.1 for more information).

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2.3 Building Control

The building control department of the local authority or private sector approved inspectors are responsible for the operation and enforcement of the Building (Scotland) Regulations 2004 to protect the health, safety and welfare of people in and around buildings. This requires the protection of buildings and associated land from the effects of contamination, to be applied (non-exclusively) in all changes of use from commercial or industrial premises, to residential property.

3 APPROACH

As with CLR11 the guidance given in LC:RM presents three stages of risk management:

- (a) Stage 1 - Risk Assessment;
- (b) Stage 2 - Options Appraisal; and
- (c) Stage 3 - Remediation.

Each stage has three tiers. The three tiers of Stage 1 Risk Assessment are:

- Tier 1 - Preliminary Risk Assessment (PRA) - first tier of RA that develops the outline conceptual model (CM) and establishes whether there are any potentially unacceptable risks.
- Tier 2 - Generic Quantitative Risk Assessment (GQRA) - carried out using generic assessment criteria and assumptions to estimate risk.
- Tier 3 - Detailed Quantitative Risk Assessment (DQRA) - carried out using detailed site-specific information to generate Site Specific Assessment Criteria (SSAC) as risk evaluation criteria.

For each tier of a Stage 1 - Risk Assessment you must:

1. Identify the hazard - establish contaminant sources.
2. Assess the hazard - use a source-pathway-receptor (S-P-R) pollutant linkage approach to find out if there is the potential for unacceptable risk.
3. Estimate the risk - predict what degree of harm or pollution might result and how likely it is to occur.
4. Evaluate the risk - decide whether a risk is unacceptable.

A Stantec Preliminary Investigation report normally comprises a desk study, walkover site reconnaissance and preliminary risk assessment (PRA). The project specific proposal defines the actual scope of work which might include review of ground investigation data in which case the report includes a GQRA.

Risk estimation involves identifying the magnitude of the potential consequence (taking into account both the potential severity of the hazard and the sensitivity of the receptor) and the magnitude of the likelihood i.e. the probability (taking into account the presence of the hazard and the receptor and the integrity of the pathway). This approach is promoted in current guidance such as R&D 66 (NHBC 2008).

For a PRA, Stantec's approach is that if a pollution linkage is identified then it represents a potentially unacceptable risk which either (1) remediation / direct risk management or (2) progression to further tiers of risk assessment (GQRA and DQRA) requiring additional data collection and enabling refinement of the CM using the site specific data.

4 IDENTIFICATION OF POLLUTANT LINKAGES AND CONCEPTUAL MODEL (CM)

For all Tiers the underlying principle to ground condition assessment is the identification of *pollutant linkages* in order to evaluate whether the presence of a source of contamination could potentially lead to harmful consequences. A pollutant linkage consists of the following three elements:

- A source/hazard – a substance or situation which has the potential to cause harm or pollution;
- A pathway – a means by which the hazard moves along / generates exposure; and
- A receptor/target – an entity which is vulnerable to the potential adverse effects of the hazard.

The *Conceptual Model* identifies the types and locations of potential contaminant sources/hazards and potential receptors and potential migration/transportation pathway(s). The CM is refined through progression to further tiers of risk assessment (GQRA and DQRA) requiring additional data collection.

4.1 Hazard Identification

A hazard is a substance or situation that has the potential to cause harm. Hazards may be chemical, biological or physical.

In a PRA the potential for hazards to be present is determined from consideration of the previous or ongoing activities on or near to the site in accordance with the criteria presented in the **Table 1**.

Based on the land use information Contaminants of Potential Concern (COPC) are identified. The COPC direct the scope of the collection of site-specific data and the analytical testing selected for subsequent Tiers.

At Tier 2 the site-specific data is evaluated using appropriate published assessment criteria (refer to Stantec document entitled Rationale for the Selection of Evaluation Criteria for a Generic Quantitative Risk Assessment (GQRA)). In general, published criteria have been developed using highly conservative assumptions and therefore if the screening criterion is not exceeded (and if enough samples from appropriate locations have been analysed) then the COPC is eliminated as a potential Hazard. It should be noted that exceedance does not necessarily indicate that a site is contaminated and/or unsuitable for use only that the COPC is retained as a potential Hazard. Published criteria are generated using models based on numerous and complex assumptions. Whether or not these assumptions are appropriate or sufficiently protective requires confirmation on a project by project basis. Manipulation of the default assumptions would normally form part of a Tier 3 Detailed Quantitative Risk Assessment (DQRA).

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When reviewing or assessing site specific data Stantec utilise published guidance on comparing contamination data with a critical concentration (CL:AIRE/ClEH 2008) which presents a structured process for employing statistical techniques for data assessment purposes.

4.2 Receptor and Pathway Identification

For all Tiers the potential receptors (for both on site and adjoining land) that will be considered are:

- Human Health – including current and future occupiers, construction and future maintenance workers and neighbouring properties/third parties;
- Ecological Systems; *1
- The Water Environment *2 – including surface water and groundwater;
- Property - Animal or Crop (including timber; produce grown domestically, or on allotments, for consumption; livestock; other owned or domesticated animals; wild animals which are the subject of shooting or fishing rights); and
- Property – Buildings (existing and proposed) (including any structure or erection, and any part of a building including any part below ground level, but does not include plant or machinery comprised in a building, or buried services such as sewers, water pipes or electricity cables including archaeological sites and ancient monuments).

*1 International or nationally designated sites (as defined in the statutory guidance (Defra Circular 04/12)) “in the local area” will be identified as potential ecological receptors. A search radius of 1, 2 or 5km will be utilised depending on the site specific circumstances (see also pathway identification). The Environment Agency has published an ecological risk assessment framework (EA 2008) which promotes (as opposed to statutorily enforces) consideration of additional receptors to include locally protected sites and protected or notable species. These additional potential receptors will only be considered if a Phase 1 habitat survey, undertaken in accordance with guidance (JNCC 1993), is commissioned and the data provided to Stantec. It should be noted that without such a survey the Tier 1 risk assessment may conclude that the identification of potential ecological receptors is inconclusive (refer to Stantec Specification for Phase 1).

*2 the definition of “pollution of controlled water” was amended by the introduction of the Water Environment and Water Services (Scotland) Act 2003. The water environment is defined as all surface water, groundwater and wetlands. For the purposes of Part 2A groundwater does not include waters above the saturated zone and our assessment does not therefore address perched water other than where development causes a pathway to develop.

If a receptor is taken forward for further assessment it will be classified in terms of its sensitivity, the criteria for which are presented in **Table 2**. Table 2 has been generated using descriptions of environmental receptor importance/value given in various guidance documents including R&D 66 (NHBC 2008) and Transport Analysis Guidance (based on DETR 2000). Human health and buildings classifications have been generated by Stantec using the attribute description for each class.

The exposure pathway and modes of transport that will be considered are presented in **Table 3**.

4.3 Note Regarding Ecological Systems

The Environment Agency (EA) has developed an ecological risk assessment framework which aims to provide a structured approach for assessing the risks to ecology from chemical contaminants in soils (EA 2008). In circumstances where contaminants in water represent a potential risk to aquatic ecosystems then risk assessors will need to consider this separately.

The framework consists of a three-tiered process:

- Tier 1 is a screening step where the site soils chemical data is compared to a soil screening value (SSV)
- Tier 2 uses various tools (including surveys and biological testing) to gather evidence for any harm to the ecological receptors
- Tier 3 seeks to attribute the harm to the chemical contamination

Tier 1 is preceded by a desk study to collate information about the site and the nature of the contamination to assess whether pollutant linkages are feasible. The framework presents ten steps for ecological desk studies and development of a CM as follows.

- 1 Establish Regulatory Context
- 2 Collate and Assess Documentary Information
- 3 Summarise Documentary Information
- 4 Identify Potential Contaminants of Concern
- 5 Identify Likely Fate Transport of Contaminants
- 6 Identify Potential Receptors of Concern
- 7 Identify Potential Pathways of Concern
- 8 Create a Conceptual Model
- 9 Identify Assessment and Measurement Endpoints
- 10 Identify Gaps and Uncertainties

The information in a standard PRA covers Steps 1 to 4 inclusive. Step 5 considers fate and transport of contaminants and it should be noted that our standard report adopts a simplified approach considering only transport mechanisms. A simplified approach has also been adopted in respect of Steps 6 and 7 receptors (a detailed review of the ecological attributes has not been undertaken) and pathways (a food chain assessment has not been undertaken). Step 9 is outside the scope of our standard PRA.

It should be noted that the PRA report will present an assessment for ecological systems (where identified as a receptor for a land contamination assessment) considering the viability of the mode of transport given the site-specific circumstances and not specific pathways. The PRA may conclude that the risk to potential ecological receptors is inconclusive.

4.4 Note regarding the Water Environment

The water environment is rivers, estuaries, coastal waters, lakes and groundwater, but not perched waters.

The EU Water Framework Directive (WFD) aims to protect and enhance the quality of surface freshwater, groundwater and dependent ecosystems, estuaries and coastal waters. The WFD was transposed into UK law in 2003 (Statutory Instruments 2003). Member

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states must aim to reach good chemical and ecological status as defined in the Directive by 2015.

The EU Groundwater Daughter Directive (GWDD) was enacted by the Groundwater Regulations (2009), which were subsumed by the Water Environment and Water Services (Scotland) Act 2003 ("the WEWS Act") which provides essential clarification including on the four objectives specifically for groundwater quality in the WFD:

- Achieve 'Good' groundwater chemical status by 2015, commonly referred to as 'status objective';
- Achieve Drinking Water Protected Area Objectives;
- Implement measures to reverse any significant and sustained upward trend in groundwater quality, referred to as 'trend objective'; and
- Prevent or limit the inputs of pollutants into groundwater, commonly referred to as 'prevent or limit' objectives

The Water Act 2003 (Commencement No.11) Order 2012 amends the test for 'contaminated land' which relates to water pollution so that pollution of controlled waters (known as "the water environment" in Scotland) must now be "significant" to meet the definition of contaminated land.

River Basin Management Plans (RBMP) have been developed by SEPA for the River Basin Districts in Scotland.

These RBMP's establish the current status of waters within the catchments of the respective Districts and the current status of adjoining waters identified. As part of a Tier 2 risk assessment water quality data is screened against the WFD assessment criteria. Compare to the RBMP's current status of waters for the catchment under consideration would form part of a Tier 3 assessment.

5 RISK ESTIMATION

Risk estimation classifies what degree of harm might result to a receptor (defined as consequence) and how likely it is that such harm might arise (probability). At Tier 1 the consequence classification is generated by multiplying the hazard classification score and the receptor sensitivity score. This approach follows that presented in the republished R&D 66 (NHBC 2008).

The criteria for classifying probability are set out in **Table 4** and have been taken directly from Table 6.4 CIRIA C552 (CIRIA 2001). Probability considers the integrity of the exposure pathway.

The consequence classifications detailed in **Table 5** have been adapted from Table 6.3 presented in C552 and R&D 66 (Annex 4 Table A4.3).

The Tier 1 risk classification is estimated for each pollutant linkage using the matrix given in **Table 6** which is taken directly from C552 (Table 6.5). Subsequent Tiers refine the CM through retention or elimination of potential hazards and pollutant linkages.

6 RISK EVALUATION

Evaluation criteria are the parameters used to judge whether particular harm or pollution needs further assessment or is unacceptable. The evaluation criteria used will depend on:

- the reasons for doing the risk assessment and the regulatory context such as Part 2A
- the CM and pollutant linkages present
- any criteria set by regulators
- any advisory requirements such as from Public Health England (Public Health Scotland will become operational in 2020 and consequentially this guidance may be updated to incorporate any new/changes to requirements)
- the degree of confidence and precaution required
- the level of confidence required to judge whether a risk is unacceptable
- how you've used or developed more detailed assessment criteria in the later tiers of risk assessment
- the availability of robust scientific data
- how much is known - for example, about the pathway mechanism and how the contaminants affect receptors
- any practical reasons such as being able to measure or predict against the criteria

In order to put the Tier 1 risk classification into context the likely actions are described in **Table 7** which is taken directly from Table 6.6 of C552 (CIRIA 2001).

7 REFERENCES

BS 10175:2011+A2:2017 Investigation of potentially contaminated sites. Code of Practice

CIRIA (2001) Contaminated land risk assessment – a guide to good practice C552.

CIRIA (2008) Assessing risks posed by hazardous ground gases to buildings C655.

CL:AIRE/EIH (2008) Guidance on Comparing Soil Contamination Data with a Critical Concentration. Published by Contaminated Land: Applications in Real Environments (CL:AIRE).

CL:AIRE (2013) SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Final Project Report published by Contaminated Land: Applications in Real Defra (2012) Environments (CL:AIRE) 20th December 2013.

EA (2004) Contaminated Land Research (CLR) Report 11: The Model Procedures for the Management of Land Contamination CRL 11 by the Environment Agency (EA).

EA (2019) Land Contamination: Risk Management published by the Environment Agency.

EA (2008) Ecological Risk Assessment Science Report Series SC070009 published by the Environment Agency (EA).

Stantec Guide: Methodology for Assessment of Land Contamination (Scotland)

JNCC (1993) Handbook for Phase 1 Habitat Survey – A Technical for Environmental Audit prepared by the Joint Nature Conservancy Council (JNCC).

NHBC Standards, 2016.

NHBC/EA/CIEH (2008) R&D Publication 66 Guidance for the safe development of housing on land affected by contamination.

Scottish Executive (2006) Environmental Protection Act 1990: Part IIA Contaminated Land Statutory Guidance: Edition 2 (Paper SE/2006/44).

Scottish Government (2000) Planning Advice Note 33, Development of Contaminated Land (PAN 33).

Scottish Government (2014), Scottish Planning Policy.

SEPA (2009) Groundwater Protection Policy for Scotland v3.

SEPA (2014) Position Statement WAT-PS-10-01 Assigning Groundwater Assessment Criteria for Pollutant Inputs v3.0.

SEPA (2019) Supporting Guidance (WAT-SG-53) Environmental Quality Standards and Standards for Discharges to Surface Waters v7.

The Building (Scotland) Regulations 2004.

The Contaminated Land (Scotland) Regulations 2005.

The EU Groundwater Daughter Directive (2006/118/EC).

The EU Water Framework Directive (2000/60/EC).

The Scotland River Basin District (Status) Directions 2014.

The Water Act 2003 (Commencement No.11) Order 2012.

The Water Environment and Water Services (Scotland) Act 2003.

Stantec Guide: Methodology for Assessment of Land Contamination (Scotland)

Table 1: Indicative Criteria for Classifying Hazards / Potential for Generating Contamination

Classification/Score	Potential for generating contamination/gas based on land use
Very Low 1	Land Use: residential, retail or office use, agriculture Contamination: limited Gas generation potential: soils with low organic content
Low 2	Land Use: recent small scale industrial and light industry Contamination: locally slightly elevated concentrations Gas generation potential: soils with high organic content (limited thickness)
Moderate 3	Land Use: railway yards, collieries, scrap yards, engineering works Contamination: possible widespread slightly elevated concentrations and locally elevated concentrations Gas generation potential: dock silt and substantial thickness of organic alluvium/peat
High 4	Land Use: heavy industry, non-hazardous landfills Contamination: possible widespread elevated concentrations Gas generation potential: shallow mine workings, pre-1960's landfill
Very High 5	Land Use: Hazardous waste landfills, gas works, chemical works Contamination: Likely widespread elevated concentrations Gas generation potential: Landfill post-1960

“Greenfield” is land which has not been developed or used for commercial agriculture (no use of agrochemicals) – without a source/hazard this are no plausible pollutant linkages and therefore no risk.

Table 2: Criteria for Classifying Receptor Sensitivity/Value

Classification/Score	Definition
Very Low 1	Receptor of limited importance <ul style="list-style-type: none"> Groundwater: Very Low productivity and / or SEPA overall classification Poor Surface water: Water body within 25m or eliminate and/or SEPA overall classification Bad Ecology: No local designation Buildings: Replaceable Human health: Unoccupied/limited access
Low 2	Receptor of local or county importance with potential for replacement <ul style="list-style-type: none"> Groundwater: Low productivity and / or SEPA overall classification Poor Surface water: Immediately adjacent and/or SEPA overall classification Poor Ecology: Local designations and local habitat resources Buildings: Local value Human health: Minimum score 4 where human health identified as potential receptor
Moderate 3	Receptor of local or county importance with potential for replacement <ul style="list-style-type: none"> Groundwater: Moderate productivity and / or SEPA overall classification Good Surface water: Immediately adjacent and/or SEPA overall classification Moderate Ecology: County wildlife sites, National Scenic Areas (NSA) Buildings: Area of Historic Character or proposed new buildings* Human health: Minimum score 4 where human health identified as potential receptor
High 4	Receptor of country or regional importance with limited potential for replacement <ul style="list-style-type: none"> Groundwater: High productivity and / or SEPA overall classification Good with no known abstractions Surface water: Immediately adjacent and/or SEPA classification overall Good Ecology: Nationally designated sites i.e. Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Marine Protected Areas (MPA), Marine Consultation Areas (MCAs) and other relevant designations Buildings: Conservation Area Human health: Minimum score 4 where human health identified as potential receptor
Very High 5	Receptor of national or international importance <ul style="list-style-type: none"> Groundwater: High productivity and / or SEPA overall classification Good with known existing or proposed abstractions Surface water: Water body onsite and/or SEPA overall classification High Ecology: Internationally designated sites such as Special Areas of Conservation (SAC and candidates), Special Protection Areas (SPA and potentials) or wetlands of international importance (RAMSAR) Buildings: World Heritage Site Human health: Residential, open spaces and uses where children are present

* Minimum score 3 where a new building is proposed

Stantec Guide: Methodology for Assessment of Land Contamination (Scotland)

Table 3: Exposure Pathway and Modes of Transport

Receptor	Pathway	Mode of transport
Human health	Ingestion	Fruit or vegetable leaf or roots
		Contaminated water
		Soil/dust indoors
		Soil/dust outdoors
	Inhalation	Particles (dust / soil) – outdoor
		Particles (dust / soil) - indoor
		Vapours - outdoor - migration via natural or anthropogenic pathways
		Vapours - indoor - migration via natural or anthropogenic pathways
	Dermal absorption	Direct contact with soil
Direct contact with waters (swimming / showering)		
Irradiation		
Groundwater	Leaching	Gravity / permeation
	Migration	Natural – groundwater as pathway Anthropogenic (e.g. boreholes, culverts, pipelines etc.)
Surface Water	Direct	Runoff or discharges from pipes
	Indirect	Recharge from groundwater
	Indirect	Deposition of windblown dust
Buildings	Direct contact	Sulphate attack on concrete, hydrocarbon corrosion of plastics
	Gas ingress	Migration via natural or anthropogenic paths
Ecological systems	See Notes	Runoff/discharge to surface water body
	See Notes	Windblown dust
	See Notes	Groundwater migration
	See Notes	At point of contaminant source
Animal and crop	Direct	Wind blown or flood deposited particles / dust / sediments
	Indirect	Plants via root up take or irrigation. Animals through watering
	Inhalation	By livestock / fish - gas / vapour / particulates / dust
	Ingestion	Consumption of vegetation / water / soil by animals

Table 4: Classification of Probability

Classification	Definition
High likelihood	There is a pollution linkage and an event either appears very likely in the short-term and almost inevitable over the long-term, or there is already evidence at the receptor of harm / pollution.
Likely	There is a pollution 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.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter-term.
Unlikely	There is a pollution linkage, but circumstances are such that it is improbable that an event would occur even in the very long-term.

Stantec Guide: Methodology for Assessment of Land Contamination (Scotland)

Table 5: Classification of Consequence (score = magnitude of hazard Table 1 and sensitivity of receptor Table 2)

Classification / Score	Examples
Severe 17 - 25 (3 out of 25 outcomes)	Human health effect - exposure likely to result in "significant harm" as defined in the Defra (2012) Part 2A Statutory Guidance ¹ . Water environment effect - short-term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. Equivalent to EA Category 1 incident (persistent and/or extensive effects on water quality leading to closure of potable abstraction point or loss of amenity, agriculture or commercial value. Major fish kill. Ecological effect - short-term exposure likely to result in a substantial adverse effect. Catastrophic damage to crops, buildings or property
Medium 11 - 16 (7 out of 25 outcomes)	Human health effect - exposure could result in "significant harm" ¹ . Water environment effect - equivalent to EA Category 2 incident requiring notification of abstractor Ecological effect - short-term exposure may result in a substantial adverse effect. Damage to crops, buildings or property
Mild 4 - 9 (7 out of 25 outcomes)	Human health effect - exposure could result in "significant harm" ¹ . Water environment effect - equivalent to EA Category 3 incident (short lived and/or minimal effects on water quality). Ecological effect - unlikely to result in a substantial adverse effect. Minor damage to crops, buildings or property. Damage to building rendering it unsafe to occupy (for example foundation damage resulting in instability).
Minor 1 - 4 (8 out of 25 outcomes)	No measurable effect on humans. Protective equipment is not required during site works. Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems. Repairable effects to crops, buildings or property. The loss of plants in a landscaping scheme. Discolouration of concrete.

Note ¹: Significant harm includes death, disease, serious injury, genetic mutation, birth defects or impairment of reproductive function. The local authority may also consider other health effects to constitute significant harm such as physical injury; gastrointestinal disturbances; respiratory tract effects; cardio-vascular effects; central nervous system effects; skin ailments; effects on organs such as the liver or kidneys; or a wide range of other health impacts. Whether or not these would constitute significant harm would depend on the seriousness of harm including impact on health, quality of life and scale of impact.

Table 6: Classification of Risk (Combination of Consequence Table 5 and Probability Table 4)

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

Table 7: Description of Risks and Likely Action Required

Risk Classification	Description
Very high risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation is likely to be required in the short term.
High risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial 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, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer-term.
Low risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very low risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.


Appendix B Site Walkover Photographs



Photograph 1 – Overview of study area looking south from northern point of the site.



Photograph 2 – Overview looking west across the Designated Ancient Woodland, which is situated onsite and along the western boundary area.


	Equinor	Loch Ryan Habitat Restoration, Stranraer Photographic Record	Appendix	B
			Date	09/02/2023
			Drawn by	CB
			Approved by	GS
			FINAL	



Photograph 3 – Onsite overground ruined historical residential property close to western boundary (red arrows represent a corner of the property)



Photograph 4 – View looking south eastwards across south eastern corner. Grassy fields, with some wetter ground signified by rushes and tress beyond.


	Equinor	Loch Ryan Habitat Restoration, Stranraer Photographic Record	Appendix	B
			Date	09/02/2023
			Drawn by	CB
			Approved by	GS
			FINAL	



Photograph 5 – View westwards along the southern boundary area of the site.



Photograph 6 – Overview of southern site land use looking northwards. The land appears to belong to Corsewell Estate.


	Equinor	Loch Ryan Habitat Restoration, Stranraer Photographic Record	Appendix	B
			Date	09/02/2023
			Drawn by	CB
			Approved by	GS
			FINAL	



Photograph 7 – View looking northwards across the central portion of the study area. The fence line marks a drop in ground elevations, higher ground on the west (LHS of photograph) and lower wetter ground on the east (RHS of photograph).



Photograph 8 – View looking eastwards across the south eastern wetland area with reeds in the foreground. The location of the overgrown ruined historical residential property is marked by the red arrow. A close up of the property is also provided.


	Equinor	Loch Ryan Habitat Restoration, Stranraer Photographic Record	Appendix	B
			Date	09/02/2023
			Drawn by	CB
			Approved by	GS
			FINAL	



Photograph 9 – Overview looking northwards across low lying wetter ground and raised overgrown pebble beach boundary with public footpath along it on the eastern side of the site.



Photograph 10 – Ponding was observed in several places on the lower lying eastern ground. A notable quantity of mallard ducks were observed on approach to this pond.


	Equinor	Loch Ryan Habitat Restoration, Stranraer Photographic Record	Appendix	B
			Date	09/02/2023
			Drawn by	CB
			Approved by	GS
			FINAL	



Photograph 11 – Overview of Shell Home Plantation and further wet ground.



Photograph 12 – Overview of overground possible drainage channel area situated south of the Shell Home Plantation.


	<p>Equinor</p>	<p>Loch Ryan Habitat Restoration, Stranraer</p> <p>Photographic Record</p>	Appendix	B
			Date	09/02/2023
			Drawn by	CB
			Approved by	GS
			FINAL	



Photograph 13 – Looking northwards along western boundary area. The neighbouring offsite land to the west slopes east and downwards towards the site.



Photograph 14 – Overview of offsite pumping station looking southwards and some sort of discharge pipe leading into the Corsewall Burn.


	Equinor	Loch Ryan Habitat Restoration, Stranraer Photographic Record	Appendix	B
			Date	09/02/2023
			Drawn by	CB
			Approved by	GS
			FINAL	



Photograph 15 – Overview looking southwards of offsite suspected Japanese Knotweed canes (red circle) on southern bank of Corsewall Burn. Situated approximately 10 m from the southern site boundary. The former RAF Wig Bay Seaplane base is located in the background (over the green hill).



Photograph 16 – Overview of Loch Ryan, offsite to the east, and sign cautioning waves from the ferries.

	Equinor	Loch Ryan Habitat Restoration, Stranraer Photographic Record	Appendix	B
			Date	09/02/2023
			Drawn by	CB
			Approved by	GS
			FINAL	

Appendix C Groundsure Report

Project Capricorn, KIRKCOLM, STRANRAER , DG9 0NX

Order Details

Date: 24/01/2023
Your ref: EPL017854
Our Ref: GS-9313439

Site Details

Location: 203435 568893
Area: 30.11 ha
Authority: [Dumfries and Galloway Council](#)



Summary of findings

p. 2

Aerial image

p. 7

OS MasterMap site plan

N/A: >10ha

groundsure.com/insightuserguide

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
12	1.1	<u>Historical industrial land uses</u>	0	1	3	7	-
13	1.2	Historical tanks	0	0	0	0	-
13	1.3	<u>Historical energy features</u>	0	0	0	1	-
14	1.4	<u>Historical petrol stations</u>	0	0	0	1	-
14	1.5	Historical garages	0	0	0	0	-
14	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
15	2.1	<u>Historical industrial land uses</u>	0	1	6	10	-
16	2.2	Historical tanks	0	0	0	0	-
16	2.3	<u>Historical energy features</u>	0	0	0	1	-
17	2.4	<u>Historical petrol stations</u>	0	0	0	1	-
17	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
18	3.1	<u>Active or recent landfill</u>	0	0	0	1	-
19	3.2	Historical landfill (BGS records)	0	0	0	0	-
19	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
19	3.4	Licensed waste sites	0	0	0	0	-
19	3.5	Historical waste sites	0	0	0	0	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
20	4.1	<u>Recent industrial land uses</u>	0	1	1	-	-
21	4.2	Current or recent petrol stations	0	0	0	0	-
21	4.3	Electricity cables	0	0	0	0	-
21	4.4	Gas pipelines	0	0	0	0	-
21	4.5	Sites determined as Contaminated Land	0	0	0	0	-
21	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
22	4.7	Regulated explosive sites	0	0	0	0	-



22	4.8	Hazardous substance storage/usage	0	0	0	0	-
22	4.9	Part A(1), IPPC and Historic IPC Authorisations	0	0	0	0	-
22	4.10	Part B Authorisations	0	0	0	0	-
22	4.11	Pollution inventory substances	0	0	0	0	-
23	4.12	Pollution inventory waste transfers	0	0	0	0	-
23	4.13	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
24	5.1	Superficial aquifer	None (within 500m)				
25	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
26	6.1	<u>Water Network (OS MasterMap)</u>	5	1	0	-	-
27	6.2	<u>Surface water features</u>	1	2	0	-	-
Page	Section	River flooding					
28	7.1	<u>River flooding</u>	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Coastal flooding					
30	8.1	<u>Coastal flooding</u>	1 in 30 year, Greater than 1.0m (within 50m)				
Page	Section	Surface water flooding					
32	9.1	<u>Surface water flooding</u>	1 in 30 year, Greater than 1.0m (within 50m)				
Page	Section	Groundwater flooding					
34	10.1	<u>Groundwater flooding</u>	Moderate (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
35	11.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
36	11.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
36	11.3	Special Areas of Conservation (SAC)	0	0	0	0	0
36	11.4	Special Protection Areas (SPA)	0	0	0	0	0
36	11.5	National Nature Reserves (NNR)	0	0	0	0	0
37	11.6	Local Nature Reserves (LNR)	0	0	0	0	0
37	11.7	<u>Designated Ancient Woodland</u>	1	0	0	0	1
37	11.8	Biosphere Reserves	0	0	0	0	0



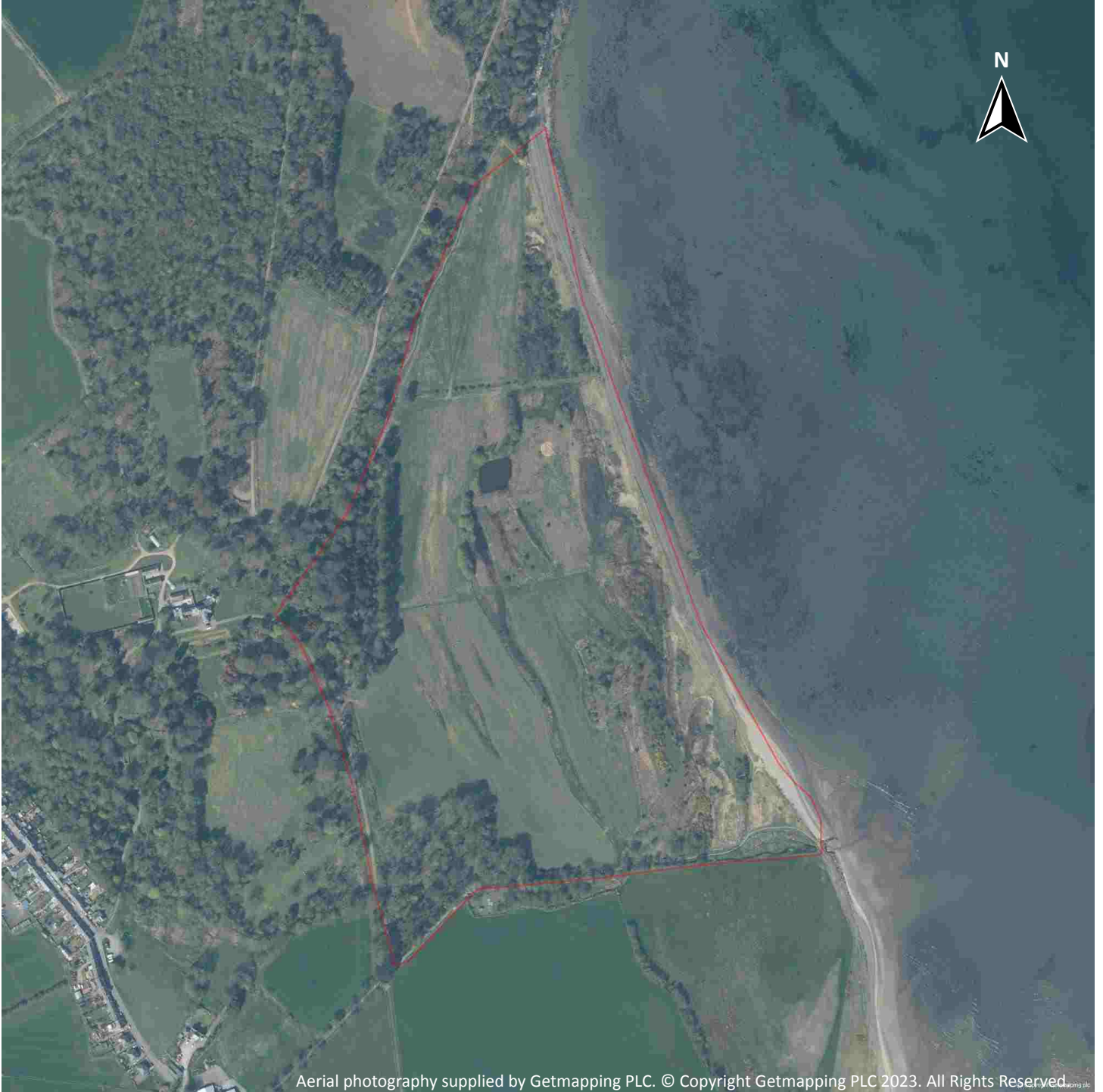
37	11.9	Forest Parks	0	0	0	0	0
38	11.10	Marine Conservation Zones	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
39	12.1	World Heritage Sites	0	0	0	-	-
40	12.2	Area of Outstanding Natural Beauty	0	0	0	-	-
40	12.3	National Parks	0	0	0	-	-
40	12.4	Listed Buildings	0	0	5	-	-
41	12.5	Conservation Areas	0	0	0	-	-
41	12.6	Scheduled Ancient Monuments	0	0	0	-	-
41	12.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
42	13.1	Agricultural Land Classification	Grade 3.2 (within 250m)				
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
44	14.1	10k Availability	Identified (within 500m)				
45	14.2	Artificial and made ground (10k)	0	0	0	0	-
46	14.3	Superficial geology (10k)	0	0	0	0	-
46	14.4	Landslip (10k)	0	0	0	0	-
47	14.5	Bedrock geology (10k)	0	0	0	0	-
47	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
48	15.1	50k Availability	Identified (within 500m)				
49	15.2	Artificial and made ground (50k)	0	0	0	0	-
49	15.3	Artificial ground permeability (50k)	0	0	-	-	-
50	15.4	Superficial geology (50k)	3	0	0	0	-
51	15.5	Superficial permeability (50k)	Identified (within 50m)				
51	15.6	Landslip (50k)	0	0	0	0	-
51	15.7	Landslip permeability (50k)	None (within 50m)				
52	15.8	Bedrock geology (50k)	1	0	1	0	-
53	15.9	Bedrock permeability (50k)	Identified (within 50m)				



Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
53	15.10	<u>Bedrock faults and other linear features (50k)</u>	1	0	0	0	-
54	16.1	<u>BGS Boreholes</u>	0	0	2	-	-
55	17.1	<u>Shrink swell clays</u>	Very low (within 50m)				
56	17.2	<u>Running sands</u>	Moderate (within 50m)				
58	17.3	<u>Compressible deposits</u>	Moderate (within 50m)				
60	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
61	17.5	<u>Landslides</u>	Moderate (within 50m)				
63	17.6	<u>Ground dissolution of soluble rocks</u>	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
64	18.1	Natural cavities	0	0	0	0	-
65	18.2	<u>BritPits</u>	0	0	0	1	-
65	18.3	<u>Surface ground workings</u>	0	1	9	-	-
66	18.4	Underground workings	0	0	0	0	0
66	18.5	Historical Mineral Planning Areas	0	0	0	0	-
66	18.6	<u>Non-coal mining</u>	0	0	0	0	3
67	18.7	Mining cavities	0	0	0	0	0
67	18.8	JPB mining areas	None (within 0m)				
67	18.9	Coal mining	None (within 0m)				
67	18.10	Brine areas	None (within 0m)				
67	18.11	Gypsum areas	None (within 0m)				
68	18.12	Tin mining	None (within 0m)				
68	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
69	19.1	<u>Radon</u>	Less than 1% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
71	20.1	<u>BGS Estimated Background Soil Chemistry</u>	15	3	-	-	-
72	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-

72	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
73	21.1	Underground railways (London)	0	0	0	-	-
73	21.2	Underground railways (Non-London)	0	0	0	-	-
73	21.3	Railway tunnels	0	0	0	-	-
73	21.4	Historical railway and tunnel features	0	0	0	-	-
73	21.5	Royal Mail tunnels	0	0	0	-	-
74	21.6	Historical railways	0	0	0	-	-
74	21.7	Railways	0	0	0	-	-
74	21.8	Crossrail 1	0	0	0	0	-
74	21.9	Crossrail 2	0	0	0	0	-
74	21.10	HS2	0	0	0	0	-

