



**REPORT C8874
NOVEMBER 2020**

GEOENVIRONMENTAL APPRAISAL

**of
GREY TOWERS FARM, NUNTHORPE, MIDDLESBROUGH**

Prepared for

FORDY FARMS (INGLEBY) LIMITED



REPORT TYPE: GEOENVIRONMENTAL APPRAISAL

REPORT NUMBER: C8874 RevA **REPORT STATUS:** FINAL

REPORT DATE: NOVEMBER 2020

SITE NAME: GREY TOWERS FARM, NUNTHORPE,
MIDDLESBROUGH

PREPARED FOR: FORDY FARMS (INGLEBY) LTD

PREPARED BY: Sirius Geotechnical Ltd Tel: 0191 378 9972
Russel House
Mill Road
Langley Moor
Durham
DH7 8HJ

WRITTEN BY: *Michelle Gibson* *M. Gibson*
Principal Engineer 10/11/2020

**REVIEWED &
APPROVED BY:** *David Brooks* *David Brooks*
Technical Associate 10/11/2020

This report is written for the use of Robertson Homes North East Ltd and Fordy Farms (Ingleby) Ltd. No other third party may rely on or reproduce the contents of this report without the written approval of Sirius. If any unauthorised third party comes into possession of this report, they rely upon it entirely at their own risk and the authors do not owe them any Duty of Care or Skill.

GEOENVIRONMENTAL APPRAISAL

of

GREY TOWERS FARM

NUNTHORPE

MIDDLESBROUGH

Prepared for

FORDY FARMS (INGLEBY) Ltd

CONTENTS

EXECUTIVE SUMMARY

1. INTRODUCTION.....	6
2. SITE DETAILS AND DESCRIPTION.....	8
3. ENVIRONMENTAL SETTING	9
3.1. Introduction.....	9
3.2. Site History	9
3.3. Published Geological Information	10
3.4. Hydrology and Hydrogeology	11
3.5. Landfilling and Waste Management	14
3.6. Radon Risk.....	15
3.7. Other	15
3.8. Geotechnical Constraints	16
4. PREVIOUS INVESTIGATION FINDINGS.....	17
5. PRELIMINARY CONCEPTUAL SITE MODEL.....	18
6. FIELDWORK	20
6.1. Scope of Investigation	20
6.2. Exploratory Hole Locations and Constraints.....	20
6.3. Strata Description.....	22
6.4. Geotechnical Testing.....	22
6.5. Chemical Testing.....	23

7.	GROUND CONDITIONS AND MATERIAL PROPERTIES.....	24
7.1.	Stockpile Materials Profile	24
7.2.	Strata Profile.....	25
7.3.	Material Properties	26
7.4.	Obstructions	27
7.5.	Ground Stability	27
7.6.	Groundwater.....	28
7.7.	Visual / Olfactory Evidence of Contamination.....	28
7.8.	Ground Gas.....	28
8.	RESULTS OF CHEMICAL TESTING	29
8.1.	Assessment Methodology	29
8.2.	Soil Analysis	29
9.	REVISED CONCEPTUAL SITE MODEL.....	35
9.1.	Summary of Residual Contaminant Linkages.....	35
10.	CONCLUSIONS AND RECOMMENDATIONS.....	36
10.1.	General.....	36
10.2.	Flood Risk	36
10.3.	Geotechnical	36
10.4.	Asbestos-Containing Materials.....	41
10.5.	Soil and Groundwater Contamination.....	42
10.6.	Ground Gas.....	45
10.7.	Invasive and Protected Species	45
10.8.	Disposal of Soils.....	46
11.	REGULATORY APPROVALS.....	47

TABLES

Table 2.1	Current Site Overview	8
Table 3.1	Site History	9
Table 3.2	Geological Summary	10
Table 3.3	Surface Water Features	12
Table 3.4	Groundwater Occurrence and Abstraction.....	12
Table 3.5	Groundwater Vulnerability Status	14
Table 3.6	Waste Management Activities	14
Table 6.1	Exploratory Hole Rationale	22
Table 7.1	Strata Profile.....	24
Table 7.2	Strata Profile.....	25
Table 7.3	Summary of Hand Shear Vane Test Results.....	27
Table 8.1	Summary of Total Soil Concentrations – Stockpile Materials	29
Table 8.2	Summary of Total Soil Concentrations – Made Ground (In Situ Soils)	32

APPENDICES

APPENDIX A FIGURES AND DRAWINGS

Drawing No.	Title	Scale
ARC_003	Appraisal Layout	1:500@A1
C8874/01	Site Location Plan	1:25,000
C8874/02	Preliminary Conceptual Site Model	NTS
C8874/03	Exploratory Hole Location Plan	1:500
C8874/04	Revised Conceptual Site Model	NTS
C8874/101&102	Trial Trench Details FTP101 & FTP102	1:50
C8874/103&104	Trial Trench Details FTP103 & FTP104	1:50

NTS: Not to Scale

APPENDIX B LANDMARK INFORMATION GROUP ENVIROCHECK REPORT

APPENDIX C RISK ASSESSMENT METHODOLOGY

APPENDIX D EXPLORATORY HOLE LOGS AND FIELD TEST RESULTS

APPENDIX E LABORATORY TEST RESULTS

APPENDIX F SIRIUS GENERIC ASSESSMENT CRITERIA

EXECUTIVE SUMMARY

Introduction	Sirius Geotechnical (Sirius) was commissioned by Fordy Farms (Ingleby) Limited to undertake a geoenvironmental appraisal of land at Grey Towers Farm, Nunthorpe, Middlesbrough (the “site”). It is understood that consideration is being given to development for a residential with gardens end use.
Site Details	<p>The site is located to the immediate south-west of Grey Towers farmhouse, approximately 200m south-west of the junction of the A172 and A1043, and is centred on National Grid Reference 453590, 513790.</p> <p>The site occupies a rectangular shaped area of derelict farmland of circa 0.71 hectares, which is now overgrown. Stockpiled soils/materials are present across the site.</p>
Site History	<p>The site appears to have remained largely in agricultural use, with farm buildings constructed in the east in the latter half of the 1800s. Additional buildings were erected in the north-east in the 1930s. The remainder of the site area appears to have remained undeveloped. The site is now derelict with all buildings demolished in the early 2000s.</p> <p>Early mapping records the surrounding land to be predominantly rural, with Grey Towers Farm and a hospital established to the immediate east and circa 235m to the south-east, respectively, in the late 1800s. Residential development has taken place (and is currently ongoing) in the immediately surrounding area during the 2000s.</p>
Fieldwork	Excavation of 34 No. trial pits/trenches to a maximum depth of 3.2m below ground level.
Laboratory Testing	Selected samples of soil were submitted for analysis for a range of metal, other inorganic and organic contaminants. Geotechnical testing was scheduled on selected samples. All testing was undertaken at MCERTS and/ or UKAS accredited laboratories.
Ground Conditions	<p>The investigation has identified made ground across the site, typically encountered to depths of between 0.1m and 0.4m bgl, though locally in the east up to a maximum depth 0.95m bgl, overlying typically stiff and very stiff medium and high strength clay (glacial till), interbedded with horizons of silt and sand, and locally sand and gravel, below depths of circa 1.0-2.0m bgl notably in the centre and south. Bedrock has not been proven during this investigation.</p> <p>No significant groundwater strikes or seepages were encountered during the investigation.</p>
Ground Stability	<p>Made ground and superficial soils should be assumed to be unstable in the short term within all excavations to any depth, and appropriate support should be provided to all excavations.</p> <p>The risk of instability resulting from past underground mineral extraction is considered to be negligible.</p>
Soakaways	Based on the ground conditions encountered during the site investigation soakaway drainage is considered unlikely to be viable at the site.

Foundations and Floor Slabs	<p>Spread foundations, at minimum 0.9m depth, bearing onto natural, predominantly cohesive soils, are considered suitable across the site.</p> <p>Foundations will require to be increased in depth locally, where deeper made ground is identified, and in areas influenced by trees. Trench fill foundations are likely to be suitable in such areas.</p> <p>Ground bearing floor slabs are considered appropriate across the majority of the site, although suspended slabs should be allowed for where made ground in excess of 600mm thick is expected to be encountered i.e. in the east associated with former development and where trees affect properties.</p>
Sulphate Class	<p>DS-1 AC-1 for concrete products placed in the made ground and natural soils.</p>
Contamination	<p>Elevated benzo(a)pyrene in stockpiled materials on the site comprising predominantly of crushed demolition materials.</p> <p>No contamination has been identified in the shallow in situ made ground soils throughout the site, including reworked topsoil. However, some made ground soils could be considered texturally unsuitable to remain at shallow depth in a residential setting. Where any made ground remains on the site beneath proposed gardens it is recommended allowance is made for a clean capping layer.</p>
Asbestos	<p>Low concentration of chrysotile asbestos fibres (0.001% by mass) in stockpiled materials on the site comprising predominantly of topsoil mixed with demolition materials.</p>
Ground Gas	<p>The conceptual site model for the site has identified a very low/negligible risk from hazardous ground gas, and the site is considered to fall within a Characteristic Situation 1 (CS1) classification, for which no specific measures are considered necessary for the protection of the proposed development.</p> <p>No radon protective measures are required.</p>
Invasive Species	<p>No evidence of invasive plant species was observed during the investigation. However, it is recommended that the absence of invasive plant species or any protected/ sensitive species is confirmed by a qualified ecological consultant.</p>

The executive summary is an overview of the key findings and conclusions of the report. There may be other information contained in the body of the report which puts into context the findings of the executive summary. No reliance should be placed on the executive summary in isolation, particularly when deriving design detail/abnormal costs.

1. INTRODUCTION

Sirius Geotechnical Ltd ('Sirius') was commissioned by Fordy Farms (Ingleby) Limited ('Fordy Farms') to undertake a geoenvironmental investigation of land at Grey Towers Farm, Nunthorpe, Middlesbrough (the "site"). From information supplied by the client, it is understood that consideration is being given to development for a residential with gardens end use. A proposed development layout plan, provided by Fordy Farms, is presented as Summerhouse Architects Drawing No. S231 PL003 in Appendix A.

Sirius has previously investigated the eastern two thirds of the site on behalf of a third-party developer, in 2006. Whilst the client has no reliance on the previous report, pertinent information has been used to inform the scope of this investigation.

The objectives of this appraisal were to:

- Establish the historical development of the site and surrounding area from a review of available historical OS maps and other pertinent referenced data.
- Establish the environmental setting of the site;
- Investigate soil and groundwater conditions;
- Determine the potential risks posed by any ground contamination and provide outline recommendations on remedial measures to manage such risks;
- Establish the risks associated with hazardous ground gas;
- Evaluate whether past mining or other extractive industries could have an influence on the site;
- Provide advice relating to geotechnical issues associated with the site; and,
- Provide outline foundation recommendations.

The desk study element of this investigation includes a review of information obtained in a Landmark Information Group (LIG) Envirocheck report, and information from the British Geological Survey (BGS), the Coal Authority (CA) and other references sources.

Fieldwork was undertaken from 7 to 8 September 2020 and comprised the excavation of 34 No. trial pits across the site. These pits targeted potential historical foundations and stockpiles present on site as well as general site conditions.

This report, which was designed to meet the requirements of relevant current guidance, presents the factual information available during this appraisal, an interpretation of the data obtained and recommendations relevant to the defined objectives.

It has been assumed in the production of this report that the site is to be developed for a residential with gardens end use. In addition, it is assumed that ground levels will not change significantly from those described in this report. If these are not the case, then amendments to the recommendations made in this report may be required.

Where the report refers to the potential presence of invasive plants (such as Japanese Knotweed) or asbestos-containing materials (ACMs), such observations are for information only and should be verified by a suitably qualified expert.

The comments and opinions presented in this report are based on the findings of the desk study, ground conditions encountered during intrusive investigation works performed by Sirius and the results of tests carried out within one or more laboratories. There may be other conditions prevailing on the site which have not been revealed by this investigation and which have not been taken into account by this report. Responsibility cannot be accepted for any conditions not revealed by this investigation. Any diagram or opinion on the possible configuration of strata, contamination or other spatially variable features between or beyond investigation positions is conjectural and given for guidance only. Confirmation of ground conditions between exploratory holes should be undertaken if deemed necessary. Evaluation of ground gas and groundwater is based on observations made at the time of the investigation. It should be noted that ground gas and groundwater levels and quality may vary due to seasonal and other effects.

This report has been prepared for the use of Fordy Farms (Ingleby) Ltd ('Fordy Farms'). No other third party may rely upon or reproduce the contents of this report without the written approval of Sirius. If any unauthorised third party comes into possession of this report, they rely on it entirely at their own risk and the authors do not owe them any Duty of Care or Skill.

2. SITE DETAILS AND DESCRIPTION

Table 2.1 Current Site Overview

Location	<p>The site is located to the immediate south-west of Grey Towers farmhouse, approximately 200m south-west of the junction of the A172 and A1043.</p> <p>A site location plan is provided as Drawing No. C8874/01 within Appendix A.</p>
National Grid Reference (NGR)	453590, 513790
Topography and Features	<p>The site occupies a rectangular shaped area, with major dimensions of approximately 80m x 90m.</p> <p>Topographically, the site undulates slightly but generally slopes gently to the south-east. A small south facing slope/cut, circa 0.5m high, is found in the north-east of the site.</p> <p>Five stockpiles, circa 1-2m high, are noted across the site; one comprising of crushed brick, three comprising a topsoil type soil entrained with brick and other demolition materials and the fifth comprising reworked clay also entrained with demolition materials. The surrounding land is overgrown with vegetation.</p>
Approximate Site Area	0.71 hectares.
Current Land Use	Fallow/derelict farmland. Stockpiles of soil and demolition materials are present on site.
Invasive Plant Species	None noted. An ecological survey should be carried out by a suitably qualified specialist to confirm if any invasive, protected or sensitive species or habitats are present.
Adjacent Land Uses	<p>Residential developments to the north, south and west</p> <p>Grey Towers farmhouse to the immediate east with farmland beyond.</p>

The main site features are shown on Drawing No. C8874/03 within Appendix A.

3. ENVIRONMENTAL SETTING

3.1. Introduction

Published environmental, geological and historical data relating to the site has been reviewed. A summary of relevant information is provided below, and a copy of the Envirocheck report is enclosed within Appendix B.

3.2. Site History

Table 3.1 presents a summary of the site history from 1856 to date. It is not the intention of this report to describe in detail all of the changes that have occurred on or adjacent to the site, only those pertinent to the proposed development.

Table 3.1 Site History

Map Dates	On-Site Features	Off-Site Features (only features within 500m that may affect the site are listed)
1856	The site is recorded as an open agricultural field.	Surrounding land is predominantly agricultural land, with tracks/roads and sporadic buildings/farmsteads.
1894 – 1930	Farm buildings are recorded in the east of the site including stables and a barn. An additional rectangular barn is recorded parallel to the stables in the approximate centre of the site from 1915.	Grey Towers Farm is recorded adjacent to the site to the east. Woodland plantation is shown adjacent to the southern site boundary. Two small ponds are located within the grounds of Grey Towers (later referred to as Poole Sanatorium/Hospital), 235m to the south-east. From 1915 a sheepwash and allotment gardens are recorded circa 20m to the south-east and south respectively. The larger of the two ponds to the south is no longer recorded.
1938 – 1958	Additional buildings are recorded in the north-east corner of the site.	The smaller pond to the south is no longer recorded.
1967 – 2000	No significant changes until circa 2000, from which time buildings in the north-east corner of the site have been demolished. The rectangular barn located approximately centrally on the site has also been demolished.	Allotment gardens to the south are no longer recorded. The A172 carriageway is established circa 220m to the north/north-east of the site.
2020	Remaining farm buildings have been demolished.	Residential developments are recorded to the north and south of the site. No significant changes are recorded to the west of the site.

3.3. Published Geological Information

A summary of available published geological information is provided in Table 3.2.

Table 3.2 Geological Summary

Sources of Information	<p>BGS 1:50,000 scale geological map (Sheet 33, Stockton, 1987).</p> <p>BGS Geology of Britain interactive online viewer and BGS Lexicon of named Rock Units.</p> <p>Envirocheck report, reference 255485552_1_1, dated 3 September 2020.</p> <p>CA interactive online viewer.</p>
Made Ground	<p>None recorded on the published maps, but, considering the history of the site, in particular the previous development in the east and the evident presence of recently placed soils, deposits of made ground and/or disturbed ground, including reworked and relict topsoil and reworked natural soils, are to be expected.</p>
Superficial Deposits	<p>The site is recorded on geological mapping to be superficial deposits of the Vale of York Formation, described by the BGS as predominantly glacial till (sandy clay, clayey sand and clay with gravel and boulders), with interbedded sand, gravel and laminated clay. The Vale of York Formation is generally 10 to 30m in thickness.</p> <p>The full thickness of the superficial deposits is not recorded on geological mapping.</p>
Solid Geology	<p>The site is recorded to be underlain by mudstone of the Redcar Mudstone Formation of Jurassic age, described by the BGS as grey fossiliferous fissile mudstones and siltstones with subordinate thin beds of shelly limestone in lower part, and fine grained carbonate-cemented sandstone in upper part.</p> <p>The depth to bedrock is not recorded on geological mapping.</p>

<p>Mining and Quarrying</p>	<p>Coal Mining: The site is not recorded by the CA to be underlain by coal mineworkings and is not located within a development high risk area. As such, the site is not at risk from coal mining.</p> <p>Other Mining: The Envirocheck report indicates the site is not at risk from non-coal mining activities. No man-made cavities are recorded on the site or in the local area.</p> <p>Quarries: There is no evidence of quarrying activities having taken place on the site.</p> <p>Nunthorpe Sand Pit is recorded as a BGS Mineral Site 622m to the south-east of the site, however extraction operations have ceased at that site.</p>
------------------------------------	--

3.4. Hydrology and Hydrogeology

A summary of available information pertaining to hydrology and hydrogeology is presented in Table 3.3 to

Table 3.5, inclusive.

Table 3.3 Surface Water Features

	Presence/location	Comments
Classified Watercourses (within 500m)	NR	
Unclassified Watercourses (within 500m)	Nearest recorded 354m west of the site.	Recorded as an inland river, part of the Tees catchment, which flows to the south along the edge of Ellerby's Plantation.
Licensed Surface Water Abstractions (within 1000m)	NR	
Other Surface Water Features (Canals, Ponds, Lakes, etc.) (within 250m)	A SuDS drainage pond is recorded as the nearest surface water feature to the site, 108m to the north-west. No other surface water features are recorded within 250m.	
Flood Risk Status	The site lies within a Zone 1 flood risk area and is not within an area considered by the EA to be at significant risk of flooding from rivers. A flood risk assessment is unlikely to be required to comply with the National Planning Policy Framework as the site is <1ha in area.	

NR – None recorded.

Table 3.4 Groundwater Occurrence and Abstraction

	Presence/location	Comments
Licensed Abstractions (within 1000m)	NR	
Private Wells	NR	
Source Protection	NR	

	Presence/location	Comments
Zones (within 500m)		
Springs	NR	
Groundwater Flooding Susceptibility	The majority of the site is recorded by the BGS to lie in an area with the potential for groundwater flooding to occur in property situated below ground level.	

NR – None recorded.

Table 3.5 Groundwater Vulnerability Status

	Environment Agency Classification
Superficial Aquifer Designation	The Vale of York Formation is classified as a Secondary Aquifer – Undifferentiated. The EA has assigned this classification where it has not been possible to attribute either Secondary Aquifer category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.
Bedrock Aquifer Designation	The Redcar Mudstone Formation is also classified as a Secondary Aquifer – Undifferentiated.
Groundwater Vulnerability	The groundwater beneath the site within both the superficial and bedrock Secondary Aquifers is recorded to be of medium vulnerability.

3.5. Landfilling and Waste Management

Information on waste management and related activities that could impact upon the site is summarised in Table 3.6.

Table 3.6 Waste Management Activities

	Presence / Location	Comments
Recorded Landfills (within 1000m)	NR	
Other Licensed Waste Management Facilities (within 500m)	NR	
Evidence of Fly-Tipping on Site?	NR	
Other Evidence of Waste Disposal on or within 250m of Site	Demolition arisings (crushed brick) and soils entrained with demolition materials stockpiled on the site.	

	Presence / Location	Comments
Ground Gas Risk Assessment Required?	No	<p>The conceptual model for ground gas indicates that potential risks associated with ground gas are very low/negligible, based on the following:</p> <p>No landfills are known to exist within 250m of the site and no historical landfills are recorded within 500m of the site.</p> <p>There was no evidence of putrescible matter within the made ground or natural soils during Sirius’ 2006 investigation.</p>

3.6. Radon Risk

To determine whether the site is at risk from radon gas, the BRE Document “BRE 211 - Radon: Guidance on the protective measures for new dwellings” together with the National Radiological Protection Board (NRPB) “Radon Atlas of England and Wales” have been referenced.

These documents, together with a geological assessment contained within the Landmark report, which includes information obtained from the Health Protection Agency and British Geological Survey, state that the site lies within an area in which no radon protective measures are required.

3.7. Other

No potentially contaminative activities or environmental constraints are recorded to be located within approximately 250m of the site.

No COMAH facilities are recorded to be located within approximately 1km of the site.

3.8. Geotechnical Constraints

The Envirocheck Report obtained indicates that there is a potential very low ground stability hazard associated with collapsible ground, landslides and the shrinking or swelling of clays, and no potential hazard associated with compressible ground, running sands and ground dissolution, at the site.

4. PREVIOUS INVESTIGATION FINDINGS

A previous Geoenvironmental Appraisal Report (GAR) has been undertaken by Sirius on behalf of a third-party developer in October 2006, which covers the eastern two thirds of the site. However, Fordy Farms do not have reliance on this report. Whilst Sirius' knowledge of the site based on the previous works has been used in designing this ground investigation and has been considered where relevant, given the time elapsed since that study it was considered that an up to date investigation was required for the use of Fordy Farms and the findings and recommendations made within this appraisal supersede those made in the old report.

The main findings from the previous Sirius GAR were:

- A marginally elevated benzo(a)pyrene concentration (a concentration of 2.7mg/kg, above current assessment criteria of 2.1mg/kg) within the shallow in situ made ground at one location in the south of the site.

5. PRELIMINARY CONCEPTUAL SITE MODEL

Based on the desk study information a combined preliminary conceptual site model and conceptual exposure model (CSM) has been developed for the proposed future land use (residential with gardens). This summarises the understanding of surface and sub-surface features, the potential contaminant sources, transport pathways and receptors to assess potential contaminant linkages.

A qualitative risk assessment has also been made of each contaminant linkage operating following the methodology described within Appendix C.

The preliminary CSM is presented in schematic form in Drawing No. C8874/02 within Appendix A.

In summary, the following potential contaminant linkages have been assessed as posing a potentially unacceptable level of risk (defined as being greater than “low” risk) in the proposed end-use:

- Direct and indirect ingestion, inhalation and dermal contact with heavy metals/metalloids, organic and inorganic contaminants, including asbestos, within stockpiled soils on the site, presenting a potential **moderate** risk to site end users and construction/maintenance workers.
- Direct and indirect ingestion, inhalation and dermal contact with heavy metals/metalloids, organic and inorganic contaminants, including asbestos, within shallow in situ made ground on the site, presenting a potential **low to moderate** risk to site end users and construction/maintenance workers.
- Direct contact of concrete products with elevated sulphates within stockpiled soils on the site, presenting a **low to moderate** risk to construction materials.

The site is considered to lie within a setting of low environmental sensitivity and as such the risk to controlled waters receptors, principally the underlying Secondary Aquifers, from potential leachable and/or dissolved concentrations of heavy metal/metalloid, organic and inorganic contaminants within made ground are considered to be low/very low. This is based on the following evidence:

- The deposits of the Vale of York Formation, which typically comprise sandy gravelly clays (glacial till), are likely to be of low permeability.

- No major surface water features or classified watercourses are located within 500m of the site.
- There are no surface or groundwater abstractions within 1km of the site.
- The site does not lie within a groundwater Source Protection Zone.

6. FIELDWORK

6.1. Scope of Investigation

The information contained in this report is limited to areas of land accessible during the investigation within the site boundary, as indicated on the site plan presented in Appendix A as Drawing No. C8874/03.

The investigation, which was supervised by a Sirius Geoenvironmental Engineer, took place from 7 to 8 September 2020 and comprised:

- Excavation of 7 No. machine-excavated trial pits (TP101 to TP107) across the site, to a maximum depth of 3.2m below ground level (bgl).
- Excavation of 5 No. shallow machine-excavated trial pits (STP101 to STP105) in the south of the site, to a depth of 0.3m bgl.
- Excavation of 1 No. machine-excavated trial pit (SP01) in the north-east of the site, to a maximum depth of 1.0m bgl.
- Excavation of a total of 17 No. machine-excavated trial pits (SH1/1-5, SH2/1-5, SH3/1-3, SH4/1-3 and NSH01) into the five stockpiles present on site, to a maximum depth of 1.2m below the apex of the stockpile.
- Excavation of 4 No. machine-excavated trial trenches (FTP101 to FTP104) in the east of the site, to a maximum depth of 1.2m bgl.

6.2. Exploratory Hole Locations and Constraints

The exploratory hole locations were selected using the findings of the preliminary CSM in order to achieve general site coverage, target specific areas of interest and resolve key uncertainties, as detailed in

Table 6.1. The principles given in BS 10175:2011+A2:2017 and BS EN 1997:2007 were followed when determining exploratory hole locations.

Table 6.1 Exploratory Hole Rationale

Exploratory Hole	Rationale
TP101 – TP107	General site coverage to determine nature of shallow soils and groundwater.
SP01	Targeted investigation to investigate nature of the materials behind the small slope in the north-east of the site.
SH1/1 – SH1/5, SH2/1 – SH2/5, SH3/1 – SH3/3, SH4/1 – SH4/3, NSH01	Targeted investigation of on-site stockpiles to determine nature of the stockpiled materials.
STP101 – STP105	Shallow trial pits to delineate the extent of previously reported benzo(a)pyrene contamination.
FTP101 – FTP104	Targeted investigation over footprint of previous buildings in the eastern portion of the site to assess potential for historical foundations which may remain in-situ.

Exploratory hole locations are shown on Drawing No. C8874/03 within Appendix A of this report.

6.3. Strata Description

Strata descriptions were logged in accordance with BS EN ISO 14688-1&2:2018. Detailed descriptions of strata and groundwater observations made during investigation works, together with samples recovered and the results of all *in situ* field testing, are presented on the Engineer’s records within Appendix D. The depths of strata on the record sheets are recorded from current ground levels at each location, unless indicated otherwise.

6.4. Geotechnical Testing

Geotechnical laboratory testing on selected samples was carried out under subcontract by Professional Soils Laboratory (PSL), a UKAS-accredited laboratory.

Geotechnical and geochemical test results are included within Appendix E of this report.

6.5. Chemical Testing

Selected samples of the made ground were tested for a range of potential contaminants under subcontract with Derwentside Environmental Testing Limited (DETS), a UKAS and MCERTS-accredited laboratory.

The potential contaminants of concern identified by the preliminary CSM were selected as the analytes for the samples recovered from the site. The results of soil analysis, as received from the laboratory, are presented within Appendix E of this report.

7. GROUND CONDITIONS AND MATERIAL PROPERTIES

7.1. Stockpile Materials Profile

A summary of the stockpile materials profile encountered is provided in Table 7.2.

Table 7.1 Strata Profile

Stockpile	Estimated Size (Estimated Volume)	Description and Comments
SH1	20.0m x 5.0m x 0.5m (50m ³)	Topsoil with demolition rubble (grey sandy gravelly clay with brick and concrete fragments).
SH2	40.0m x 15.0m x 0.75m (300m ³)	Demolition rubble (reddish brown sand and gravel with abundant brick and concrete fragments). Slight creosote odour from timber within the material.
SH3	25.0m x 8.0m x 0.5m (100m ³)	Topsoil with demolition rubble (grey sandy gravelly clay with brick and concrete fragments).
SH4	12.0m x 12.0m x 1.0m (144m ³)	Topsoil with demolition rubble (grey sandy gravelly clay with brick and concrete fragments).
NSH	5.0m x 5.0m x 0.5m (12.5m ³)	Reworked natural clay with demolition rubble (brown sandy gravelly clay with concrete and brick fragments).

7.2. Strata Profile

A summary of the strata profile encountered is provided in Table 7.2.

Table 7.2 Strata Profile

Strata	Depth Range (Thickness Range)	Description and Comments
Made Ground	Ground Level (0.1m to 0.95m)	<p>Made ground was encountered across the site to depths of between 0.1m and 0.95m. Where deeper than approximately 0.4m, made ground was generally associated with buried structures including shallow brick foundations.</p> <p>In TP101 to TP106, across the northern and central site areas the made ground comprised a cover of reworked topsoil at the ground surface, 0.15m to 0.35m thick, described as firm brown mottled grey slightly gravelly sandy silty clay, locally grading to very clayey sand, with gravel inclusions of sandstone, and occasionally brick fragments.</p> <p>Within the south of the site, STP01 to SPT05 encountered firm friable dark grey slightly sandy slightly gravelly clay, to a depth of at least 0.3m bgl, with gravel inclusions of sandstone, mudstone and brick fragments. Cobbles of brick and concrete were also observed within the strata.</p> <p>From ground level in the east of the site, over the plan area of former farm buildings, made ground typically comprised reworked clay (soft brown and gravelly clay, with gravel inclusions of sandstone, mudstone and occasional brick) with pockets of black sand.</p>
Superficial Deposits (Vale of York Formation)	0.1m to 0.95m (NP)	The natural superficial deposits predominantly comprised horizons of stiff or very stiff medium and high strength friable orangish to reddish brown slightly sandy slightly gravelly clay (glacial till), interbedded with horizons of sandy clayey silt and silty clayey sand, and locally sand & gravel, notably in central and southern areas of the site. Horizons of silt, sand and sand and gravel were typically encountered below depths of 1.0m to 2.0m bgl, extending to depths of between 2.0m and in excess of 3.0m bgl.
Bedrock (Redcar Mudstone Formation)	NP	Bedrock was not encountered within any exploratory hole formed during this investigation.

NR – Not proven.

7.3. Material Properties

Made Ground (Above Ground Stockpiles)

Water soluble sulphate (SO_4^{2-}) analyses performed on 14 No. samples of the stockpiled materials recorded concentrations of between 18mg/l and 150mg/l, together with recorded pH ranging from 7.5 to 10.0. These results indicate a design sulphate class of DS-1 and an ACEC class of AC-1, in accordance with BRE Special Digest 1 (2005) for the design of buried concrete, based on brownfield site designation and mobile groundwater conditions.

Made Ground (In Situ)

Water soluble sulphate (SO_4^{2-}) analyses performed on seven samples of the shallow in situ made ground recorded concentrations of between 13mg/l and 31mg/l, together with recorded pH ranging from 7.1 to 8.2. These results indicate a design sulphate class of DS-1 and an ACEC class of AC-1, in accordance with BRE Special Digest 1 (2005) for the design of buried concrete, based on brownfield site designation and mobile groundwater conditions.

Superficial Deposits

Water soluble sulphate (SO_4^{2-}) analyses performed on eight samples of natural superficial strata recorded concentrations of between 11mg/l and 50mg/l, together with recorded pH ranging from 8.1 to 8.3. These results indicate a design sulphate class of DS-1 and an ACEC class of AC-1, in accordance with BRE Special Digest 1 (2005) for the design of buried concrete, based on brownfield site designation and mobile groundwater conditions.

Atterberg limit determinations undertaken on eight samples of natural superficial clay soils indicate the material to be clay of predominantly low or intermediate, occasionally high, plasticity, with liquid limits ranging between 31% and 62%, plastic limits ranging between 18% and 26%, and plasticity indices ranging between 12% and 36%. A further two Atterberg limit determinations undertaken on samples of silt, indicated the material to be non-plastic.

Calculation of the modified Plasticity Index, in accordance with NHBC standards, indicates these soils to have a low and medium volume change potential. The Consistency Index (I_c) values for the samples tested ranged from 0.94 to 1.25 indicating the material to be of stiff and very stiff consistency.

The cohesive soils on the site were frequently observed to be friable in nature which has resulted in highly variable hand vane results. The Consistency Index for these materials suggests that they are of stiff and very stiff consistency and it is therefore considered that the friable nature of the clays, particularly where the low strength values have been recorded, has resulted in an underestimation of their strength via field shear vane tests. The results of the in situ hand shear vane tests undertaken in cohesive superficial deposits are summarised in Table 7.3.

Table 7.3 Summary of Hand Shear Vane Test Results

Depth (m bgl)	Number of tests	Minimum Result (kN/m ²)	Maximum Result (kN/m ²)	Median Result (kN/m ²)	Average Result (kN/m ²)	Indicative shear strength
0.0 – 1.0	2	106	118	112	112	High strength
1.0 – 2.0	7	38	80	74	66	Medium and high strength, locally low strength.
>2.0	7	78	84	81	81	High strength

7.4. Obstructions

Relict foundation footings, in addition to concrete slabs, were encountered at several locations in the east of the site, where the historical farm buildings were previously recorded.

Relict brick footings, 400mm thick and spaced 3.1m apart, were encountered in trial trench FTP102 at a depth of approximately 0.65m bgl. Possible relict footings were also encountered in the north-east end of trial trench FTP101 and partly along the northern edge of FTP103, extending to depths of 0.3m to 0.4m bgl.

Concrete slabs were encountered at the base of stockpile SH2 at two test locations: one in its southern end (SH2/5) and one towards its northern end (SH2/2).

7.5. Ground Stability

Trial pits were generally noted to be stable during the short period for which they remained open during fieldwork, although small slumps were noted within the silt deposits encountered in TP103.

7.6. Groundwater

Groundwater was encountered within granular layers in TP101 only, at a depth of 2.0m bgl. No groundwater strikes or seepages were recorded in any other trial pit during the Sirius ground investigation.

7.7. Visual / Olfactory Evidence of Contamination

Occasional fragments of creosote treated timber were noted within stockpile SH2 in which discernible odours were noted. Elsewhere, there was no olfactory or visual evidence of hydrocarbon or similar contamination within the made ground, or the underlying natural soils.

The made ground soils encountered in the south and east of the site, and the five stockpiles on the site, were observed to comprise and/or contain gravel and cobbles of brick and concrete and, as discussed above, occasionally fragments of timber. Such soils could exhibit elevated concentrations of metals/metalloids, sulphates, polycyclic aromatic hydrocarbons (PAHs), volatile hydrocarbons and asbestos.

7.8. Ground Gas

The requirement for ground gas monitoring (in accordance with CIRIA C665) has been considered previously and with cognisance to the conceptual ground model for the site, it is considered that monitoring of hazardous ground gas is not required.

The risk of hazardous ground gas generation is considered to be very low/negligible based on the following lines of evidence:

- No recorded landfills are known to exist within 250m of the site.
- No made ground containing potentially degradable organic material was identified on the site during the Sirius investigation.
- No evidence of putrescible matter within natural soils was identified during the Sirius investigation.

8. RESULTS OF CHEMICAL TESTING

The results of chemical analysis are provided in full within Appendix E.

8.1. Assessment Methodology

Soil Data

The laboratory test data for the relevant soil strata were reviewed for completeness and consistency. Those determinands that represent potential contaminants of concern were subject to further evaluation.

For each potential contaminant of concern, analytical data for soil samples were evaluated against the relevant Generic Assessment Criterion (GAC), taking account of the Soil Organic Matter (SOM) content. For this site, measured values were compared to GACs derived for a residential with gardens end use. Source data for all GACs are provided within Appendix F.

If any samples recorded contaminant concentrations that exceeded that GAC, then consideration was given to the applicability of statistical data evaluation in line with the methods described within CL:AIRE (2020) 'professional Guidance: Comparing soil contamination data with a critical concentration'.

8.2. Soil Analysis

Stockpile Materials

Table 8.1 presents a summary of the analytical results obtained and their evaluation against the applicable GACs.

Table 8.1 Summary of Total Soil Concentrations – Stockpile Materials

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (2.5% SOM)	No. of Samples >GAC	Exceedances
Metals					
Inorganic Arsenic	14	5.4 – 16	37	0	
Cadmium	14	0.1 – 1.4	11	0	
Chromium (III)	14	16 – 24	910	0	
Chromium (VI)	14	<1.0	6	0	
Copper	14	17 – 77	200	0	

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (2.5% SOM)	No. of Samples >GAC	Exceedances
Lead	14	20 – 160	200	0	
Inorganic Mercury	14	<0.05 – 0.3	40	0	
Nickel	14	5.6 – 34	130	0	
Selenium	14	<0.5 – 0.7	250	0	
Zinc	14	35 – 330	450	0	
Inorganics					
pH	14	pH7.5 – 10	<pH5 or >pH9	6	SH1/2, SH4/1, multiple from SH2
Water Sol. Sulphate	14	0.018 – 0.15g/l	0.5g/l	0	
Speciated PAHs					
Acenaphthene	14	<0.1 – 0.2	490	0	
Acenaphthylene	14	<0.1 – 2.6	400	0	
Anthracene	14	<0.1 – 1.3	5300	0	
Benzo(a)anthracene	14	<0.1 – 6.7	B(a)P**	**	
Benzo(b)fluoranthene	14	<0.1 – 6	B(a)P**	**	
Benzo(k)fluoranthene	14	<0.1 – 3.4	B(a)P**	**	
Benzo(g,h,i)perylene	14	<0.1 – 5	B(a)P**	**	
Benzo(a)pyrene	14	<0.1 – 7.7	2.1	1	SH2/2
Chrysene	14	<0.1 – 6.9	B(a)P**	**	
Dibenzo(a,h)anthracene	14	<0.1 – 0.9	B(a)P**	**	
Fluoranthene	14	<0.1 – 12	560	0	
Fluorene	14	<0.1 – 0.3	390	0	
Indeno(1,2,3-cd)pyrene	14	<0.1 – 5.2	B(a)P**	**	
Naphthalene	14	<0.1	2.3	0	
Phenanthrene	14	<0.1 – 2.1	220	0	
Pyrene	14	<0.1 – 12	1200	0	
Speciated TPH					
Aliphatic EC5-6	14	<0.01	41	0	
Aliphatic EC6-8	14	<0.01 – 0.02	110	0	
Aliphatic EC8-10	14	<0.01 – 0.08	31	0	
Aliphatic EC10-12	14	<1.5	150	0	
Aliphatic EC12-16	14	<1.2	1200	0	
Aliphatic EC16-21	14	<1.5	70000	0	
Aliphatic EC21-35	14	<3.4		0	
Aromatic EC5-7	14	<0.01 – 0.01	110	0	
Aromatic EC7-8	14	<0.01	240	0	
Aromatic EC8-10	14	<0.01	48	0	
Aromatic EC10-12	14	<0.9 – 1.2	150	0	
Aromatic EC12-16	14	0.5 – 4.2	320	0	
Aromatic EC16-21	14	<0.6 – 20	540	0	
Aromatic EC21-35	14	<1.4 – 61	1500	0	



Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (2.5% SOM)	No. of Samples >GAC	Exceedances
BTEX					
Benzene	14	<0.01 – 0.01	0.13	0	
Toluene	14	<0.01	240	0	
Ethylbenzene	14	<0.01	62	0	
Xylenes	14	<0.01	67	0	
Other					
Phenol	14	<0.3 – 0.4	190	0	
MTBE	14	<0.01	55	0	
TOC	14	0.6 – 8.7%w/w	3%w/w	7	SH2/2, SH4/3, multiple from SH1 & SH3
Asbestos	14	NAD – bundle of Chrysotile fibres	Fibres present	1	SH3/2

Table based on a Residential with Gardens end use.
 ** Assessed using benzo(a)pyrene as a surrogate marker
 NAD - No asbestos detected.