Recent aerial photograph



Capture Date: 19/04/2020

Site Area: 30.11ha



Recent site history - 2017 aerial photograph

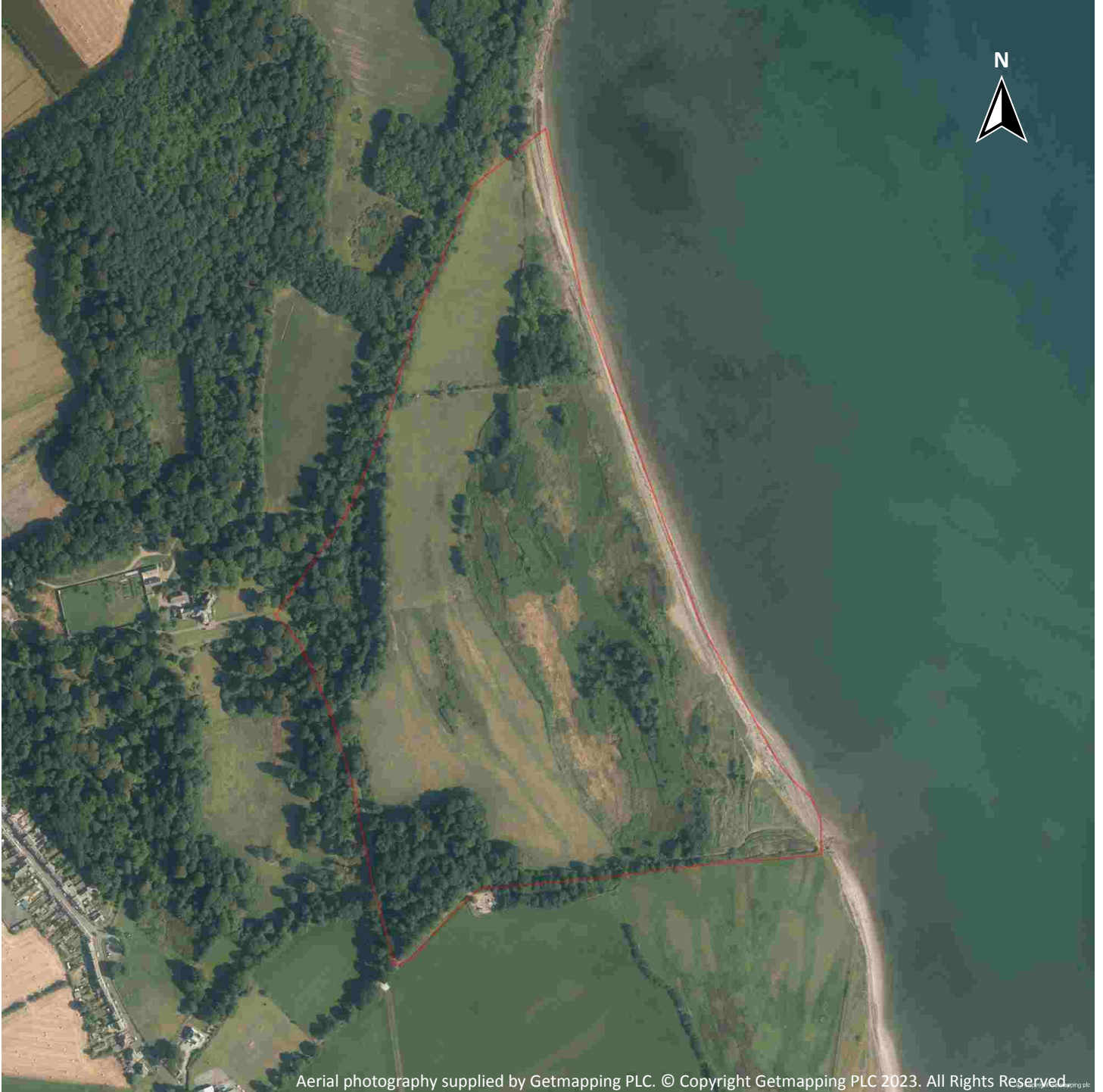


Capture Date: 08/05/2017

Site Area: 30.11ha



Recent site history - 2014 aerial photograph



Capture Date: 25/07/2014

Site Area: 30.11ha



Recent site history - 2009 aerial photograph



Capture Date: 13/09/2009

Site Area: 30.11ha



Recent site history - 2005 aerial photograph



Capture Date: 11/07/2005

Site Area: 30.11ha



1 Past land use



— Site Outline

Search buffers in metres (m)

- Historical industrial land uses
- Historical energy features
- Historical petrol stations

1.1 Historical industrial land uses

Records within 500m **11**

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 12**

ID	Location	Land use	Dates present	Group ID
1	30m S	Unspecified Ground Workings	1893	191589

ID	Location	Land use	Dates present	Group ID
2	180m W	Grave Yard	1909 - 1953	206926
A	236m NW	Unspecified Pit	1893	206153
A	239m NW	Old Gravel Pit	1909 - 1953	207909
B	269m SW	Sawmill	1893	206867
B	274m SW	Sawmill	1893 - 1909	203318
B	277m SW	Unspecified Mill	1953	191798
C	426m SW	Police Station	1893	197414
C	444m SW	Police Station	1893 - 1909	207193
C	445m SW	Police Station	1953	207729
4	475m S	Smithy	1893	201380

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	0
----------------------------	----------

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

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	1
----------------------------	----------

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 ungrouped 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 12**

ID	Location	Land use	Dates present	Group ID
C	483m SW	Electricity Substation	1995	14929



This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

1

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 ungrouped 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 12**

ID	Location	Land use	Dates present	Group ID
3	458m SW	Filling Station	1970	497

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 ungrouped 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 energy features
-  Historical petrol stations

2.1 Historical industrial land uses

Records within 500m **17**

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 15**

ID	Location	Land Use	Date	Group ID
1	30m S	Unspecified Ground Workings	1893	191589
A	180m W	Grave Yard	1953	206926
A	184m W	Grave Yard	1909	206926

ID	Location	Land Use	Date	Group ID
B	236m NW	Unspecified Pit	1893	206153
B	239m NW	Old Gravel Pit	1909	207909
B	239m NW	Unspecified Pit	1893	206153
B	241m NW	Old Gravel Pit	1953	207909
C	269m SW	Sawmill	1893	206867
C	274m SW	Sawmill	1909	203318
C	274m SW	Sawmill	1893	203318
C	277m SW	Unspecified Mill	1953	191798
D	426m SW	Police Station	1893	197414
D	444m SW	Police Station	1909	207193
D	444m SW	Police Station	1893	207193
D	445m SW	Police Station	1953	207729
E	475m S	Smithy	1893	201380
E	476m S	Smithy	1893	201380

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

0

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

2.3 Historical energy features

Records within 500m

1

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 15**



ID	Location	Land Use	Date	Group ID
D	483m SW	Electricity Substation	1995	14929

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m

1

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'.

Features are displayed on the Past land use - un-grouped map on **page 15**

ID	Location	Land Use	Date	Group ID
2	458m SW	Filling Station	1970	497

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 point

3.1 Active or recent landfill

Records within 500m

1

Active or recently closed landfill sites under Scottish Environment Protection (SEPA) regulation. Features are displayed on the Waste and landfill map on **page 18**

ID	Location	Address	Details
1	484m SW	Name: Kirranrae, Kirkcolm.	Licence number: WML/W/00263 Waste type: Unspecified Facility type: Landfill

This data is sourced from the Scottish Environment Protection Agency.

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	0
---------------------	---

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

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

3.4 Licensed waste sites

Records within 500m	0
---------------------	---

Active or recently closed waste sites under Scottish Environment Protection Agency (SEPA) regulation.

This data is sourced from the Scottish Environment Protection Agency.

3.5 Historical waste sites

Records within 500m	0
---------------------	---

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

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

4 Current industrial land use



— Site Outline

Search buffers in metres (m)

● Recent industrial land uses

4.1 Recent industrial land uses

Records within 250m **2**

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 20**

ID	Location	Company	Address	Activity	Category
1	21m S	Sewage Pumping Station	Wigtown, DG9	Waste Storage, Processing and Disposal	Infrastructure and Facilities
2	78m W	Fortnum & Woolley Ltd	Corsewall House, Stranraer, Wigtown, DG9 ONX	General Construction Supplies	Industrial Products

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	0
---------------------	---

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.

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	0
---------------------	---

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.

This data is sourced from Local Authority records.

4.9 Part A(1), IPPC and Historic IPC Authorisations

Records within 500m	0
---------------------	---

Records of Part A installations regulated for the release of substances to the environment.

This data is sourced from the Scottish Environment Protection Agency.

4.10 Part B Authorisations

Records within 500m	0
---------------------	---

Records of Part B installations regulated for the release of substances to the environment.

This data is sourced from the Scottish Environment Protection Agency.

4.11 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.

4.12 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.

4.13 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

5.1 Superficial aquifer

Records within 500m

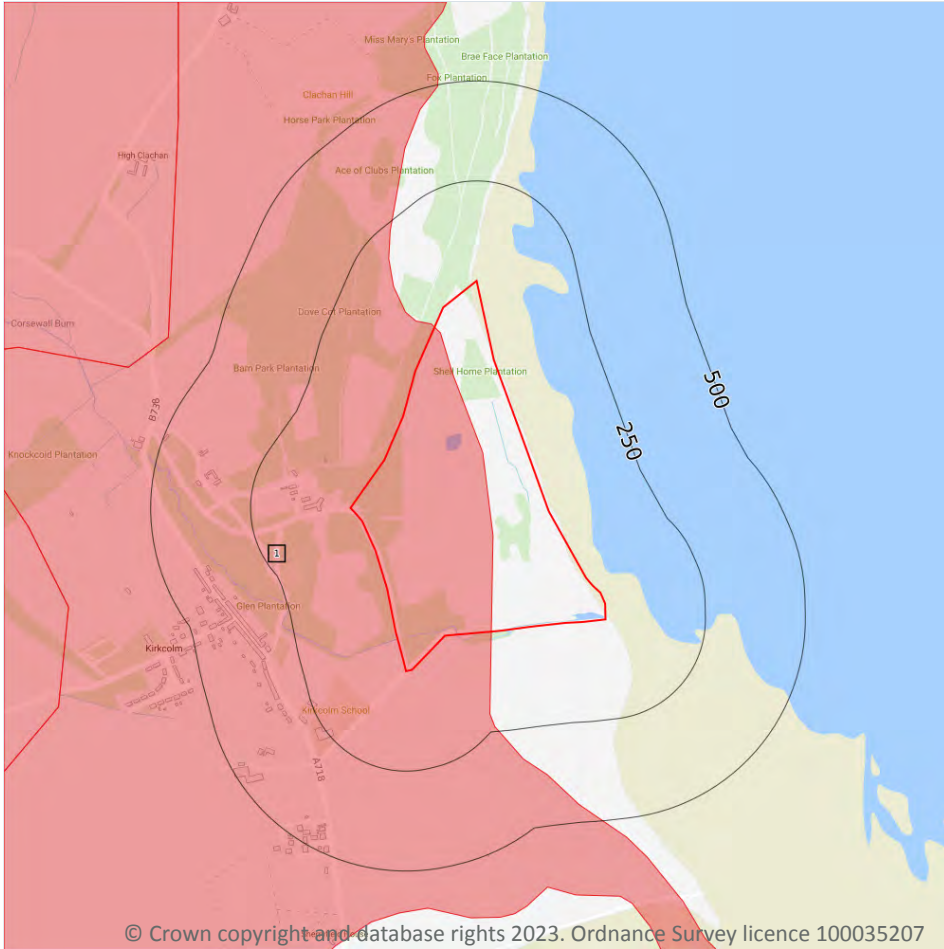
0

Records of groundwater classification within superficial geology.

This data is sourced from the British Geological Survey.



Bedrock aquifer



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5.2 Bedrock aquifer

Records within 500m

1

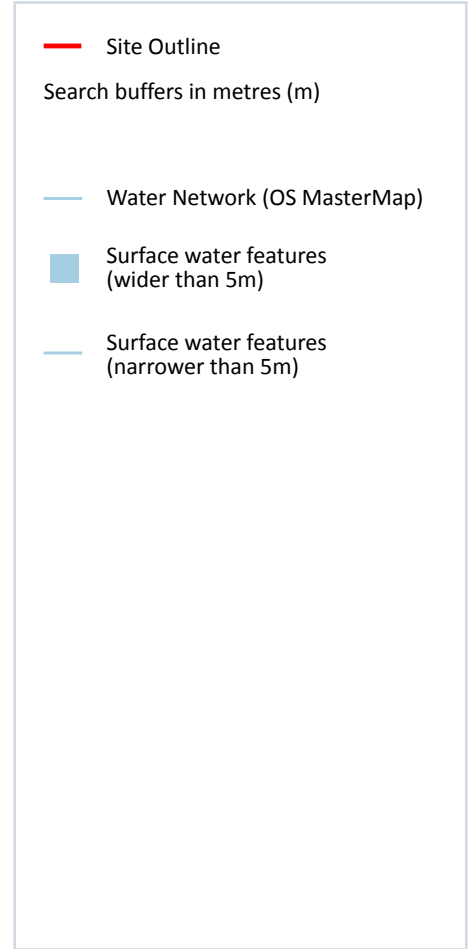
Records of groundwater classification within bedrock geology.
Features are displayed on the Bedrock aquifer map on **page 25**

ID	Location	Description	Flow	Summary	Rock description
1	On site	Moderately productive aquifer	Flow is virtually all through fractures and other discontinuities	Unfractured, low permeability breccias.	STEWARTRY GROUP

This data is sourced from the British Geological Survey.



6 Hydrology



6.1 Water Network (OS MasterMap)

Records within 250m

6

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 26**

ID	Location	Type of water feature	Ground level	Permanence	Name
1	On site	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Corsewall Burn

ID	Location	Type of water feature	Ground level	Permanence	Name
A	On site	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	On site	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Corsewall Burn
C	On site	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Corsewall Burn
C	On site	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	Corsewall Burn
D	8m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

3

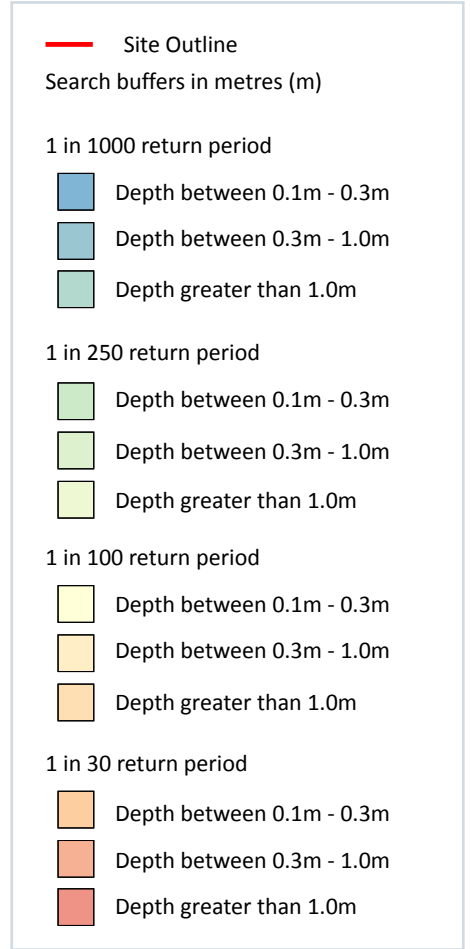
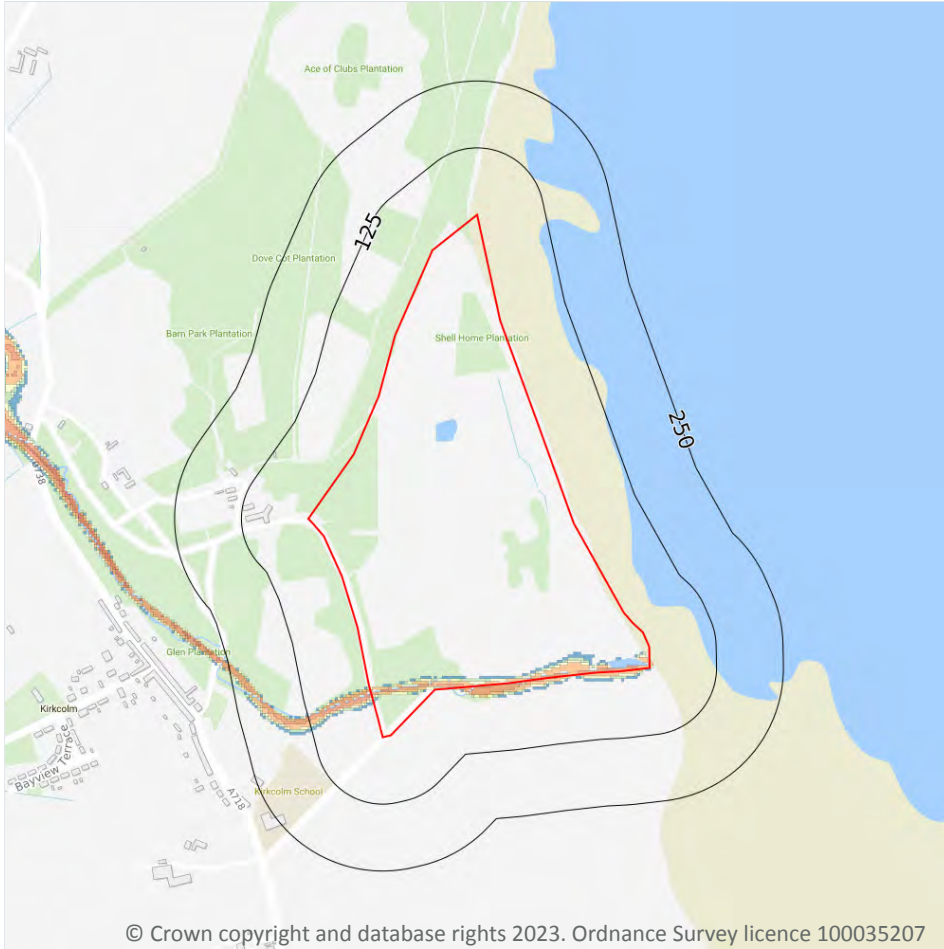
Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as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

Features are displayed on the Hydrology map on **page 26**

This data is sourced from the Ordnance Survey.



7 River flooding



7.1 River flooding

Highest risk on site

1 in 30 year, 0.3m - 1.0m

Highest risk within 50m

1 in 30 year, 0.3m - 1.0m

This is an assessment of flood risk for rivers in Scotland produced using modelled data, provided by Ambiental Risk Analytics. It also takes account of flood defence information provided by the Scottish Environment Protection Agency (SEPA). It shows the chance of flooding from rivers presented in the following categories:

- 1 in 30 year (3.33%)
- 1 in 100 year (1%)
- 1 in 250 year (0.4%)

- and 1 in 1,000 year (0.1%)

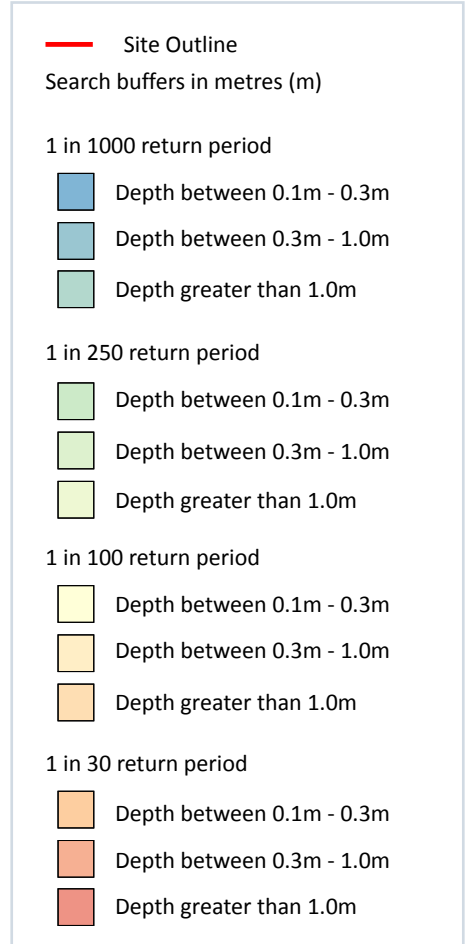
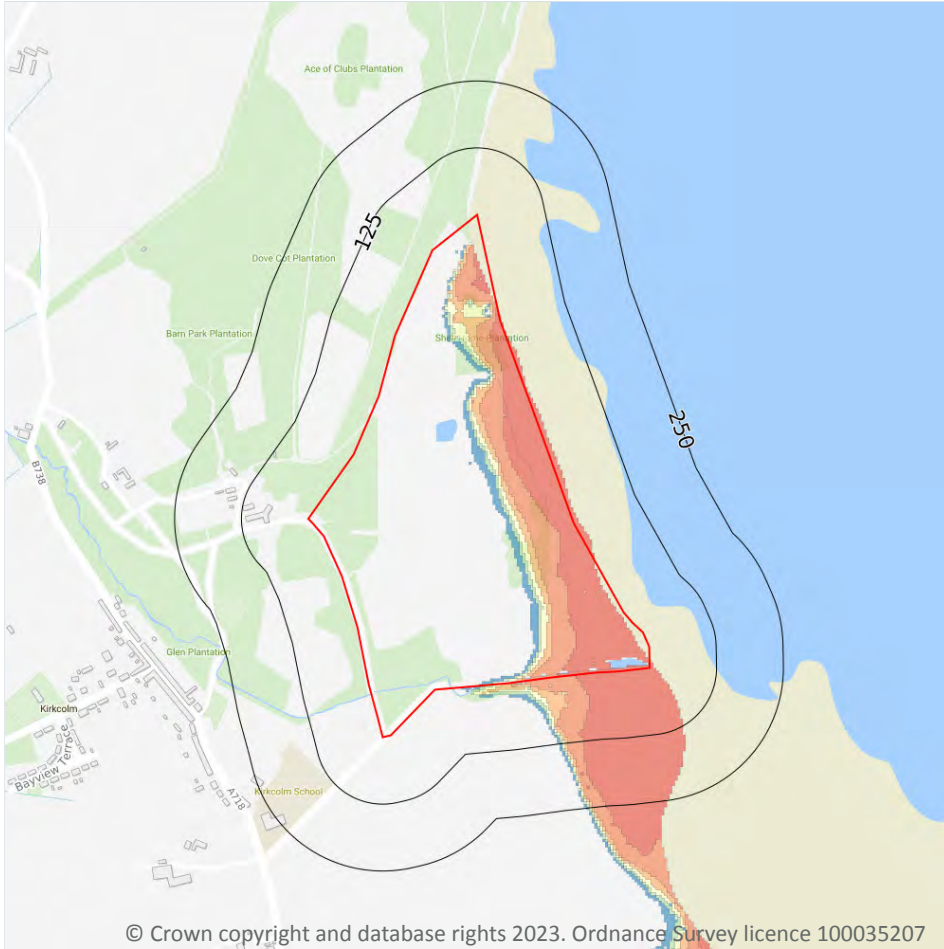
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the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

Features are displayed on the River flooding map on **page 28**

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 0.3m and 1.0m

This data is sourced from Ambiental Risk Analytics.

8 Coastal flooding - Coastal flooding



8.1 Coastal flooding

Highest risk on site

1 in 30 year, Greater than 1.0m

Highest risk within 50m

1 in 30 year, Greater than 1.0m

This is an assessment of coastal flood risk in Scotland produced using modelled data, provided by Ambiantal Risk Analytics. It also takes account of flood defence information provided by the Scottish Environment Protection Agency (SEPA). It shows the chance of coastal flooding presented in the following categories:

- 1 in 30 year (3.33%)
- 1 in 100 year (1%)
- 1 in 250 year (0.4%)

- and 1 in 1,000 year (0.1%)

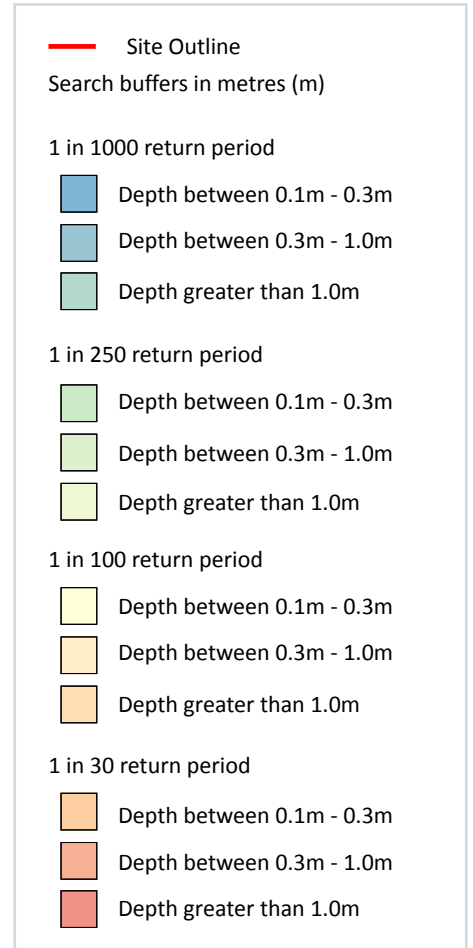
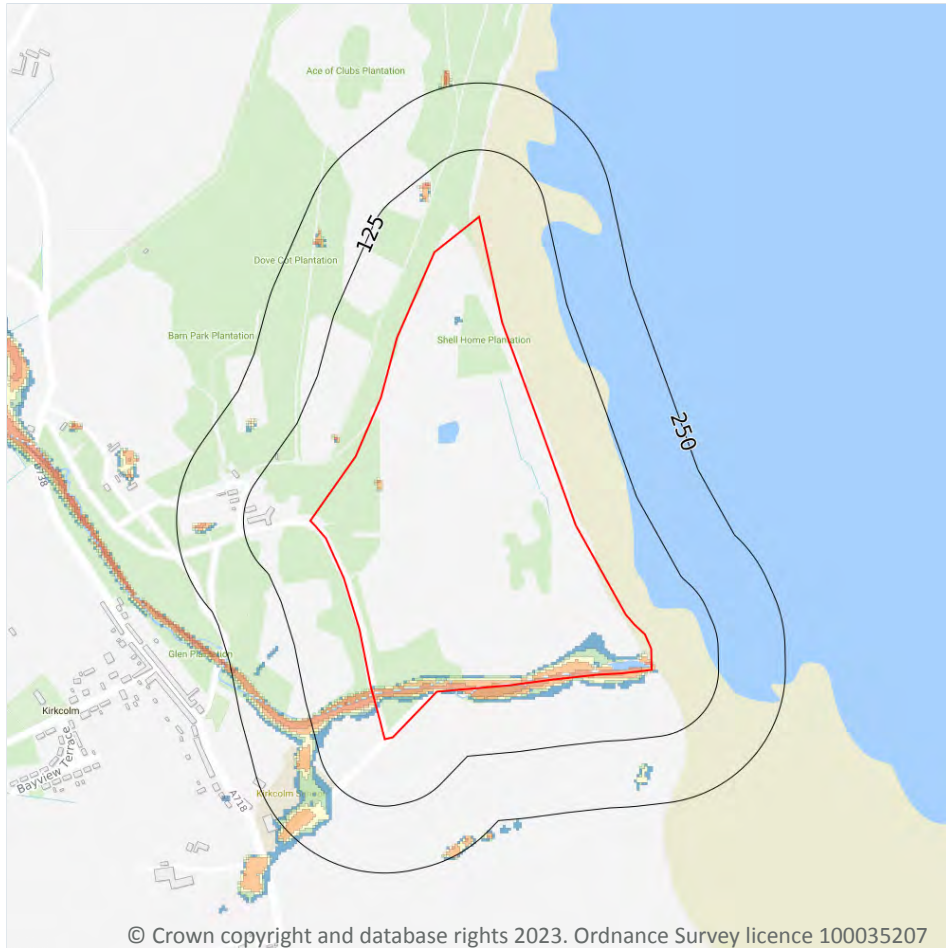
The data shown on the map shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the site.

Features are displayed on the Coastal flooding map on **page 30**

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

This data is sourced from Ambiental Risk Analytics.

9 Surface water flooding



9.1 Surface water flooding

Highest risk on site

1 in 30 year, 0.3m - 1.0m

Highest risk within 50m

1 in 30 year, Greater than 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 32**

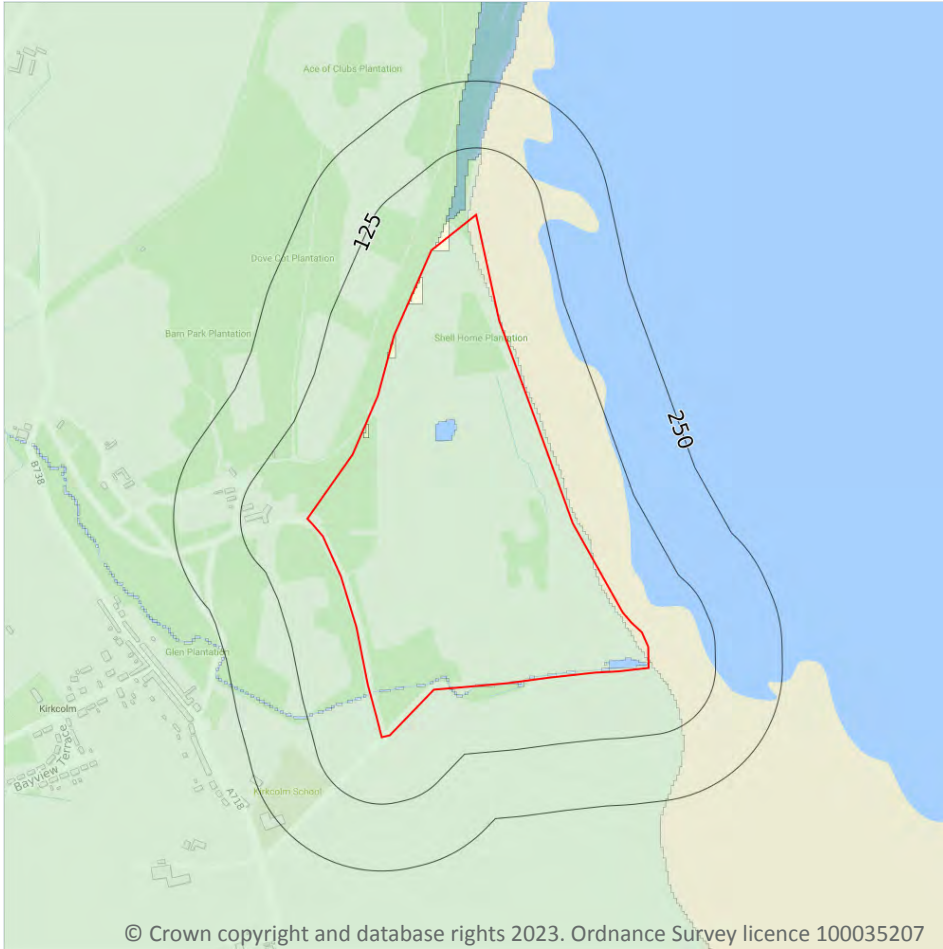
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

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	Greater than 1.0m
1 in 100 year	Greater than 1.0m
1 in 30 year	Between 0.3m and 1.0m

This data is sourced from Ambiental Risk Analytics.

10 Groundwater flooding



10.1 Groundwater flooding

Highest risk on site

Moderate

Highest risk within 50m

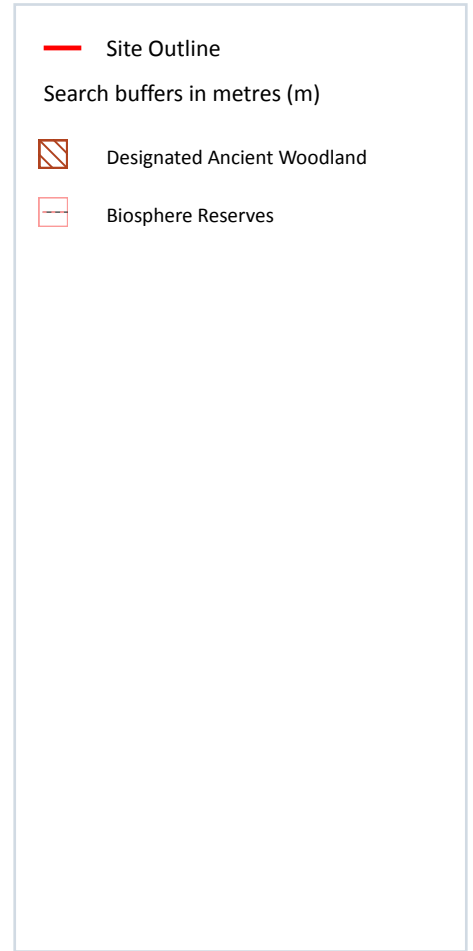
Moderate

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 34**

This data is sourced from Ambient Risk Analytics.

11 Environmental designations



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11.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

0

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.

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

11.2 Conserved wetland sites (Ramsar sites)

Records within 2000m

0

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.

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

11.3 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.

11.4 Special Protection Areas (SPA)

Records within 2000m

0

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.

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

11.5 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.



11.6 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.

11.7 Designated Ancient Woodland

Records within 2000m

2

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.

Features are displayed on the Environmental designations map on **page 35**

ID	Location	Name	Woodland Type
1	On site	Barn Park/dove Cot Plantations	Long-Established (of plantation origin)
2	651m SW	Clayhill Plantation	Long-Established (of plantation origin)

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

11.8 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.

11.9 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.



11.10 Marine Conservation Zones

Records within 2000m

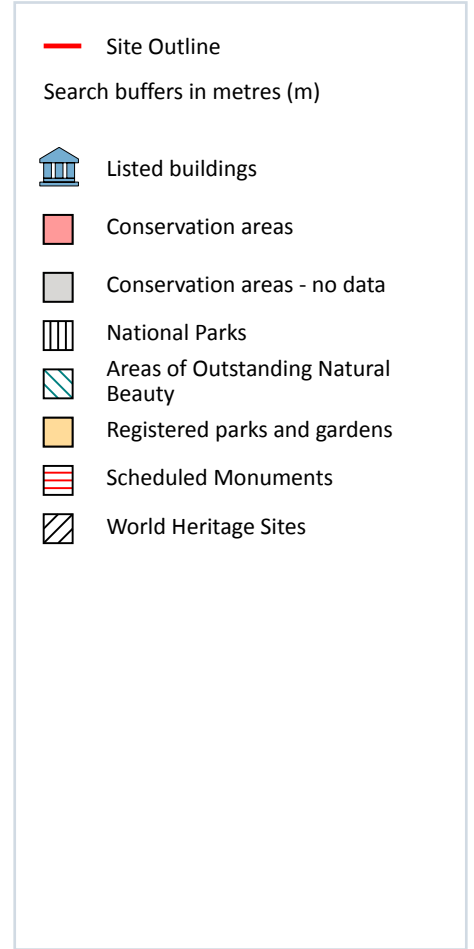
0

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.



12 Visual and cultural designations



12.1 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.

12.2 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.

12.3 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.

12.4 Listed Buildings

Records within 250m

5

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.

Features are displayed on the Visual and cultural designations map on **page 39**

ID	Location	Name	Grade	Reference Number	Listed date
1	86m W	Corsewall, Kirkcolm, Dumfries and Galloway	B	342258	20/07/1972
2	159m W	Stables, Corsewall, Kirkcolm, Dumfries and Galloway	C	342255	25/02/1994
3	200m W	Walled Garden, Corsewall, Kirkcolm, Dumfries and Galloway	C	342256	17/12/1979
4	217m W	Graveyard And Well, St Columba's Old Parish Church, Kirkcolm, Dumfries and Galloway	B	346685	20/07/1972
5	239m SW	The Elms, Dumfries and Galloway	C	346680	17/12/1979

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

12.5 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.