Metals and Metalloids

No metals/metalloids recorded concentrations above the relevant GAC.

Other Inorganic Analytes

Six samples have returned pH values elevated marginally above the upper bound of the GAC, which is indicative of slightly alkaline conditions. Whilst this value is slightly above the assessment criteria, this value is considered unlikely to be representative of a significant risk to human health.

No other inorganics recorded concentrations above the relevant GAC.

Organics

Seven samples returned concentrations of total organic carbon (TOC) above the GAC. However, TOC is a measure of organic carbon within the material and is not a determinand that directly poses a risk to human health. These results are, however, used to determine the classification of material for removal from site to a licensed disposal facility. The TOC is also used to derive the relevant SOM for the soils, necessary to derive an appropriate GAC for some organic determinands. TOC is therefore not considered further in respect of human health risk assessment.

One sample, taken from SH2 (predominantly crushed demolition arisings of brick and concrete), returned a concentration of benzo(a)pyrene above the relevant GAC.



No other organics recorded concentrations above the relevant GAC.

Asbestos

One sample, taken from SH3 (soil mixed with demolition materials), recorded the presence of asbestos in the form of a small bundle of chrysotile fibres. That sample was further subject to asbestos quantification, using the Phase Contrast Optical Microscopy method. The results of that analysis indicate that the asbestos is present at 0.001% by mass.

However, it is possible that the source of the identified asbestos in one sample is from construction products, likely derived from past buildings on the site which have been demolished, as evidenced on historic OS maps. Consequently, dispersed, microscopic quantities, of asbestos fibres and/or other ACM products (e.g. cement sheet) could reasonably be anticipated throughout the stockpiled soils on site, albeit at a low level, particularly as the soils are observed to comprise or be mixed with demolition materials.

Waste Acceptance Criteria

Four samples, taken from SH1, SH2, SH3 and SH4, were further subject to WAC analysis, and the results should be passed on to the waste facility/landfill operator to allow them to adequately categorise the waste type for disposal.

In Situ Made Ground

Table 8.2 presents a summary of the analytical results obtained and their evaluation against the applicable GACs.

Table 8.2 Summary of Total Soil Concentrations – Made Ground (In Situ Soils)

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (2.5% SOM)	No. of Samples >GAC	Exceedances
Metals					
Inorganic Arsenic	7	7.4 – 24	37	0	
Cadmium	7	0.2 – 0.6	11	0	
Chromium (III)	7	15 – 47	910	0	
Chromium (VI)	7	<1.0	6	0	
Copper	7	25 – 80	200	0	
Lead	7	15 – 170	200	0	
Inorganic Mercury	7	<0.05 – 8.3	40	0	
Nickel	7	19 – 29	130	0	



Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (2.5% SOM)	No. of Samples >GAC	Exceedances
Selenium	7	<0.5	250	0	
Zinc	7	66 – 300	450	0	
Inorganics					
pH	7	pH7.1 – 8.2	<pH5 or >pH9	0	
Water Sol. Sulphate	7	0.013 – 0.031g/l	0.5g/l	0	
Speciated PAHs					
Acenaphthene	11	<0.1	490	0	
Acenaphthylene	11	<0.1	400	0	
Anthracene	11	<0.1 – 0.5	5300	0	
Benzo(a)anthracene	11	<0.1 – 1.9	B(a)P**	**	
Benzo(b)fluoranthene	11	<0.1 – 1.4	B(a)P**	**	
Benzo(k)fluoranthene	11	<0.1 – 0.9	B(a)P**	**	
Benzo(g,h,i)perylene	11	<0.1 – 0.8	B(a)P**	**	
Benzo(a)pyrene	11	<0.1 – 2	2.1	0	
Chrysene	11	<0.1 – 2	B(a)P**	**	
Dibenzo(a,h)anthracene	11	<0.1 – 0.9	B(a)P**	**	
Fluoranthene	11	<0.1 – 3.3	560	0	
Fluorene	11	<0.1	390	0	
Indeno(1,2,3-cd)pyrene	11	<0.1 – 0.4	B(a)P**	**	
Naphthalene	11	<0.1	2.3	0	
Phenanthrene	11	<0.1 – 1.1	220	0	
Pyrene	11	<0.1 – 3	1200	0	
Other					
Phenol	7	<0.3	190	0	
TOC	7	0.6 – 22%w/w	3%w/w	5	TP103, TP104, TP105, TP106, SP01
Asbestos	7	NAD	Fibres present	0	

Table based on a Residential with Gardens end use.
 ** Assessed using benzo(a)pyrene as a surrogate marker
 NAD - No asbestos detected.

Metals and Metalloids

No metals/metalloids recorded concentrations above the relevant GAC.

Other Inorganic Analytes

No other inorganics recorded concentrations above the relevant GAC.



Organics

Five samples, mostly of reworked topsoil, returned concentrations of TOC above the GAC. As previously discussed, TOC is a measure of organic carbon within the material and is not a determinand that directly poses a risk to human health. TOC is therefore not considered further in respect of human health risk assessment.

No other organics recorded concentrations above the relevant GAC.

9. REVISED CONCEPTUAL SITE MODEL

The preliminary combined conceptual site model and conceptual exposure model, developed from the desk study information and presented in Section 5, has been revised in light of the ground investigation and the chemical analysis results presented above.

The revised CSM has been developed for the proposed future land use (residential with gardens). This summarises the understanding of surface and sub-surface features, the potential contaminant sources, transport pathways and receptors.

The revised CSM is presented in schematic form in Appendix A, as Drawing No. C8874/04.

9.1. Summary of Residual Contaminant Linkages

The qualitative risk assessment of identified contaminant linkages has also been revised, following the methodology described within Appendix D. In summary, the revised CSM has identified the following residual contaminant linkages (defined as being greater than “low” risk) that could result in an unacceptable risk in the proposed end-use:

- Direct and indirect ingestion, inhalation of contaminated particles/dusts and dermal contact with elevated benzo(a)pyrene concentrations in stockpiled materials from SH2 only (comprising crushed demolition materials) on the site, presenting a potential **low to moderate** risk to end users and construction workers. However, risks presented to construction workers could be adequately reduced by wearing appropriate PPE and good soil management practices.
- Inhalation of asbestos dusts/fibres present in stockpiled soils from SH3 (comprising topsoil mixed with demolition materials) on the site, presenting a potential **low to moderate** risk to end users and construction workers. Again, risks presented to construction workers could be adequately reduced by wearing appropriate PPE and good soil management practices.

The following uncertainties are identified in the revised CSM:

No further elevated benzo(a)pyrene concentrations have been detected within shallow in situ made ground soils in the south of the site. Notwithstanding, the made ground soils on this site, with exception of reworked topsoil, could be considered texturally unsuitable to remain at shallow depth in garden areas.

10. CONCLUSIONS AND RECOMMENDATIONS

10.1. General

This geoenvironmental appraisal has been performed for land at Grey Towers Farm, Nunthorpe.

It has been assumed in the production of this report that the site is to be developed for a residential with gardens end use. In addition, it has been assumed that ground levels will not change significantly from those described in this report. If these are not the case, then amendments to the interpretation and conclusions in this report may be required.

10.2. Flood Risk

The site is not recorded by the EA to be at risk from flooding from river or sea.

The majority of the site is recorded to have the potential for groundwater flooding of property situated below ground level.

A detailed flood risk assessment is unlikely to be required to comply with the National Planning Policy Framework, as the site is <1 Ha in area.

10.3. Geotechnical

Mining and Quarrying

Based on published geological information, it is considered that there is no risk of coal mining affecting surface stability at the site. No mine entries are known to exist on site.

Inspection of historical plans has not revealed any evidence of quarrying or opencast workings beneath the site.

Foundations

It is understood that consideration is being given to the development of the site with traditional low-rise residential properties with private gardens. Proposed development loads were not available to Sirius at the time of writing, although loads for such development are expected to be relatively light.

The investigation has identified made ground across the site, typically encountered to depths of between 0.1m and 0.4m bgl, though locally in the east up to a maximum depth 0.95m bgl, overlying typically stiff and very stiff high strength clay (glacial till), interbedded with horizons of silt and sand, and locally sand and gravel, notably in the central and southern areas of the site, at depths of between 1.0-2.0m bgl. Bedrock has not been proven during this investigation.

The made ground soils are unsuitable as bearing strata for structural loads due to the potential for excessive total and differential settlements. It is considered that the most suitable foundation solution across the site, following removal of above ground stockpiles, is likely to comprise conventional spread foundations (i.e. a strip), taken down through any shallow in situ made ground to bear upon underlying natural ground of adequate bearing resistance.

The cohesive soils on this site have been found to be of low and medium volume change potential as defined in NHBC Standards, Chapter 4.2. Foundations placed into natural clay deposits soils should be a minimum of 900mm deep (below finished or original ground levels, whichever is the lower).

Trees may affect the moisture content of clays to greater depths and as such, foundations may be required to extend to greater depths to penetrate to a moisture stable level within the area of influence of existing or proposed trees. A tree survey was not included in the scope of this investigation, but should be carried out prior to the production of a detailed plot-specific foundation schedule and the presence of existing and proposed trees should be taken into account during detailed foundation design.

Recorded undrained shear strengths in the natural clays at depths of up to 1.0m depth generally returned a minimum characteristic undrained shear strength of circa $C_u = 100\text{kN/m}^2$. However, this decreases to circa 65kN/m^2 at depths of between 1.0m and 2.0m, excluding potentially erroneous low strength results due to the friable nature of the soils. A conservative minimum characteristic undrained shear strength of $C_u = 65\text{kN/m}^2$ is therefore considered appropriate for the natural cohesive soils at anticipated founding depths.

By way of example, calculations indicate that a 0.6m wide strip bearing on the glacial till at a depth of 0.9m bgl, could support a line load of up to 85kN/m run. The application of such a pressure would keep settlements to 25mm or less.

If higher structural loads are anticipated, in light of parts of the site being underlain by higher strength soils, a plot specific investigation and/or detailed foundation schedule could be undertaken to confirm with greater confidence the strength of the natural soils beneath specific plots and the most appropriate foundation solution.

To mitigate against the effects of differential settlement foundations should bear entirely upon on consistent soil type. However, if it is unavoidable and foundations are to bear upon a mix of soils (cohesive and granular), it is recommended that settlement performance between the foundation types be calculated/assessed once plot layouts are known, and suitable reinforcement of foundations is incorporated into the foundation to mitigate against any potential differential settlement.

The above calculations are based on theoretical foundations. Settlements of foundations upon granular and cohesive materials are dependent on foundation loading and dimensions. It is therefore recommended that foundation settlements are reviewed once final loading arrangements and foundation sizes are known.

Foundations should be taken below a line drawn up at 45° from the base of any existing or proposed services.

The layout of foundations should consider any relict foundations, substructures or other potential obstructions on site.

If greater structural loads are anticipated alternative foundation solutions may be required.

It should be noted that any groundwater encountered may have an adverse effect on foundation construction and performance (such as softening/loosening of founding materials, instability of excavation walls, etc.), particularly in winter months. This should be considered when designing foundations.

Floors

Based on proven ground conditions and in accordance with current NHBC Standards, it is considered that ground bearing floor slabs could potentially be utilised across the majority of the site. If ground bearing slabs are adopted, then any made ground within the proposed floor plan should be removed prior to construction of the floor, with any resultant void replaced with a chemically inert/clean well compacted hardcore.

Suspended floor slabs may be required where soil swelling could occur, as a consequence of the influence of trees, or where made ground will be in excess of 600mm thick. It is anticipated that suspended floor slabs will be required locally in the eastern area of the site owing to the presence of made ground in excess of 600mm thick associated with relict foundation footings.

Sulphate Attack

Based on the samples tested, a Design Sulphate Class of DS-1 and an ACEC Class of AC-1 could be used for buried concrete structures in contact with both the made ground and natural soils on this site.

Groundworks, Excavation Stability and Groundwater Dewatering

Any residual hardstand materials and sub-structures/foundation footings identified on the site should be removed, and the excavation(s) be replaced with suitably compacted selected fill.

It is recommended that an Earthworks Strategy is prepared for the site, alongside a Material Management Plan (MMP), where recovered materials are being considered for re-use either on or off-site.

Excavations into the soils present across the site should be assumed to be unstable, even in the short term, and it is recommended that allowance is made for provision of support to all excavations including for drainage and foundation construction.

No personnel entry into unsupported excavations shall be allowed without an appropriate risk assessment. Reference to CIRIA report 97 (1992) and BS5975:2008+A1:2011 Code of Practice for Temporary Works, should be made to establish suitable means of support or battering of excavation sides.

Excavation should generally be possible with standard plant, although the use of a hydraulic or pneumatic breaker is likely to be required where residual buried structures/obstructions are likely to be encountered.

Based on the results of this investigation, significant groundwater seepages or inflows within shallow (<1.5m) excavations are considered unlikely. It should be possible to deal with seepages through normal site pumping practices for any shallow excavations open for short periods of time. Disposal/discharge of water will require appropriate treatment/consent.

If perched groundwater is found within any residual intact sub-structures, this should be pumped out for disposal at a suitable liquid waste disposal facility, or for discharge to foul sewer in accordance with an appropriate discharge consent provided by the local statutory body.

It is recommended that an adequate drainage system for surface water be installed by a competent contractor in order to prevent surface water ponding or collecting both during and post construction, as this may lead to deterioration of the founding stratum.

It is recommended that, in order to reduce the possibility of softening or swelling of cohesive soils at the base of foundation trenches as a result of exposure to rain or groundwater, these should be suitably blinded with concrete in the event foundation concrete is not poured immediately following excavation of the foundation trench.

Pavements and Highways

Untreated made ground on this site, in its present condition, should be assumed to have a CBR value of <2.5%, and is considered unsuitable support for a normal pavement, and must be improved. It is recommended that any made ground, to a depth of at least 1.0m below proposed subgrade level, or to the base of the made ground, whichever is shallower, beneath proposed roads and pavements is excavated, sorted and classified in accordance with Series 600 (Earthworks) Highways Agency “Specification for Highway Works”. Following the above, any suitable material which can be used as part of any proposed earthworks on site should be compacted in accordance with the aforementioned earthworks specification.

On the basis of the recorded Atterberg limit determinations obtained for the natural cohesive soils, using previous experience and the now withdrawn Highways Agency document HD25 Interim Advice Note 73/06, a CBR value of 3.0 to 4.0% may be considered appropriate for highways design, assuming construction in “average” conditions and assuming a ‘thin’ layered construction, and it is recommended that these lower CBR values are adopted for road construction design unless in situ testing proves higher values are appropriate.

The subgrade is however, expected to deteriorate on exposure particularly to rain, surface or groundwater, which could result in a reduction in the CBR value of the formation over time if left exposed.

It is recommended that in-situ CBR testing is carried out following completion of the enabling works, when final site levels will be known. All road design should be discussed with the relevant local authority if highways are to be subject to a Section 38 agreement.

Soakaways

Based on the ground conditions encountered during the site investigation, i.e. predominantly low permeability cohesive deposits at likely soakaway drainage depths, soakaway drainage is considered unlikely to be viable on the site.

10.4. Asbestos-Containing Materials

One sample of the stockpiled soils from SH3 was found to contain asbestos, in the form of chrysotile fibres. Quantitative asbestos analysis identified that the concentration of asbestos within this sample was 0.001%. Reference to CIRIA Report C733¹ (specifically, Figure 9.1) indicates that even deliberate vigorous disturbance of dry soils containing such a concentration would be expected to result in release of asbestos fibres that would give airborne concentrations less than, or within the range, recorded as background air quality in urban areas (see Table 6.1 of that report). Therefore, the risk to human health posed by the very small amount of asbestos contamination in soil detected at the site to date is not considered to be significant. The rate of asbestos detection across all of the stockpiled materials is relatively low and indicates that any asbestos within these materials is probably secondary as a result of entrainment of small quantities of ACMs or fibres resulting from historic demolition. However, demolition arisings were observed within all of the stockpiled materials to some degree and the presence of very low levels of asbestos within all of these materials cannot be ruled out at this stage. If future use of the materials is proposed within a residential development, then further analysis at an appropriate frequency will be required in order to confirm the status of these soils in respect of risk to future site users. Notwithstanding, soils containing any detectable asbestos would not be considered suitable for re-use as a topsoil within proposed residential gardens.

Further, the possibility of ACMs e.g. asbestos sheeting, used as shuttering below existing floor slabs, and/or fragments of ACMs within made ground or fill materials beneath/surrounding existing building foundations, cannot be entirely discounted. If encountered, advice should be sought from an appropriately qualified asbestos specialist and an appropriate strategy developed for the safe removal and disposal of the material.

¹ Nathanail, P., et al., 2014. *Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risks*. CIRIA, London.

10.5. Soil and Groundwater Contamination

Risk Evaluation for the Proposed Land Use (Residential with gardens)

The revised CSM indicates that potentially unacceptable contaminant linkages exist for end users and construction workers. Contaminant linkages assessed as a Low or Negligible risk are not considered significant or requiring remedial action and are not discussed further.

Human Health Receptors

There is considered to be a potential unacceptable risk to human health receptors from exposure to elevated benzo(a)pyrene and asbestos fibres within stockpiled materials on the site, via dermal exposure, ingestion and dust inhalation pathways following development, if appropriate remedial measures are not taken.

Additionally, much of the made ground on this site could be considered texturally unsuitable to remain at shallow depth in garden areas within a residential development.

Controlled Waters Receptors

No unacceptable contamination linkages to controlled waters receptors have been identified during the investigation.

Utilities

It is recommended that the results of the chemical testing and details of the proposed remedial works are provided to the appropriate utility companies to determine the necessity for service protection.

Construction and Maintenance Workers

Contamination may pose a short-term (acute) or long-term (chronic) risk to workers during construction and maintenance. The potential risks must be specifically assessed as part of the health and safety evaluation for the works to be performed in accordance with prevailing legislation. Site practices must conform to the specific legislative requirements and follow appropriate guidance (e.g., HSE, 1991; CIRIA, 1996).

On the basis of the results obtained, the principal potential exposure risks to workers may arise from elevated benzo(a)pyrene concentrations and asbestos fibres within the stockpiled soils in the field to the south of the farmstead. However, these risks can be adequately reduced by appropriate PPE and hygiene precautions, good working and soil management practices and proposed remedial measures.

Notwithstanding, it is recommended that procedures outlined in the HSE document “Protection of Workers and the General Public during Redevelopment of Contaminated Land” be followed. There will be a requirement to comply with the COSHH (Control of Substances Hazardous to Health 1994) Regulations and the CDM (Construction Design and Management 2007) Regulations during any proposed development works.

Outline Remediation Requirements

The stockpiled soils on this site have been found to contain elevated concentrations of benzo(a)pyrene (SH2, crushed brick stockpile) and low concentrations of asbestos (SH3, topsoil stockpile), in addition to being of poor textural quality, and are considered in their entirety to present a potential unacceptable risk to end users.

Consideration could be given to re-use of the stockpile of crushed brick (SH2) as a general fill material on the site, providing it is placed below proposed hardstand areas or beneath a suitable capping layer to break the identified contamination linkages associated with benzo(a)pyrene and end users.

Further analysis at an appropriate frequency will be required for the three topsoil stockpiles on the site (SH1, SH3 and SH4) in order to confirm the status of these soils in respect of risk to future site users. This approach may still indicate asbestos contamination is present for this material type and does not guarantee that the soil would be suitable for re-use. These soils would also require screening/processing to remove coarse anthropogenic materials. Notwithstanding, soils containing any detectable asbestos would not be considered suitable for re-use as a topsoil within proposed residential gardens. Any chemically and texturally unsuitable soils will require off-site disposal to a suitably licensed waste disposal facility.

No asbestos has been identified, to date, within the stockpile of reworked clay (NSH), and it is possible that this material could be screened to removed coarse demolition materials and be further tested for suitability for potential re-use, pending regulatory approval.

At this stage, based on the laboratory test results, it is considered that the reworked topsoil made ground, encountered predominantly in the western part of the site, may be suitable for re-use within gardens and landscaped areas in the development, subject to regulatory approval. However, it is recommended that any site won topsoil is carefully stripped, stockpiled and further chemically tested and visually assessed/screened for suitability, as part of the enabling works, before being approved for re-use.

Based on laboratory testing, shallow in situ made ground soils encountered elsewhere on the site have not returned any elevated concentrations of contaminants that would be considered to present a risk to the proposed development. However, the shallow made ground soils within the site are generally considered texturally unsuitable to remain at shallow depth within garden areas, primarily due to inclusion of materials such as gravel and cobbles of brick and concrete, contrary to YALPAG guidance.

As such, where the made ground soils remain in any location on the site at shallow depth, it is recommended a 400mm thick clean cover system is placed to gardens and landscaped areas. It is suggested that the cover includes a minimum 100mm topsoil layer at the surface (dependant on NHBC requirements in connection with the depth of subsoil). The provision of a clean capping layer will provide a suitable growing medium for plants/vegetation. Elsewhere, (where made ground is absent) consideration should also be given to the placement of a nominal thickness of suitable topsoil to gardens and landscaped areas on the site. The provision of a nominal thickness of suitable topsoil will provide a suitable growing medium for plants/vegetation.

It is anticipated that an element of the clean cover soil system soils (subsoil) could be generated from site won natural soil for example from foundation excavation arisings. This would of course require careful soil management and control during excavations.

The physical and chemical suitability of any imported soils, either to complete the clean cover, to make up ground levels, or to provide a growth medium where cover soils are not required, will require validation. The physical and chemical suitability of any site won subsoils used to complete the clean cover system should similarly be validated. It is recommended that validation of site won and imported soils adopts guidance provided in the relevant YALPAG document.

The design and validation of the clean cover should be agreed with regulatory authorities prior to commencement of any earthworks. It is envisaged that validation of the works by a geoenvironmental consultant will be required.

Some site clearance, including removal of floor slabs, external hardstanding and below ground structures, such as historical foundations/basements, is likely to be required. Such works should be detailed in Specification for Remedial works and it should be ensured that they do not give rise to further ground contamination.

Any off-site disposal of soils should be carried out by a registered waste carrier in accordance with the Duty of Care Regulations and the Waste (England and Wales) Regulations.

The above recommendations comprise a general outline of possible or likely works. A remediation strategy report shall be produced and agreed with the regulatory authorities prior to commencement of remediation.

It is possible that areas of more significant contamination, not identified to date, may be encountered on site during excavation and construction works. If any areas of noxious, odorous, brightly coloured, fibrous, liquid or other potential contamination are encountered, then further advice should be sought from a suitably qualified consultant.

10.6. Ground Gas

No significant sources of hazardous ground gas have been identified on the site or in the immediately surrounding area which have the potential to affect the proposed development. In accordance with BS8584:2015+A1:2019 and CIRIA C665 the site is therefore classified as Characteristic Situation (CS) 1 with respect to hazardous ground gas and no specific mitigation measures are required.

Radon protection measures are not required by current guidance for the proposed development on this site.

10.7. Invasive and Protected Species

No evidence of invasive plant species was observed during the fieldworks. Notwithstanding, it is recommended that an ecological survey be undertaken by an appropriate specialist, to confirm or otherwise the absence of any invasive, sensitive or protective species across the site.

10.8. Disposal of Soils

Any materials removed from site should be undertaken in accordance with current Duty of Care requirements and the Environment Agency Technical Guidance Document WM3, dated 2015. The waste may also be subject to Waste Acceptance Criteria (WAC) testing. In light of the regulations it is recommended that discussion with landfill operators takes place at an early stage.

11. REGULATORY APPROVALS

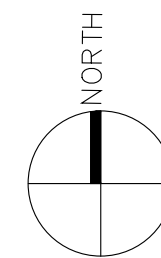
The conclusions and recommendations presented above are considered reasonable based on the findings of the site investigation. However, these cannot be guaranteed to gain regulatory approval and, therefore, the report should be passed to the appropriate regulatory authorities and/or other relevant organisations for their comment and approval prior to undertaking any works on site.



APPENDIX A

FIGURES AND DRAWINGS

Notes:
 This drawing is property of [summerhouse](http://summerhouse.uk).
 It may not be reproduced or disclosed to a third party without written consent.
 This drawing is not to be scaled, figured dimensions only to be taken.
 Should any discrepancies be found please inform this office.



Accommodation Schedule

Plot 1	4 Bed	GIA - 182m ² (1959ft ²)
Plot 2	4 Bed	GIA - 182m ² (1959ft ²)
Plot 3	5 Bed	GIA - 247m ² (2658ft ²)
Plot 4	4 Bed	GIA - 182m ² (1959ft ²)
Plot 5	5 Bed	GIA - 247m ² (2658ft ²)
Plot 6	3 Bed	GIA - 152m ² (1636ft ²)
Plot 7	4 Bed	GIA - 182m ² (1959ft ²)
Plot 8	3 Bed	GIA - 152m ² (1636ft ²)
Plot 9	5 Bed	GIA - 247m ² (2658ft ²)
Plot 10	4 Bed	GIA - 182m ² (1959ft ²)

Total

2No 3 Beds
 5No 4 Beds
 3No 5 Beds

DRAFT

summerhouse
 architects

mill farm
 guisborough
 north yorkshire
 TS14 6RW
 t - 01287 632640
 e - admin@summerhouse.uk.net
 w - www.summerhouse.uk.net

client **FORDY FARMS (INGLEBY) LTD**

project **LAND AT GREYTOWERS
 NUNTHORPE**

drawing **PROPOSED SITE PLAN
 BLOCK PLAN**

scale **1:500@A3**

date **FEB 22**

drg no **S231 PL003** rev

status **PLANNING**



Reproduced from the Ordnance Survey 1:50,000 scale Landranger® map with the permission of The Controller of Her Majesty's Stationary Office, © Crown Copyright. All rights reserved. Sirius Geotechnical Ltd, Suite 2, Russel House, Mill Road, Langley Moor, Durham DH7 8HJ. Licence No. 100042005

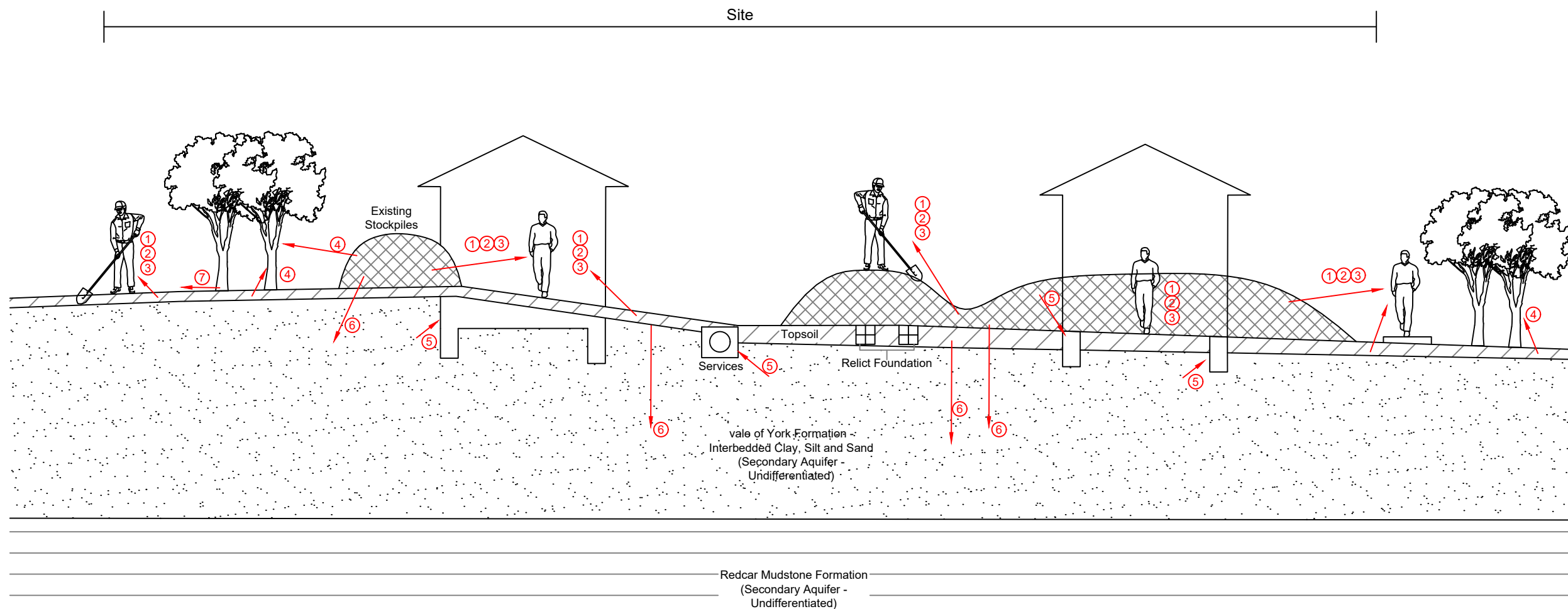
NOTES

 Site Location

REVISION		CLIENT	DRAWING NO.	REVISION NO.	
0	For Information	Fordy Farms (Ingleby) Ltd	C8874/01	0	
A	>>				
B	>>				
C	>>				
D	>>	SITE	DRAWN BY	APPROVED BY	
SIRIUS GEOTECHNICAL LTD Russel House, Mill Road, Langley Moor, Durham DH7 8HJ www.thesiriusgroup.com TEL: 0191 378 9972 FAX: 0191 378 1537		Grey Towers Farm Nunthorpe Middlesbrough	SM	APC	
		DRAWING TITLE	DATE	SCALE	
		Site Location Plan	Sept 2020	1:25,000	A4



NOTES



REVISION	BY	DATE
0	For Information	MF 16/09/20
A	>>	>> >>
B	>>	>> >>
C	>>	>> >>
D	>>	>> >>

Contamination Sources	Contamination Pathway	Potential Receptors	Risk
Metal, metalloid, organic and inorganic contaminants, including asbestos, in stockpiled materials associated with demolition of former structures and nearby development	1. Direct and indirect ingestion	End users	Moderate
	2. Inhalation of contaminants particles/dust/vapours	Construction workers	Moderate
	3. Dermal contact		
	4. Plant uptake	Gardens and landscaping	Low
	5. Direct contact with construction materials	Construction products including buried concrete and plastics	Low to Moderate
	6. Leaching	Controlled waters	Low/Very Low
Metal, metalloid, organic and inorganic contaminants, including asbestos, in topsoil at surface and below stockpiles	1. Direct and indirect ingestion	End users	Low to Moderate
	2. Inhalation of contaminants particles/dust/vapours	Construction workers	Low to Moderate
	3. Dermal contact		
	4. Plant uptake	Gardens and landscaping	Low
	5. Direct contact with construction materials	Construction products including buried concrete and plastics	Low
	6. Leaching	Controlled waters	Low/Very Low

SIRIUS
 GEOTECHNICAL LTD
 Russel House,
 Mill Road,
 Langley Moor,
 Durham DH7 8HJ
www.thesiriusgroup.com
 TEL: 0191 378 9972
 FAX: 0191 378 1537

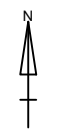


CLIENT
Fordy Farms (Ingleby) Ltd

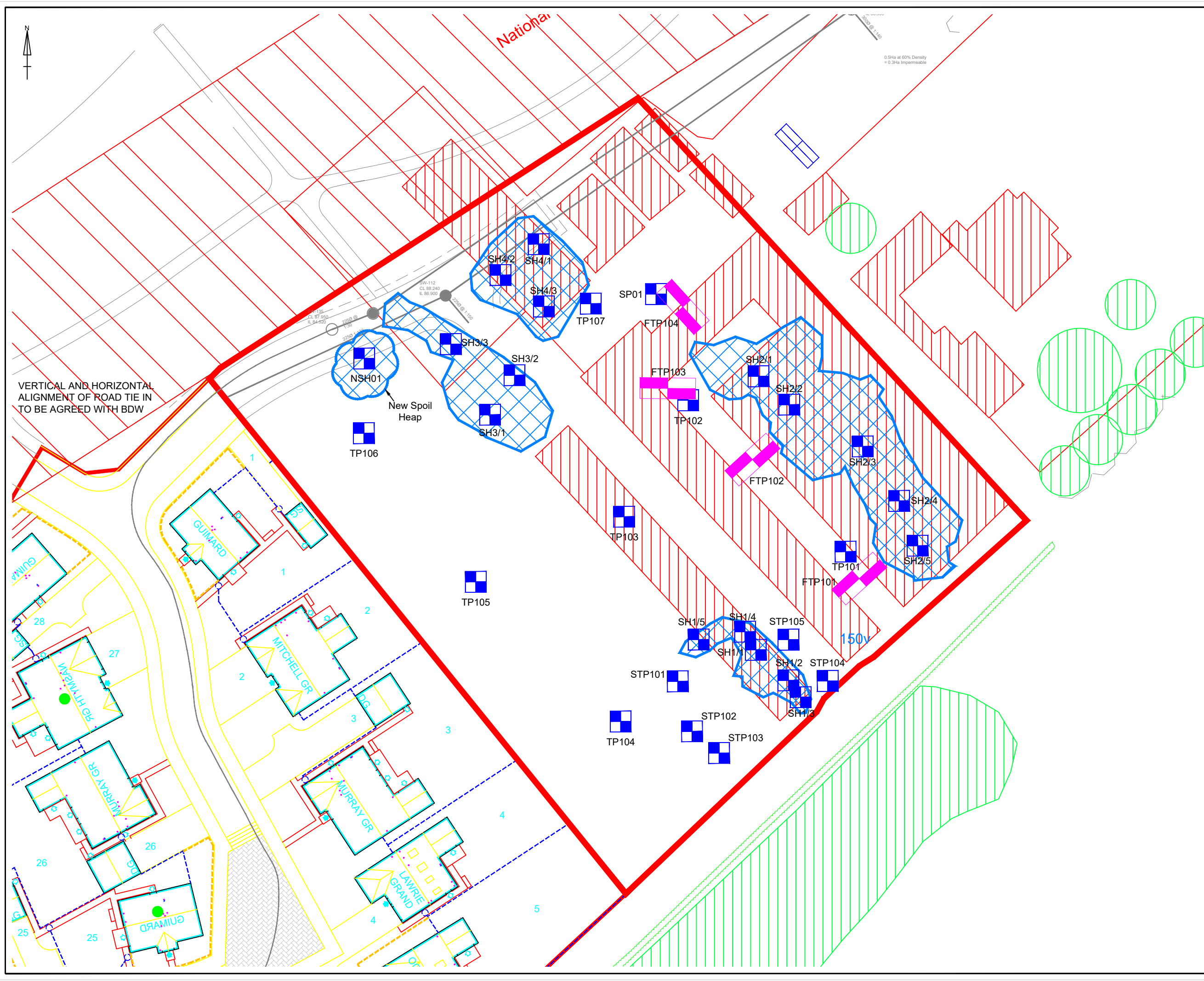
SITE
**Grey Towers Farm
 Nunthorpe
 Middlesbrough**

DRAWING TITLE
**Preliminary Conceptual
 Site Model**

DRAWING NO. C8874/02	REVISION NO. 0
DRAWN BY MF	APPROVED BY APC
DATE September 2020	SCALE NTS
	PAPER SIZE A3



VERTICAL AND HORIZONTAL ALIGNMENT OF ROAD TIE IN TO BE AGREED WITH BDW



NOTES

- Site Boundary
- Trial Pit
- Trench to Investigate Foundations
- ▨ Former Building Footprint
- ▨ Stockpiles

REVISION	BY	DATE
0	For Information	MF 16/09/20
A	>>	>> >>
B	>>	>> >>
C	>>	>> >>
D	>>	>> >>

SIRIUS
 GEOTECHNICAL LTD
 Russel House,
 Mill Road,
 Langley Moor,
 Durham DH7 8HJ
www.siriusgroup.com
 TEL: 0191 378 9972
 FAX: 0191 378 1537



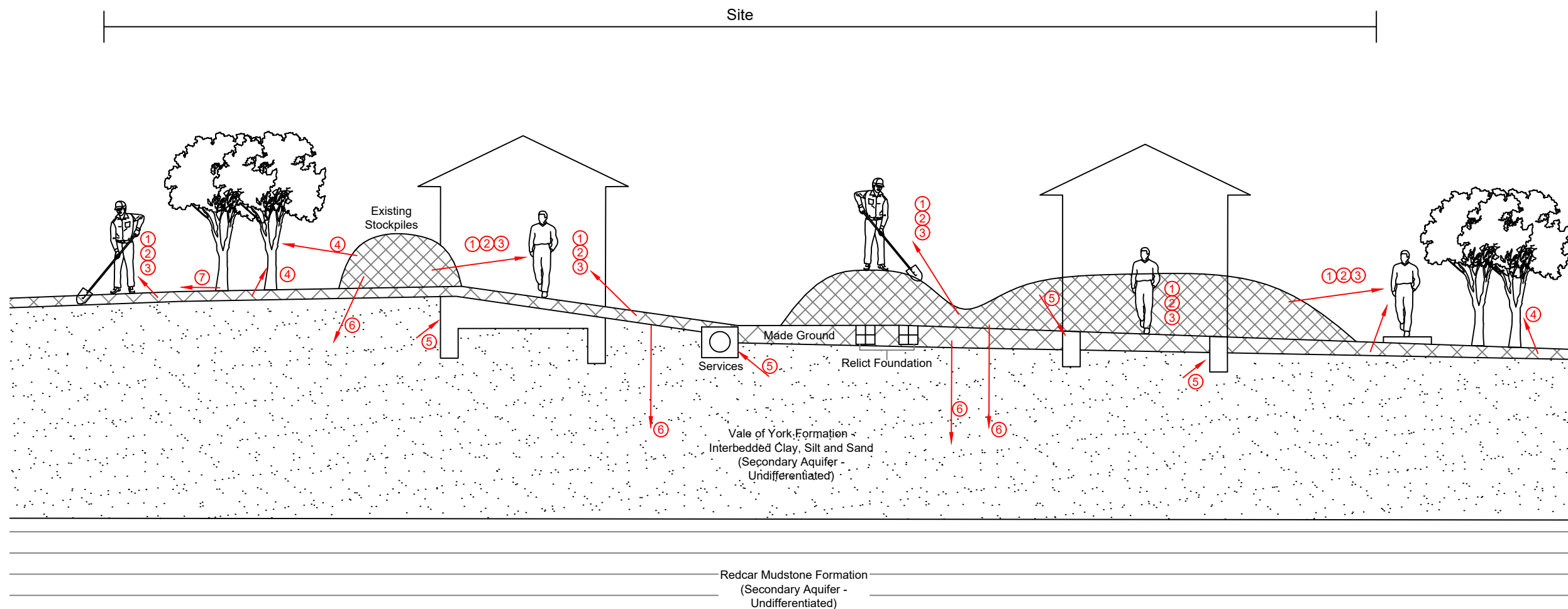
CLIENT
Fordy Farms (Ingleby) Ltd

SITE
**Grey Towers Farm,
 Nunthorpe,
 Middlesbrough**

DRAWING TITLE
**Proposed Exploratory
 Hole Location Plan**

DRAWING NO. C8874/03	REVISION NO. 0
DRAWN BY MF	APPROVED BY APC
DATE September 2020	SCALE 1:500
	PAPER SIZE A3

NOTES



REVISION	BY	DATE
0	For Information	MF 06/11/20
A	>>	>> >>
B	>>	>> >>
C	>>	>> >>
D	>>	>> >>