12.6 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.

12.7 Registered Parks and Gardens

Records within 250m

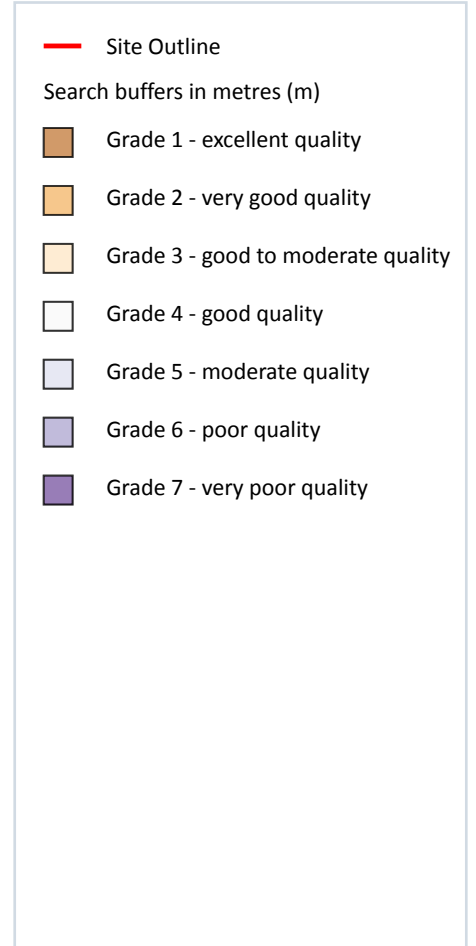
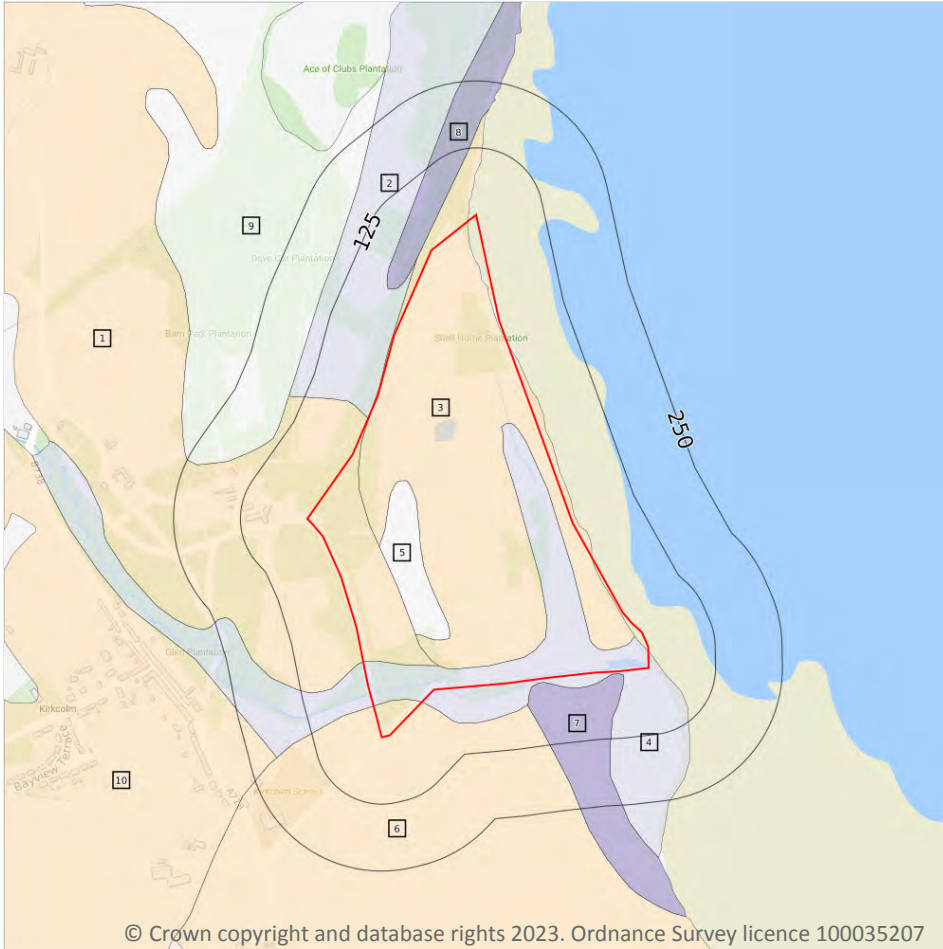
0

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.



13 Agricultural designations



13.1 Agricultural Land Classification

Records within 250m

10

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 42**

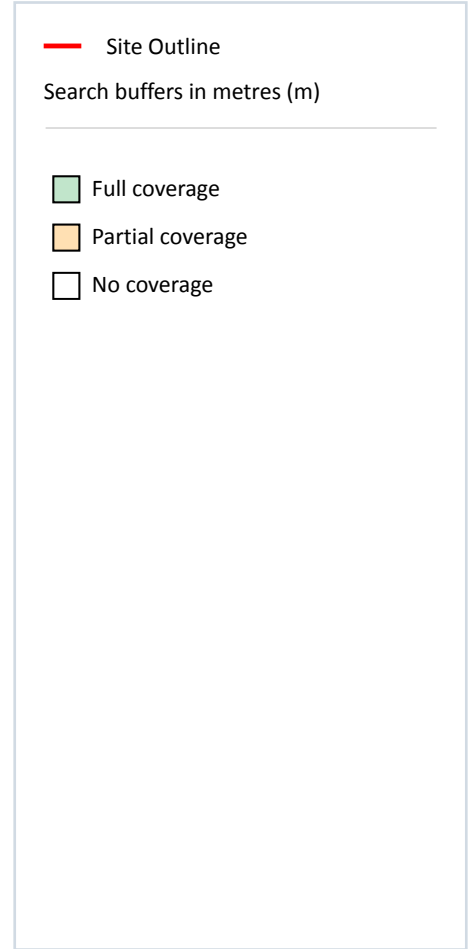
ID	Location	Classification	Description
1	On site	Grade 3.2	Land Suited to Arable Cropping
2	On site	Grade 5.3	Land Suited only to Improved Grassland and Rough Grazings
3	On site	Grade 3.1	Land Suited to Arable Cropping

ID	Location	Classification	Description
4	On site	Grade 5.2	Land Suited only to Improved Grassland and Rough Grazings
5	On site	Grade 4.2	Land Suited to Arable Cropping
6	On site	Grade 3.1	Land Suited to Arable Cropping
7	4m SE	Grade 6.2	Land Suited only to Improved Grassland and Rough Grazings
8	18m N	Grade 6.1	Land Suited only to Improved Grassland and Rough Grazings
9	139m W	Grade 4.1	Land Suited to Arable Cropping
10	199m SW	Grade 3.2	Land Suited to Arable Cropping

This data is sourced from the James Hutton Institute.



14 Geology 1:10,000 scale - Availability



14.1 10k Availability

Records within 500m

1

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 44**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	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

14.2 Artificial and made ground (10k)

Records within 500m

0

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.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial

14.3 Superficial geology (10k)

Records within 500m

0

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.

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

14.5 Bedrock geology (10k)

Records within 500m

0

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.

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

1

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 48**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	SC001_Rhins_of_Galloway_v4

This data is sourced from the British Geological Survey.

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

15.2 Artificial and made ground (50k)

Records within 500m

0

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.

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

Records within 50m

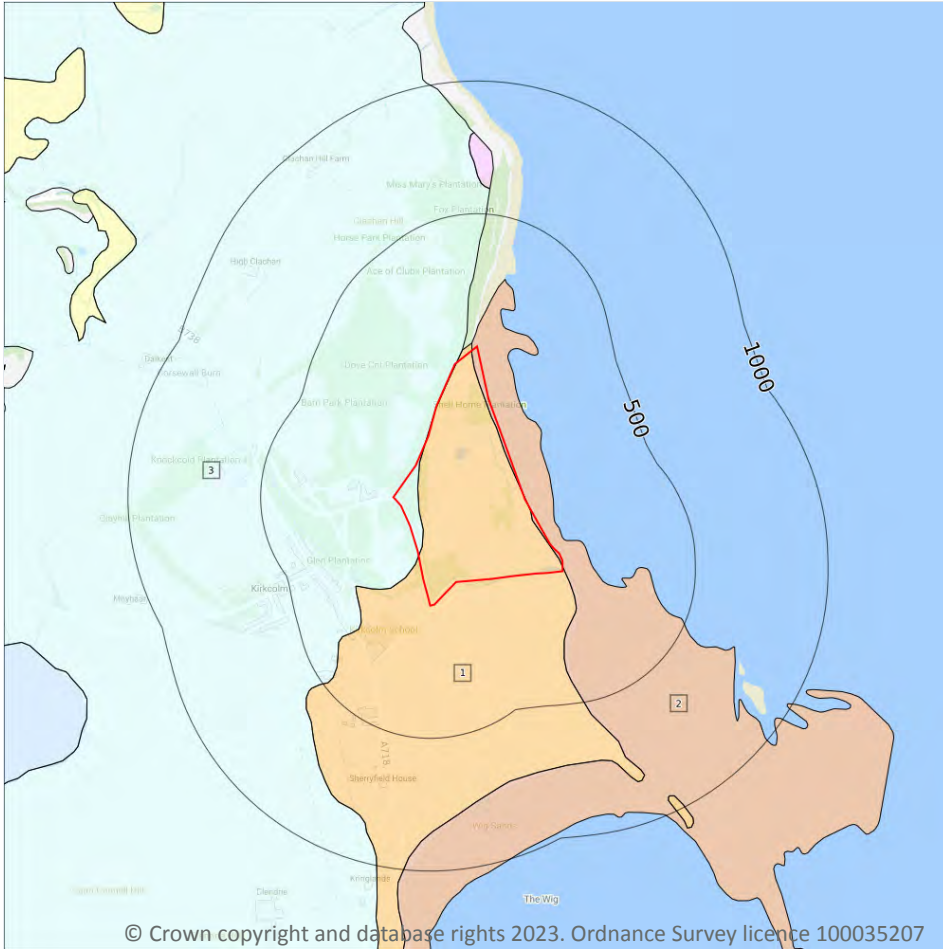
0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial 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 - 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

3

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 50**

ID	Location	LEX Code	Description	Rock description
1	On site	RMBDF-XVSZ	RAISED MARINE BEACH DEPOSITS OF HOLOCENE AGE	GRAVEL, SAND AND SILT
2	On site	MBD-XCZSV	MARINE BEACH DEPOSITS	CLAY, SILT, SAND AND GRAVEL
3	On site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m **3**

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	Very Low
On site	Intergranular	Very High	Moderate
On site	Mixed	High	Low

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.

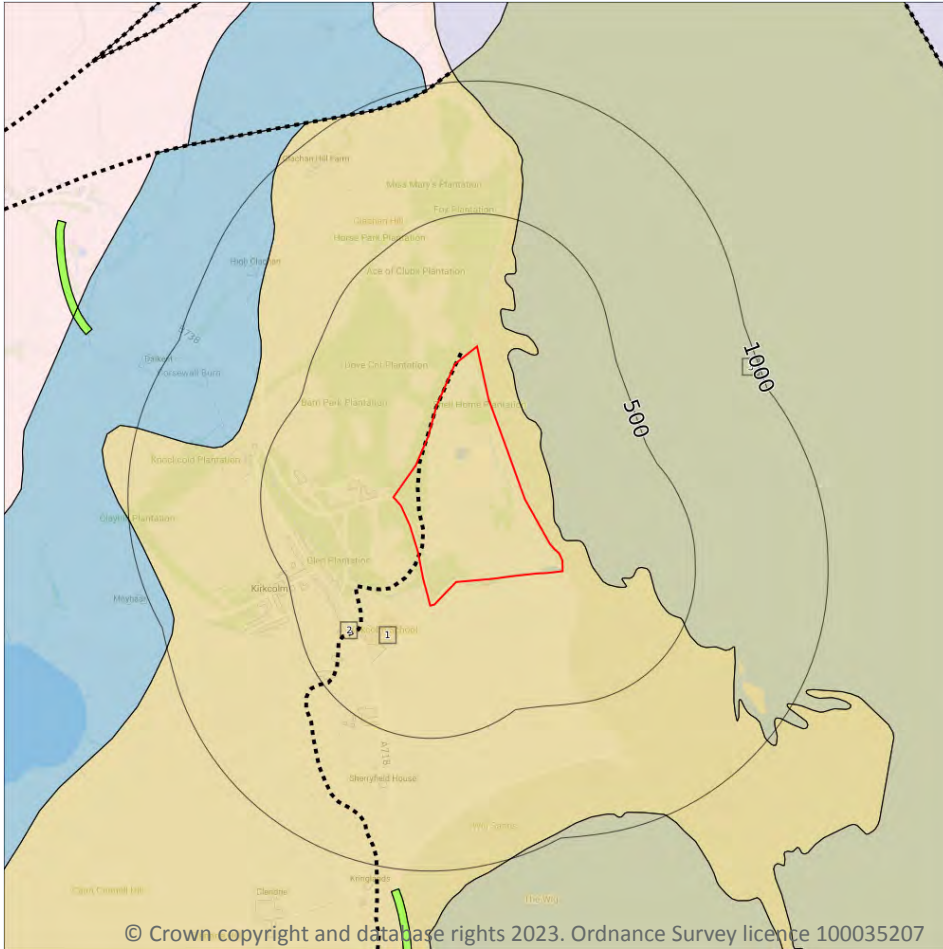
15.7 Landslip permeability (50k)

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

2

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 52**

ID	Location	LEX Code	Description	Rock age
1	On site	LRN-SDST	LOCH RYAN FORMATION - SANDSTONE	-
3	52m SE	LRN-SDST	LOCH RYAN FORMATION - SANDSTONE	-

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m **1**

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	Mixed	Moderate	Moderate

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m **1**

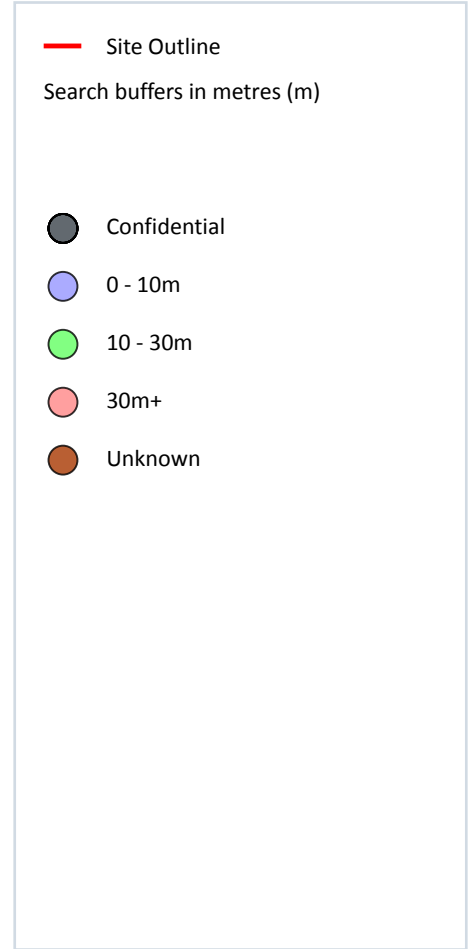
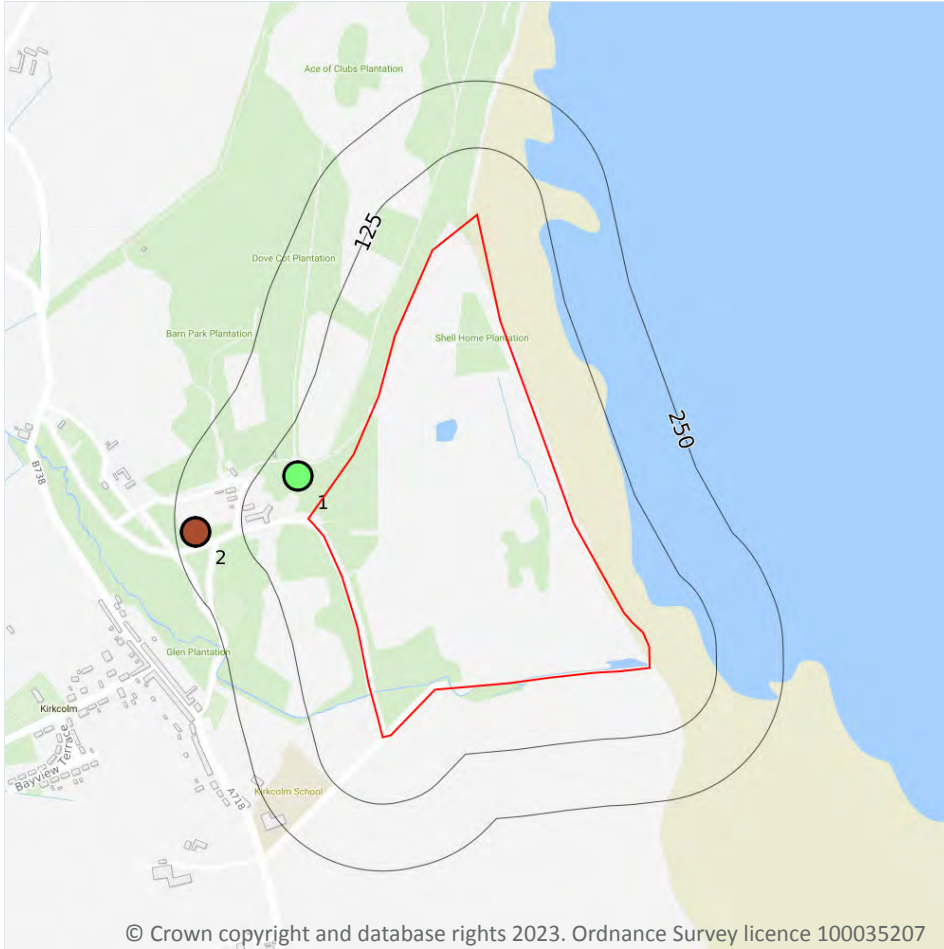
Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 52**

ID	Location	Category	Description
2	On site	LANDFORM	Back-feature marking former coastline

This data is sourced from the British Geological Survey.

16 Boreholes



16.1 BGS Boreholes

Records within 250m

2

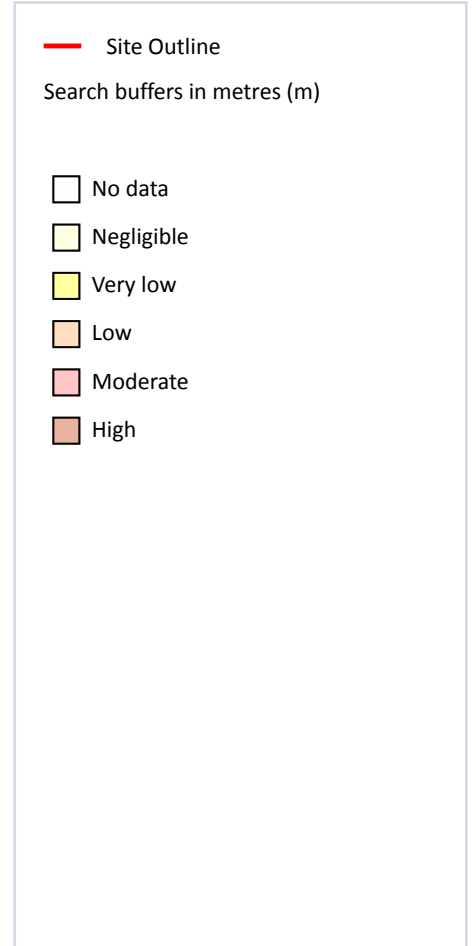
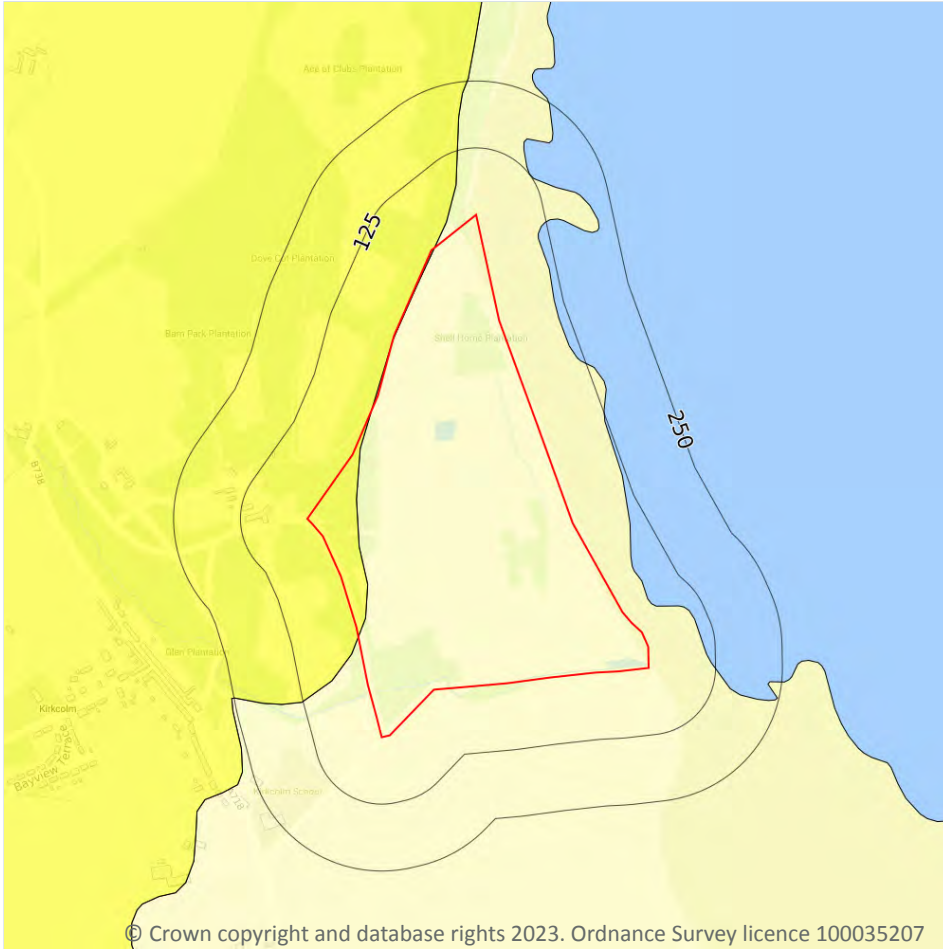
The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several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

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

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	61m W	203191 569103	CORSEWALL BORE	19.0	N	627729
2	212m W	203000 569000	SPIERS BH	-1.0	N	627739

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



17.1 Shrink swell clays

Records within 50m

2

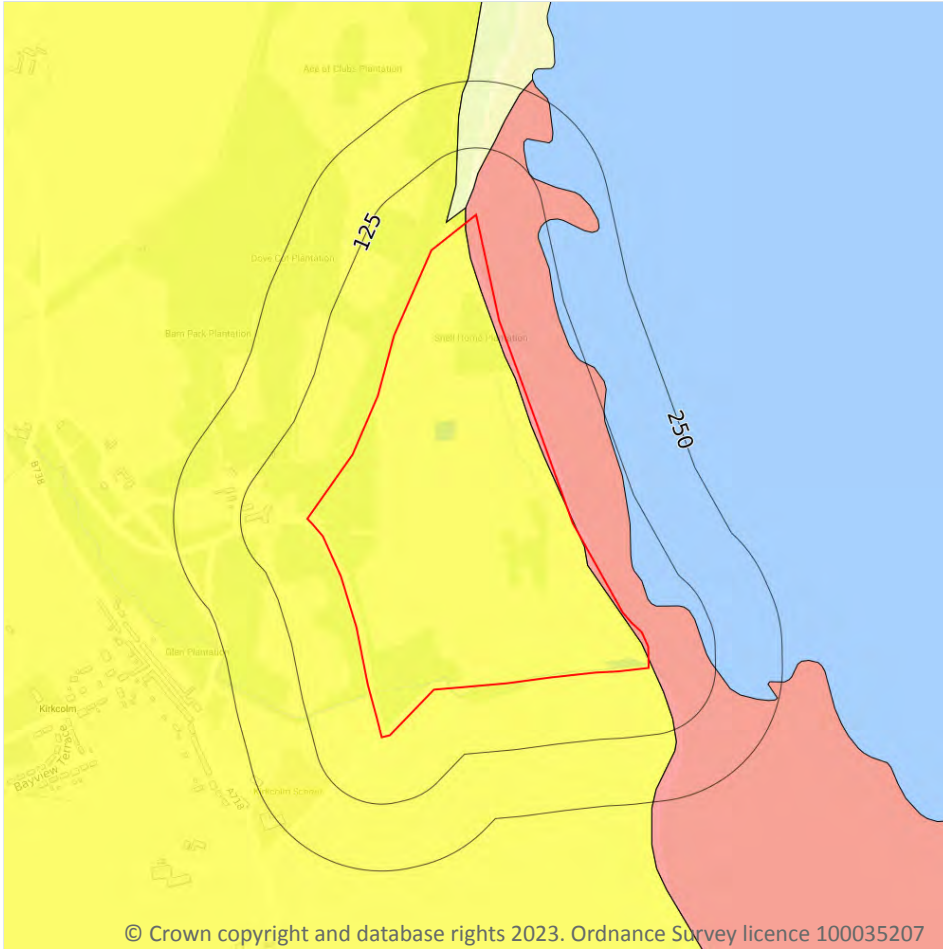
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 55**

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

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



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17.2 Running sands

Records within 50m

3

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 56**

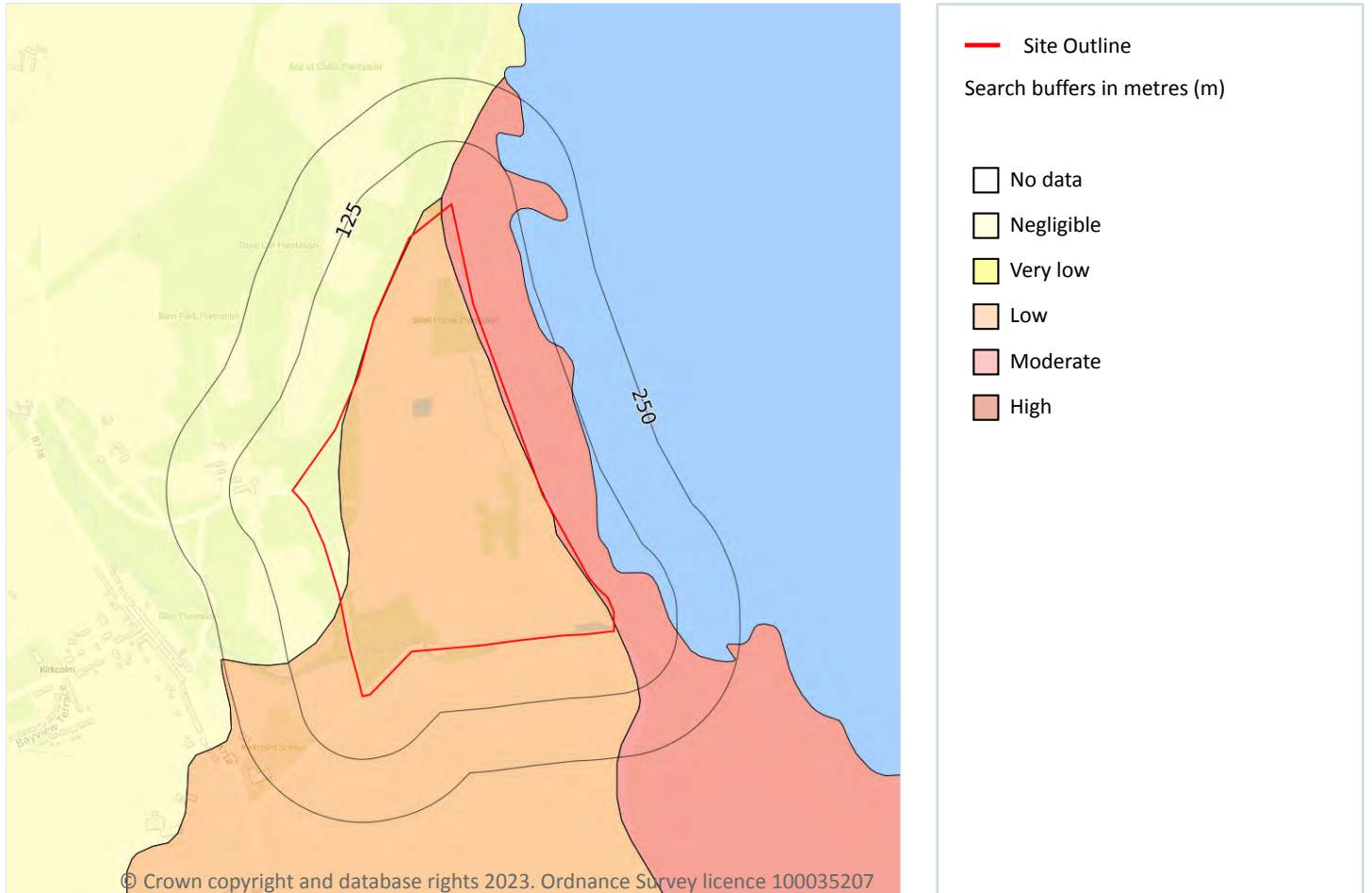
Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

Location	Hazard rating	Details
On site	Moderate	Running sand conditions are probably present. Constraints may apply to land uses involving excavation or the addition or removal of water.
22m N	Negligible	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



17.3 Compressible deposits

Records within 50m

3

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 58**

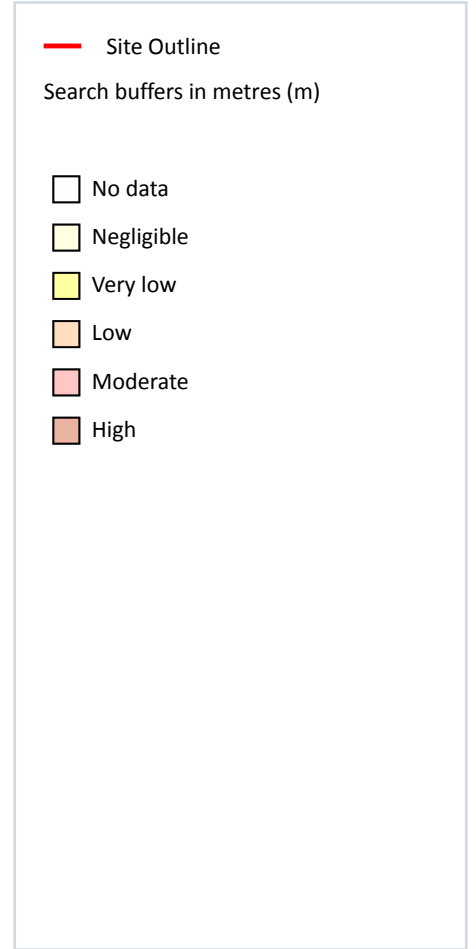
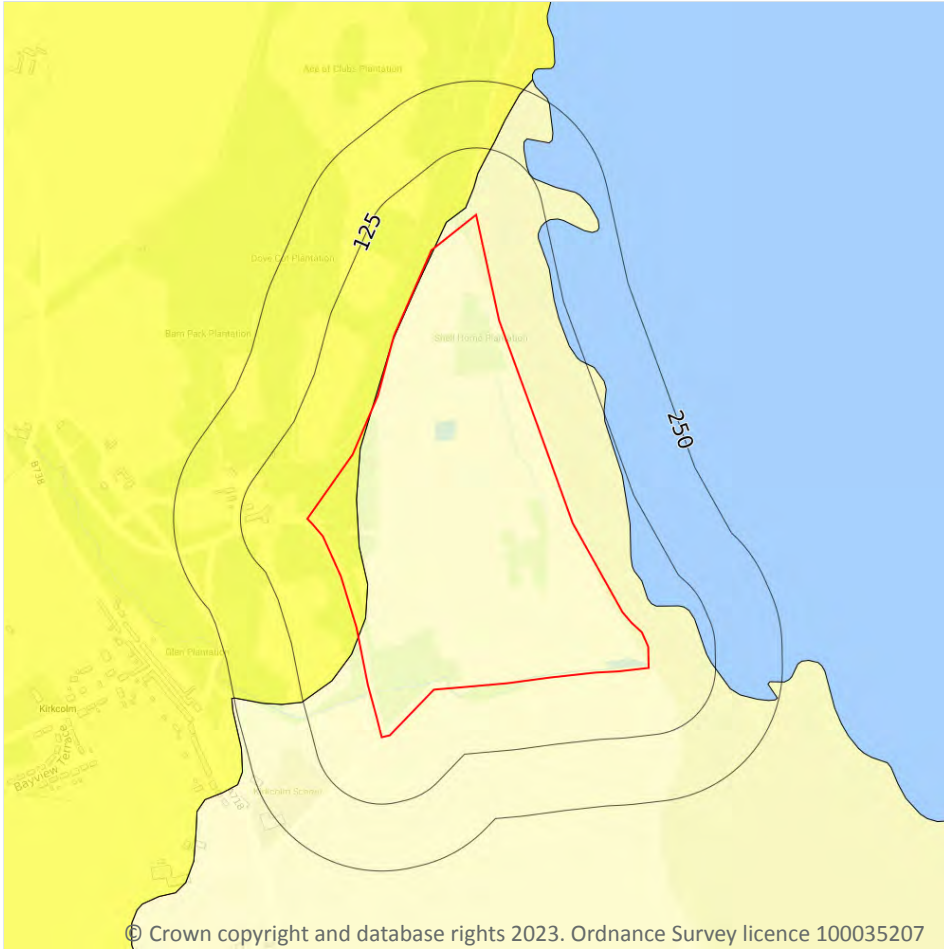
Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.
On site	Low	Compressibility and uneven settlement potential may be present. Land use should consider specifically the compressibility and variability of the site.

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.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Collapsible deposits



17.4 Collapsible deposits

Records within 50m

2

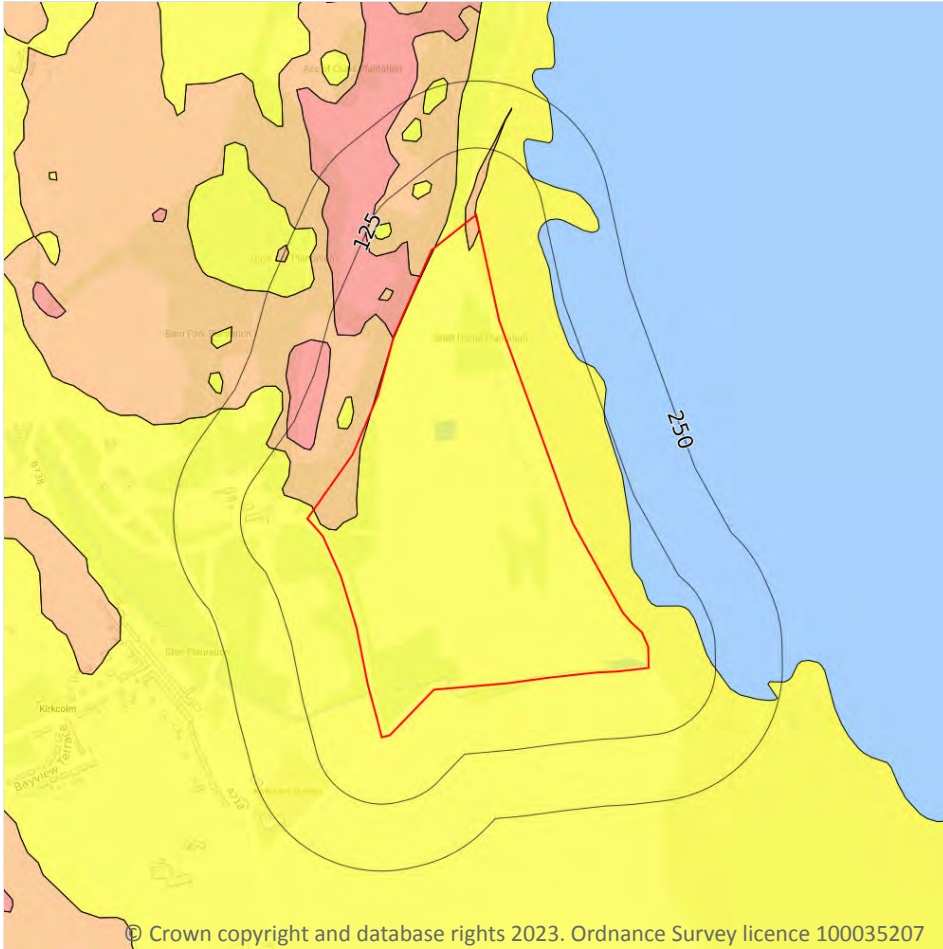
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 60**

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

5

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.

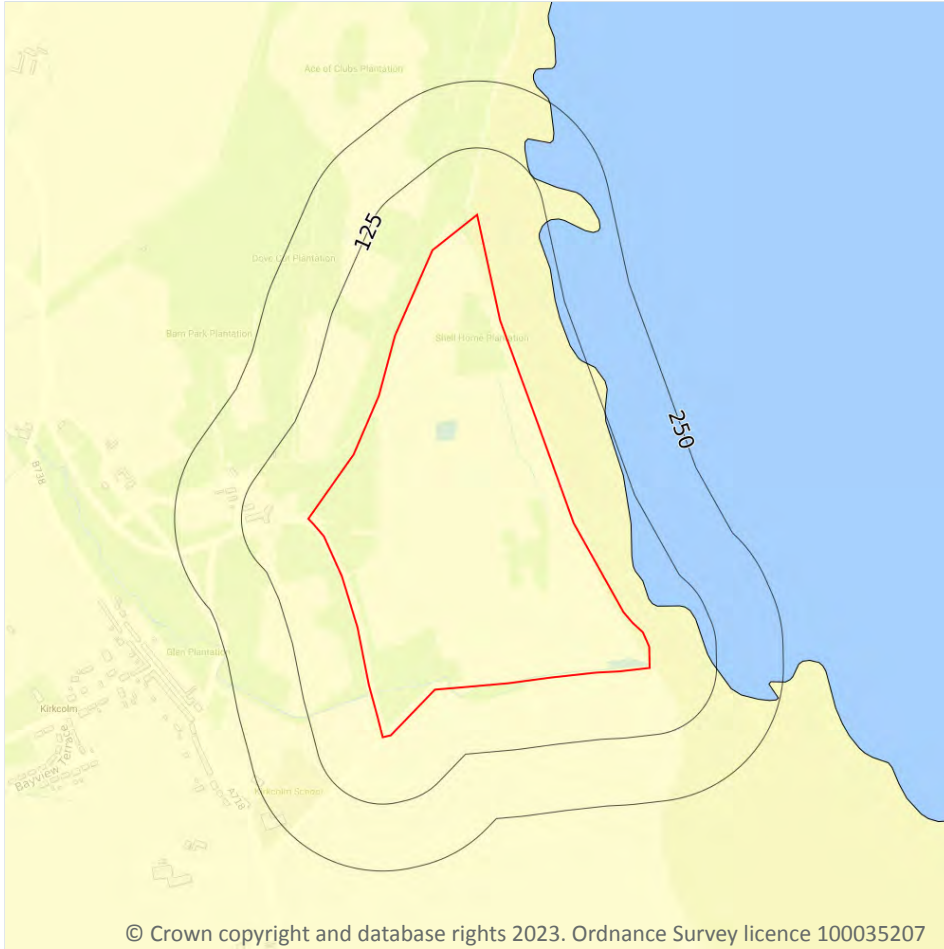
Features are displayed on the Natural ground subsidence - Landslides map on **page 61**

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.

Location	Hazard rating	Details
On site	Low	Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.
On site	Moderate	Slope instability problems are probably present or have occurred in the past. Land use should consider specifically the stability of the site.
26m NW	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.
35m N	Low	Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Ground dissolution of soluble rocks



17.6 Ground dissolution of soluble rocks

Records within 50m

1

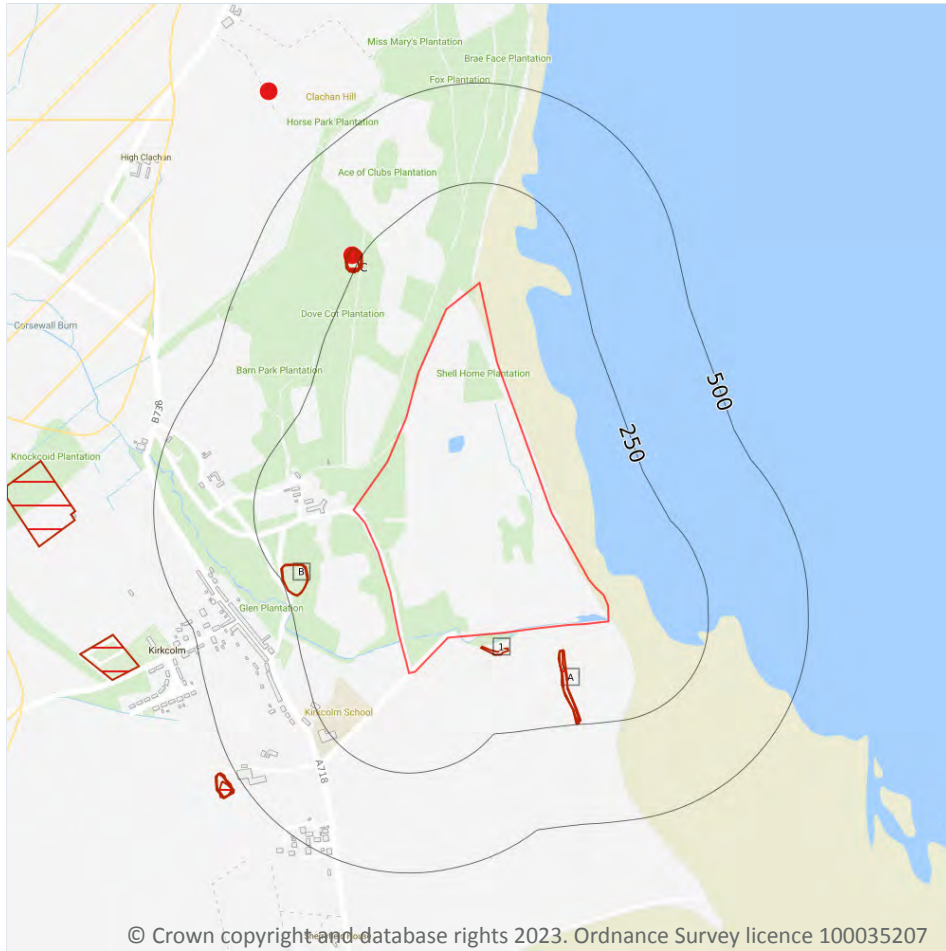
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 63**

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



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

1

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.

Features are displayed on the Mining, ground workings and natural cavities map on **page 64**

ID	Location	Details	Description
C	271m NW	Name: Dove Cot Plantation Gravel Pit Address: Corsewall, STRANRAER, Dumfries and Galloway Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m

10

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 64**

ID	Location	Land Use	Year of mapping	Mapping scale
1	30m S	Unspecified Ground Workings	1893	1:10560
A	62m SE	Water Body	1909	1:10560
A	62m SE	Water Body	1893	1:10560
A	62m SE	Water Body	1893	1:10560
B	180m W	Grave Yard	1953	1:10560
B	184m W	Grave Yard	1909	1:10560
C	236m NW	Unspecified Pit	1893	1:10560
C	239m NW	Old Gravel Pit	1909	1:10560
C	239m NW	Unspecified Pit	1893	1:10560
C	241m NW	Old Gravel Pit	1953	1:10560



This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m

0

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

This is data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m

0

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.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m

3

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).

Features are displayed on the Mining, ground workings and natural cavities map on **page 64**

ID	Location	Name	Commodity	Class	Likelihood
2	632m W	Not available	Vein Mineral	A	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered
6	832m NW	Not available	Vein Mineral	A	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered
-	983m N	Not available	Vein Mineral	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered

This data is sourced from the British Geological Survey.



18.7 Mining cavities

Records within 1000m	0
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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
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Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

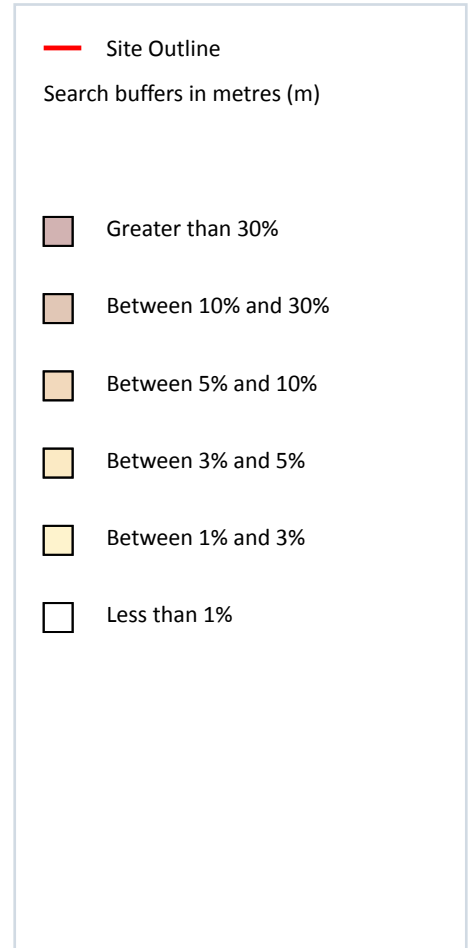
18.13 Clay mining

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



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19.1 Radon

Records on site

1

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on **page 69**

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None

This data is sourced from the British Geological Survey and UK Health Security Agency.



20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m

18

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 km². 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 km²; 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 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg



Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
0m E	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
22m N	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 mg/kg	15 - 30 mg/kg
23m N	15 mg/kg	-	100 mg/kg	60 mg/kg	1.8 mg/kg	120 - 180 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 km²).

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 km².

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 0

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.

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.



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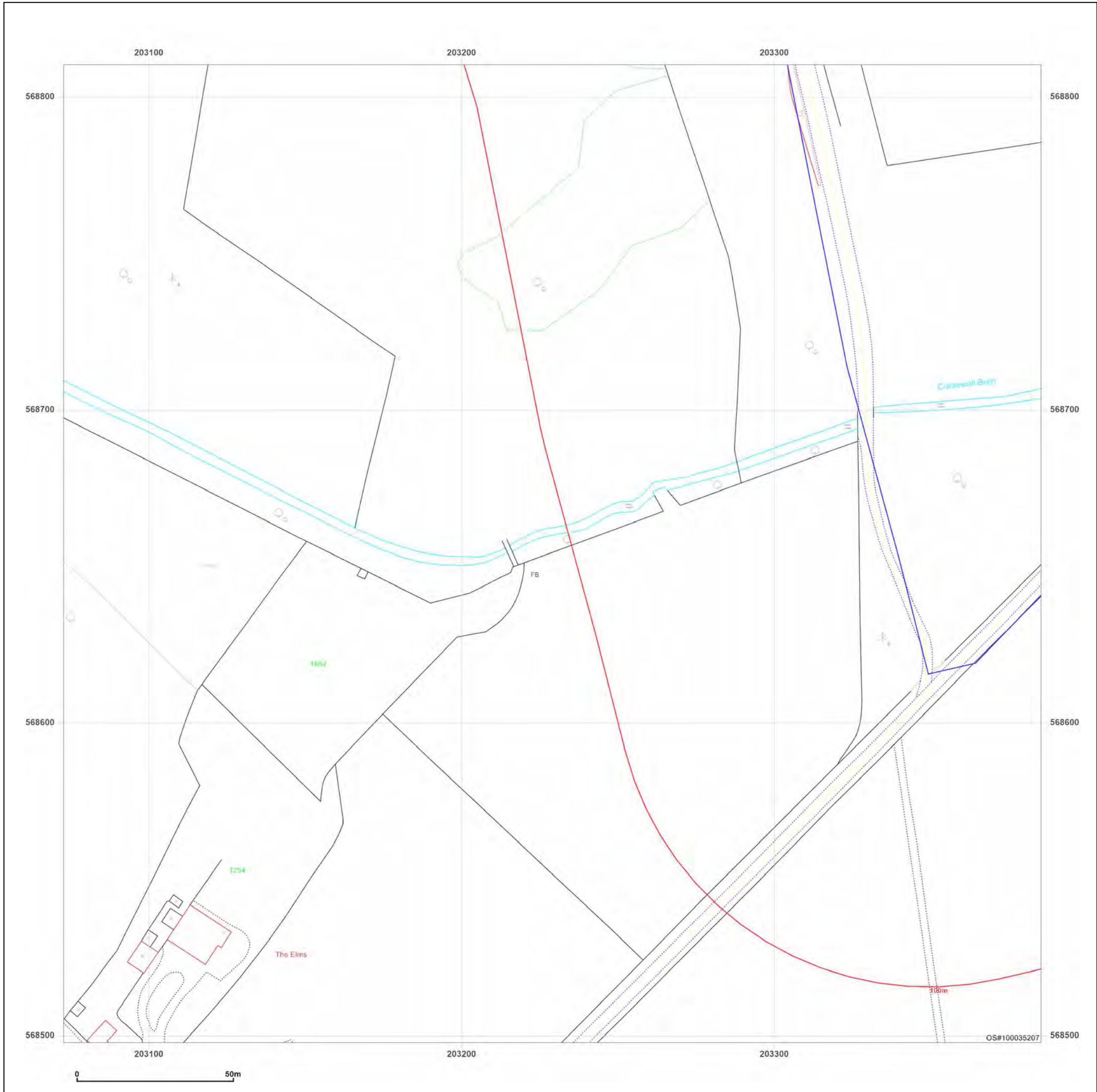
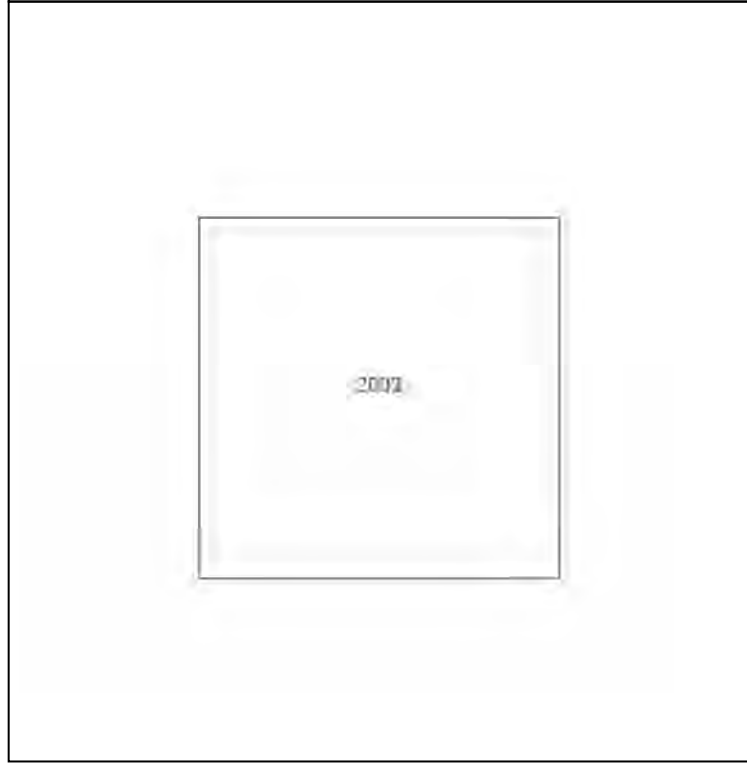
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Grid Ref: 203229, 568654

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

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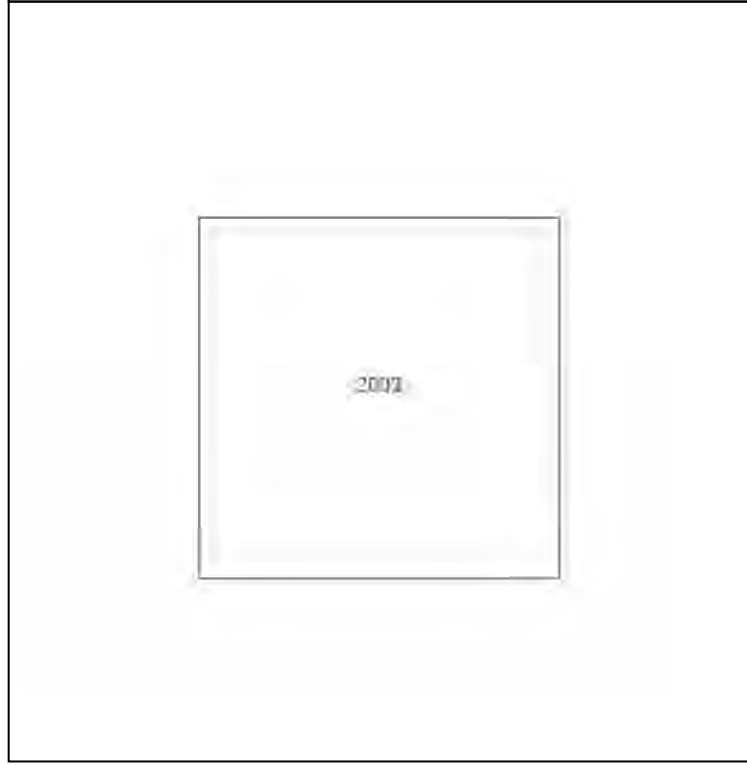
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Map date: 2003

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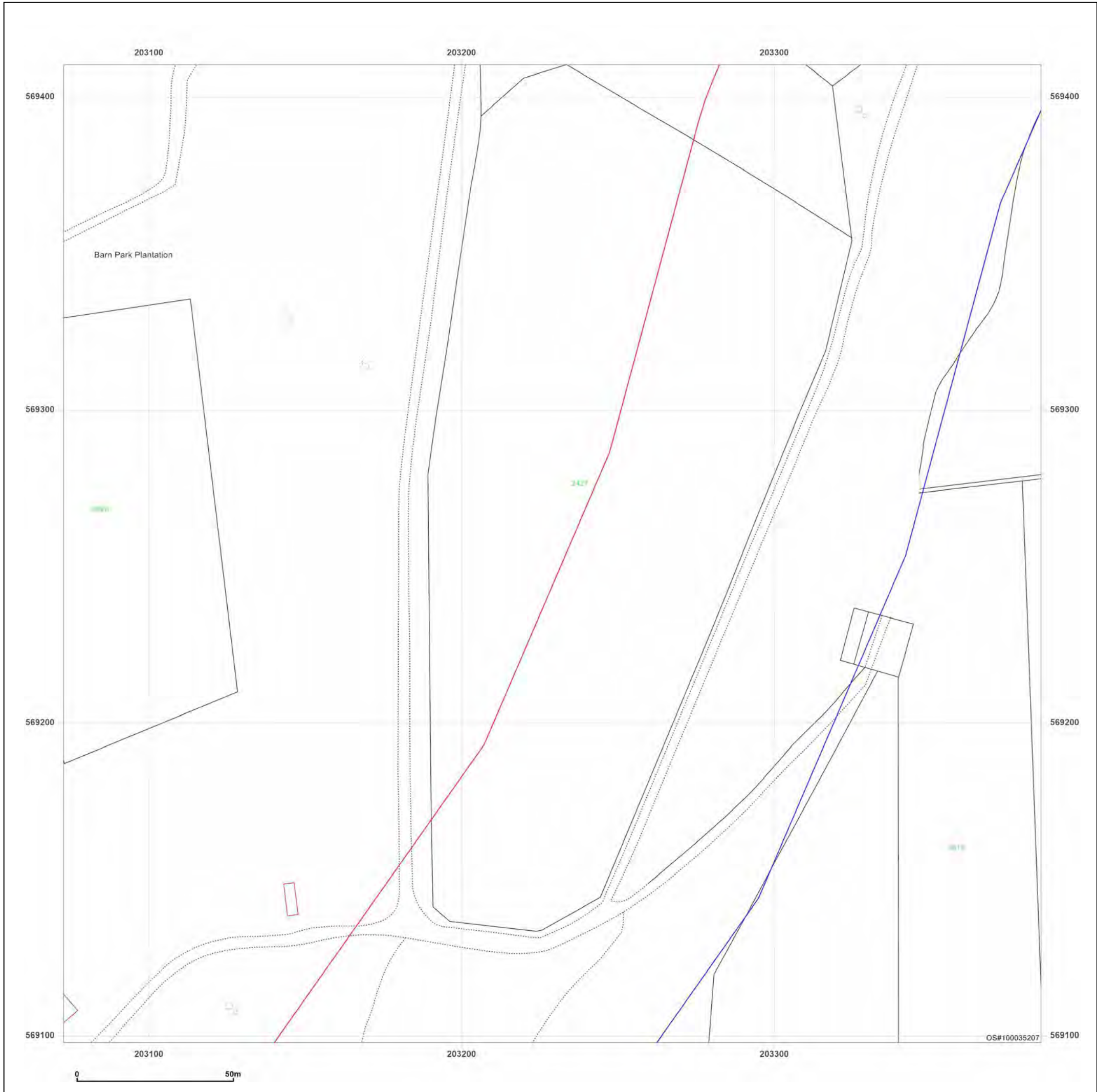
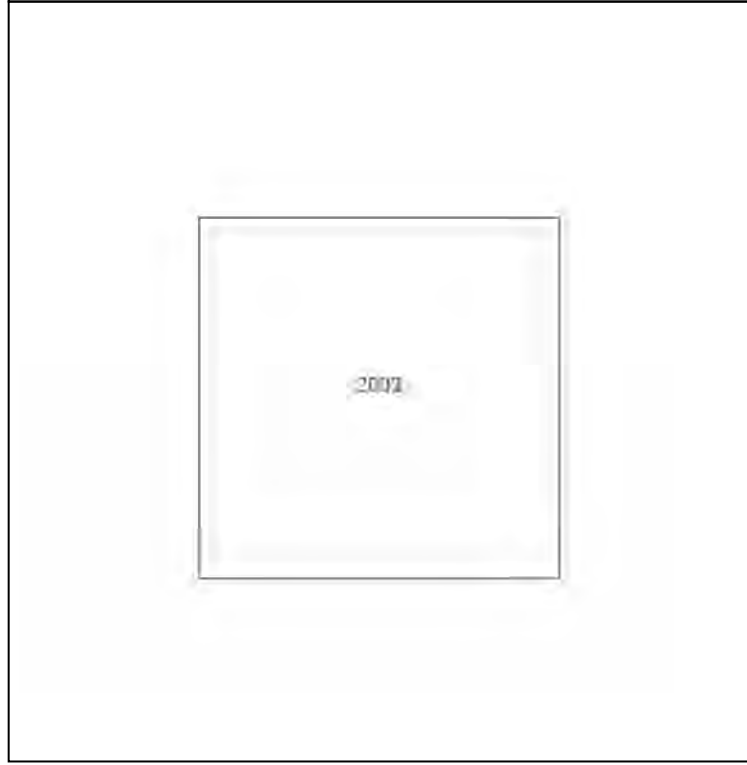
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Map Name: LandLine

Map date: 2003

Scale: 1:1,250

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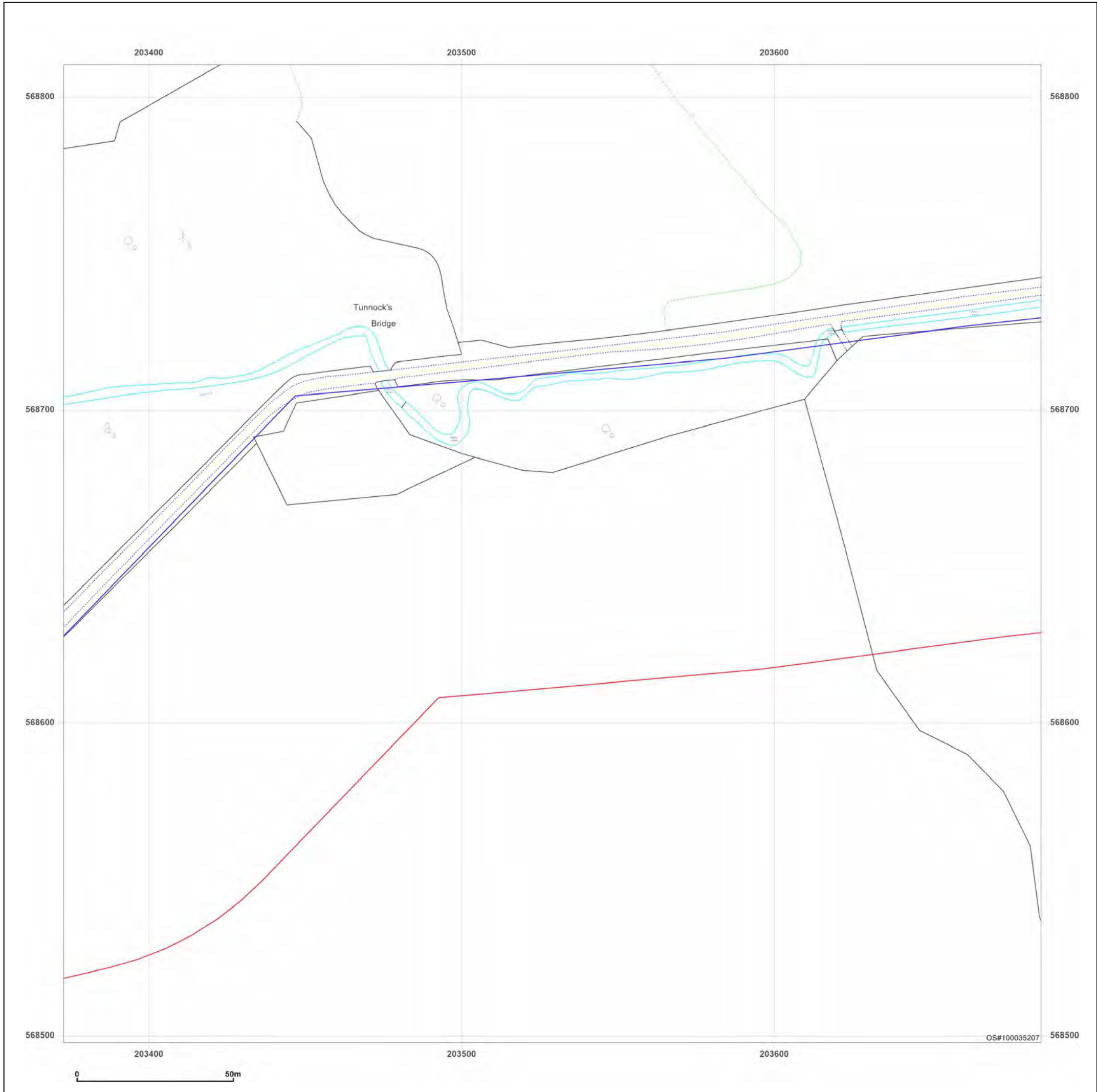
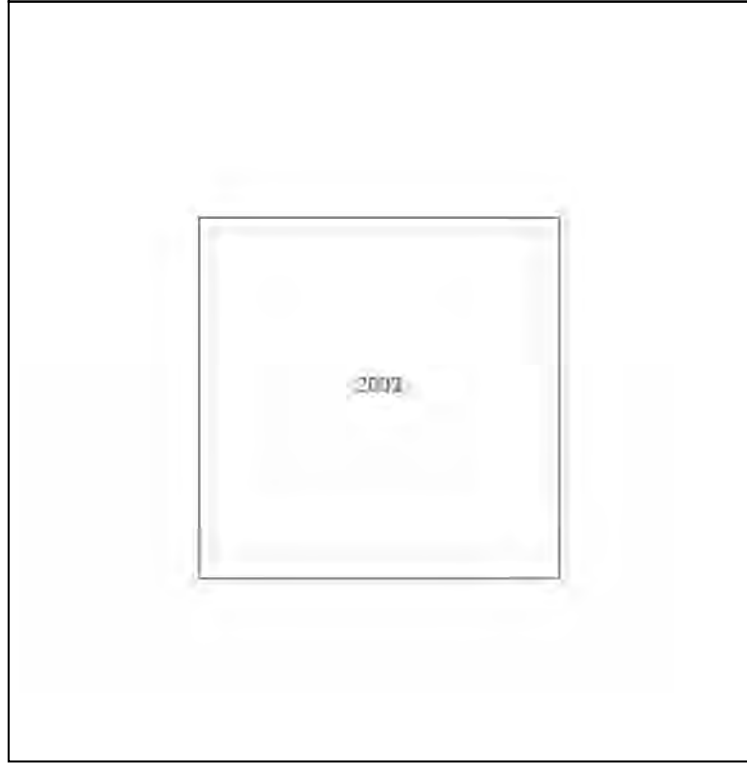
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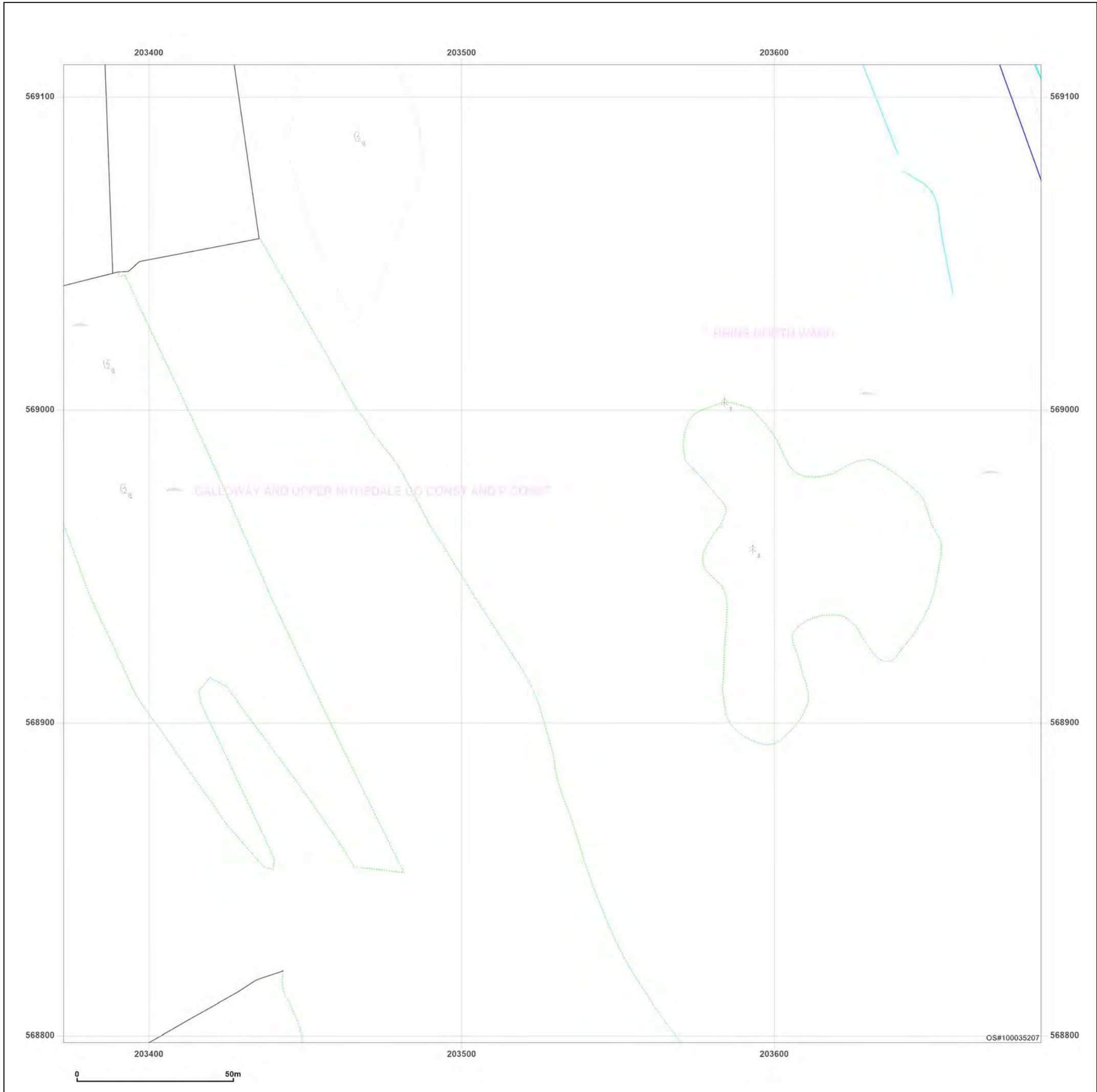
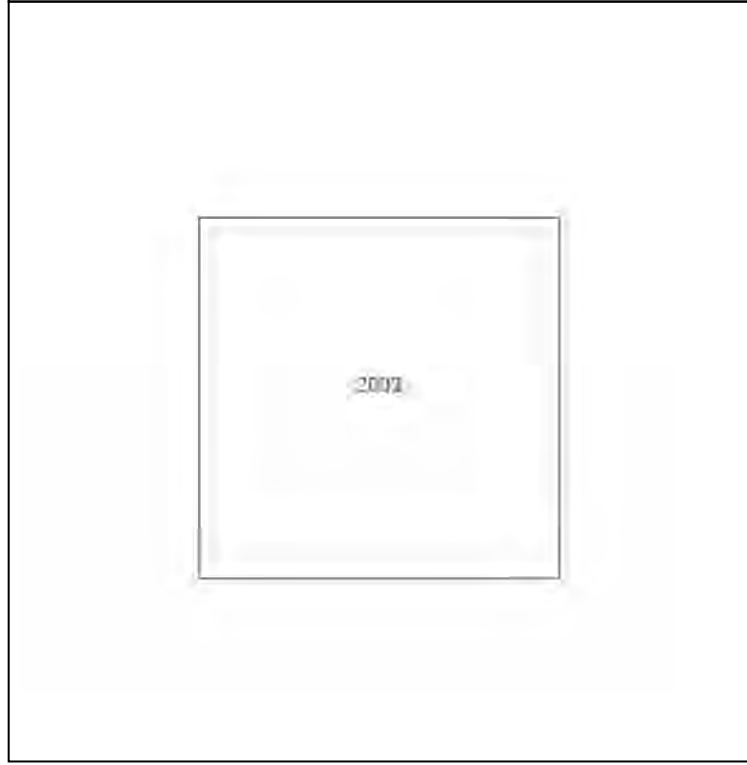
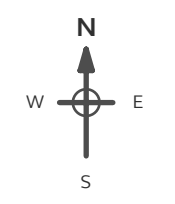
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Grid Ref: 203529, 568954