Contamination Sources	Contamination Pathway	Potential Receptors	Risk	
Metal, metalloid, organic and inorganic contaminants, including asbestos, in stockpiled materials associated with demolition of former structures and nearby development	<ol style="list-style-type: none"> 1. Direct and indirect ingestion 2. Inhalation of contaminants particles/dust/vapours 3. Dermal contact 	End users	Low to Moderate	
		Construction workers	Low to Moderate (can be reduced by appropriate PPE and soil management practices)	
		Gardens and landscaping	Very Low	
	Metal, metalloid, organic and inorganic contaminants, including asbestos, in topsoil at surface and below stockpiles	<ol style="list-style-type: none"> 4. Plant uptake 5. Direct contact with construction materials 6. Leaching 	Construction products including buried concrete and plastics	Very Low
			Controlled waters	Low/Very Low
			End users	Low
	<ol style="list-style-type: none"> 1. Direct and indirect ingestion 2. Inhalation of contaminants particles/dust/vapours 3. Dermal contact 4. Plant uptake 5. Direct contact with construction materials 6. Leaching 	Construction workers	Low	
		Gardens and landscaping	Very Low	
		Construction products including buried concrete and plastics	Very Low	
		Controlled waters	Low/Very low	

SIRIUS
 GEOTECHNICAL LTD
 Russel House,
 Mill Road,
 Langley Moor,
 Durham DH7 8HJ
www.thesiriusgroup.com
 TEL: 0191 378 9972
 FAX: 0191 378 1537

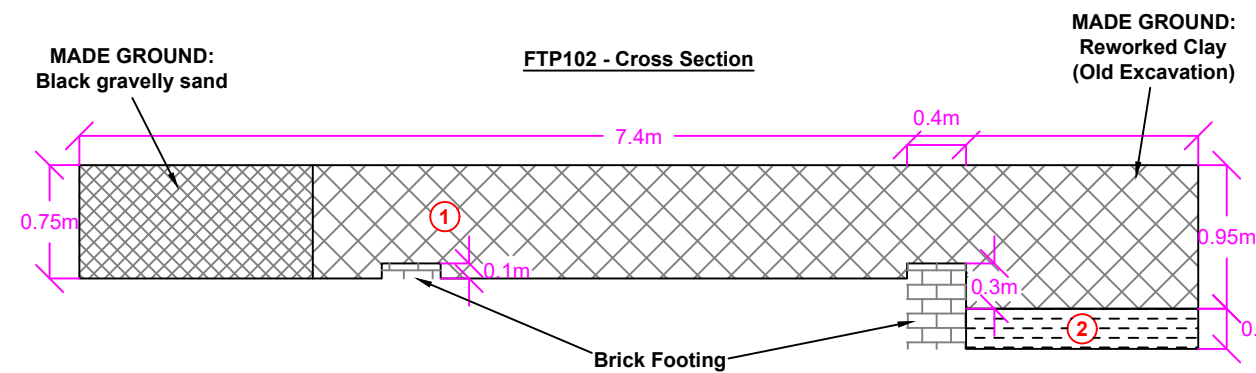
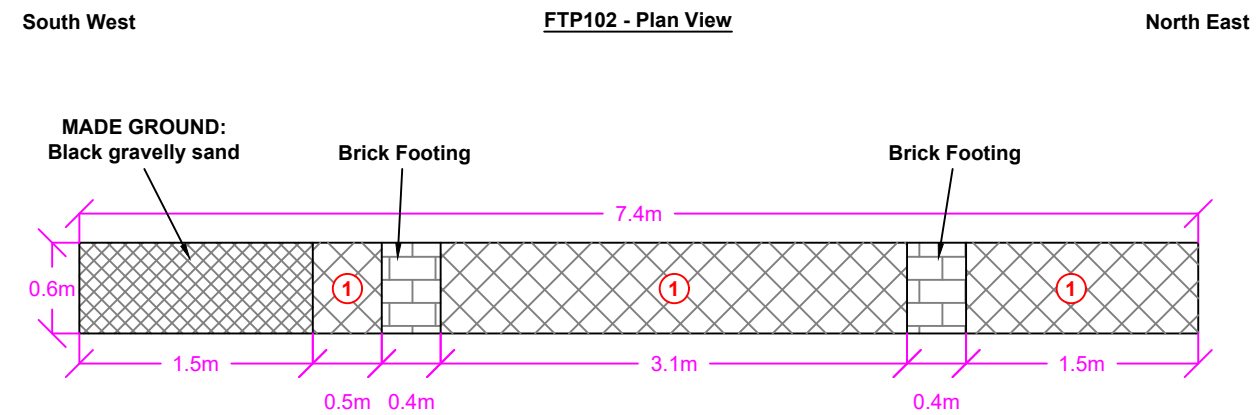
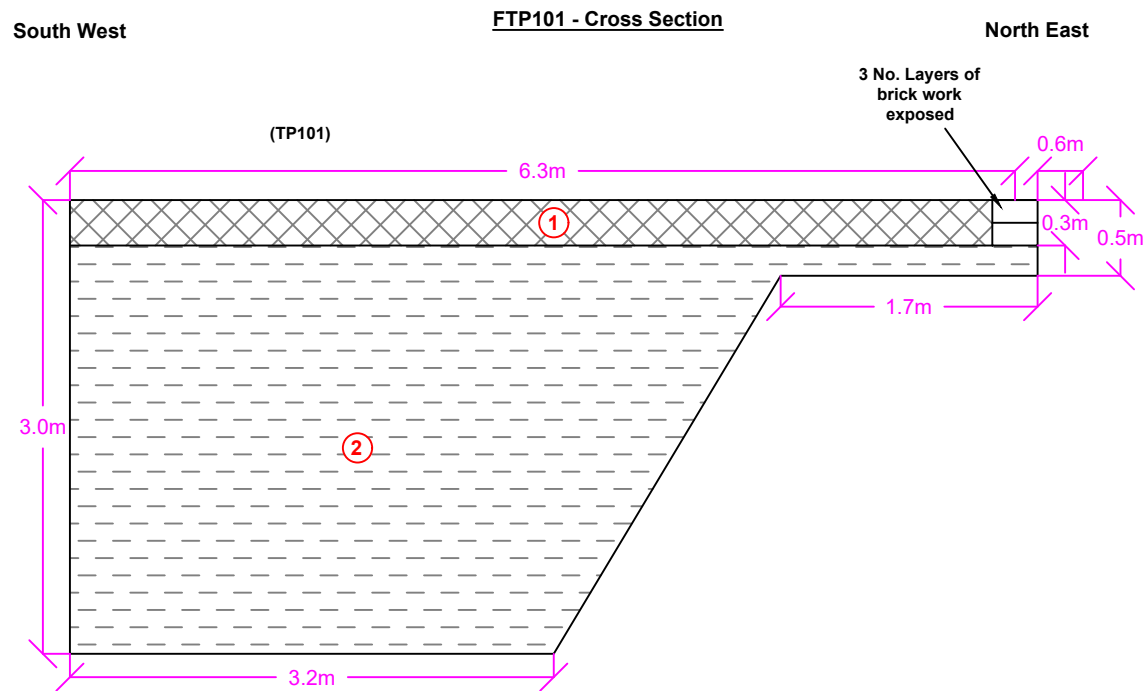


CLIENT
Fordy Farms (Ingleby) Ltd

SITE
**Grey Towers Farm
 Nunthorpe
 Middlesbrough**

DRAWING TITLE
**Revised Conceptual
 Site Model**

DRAWING NO. C8874/04	REVISION NO. 0
DRAWN BY MG	APPROVED BY DCB
DATE November 2020	SCALE NTS
	PAPER SIZE A3



- ① **MADE GROUND (Reworked clay):** Soft brown sandy gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone mudstone and occasional brick fragments.
- ② **Firm to stiff brown sandy slightly gravelly silty CLAY.** Gravel is fine to coarse subangular to rounded of sandstone.

NOTES

REVISION	BY	DATE
0	For Information	MF 30/09/20
A	Minor amendments following final review	MG 06/11/20
B	>>	>> >>
C	>>	>> >>
D	>>	>> >>

SIRIUS
GEOTECHNICAL LTD
Russel House,
Mill Road,
Langley Moor,
Durham DH7 8HJ
www.thesiriusgroup.com
TEL: 0191 378 9972
FAX: 0191 378 1537

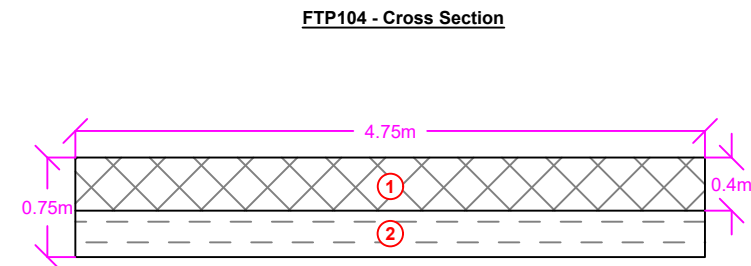
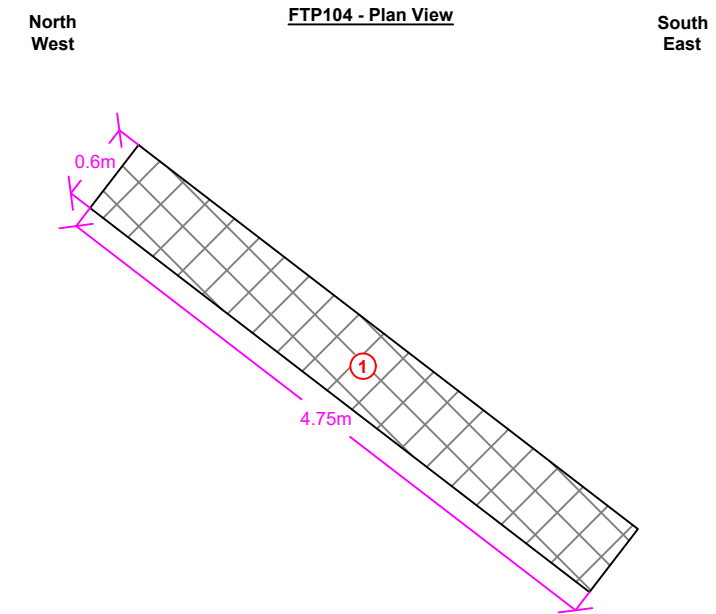
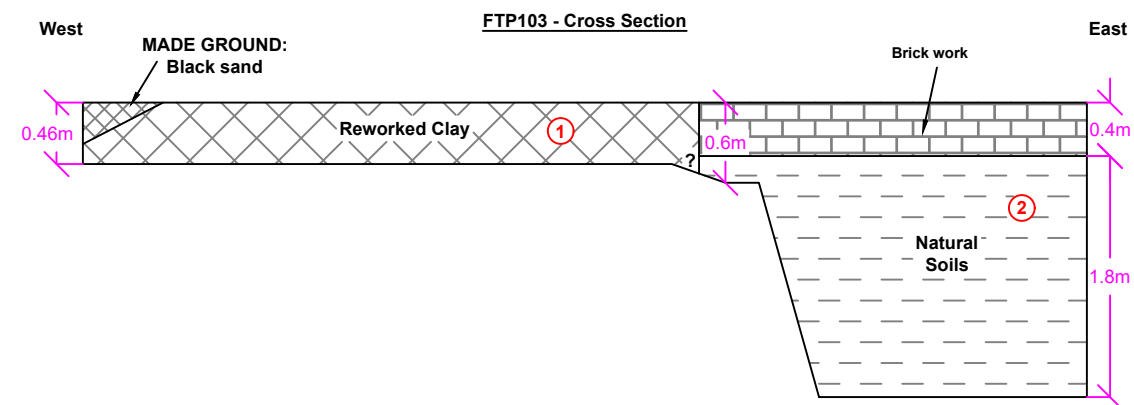
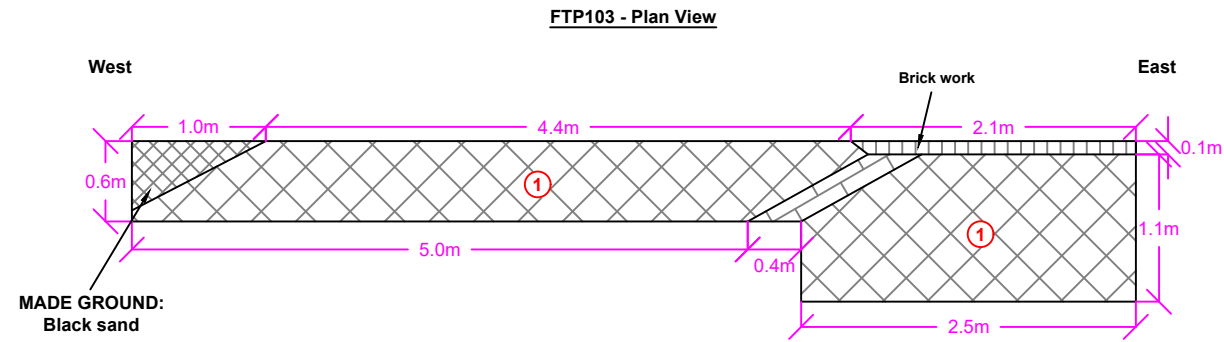


CLIENT
Fordy Farms (Ingleby) Ltd

SITE
**Grey Towers Farm
Nunthorpe
Middlesbrough**

DRAWING TITLE
**Trial Trench Details
FTP101 & FTP102**

DRAWING NO. C8874/101&102	REVISION NO. A
DRAWN BY MG	APPROVED BY APC
DATE November 2020	SCALE 1:50
	PAPER SIZE A3



Note: No Foundations Encountered

- ① **MADE GROUND (Reworked clay):** Soft brown sandy gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone mudstone and occasional brick fragments.
- ② **Firm to stiff brown sandy slightly gravelly silty CLAY.** Gravel is fine to coarse subangular to rounded of sandstone.

NOTES

REVISION	BY	DATE
0	For Information	MF 30/09/20
A	Minor amendments following final review	MG 06/11/20
B	>>	>> >>
C	>>	>> >>
D	>>	>> >>

SIRIUS
GEOTECHNICAL LTD
Russel House,
Mill Road,
Langley Moor,
Durham DH7 8HJ
www.the-siriusgroup.com
TEL: 0191 378 9972
FAX: 0191 378 1537



CLIENT

Fordy Farms (Ingleby) Ltd

SITE

**Grey Towers Farm
Nunthorpe
Middlesbrough**

DRAWING TITLE

**Trial Trench Details
FTP103 & TT104**

DRAWING NO. C8874/103&104	REVISION NO. A
DRAWN BY MG	APPROVED BY APC
DATE November 2020	SCALE NTS
	PAPER SIZE A3



APPENDIX B

LANDMARK INFORMATION GROUP ENVIROCHECK REPORT



Envirocheck[®] Report:

Datasheet

Order Details:

Order Number:

255485552_1_1

Customer Reference:

Grey Towers Farm

National Grid Reference:

453590, 513790

Slice:

A

Site Area (Ha):

0.71

Search Buffer (m):

1000

Site Details:

Grey Towers Farm

Nunthorpe

Client Details:

S Howson

Sirius Geotechnical Ltd

4245 Park Approach

Thorpe Park

Leeds

LS15 8GB

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	8
Hazardous Substances	-
Geological	9
Industrial Land Use	10
Sensitive Land Use	-
Data Currency	13
Data Suppliers	18
Useful Contacts	19

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination. For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client. In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

Copyright Notice

© Landmark Information Group Limited 2020. The Copyright on the information and data and its format as contained in this Envirocheck® Report ("Report") is the property of Landmark Information Group Limited ("Landmark") and several other Data Providers, including (but not limited to) Ordnance Survey, British Geological Survey, the Environment Agency/Natural Resources Wales and Natural England, and must not be reproduced in whole or in part by photocopying or any other method. The Report is supplied under Landmark's Terms and Conditions accepted by the Customer. A copy of Landmark's Terms and Conditions can be found with the Index Map for this report. Additional copies of the Report may be obtained from Landmark, subject to Landmark's charges in force from time to time. The Copyright, design rights and any other intellectual rights shall remain the exclusive property of Landmark and/or other Data providers, whose Copyright material has been included in this Report. © Environment Agency & United Kingdom Research and Innovation 2020. © Natural Resources Wales & United Kingdom Research and Innovation 2020.

Natural England Copyright Notice

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

Scottish Natural Heritage Copyright

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

Ove Arup Copyright Notice

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

Stantec Copyright Notice

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

Radon Potential dataset Copyright Notice

Information supplied from a joint dataset compiled by The British Geological Survey and Public Health England.

Natural Resources Wales Copyright Notice

Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right. Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Some features of this information are based on digital spatial data licensed from the Centre for Ecology & Hydrology © NERC (CEH). Defra, Met Office and DARD Rivers Agency © Crown copyright. © Cranfield University. © James Hutton Institute. Contains OS data © Crown copyright and database right 2020. Land & Property Services © Crown copyright and database right.

Report Version v53.0



Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 2			5	2
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls					
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 3		Yes		
Pollution Incidents to Controlled Waters					
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances					
River Quality					
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register					
Water Abstractions					
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 4	Yes	n/a	n/a	n/a
Groundwater Vulnerability - Soluble Rock Risk			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 4	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 4	Yes	n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
OS Water Network Lines	pg 4			13	15



Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites					
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)					
Local Authority Landfill Coverage	pg 8	1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Registered Landfill Sites					
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					
Geological					
BGS 1:625,000 Solid Geology	pg 9	Yes	n/a	n/a	n/a
BGS Recorded Mineral Sites	pg 9				1
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
Mining Instability			n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 9	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards				n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 9	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 9		Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 9	Yes	Yes	n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a



Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Industrial Land Use					
Contemporary Trade Directory Entries	pg 10				5
Fuel Station Entries					
Gas Pipelines					
Underground Electrical Cables	pg 10		8	4	12
Sensitive Land Use					
Ancient Woodland					
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					



Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SW (S)	0	1	453595 513750
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (SE)	0	1	453595 513791
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NE (E)	1	1	453650 513800
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13NW (N)	69	1	453550 513900
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (W)	87	1	453450 513791
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SE (S)	100	1	453650 513650
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13NE (E)	206	1	453850 513850
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (E)	215	1	453850 513700
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A14NW (E)	297	1	453950 513800
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SW (SW)	301	1	453400 513500
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (NW)	307	1	453300 514000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A14SW (E)	309	1	453950 513700
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13SW (SW)	312	1	453300 513600
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A12SE (W)	325	1	453250 513650
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (SE)	343	1	453900 513550
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A14NW (E)	352	1	454000 513850
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (NE)	395	1	453950 514050
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NW (S)	407	1	453450 513350
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A14NW (E)	412	1	454050 513900
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A14SW (E)	420	1	454050 513650
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NW (SW)	427	1	453400 513350
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SW (NW)	459	1	453300 514200



Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12NE (W)	460	1	453100 513950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A14NW (E)	475	1	454100 513950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NW (S)	481	1	453595 513250
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12NE (W)	487	1	453050 513791
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12SE (W)	498	1	453050 513700
1	Discharge Consents Operator: Northumbrian Water Limited Property Type: Sewerage Network - Pumping Station - Water Company Location: Cso And Eo At Nunthorpe Sps Dixons Bank, Nunthorpe, Middlesbrough, Cleveland Authority: Environment Agency, North East Region Catchment Area: Tees (Lower); Leven; Tame Reference: 25/04/1621 Permit Version: 1 Effective Date: 23rd December 1999 Issued Date: 23rd December 1999 Revocation Date: Not Supplied Discharge Type: Unspecified Discharge: Freshwater Stream/River Environment: Receiving Water: Unnamed Trib Marton West Beck Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A12NE (W)	358	2	453180 513830
1	Discharge Consents Operator: Northumbrian Water Limited Property Type: PUMPING STATION ON SEWERAGE NETWORK (WATER COMPANY) Location: Cso And Eo At Nunthorpe Sps Dixons Bank, Nunthorpe, Middlesbrough, Cleveland Authority: Environment Agency, North East Region Catchment Area: Tees (Lower); Leven; Tame Reference: 25/04/1621 Permit Version: 1 Effective Date: 23rd December 1999 Issued Date: 23rd December 1999 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Pumping Station - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Unnamed Trib Marton West Beck Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A12NE (W)	358	2	453180 513830
1	Discharge Consents Operator: Northumbrian Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Nunthorpe No 1 Sso, Nunthorpe Authority: Environment Agency, North East Region Catchment Area: Tees (Lower); Leven; Tame Reference: 254/0768 Permit Version: 1 Effective Date: 21st September 1989 Issued Date: 21st September 1989 Revocation Date: 15th January 1991 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Ellerby'S Plantation Beck Status: Authorisation revoked Positional Accuracy: Located by supplier to within 10m	A12NE (W)	358	2	453180 513840



Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	<p>Discharge Consents</p> <p>Operator: Northumbrian Water Limited Property Type: Sewage Disposal Works - Water Company Location: Nunthorpe No 1 Pumping Station, Nunthorpe Authority: Environment Agency, North East Region Catchment Area: Not Supplied Reference: 254/0947 Permit Version: 2 Effective Date: 22nd December 1999 Issued Date: 21st September 1989 Revocation Date: 23rd December 1999 Discharge Type: Unspecified Discharge: Into Land Environment: Receiving Water: Ellerby Plantation Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 10m</p>	A12NE (W)	377	2	453160 513810
1	<p>Discharge Consents</p> <p>Operator: Northumbrian Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Nunthorpe No 1 Pumping Station, Nunthorpe Authority: Environment Agency, North East Region Catchment Area: Tees (Lower); Leven; Tame Reference: 254/0947 Permit Version: 1 Effective Date: 21st September 1989 Issued Date: 21st September 1989 Revocation Date: 23rd December 1999 Discharge Type: Sewage Discharges - Pumping Station - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Ellerby Plantation Status: Revoked (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 100m</p>	A12NE (W)	377	2	453160 513810
2	<p>Discharge Consents</p> <p>Operator: J A Coles Property Type: WWTW (NOT WATER CO) (NOT STP AT A PRIVATE PREMISES) Location: Brass Castle Lane, Bungalow Sewage, Nunthorpe Authority: Environment Agency, North East Region Catchment Area: Tees (Lower); Leven; Tame Reference: 254/E/0090 Permit Version: 1 Effective Date: 24th June 1955 Issued Date: 24th June 1955 Revocation Date: 1st October 1996 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Marton West Beck, Tributary Of Status: Lapsed (under Environment Act 1995, Schedule 23) Positional Accuracy: Located by supplier to within 100m</p>	A12NW (W)	737	2	452800 513800
3	<p>Discharge Consents</p> <p>Operator: Northumbrian Water Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Bonny Grove Pumping Station, Marton Authority: Environment Agency, North East Region Catchment Area: Tees (Lower); Leven; Tame Reference: 254/1364 Permit Version: 1 Effective Date: 8th March 1994 Issued Date: 8th March 1994 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Pumping Station - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Marton West Beck Status: New Consent, by Application (Water Resources Act 1991, Section 88) Positional Accuracy: Located by supplier to within 10m</p>	A12NW (W)	895	2	452669 514024
	<p>Nearest Surface Water Feature</p>	A13NW (NW)	108	-	453505 513915



Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Groundwater Vulnerability Map Combined Classification: Secondary Superficial Aquifer - Medium Vulnerability Combined Vulnerability: Medium Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer Pollutant Speed: Low Bedrock Flow: Well Connected Fractures Dilution: <300 mm/year Baseflow Index: <40% Superficial Patchiness: >90% Superficial Thickness: >10m Superficial Recharge: Low	A13NW (SE)	0	3	453595 513791
	Groundwater Vulnerability - Soluble Rock Risk None				
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - Undifferentiated	A13NW (SE)	0	3	453595 513791
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - Undifferentiated	A13NW (SE)	0	3	453595 513791
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
4	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 319.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A12NE (W)	354	4	453184 513831
5	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 104.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A14SW (SE)	406	4	454013 513601
6	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 29.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A12SE (SW)	421	4	453188 513570
7	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 4.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A14SW (SE)	435	4	454024 513560



Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
8	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 32.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A12SE (SW)	437	4	453189 513540
9	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 260.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A14SW (SE)	439	4	454026 513556
10	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 26.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A14SW (E)	440	4	454065 513633
11	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 284.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A14SW (E)	457	4	454088 513647
12	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 100.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A12SE (SW)	464	4	453181 513505
13	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 46.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A12SE (SW)	465	4	453175 513511
14	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 4.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A14NW (E)	492	4	454143 513833
15	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 167.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A14NW (E)	494	4	454146 513837
16	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 67.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A12SE (SW)	499	4	453130 513515



Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
17	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 283.7 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A7NE (SW)	505	4	453199 513415
18	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 764.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A12SE (SW)	563	4	453064 513500
19	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 1.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A9NW (SE)	667	4	454223 513442
20	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 151.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A9NW (SE)	668	4	454224 513440
21	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 136.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A7NE (SW)	734	4	453167 513133
22	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 20.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A19NW (NE)	795	4	454064 514492
23	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 281.4 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A19NW (NE)	815	4	454075 514509
24	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 119.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A7SE (SW)	869	4	453099 513015
25	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 27.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A12NW (W)	889	4	452675 514024



Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
26	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 21.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A12NW (W)	915	4	452648 514022
27	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 8.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A12NW (W)	932	4	452629 514014
28	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 667.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A12NW (W)	936	4	452621 513997
29	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 10.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A19NW (NE)	968	4	454155 514639
30	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 33.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A19NW (NE)	976	4	454156 514649
31	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 421.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Tees Primacy: 1	A7SE (SW)	985	4	453008 512938



Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Local Authority Landfill Coverage Name: Middlesbrough Unitary Council - Has no landfill data to supply		0	5	453595 513791
	Local Authority Landfill Coverage Name: Redcar and Cleveland Unitary Council - Has no landfill data to supply		754	6	454374 514011

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Lias Group	A13NW (SE)	0	1	453595 513791
32	BGS Recorded Mineral Sites Site Name: Nunthorpe Sand Pit Location: Nunthorpe, Middlesbrough, North Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 124165 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Quaternary Geology: Glaciofluvial Deposits, Devensian Commodity: Sand Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	622	1	454024 513284
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	453595 513791
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	453595 513791
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	453595 513791
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	453595 513791
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	453595 513791
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	174	1	453391 513901
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	453595 513791
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	174	1	453391 513901
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	453595 513791
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	453595 513791



Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
33	Contemporary Trade Directory Entries Name: Drop Ship 4 You Location: West Side, Nunthorpe, Middlesbrough, Cleveland, TS7 0NN Classification: Distribution Services Status: Inactive Positional Accuracy: Manually positioned within the geographical locality	A9NW (SE)	698	-	454049 513203
34	Contemporary Trade Directory Entries Name: J C G Plant & Power Location: 60, Eagle Park, Marton-in-Cleveland, Middlesbrough, TS8 9NT Classification: Electricity Generating & Distributing Equipment Status: Active Positional Accuracy: Automatically positioned to the address	A17SW (NW)	936	-	452751 514313
35	Contemporary Trade Directory Entries Name: Ricco Blinds Location: 31, Bonnygrove, Marton-in-Cleveland, Middlesbrough, Cleveland, TS8 9QZ Classification: Blinds, Awnings & Canopies Status: Inactive Positional Accuracy: Automatically positioned to the address	A17SW (W)	941	-	452657 514138
36	Contemporary Trade Directory Entries Name: Mobile Electronics Location: 36, Nunthorpe Gardens, Nunthorpe, Middlesbrough, Cleveland, TS7 0GA Classification: Mobile Phone Accessories and Car Kits Status: Inactive Positional Accuracy: Automatically positioned to the address	A18NE (N)	968	-	453930 514758
37	Contemporary Trade Directory Entries Name: Sharptune Location: 15, Green Way, Nunthorpe, Middlesbrough, Cleveland, TS7 0DB Classification: Car Engine Tuning & Diagnostic Services Status: Inactive Positional Accuracy: Automatically positioned to the address	A18NW (N)	970	-	453399 514798
38	Underground Electrical Cables Unique Feature Identifier: 10006965 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 27th October 2017	A13NW (NW)	4	7	453567 513835
39	Underground Electrical Cables Unique Feature Identifier: 10008062 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 27th October 2017	A13NW (NW)	10	7	453564 513839
40	Underground Electrical Cables Unique Feature Identifier: 10007322 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 27th October 2017	A13NW (NW)	21	7	453557 513849
41	Underground Electrical Cables Unique Feature Identifier: 10006914 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 27th October 2017	A13NW (NW)	27	7	453554 513853
42	Underground Electrical Cables Unique Feature Identifier: 10006966 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017	A13SW (W)	45	7	453495 513788
43	Underground Electrical Cables Unique Feature Identifier: 10006989 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017	A13NW (W)	46	7	453492 513794



Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
44	Underground Electrical Cables Unique Feature Identifier: 10007323 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017	A13NW (W)	51	7	453486 513803
45	Underground Electrical Cables Unique Feature Identifier: 10006915 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017	A13NW (W)	54	7	453482 513808
46	Underground Electrical Cables Unique Feature Identifier: 10006913 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017	A13NE (NE)	320	7	453853 514043
47	Underground Electrical Cables Unique Feature Identifier: 10007321 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017	A13NE (NE)	321	7	453858 514039
48	Underground Electrical Cables Unique Feature Identifier: 10006581 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017	A13NE (NE)	322	7	453867 514032
49	Underground Electrical Cables Unique Feature Identifier: 10005903 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017	A13NE (NE)	323	7	453871 514028
50	Underground Electrical Cables Unique Feature Identifier: 10005889 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017	A12SE (SW)	522	7	453086 513540
51	Underground Electrical Cables Unique Feature Identifier: 10006990 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017	A12SE (SW)	522	7	453089 513535
52	Underground Electrical Cables Unique Feature Identifier: 10006967 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017	A12SE (SW)	522	7	453092 513530
53	Underground Electrical Cables Unique Feature Identifier: 10007751 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017	A12SE (SW)	523	7	453083 513545



Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
54	<p>Underground Electrical Cables</p> <p>Unique Feature Identifier: 10007320 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017</p>	A19SW (NE)	790	7	454177 514385
55	<p>Underground Electrical Cables</p> <p>Unique Feature Identifier: 10006912 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017</p>	A19SW (NE)	790	7	454173 514389
56	<p>Underground Electrical Cables</p> <p>Unique Feature Identifier: 10006580 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017</p>	A19SW (NE)	790	7	454184 514377
57	<p>Underground Electrical Cables</p> <p>Unique Feature Identifier: 10005902 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017</p>	A19SW (NE)	790	7	454189 514373
58	<p>Underground Electrical Cables</p> <p>Unique Feature Identifier: 10006968 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017</p>	A7SW (SW)	984	7	452830 513109
59	<p>Underground Electrical Cables</p> <p>Unique Feature Identifier: 10006991 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017</p>	A7SW (SW)	984	7	452825 513114
60	<p>Underground Electrical Cables</p> <p>Unique Feature Identifier: 10005890 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017</p>	A7NW (SW)	985	7	452819 513121
61	<p>Underground Electrical Cables</p> <p>Unique Feature Identifier: 10006505 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 26th October 2017</p>	A7NW (SW)	986	7	452814 513126

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices Hambleton District Council - Planning & Environmental Services Environment Agency - Head Office Middlesbrough Council - Public Protection and Planning Stockton-on-Tees Borough Council - Environmental Health Department Redcar and Cleveland Borough Council - Development Department	January 2015 June 2020 November 2013 October 2017 September 2014	Annual Rolling Update Annually Annual Rolling Update Annual Rolling Update Annual Rolling Update
Discharge Consents Environment Agency - North East Region	July 2020	Quarterly
Enforcement and Prohibition Notices Environment Agency - North East Region	March 2013	Annual Rolling Update
Integrated Pollution Controls Environment Agency - North East Region	October 2008	Variable
Integrated Pollution Prevention And Control Environment Agency - North East Region	July 2020	Quarterly
Local Authority Integrated Pollution Prevention And Control Redcar and Cleveland Borough Council - Environmental Health Department Stockton-on-Tees Borough Council - Environmental Health Department Hambleton District Council - Planning & Environmental Services Middlesbrough Council - Environmental Health Department	December 2014 June 2014 May 2016 September 2013	Variable Variable Variable Variable
Local Authority Pollution Prevention and Controls Redcar and Cleveland Borough Council - Environmental Health Department Stockton-on-Tees Borough Council - Environmental Health Department Middlesbrough Council - Environmental Health Department Hambleton District Council - Planning & Environmental Services	December 2014 June 2014 June 2015 May 2016	Annual Rolling Update Annual Rolling Update Annual Rolling Update Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements Redcar and Cleveland Borough Council - Environmental Health Department Stockton-on-Tees Borough Council - Environmental Health Department Middlesbrough Council - Environmental Health Department Hambleton District Council - Planning & Environmental Services	December 2014 June 2014 June 2015 May 2016	Variable Variable Variable Variable
Nearest Surface Water Feature Ordnance Survey	June 2020	
Pollution Incidents to Controlled Waters Environment Agency - North East Region	December 1998	Not Applicable
Prosecutions Relating to Authorised Processes Environment Agency - North East Region	March 2013	Annual Rolling Update
Prosecutions Relating to Controlled Waters Environment Agency - North East Region	March 2013	Annual Rolling Update
Registered Radioactive Substances Environment Agency - North East Region	June 2016	
River Quality Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points Environment Agency - Head Office	July 2012	Annually
River Quality Chemistry Sampling Points Environment Agency - Head Office	July 2012	Annually
Substantiated Pollution Incident Register Environment Agency - North East Region - Dales Area Environment Agency - North East Region - North East Area Environment Agency - North East Region - Yorkshire Area	July 2020 July 2020 July 2020	Quarterly Quarterly Quarterly
Water Abstractions Environment Agency - North East Region	July 2020	Quarterly



Agency & Hydrological	Version	Update Cycle
Water Industry Act Referrals Environment Agency - North East Region	October 2017	Quarterly
Groundwater Vulnerability Map Environment Agency - Head Office	June 2018	As notified
Bedrock Aquifer Designations Environment Agency - Head Office	January 2018	Annually
Superficial Aquifer Designations Environment Agency - Head Office	January 2018	Annually
Source Protection Zones Environment Agency - Head Office	October 2019	Quarterly
Extreme Flooding from Rivers or Sea without Defences Environment Agency - Head Office	June 2020	Quarterly
Flooding from Rivers or Sea without Defences Environment Agency - Head Office	June 2020	Quarterly
Areas Benefiting from Flood Defences Environment Agency - Head Office	June 2020	Quarterly
Flood Water Storage Areas Environment Agency - Head Office	June 2020	Quarterly
Flood Defences Environment Agency - Head Office	June 2020	Quarterly
OS Water Network Lines Ordnance Survey	June 2020	Quarterly
BGS Groundwater Flooding Susceptibility British Geological Survey - National Geoscience Information Service	May 2013	Annually


Waste	Version	Update Cycle
BGS Recorded Landfill Sites British Geological Survey - National Geoscience Information Service	June 1996	Not Applicable
Historical Landfill Sites Environment Agency - Head Office	October 2019	Quarterly
Integrated Pollution Control Registered Waste Sites Environment Agency - North East Region	October 2008	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries) Environment Agency - North East Region - Dales Area Environment Agency - North East Region - North East Area Environment Agency - North East Region - Yorkshire Area	July 2020 July 2020 July 2020	Quarterly Quarterly Quarterly
Licensed Waste Management Facilities (Locations) Environment Agency - North East Region - Dales Area Environment Agency - North East Region - North East Area Environment Agency - North East Region - Yorkshire Area	July 2020 July 2020 July 2020	Quarterly Quarterly Quarterly
Local Authority Landfill Coverage Hambleton District Council - Planning & Environmental Services Middlesbrough Council North Yorkshire County Council Redcar and Cleveland Borough Council Stockton-on-Tees Borough Council - Environmental Health Department	May 2000 May 2000 May 2000 May 2000 May 2000	Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable
Local Authority Recorded Landfill Sites Hambleton District Council - Planning & Environmental Services Middlesbrough Council North Yorkshire County Council Redcar and Cleveland Borough Council Stockton-on-Tees Borough Council - Environmental Health Department	May 2000 May 2000 May 2000 May 2000 May 2000	Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable
Registered Landfill Sites Environment Agency - North East Region - Dales Area Environment Agency - North East Region - North East Area Environment Agency - North East Region - Yorkshire Area	March 2003 March 2003 March 2003	Not Applicable Not Applicable Not Applicable
Registered Waste Transfer Sites Environment Agency - North East Region - Dales Area Environment Agency - North East Region - North East Area Environment Agency - North East Region - Yorkshire Area	March 2003 March 2003 March 2003	Not Applicable Not Applicable Not Applicable
Registered Waste Treatment or Disposal Sites Environment Agency - North East Region - Dales Area Environment Agency - North East Region - North East Area Environment Agency - North East Region - Yorkshire Area	March 2003 March 2003 March 2003	Not Applicable Not Applicable Not Applicable



Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH) Health and Safety Executive	April 2018	Bi-Annually
Explosive Sites Health and Safety Executive	March 2017	Annually
Notification of Installations Handling Hazardous Substances (NIHHS) Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements Redcar and Cleveland Borough Council - Planning Department Hambleton District Council - Planning & Environmental Services Middlesbrough Council North Yorkshire County Council Stockton-on-Tees Borough Council North Yorkshire Moors National Park	April 2016 February 2016 January 2016 October 2007 October 2015 September 2007	Variable Variable Variable Annual Rolling Update Variable Annual Rolling Update
Planning Hazardous Substance Consents Redcar and Cleveland Borough Council - Planning Department Hambleton District Council - Planning & Environmental Services Middlesbrough Council North Yorkshire County Council Stockton-on-Tees Borough Council North Yorkshire Moors National Park	April 2016 February 2016 January 2016 October 2007 October 2015 September 2007	Variable Variable Variable Annual Rolling Update Variable Annual Rolling Update
Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	Not Applicable
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	June 2020	Bi-Annually
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011	Not Applicable
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	Annual Rolling Update
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	April 2020	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	Annually
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	Annually

Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries Thomson Directories	July 2020	Quarterly
Fuel Station Entries Catalist Ltd - Experian	June 2020	Quarterly
Gas Pipelines National Grid	July 2014	
Underground Electrical Cables National Grid	August 2020	
Sensitive Land Use	Version	Update Cycle
Ancient Woodland Natural England	April 2020	Bi-Annually
Areas of Adopted Green Belt Hambleton District Council - Planning & Environmental Services Middlesbrough Council North Yorkshire Moors National Park Redcar and Cleveland Borough Council Stockton-on-Tees Borough Council	June 2020 June 2020 June 2020 June 2020 June 2020	As notified As notified As notified As notified As notified
Areas of Unadopted Green Belt Hambleton District Council - Planning & Environmental Services Middlesbrough Council North Yorkshire Moors National Park Redcar and Cleveland Borough Council Stockton-on-Tees Borough Council	June 2020 June 2020 June 2020 June 2020 June 2020	As notified As notified As notified As notified As notified
Areas of Outstanding Natural Beauty Natural England	June 2019	Bi-Annually
Environmentally Sensitive Areas Natural England	January 2017	
Forest Parks Forestry Commission	April 1997	Not Applicable
Local Nature Reserves Natural England	April 2020	Bi-Annually
Marine Nature Reserves Natural England	July 2019	Bi-Annually
National Nature Reserves Natural England	July 2019	Bi-Annually
National Parks Natural England	April 2017	Bi-Annually
Nitrate Sensitive Areas Natural England	April 2016	Not Applicable
Nitrate Vulnerable Zones Environment Agency - Head Office Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	December 2017 October 2015	Bi-Annually
Ramsar Sites Natural England	April 2019	Bi-Annually
Sites of Special Scientific Interest Natural England	May 2020	Bi-Annually
Special Areas of Conservation Natural England	July 2020	Bi-Annually
Special Protection Areas Natural England	April 2019	Bi-Annually

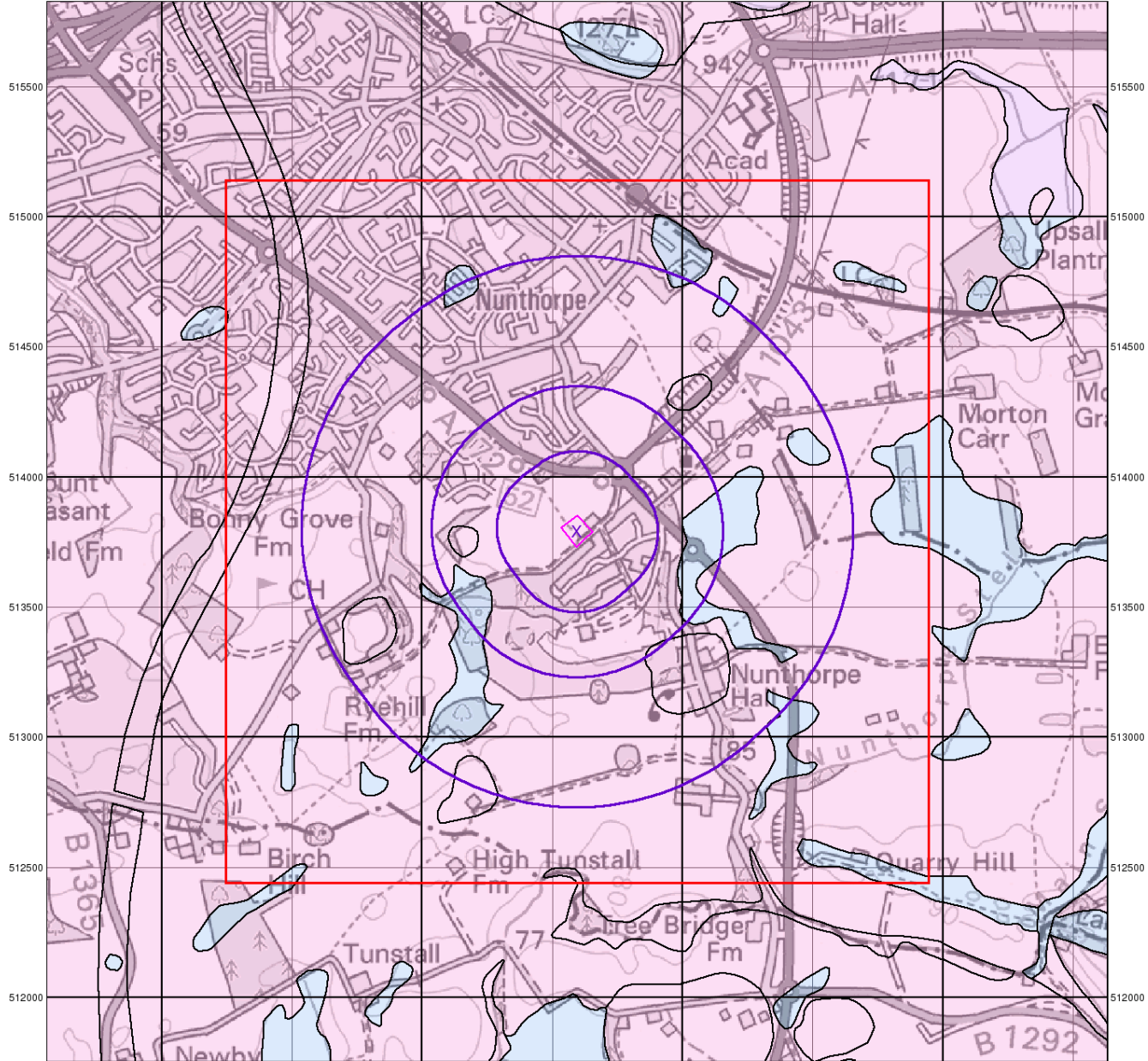
A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	 British Geological Survey <small>NATURAL ENVIRONMENT RESEARCH COUNCIL</small>
Centre for Ecology and Hydrology	 Centre for Ecology & Hydrology <small>NATURAL ENVIRONMENT RESEARCH COUNCIL</small>
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Stantec UK Ltd	

Contact	Name and Address	Contact Details
1	British Geological Survey - Enquiry Service British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	Environment Agency - National Customer Contact Centre (NCCC) PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
3	Environment Agency - Head Office Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	Telephone: 01454 624400 Fax: 01454 624409
4	Ordnance Survey Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.gov.uk
5	Middlesbrough Council P O Box 65; Vancouver House, Central Mews, Gurney Street, Middlesbrough, Cleveland, TS1 1QP	Telephone: 01642 264098 Fax: 01642 248766 Website: www.middlesbrough.gov.uk
6	Redcar and Cleveland Borough Council Town Hall, Fabian Road, South Bank, Middlesbrough, Cleveland, TS6 9AR	Telephone: 01642 444000 Website: www.redcar-cleveland.gov.uk
7	Landmark Information Group Limited Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9966 Fax: 0844 844 9951 Email: helpdesk@landmark.co.uk Website: www.landmark.co.uk
8	Natural England County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
-	Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	Landmark Information Group Limited Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

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

452000 452500 453000 453500 454000 454500 455000 455500



© Crown Copyright. All Rights Reserved. License Number 100022432



Groundwater Vulnerability

General

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

Agency and Hydrological

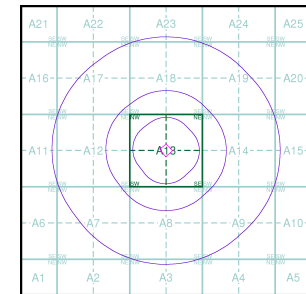
Bedrock Aquifers

- High Vulnerability, Principal Aquifer
- High Vulnerability, Secondary Aquifer
- Medium Vulnerability, Principal Aquifer
- Medium Vulnerability, Secondary Aquifer
- Low Vulnerability, Principal Aquifer
- Low Vulnerability, Secondary Aquifer
- Unproductive Aquifer
- Soluble Rock

Superficial Aquifers

- High Vulnerability, Principal Aquifer
- High Vulnerability, Secondary Aquifer
- Medium Vulnerability, Principal Aquifer
- Medium Vulnerability, Secondary Aquifer
- Low Vulnerability, Principal Aquifer
- Low Vulnerability, Secondary Aquifer

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

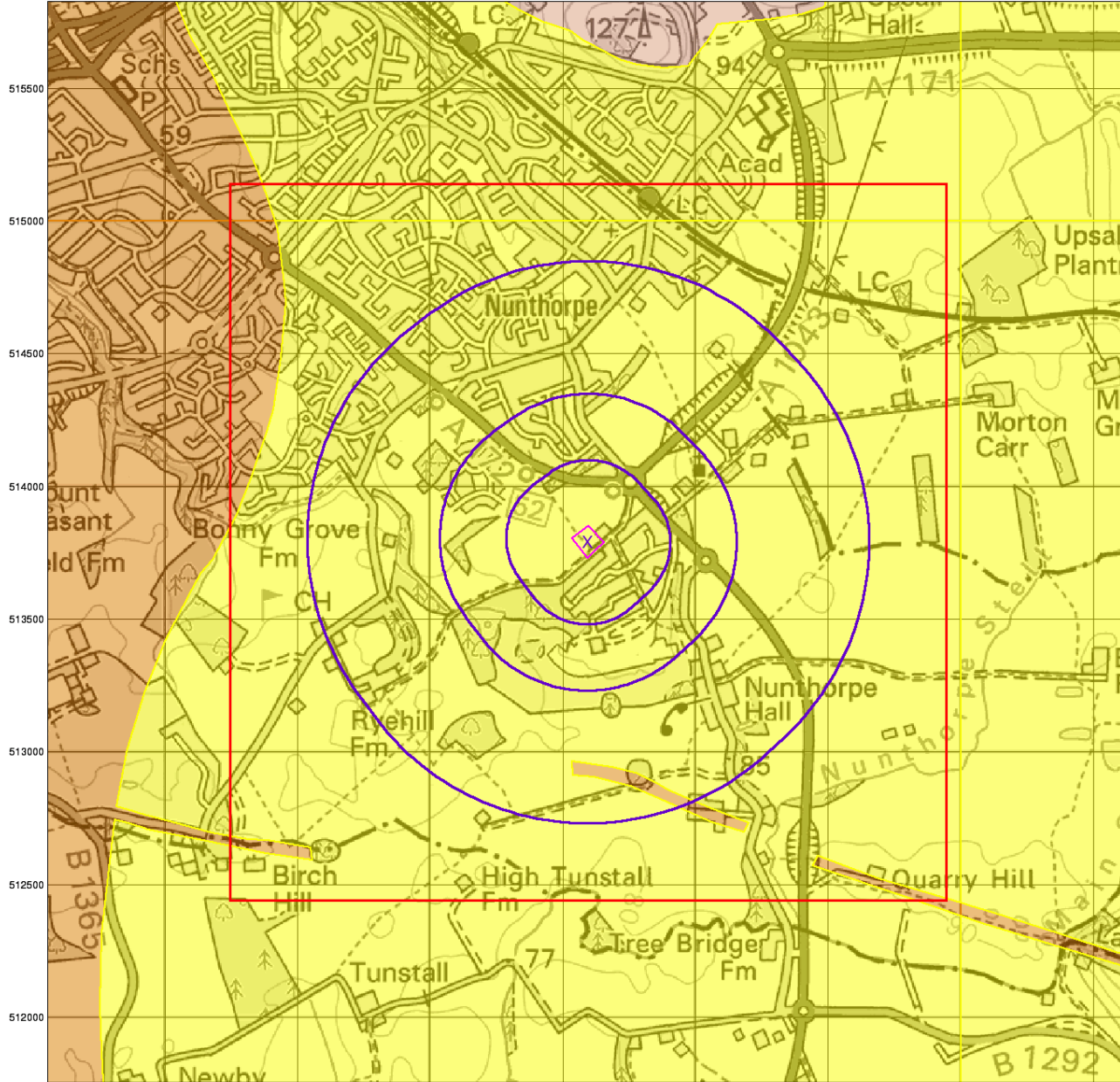
Site Details

Grey Towers Farm, Nunthorpe



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

452000 452500 453000 453500 454000 454500 455000 455500



© Crown Copyright. All Rights Reserved. License Number 100022432

0 1 km



Bedrock Aquifer Designation

General

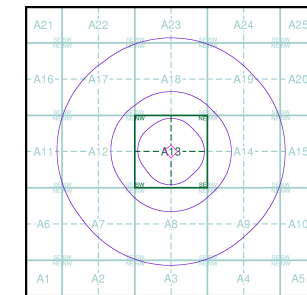
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

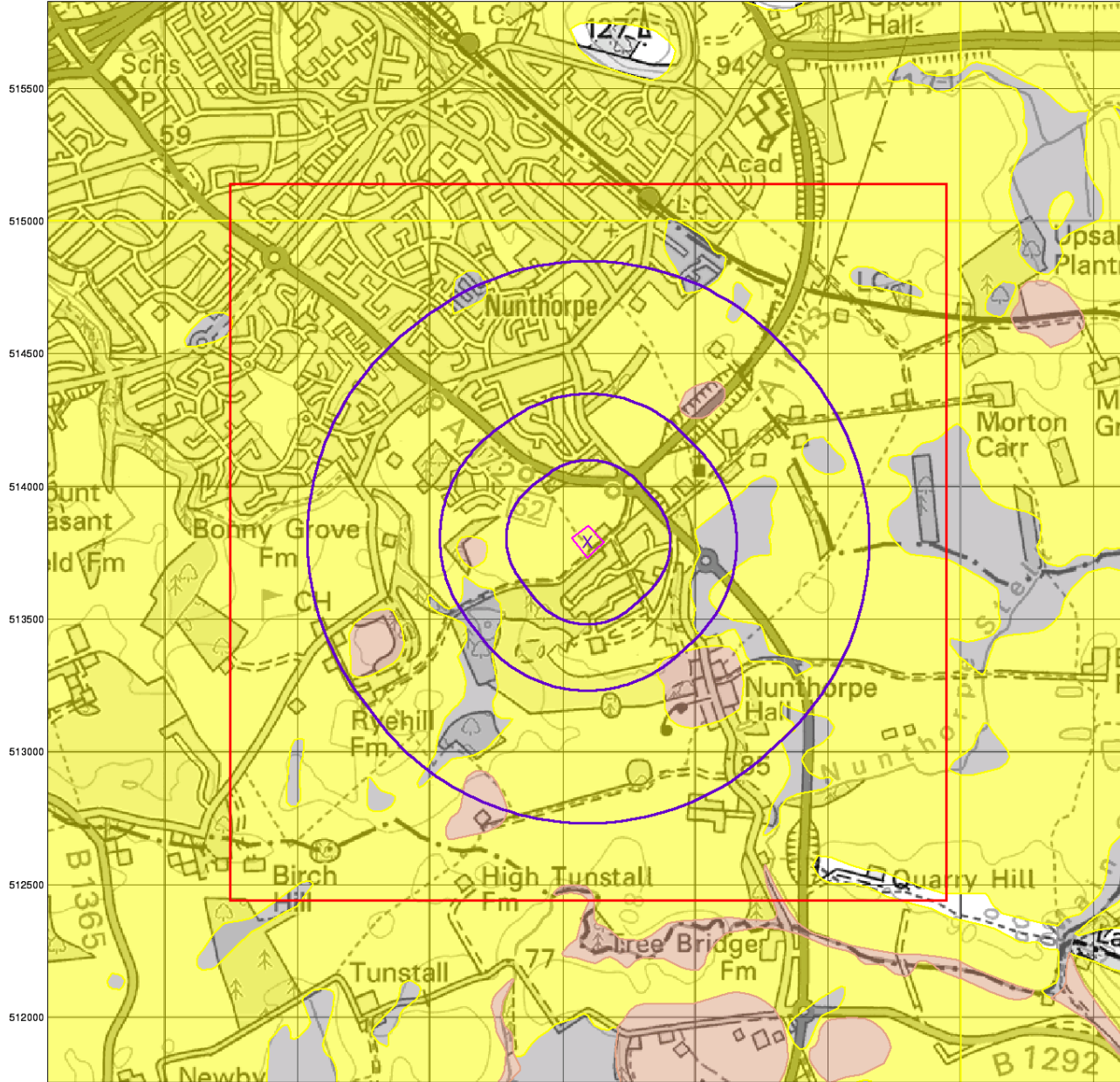
Site Details

Grey Towers Farm, Nunthorpe



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

452000 452500 453000 453500 454000 454500 455000 455500



© Crown Copyright. All Rights Reserved. License Number 100022432

0 1 km



Superficial Aquifer Designation

General

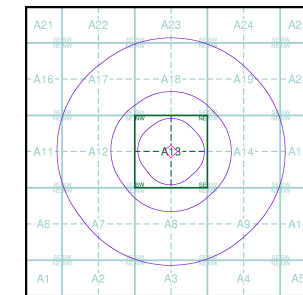
- ◊ Specified Site
- Specified Buffer(s)
- ✕ Bearing Reference Point
- Slice
- B Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

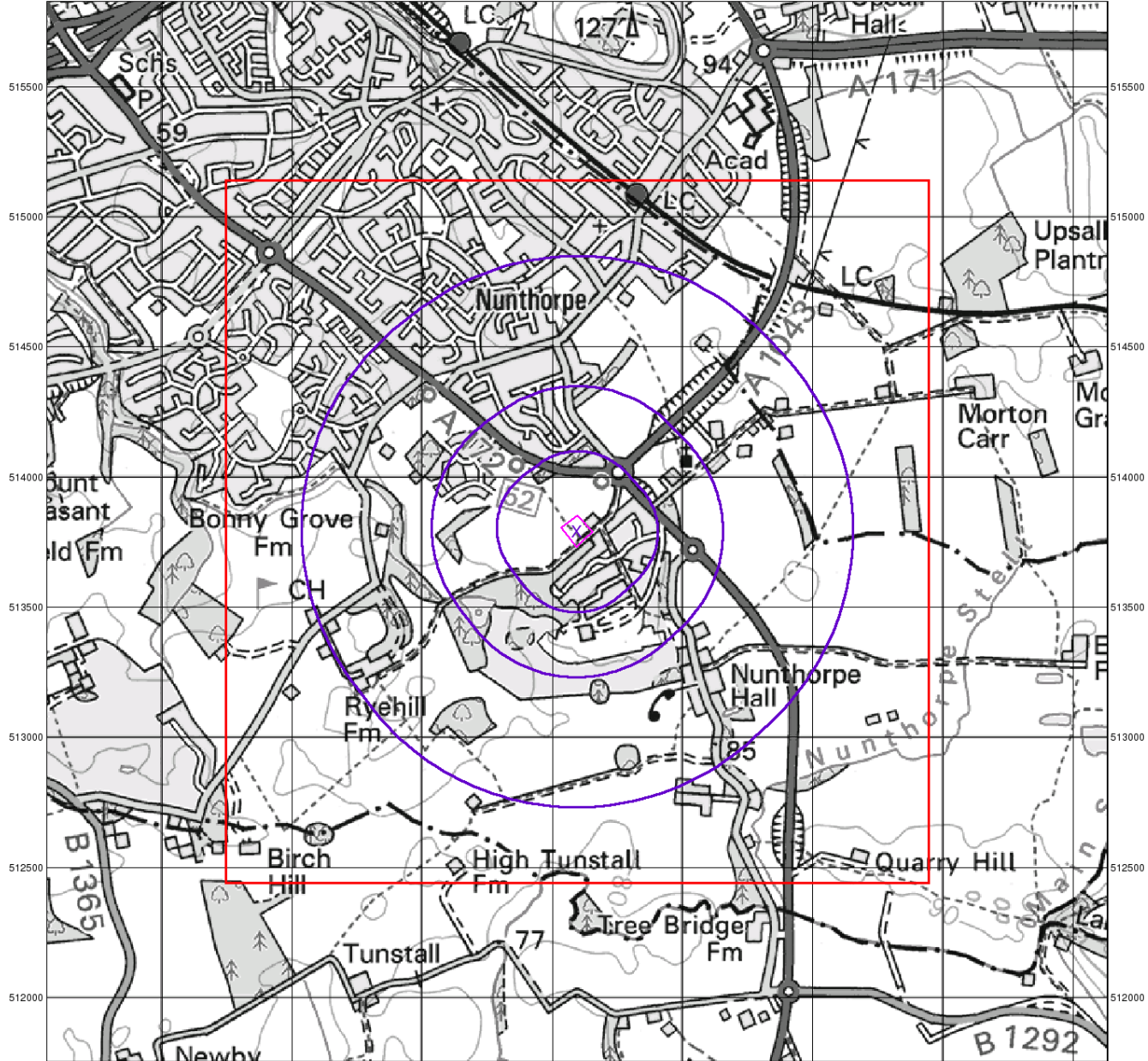
Site Details

Grey Towers Farm, Nunthorpe



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

452000 452500 453000 453500 454000 454500 455000 455500



© Crown Copyright. All Rights Reserved. License Number 100022432



Source Protection Zones

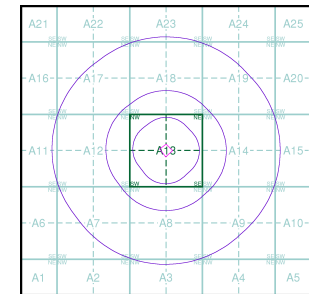
General

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

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

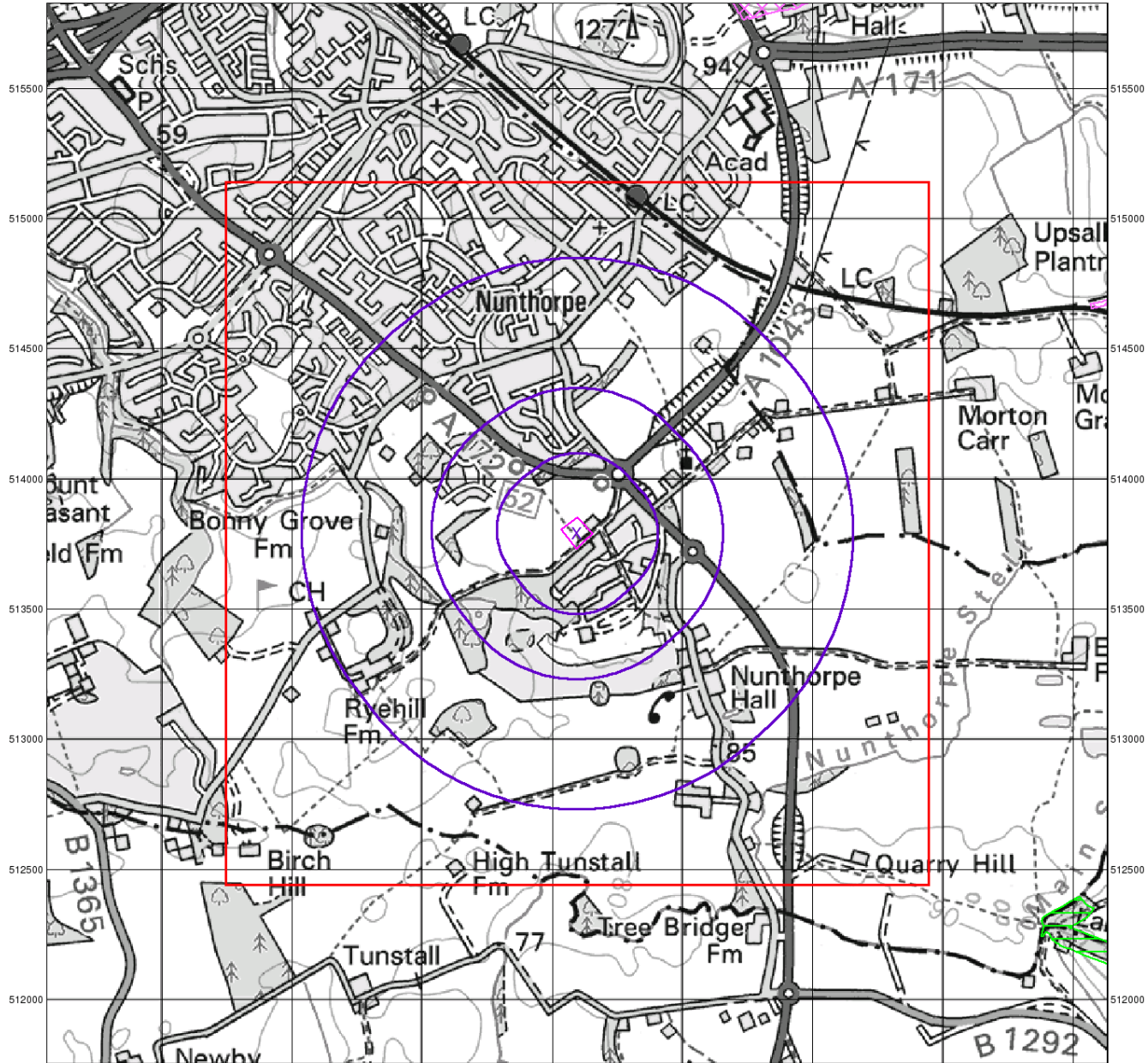
Site Details

Grey Towers Farm, Nunthorpe



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

452000 452500 453000 453500 454000 454500 455000 455500



© Crown Copyright. All Rights Reserved. License Number 100022432



Sensitive Land Uses

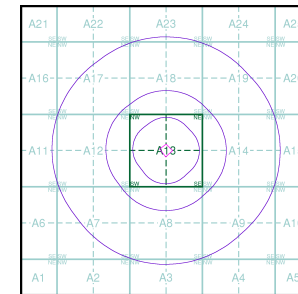
General

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

Sensitive Land Uses

- Ancient Woodland
- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area
- World Heritage Sites

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

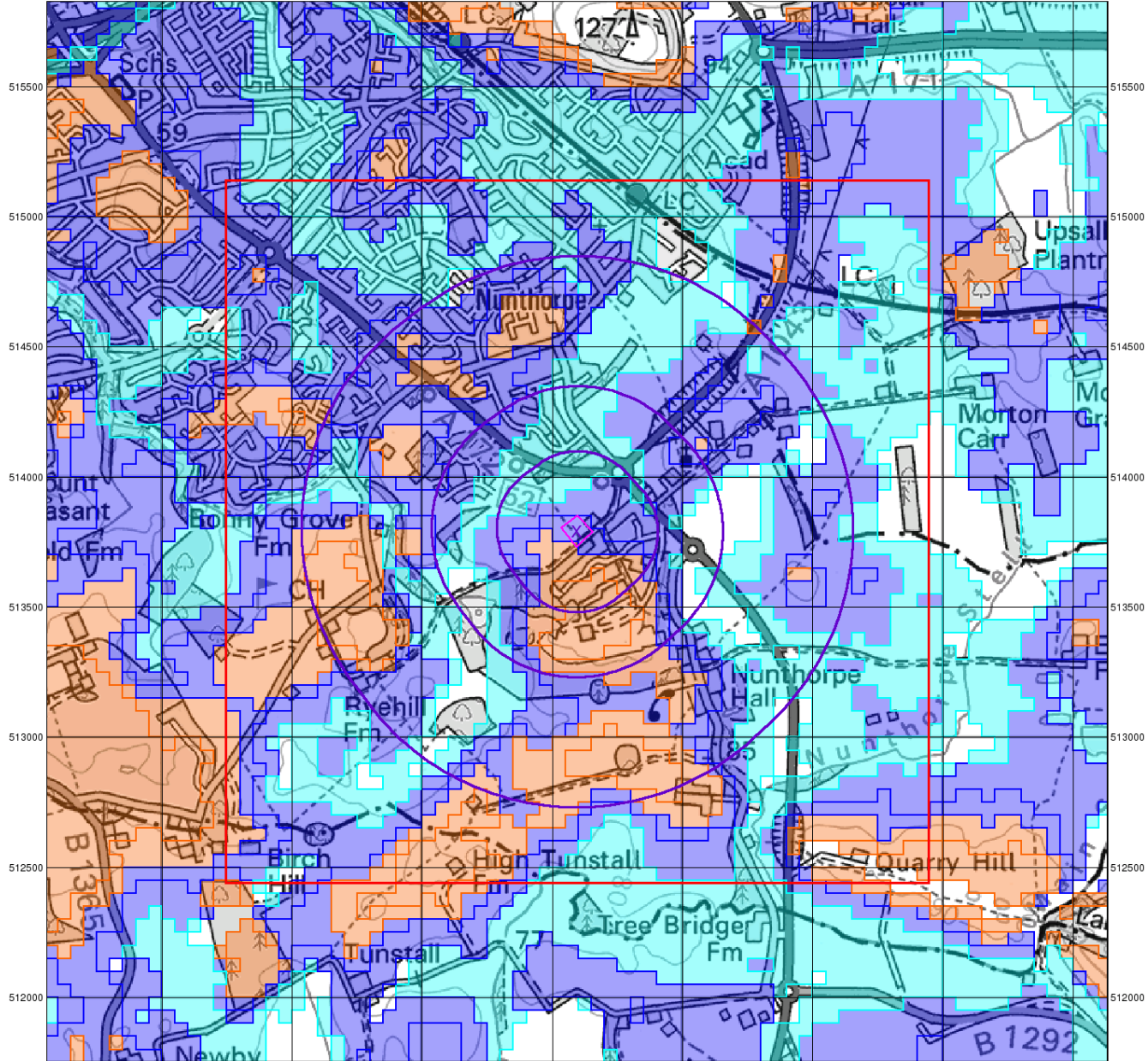
Site Details

Grey Towers Farm, Nunthorpe



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

452000 452500 453000 453500 454000 454500 455000 455500



© Crown Copyright. All Rights Reserved. License Number 100022432.

0 1 km



BGS Flood GFS Data

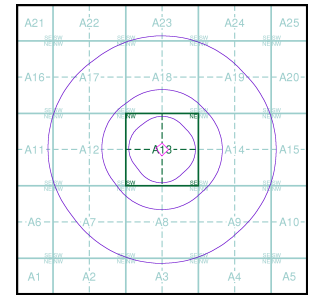
General

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

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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



General

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

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Waste

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

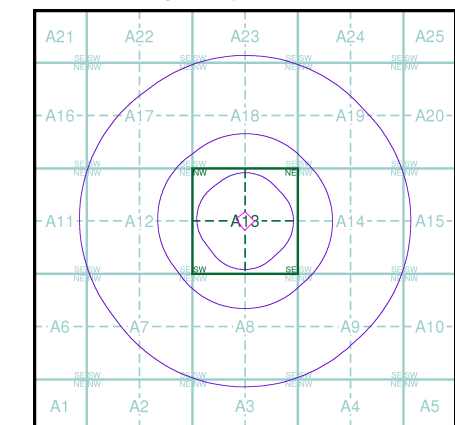
Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Site Sensitivity Map - Slice A



Order Details

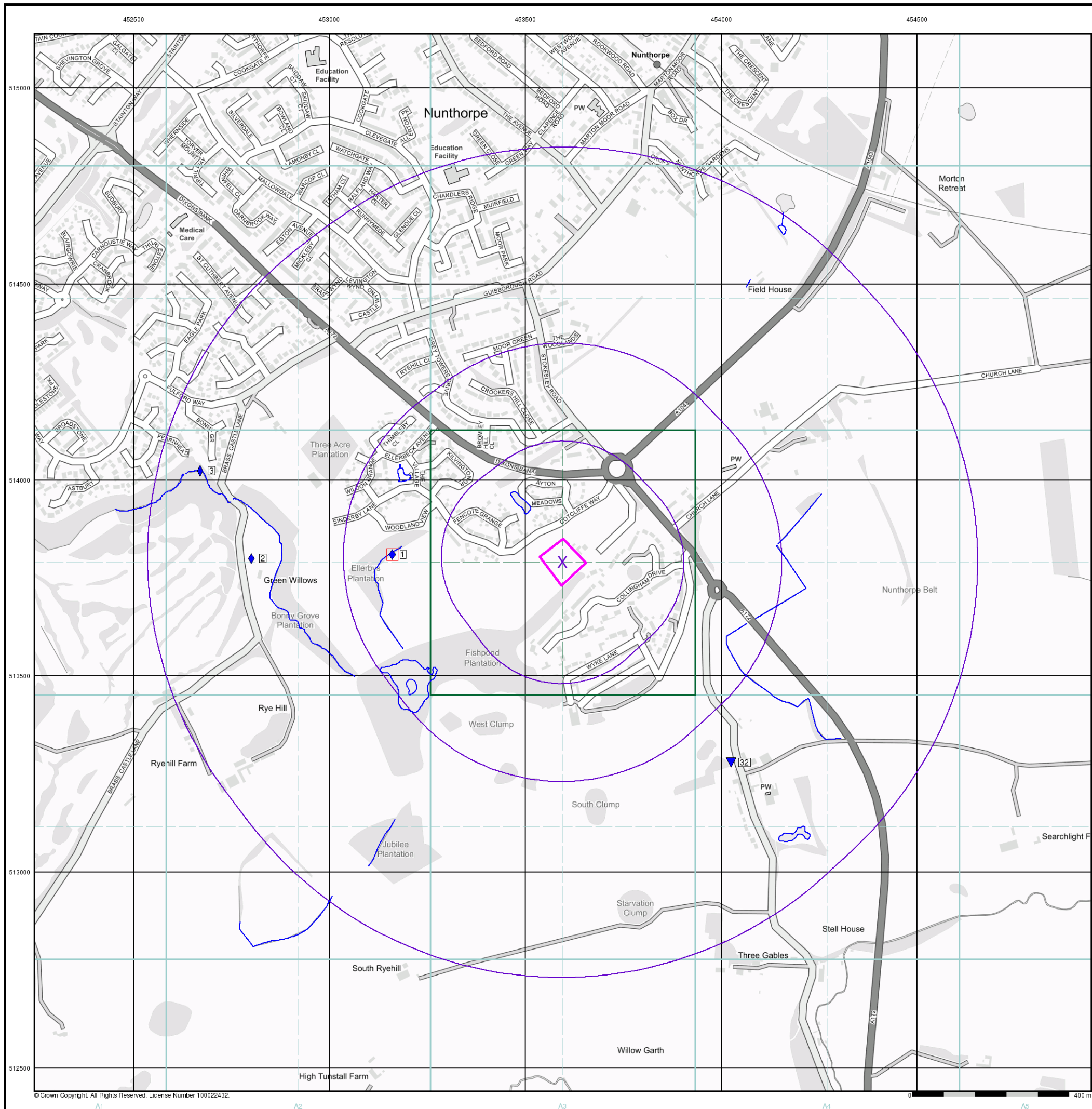
Order Number: 25548552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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



© Crown Copyright. All Rights Reserved. License Number 100022432.



Industrial Land Use Map

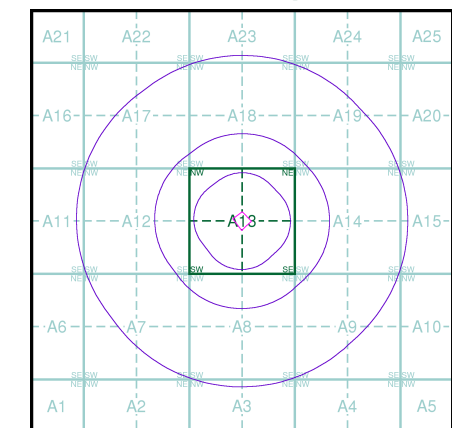
General

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

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Gas Pipeline
- Underground Electrical Cables

Industrial Land Use Map - Slice A



Order Details

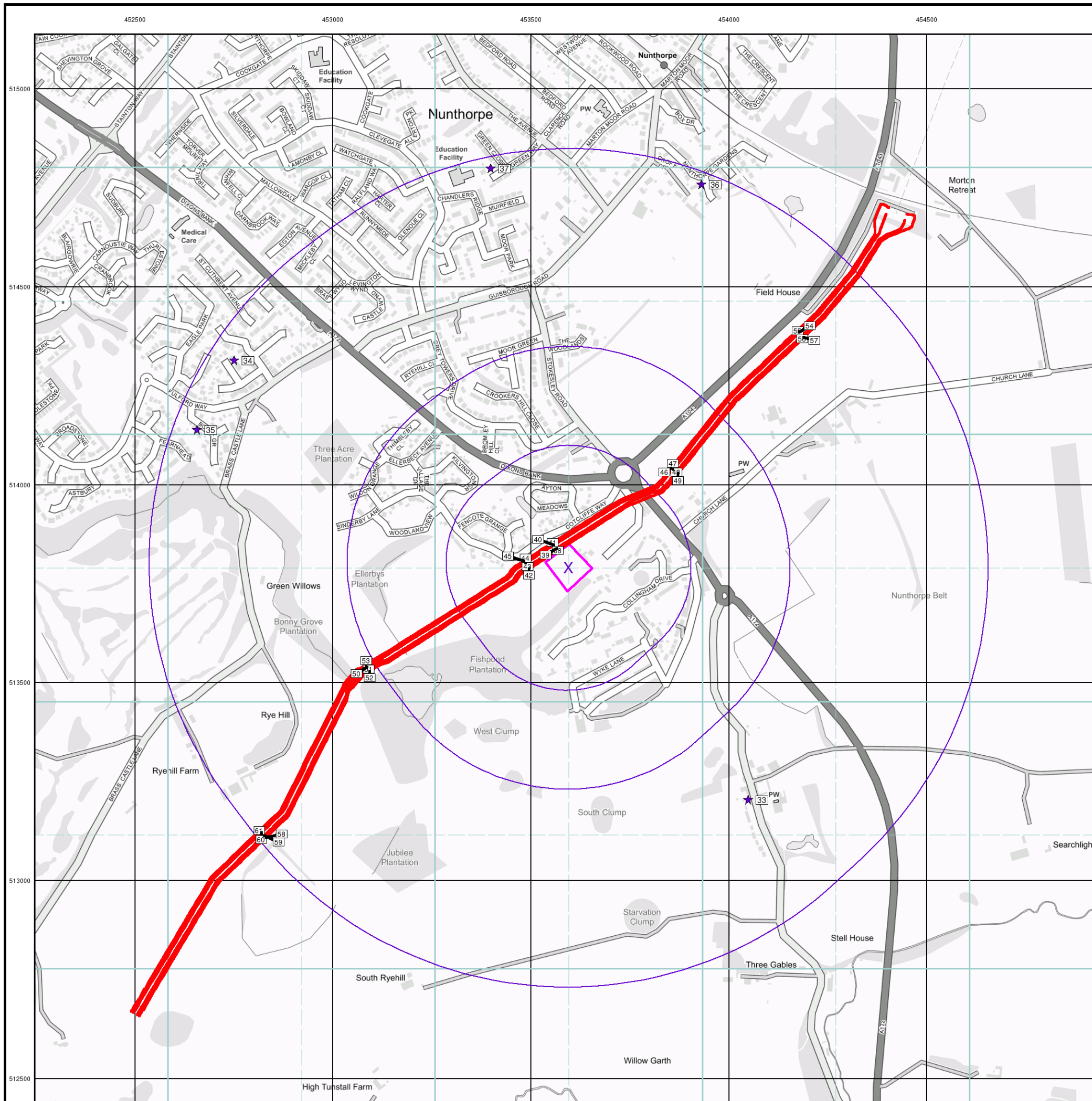
Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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



© Crown Copyright. All Rights Reserved. License Number 100022432.



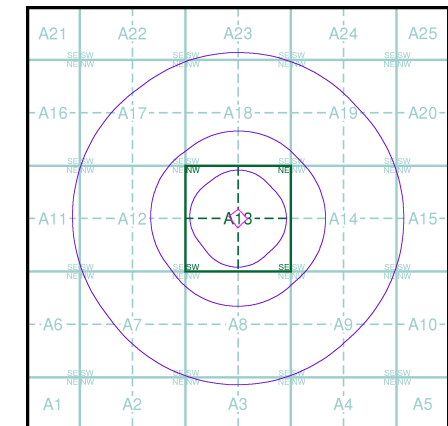
General

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

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



Order Details

Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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



© Crown Copyright. All Rights Reserved. License Number 100022432.