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Map date: 2003
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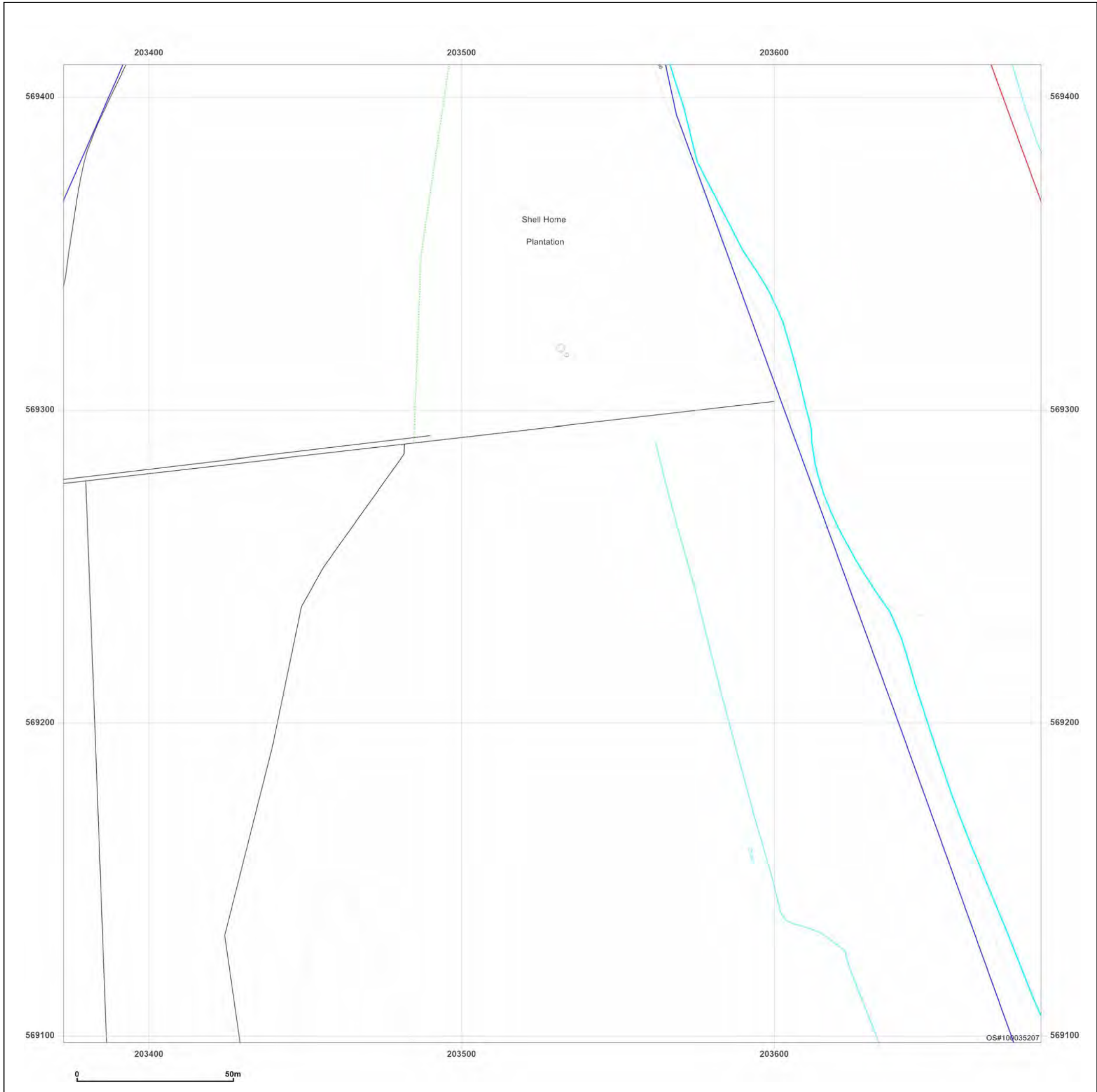
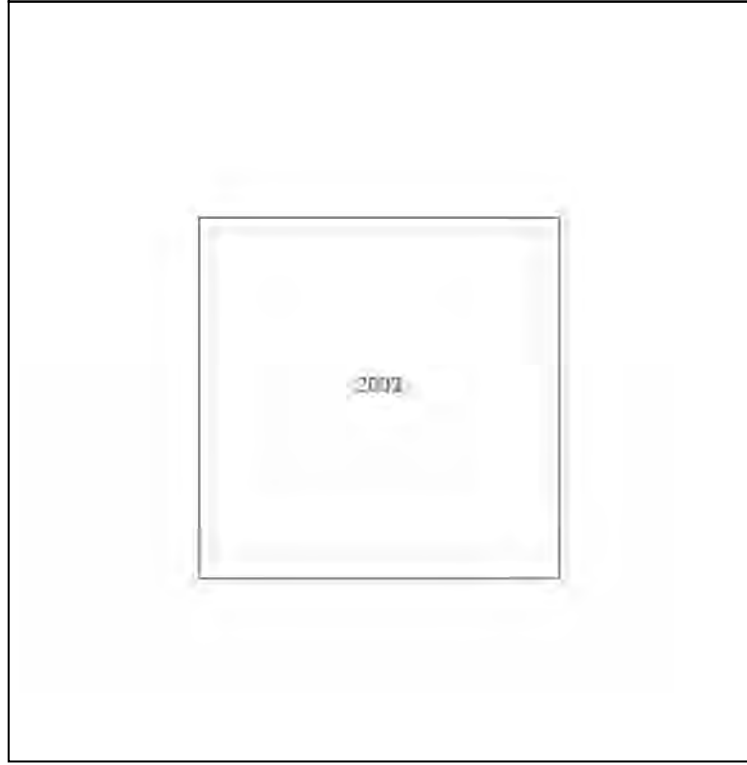
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Map date: 2003

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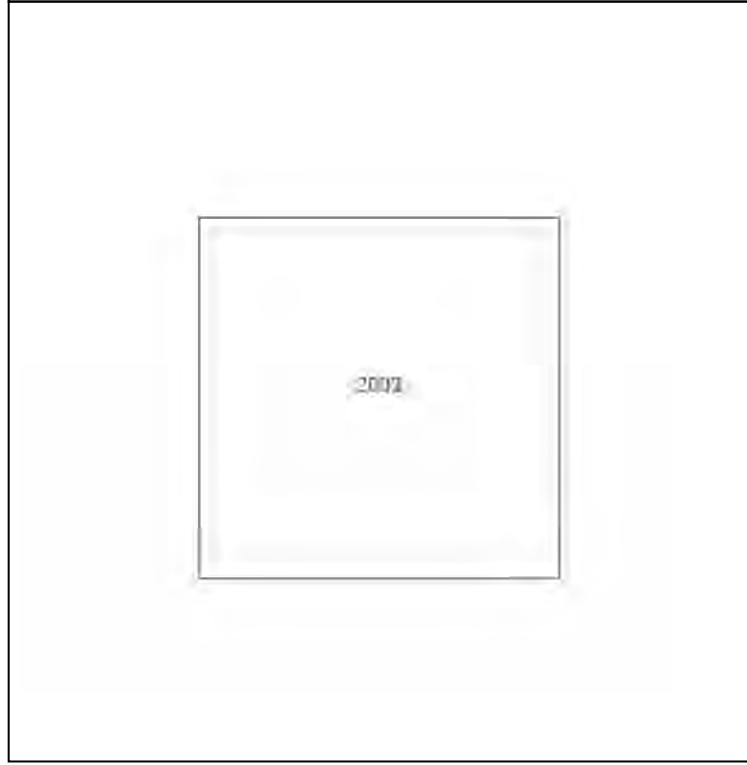
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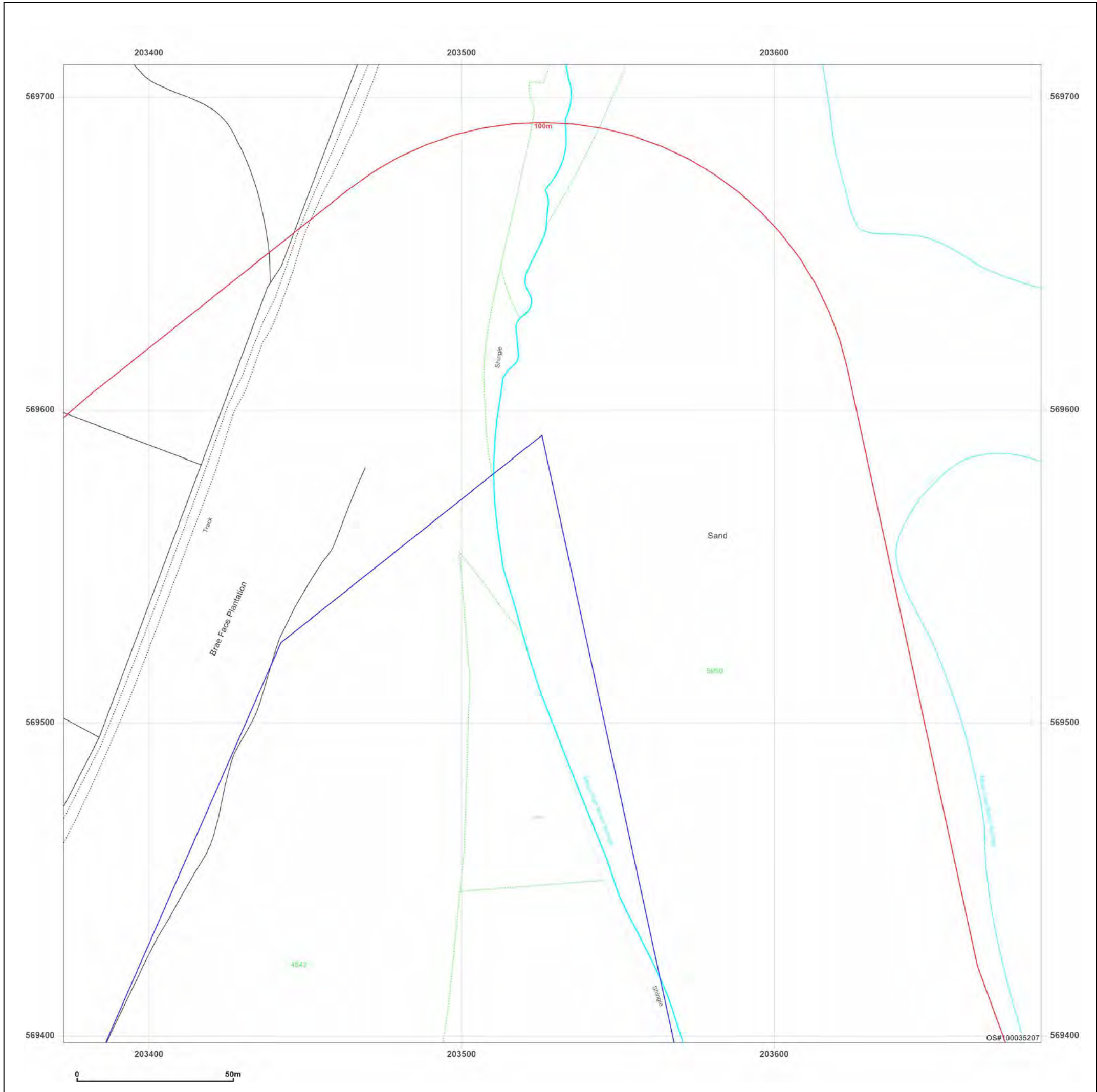


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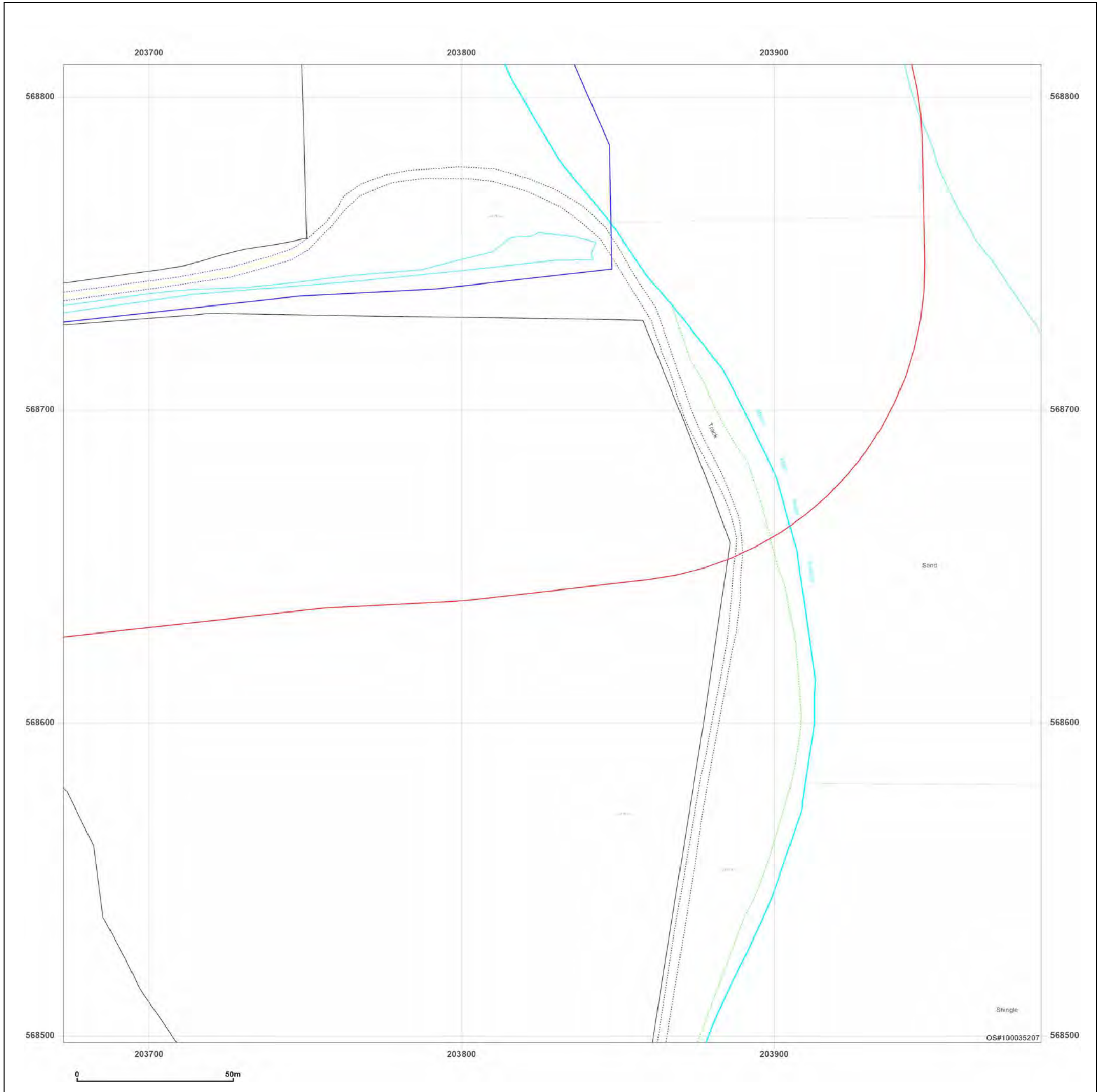
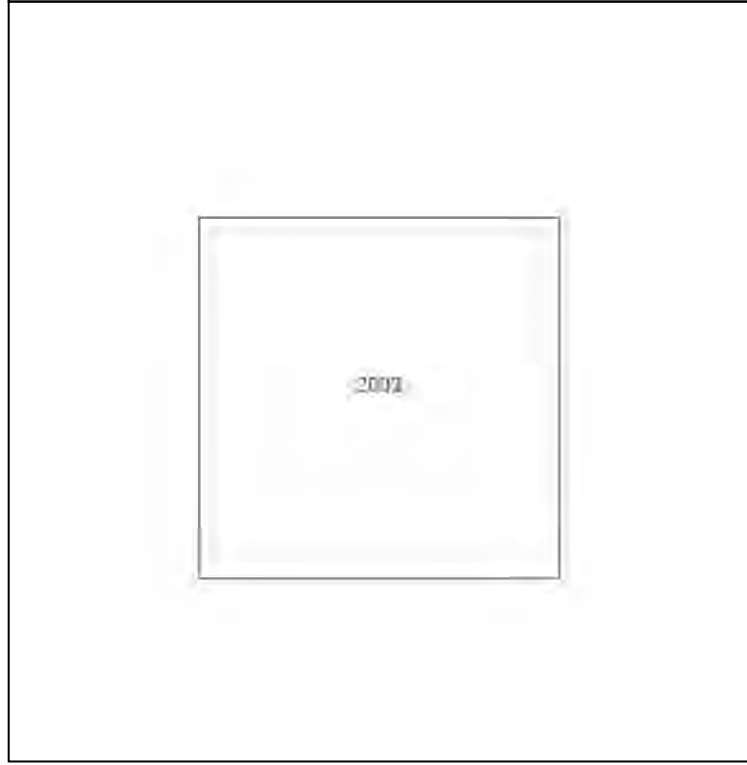
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Grid Ref: 203829, 568654

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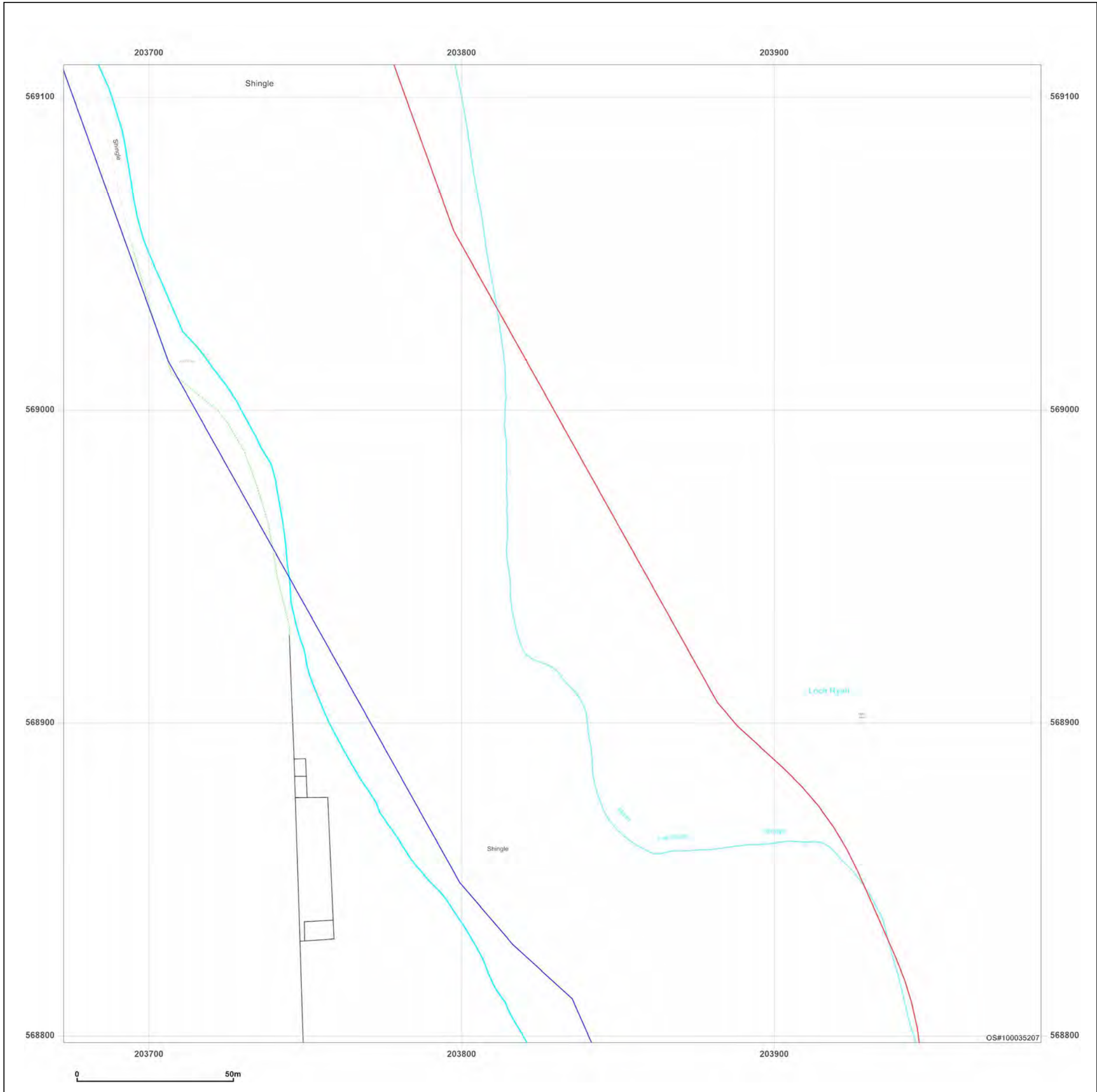
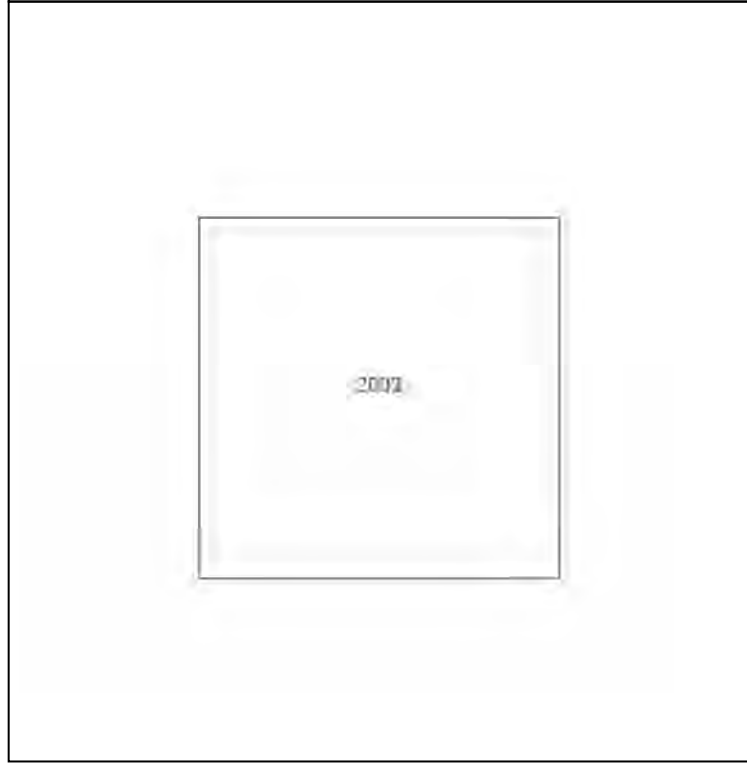
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Grid Ref: 203829, 568954

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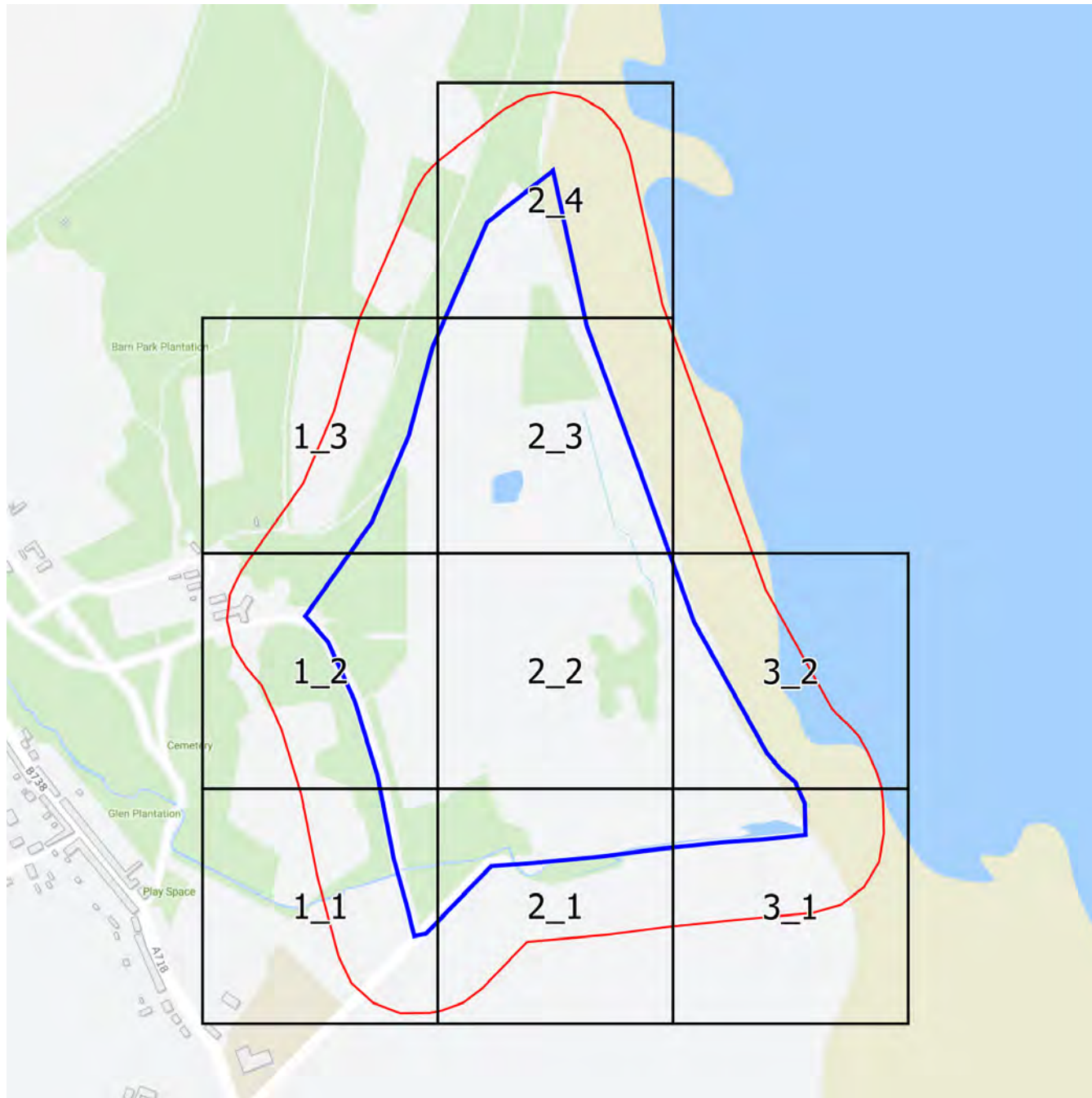
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Landline Scale Grid Index



This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m	0
----------------------------	----------

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

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m	0
----------------------------	----------

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

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.



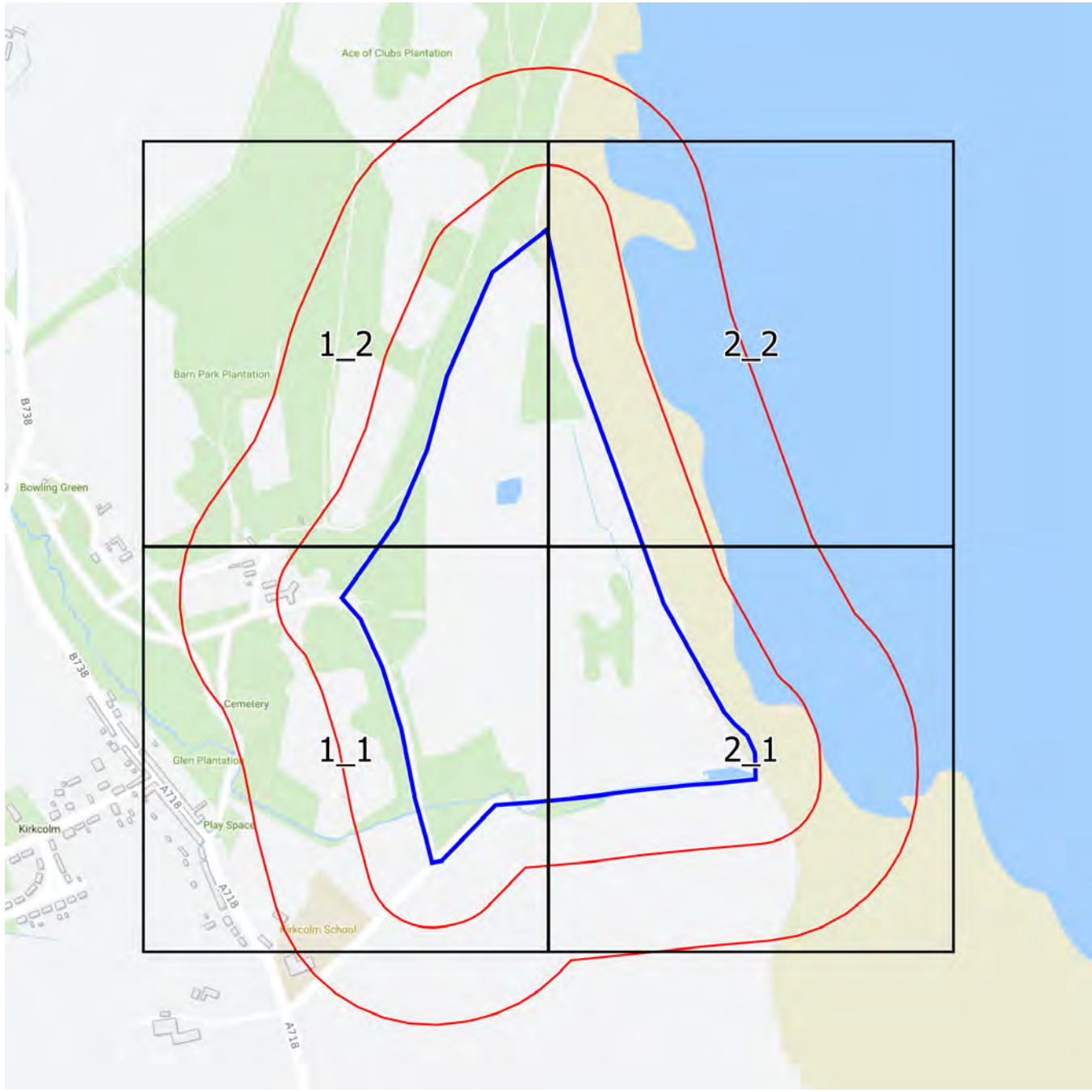
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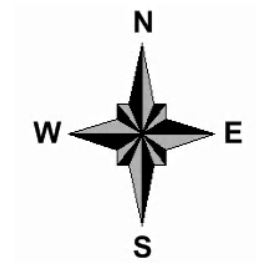
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Client Ref: EPL017854
Report Ref: GS-9313438_LS_1_1
Grid Ref: 203216, 568790

Map Name: County Series

Map date: 1894

Scale: 1:2,500

Printed at: 1:2,500



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Revised 1894
Edition N/A
Copyright N/A
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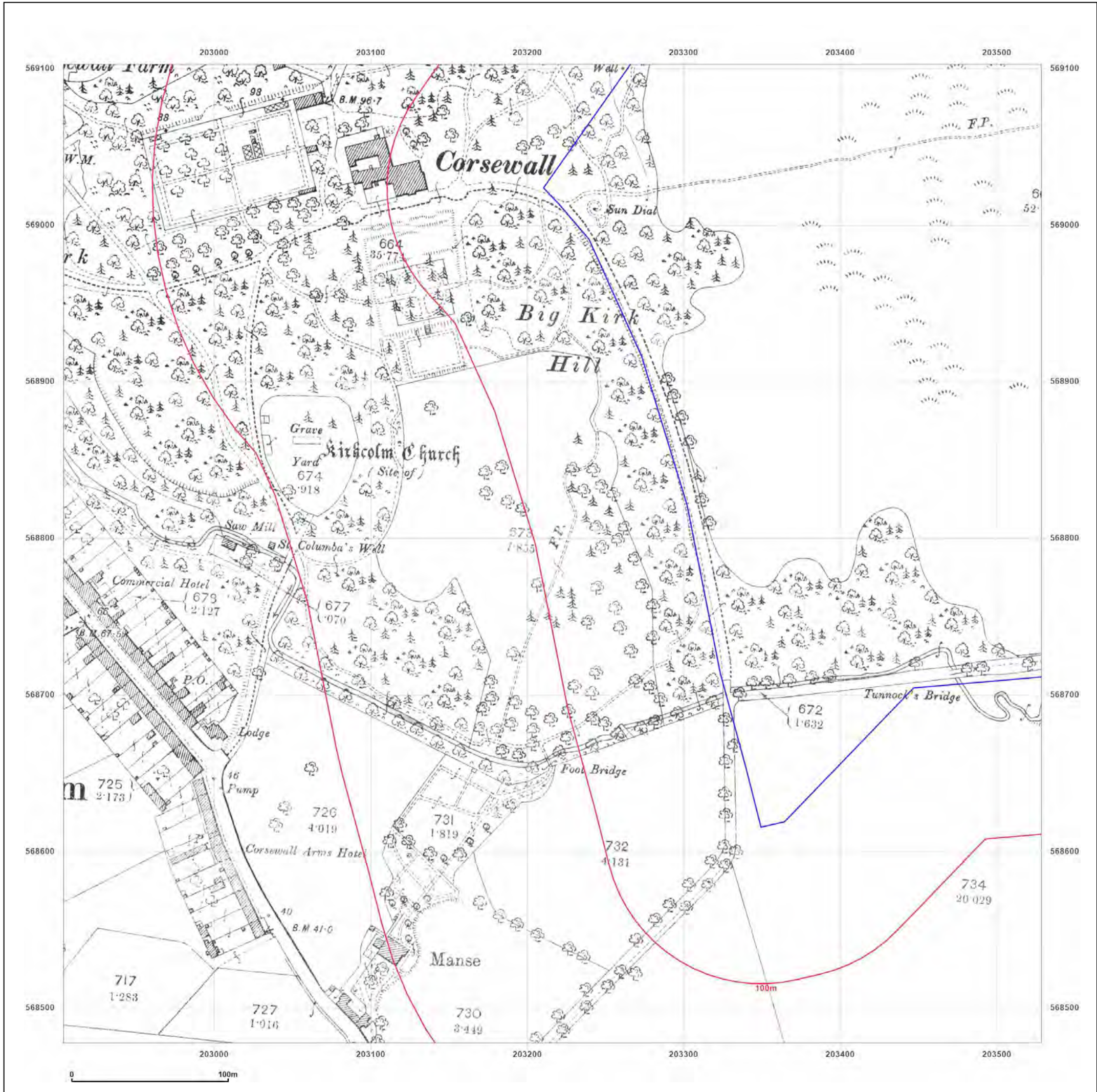


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Client Ref: EPL017854
 Report Ref: GS-9313438_LS_1_1
 Grid Ref: 203216, 568790

Map Name: County Series

Map date: 1908

Scale: 1:2,500

Printed at: 1:2,500



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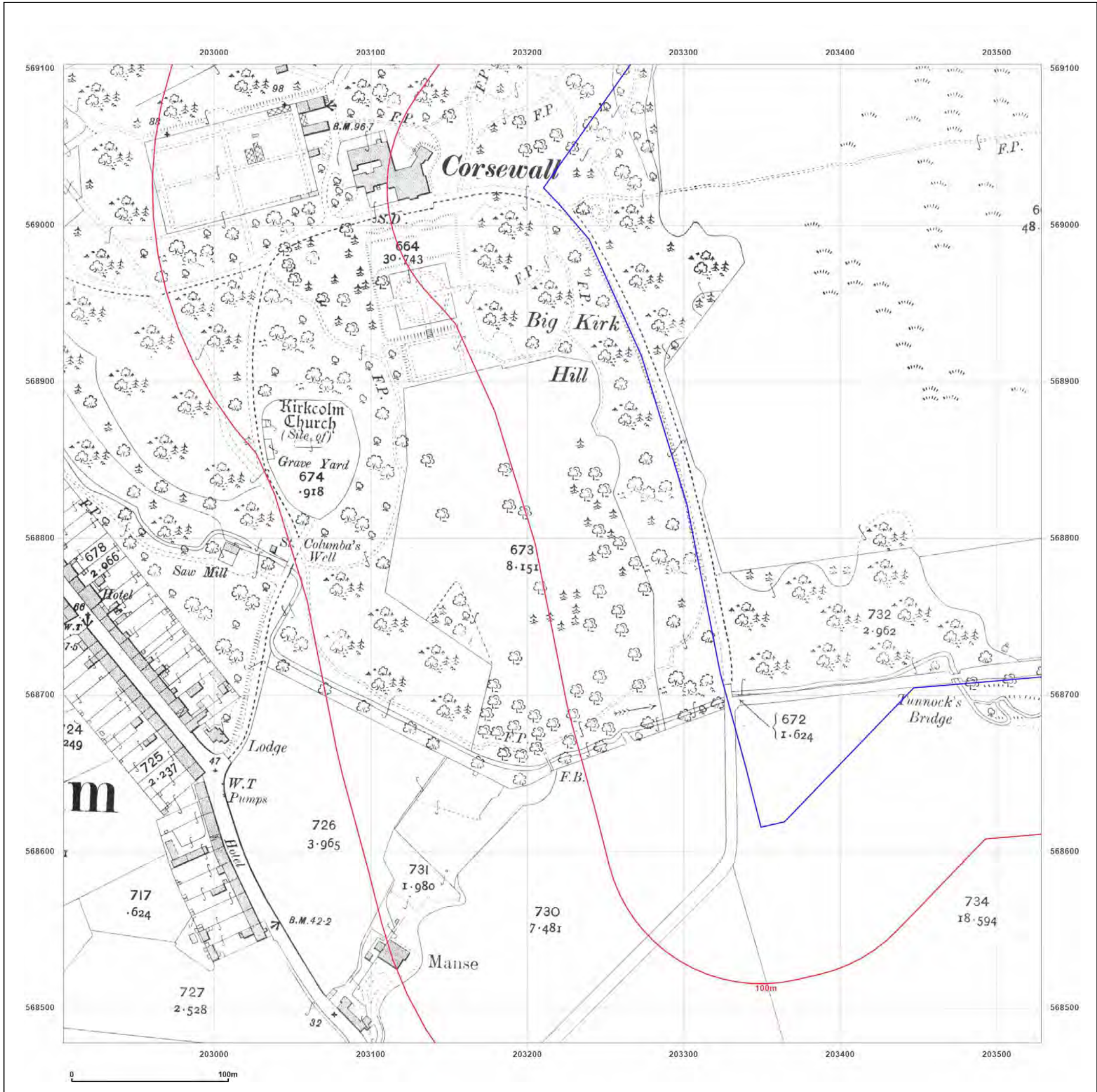


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Report Ref: GS-9313438_LS_1_1
Grid Ref: 203216, 568790

Map Name: National Grid

Map date: 1971

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1970	Surveyed N/A	Surveyed N/A
Revised 1970	Revised N/A	Revised N/A
Edition N/A	Edition N/A	Edition N/A
Copyright 1971	Copyright N/A	Copyright N/A
Levelled 1955	Levelled N/A	Levelled N/A

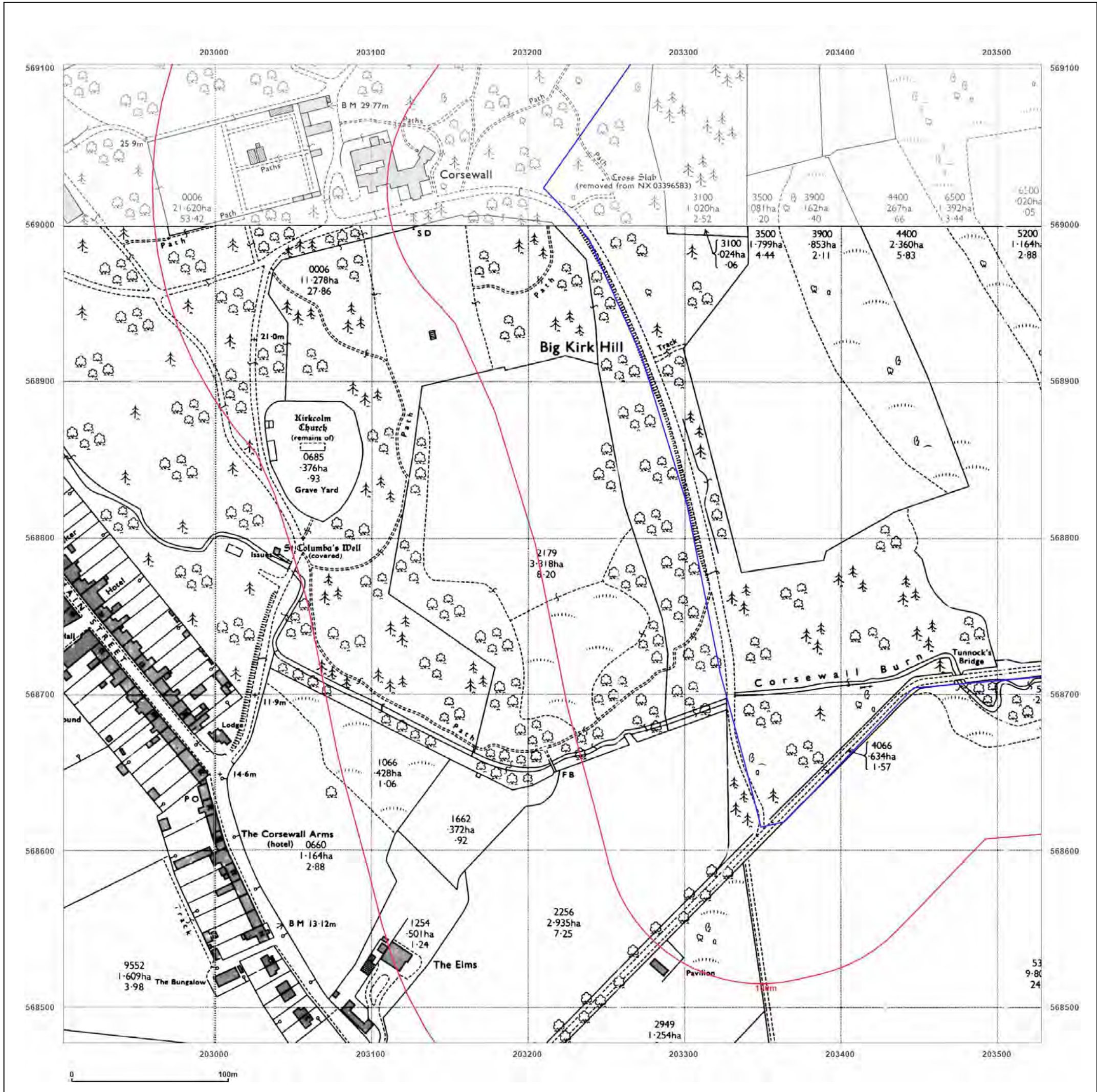


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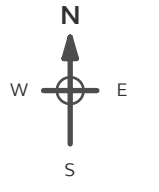
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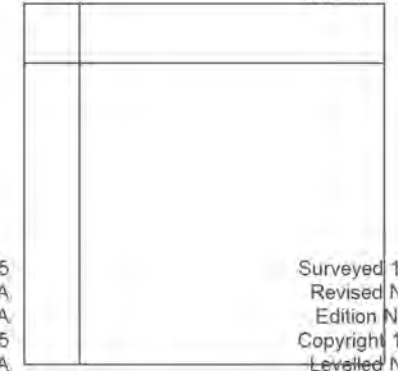
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Edition N/A
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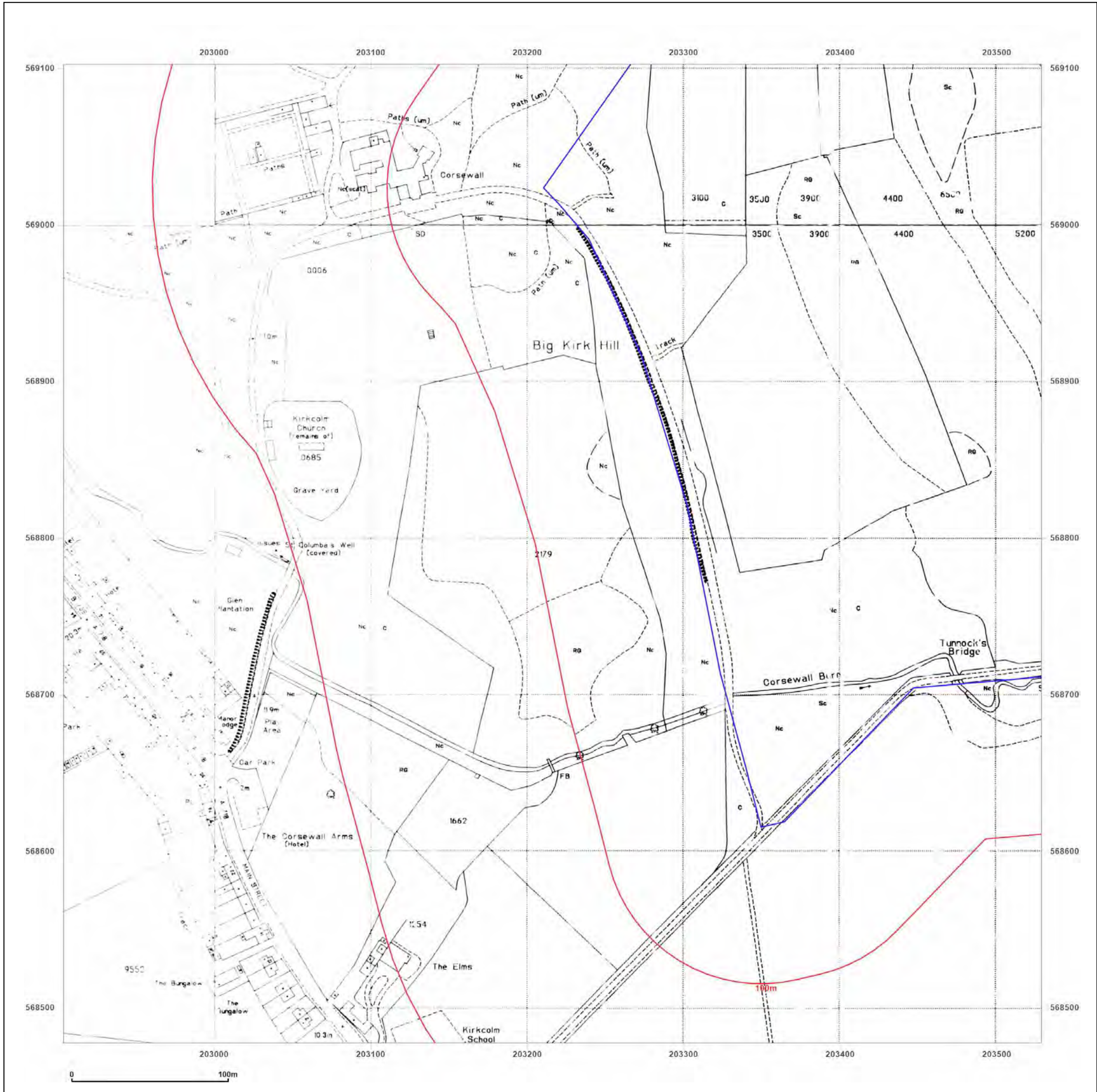


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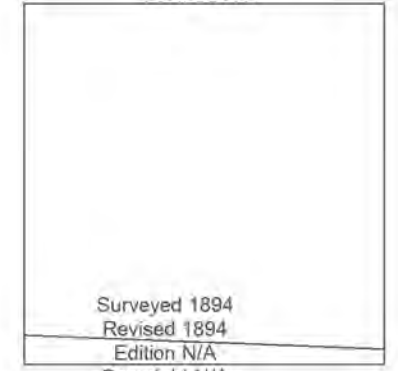
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Scale: 1:2,500

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Edition N/A
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Copyright N/A
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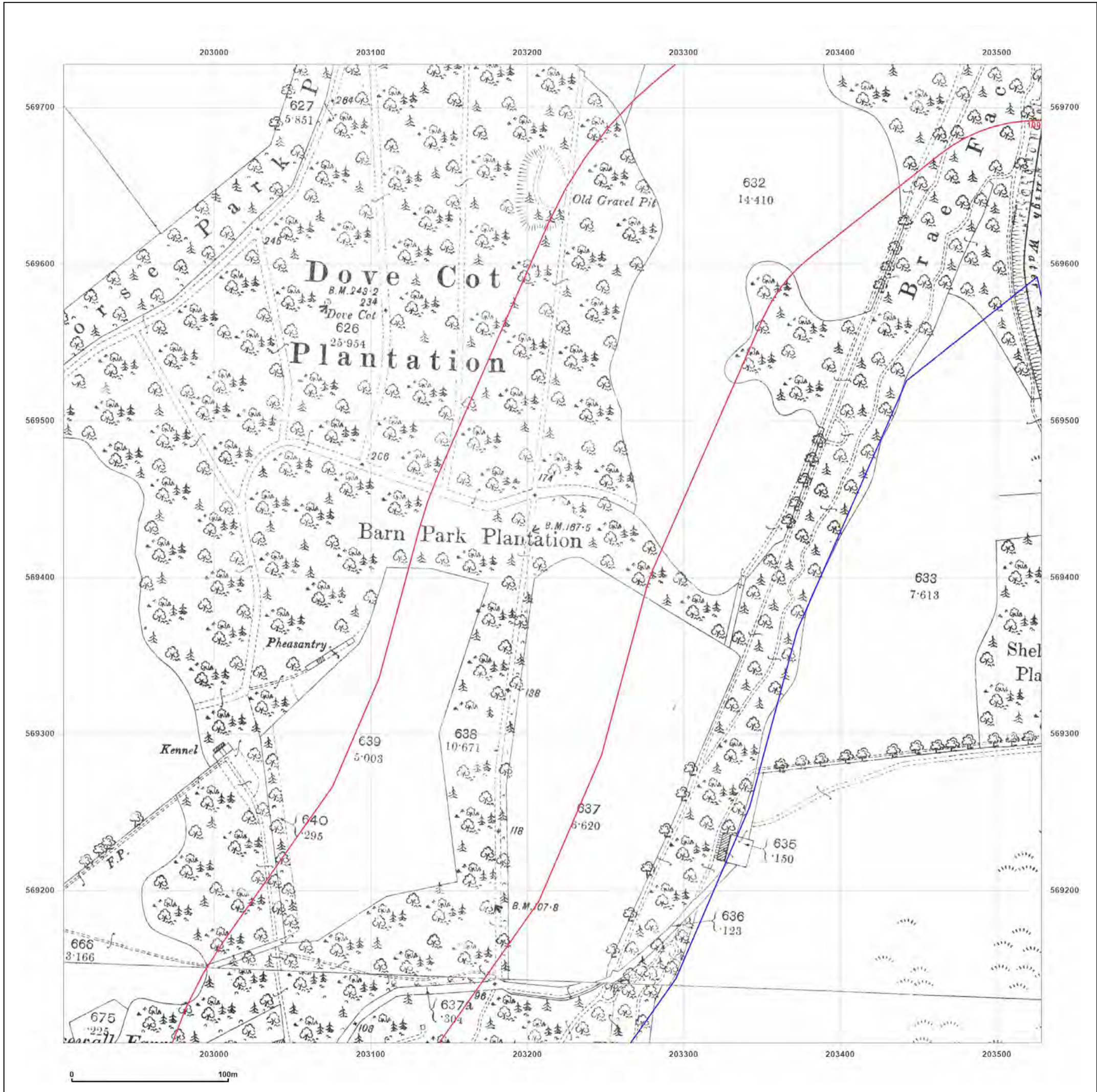


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Report Ref: GS-9313438_LS_1_2
Grid Ref: 203216, 569415

Map Name: County Series

Map date: 1908

Scale: 1:2,500

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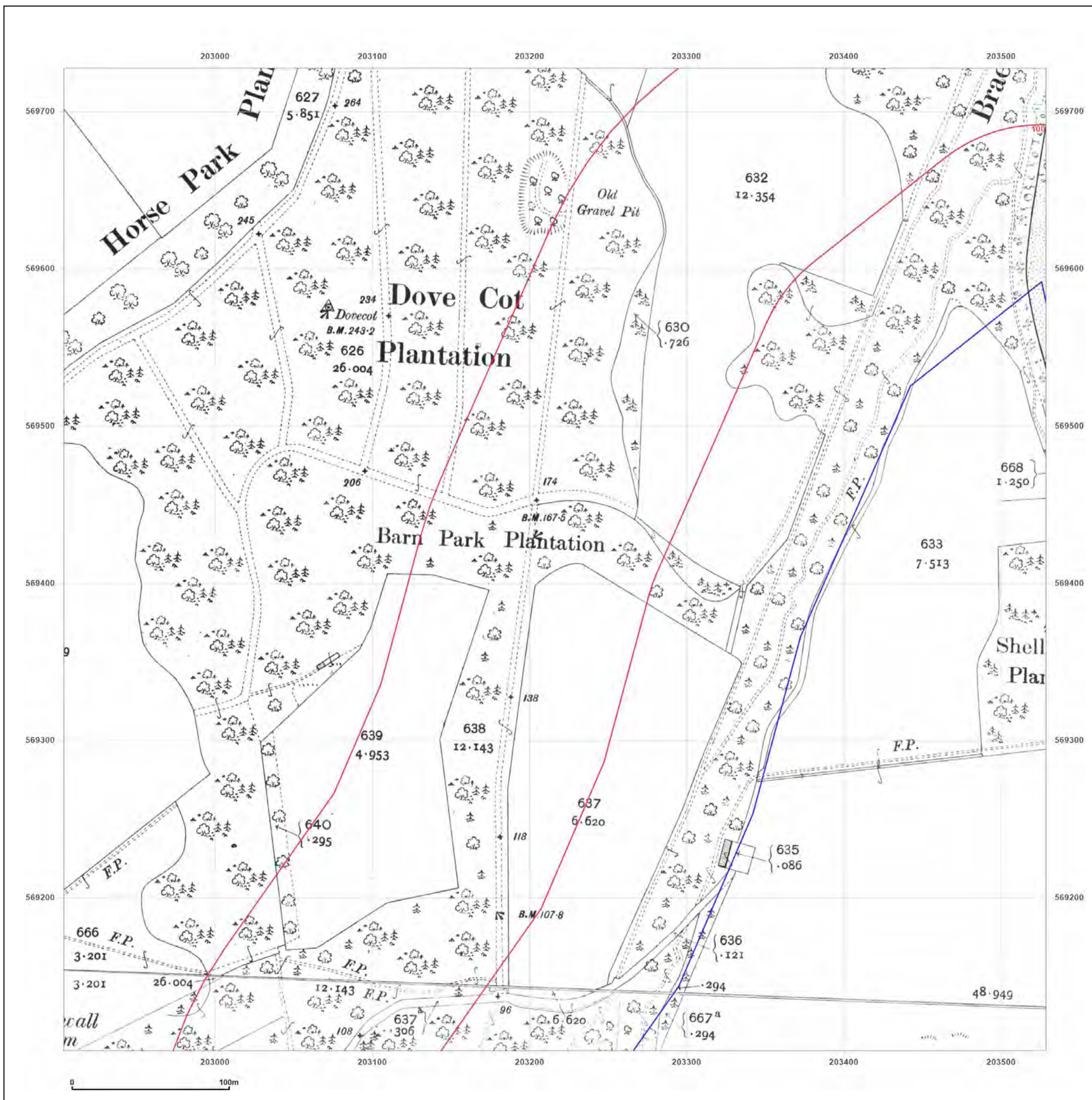


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Grid Ref: 203216, 569415

Map Name: National Grid

Map date: 1971

Scale: 1:2,500

Printed at: 1:2,500



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Edition N/A
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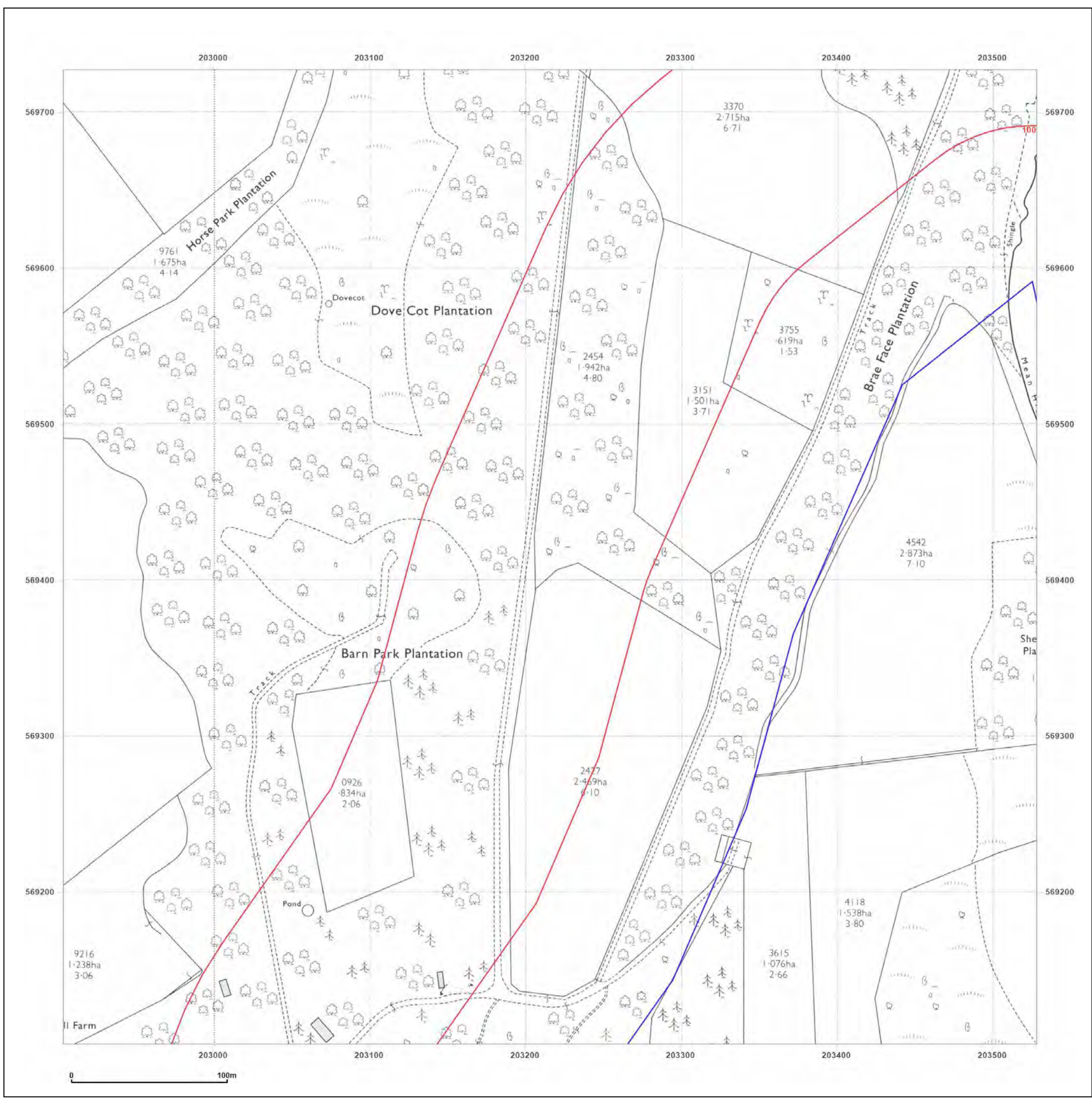


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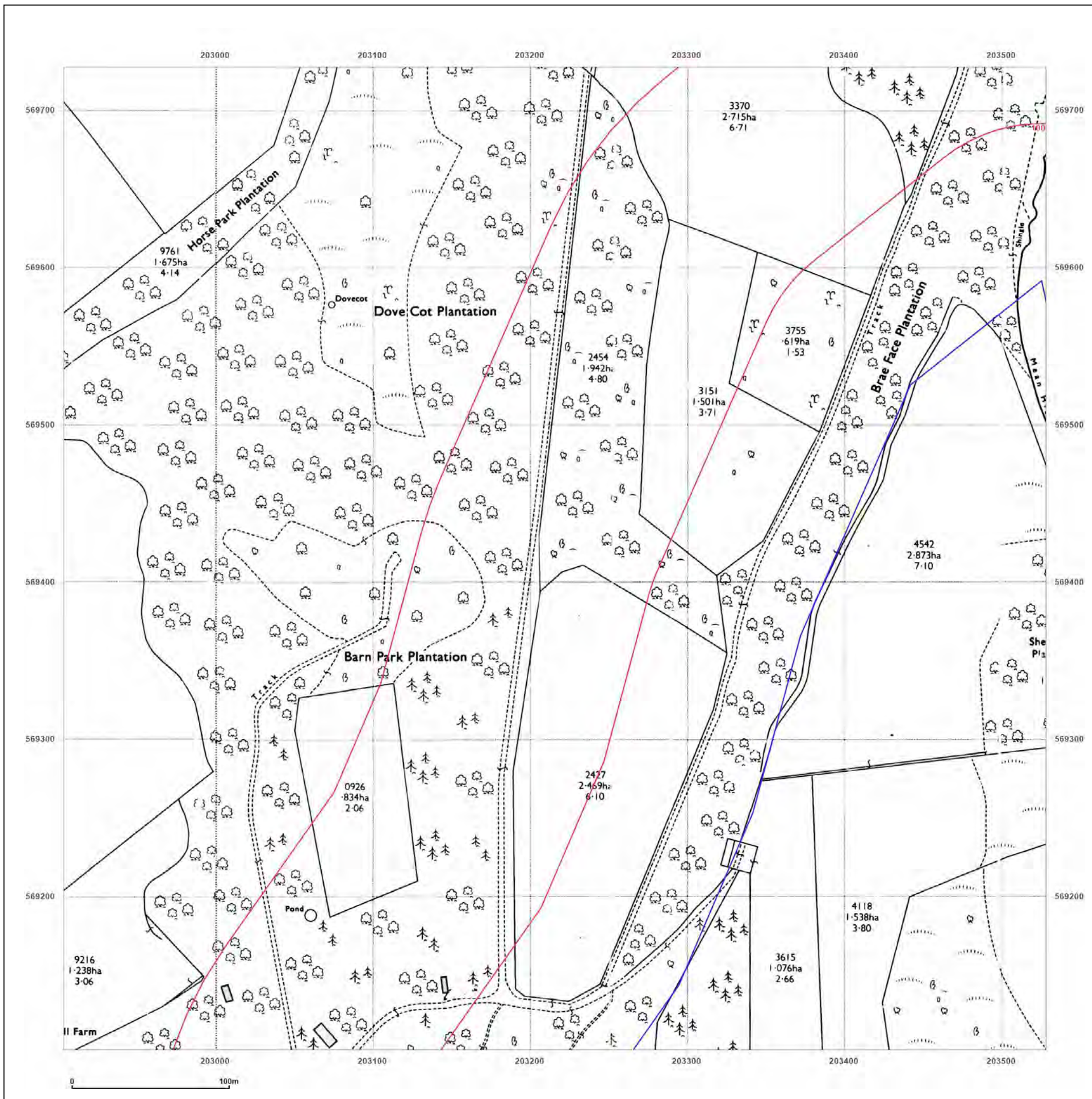


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Production date: 24 January 2023

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Site Details:

Project Capricorn, KIRKCOLM,
STRANRAER , DG9 ONX

Client Ref: EPL017854
Report Ref: GS-9313438_LS_1_2
Grid Ref: 203216, 569415

Map Name: National Grid

Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1995
Levelled N/A

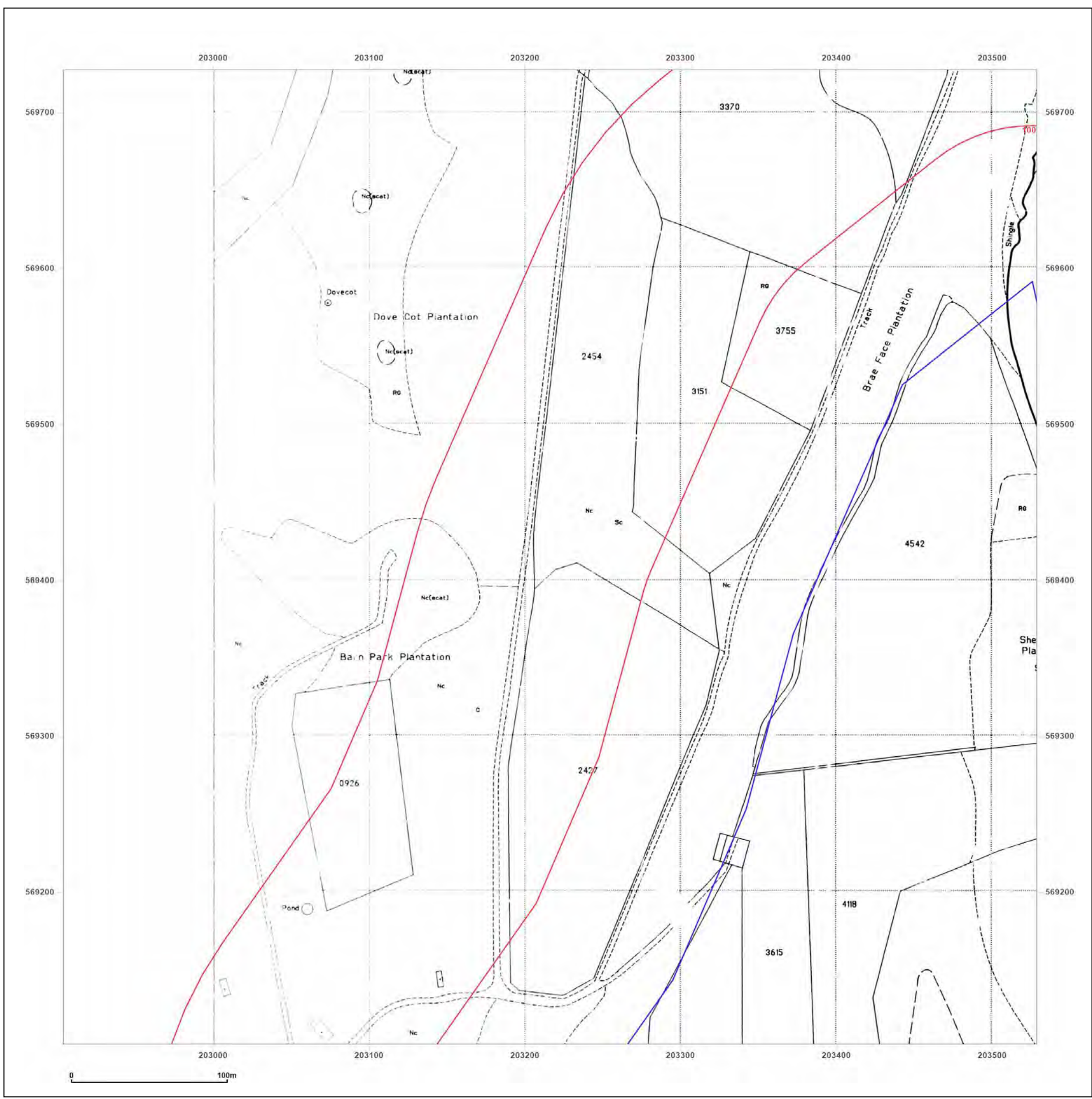


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Site Details:

Project Capricorn, KIRKCOLM,
STRANRAER , DG9 ONX

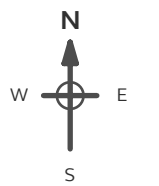
Client Ref: EPL017854
Report Ref: GS-9313438_LS_2_1
Grid Ref: 203841, 568790

Map Name: County Series

Map date: 1894

Scale: 1:2,500

Printed at: 1:2,500



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

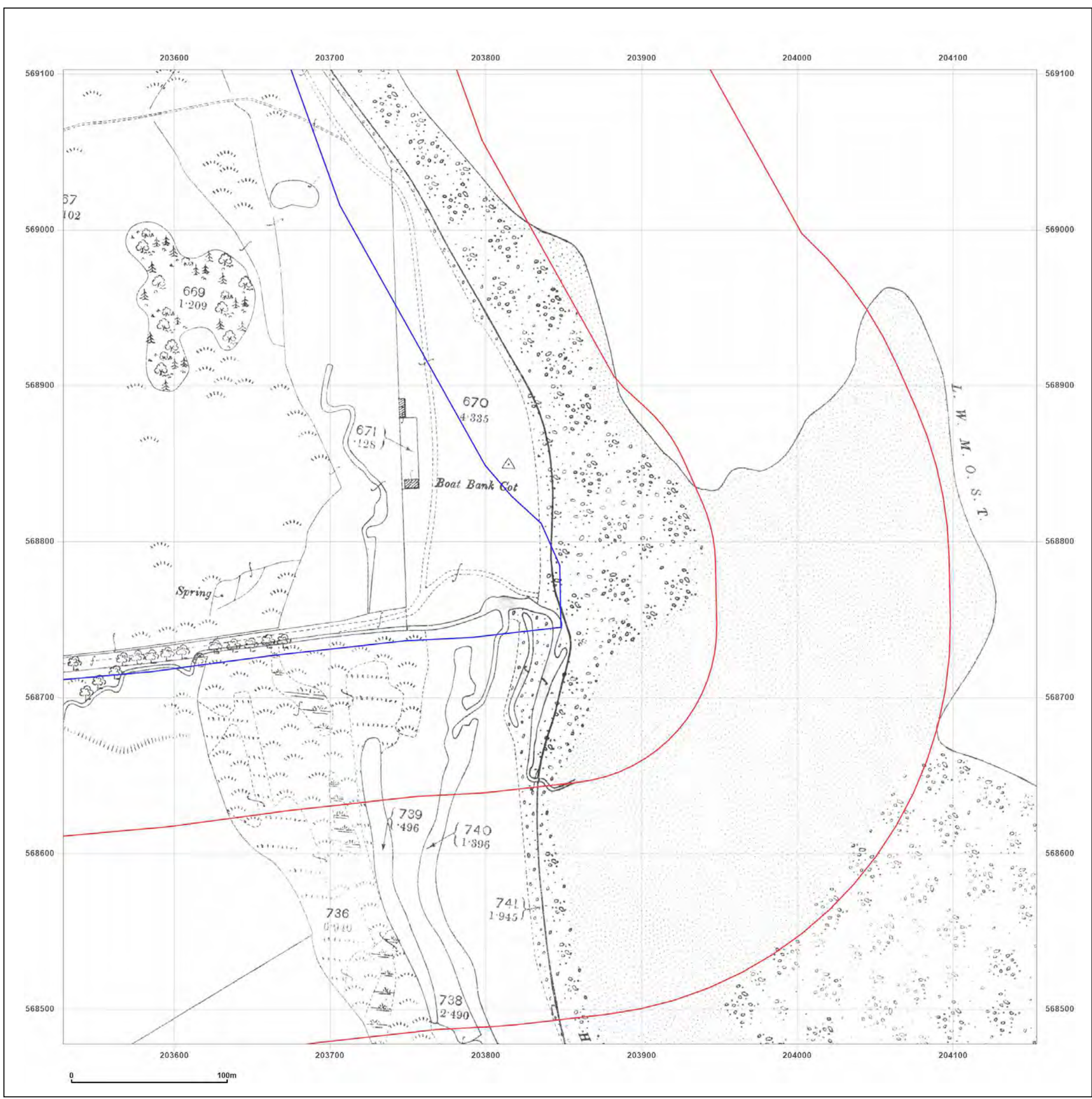


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Site Details:

Project Capricorn, KIRKCOLM,
STRANRAER , DG9 ONX

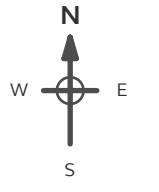
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Report Ref: GS-9313438_LS_2_1
Grid Ref: 203841, 568790