General

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

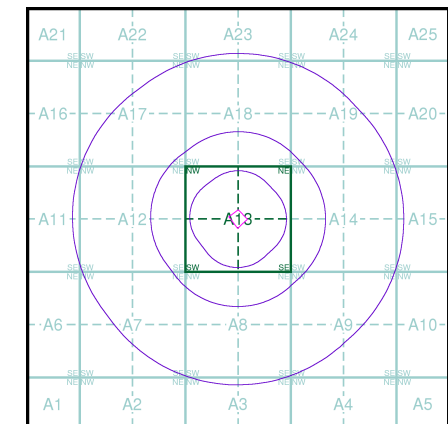
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



Order Details

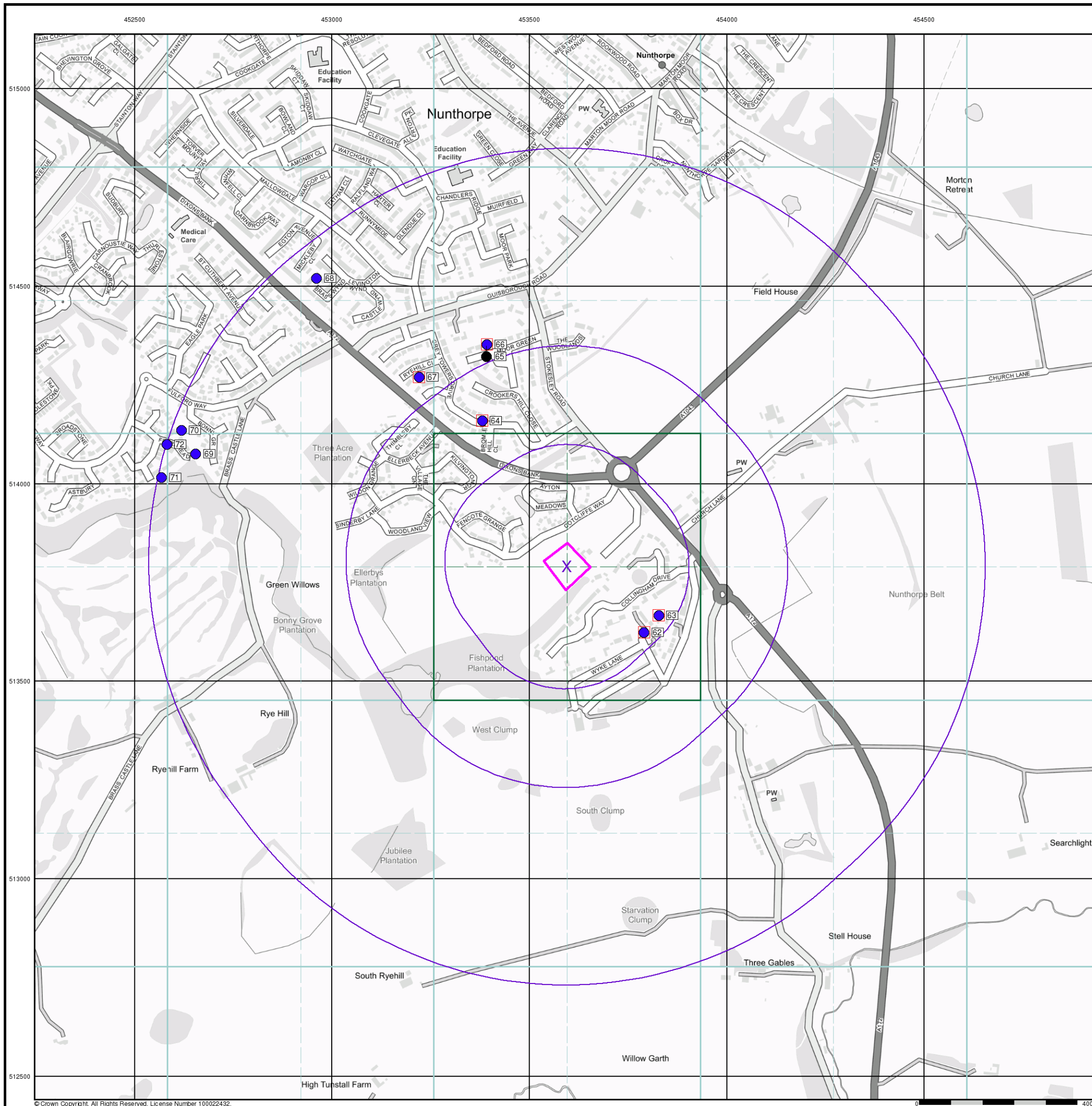
Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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



© Crown Copyright. All Rights Reserved. License Number 100022432.



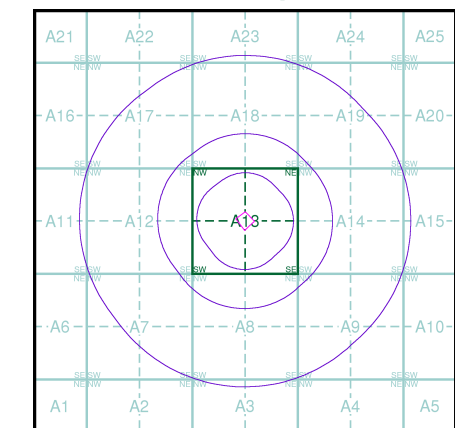
General

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

OS Water Network Data

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

OS Water Network Map - Slice A



Order Details

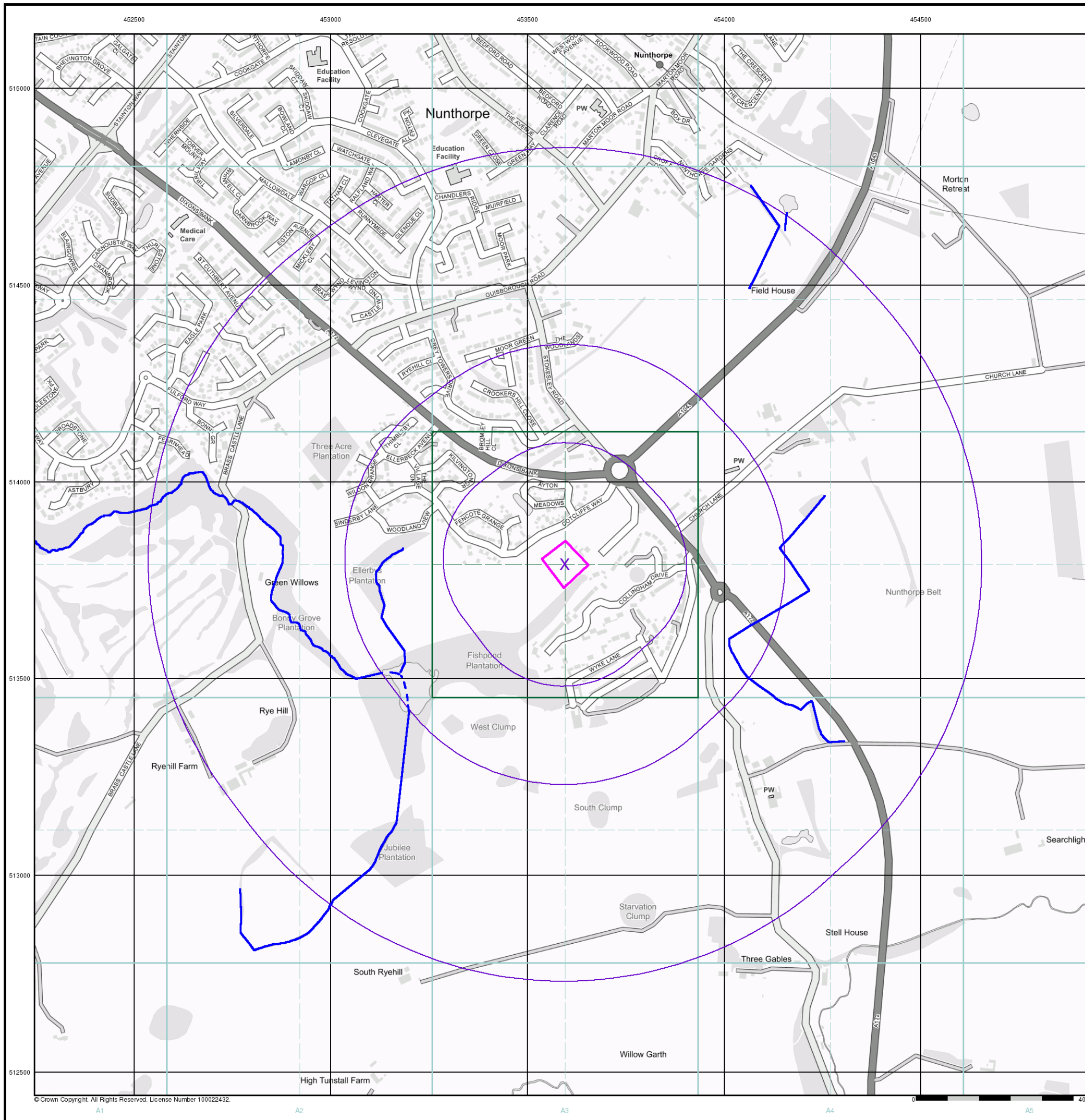
Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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



© Crown Copyright. All Rights Reserved. License Number 100022432.

Historical Mapping Legends

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

Quarry **Gravel Pit** **Sand Pit**
Clay Pit **Shingle** **Refuse Heap**
Sloping Masonry **Flat Rock**
Marsh **Reeds** **Osiers**
Rough Pasture **Furze** **Wood**
Mixed Wood **Brushwood** **Orchard**
Fir **Ford** **Stepping Stones**
Ferry **Waterfall** **Lock**
Trig. Station **Altitude at Trig. Station**
B.M. 325.9 **Bench Mark** **Surface Level**
Arrow denotes flow of water **Antiquities (site of)**
Cutting **Embankment**
Railway crossing Road **Level Crossing** **Road crossing Railway**
Railway crossing River or Canal **Road over single stream** **Road over River or Canal**
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
County Borough Boundary (England)
County Burgh Boundary (Scotland)
Co. Boro. Bdy.
Co. Burgh Bdy.
BP BS Boundary Post or Stone **P.C.B** Police Call Box
B.R. Bridle Road **P** Pump
E.P Electricity Pylon **S.P** Signal Post
F.B. Foot Bridge **SL** Sluice
F.P. Foot Path **Sp.** Spring
G.P Guide Post or Board **T.C.B** Telephone Call Box
M.S Mile Stone **Tr.** Trough
M.P M.R Mooring Post or Ring **W** Well

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

Inactive Quarry, Chalk Pit or Clay Pit **Active Quarry, Chalk Pit or Clay Pit**
Rock **Boulders**
Cliff **Slopes** **Top**
Roofed Building **Glazed Roof Building**
Sloping Masonry **Archway**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Bench Mark** **Antiquity (site of)**
Cave Entrance **Triangulation Station** **Electricity Pylon**
Electricity Transmission Line
County Boundary (Geographical)
County & Civil Parish Boundary
Civil Parish Boundary
Admin. County or County Bor. Boundary
London Borough Boundary
Symbol marking point where boundary mereing changes
BH Beer House **P** Pillar, Pole or Post
BP, BS Boundary Post or Stone **PO** Post Office
Cn, C Capstan, Crane **PC** Public Convenience
Chy Chimney **PH** Public House
D Fn Drinking Fountain **Pp** Pump
EI P Electricity Pillar or Post **SB, S Br** Signal Box or Bridge
FAP Fire Alarm Pillar **SP, SL** Signal Post or Light
FB Foot Bridge **Spr** Spring
GP Guide Post **Tk** Tank or Track
H Hydrant or Hydraulic **TCB** Telephone Call Box
LC Level Crossing **TCP** Telephone Call Post
MH Manhole **Tr** Trough
MP Mile Post or Mooring Post **Wr Pt, Wr T** Water Point, Water Tap
MS Mile Stone **W** Well
NTL Normal Tidal Limit **Wd Pp** Wind Pump

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

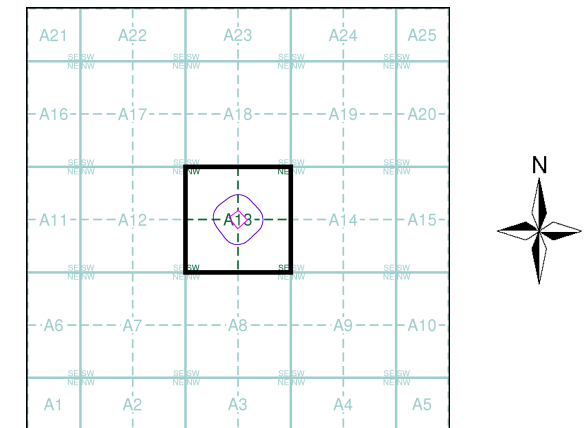
Cliff **Slopes** **Top**
Rock **Rock (scattered)**
Boulders **Boulders (scattered)**
Positioned Boulder **Scree**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Triangulation Station** **Antiquity (site of)**
Electricity Transmission Line **Electricity Pylon**
B.M. 231.60m Bench Mark **Buildings with Building Seed**
Roofed Building **Glazed Roof Building**
Civil parish/community boundary
District boundary
County boundary
Boundary post/stone
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)
Bks Barracks **P** Pillar, Pole or Post
Bty Battery **PO** Post Office
Cemy Cemetery **PC** Public Convenience
Chy Chimney **Pp** Pump
Cis Cistern **Ppg Sta** Pumping Station
Dismtd Rly Dismantled Railway **PW** Place of Worship
EI Gen Sta Electricity Generating Station **Sewage Ppg Sta** Sewage Pumping Station
EI P Electricity Pole, Pillar **SB, S Br** Signal Box or Bridge
EI Sub Sta Electricity Sub Station **SP, SL** Signal Post or Light
FB Filter Bed **Spr** Spring
Fn / D Fn Fountain / Drinking Ftn. **Tk** Tank or Track
Gas Gov Gas Valve Compound **Tr** Trough
GVC Gas Governor **Wd Pp** Wind Pump
GP Guide Post **Wr Pt, Wr T** Water Point, Water Tap
MH Manhole **Wks** Works (building or area)
MP, MS Mile Post or Mile Stone **W** Well



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Yorkshire	1:2,500	1894	2
Yorkshire	1:2,500	1915	3
Yorkshire	1:2,500	1928	4
Yorkshire	1:2,500	1938	5
Ordnance Survey Plan	1:2,500	1967 - 1968	6
Ordnance Survey Plan	1:1,250	1974	7
Large-Scale National Grid Data	1:1,250	1992	8
Large-Scale National Grid Data	1:2,500	1992	9

Historical Map - Segment A13



Order Details

Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 100

Site Details

Grey Towers Farm, Nunthorpe



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



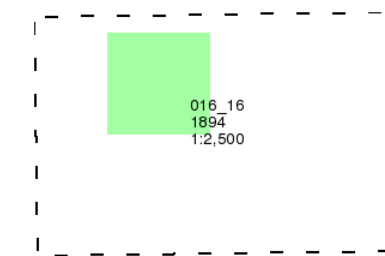
Yorkshire

Published 1894

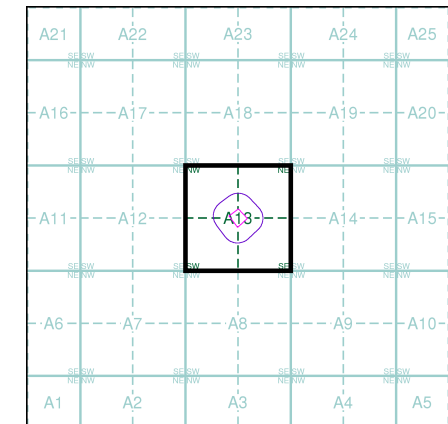
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

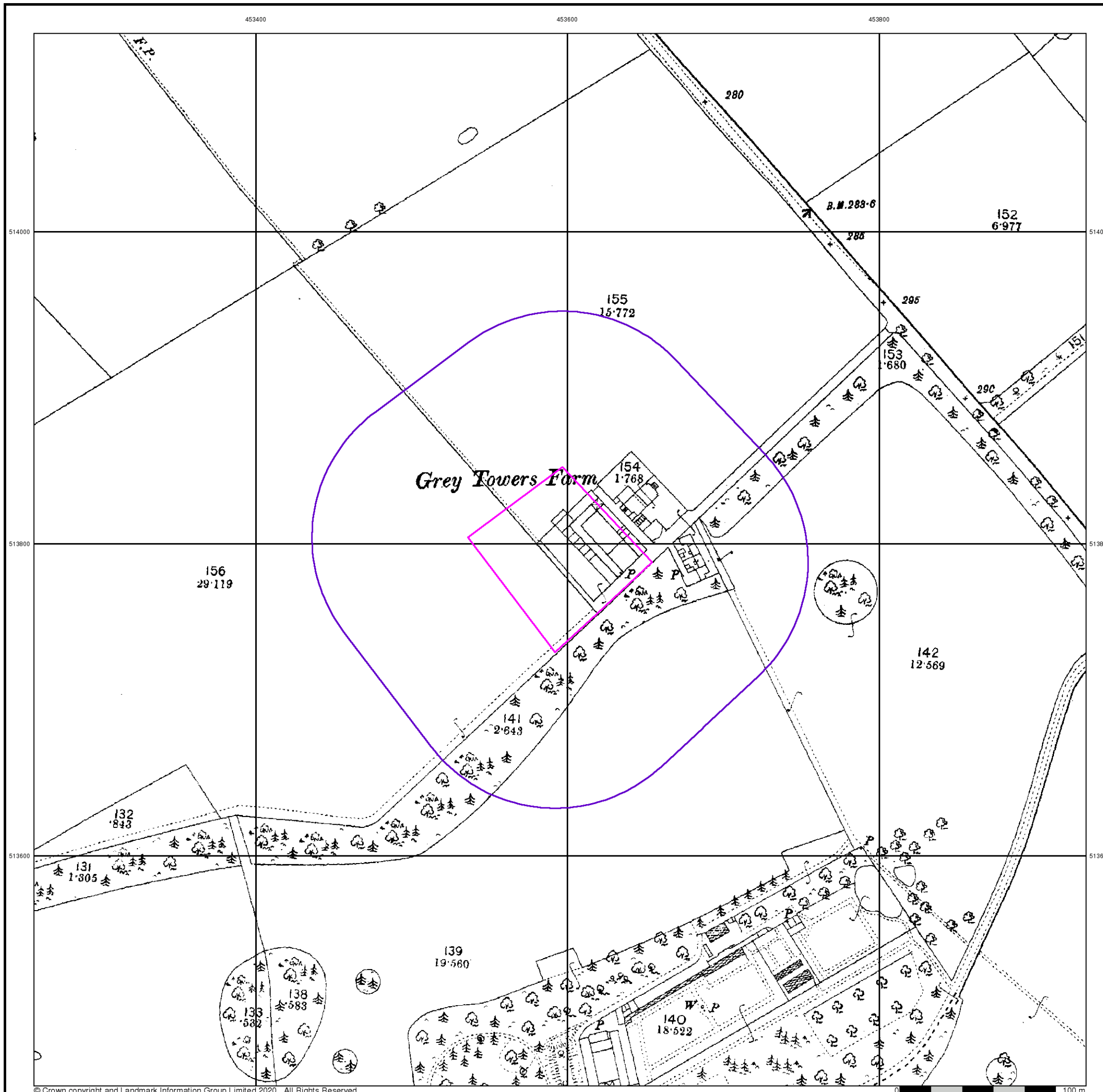
Order Number: 255485552_1_1
Customer Ref: Grey Towers Farm
National Grid Reference: 453590, 513790
Slice: A
Site Area (Ha): 0.71
Search Buffer (m): 100

Site Details

Grey Towers Farm, Nunthorpe



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





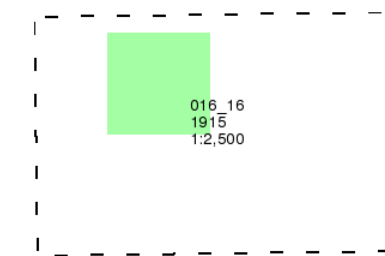
Yorkshire

Published 1915

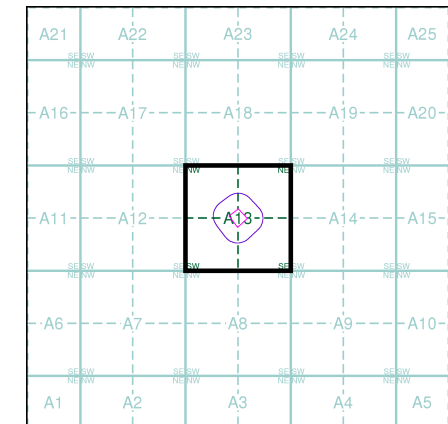
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

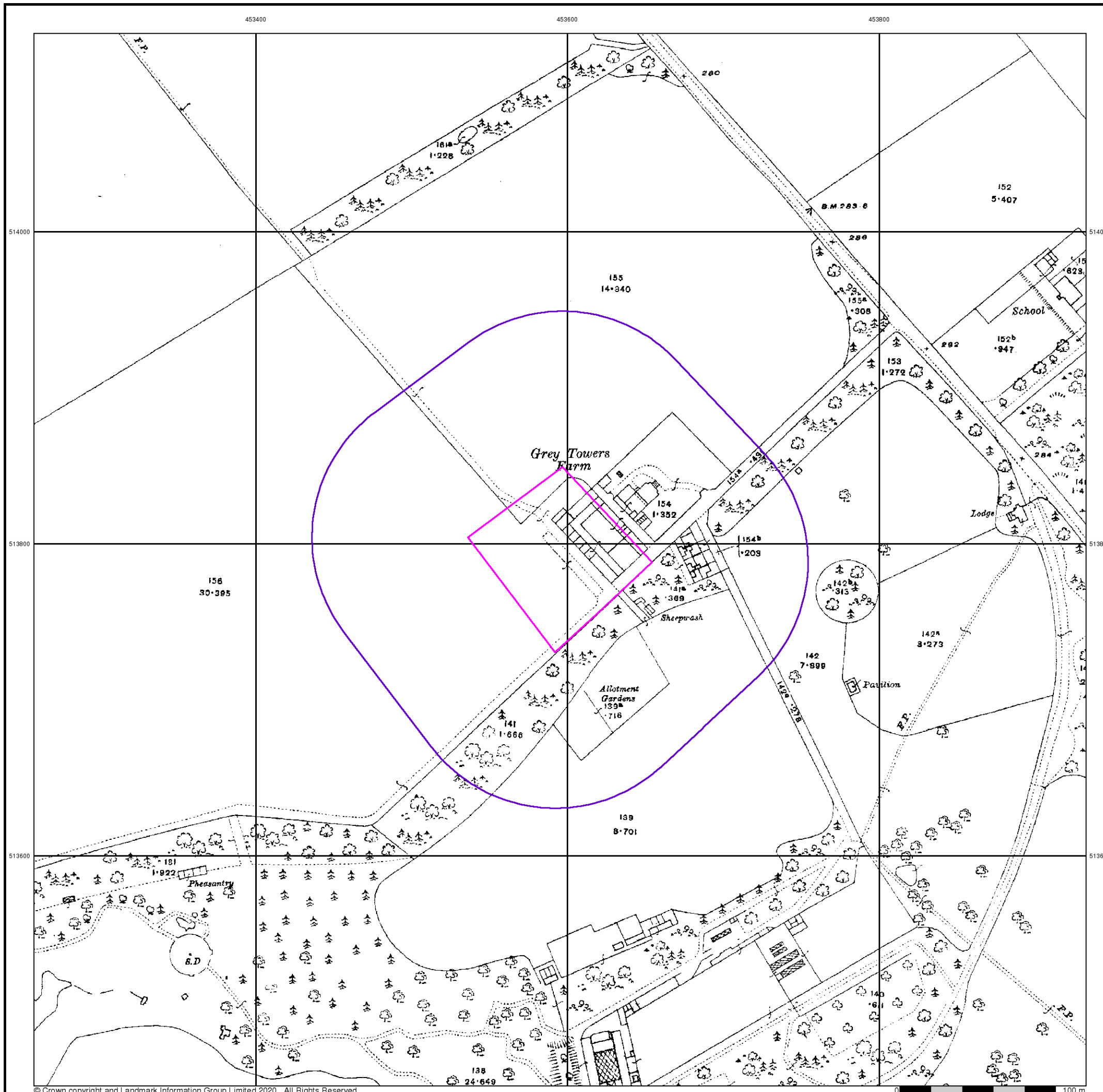
Order Number: 255485552_1_1
Customer Ref: Grey Towers Farm
National Grid Reference: 453590, 513790
Slice: A
Site Area (Ha): 0.71
Search Buffer (m): 100

Site Details

Grey Towers Farm, Nunthorpe



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





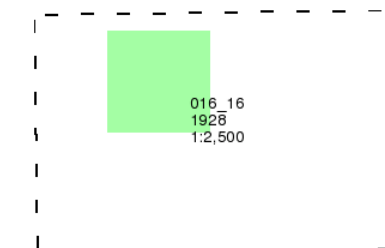
Yorkshire

Published 1928

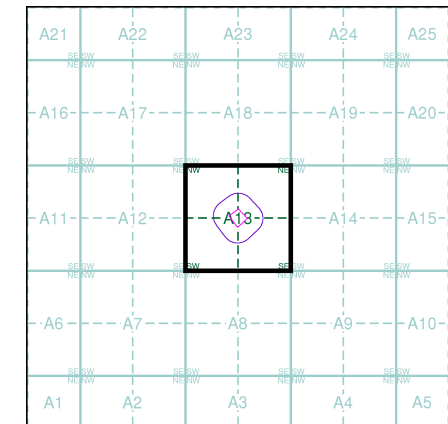
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

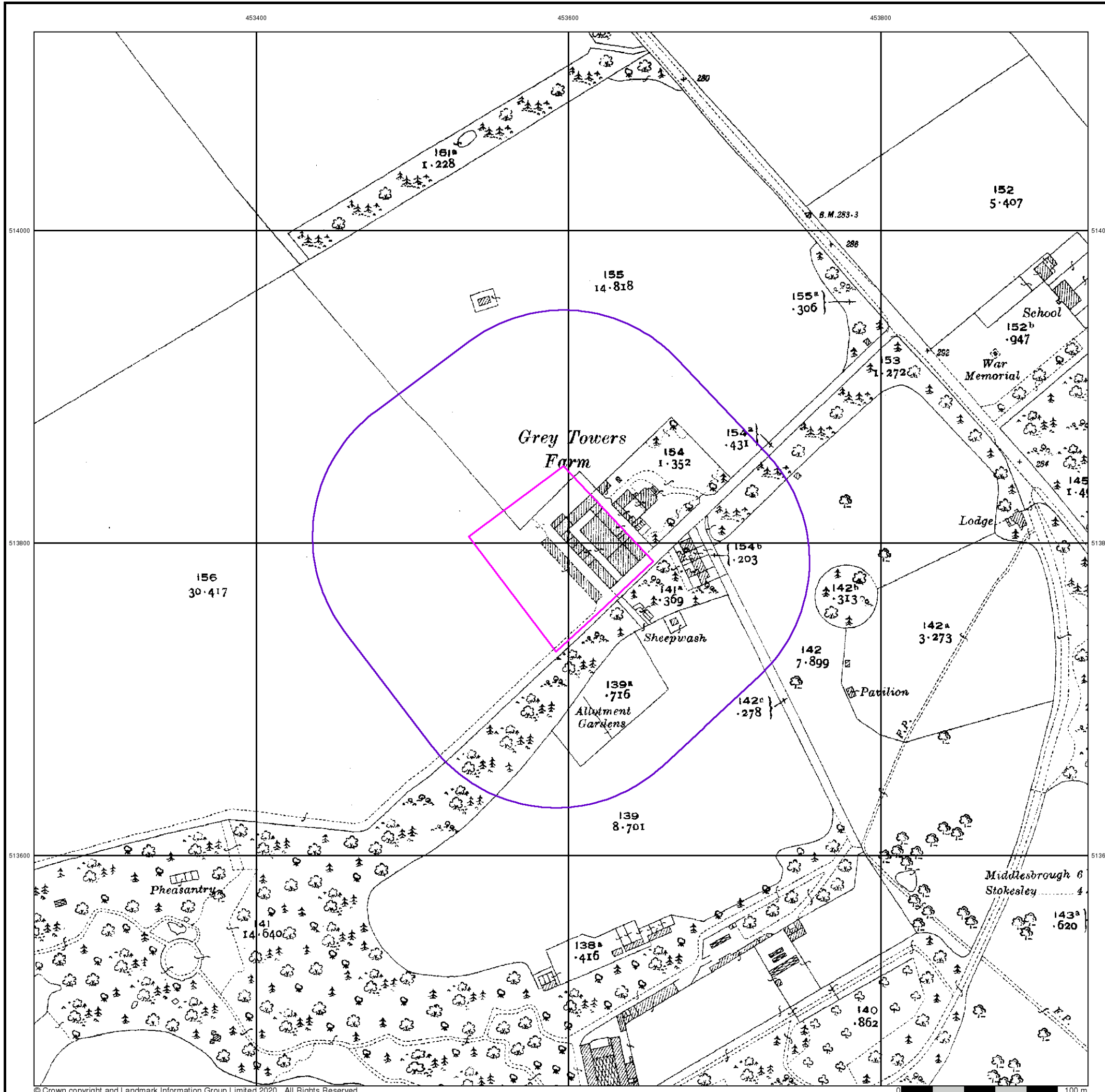
Order Number: 255485552_1_1
Customer Ref: Grey Towers Farm
National Grid Reference: 453590, 513790
Slice: A
Site Area (Ha): 0.71
Search Buffer (m): 100

Site Details

Grey Towers Farm, Nunthorpe



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





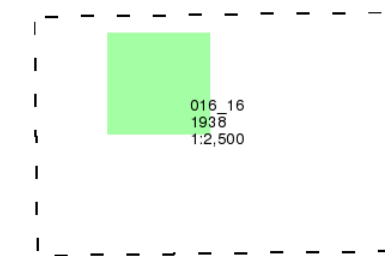
Yorkshire

Published 1938

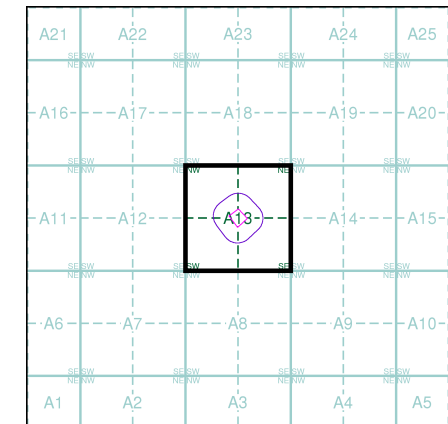
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

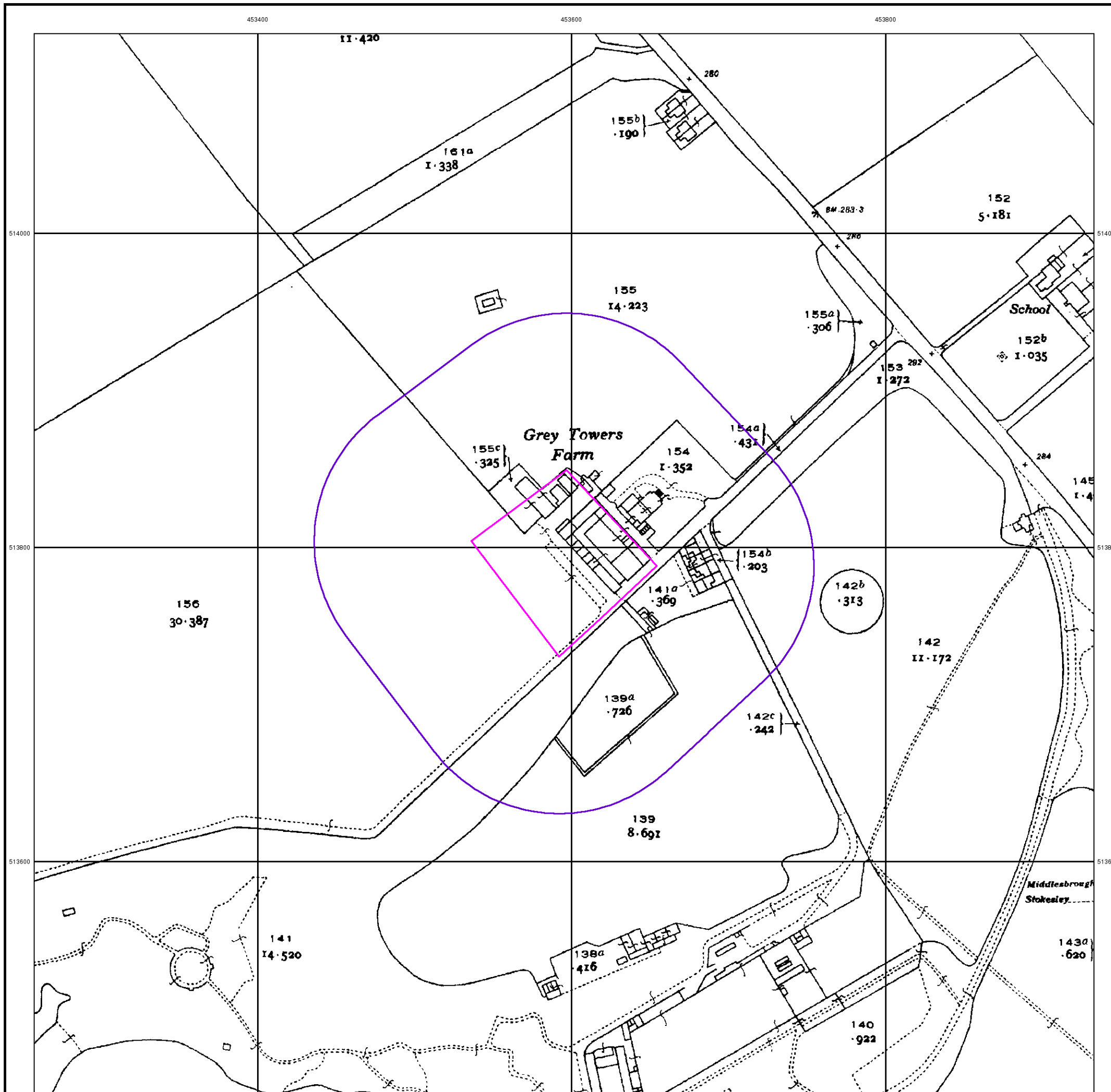
Order Number: 255485552_1_1
Customer Ref: Grey Towers Farm
National Grid Reference: 453590, 513790
Slice: A
Site Area (Ha): 0.71
Search Buffer (m): 100

Site Details

Grey Towers Farm, Nunthorpe



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





Ordnance Survey Plan

Published 1967 - 1968

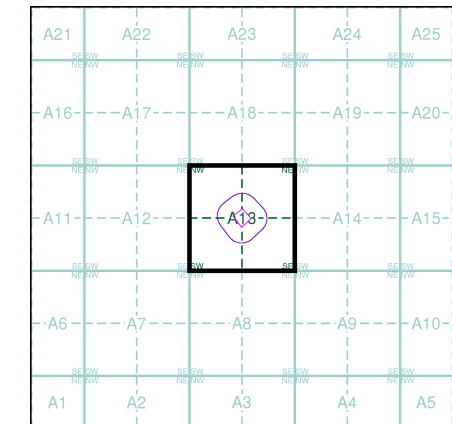
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

NZ5314	1967	1:2,500
NZ5313	1968	1:2,500

Historical Map - Segment A13



Order Details

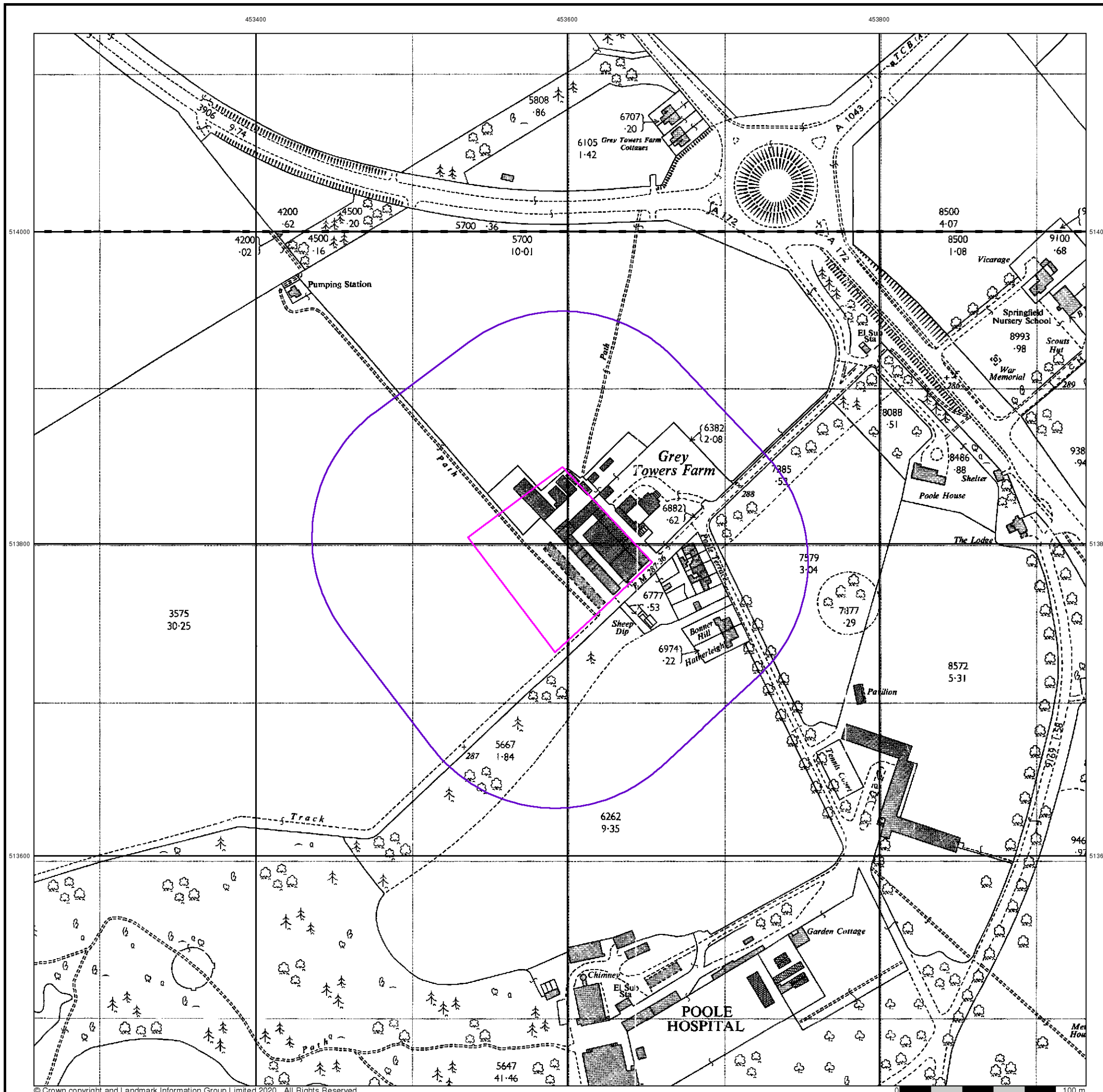
Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 100

Site Details

Grey Towers Farm, Nunthorpe



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





Ordnance Survey Plan

Published 1974

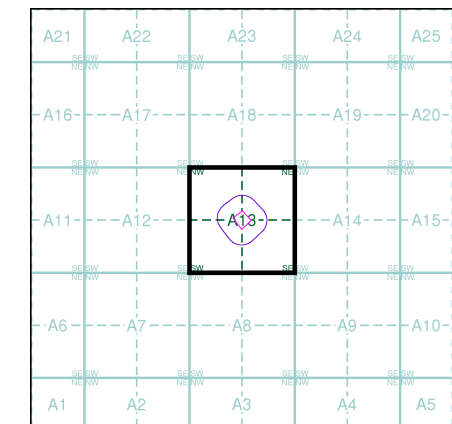
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

NZ5314SW	NZ5314SE
1974	1974
1:1,250	1:1,250

Historical Map - Segment A13



Order Details

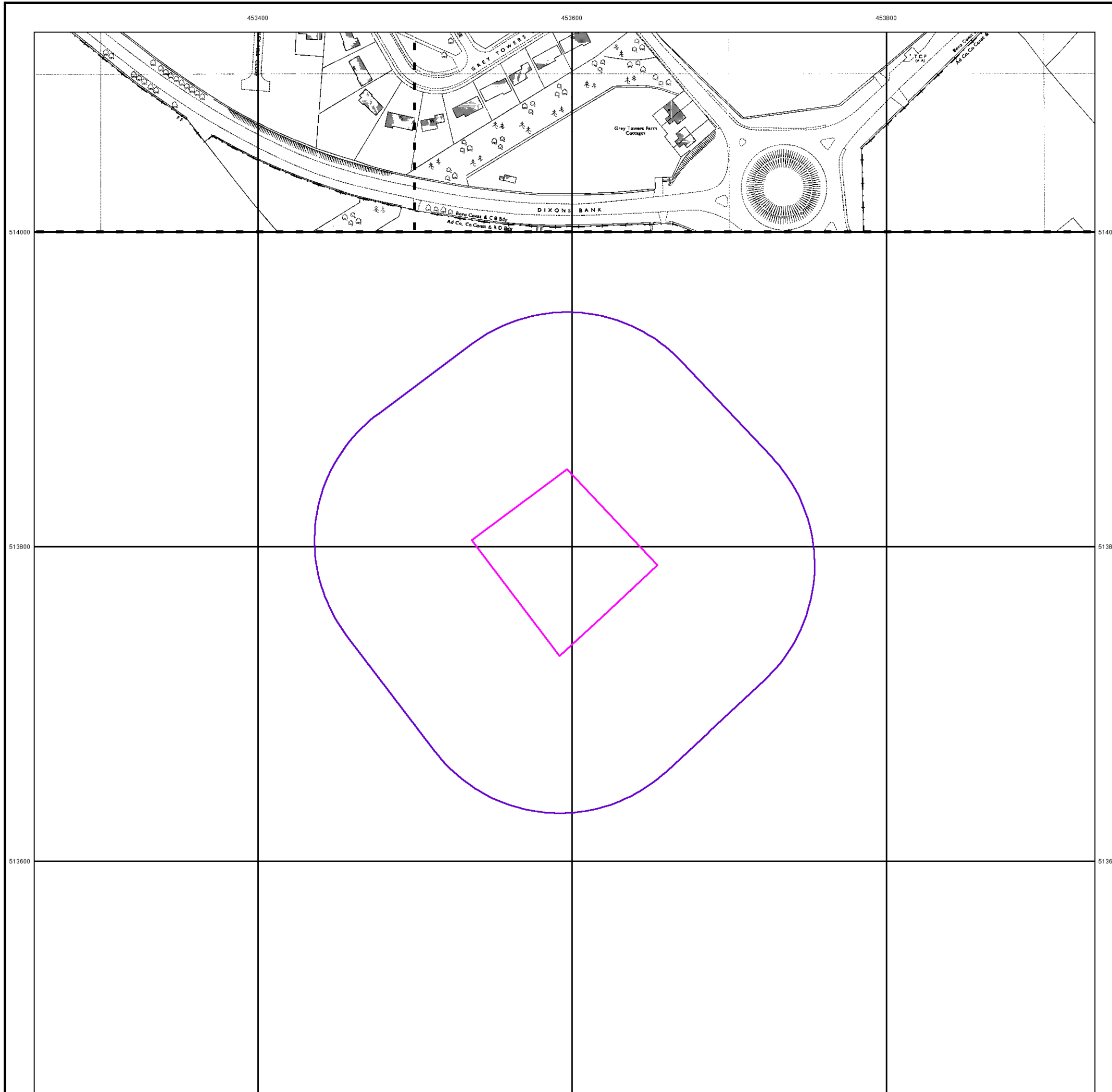
Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 100

Site Details

Grey Towers Farm, Nunthorpe



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





Large-Scale National Grid Data

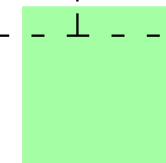
Published 1992

Source map scale - 1:1,250

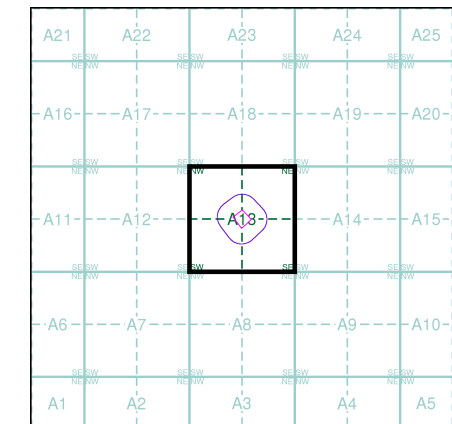
'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

NZ5314SW	NZ5314SE
1992	1992
1:1,250	1:1,250



Historical Map - Segment A13



Order Details

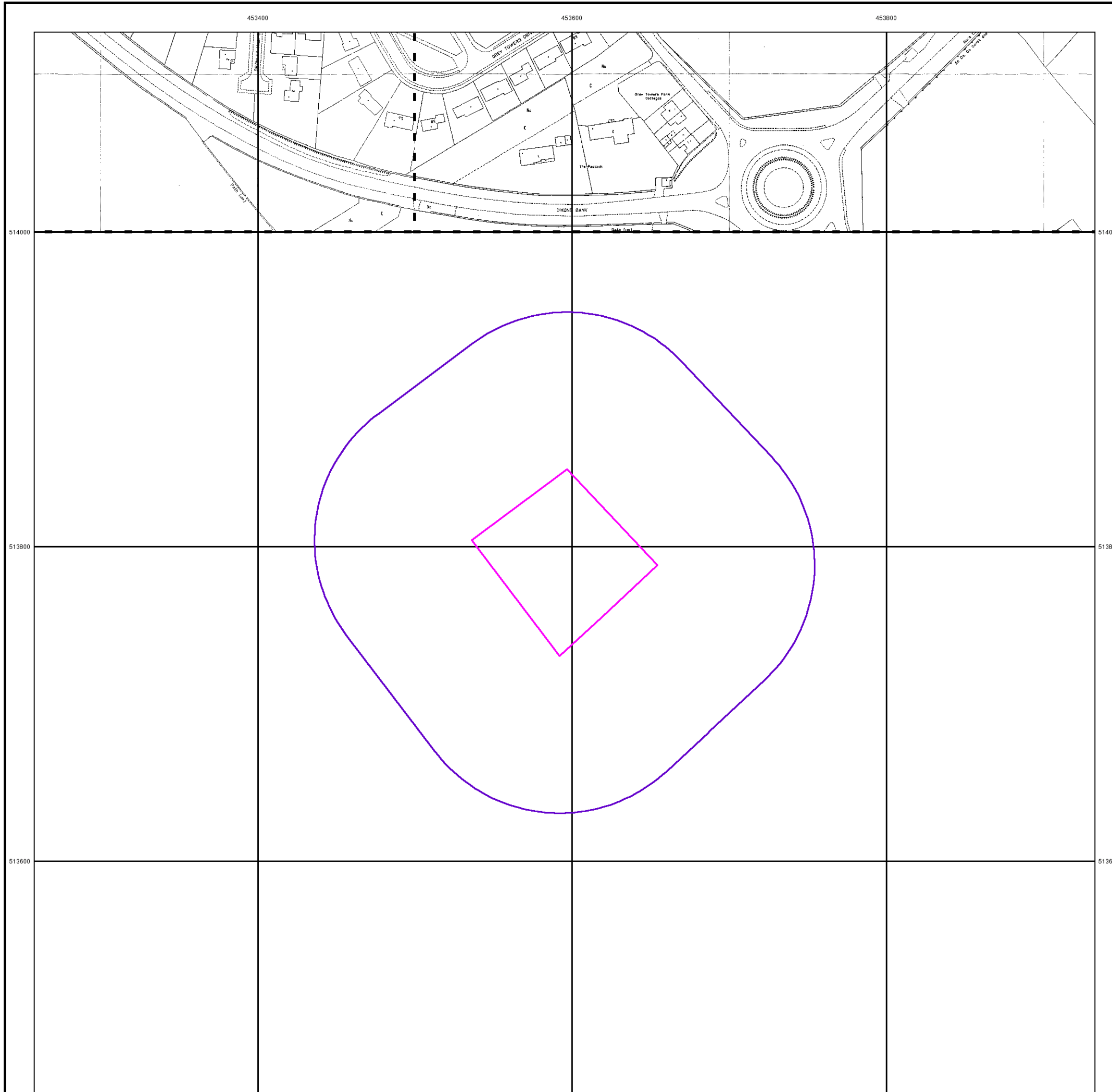
Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 100

Site Details

Grey Towers Farm, Nunthorpe



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





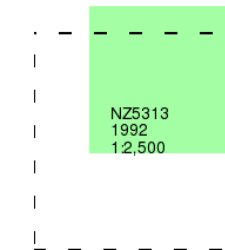
Large-Scale National Grid Data

Published 1992

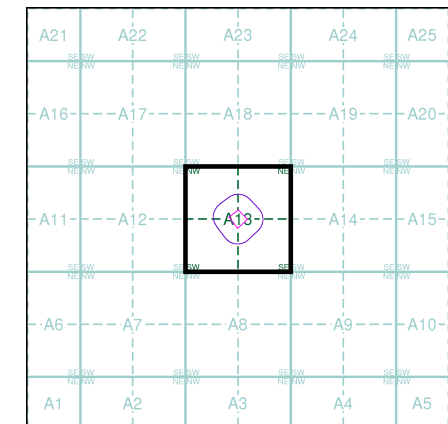
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

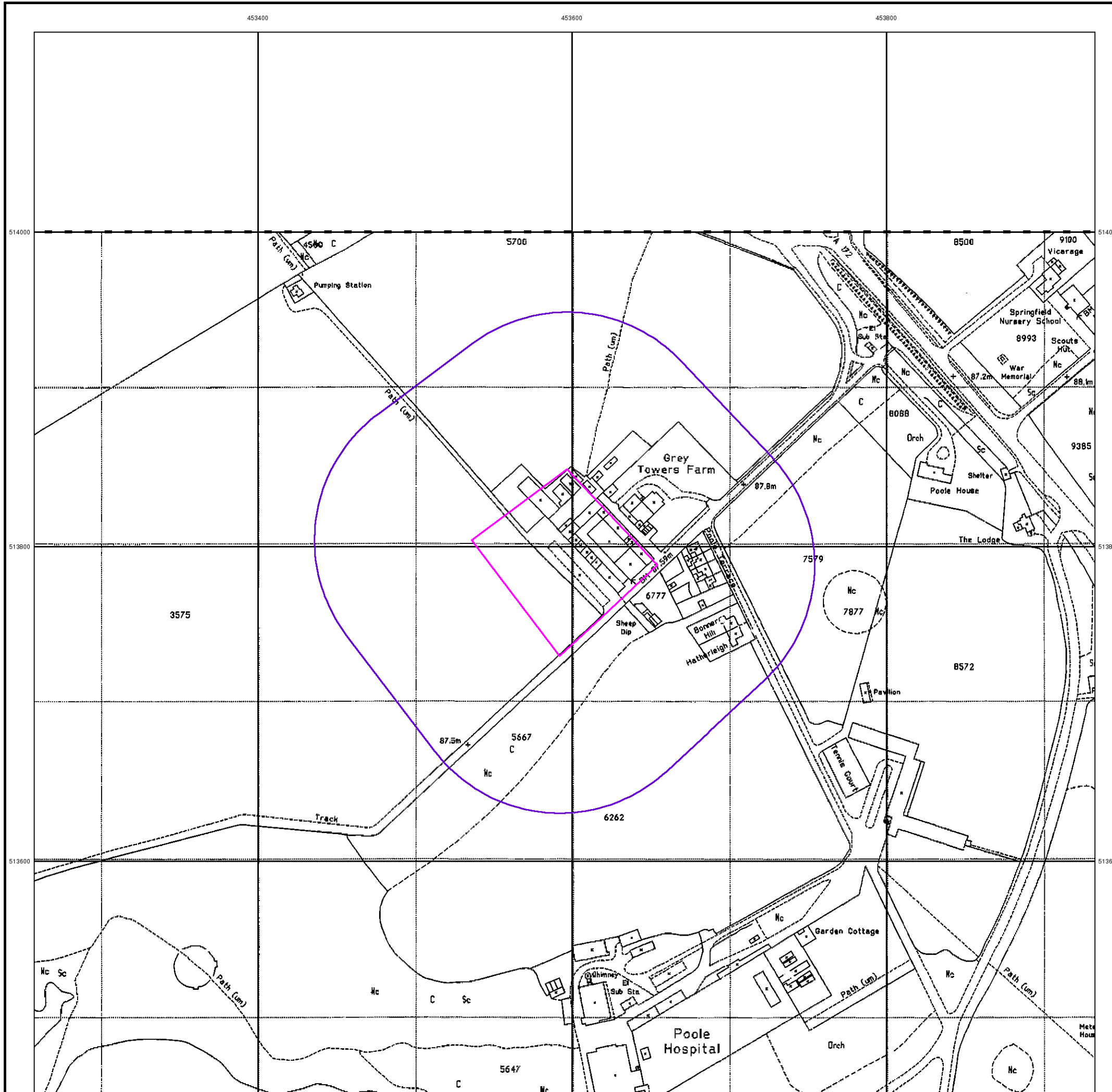
Order Number: 255485552_1_1
Customer Ref: Grey Towers Farm
National Grid Reference: 453590, 513790
Slice: A
Site Area (Ha): 0.71
Search Buffer (m): 100

Site Details

Grey Towers Farm, Nunthorpe



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



Historical Mapping Legends

Ordnance Survey County Series 1:10,560

	Gravel Pit		Sand Pit		Other Pits
	Quarry		Shingle		Orchard
	Osiers		Reeds		Marsh
	Mixed Wood		Deciduous		Brushwood
	Fir		Furze		Rough Pasture
	Arrow denotes flow of water		Trigonometrical Station		Bench Mark
	Site of Antiquities		Well, Spring, Boundary Post		
	Pump, Guide Post, Signal Post				
	-285 Surface Level				
	Sketched Contour		Instrumental Contour		
	Main Roads		Minor Roads		
	Sunken Road		Raised Road		
	Road over Railway		Railway over River		
	Railway over Road		Level Crossing		
	Road over River or Canal		Road over Stream		
	Road over Stream				
	County Boundary (Geographical)				
	County & Civil Parish Boundary				
	Administrative County & Civil Parish Boundary				
	County Borough Boundary (England)				
	County Burgh Boundary (Scotland)				
	Rural District Boundary				
	Civil Parish Boundary				

Ordnance Survey Plan 1:10,000

	Chalk Pit, Clay Pit or Quarry		Gravel Pit
	Sand Pit		Disused Pit or Quarry
	Refuse or Slag Heap		Lake, Loch or Pond
	Dunes		Boulders
	Coniferous Trees		Non-Coniferous Trees
	Orchard		Scrub
	Coppice		Heath
	Rough Grassland		Marsh
	Reeds		Saltings
	Building		Glasshouse
	Sloping Masonry		Pylon
	Electricity Transmission Line		Pole
	Cutting		Embankment
	Standard Gauge Multiple Track		Standard Gauge Single Track
	Siding, Tramway or Mineral Line		Narrow Gauge
	Geographical County		
	Administrative County, County Borough or County of City		
	Municipal Borough, Urban or Rural District, Burgh or District Council		
	Borough, Burgh or County Constituency Shown only when not coincident with other boundaries		
	Civil Parish Shown alternately when coincidence of boundaries occurs		
	BP, BS Boundary Post or Stone		Pol Sta Police Station
	Ch Church		PO Post Office
	CH Club House		PC Public Convenience
	F E Sta Fire Engine Station		PH Public House
	FB Foot Bridge		SB Signal Box
	Fn Fountain		Spr Spring
	GP Guide Post		TCB Telephone Call Box
	MP Mile Post		TCP Telephone Call Post
	MS Mile Stone		W Well

1:10,000 Raster Mapping

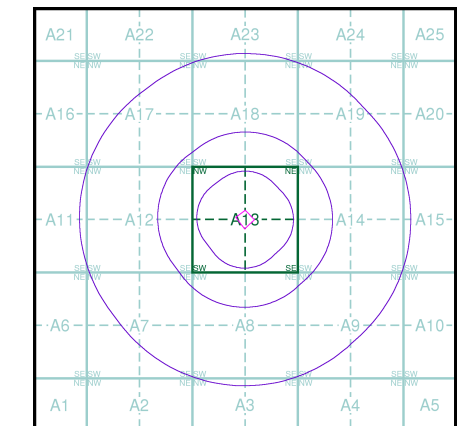
	Gravel Pit		Refuse tip or slag heap
	Rock		Rock (scattered)
	Boulders		Boulders (scattered)
	Shingle		Mud
	Sand		Sand Pit
	Slopes		Top of cliff
	General detail		Underground detail
	Overhead detail		Narrow gauge railway
	Multi-track railway		Single track railway
	County boundary (England only)		Civil, parish or community boundary
	District, Unitary, Metropolitan, London Borough boundary		Constituency boundary
	Area of wooded vegetation		Non-coniferous trees
	Non-coniferous trees (scattered)		Coniferous trees
	Coniferous trees (scattered)		Positioned tree
	Orchard		Coppice or Osiers
	Rough Grassland		Heath
	Scrub		Marsh, Salt Marsh or Reeds
	Water feature		Flow arrows
	MHW(S) Mean high water (springs)		MLW(S) Mean low water (springs)
	Telephone line (where shown)		Electricity transmission line (with poles)
	Bench mark (where shown)		Triangulation station
	Point feature (e.g. Guide Post or Mile Stone)		Pylon, flare stack or lighting tower
	Site of (antiquity)		Glasshouse
	General Building		Important Building



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Yorkshire	1:10,560	1856	2
Yorkshire	1:10,560	1895	3
Yorkshire	1:10,560	1895	4
Yorkshire	1:10,560	1919	5
Yorkshire	1:10,560	1930	6
Yorkshire	1:10,560	1952	7
Ordnance Survey Plan	1:10,000	1953 - 1958	8
Ordnance Survey Plan	1:10,000	1971 - 1973	9
Ordnance Survey Plan	1:10,000	1982 - 1983	10
Ordnance Survey Plan	1:10,000	1991 - 1994	11
10K Raster Mapping	1:10,000	2000	12
Street View	Variable		13

Historical Map - Slice A



Order Details

Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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



Yorkshire

Published 1856

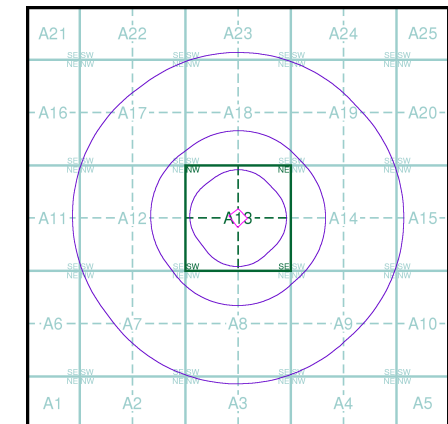
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

01600	1856	1:10,560
02800	1856	1:10,560

Historical Map - Slice A



Order Details

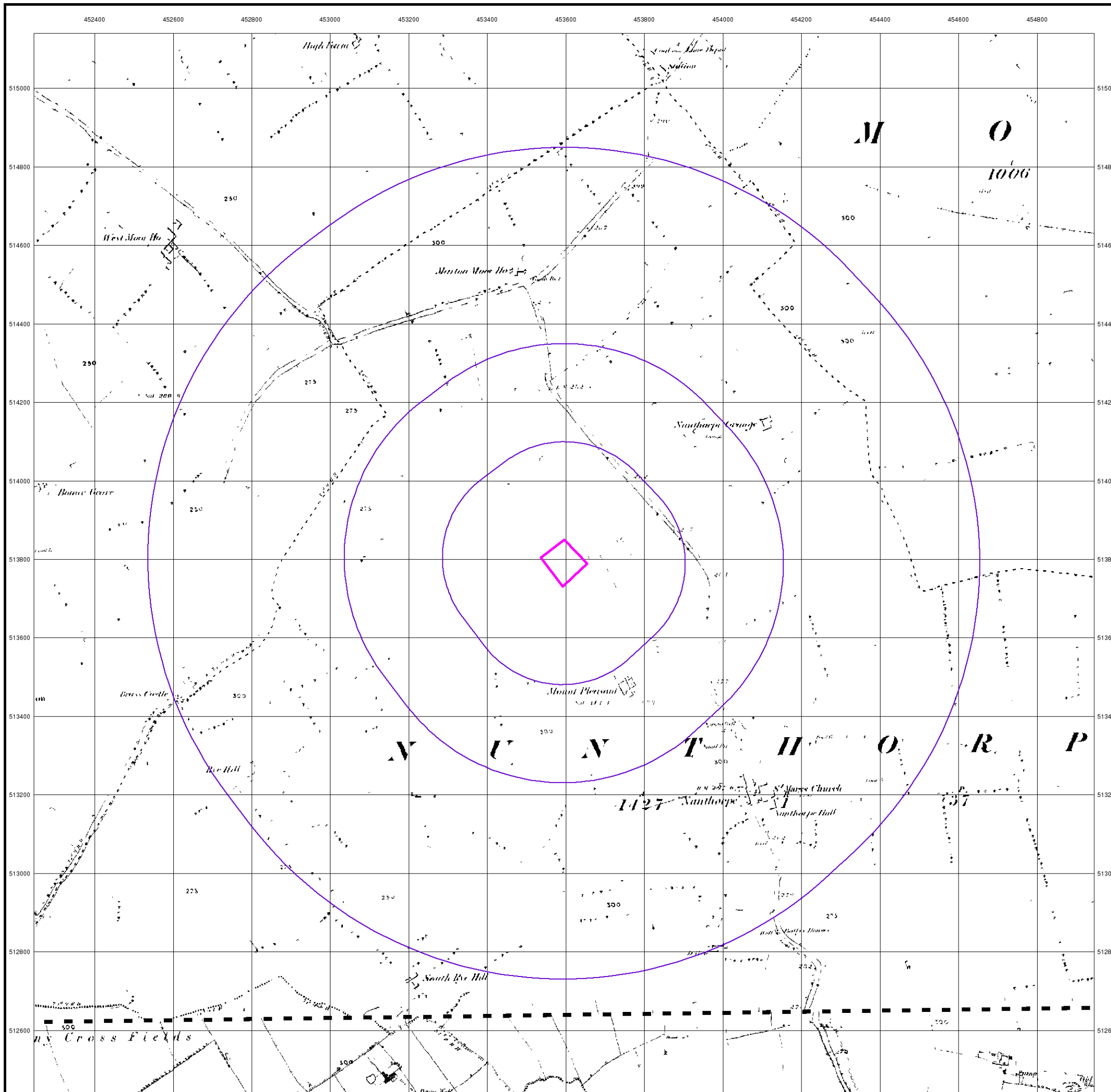
Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

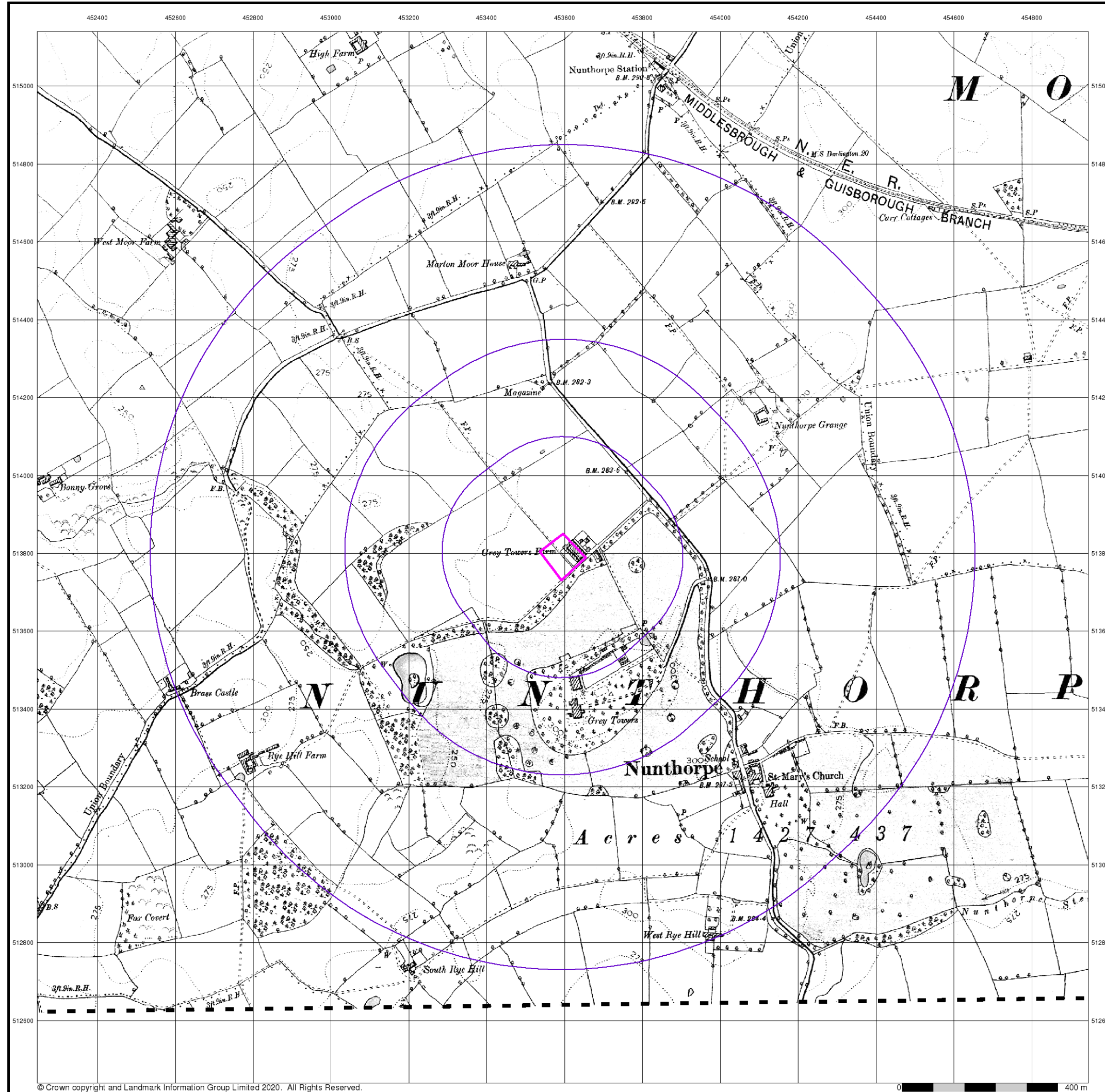
Site Details

Grey Towers Farm, Nunthorpe



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





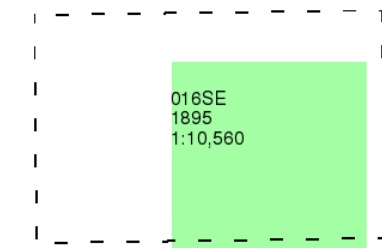
Yorkshire

Published 1895

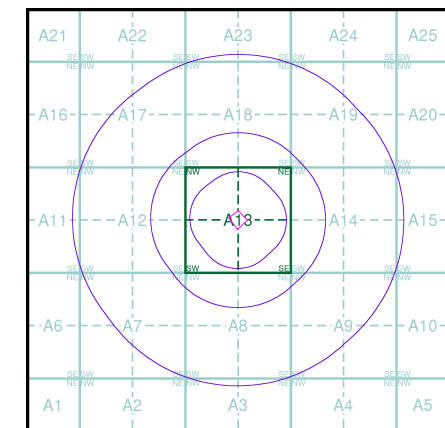
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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



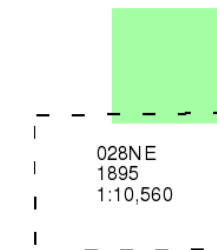
Yorkshire

Published 1895

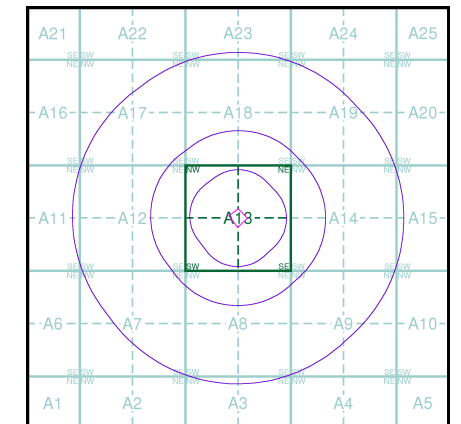
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

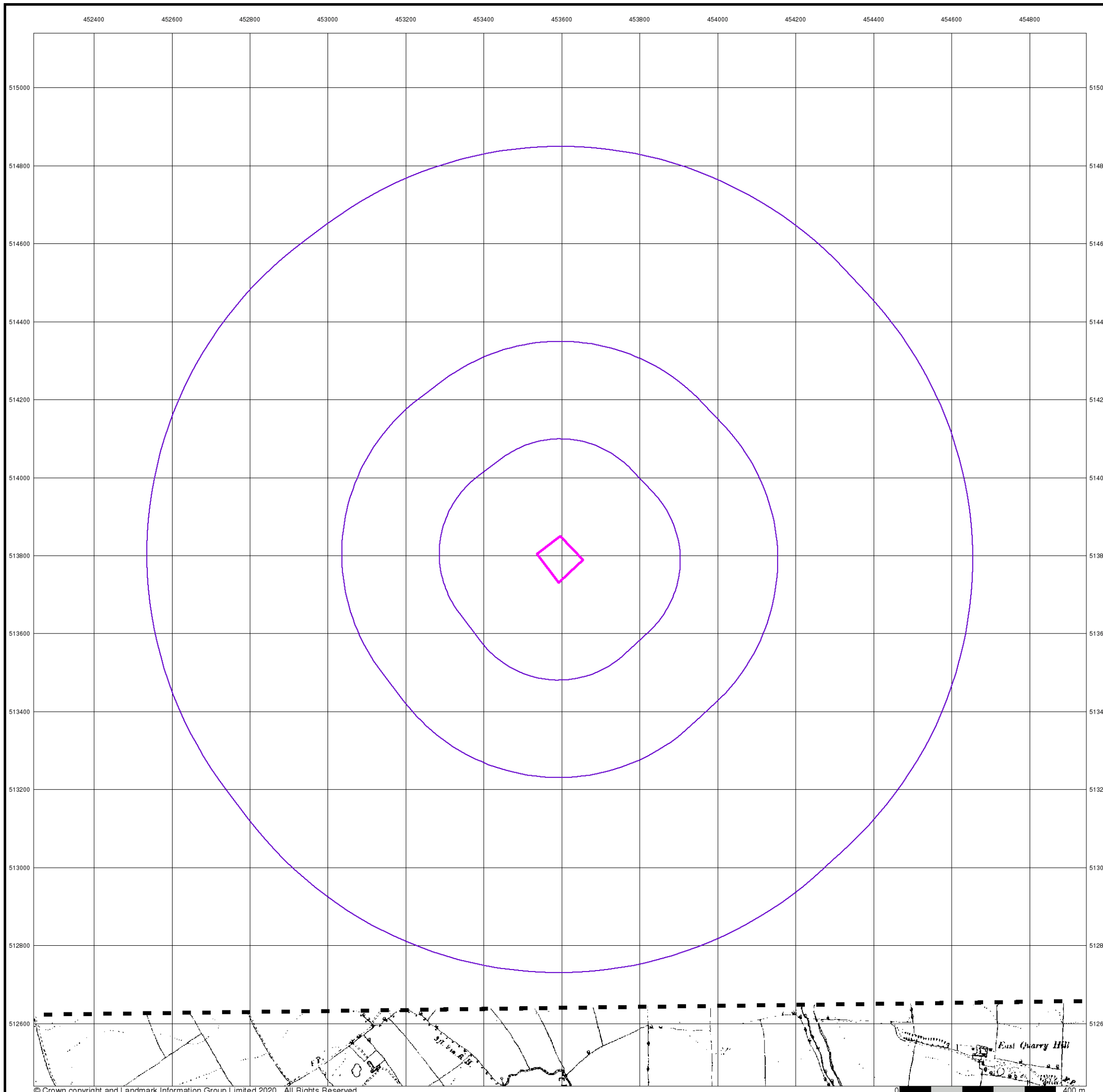
Order Number: 255485552_1_1
Customer Ref: Grey Towers Farm
National Grid Reference: 453590, 513790
Slice: A
Site Area (Ha): 0.71
Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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





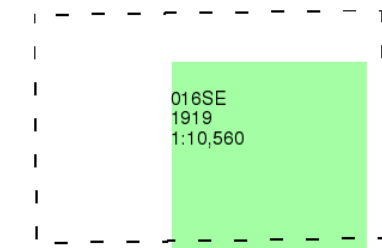
Yorkshire

Published 1919

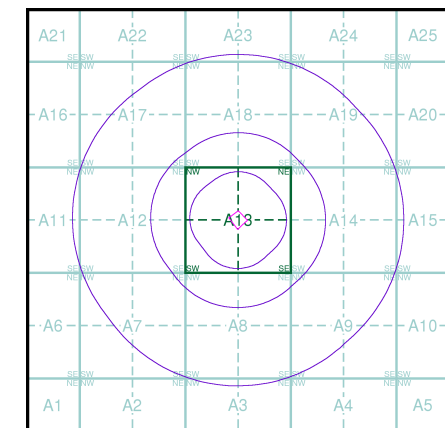
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

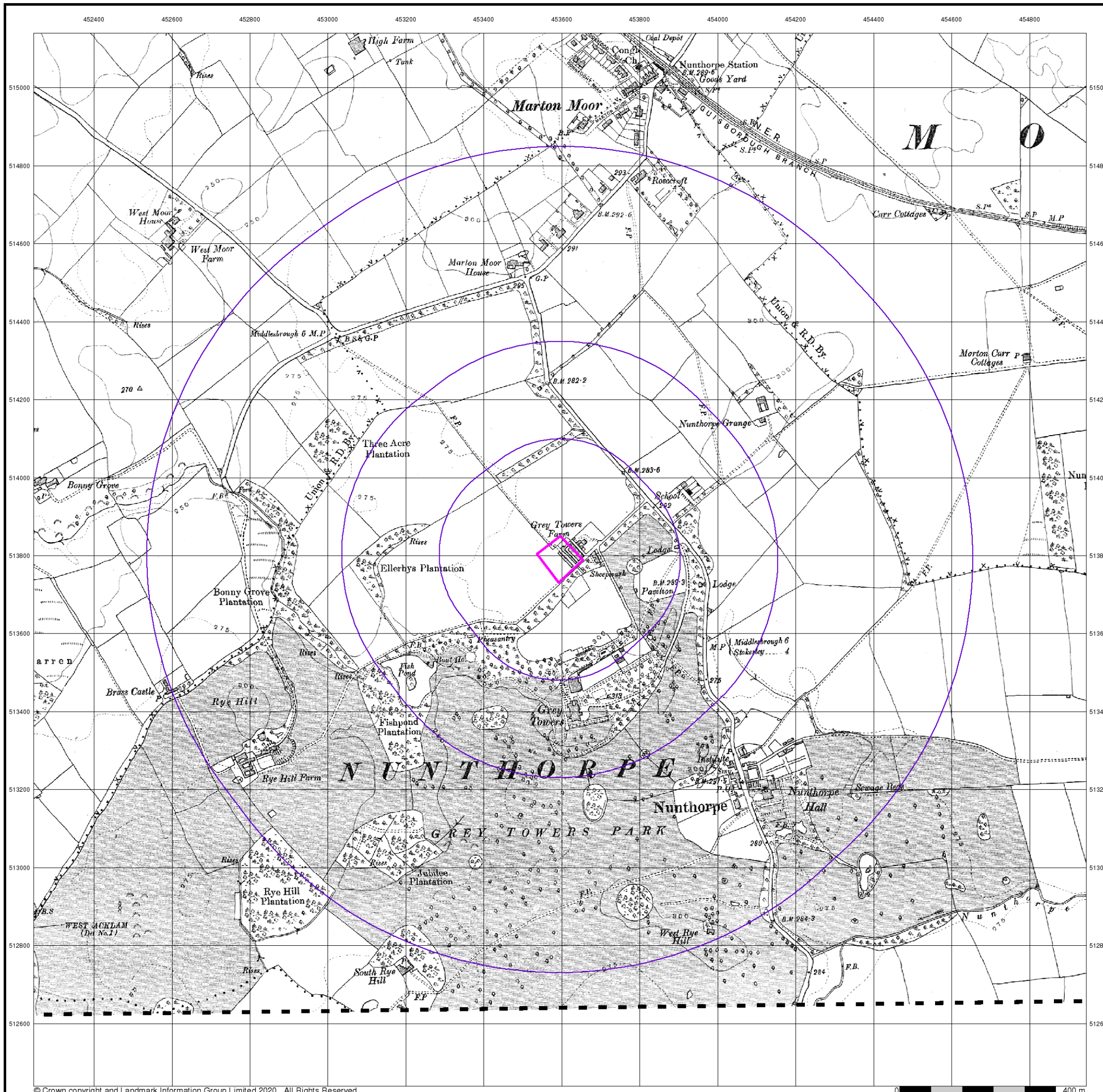
Order Number: 255485552_1_1
Customer Ref: Grey Towers Farm
National Grid Reference: 453590, 513790
Slice: A
Site Area (Ha): 0.71
Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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





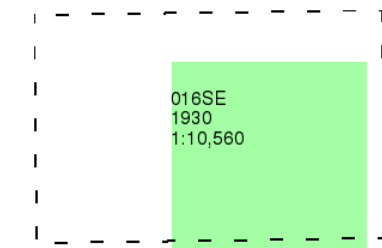
Yorkshire

Published 1930

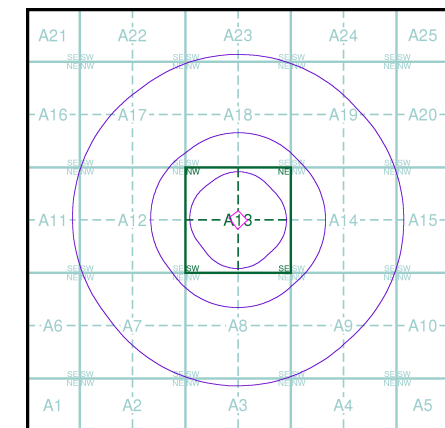
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