Map Name: County Series

Map date: 1908

Scale: 1:2,500

Printed at: 1:2,500



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

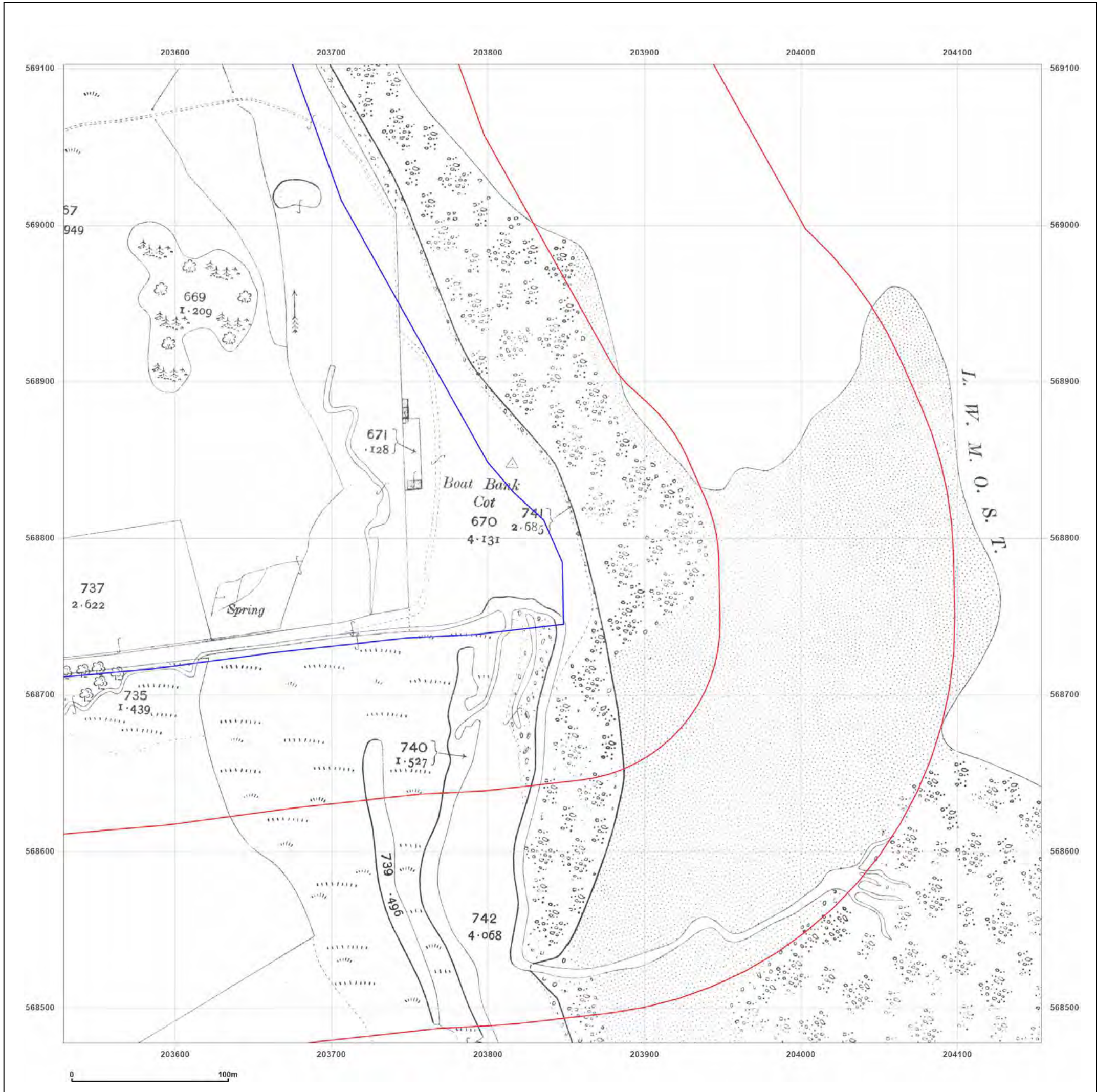


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Site Details:

Project Capricorn, KIRKCOLM,
STRANRAER , DG9 ONX

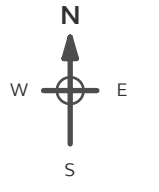
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Map Name: National Grid

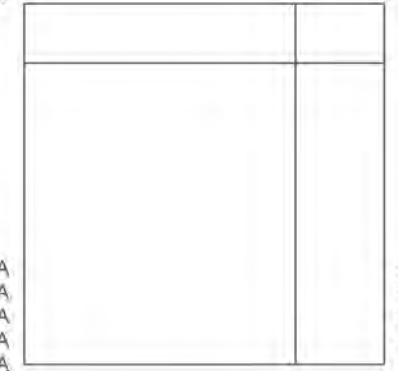
Map date: 1970-1971

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1970
Revised 1970
Edition N/A
Copyright 1971
Levelled 1955



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

Surveyed 1969
Revised 1969
Edition N/A
Copyright 1970
Levelled 1954

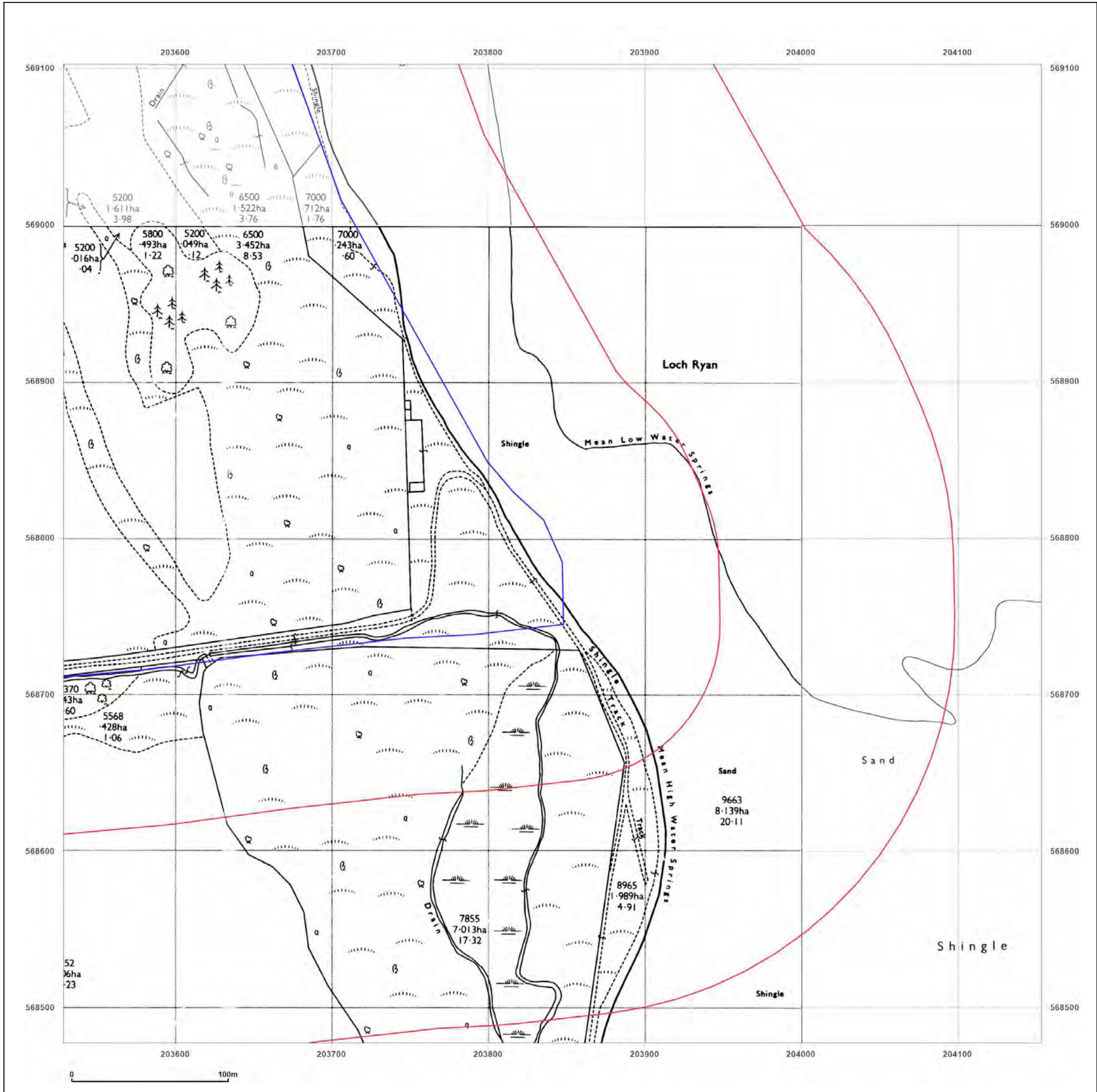


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Production date: 24 January 2023

Map legend available at:
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Site Details:

Project Capricorn, KIRKCOLM,
STRANRAER , DG9 0NX

Client Ref: EPL017854
Report Ref: GS-9313438_LS_2_1
Grid Ref: 203841, 568790

Map Name: National Grid

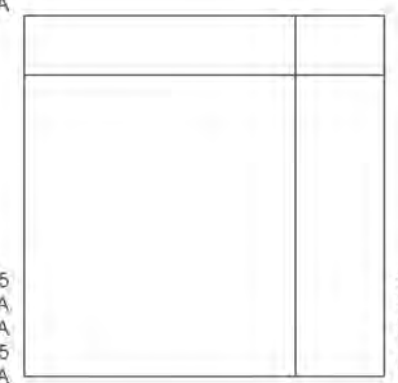
Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1995
Levelled N/A



Surveyed 1995
Revised N/A
Edition N/A
Copyright 1995
Levelled N/A

Surveyed 1995
Revised N/A
Edition N/A
Copyright 1995
Levelled N/A

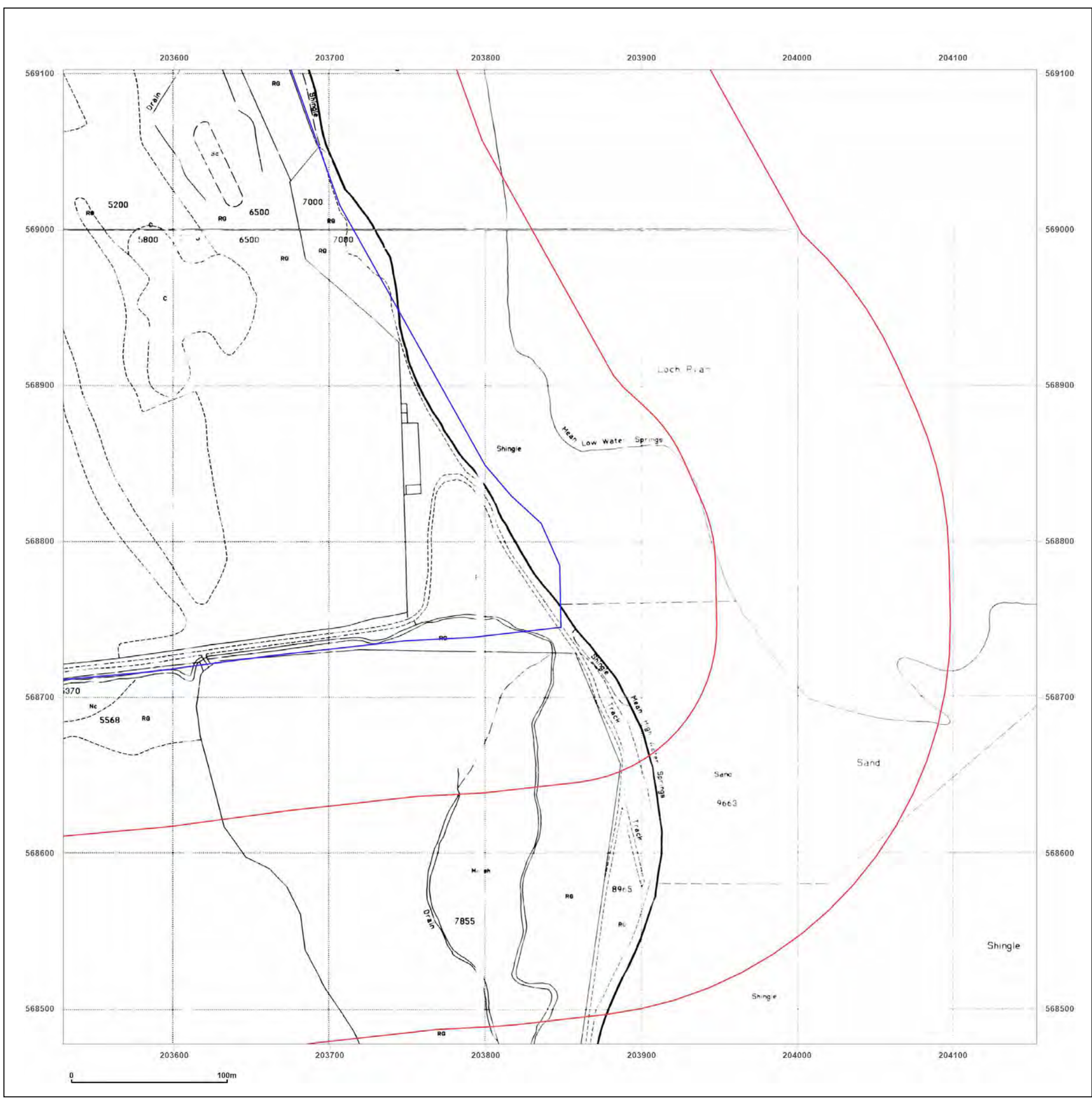


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Production date: 24 January 2023

Map legend available at:
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Site Details:

Project Capricorn, KIRKCOLM,
STRANRAER , DG9 0NX

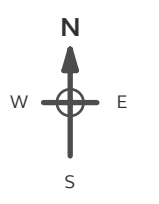
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Report Ref: GS-9313438_LS_2_2
Grid Ref: 203841, 569415

Map Name: County Series

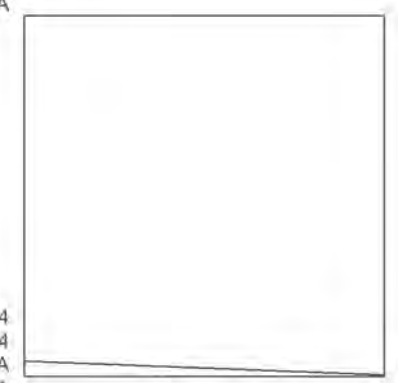
Map date: 1894

Scale: 1:2,500

Printed at: 1:2,500



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

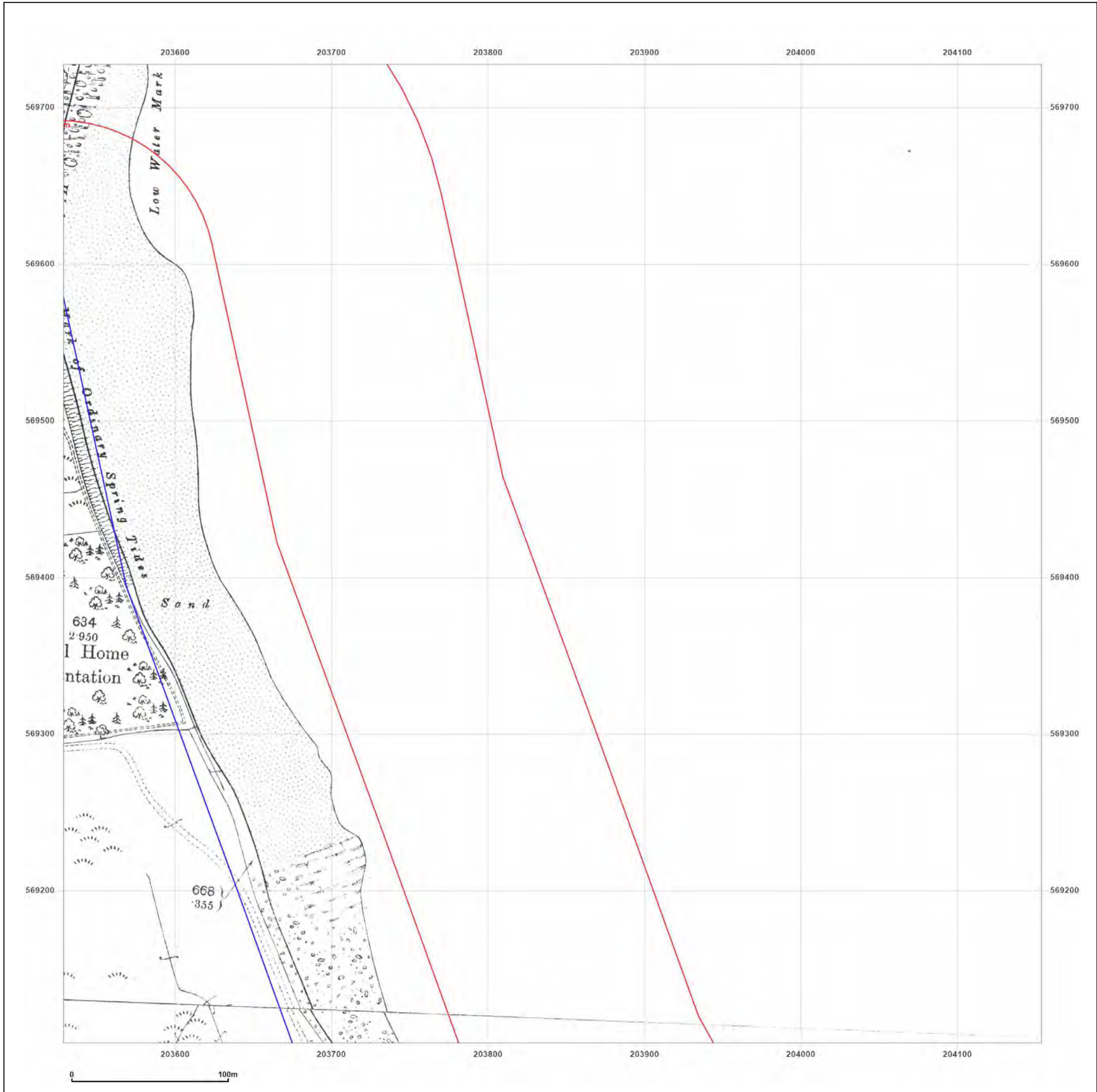


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Production date: 24 January 2023

Map legend available at:
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Site Details:

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STRANRAER , DG9 ONX

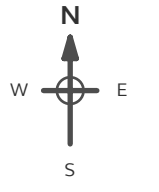
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Report Ref: GS-9313438_LS_2_2
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Map Name: County Series

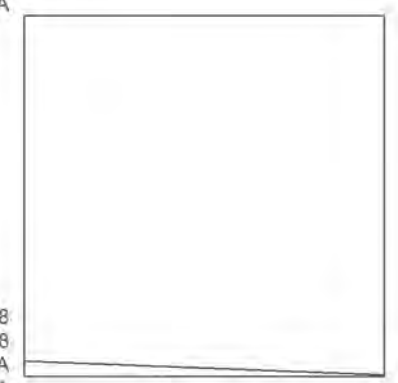
Map date: 1908

Scale: 1:2,500

Printed at: 1:2,500



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



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

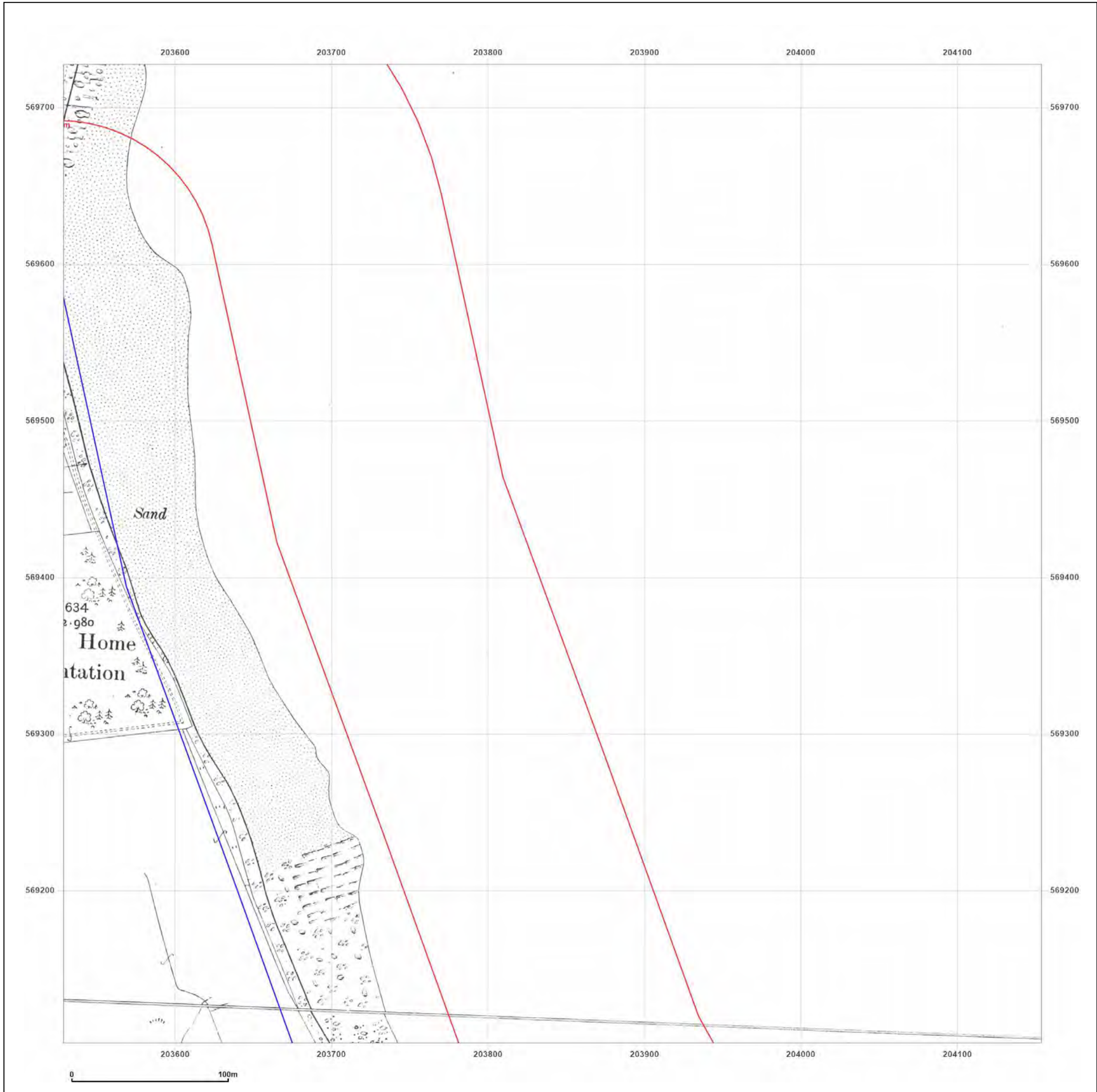


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Site Details:

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STRANRAER , DG9 ONX

Client Ref: EPL017854
Report Ref: GS-9313438_LS_2_2
Grid Ref: 203841, 569415

Map Name: National Grid

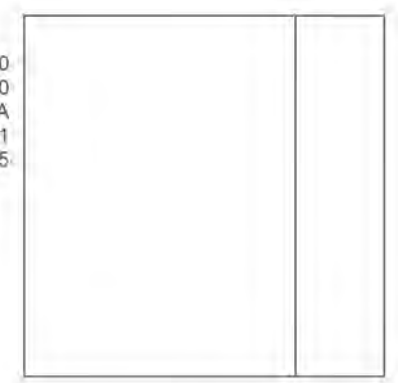
Map date: 1971

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1970
Revised 1970
Edition N/A
Copyright 1971
Levelled 1955

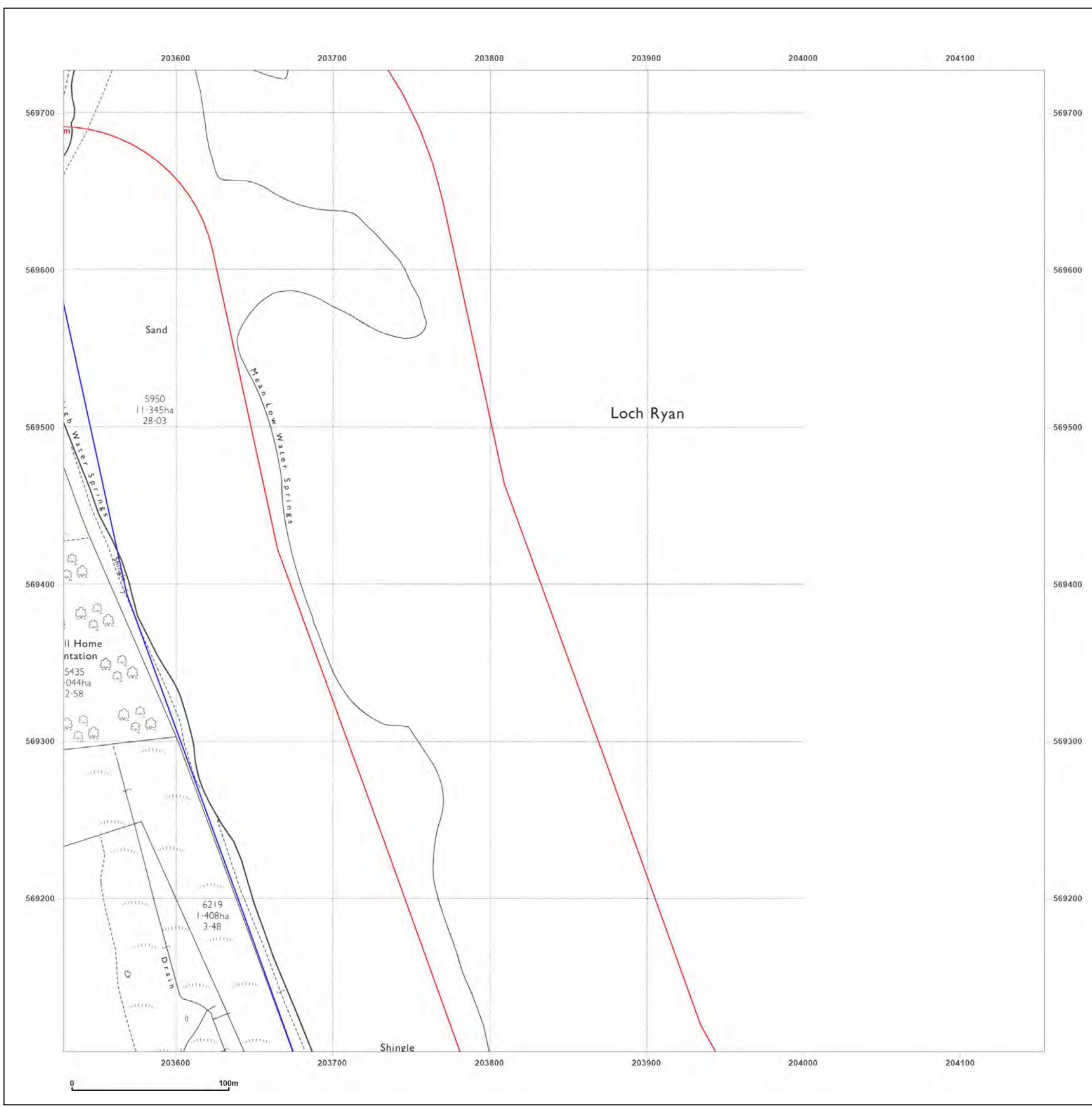


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Site Details:

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STRANRAER , DG9 0NX

Client Ref: EPL017854
Report Ref: GS-9313438_LS_2_2
Grid Ref: 203841, 569415

Map Name: National Grid

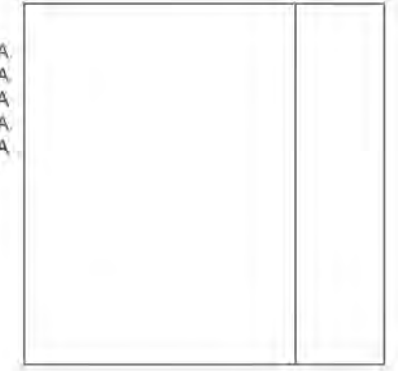
Map date: 1971

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Printed at: 1:2,500



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

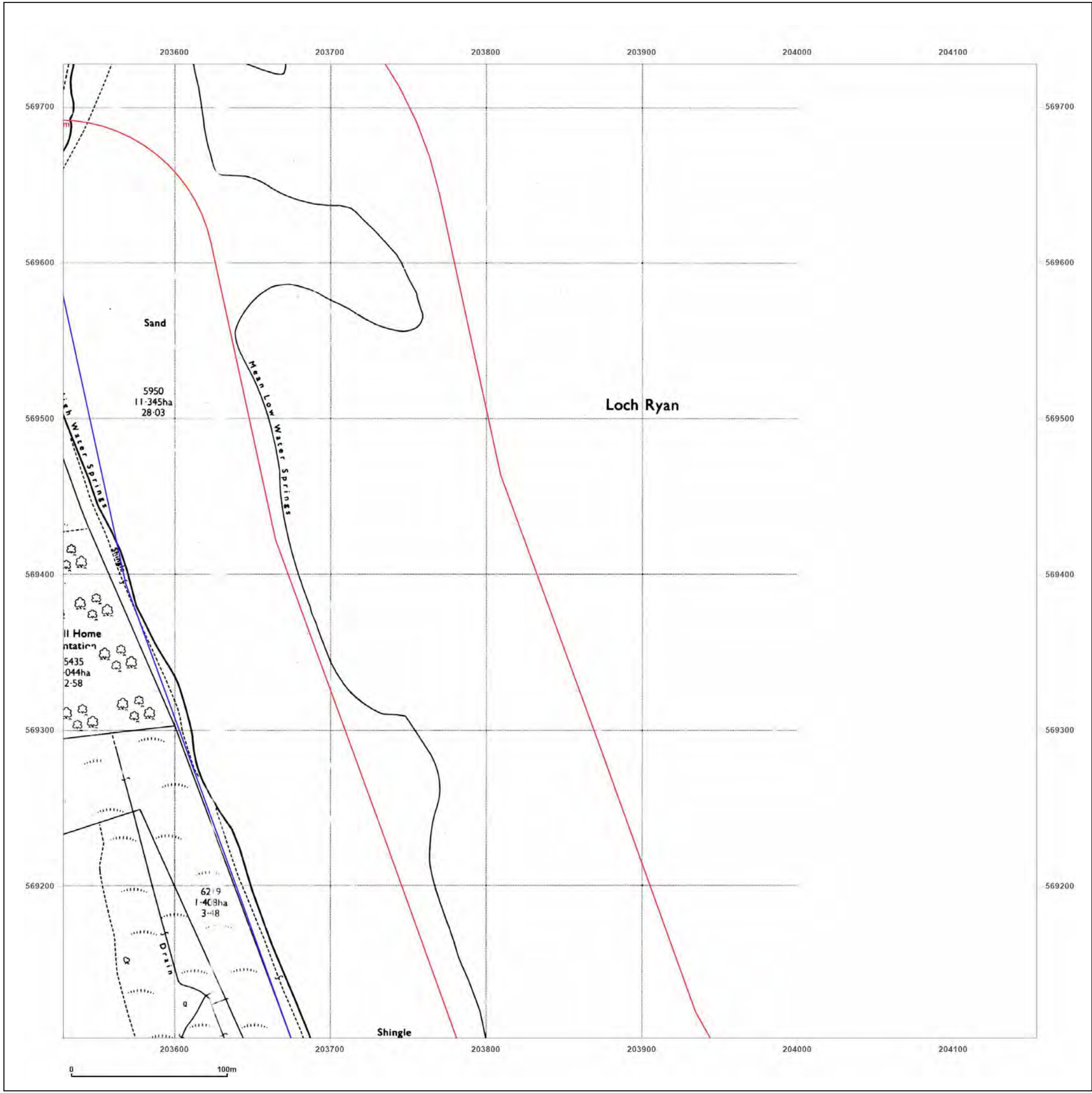


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Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Site Details:

Project Capricorn, KIRKCOLM,
STRANRAER , DG9 0NX

Client Ref: EPL017854
Report Ref: GS-9313438_LS_2_2
Grid Ref: 203841, 569415

Map Name: National Grid

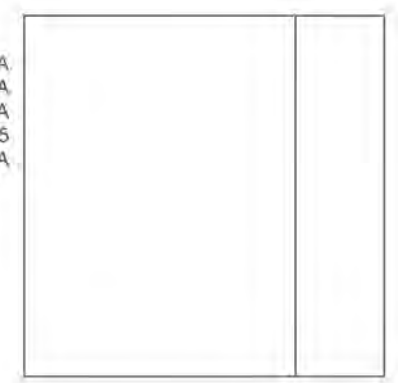
Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1995
Levelled N/A

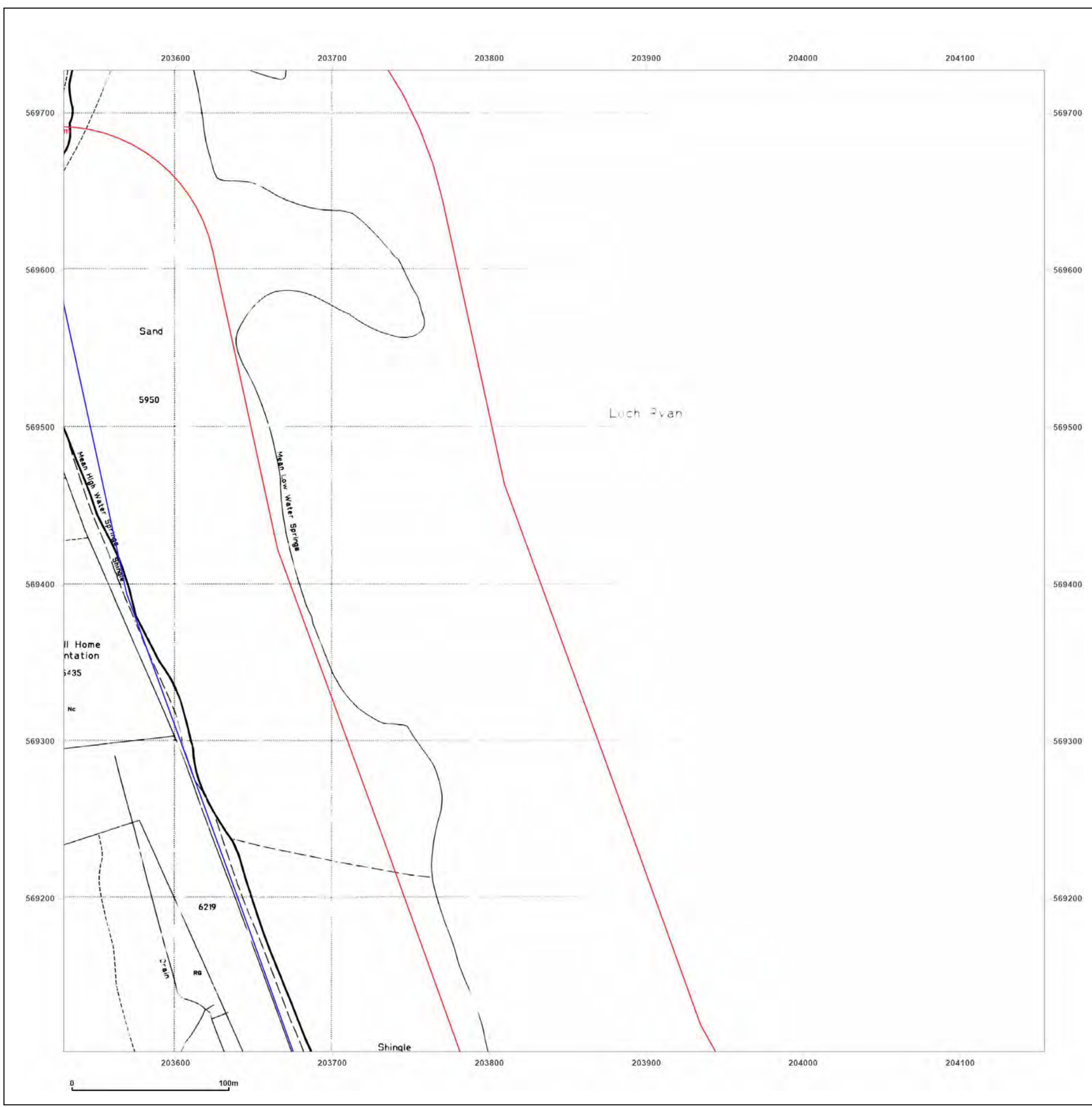


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Appendix D Regulatory Correspondence

From: info@scotland.nhs.uk
To: scotland.nhs.uk
Subject: OFFICIAL: Your Response to Environmental Information relating to site control at approx National Grid for 8021646 (approx. postcode S20 9RE)
Date: 15 February 2023 10:08:21

Please find below the Council's response to your request 5410396 which was received on 23/01/2023.