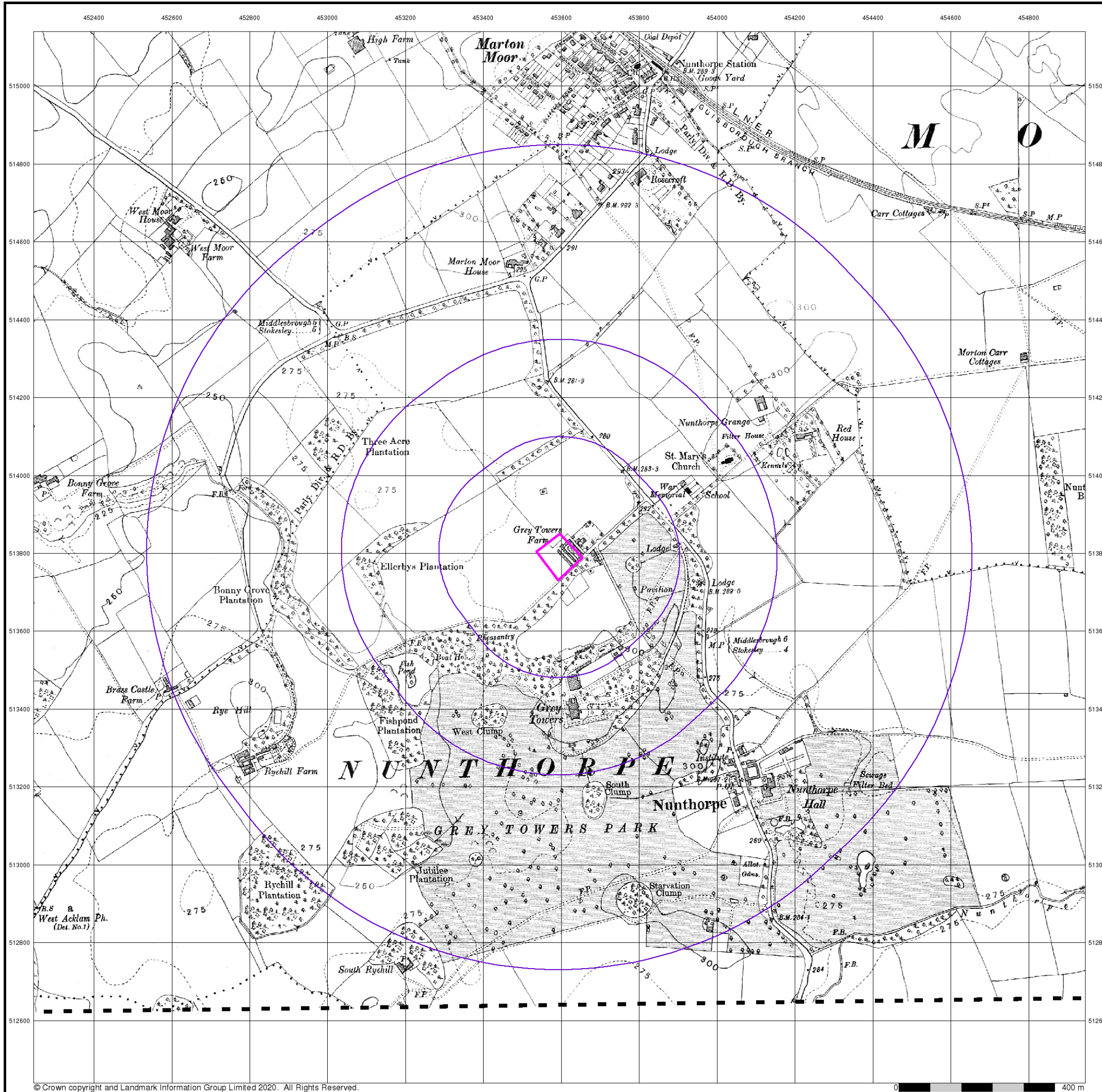
Order Number: 25548552_1_1
Customer Ref: Grey Towers Farm
National Grid Reference: 453590, 513790
Slice: A
Site Area (Ha): 0.71
Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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





Yorkshire

Published 1952

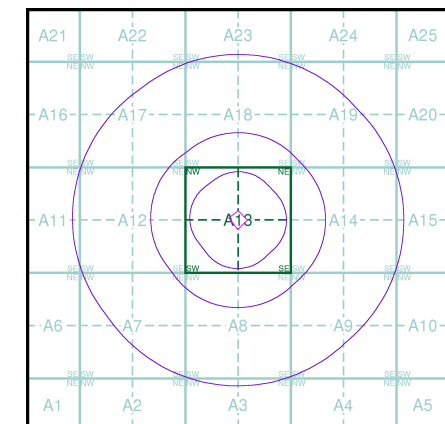
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

016SE	1952	1:10,560
028NE	1952	1:10,560

Historical Map - Slice A



Order Details

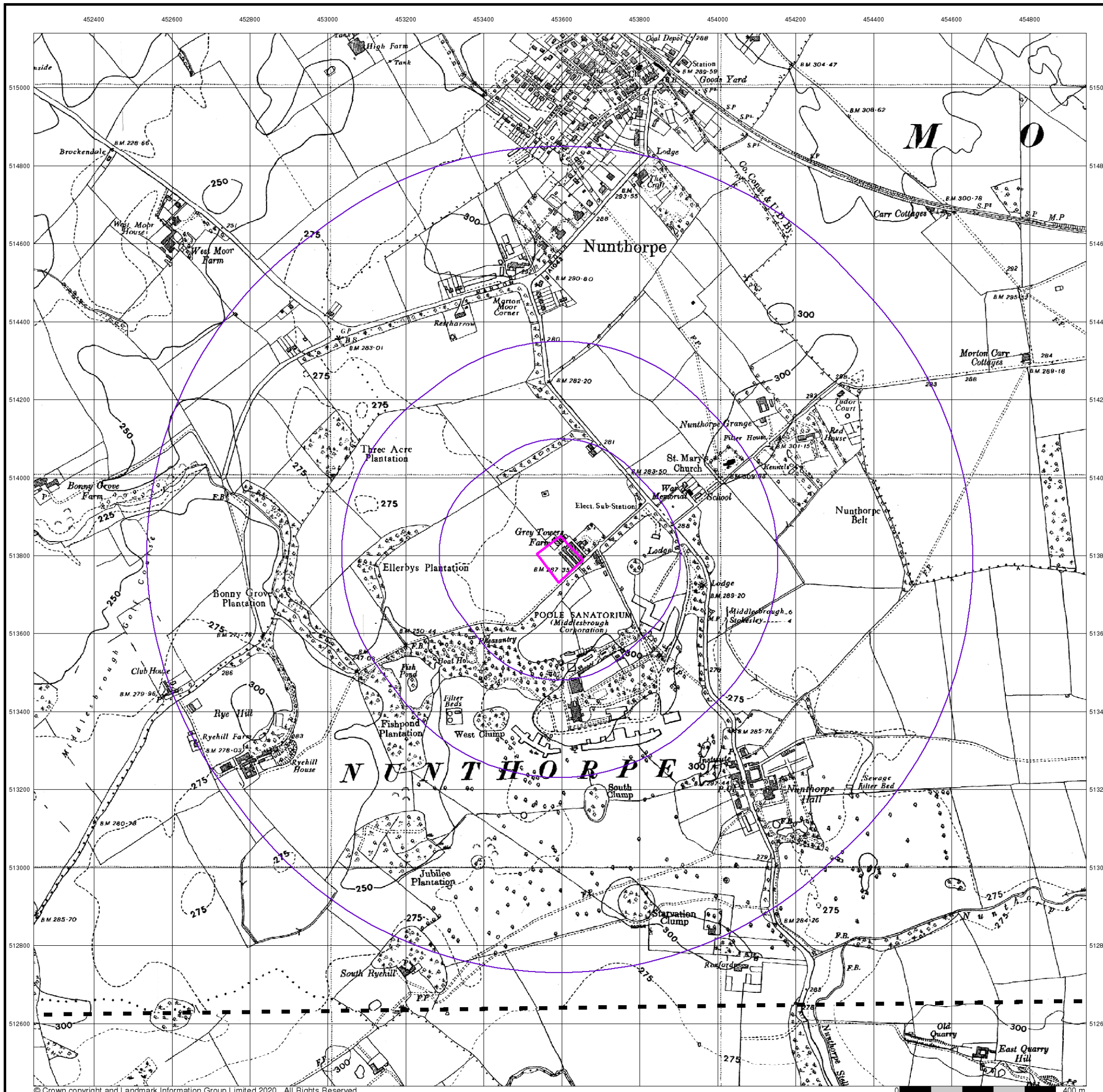
Order Number: 25548552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

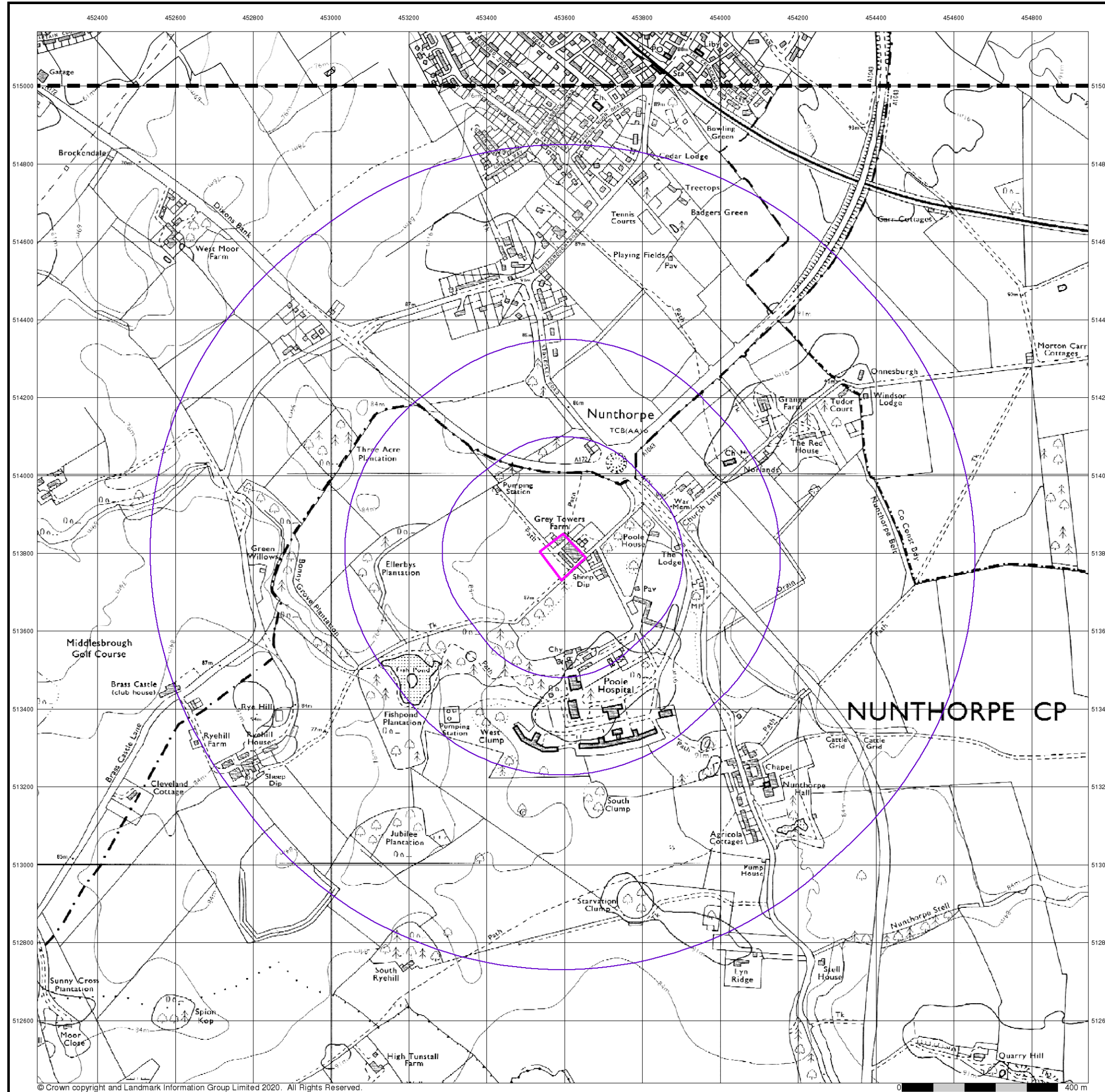
Site Details

Grey Towers Farm, Nunthorpe



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





Ordnance Survey Plan

Published 1971 - 1973

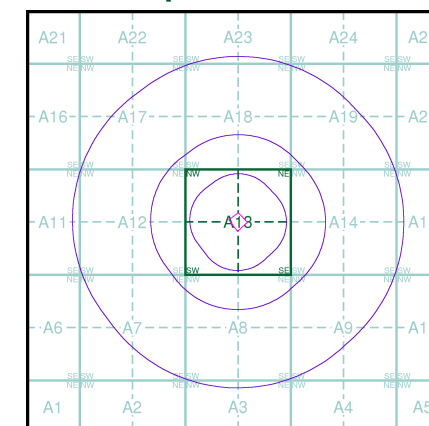
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

NZ51NW	1973	1:10,000
NZ51SW	1971	1:10,560

Historical Map - Slice A



Order Details

Order Number: 25548552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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



Ordnance Survey Plan

Published 1982 - 1983

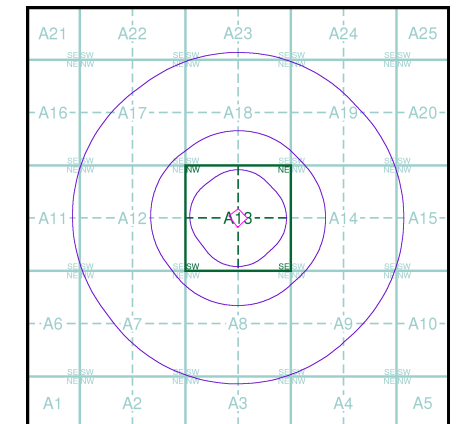
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

NZ51NW	1983	1:10,000
NZ51SW	1982	1:10,000

Historical Map - Slice A



Order Details

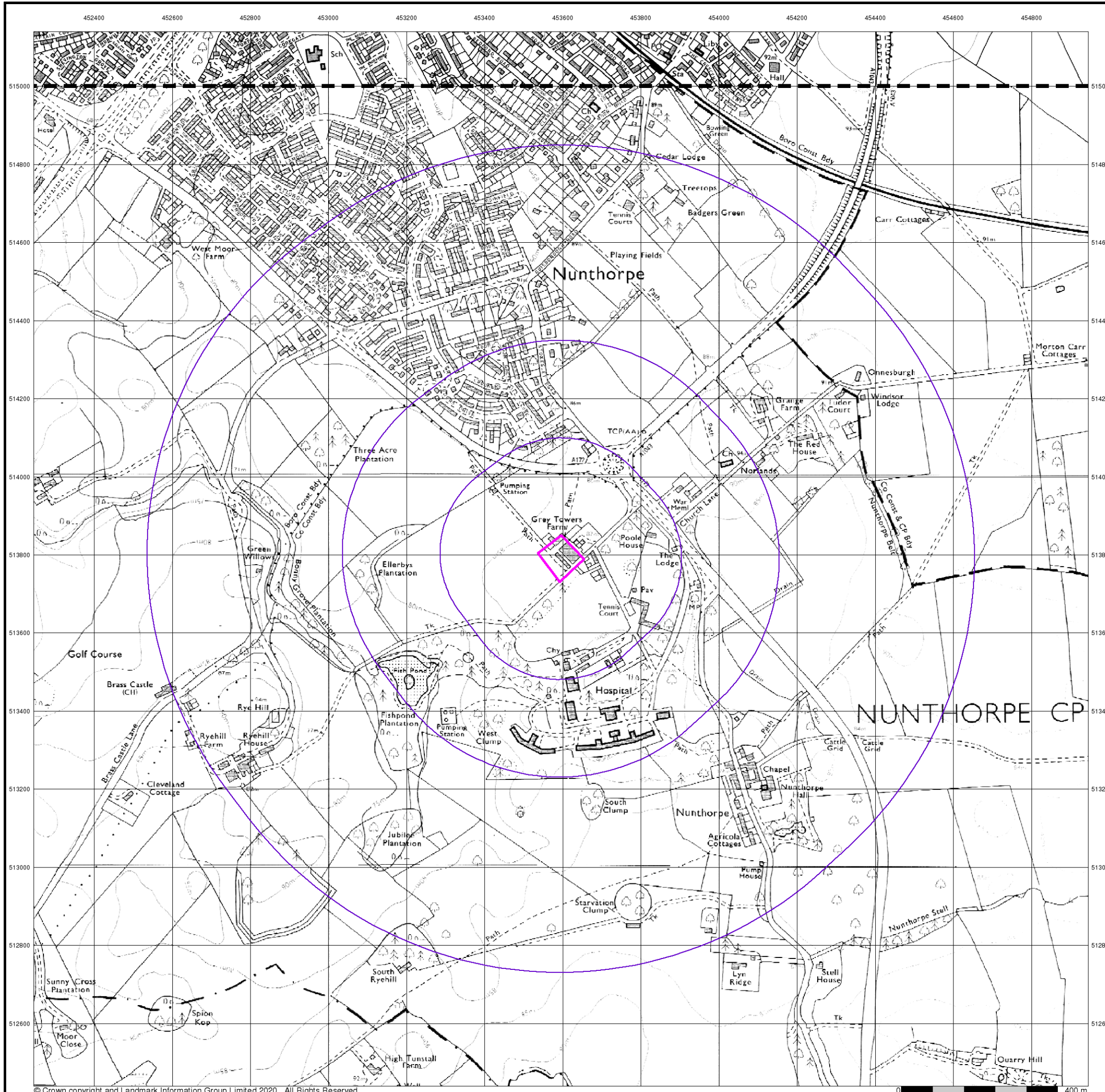
Order Number: 25548552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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





Ordnance Survey Plan

Published 1991 - 1994

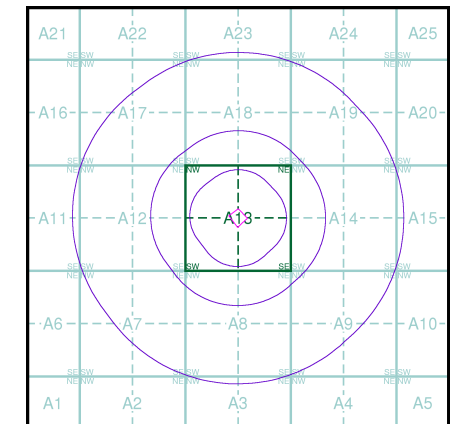
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

NZ51NW	1994	1:10,000
NZ51SW	1991	1:10,000

Historical Map - Slice A



Order Details

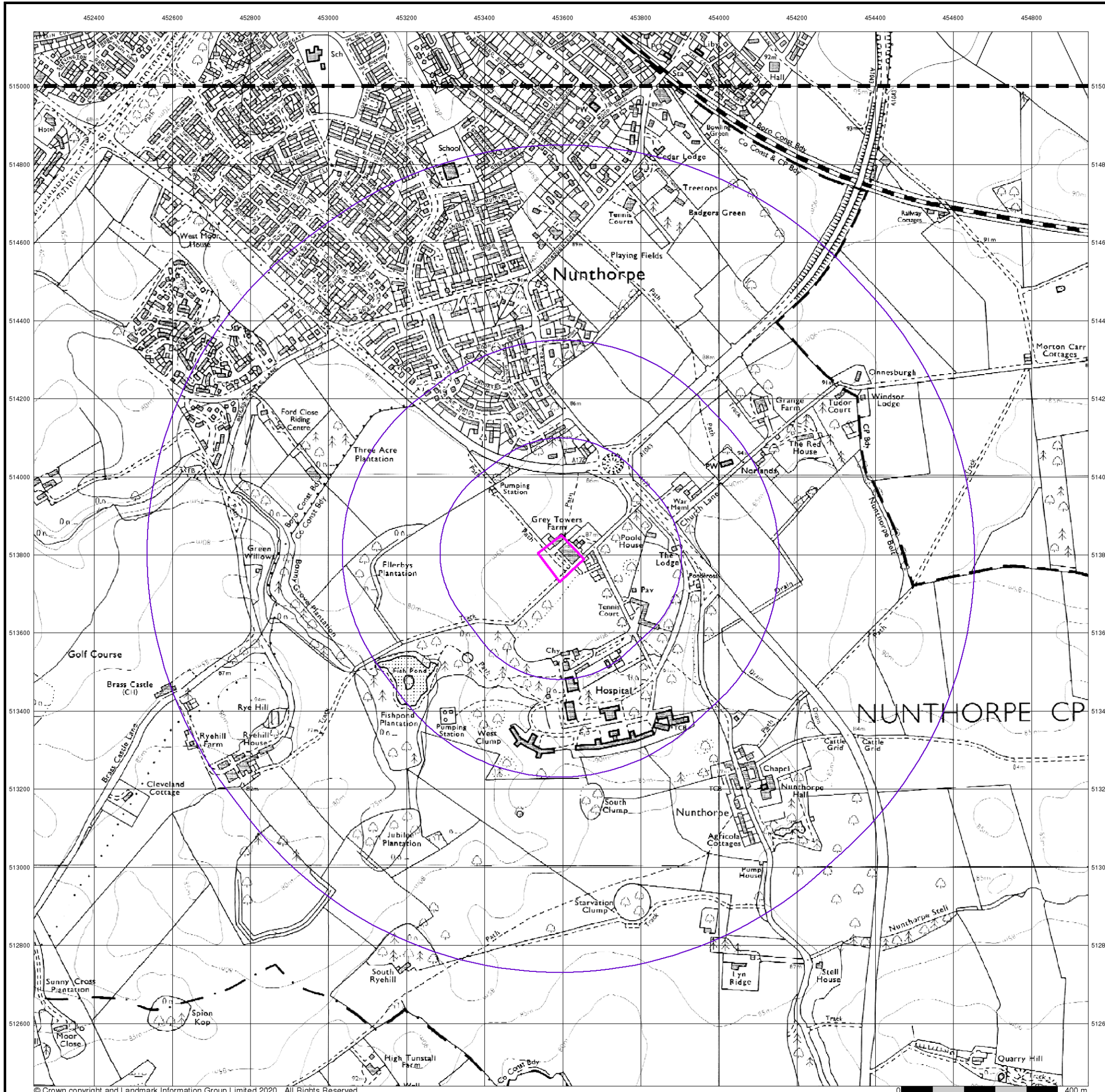
Order Number: 25548552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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





10k Raster Mapping

Published 2000

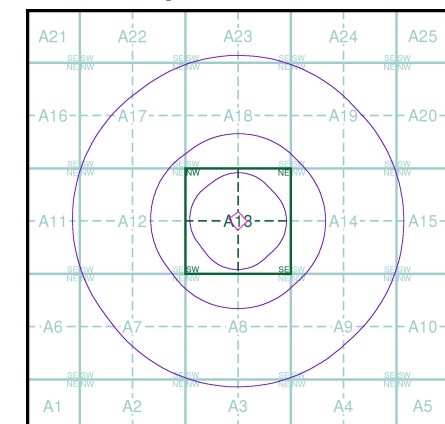
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

NZ51NW	2000	1:10,000
NZ51SW	2000	1:10,000

Historical Map - Slice A



Order Details

Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

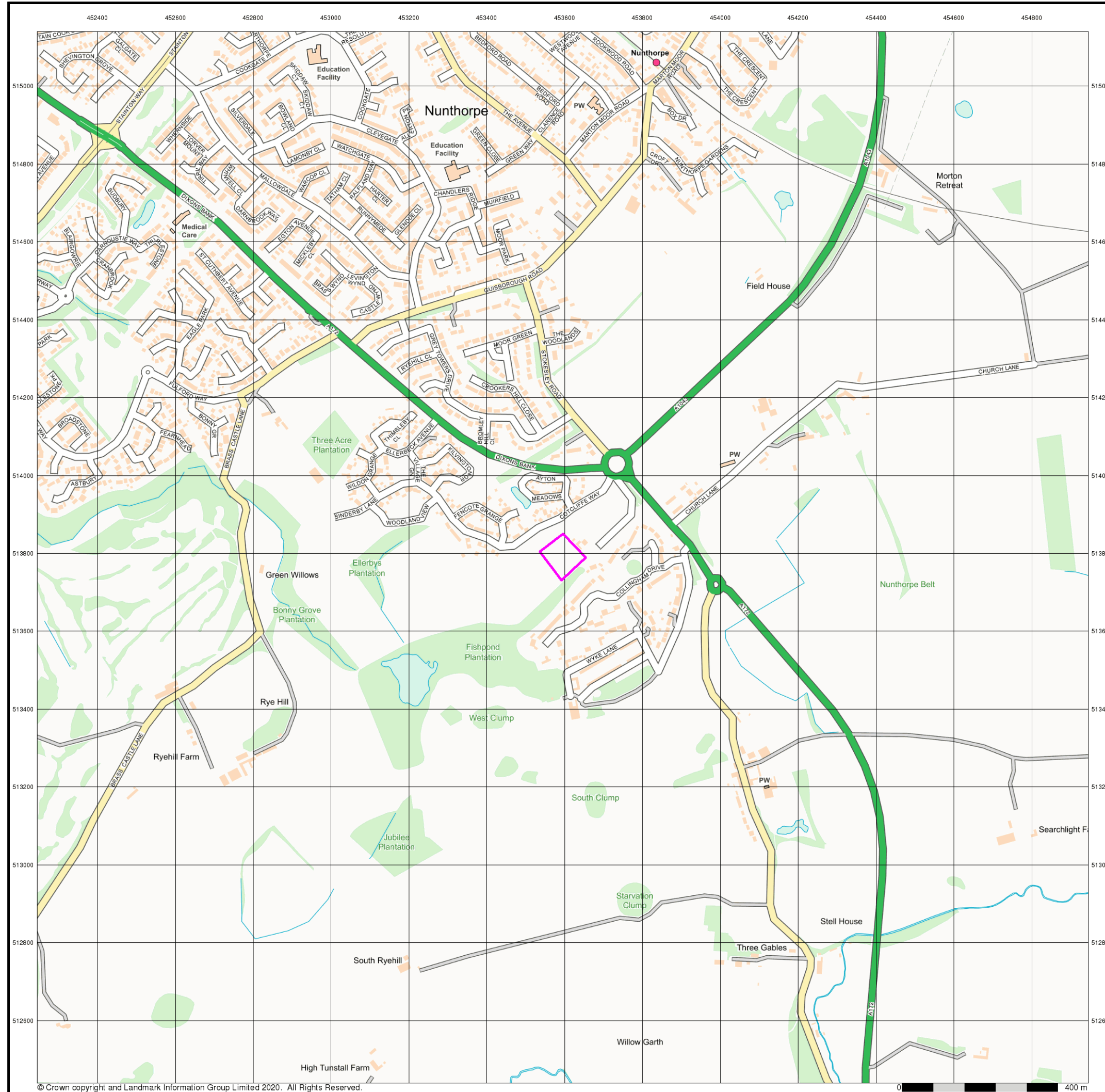
Site Details

Grey Towers Farm, Nunthorpe



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





Street View

Published 2020

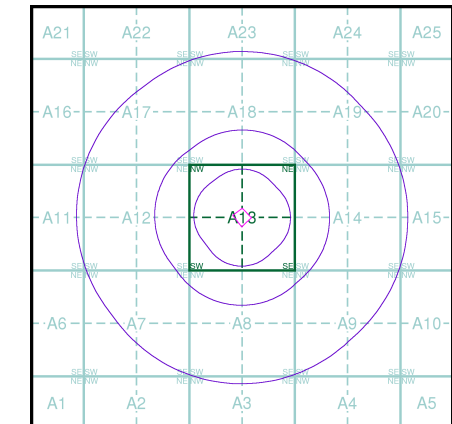
Source map scale - 1:10,000

Street View is a street-level map for the whole of Great Britain produced by the Ordnance Survey. These maps are provided at a nominal scale of 1:10,000

Map Name(s) and Date(s)



Street View Map - Slice A



Order Details

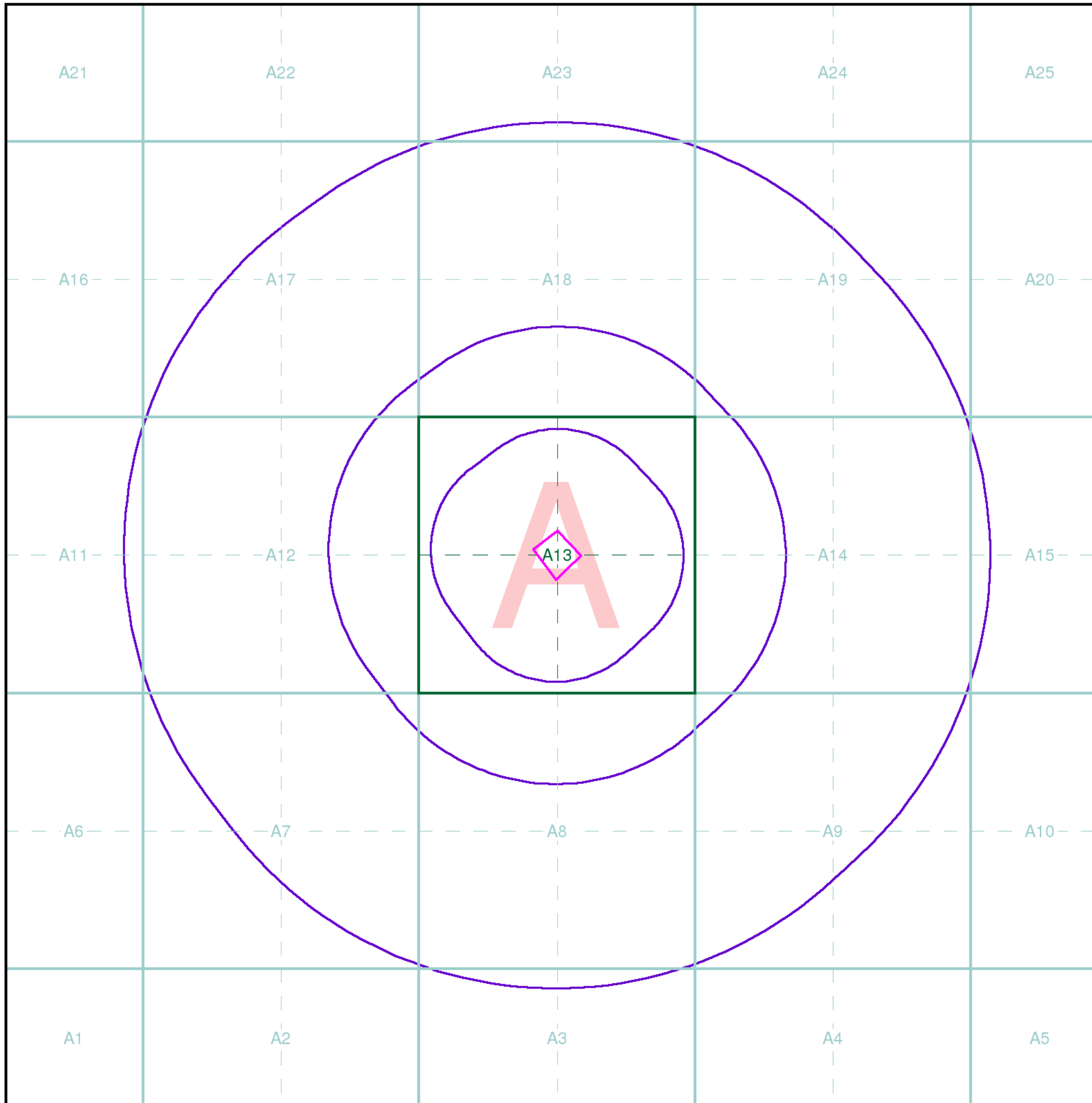
Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Slice: A
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe



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



Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice

Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment

A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant

A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:



Envirocheck reports are compiled from 136 different sources of data.

Client Details

S Howson, Sirius Geotechnical Ltd, 4245 Park Approach, Thorpe Park, Leeds, LS15 8GB

Order Details

Order Number: 255485552_1_1
 Customer Ref: Grey Towers Farm
 National Grid Reference: 453590, 513790
 Site Area (Ha): 0.71
 Search Buffer (m): 1000

Site Details

Grey Towers Farm, Nunthorpe

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



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



APPENDIX C

RISK ASSESSMENT METHODOLOGY



Qualitative Risk Assessment Methodology

The approach adopted by Sirius for the qualitative assessment of risk is based upon that given in Annex 4 of NHBC-Environment Agency-CIEH “Guidance for the Safe Development of Housing on Land Affected by Contamination” (2008) and is consistent with other current guidance.

The risk posed by viable contaminant linkages is based upon the consideration of both:

- a) the magnitude of the potential consequence (i.e. its severity); and,
- b) the probability (likelihood) of that consequence being realised.

The classifications used in this report for consequence and probability are given in Tables 1 and 2, respectively. The derived risk classifications are defined in Table 3.

Where there is no viable contaminant linkage there is no potential risk.

Table 1. Classification of Consequence

Classification	Definition
Severe	<p>Contaminant concentrations at the receptor that are likely to result in “significant harm” to human health (as defined in Part 2A of the Environmental Protection Act 1990).</p> <p>Major pollution of controlled waters that could have persistent and/or extensive effects on water quality, for example fish kills, closure of an abstraction, or substantial deterioration in quality of the receiving water body.</p> <p>Major impact on receptor amenity value or major damage to agriculture or commerce.</p> <p>Major damage to an ecosystem that is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population.</p> <p>Catastrophic damage to crops, buildings or property.</p>
Medium	<p>Elevated concentrations at the receptor that might result in “significant harm” to human health (as defined in Part 2A of the Environmental Protection Act 1990).</p> <p>A pollution incident that has significant effect on water quality or abstraction potential.</p> <p>An incident that has a marked effect on receptor amenity value, agriculture or commerce.</p> <p>Damage to an ecosystem that may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population.</p> <p>Significant damage to crops, buildings or property.</p>



Classification	Definition
Mild	<p>Potential human health impact at the receptor point but unlikely to be classified as “significant harm” (as defined in Part 2A of the Environmental Protection Act 1990).</p> <p>Pollution of water that will have a small or short-lived effect on water quality and marginal effects on its amenity or resource value or its use in agriculture or commerce.</p> <p>Minor or short-lived damage to ecosystems, which is unlikely to result in a substantial adverse change</p> <p>Minor damage to crops, buildings or property</p>
Minor	<p>No potential measurable detrimental human health impacts at the receptor point.</p> <p>Impact on water that will have no or minimal effect on water quality or use.</p> <p>No or minor and easily repairable effects on buildings, structures and services.</p>

Table 2. Classification of Probability

Classification	Definition
High	An impact is already occurring or is very likely in the short-term and almost inevitable over the long-term.
Medium	It is probable that an event would occur. This is not inevitable but possible in the short-term and likely over the long-term.
Low	Circumstances are possible under which an event could occur. However, it is by no means certain that an event will take place, even over the long-term.
Unlikely	Circumstances are such that it is improbable that an event would occur even over the very long-term.

Table 3. Risk Classification

Probability	Consequence			
	<i>Severe</i>	<i>Medium</i>	<i>Mild</i>	<i>Minor</i>
<i>High</i>	Very High	High	Moderate	Low
<i>Medium</i>	High	Moderate	Low to Moderate	Low
<i>Low</i>	Moderate	Low to Moderate	Low	Very Low
<i>Unlikely</i>	Low to Moderate	Low	Very Low	Negligible



Table 4 provides a context for interpretation of the risk classification categories. The definitions provided are based on those given in CIRIA (2001) “Contaminated Land Risk Assessment. A Guide to Good Practice”, Report C552.

Table 4. Interpretation of Risk Classification Categories

Risk Classification	Definition
Very High	There is a high probability that severe harm to one or more identified receptors could occur or there is evidence that this is already happening. This risk is likely to result in a substantial liability. Urgent investigation and remediation are likely to be required.
High	Harm is likely to be caused to one or more identified receptors. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required and remedial works may be necessary in the short-term and are likely over the longer term.
Moderate	It is possible that harm could be caused to one or more identified receptors. However, it is relatively unlikely that such harm would be severe. Investigation is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low	It is possible that harm could be caused to one or more identified receptors but it is likely that this harm, if realised, would normally be mild. No further investigation is considered necessary to assess risk or environmental liability but investigations could be undertaken if desired to confirm ‘baseline’ conditions for the purposes of liability management. Remedial works are unlikely to be required.
Very Low	There is a low probability that harm could be caused to one or more identified receptors. In the event of such harm being realised, it is likely to be mild, at worst. No further investigation is considered necessary to assess risk or environmental liability but investigations could be undertaken if desired to confirm ‘baseline’ conditions for the purposes of liability management. Remedial works are very unlikely to be required.
Negligible	It is unlikely that harm could be caused to one or more identified receptors. In the event of harm being realised, it is likely to be minor. No further investigation is considered necessary to assess risk or environmental liability. Remedial works are not expected.



APPENDIX D

EXPLORATORY HOLE LOGS AND FIELD TEST RESULTS



TRIAL PIT RECORD

TP No. **NSH01**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date: 08/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10			MADE GROUND: Firm friable brown slightly sandy slightly gravelly CLAY of low plasticity (field test), with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments (Reworked natural material with demolition rubble).	0.50			
				End of trial pit at 0.50m				
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile.

GL (m AOD)

Easting:

Northing:

Fig No.

NSH01



TRIAL PIT RECORD

TP No. **SH1/1**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.50			<p>MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test), with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments (Topsoil with demolition rubble).</p>	0.60			
				<p>End of trial pit at 0.60m</p>				
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile.

GL (m AOD)

Eastings:

Northing:

Fig No.

SH1/1



TRIAL PIT RECORD

TP No. **SH1/2**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.30			MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test), with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments (Topsoil with demolition rubble).	0.70			
ES	0.70		End of trial pit at 0.70m					
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile.

GL (m AOD)

Easting:

Northing:

Fig No.

SH1/2



TRIAL PIT RECORD

TP No. **SH1/3**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.15			MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test), with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments (Topsoil with demolition rubble).	0.40			
				Firm friable orangish brown slightly sandy slightly gravelly silty CLAY. Gravel is fine occasionally medium subangular to subrounded of sandstone.	0.45			
				End of trial pit at 0.45m				
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile; pit terminated on encountering natural soils at base of stockpile.

GL (m AOD)

Easting:

Northing:

Fig No.

SH1/3



TRIAL PIT RECORD

TP No. **SH1/4**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date: 07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			<p>MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test), with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments (Topsoil with demolition rubble).</p> <p>Firm friable orangish brown slightly sandy slightly gravelly silty CLAY of low plasticity (field test). Gravel is fine occasionally medium subangular to subrounded of sandstone.</p> <p style="text-align: center;">End of trial pit at 0.40m</p>	0.30			
					0.40			
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile; pit terminated on encountering natural soils at base of stockpile.

GL (m AOD)

Easting:

Northing:

Fig No.

SH1/4



TRIAL PIT RECORD

TP No. **SH1/5**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10			<p>MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test), with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments (Topsoil with demolition rubble).</p> <p>Firm friable orangish brown slightly sandy slightly gravelly silty CLAY of low plasticity (field test). Gravel is fine occasionally medium subangular to subrounded of sandstone.</p> <p style="text-align: center;">End of trial pit at 0.30m</p>	0.20			
					0.30			
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile; pit terminated on encountering natural soils at base of stockpile.

GL (m AOD)	Fig No. SH1/5
Easting:	
Northing:	



TRIAL PIT RECORD

TP No. **SH2/2**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.25			MADE GROUND: Reddish brown SAND & GRAVEL with a medium cobble content of brick. Gravel is predominantly medium to coarse, occasionally fine, angular of brick and concrete fragments (Demolition rubble).	0.80 0.85			
				MADE GROUND: Concrete slab.				
				End of trial pit at 0.85m				
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile; pit terminated on encountering a concrete slab at the base of the stockpile.

GL (m AOD)	Fig No. SH2/2
Easting:	
Northing:	



TRIAL PIT RECORD

TP No. **SH2/3**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.30			MADE GROUND: Reddish brown SAND & GRAVEL with a medium cobble content of brick. Gravel is predominantly medium to coarse, occasionally fine, angular of brick and concrete fragments (Demolition rubble).	0.60 0.65			
				Firm friable orangish brown slightly sandy slightly gravelly silty CLAY of low plasticity (field test). Gravel is fine occasionally medium subangular to subrounded of sandstone. End of trial pit at 0.65m				
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile; pit terminated on encountering natural soils at base of stockpile.

GL (m AOD)	Fig No. SH2/3
Easting:	
Northing:	



TRIAL PIT RECORD

TP No. **SH2/4**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.30		1	MADE GROUND: Reddish brown SAND & GRAVEL with a medium cobble content of brick. Gravel is predominantly medium to coarse, occasionally fine, angular of brick and concrete fragments (Demolition rubble).	0.80	1.20		
				Firm friable orangish brown slightly sandy slightly gravelly silty CLAY of low plasticity (field test). Gravel is fine occasionally medium subangular to subrounded of sandstone.				
				End of trial pit at 1.20m				
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile; pit terminated on encountering natural soils at base of stockpile.