Details of request: We are currently carrying out a geo-environmental desk study on a parcel of land near Crowswell, Stameon. Please could carry out a search of your records for any environmental information relating to the site and within 250m of the site boundary?

The site is control at the approximate National Grid Reference NX2034609 (approx. postcode DG9 0XN) and a location plan and red line boundary is shown below for your information.

We are particularly interested in any issues concerning:

- Land contamination (including ground investigation or discharges under Part IIA)
- Environmental and historical health: (known or observed including any remaining records)
- Any former animal burial sites
- Surface water and groundwater abstractions (including any private water supplies)
- Discharge consent
- Controlled gas emissions and/or protection measures
- Prevention relating to unauthorised processes
- Air pollution controls
- Information relating to existing and historical above and below ground storage tanks via Local Authority Trading Standards records for details of Petroleum Licences information
- Enforcement (e.g. remediation and prohibition notices)
- Any sites of substantive local nature conservation and geological value, such as Sites of Importance for Nature Conservation (SINCs) or equivalent
- Environmental Health - nuisance complaints
- Any other information relating to the environmental susceptibility of the site
- Any historical ground investigations, geo-environmental studies and remediation reports and can they be shared
- Any records of ground instability (e.g. due to subsidence, ground collapse due to voids below etc.)
- Any relevant ground conditions information that may impact the proposed development
- Any plans showing potentially contaminative content and past land uses (and other features noted above) at the site

We would be grateful if you could provide a plan of the location of any potentially contaminative content past site uses and other features as above.

Response

As the information you have requested is environmental information, as defined in Regulation 2 of the Environmental Information (Scotland) Regulations 2004 (EIR), we are required to deal with your request under those Regulations. We have therefore applied the exemption in section 9(2) of Freedom of Information (Scotland) Act 2002 (FOISA) and deal with your request under the EIR above. Further information on the definition of 'environmental information' under the EIR is available at the following link: <https://canal.scot.nhs.uk/links/protection-and-control.aspx?url=https://www.stgpublicknowledge.info/2019/03/28/land%20fill%20sites%202022>

- There are no records of land contamination (including ground investigation or discharges under Part IIA) within 50m
- The only potentially contaminative past land use at the site is a sewage pumping station within the site boundary (grid reference NX 05453 66681)
- There are no known animal burial sites within 500m
- There are no known discharge consents at the site or in the surrounding area
- There are no known ground gas emissions and/or protection measures at the site or in the surrounding area
- There are no pre-ventions relating to unauthorised processes at the site or in the surrounding area
- There are no air pollution controls within 50m
- We hold no information relating to existing and historical above and below ground storage tanks at the site. In accordance with Regulation 9(6)(a) of the Environmental Information (Scotland) Regulations 2004, Dumfries and Galloway Council can confirm we do not hold the information requested.
- There are no enforcement (e.g. remediation and prohibition notices) at the site or in the surrounding area
- There are no sites of substantive local nature conservation and geological value within 500m
- Environmental Health nuisance complaints at the site or in the surrounding area
- We do not hold any historical ground investigations, geo-environmental studies or remediation reports for this site. In accordance with Regulation 9(6)(a) of the Environmental Information (Scotland) Regulations 2004, Dumfries and Galloway Council can confirm we do not hold the information requested.
- There are no records of ground instability at the site or in the surrounding area

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If you require any further clarification, please contact us. However, if you are not satisfied with the way in which your request has been dealt with, you can request us to carry out an internal review of the document by sending FOI@dg.gov.scot or writing to us within 40 working days of receiving this response.

If you are dissatisfied with the outcome of this review, you have the right to apply to the Scottish Information Commissioner for a decision. Appeals to the Commissioner can be made online at <https://canal.scot.nhs.uk/links/protection-and-control.aspx?url=https://www.stgpublicknowledge.info/2019/03/28/land%20fill%20sites%202022> or by writing to The Office of the Scottish Information Commissioner, Watson Centre, Dundee Road, St Andrews, Fife, KY16 9DE.

Kind Regards,

FOI Unit
Dumfries and Galloway Council

This email, from Dumfries and Galloway Council, and any files transmitted with it, is confidential and intended solely for the use of the individual or entity to whom they are addressed.

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Content: This email originated from outside of Stameon. Please take extra precautions.

Attention: Ce contenu peut provenir de l'extérieur de Stameon. Veuillez prendre des précautions supplémentaires.

Atenção: Este conteúdo eletrônico provém de fora de Stameon. Por favor, tomar precauções adicionais.

From: [Access to Information Enquiries](#)
To: [Burns, Callum](#)
Cc: [Access to Information Enquiries](#)
Subject: SEPA Access to Information Request – Response – F0194978
Date: 31 March 2023 12:33:24
Attachments: [image001.jpg](#)
[F0194978 EIR Response.pdf](#)

OFFICIAL

Dear Callum,
REQUEST FOR INFORMATION – RESPONSE

Please see the attached response to your request F0194978.

Please quote this in any future contact with us about your request.

Your rights

If you are not happy with our response you have the right to request a Formal Review from SEPA. For the review to be valid, you must ask for it within the next 40 days.

Guidance on your rights can be found on the Scottish Information Commissioner's website at the following link: <https://www.itspublicknowledge.info/asking-for-a-review>

Regards,
Alicia Jones
Access to Information
Scottish Environment Protection Agency (SEPA)



You can find latest information on our current service status and recovery from a significant cyber-attack on our website www.sepa.org.uk

The information contained in this email and any attachments may be confidential and is intended solely for the use of the intended recipients. Access, copying or re-use of the information in it by any other is not authorised. If you are not the intended recipient please notify us immediately by return email to <mailto:postmaster@sepa.org.uk>

Registered office: SEPA, Angus Smith Building, 6 Parklands Avenue, Eurocentral, Holytown, North Lanarkshire, ML1 4WQ.

Dh'fhaodadh gum bi am fiosrachadh sa phost-d seo agus ceanglachan sam bith a tha na chois dìomhair, agus cha bu chòir am fiosrachadh a bhith air a chleachdadh le neach sam bith ach an luchd-faighinn a bha còir am fiosrachadh fhaighinn. Chan fhaod neach sam bith eile cothrom fhaighinn air an fhiosrachadh a tha sa phost-d no a tha an cois a' phuist-d, chan fhaod iad lethbhreac a dhèanamh dheth no a chleachdadh a-rithist. Mura h-ann dhuibhse a tha am post-d seo, feuch gun inns sibh dhuinn sa bhad

le bhith cur post-d gu postmaster@sepa.org.uk

Oifis chlàraichte: Togalach Aonghais Mhic a' Ghobhainn, 6 Craobhraid Parklands, Eurocentral, Baile a' Chuilinn, Siorrachd Lannraig a Tuath, ML1 4WQ. Fo Achd Riaghladh nan Cumhachdan Rannsachaidh 2000, dh'fhaodadh gun tèid an siostam puist-d aig SEPA a sgrùdadh bho àm gu àm.

OFFICIAL

Caution: This email originated from outside of Stantec. Please take extra precaution.

Attention: Ce courriel provient de l'extérieur de Stantec. Veuillez prendre des précautions supplémentaires.

Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

From: [Access to Information Enquiries](#)
To: [Burns, Callum](#)
Subject: SEPA Access to Information Request – Update on your request – F0194978
Date: 24 February 2023 13:31:00
Attachments: [image010.png](#)
[image011.png](#)
[image012.gif](#)
[image013.png](#)
[image014.png](#)
[image015.png](#)
[image016.jpg](#)
[image017.png](#)
[image018.jpg](#)
[image019.jpg](#)
[image001.png](#)

OFFICIAL

Dear Callum

REQUEST FOR INFORMATION – UPDATE

I'm sorry that we have not issued you with a response by the statutory deadline 21 February 2023.

Please accept my apology for the delay in handling your request.

We are working on your request. We will respond as soon as possible.

Your Rights

You have the right to ask us for a Formal Review because we have not responded to your request in time. You have until XX/XX/2023 to ask us for this at foi@sepa.org.uk if you do not receive a response to your request.

You can find out more about Formal Reviews on the Scottish Information Commissioner's website <https://www.itspublicknowledge.info/asking-for-a-review>

Your unique reference number is F0194978. Please quote this when you contact us about your request.

Yours sincerely,

Alison Ewing
Access to Information
Scottish Environment Protection Agency (SEPA)



The information contained in this email and any attachments may be confidential and is intended solely for the use of the intended recipients. Access, copying or re-use of the information in it by any other is not authorised. If you are not the intended recipient please notify us immediately by return email to <mailto:postmaster@sepa.org.uk>

Registered office: Strathallan House, Castle Business Park, Stirling FK9 4TZ.

Dh'fhaodadh gum bi am fiosrachadh sa phost-d seo agus ceanglachan sam bith a tha na chois dìomhair, agus cha bu chòir am fiosrachadh a bhith air a chleachdadh le neach sam bith ach an luchd-faighinn a bha còir am fiosrachadh fhaighinn. Chan fhaod neach sam bith eile cothrom fhaighinn air an fhiosrachadh a tha sa phost-d no a tha an cois a' phuist-d, chan fhaod iad lethbhreac a dhèanamh dheth no a chleachdadh a-rithist. Mura h-ann dhuibhse a tha am post-d seo, feuch gun inns sibh dhuinn sa bhad le bhith cur post-d gu postmaster@sepa.org.uk

Oifis chlàraichte: Taigh Srath Alain, Pàirc Gnothachais a' Chaisteil, Sruighlea FK9 4TZ. Fo Achd Riaghladh nan Cumhachdan Rannsachaidh 2000, dh'fhaodadh gun tèid an siostam puist-d aig SEPA a sgrùdadh bho àm gu àm.

From: Access to Information Enquiries <foi@sepa.org.uk>

Sent: 25 January 2023 15:37

To: Burns, Callum <callum.burns@stantec.com>

Subject: RE: SEPA Access to Information Request – Clarification Acknowledgement – F0194978

OFFICIAL

Dear Callum

REMINDER - CLARIFICATION RECEIVED AND ACKNOWLEDGED

Thank you for providing the clarification needed to progress your request, unique reference number F0194978

Request

**[...] geo-environmental desk study on a parcel of land near Corsewall, Stranraer [...]
Please could carry out a search of your records for any environmental information relating to the site and within 250m of the site boundary?**

The site is centred at the approximate National Grid Reference NX034690 (approx. postcode is DG9 0NX) and a location plan and red line boundary is shown below for your information.

We are particularly interested in any issues concerning:

- 1. Land contamination (including ground investigated or designated under Part IIA)**
- 2. Operational and historical landfill sites (licensed or otherwise) including any monitoring records**
- 3. Any known animal burial sites**
- 4. Surface water and groundwater abstractions**
- 5. Discharge consents**
- 6. Explosive sites (including COMAH or other hazardous substances consents)**
- 7. Pollution Prevention and Control (PPC) activities and permits**
- 8. Radioactive substances activities and authorisations**
- 9. Prosecutions relating to authorised processes**
- 10. Enforcement (e.g. remediation) and prohibition notices**
- 11. Any records of ground instability (e.g., due to subsidence, ground collapse due to soluble bedrock etc)**
- 12. Any relevant ground conditions information that may impact the proposed development**
- 13. Any plans showing potentially contaminative current and past land uses (and other features noted above) at the site**

We would be grateful if you could provide a plan of the location of any potentially contaminative current/ past site uses and other features as above.

Clarification

Regards your clarification on timeframe. Essentially no timeframe limit please. We would be grateful for any current/historical records you may have on the points we listed. That way we can comprehensively collate any previous environmentally related information on the site for our desk based preliminary risk assessment report.

What happens next

Your clarification will now be forwarded to the relevant business area(s) to search for the requested information. We are working hard to answer requests promptly, and in line with the Environmental Information Regulations/Freedom of Information (Scotland) Act within twenty working days of the date your clarification was received. In this case no later than **22 February 2023**

Please note, the business area(s) holding the information may need additional clarification from you to locate the information you have requested once they have received your clarification. You will be contacted again should this be necessary.

Service Status

We must advise you that the continued disruption due to the cyber-attack in December 2020 and office restrictions due to COVID-19, have significantly affected SEPA's ability to respond to Access to Information enquiries. Much of our information impacted by the cyber-attack remains offline and we continue to be unable to provide copies of our hard copy information. Where possible we will provide you with the information requested.

You can check the status of our Access to Information service, which is updated weekly.

- [Check the service status](#)

You can also access further information about SEPA's approach to the delivery of services and the cyber-attack.

- [Information about the cyber-attack](#)

We continue to keep the Scottish Information Commissioner updated about our service status. In relation to systemic issues arising out of the 24 December 2020 cyber-attack, the Commissioner is working with us to assist in rebuilding our Access to Information capacity, by way of a Level 2 Intervention under his Intervention Procedures.

While you wait for your response

If you haven't already done so, you may wish to check the [SEPA website](#) or search our [Disclosure Log](#) for information we've already published that may be relevant to the subject of your request. You can search our Disclosure Log by entering a key search word in the Title box and clicking on the filter icon .

You can also check [Scotland's Environment website](#). This website brings together environmental information and data in one place so that is easy to search, discover, analyse and interpret.

If you have any queries in the meantime please contact us.

Regards,
Alison Ewing

From: Burns, Callum <callum.burns@stantec.com>

Sent: 25 January 2023 10:53

To: Access to Information Enquiries <foi@sepa.org.uk>

Subject: RE: SEPA Access to Information Request – Clarification – F0194978

CAUTION: This email originated from outside the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

F0194978

Hello Allison,

Regards your clarification on timeframe. Essentially no timeframe limit please. We would be grateful for any current/historical records you may have on the points we listed. That way we can comprehensively collate any previous environmentally related information on the site for our desk based preliminary risk assessment report.

Thank you and we look forward to hearing back from you.

Kind regards

Callum Burns

BSc (hons) MSc CSci MEnvSc
Senior Geoenvironmental Scientist

Infrastructure & Buildings, Stantec UK
3rd Floor, Capital Square, 58 Morrison Street, Edinburgh, EH3 8BP, UK

Direct: +44 (0) 131 297 7013
Mobile: +44 (0) [Redacted]
callum.burns@stantec.com



Better Together, Even If We're Apart. [Read more](#) about Stantec's COVID-19 response, including remote working and business continuity measures.



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Please consider the environment before printing this email.

From: Access to Information Enquiries <foi@sepa.org.uk>
Sent: 25 January 2023 09:34
To: Burns, Callum <callum.burns@stantec.com>
Subject: SEPA Access to Information Request – Clarification – F0194978

OFFICIAL

Dear Callum

CLARIFICATION OF YOUR REQUEST REQUIRED

Thank you for your request.

We are writing with regards to your request, which we received on 23 January 2023 in which you asked for the following information:

[...] geo-environmental desk study on a parcel of land near Corsewall, Stranraer [...]
Please could carry out a search of your records for any environmental information relating to the site and within 250m of the site boundary?
The site is centred at the approximate National Grid Reference NX034690 (approx. postcode is DG9 0NX) and a location plan and red line boundary is shown below for your information.
We are particularly interested in any issues concerning:

1. **Land contamination (including ground investigated or designated under Part IIA)**
2. **Operational and historical landfill sites (licensed or otherwise) including any monitoring records**
3. **Any known animal burial sites**
4. **Surface water and groundwater abstractions**
5. **Discharge consents**
6. **Explosive sites (including COMAH or other hazardous substances consents)**
7. **Pollution Prevention and Control (PPC) activities and permits**
8. **Radioactive substances activities and authorisations**
9. **Prosecutions relating to authorised processes**
10. **Enforcement (e.g. remediation) and prohibition notices**
11. **Any records of ground instability (e.g., due to subsidence, ground collapse due to soluble bedrock etc)**
12. **Any relevant ground conditions information that may impact the proposed development**
13. **Any plans showing potentially contaminative current and past land uses (and other features noted above) at the site**

**We would be grateful if you could provide a plan of the location of any potentially contaminative current/ past site uses and other features as above.
[...]**

In order to proceed with your request, we need to clarify the following points.

Can you please provide a timeframe for the information that you require? E.g. last 3 years

Once we have received these details, we will be pleased to respond to your request within 20 working days. Your unique reference number is F0194978. Please quote this in any future contact with us about your request.

Thanks
Alison Ewing

OFFICIAL

From: Burns, Callum <callum.burns@stantec.com>
Sent: 23 January 2023 15:20
To: Access to Information Enquiries <foi@sepa.org.uk>
Subject: Habitat Restoration Loch Ryan - Environmental Information Request

CAUTION: This email originated from outside the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Dear SEPA,

We are currently carrying out a geo-environmental desk study on a parcel of land near Corsewall, Stranraer, on behalf of our client. Please could carry out a search of your records for any environmental information relating to the site and within 250m of the site boundary?

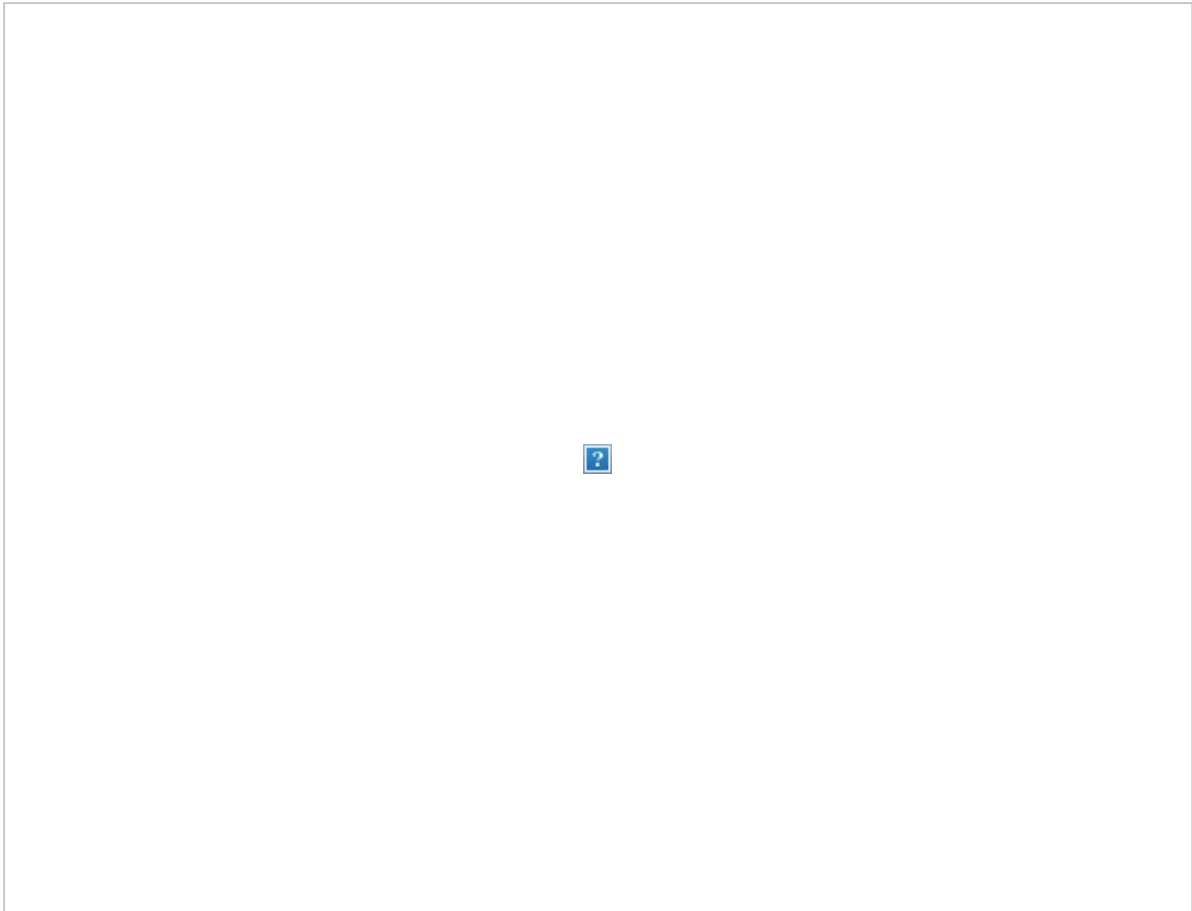
The site is centred at the approximate National Grid Reference NX034690 (approx. postcode is **DG9 0NX**) and a location plan and red line boundary is shown below for your information.

We are particularly interested in any issues concerning:

- Land contamination (including ground investigated or designated under Part IIA)
- Operational and historical landfill sites (licensed or otherwise) including any monitoring records
 - Any known animal burial sites
 - Surface water and groundwater abstractions
 - Discharge consents
 - Explosive sites (including COMAH or other hazardous substances consents)
 - Pollution Prevention and Control (PPC) activities and permits
 - Radioactive substances activities and authorisations
 - Prosecutions relating to authorised processes
 - Enforcement (e.g. remediation) and prohibition notices
 - Any records of ground instability (e.g., due to subsidence, ground collapse due to soluble bedrock etc)
 - Any relevant ground conditions information that may impact the proposed development
 - Any plans showing potentially contaminative current and past land uses (and other features noted above) at the site

We would be grateful if you could provide a plan of the location of any potentially contaminative current/ past site uses and other features as above.

If there are any queries relating to the above, my contact details are below.



Kind regards

Callum Burns

BSc (hons) MSc CSci MEnvSc
Senior Geoenvironmental Scientist

Infrastructure & Buildings, Stantec UK
3rd Floor, Capital Square, 58 Morrison Street, Edinburgh, EH3 8BP, UK

Direct: +44 (0) 131 297 7013
Mobile: +44 (0) [Redacted]
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OFFICIAL

OFFICIAL

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Attention: Ce courriel provient de l'extérieur de Stantec. Veuillez prendre des précautions supplémentaires.


Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

Appendix E Risk Estimation Tables

Receptor	Receptor Sensitivity ('0' if not present)	Pathway	Present (Y=1, N=0)	EPH & Solvents	PAHs	Inorganics and Metals	Asbestos	Biocides	Permanent Gases	Consequence	Probability/ Likelihood	Estimated Risk	
Human Health - On-Site Current Users	4	Ingestion of fruit or vegetable leaf or roots	0	✓	✓	✓	x	✓	x	N/A	N/A	N/A	
		Ingestion of contaminated drinking water	1	✓	✓	x	✓	x	Minor	Unlikely	Very Low		
		Ingestion of water / sediments when swimming	1	✓	✓	✓	✓	✓	Minor	Unlikely	Very Low		
		Ingestion of soil/dust indoors	0	✓	✓	✓	✓	✓	x	N/A	N/A	N/A	
		Ingestion of soil/dust outdoors	1	✓	✓	✓	✓	✓	x	Minor	Low	Very Low	
		Inhalation of particles (dust / soil) indoor and outdoor	1	✓	✓	✓	✓	✓	x	Minor	Low	Very Low	
		Inhalation of vapours/gases - outdoor	1	✓	x	x	x	x	✓	Minor	Unlikely	Very Low	
		Inhalation of vapours/gases - indoor	0	✓	x	x	x	x	✓	N/A	N/A	N/A	
		Dermal absorption via direct contact with soil	1	✓	✓	✓	✓	✓	✓	x	Minor	Low	Very Low
		Dermal absorption via waters (swimming / showering)	1	✓	✓	✓	✓	✓	✓	x	Minor	Unlikely	Very Low
Human Health On-Site Future User	4	Ingestion of fruit or vegetable leaf or roots	0	✓	✓	✓	x	✓	x	N/A	N/A	N/A	
		Ingestion of contaminated drinking water	1	✓	✓	x	✓	x	Minor	Unlikely	Very Low		
		Ingestion of water / sediments when swimming	1	✓	✓	x	x	✓	x	Minor	Unlikely	Very Low	
		Ingestion of soil/dust indoors	0	✓	✓	✓	✓	✓	x	N/A	N/A	N/A	
		Ingestion of soil/dust outdoors	1	✓	✓	✓	✓	✓	x	Minor	Low	Very Low	
		Inhalation of particles (dust / soil) indoor and outdoor	1	✓	✓	✓	✓	✓	x	Minor	Low	Very Low	
		Inhalation of vapours - outdoor	1	✓	x	x	x	x	✓	Minor	Unlikely	Very Low	
		Inhalation of vapours - indoor	0	✓	x	x	x	x	✓	N/A	N/A	N/A	
		Dermal absorption via direct contact with soil	1	✓	✓	✓	✓	✓	✓	x	Minor	Low	Very Low
		Dermal absorption via waters (swimming / showering)	1	✓	✓	✓	✓	✓	✓	x	Minor	Unlikely	Very Low
Human Health - Neighbours	5	Ingestion of fruit or vegetable leaf or roots	1	✓	✓	✓	x	✓	x	Mild	Unlikely	Very Low	
		Ingestion of contaminated drinking water	1	✓	✓	x	✓	x	Minor	Unlikely	Very Low		
		Ingestion of water / sediments when swimming	1	✓	✓	x	x	✓	x	Mild	Unlikely	Very Low	
		Ingestion of soil/dust indoors	1	✓	✓	✓	✓	✓	x	Mild	Unlikely	Very Low	
		Ingestion of soil/dust outdoors	1	✓	✓	✓	✓	✓	x	Mild	Unlikely	Very Low	
		Inhalation of particles (dust / soil) indoor and outdoor	1	✓	✓	✓	✓	✓	x	Mild	Unlikely	Very Low	
		Inhalation of vapours - outdoor	1	✓	x	x	x	x	✓	Mild	Unlikely	Very Low	
		Inhalation of vapours - indoor	1	✓	x	x	x	x	✓	Mild	Unlikely	Very Low	
		Dermal absorption via direct contact with soil	1	✓	✓	✓	✓	✓	✓	Mild	Unlikely	Very Low	
		Dermal absorption via waters (swimming / showering)	1	✓	✓	✓	✓	✓	✓	Mild	Unlikely	Very Low	
Human Health - Construction/ Maintenance Workers	4	Ingestion of soil/dust indoors	0	✓	✓	✓	✓	✓	x	N/A	N/A	N/A	
		Ingestion of soil/dust outdoors	1	✓	✓	✓	✓	✓	x	Minor	Low	Very Low	
		Inhalation of particles (dust / soil) outdoor	1	✓	✓	✓	✓	✓	x	Minor	Low	Very Low	
		Inhalation of vapours - outdoor	1	✓	x	x	x	x	✓	Minor	Low	Very Low	
		Inhalation of vapours - indoor	0	✓	x	x	x	x	✓	N/A	N/A	N/A	
		Dermal absorption via direct contact with soil	1	✓	✓	✓	✓	✓	✓	x	Minor	Likely	Low
Groundwater (Shallow)	3	Leaching	1	✓	✓	✓	x	✓	x	Minor	Low	Very Low	
		Migration via natural or anthropogenic	1	✓	✓	✓	x	✓	x	Minor	Low	Very Low	
Groundwater (Deep)	2	Leaching	1	✓	✓	✓	x	✓	x	Minor	Low	Very Low	
		Migration via natural or anthropogenic	1	✓	✓	✓	x	✓	x	Minor	Low	Very Low	
Surface Water	3	Direct runoff or discharges from pipes	1	✓	✓	✓	✓	✓	x	Minor	Likely	Low	
		Indirect via recharge from groundwater (hydraulic flow)	1	✓	✓	✓	✓	✓	x	Minor	Low	Very Low	
		Deposition of wind blown dust	1	✓	✓	✓	✓	✓	x	Minor	Unlikely	Very Low	
Property - Buildings	1	Direct contact	1	✓	✓	✓	x	x	x	Minor	Low	Very Low	
		Explosion due to gas migration via natural / anthropogenic	0	✓	x	x	x	x	✓	N/A	N/A	N/A	
Ecological Systems	1	Direct deposition of particles / dust - wind blown or flood	1	✓	✓	✓	✓	✓	x	Minor	Low	Very Low	
		Indirect - through watering	1	✓	✓	✓	x	✓	x	Minor	Low	Very Low	
		Inhalation of gases/vapours or particulates/dust by animals	1	✓	✓	✓	✓	✓	✓	Minor	Low	Very Low	
Property - Animal/Crop	1	Ingestion of vegetation / water / soil by animals	1	✓	✓	✓	✓	✓	x	Minor	Low	Very Low	
		Direct (including deposition via wind or flood)	1	✓	✓	✓	✓	✓	x	Minor	Low	Very Low	
		Indirect (through watering)	1	✓	✓	✓	x	✓	x	Minor	Low	Very Low	
		Inhalation of gas / vapour / particulates / dust by animals	1	✓	✓	✓	✓	✓	✓	Minor	Low	Very Low	
Ingestion of vegetation / water / soil by animals	1		1	✓	✓	✓	✓	✓	x	Minor	Low	Very Low	

Risk estimation establishes the magnitude and probability of the possible consequences (what degree of harm might result and how likely). The criteria for classifying probability and consequence are set out in Tables 4 and 5 of the Stantec methodology. Green text highlights one or more elements of the Pollutant Linkage are missing and therefore eliminated

EPH = Extractable hydrocarbons
 PAHs = Poly Aromatic Hydrocarbons
 Note For Metals there is an Inhalation pathway if Mercury is present
 Note for PAHs there are Inhalation and/or Solubility pathways for some eg Naphthalene

	Client	Equinor		Loch Ryan Habitat Restoration, Stranraer, Dumfries & Galloway				Date	07/02/2023
			TABLE SUMMARISING POLLUTANT LINKAGES AND RISK ESTIMATION				A3 Scale	NTS	
Caversham Bridge House, Waterman Place, Reading, RG1 8DN Tel 0118 950 0761 Fax 0118 959 7499		HAZARD CLASSIFICATION	1	THE POTENTIAL CONTAMINANTS OF CONCERN ARE :- Generally, metals, inorganics, EPH, ground gases, inorganic ions, fuel oils, micro-organisms, hydraulic fluids, aviation kerosene, gasoline and diesel. De-icing chemicals including glycol, urea and calcium and magnesium acetate-based products. Possible organic solvents including ketones e.g., acetone, methanol, esters and chlorinated compounds such as Polychlorinated Biphenyls (PCBs). Possible firefighting agents including fluorinated surfactants. Washing agents such as wheel cleaners e.g., potassium hydroxide. Weed killers/ herbicides. Corrosion inhibitors such as aluminium paints. □				Drawn By	CB
								Checked By	GS

Risk Class	Consequence Value	
	Lower Boundary	Upper Boundary
Severe	20	25
Medium	10	16
Mild	5	9
Minor	1	4

Consequence Value	
Minor	2
Mild	4
Medium	6
Severe	8

Probability Value	
Unlikely	3
Low	5
Likely	7
High	9

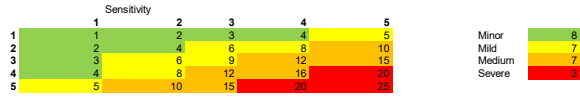
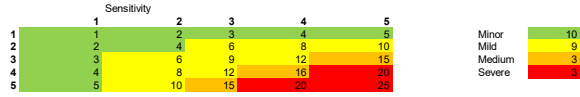
	Estimate Risk Value			
	Severe	Medium	Mild	Minor
High	72	54	36	18
Likely	56	42	28	14
Low	40	30	20	10
Unlikely	24	18	12	6

	Estimate Risk Category			
	Severe	Medium	Mild	Minor
High	Very High	High	Moderate	Low
Likely	High	Moderate	Moderate	Low
Low	Moderate	Moderate	Low	Very Low
Unlikely	Low	Low	Very Low	Very Low

Risk	Lower Boundary	Upper Boundary
Very High	72	72
High	42	56
Moderate	28	42
Moderate/Low		
Low	14	24
Very Low	6	12

1
3
5
5
3

Current Consequence Banding



**USER DEVELOPED APPLICATIONS –
CHECK AND REVIEW RECORD**

SECTION A: Application Details

Title:	Risk Estimation Table	Ver:	1	Rev:		Developer:	OT
Description:	Presentation of results to generate an estimated risk level						
Notes on revision:							

SECTION B: Validation Information

Section	Description	Checked By:	Date
Manual entry	Manual entry of receptor entry		
VBA Processing	Processing of data for presentation		
Calculations	Complex arithmetic calculations and built-in functions		
Output	Summary table of data		
Comments by Validator:			

SECTION C: Risk Rating

Criteria	Description	Risk
Complexity	Spreadsheet with complex built-in functions and/or a few external links	Medium
Human Input	Spreadsheet with multiple steps of moderate difficulty and/or manual data entry	Medium

SECTION D: Instructions for use and checking

Instructions for Use:
 Entry in yellow columns
 See email from Kobi dated 13th September 2017 and below.

You must manually enter your site hazard classification score (see Table 1 of the methodology)
 You must manually enter your receptor sensitivity value (see Table 2 of the methodology)
 You must manually enter whether a pathway is present or not. This has changed from 'Y' to a numerical value (Y=1, N=0).
 Do not change anything in any of the blue columns, particularly the exposure pathways (ticks and crosses).
 When you have done steps 1 to 3, the consequence score will be calculated automatically and the consequence severity will be populated for you (see Table 5 of the methodology).
 You must then use the drop down options to choose the probability/frequency (see Table 4 of the methodology for definitions) and the Estimated Risk is automatically populated for you in accordance with Table 6 of the methodology.
 Please fill in the 'Client' box and 'Potential Contaminants of Concern' box at the bottom of the table.

In addition to these steps, you will need to first save the table locally from the internet (it is saved in Section 4.02.03 of the database), and before use – you must check that your pc has 'automatic' ticked under the Calculation Options tab of the Formulae tool bar (otherwise the calculations may not occur automatically).

Requirements for checking:

Finally, please do a sanity check on the calculations by choosing at least 3 different receptors and pathways to do manual calculations and verify the answers.

SECTION E: Comments and Issues

Comments by Users:

Application Types

Data processing
Data presentation
Design analysis

Status

Development
Developer testing
User testing
Final Approval

Input

Manual entry into selected cells	1
Combined manual and automated entry	0
Automated entry from other applications	0

Processing

None	1
Processing of data for presentation	0
Processing of data for input to calculations	0

Calculation

None	0
Basic arithmetic calculations and built-in functions	0
Complex arithmetic calculations and built-in functions	0
Recorded or hand-coded visual basic coding	0

Output

Summary table of data	0
Illustrated presentation of data	0
Calculation sheets of design analysis	0
Input data for other applications	0

RISK RATING

Complexity:	This criteria is a rating of the complexity of the Excel functionality used in the spreadsheet.
Small	Small spreadsheet limited to basic arithmetic calculations and formatting
Medium	Spreadsheet with complex built-in functions and/or a few external links
High	Spreadsheet with recorded or hand-coded VBA and/or extensive external links

Human Involvement:

None
1
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This criteria rates the degree to which a correct output depends on the user.

Small	Spreadsheet with few, simple steps and no manual data entry
Medium	Spreadsheet with multiple steps of moderate difficulty and/or manual data entry
High	Spreadsheet with multiple, difficult steps and/or extensive manual data entry

REQUIREMENTS FOR CHECKING

0	1	Manual check of any outgoing data against source information
1	1,1	Random data of check against source information to find systematic entry errors
0	1,2	Random manual check of input data and parameters
1	2	Independent manual check of all input data and parameters
0	#REPT	Random manual check of calculations and output
1	3	Independent manual check of calculations and output
2	2	Independent manual check of all input data and parameters
3	3	Independent manual check of calculations and output
4	3	Independent manual check of calculations and output
5	3	Independent manual check of calculations and output
6	3	Independent manual check of calculations and output
7	3	Independent manual check of calculations and output