GL (m AOD)

Easting:

Northing:

Fig No.

SH2/4



TRIAL PIT RECORD

TP No. **SH2/5**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.30			MADE GROUND: Reddish brown SAND & GRAVEL with a medium cobble content of brick. Gravel is predominantly medium to coarse, occasionally fine, angular of brick and concrete fragments (Demolition rubble).	0.70 0.72			
				MADE GROUND: Concrete slab. End of trial pit at 0.72m				
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile; pit terminated on encountering concrete slab at the base of the stockpile.

GL (m AOD)

Eastings:

Northing:

Fig No.

SH2/5



TRIAL PIT RECORD

TP No. **SH3/1**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.15			<p>MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test), with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments (Topsoil with demolition rubble).</p> <p style="text-align: center;">End of trial pit at 0.30m</p>	0.30			
			<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p>					

Remarks and Groundwater Observations

1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile.

GL (m AOD)	Fig No. SH3/1
Easting:	
Northing:	



TRIAL PIT RECORD

TP No. **SH3/2**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.05			<p>MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test), with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments (Topsoil with demolition rubble).</p> <p style="text-align: center;">End of trial pit at 0.15m</p>	0.15			
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile.

GL (m AOD)

Easting:

Northing:

Fig No.

SH3/2



TRIAL PIT RECORD

TP No. **SH3/3**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10			<p>MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test), with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments (Topsoil with demolition rubble).</p> <p style="text-align: center;">End of trial pit at 0.25m</p>	0.25			

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile.

GL (m AOD)	Fig No. SH3/3
Easting:	
Northing:	



TRIAL PIT RECORD

TP No. **SH4/1**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
08/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			<p>MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test), with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments (Topsoil with demolition rubble).</p> <p style="text-align: center;">End of trial pit at 0.50m</p>	0.50			
			<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p>					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile.

GL (m AOD)

Easting:

Northing:

Fig No.

SH4/1



TRIAL PIT RECORD

TP No. **SH4/2**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
08/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test), with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments (Topsoil with demolition rubble).	0.50			
				End of trial pit at 0.50m				
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations

1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile.

GL (m AOD)

Easting:

Northing:

Fig No.

SH4/2



TRIAL PIT RECORD

TP No. **SH4/3**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
08/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			<p>MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test), with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments (Topsoil with demolition rubble).</p> <p style="text-align: center;">End of trial pit at 0.40m</p>	0.40			
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the apex of the stockpile.

GL (m AOD)

Easting:

Northing:

Fig No.

SH4/3



TRIAL PIT RECORD

TP No. **SP01**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
08/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10		1	<p>MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test) with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments. (Topsoil with demolition rubble).</p> <p>Firm friable orangish brown slightly sandy slightly gravelly silty CLAY of low plasticity (field test). Gravel is fine occasionally medium subangular to subrounded of sandstone.</p>	0.10			
				End of trial pit at 1.20m	1.20			
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. All measurements taken from the rear face of the trial pit.

GL (m AOD)	Fig No. SP01
Easting:	
Northing:	



TRIAL PIT RECORD

TP No. **STP101**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			<p>MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test) with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments.</p> <p style="text-align: center;">End of trial pit at 0.30m</p>	0.30			
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation.

GL (m AOD)
 Easting:
 Northing:

Fig No.

STP101



TRIAL PIT RECORD

TP No. **STP102**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.15			<p>MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test) with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments.</p> <p style="text-align: center;">End of trial pit at 0.30m</p>	0.30			
			<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p>					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation.

GL (m AOD)
 Easting:
 Northing:

Fig No.

STP102



TRIAL PIT RECORD

TP No. **STP103**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.15			<p>MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test) with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments.</p> <p style="text-align: center;">End of trial pit at 0.30m</p>	0.30			
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
1. No groundwater encountered. 2. Trial pit remained stable during excavation.

GL (m AOD)
Easting:
Northing:

Fig No.
STP103



TRIAL PIT RECORD

TP No. **STP104**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10			<p>MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY of low plasticity (field test) with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments.</p> <p style="text-align: center;">End of trial pit at 0.30m</p>	0.30			
			1					
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
1. No groundwater encountered. 2. Trial pit remained stable during excavation.

GL (m AOD)
Easting:
Northing:

Fig No.

STP104



TRIAL PIT RECORD

TP No. **TP101**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date:
07/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10			MADE GROUND: Firm brown mottled grey slightly gravelly sandy silty CLAY. Gravel is fine to coarse angular to subrounded of sandstone and brick fragments. (Reworked topsoil)	0.30			
D	0.45			Stiff friable orangish brown slightly sandy slightly gravelly silty CLAY of intermediate plasticity locally grading to clayey sandy SILT and very clayey silty SAND. Gravel is fine occasionally medium subangular to subrounded of sandstone.				
			1	<i>From 1.00m, occasional layers of interbedded silt, silty clay and silty sand.</i>				
D	1.45							
			2					
			3	End of trial pit at 3.00m	3.00			
			4					
			5					

Remarks and Groundwater Observations
 1. Groundwater encountered at 2.0m within granular layers. 2. Trial pit remained stable during excavation. 3. Material was unsuitable for hand shear vane tests due to sample size and composition.

GL (m AOD)	Fig No. TP101
Eastings:	
Northing:	



TRIAL PIT RECORD

TP No. **TP102**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date: 08/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.25			MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments. (Topsoil with demolition rubble).	0.05			
				MADE GROUND: Firm brown mottled grey slightly gravelly sandy silty CLAY of low plasticity (field test), locally grading to very clayey SAND. Gravel is fine to coarse angular to subrounded of sandstone. (Reworked topsoil)	0.40			
D	1.20	38.0 48.0 64.0 80.0	1	Very stiff generally medium strength, occasionally low and high strength, friable orangish brown slightly sandy slightly gravelly CLAY of low plasticity, with occasional pockets of very clayey sand. Gravel is fine to coarse angular to subrounded of sandstone and mudstone.				
				<i>From 1.40m, very sandy.</i>				
				End of trial pit at 1.80m	1.80			
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. Made ground recorded to 0.05m is the toe of SH2 stockpile. 4. Material was generally unsuitable for hand shear vane tests due to sample size and composition. Some values listed may be considered under representative of soil strength.

GL (m AOD)	Fig No. TP102
Easting:	
Northing:	



TRIAL PIT RECORD

TP No. **TP103**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date: 08/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10	118.0	1	MADE GROUND: Firm brown mottled grey slightly gravelly sandy silty CLAY, grading to very clayey SAND. Gravel is fine to coarse angular to subrounded of sandstone (Reworked topsoil).	0.15			
D	0.30			Very stiff high strength friable orangish brown slightly sandy slightly gravelly CLAY of low plasticity, with occasional pockets of very clayey sand. Gravel is fine to coarse angular to subrounded of sandstone and mudstone.				
D	1.50	78.0 84.0	2	<i>From 1.40m, becoming very sandy, grading locally to a clayey sand.</i>	1.80			
D	1.80			Greyish orangish brown sandy clayey SILT.				
D	2.10			Stiff high strength reddish brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium, occasionally coarse, subangular to rounded of sandstone and mudstone.				
				End of trial pit at 2.60m	2.60			
				3				
				4				
				5				

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation, however small slumps were noted within the silts. 3. Material was generally unsuitable for hand shear vane tests due to sample size and composition.

GL (m AOD)	Fig No. TP103
Eastings:	
Northings:	



TRIAL PIT RECORD

TP No. **TP105**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date: 08/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.15			MADE GROUND: Firm brown mottled grey slightly gravelly sandy silty CLAY. Gravel is fine to coarse angular to subrounded of sandstone (Reworked topsoil).	0.25			
D	0.30			Firm becoming stiff friable orangish brown slightly sandy slightly gravelly CLAY of low plasticity (field test), with occasional pockets of very clayey sand. Gravel is fine to coarse angular to subrounded of sandstone and mudstone.				
D	1.25	74.0 78.0 80.0	1	Stiff medium to high strength friable reddish brown slightly sandy slightly gravelly CLAY of intermediate plasticity. Gravel is fine to medium, occasionally coarse, subangular to rounded of sandstone and mudstone.	1.10			
D	2.10		2	Greyish orangish brown sandy clayey SILT.	2.00			
D	2.50			Brown silty SAND & GRAVEL. Gravel is fine to coarse subrounded to well rounded of sandstone.	2.30			
D	2.80		3	Stiff grey slightly sandy slightly gravelly CLAY of low plasticity (field test). Gravel is fine to coarse angular to subrounded of sandstone and igneous lithologies.	2.80			
End of trial pit at 3.20m					3.20			
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. Material was generally unsuitable for hand shear vane tests due to sample size and composition.

GL (m AOD)
 Easting:
 Northing:

Fig No.
 TP105



TRIAL PIT RECORD

TP No. **TP107**
Sheet 1 of 1

Site: Grey Towers Farm, Nunthorpe, Middlesbrough

Contract No: C8874

Client: Fordy Farms (Ingleby) Ltd

Date: 08/09/2020

Method: JCB 3CX Excavator with 600mm toothless bucket.

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: SAB Checked By: APC

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
D	0.75		1	<p>MADE GROUND: Firm friable dark grey slightly sandy slightly gravelly CLAY with a low cobble content of brick and concrete fragments. Gravel is predominantly medium to coarse, occasionally fine, angular to subangular of sandstone, mudstone and brick fragments. (Topsoil with demolition rubble).</p> <p>Stiff friable orangish brown slightly sandy slightly gravelly CLAY of intermediate plasticity. Gravel is fine to coarse angular to subrounded of sandstone and mudstone.</p>	0.40			
				End of trial pit at 1.70m	1.70			
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. No groundwater encountered. 2. Trial pit remained stable during excavation. 3. Made ground recorded to 0.40m is the toe of SH4 stockpile. 4. Material was unsuitable for hand shear vane tests due to sample size.

GL (m AOD)

Easting:

Northing:

Fig No.

TP107



APPENDIX E

LABORATORY TEST RESULTS



LABORATORY REPORT



4043

Contract Number: PSL20/4805

Report Date: 28 September 2020
Client's Reference: C8874
Client Name: Sirius Durham
Suite 2, Russel House
Mill Road
Langley Moor
Durham
DH7 8HJ

For the attention of: Alastair Cook

Contract Title: Grey Tower Farm
Date Received: 10/9/2020
Date Commenced: 10/9/2020
Date Completed: 28/9/2020

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson
(Director)

A Watkins
(Director)

R Berriman
(Quality Manager)

L Knight
(Senior Technician)


S Eyre
(Senior Technician)

S Royle
(Laboratory Manager)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

Page 1 of

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

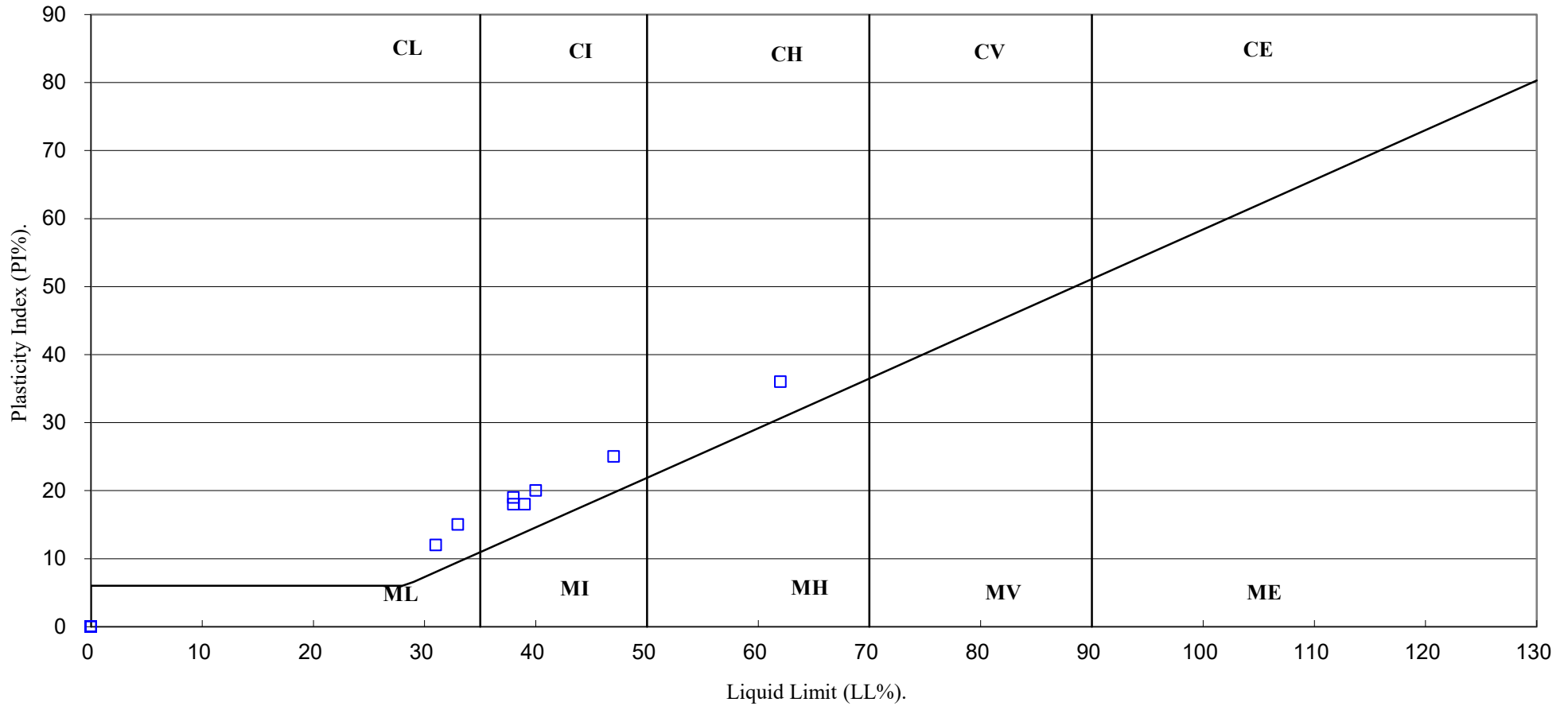
Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % <small>Clause 3.2</small>	Linear Shrinkage % <small>Clause 6.5</small>	Particle Density Mg/m ³ <small>Clause 8.2</small>	Liquid Limit % <small>Clause 4.3/4</small>	Plastic Limit % <small>Clause 5.3</small>	Plasticity Index % <small>Clause 5.4</small>	Passing .425mm %	Remarks
TP101			0.45		21			38	20	18	80	Intermediate plasticity CI.
TP101			1.55		22			39	21	18	99	Intermediate plasticity CI.
TP102			1.20		15			33	18	15	92	Low plasticity CL.
TP103			0.30		17			31	19	12	94	Low plasticity CL.
TP103			1.80		19				NP			
TP104			0.40		17			62	26	36	93	High plasticity CH.
TP105			1.25		18			38	19	19	91	Intermediate plasticity CI.
TP105			2.10		21				NP			
TP106			0.50		20			47	22	25	96	Intermediate plasticity CI.
TP107			0.75		20			40	20	20	98	Intermediate plasticity CI.

SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.

 4043		Grey Tower Farm	Contract No:
			PSL20/4805
			Client Ref:
			C8874

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



4043

PSL
Professional Soils Laboratory

Grey Tower Farm

Contract No:

PSL20/4805

Client Ref:

C8874



ANALYTICAL TEST REPORT

Contract no: 89453
Contract name: Grey Tower Farm
Client reference: PSL20/4805
Clients name: Professional Soils Laboratory
Clients address: 5/7 Hexthorpe Road
Doncaster
DN4 0AR

Samples received: 18 September 2020
Analysis started: 18 September 2020
Analysis completed: 25 September 2020
Report issued: 25 September 2020

Notes: Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

Key: U UKAS accredited test
M MCERTS & UKAS accredited test
\$ Test carried out by an approved subcontractor
I/S Insufficient sample to carry out test
N/S Sample not suitable for testing

Approved by:



Dave Bowerbank
Customer Support Hero

Chemtech Environmental Limited

SOILS

Lab number			89453-1	89453-2	89453-3	89453-4	89453-5	89453-6
Sample id			TP101	TP102	TP103	TP104	TP105	TP105
Depth (m)			0.45	1.20	0.30	1.90	1.25	2.10
Date sampled			-	-	-	-	-	-
Test	Method	Units						
pH	CE004 ^u	units	8.3	8.3	8.3	8.2	8.3	8.3
Sulphate (2:1 water soluble)	CE061 ^u	mg/l SO ₄	20	34	11	30	30	21

Chemtech Environmental Limited

SOILS

Lab number			89453-7	89453-8
Sample id			TP106	TP107
Depth (m)			0.50	0.75
Date sampled			-	-
Test	Method	Units		
pH	CE004 ^u	units	8.1	8.2
Sulphate (2:1 water soluble)	CE061 ^u	mg/l SO ₄	50	11

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE004	pH	Based on BS 1377, pH Meter	As received	U	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	U	10	mg/l SO ₄

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
89453-1	TP101	0.45	Y	All (NSD)
89453-2	TP102	1.20	Y	All (NSD)
89453-3	TP103	0.30	Y	All (NSD)
89453-4	TP104	1.90	Y	All (NSD)
89453-5	TP105	1.25	Y	All (NSD)
89453-6	TP105	2.10	Y	All (NSD)
89453-7	TP106	0.50	Y	All (NSD)
89453-8	TP107	0.75	Y	All (NSD)



Certificate of Analysis

Certificate Number 20-17549-1

29-Sep-20

Client Sirius Geotechnical & Environmental
Russel House
Suite 2
Mill Road
Langley Moor
DH7 8HJ

Our Reference 20-17549-1

Client Reference C8874

Order No 20376C8874SAB

Contract Title Grey Tower Farm, Nunthorpe

Description 25 Soil samples, 4 Leachate samples.

Date Received 11-Sep-20

Date Started 11-Sep-20

Date Completed 29-Sep-20

Test Procedures Identified by prefix DETSn (details on request).

Notes **This report supersedes 20-17549, extra testing added**

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read 'A. Fenwick'.

Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Sample ID	Depth	Lab No	Completed	Matrix Description
SH1/2	0.3	1725498	23/09/2020	Dark brown SAND
SH1/5	0.1	1725499	23/09/2020	Dark brown gravelly SAND
SH2/1	0.2	1725500	23/09/2020	Dark brown gravelly SAND
SH2/2	0.25	1725501	23/09/2020	Dark brown gravelly SAND (Possible made ground - brick) including some rootlets
SH2/3	0.3	1725502	23/09/2020	Dark brown gravelly SAND (Possible made ground - brick) including some rootlets
SH2/4	0.2	1725503	23/09/2020	Dark brown gravelly SAND
SH2/5	0.3	1725504	23/09/2020	Dark brown gravelly, sandy CLAY (Possible made ground - brick)
SH3/1	0.15	1725505	23/09/2020	Dark brown gravelly, sandy CLAY (Possible made ground - brick)
SH3/2	0.05	1725506	23/09/2020	Dark brown gravelly, sandy CLAY
SH3/3	0.1	1725507	23/09/2020	Dark brown gravelly, very sandy CLAY
SH4/1	0.2	1725508	23/09/2020	Dark brown sandy CLAY
SH4/2	0.2	1725509	23/09/2020	Dark brown sandy CLAY
SH4/3	0.2	1725510	23/09/2020	Dark brown gravelly, sandy CLAY (Possible made ground - brick)
NSH01	0.05	1725511	23/09/2020	Dark brown sandy CLAY
SP01	0.1	1725512	23/09/2020	Dark brown gravelly, sandy CLAY (Possible made ground - brick) including some rootlets
TP101	0.15	1725517	23/09/2020	Dark brown gravelly, sandy CLAY
TP102	0.25	1725518	23/09/2020	Dark brown gravelly, sandy CLAY
TP103	0.1	1725519	23/09/2020	Dark brown gravelly, sandy CLAY
TP104	0.2	1725520	23/09/2020	Dark brown gravelly, sandy CLAY
TP105	0.15	1725521	23/09/2020	Dark brown sandy CLAY
TP106	0.1	1725522	23/09/2020	Dark brown sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Lab No	1725498	1725499	1725500	1725501	1725502	1725503
Sample ID	SH1/2	SH1/5	SH2/1	SH2/2	SH2/3	SH2/4
Depth	0.30	0.10	0.20	0.25	0.30	0.20
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	07/09/2020	07/09/2020	07/09/2020	07/09/2020	07/09/2020	07/09/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	5.8	16	7.3	8.1	7.2	9.7
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.7	0.2	0.4	0.2	0.2
Chromium	DETSC 2301#	0.15	mg/kg	20	24	16	23	17	20
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	24	38	25	33	25	24
Lead	DETSC 2301#	0.3	mg/kg	39	95	45	59	51	120
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.13	0.07	0.30	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	5.6	22	15	15	16	13
Selenium	DETSC 2301#	0.5	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	81	220	65	96	63	73
Inorganics									
pH	DETSC 2008#		pH	9.6	7.6	9.1	8.6	10.0	9.8
Total Organic Carbon	DETSC 2084#	0.5	%	4.9	4.3	1.1	3.6	1.3	0.6
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	130	39	76	110	110	60
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.18	0.11	0.11	0.15	0.20	0.13
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	1.2	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	4.2	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	20	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	61	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	86	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	86	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Lab No	1725498	1725499	1725500	1725501	1725502	1725503
Sample ID	SH1/2	SH1/5	SH2/1	SH2/2	SH2/3	SH2/4
Depth	0.30	0.10	0.20	0.25	0.30	0.20
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	07/09/2020	07/09/2020	07/09/2020	07/09/2020	07/09/2020	07/09/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	1725498	1725499	1725500	1725501	1725502	1725503
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	2.6	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.3	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.6	0.8	< 0.1	2.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	0.2	0.1	< 0.1	1.3	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	1.9	1.8	0.3	12	0.3	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	1.8	1.7	0.3	12	0.4	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	1.0	0.9	< 0.1	6.7	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	1.0	1.0	< 0.1	6.9	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.9	1.0	< 0.1	6.0	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.6	0.6	< 0.1	3.4	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	1.2	1.1	< 0.1	7.7	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	0.8	0.9	< 0.1	5.2	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	< 0.1	0.9	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	0.7	0.6	< 0.1	5.0	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	11	11	< 1.6	72	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.4	< 0.3	0.4	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Lab No	1725504	1725505	1725506	1725507	1725508	1725509
Sample ID	SH2/5	SH3/1	SH3/2	SH3/3	SH4/1	SH4/2
Depth	0.30	0.15	0.05	0.10	0.20	0.20
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	07/09/2020	07/09/2020	07/09/2020	07/09/2020	08/09/2020	08/09/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%			0.001			
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	5.4	12	11	14	8.1	9.4
Cadmium	DETSC 2301#	0.1	mg/kg	0.1	0.8	0.5	1.4	0.2	0.2
Chromium	DETSC 2301#	0.15	mg/kg	19	22	19	22	21	22
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	17	39	33	77	27	28
Lead	DETSC 2301#	0.3	mg/kg	32	110	120	160	22	28
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.08	0.09	0.11	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	9.6	20	17	34	24	26
Selenium	DETSC 2301#	0.5	mg/kg	0.7	0.7	< 0.5	< 0.5	0.6	< 0.5
Zinc	DETSC 2301#	1	mg/kg	35	250	270	330	76	100
Inorganics									
pH	DETSC 2008#		pH	9.4	8.1	7.5	7.5	9.3	8.1
Total Organic Carbon	DETSC 2084#	0.5	%	0.7	4.7	7.9	8.7	1.4	1.5
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	150	28	18	34	93	63
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.14	0.14	0.06	0.12	0.07	0.07
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	0.01	< 0.01	< 0.01	0.02	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Lab No	1725504	1725505	1725506	1725507	1725508	1725509
Sample ID	SH2/5	SH3/1	SH3/2	SH3/3	SH4/1	SH4/2
Depth	0.30	0.15	0.05	0.10	0.20	0.20
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	07/09/2020	07/09/2020	07/09/2020	07/09/2020	08/09/2020	08/09/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	< 0.1	0.4	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.7	0.2	1.0	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.6	0.2	0.8	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.3	< 0.1	0.5	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	0.3	< 0.1	0.6	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.4	< 0.1	0.5	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	< 0.1	0.3	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.4	< 0.1	0.5	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.3	< 0.1	0.4	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	< 0.1	0.3	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	3.8	< 1.6	5.6	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.3	< 0.3	0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Lab No	1725510	1725511	1725512	1725513	1725514	1725515
Sample ID	SH4/3	NSH01	SP01	STP101	STP103	STP104
Depth	0.20	0.05	0.10	0.20	0.15	0.10
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	08/09/2020	08/09/2020	08/09/2020	07/09/2020	07/09/2020	07/09/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	12	7.5	16			
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.4	0.4			
Chromium	DETSC 2301#	0.15	mg/kg	21	22	47			
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0			
Copper	DETSC 2301#	0.2	mg/kg	40	21	80			
Lead	DETSC 2301#	0.3	mg/kg	65	20	170			
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	0.20			
Nickel	DETSC 2301#	1	mg/kg	21	26	25			
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5			
Zinc	DETSC 2301#	1	mg/kg	140	71	300			
Inorganics									
pH	DETSC 2008#		pH	8.0	7.7	7.1			
Total Organic Carbon	DETSC 2084#	0.5	%	5.2	0.9	17			
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	19	33	26			
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.07	0.04	0.11			
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	0.02				
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	0.08				
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5				
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2				
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5				
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4				
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10				
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	0.01				
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9				
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5				
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6				
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4				
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10				
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10				
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	0.01				
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01				
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01				
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01				
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01				
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1



Summary of Chemical Analysis Soil Samples

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Lab No	1725510	1725511	1725512	1725513	1725514	1725515
Sample ID	SH4/3	NSH01	SP01	STP101	STP103	STP104
Depth	0.20	0.05	0.10	0.20	0.15	0.10
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	08/09/2020	08/09/2020	08/09/2020	07/09/2020	07/09/2020	07/09/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.5
Fluoranthene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	0.5	0.2	0.5	1.5
Pyrene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	0.4	0.5	0.5	2.0
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.9
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	2.0
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.3
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.9
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	2.0
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.3
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.9
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.5
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	15
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3			

Summary of Chemical Analysis

Soil Samples

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Lab No	1725516	1725517	1725518	1725519	1725520	1725521
Sample ID	STP105	TP101	TP102	TP103	TP104	TP105
Depth	0.10	0.15	0.25	0.10	0.20	0.15
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	07/09/2020	07/09/2020	08/09/2020	08/09/2020	08/09/2020	08/09/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg		7.4	12	24	16	12
Cadmium	DETSC 2301#	0.1	mg/kg		0.2	0.2	0.3	0.5	0.3
Chromium	DETSC 2301#	0.15	mg/kg		19	20	15	21	20
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg		25	28	62	34	33
Lead	DETSC 2301#	0.3	mg/kg		15	30	120	160	68
Mercury	DETSC 2325#	0.05	mg/kg		< 0.05	< 0.05	0.08	8.3	0.63
Nickel	DETSC 2301#	1	mg/kg		24	21	29	19	19
Selenium	DETSC 2301#	0.5	mg/kg		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg		66	77	140	180	150
Inorganics									
pH	DETSC 2008#		pH		8.1	8.2	7.6	7.3	7.4
Total Organic Carbon	DETSC 2084#	0.5	%		0.6	1.8	22	4.1	5.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l		21	31	16	14	13
Sulphate as SO4, Total	DETSC 2321#	0.01	%		0.04	0.04	0.06	0.09	0.06
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg						
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg						
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg						
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg						
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg						
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg						
Aliphatic C5-C35	DETSC 3072*	10	mg/kg						
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg						
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg						
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg						
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg						
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg						
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg						
Aromatic C5-C35	DETSC 3072*	10	mg/kg						
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg						
Benzene	DETSC 3321#	0.01	mg/kg						
Ethylbenzene	DETSC 3321#	0.01	mg/kg						
Toluene	DETSC 3321#	0.01	mg/kg						
Xylene	DETSC 3321#	0.01	mg/kg						
MTBE	DETSC 3321	0.01	mg/kg						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Lab No	1725516	1725517	1725518	1725519	1725520	1725521
Sample ID	STP105	TP101	TP102	TP103	TP104	TP105
Depth	0.10	0.15	0.25	0.10	0.20	0.15
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	07/09/2020	07/09/2020	08/09/2020	08/09/2020	08/09/2020	08/09/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	1725516	1725517	1725518	1725519	1725520	1725521
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.5
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	3.3
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	3.0
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.6
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	2.0
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.4
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.9
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.4
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.6
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.8
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	17
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg		< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Lab No	1725522
Sample ID	TP106
Depth	0.10
Other ID	
Sample Type	ES
Sampling Date	08/09/2020
Sampling Time	n/s

Test	Method	LOD	Units	
Asbestos Quantification	DETSC 1102	0.001	%	
Metals				
Arsenic	DETSC 2301#	0.2	mg/kg	12
Cadmium	DETSC 2301#	0.1	mg/kg	0.6
Chromium	DETSC 2301#	0.15	mg/kg	21
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	39
Lead	DETSC 2301#	0.3	mg/kg	120
Mercury	DETSC 2325#	0.05	mg/kg	0.80
Nickel	DETSC 2301#	1	mg/kg	20
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5
Zinc	DETSC 2301#	1	mg/kg	300
Inorganics				
pH	DETSC 2008#		pH	7.5
Total Organic Carbon	DETSC 2084#	0.5	%	3.4
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	14
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.07
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	
Aromatic C5-C35	DETSC 3072*	10	mg/kg	
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	
Benzene	DETSC 3321#	0.01	mg/kg	
Ethylbenzene	DETSC 3321#	0.01	mg/kg	
Toluene	DETSC 3321#	0.01	mg/kg	
Xylene	DETSC 3321#	0.01	mg/kg	
MTBE	DETSC 3321	0.01	mg/kg	
PAHs				
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1

Summary of Chemical Analysis Soil Samples

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Lab No	1725522
Sample ID	TP106
Depth	0.10
Other ID	
Sample Type	ES
Sampling Date	08/09/2020
Sampling Time	n/s

Test	Method	LOD	Units	
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Sample Id SH1/2 0.30

Sample Numbers 1725498 1725523

Date Analysed 23/09/2020

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	4.9	3	5	6
DETSC 2003# Loss On Ignition	%	5.7	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	79.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	11.0	100	n/a	n/a
DETSC 2008# pH	pH Units	9.6	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	1.3	0.01	0.5	2	25
DETSC 2306 Barium as Ba	6.1	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	5.1	0.05	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	4.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.72	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.28	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.29	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.33	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	3.7	0.04	4	50	200
DETSC 2055 Chloride as Cl	1800	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	140	1.4	10	150	500
DETSC 2055 Sulphate as SO4	6500	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	42000	420	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	3800	< 50	500	800	1000

Additional Information	
DETSC 2008 pH	8.1
DETSC 2009 Conductivity uS/cm	59.5
* Temperature*	19.0
Mass of Sample Kg*	0.110
Mass of dry Sample Kg*	0.098
Stage 1	
Volume of Leachant L2*	0.967
Volume of Eluate VE1*	0.911

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Sample Id SH2/3 0.30

Sample Numbers 1725502 1725524

Date Analysed 23/09/2020

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	1.3	3	5	6
DETSC 2003# Loss On Ignition	%	6.8	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	10.0	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	0.81	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	7	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	4.6	0.05	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	2.6	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.52	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	2700	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	140	1.4	10	150	500
DETSC 2055 Sulphate as SO4	3800	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	54000	540	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	2600	< 50	500	800	1000

Additional Information	
DETSC 2008 pH	8.6
DETSC 2009 Conductivity uS/cm	77.2
* Temperature*	19.0
Mass of Sample Kg*	0.110
Mass of dry Sample Kg*	0.094
Stage 1	
Volume of Leachant L2*	0.92
Volume of Eluate VE1*	0.89

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Sample Id SH3/2 0.05

Sample Numbers 1725506 1725525

Date Analysed 29/09/2020

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	7.9
DETSC 2003# Loss On Ignition	%	7.8
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC 2008# pH	pH Units	7.5
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg
	10:1	LS10
DETSC 2306 Arsenic as As	0.94	< 0.01
DETSC 2306 Barium as Ba	2.3	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02
DETSC 2306 Chromium as Cr	0.39	< 0.1
DETSC 2306 Copper as Cu	3.3	0.03
DETSC 2306 Mercury as Hg	< 0.010	< 0.002
DETSC 2306 Molybdenum as Mo	9.4	< 0.1
DETSC 2306 Nickel as Ni	0.58	< 0.1
DETSC 2306 Lead as Pb	1	< 0.05
DETSC 2306 Antimony as Sb	1.2	< 0.05
DETSC 2306 Selenium as Se	< 0.25	< 0.03
DETSC 2306 Zinc as Zn	5.6	0.06
DETSC 2055 Chloride as Cl	1800	< 100
DETSC 2055* Fluoride as F	< 100	< 0.1
DETSC 2055 Sulphate as SO4	2500	< 100
DETSC 2009* Total Dissolved Solids	18000	180
DETSC 2130 Phenol Index	< 100	< 1
DETSC 2085 Dissolved Organic Carbon	2300	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information	
DETSC 2008 pH	8.2
DETSC 2009 Conductivity uS/cm	25.3
* Temperature*	19.0
Mass of Sample Kg*	0.110
Mass of dry Sample Kg*	0.099
Stage 1	
Volume of Leachant L2*	0.977
Volume of Eluate VE1*	0.91

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Sample Id SH4/2 0.20

Sample Numbers 1725509 1725526

Date Analysed 18/09/2020

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	1.5	3	5	6
DETSC 2003# Loss On Ignition	%	6.3	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	8.1	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	0.74	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	9	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	3.9	0.04	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	4.7	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.64	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.24	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	3.4	0.03	4	50	200
DETSC 2055 Chloride as Cl	1700	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	140	1.4	10	150	500
DETSC 2055 Sulphate as SO4	3600	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	58000	580	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	2800	< 50	500	800	1000

Additional Information	
DETSC 2008 pH	7.6
DETSC 2009 Conductivity uS/cm	82.3
* Temperature*	19.0
Mass of Sample Kg*	0.120
Mass of dry Sample Kg*	0.100
Stage 1	
Volume of Leachant L2*	0.979
Volume of Eluate VE1*	0.941

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis Soil Samples

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1725498	SH1/2 0.30	SOIL	NAD	none	Colin Patrick
1725499	SH1/5 0.10	SOIL	NAD	none	Colin Patrick
1725500	SH2/1 0.20	SOIL	NAD	none	Colin Patrick
1725501	SH2/2 0.25	SOIL	NAD	none	Colin Patrick
1725502	SH2/3 0.30	SOIL	NAD	none	Colin Patrick
1725503	SH2/4 0.20	SOIL	NAD	none	Colin Patrick
1725504	SH2/5 0.30	SOIL	NAD	none	Colin Patrick
1725505	SH3/1 0.15	SOIL	NAD	none	Colin Patrick
1725506	SH3/2 0.05	SOIL	Chrysotile	bundle of Chrysotile fibres	Colin Patrick
1725507	SH3/3 0.10	SOIL	NAD	none	Colin Patrick
1725508	SH4/1 0.20	SOIL	NAD	none	Colin Patrick
1725509	SH4/2 0.20	SOIL	NAD	none	Colin Patrick
1725510	SH4/3 0.20	SOIL	NAD	none	Colin Patrick
1725511	NSH01 0.05	SOIL	NAD	none	Colin Patrick
1725512	SP01 0.10	SOIL	NAD	none	Colin Patrick
1725517	TP101 0.15	SOIL	NAD	none	Colin Patrick
1725518	TP102 0.25	SOIL	NAD	none	Colin Patrick
1725519	TP103 0.10	SOIL	NAD	none	Colin Patrick
1725520	TP104 0.20	SOIL	NAD	none	Colin Patrick
1725521	TP105 0.15	SOIL	NAD	none	Colin Patrick
1725522	TP106 0.10	SOIL	NAD	none	Colin Patrick

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Summary of Asbestos Quantification Analysis Soil Samples

Our Ref 20-17549-1

Client Ref C8874

Contract Title Grey Tower Farm, Nunthorpe

Lab No	1725506
Sample ID	SH3/2
Depth	0.05
Other ID	
Sample Type	SOIL
Sampling Date	07/09/2020
Sampling Time	

Test	Method	Units	
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	0.001
Gravimetric Quantification (a)	DETSC 1102	Mass %	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	0.001
Quantification by PCOM (c)	DETSC 1102	Mass %	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na

Breakdown of Gravimetric Analysis (a)

Mass of Sample		g	287.32
ACMs present*		type	
Mass of ACM in sample		g	
% ACM by mass		%	
% asbestos in ACM		%	
% asbestos in sample		%	

Breakdown of Detailed Gravimetric Analysis (b)

% Amphibole bundles in sample		Mass %	na
% Chrysotile bundles in sample		Mass %	0.001

Breakdown of PCOM Analysis (c)

% Amphibole fibres in sample		Mass %	na
% Chrysotile fibres in sample		Mass %	na

Breakdown of Potentially Respirable Fibre Analysis (d)

Amphibole fibres		Fibres/g	na
Chrysotile fibres		Fibres/g	na

* Denotes test or material description outside of UKAS accreditation.
 % asbestos in Asbestos Containing Materials (ACMs) is determined by
 by reference to HSG 264.
 Recommended sample size for quantification is approximately 1kg
 # denotes deviating sample

Information in Support of the Analytical Results

Our Ref 20-17549-1
 Client Ref C8874
 Contract Grey Tower Farm, Nunthorpe

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Hold time exceeded for tests	Inappropriate container for tests
1725498	SH1/2 0.30 SOIL	07/09/20	GJ 250ml x2, PT 1L		
1725499	SH1/5 0.10 SOIL	07/09/20	GJ 250ml x2, PT 1L		
1725500	SH2/1 0.20 SOIL	07/09/20	GJ 250ml, PT 1L		
1725501	SH2/2 0.25 SOIL	07/09/20	GJ 250ml, PT 1L		
1725502	SH2/3 0.30 SOIL	07/09/20	GJ 250ml x2, PT 1L		
1725503	SH2/4 0.20 SOIL	07/09/20	GJ 250ml, PT 1L		
1725504	SH2/5 0.30 SOIL	07/09/20	GJ 250ml, PT 1L		
1725505	SH3/1 0.15 SOIL	07/09/20	GJ 250ml, PT 1L		
1725506	SH3/2 0.05 SOIL	07/09/20	GJ 250ml x2, PT 1L		
1725507	SH3/3 0.10 SOIL	07/09/20	GJ 250ml, PT 1L		
1725508	SH4/1 0.20 SOIL	08/09/20	GJ 250ml, PT 1L		
1725509	SH4/2 0.20 SOIL	08/09/20	GJ 250ml x2, PT 1L		
1725510	SH4/3 0.20 SOIL	08/09/20	GJ 250ml, PT 1L		
1725511	NSH01 0.05 SOIL	08/09/20	GJ 250ml, PT 1L		
1725512	SP01 0.10 SOIL	08/09/20	GJ 250ml, PT 1L		
1725513	STP101 0.20 SOIL	07/09/20	GJ 250ml, PT 1L		
1725514	STP103 0.15 SOIL	07/09/20	GJ 250ml, PT 1L		
1725515	STP104 0.10 SOIL	07/09/20	GJ 250ml, PT 1L		
1725516	STP105 0.10 SOIL	07/09/20	GJ 250ml, PT 1L		
1725517	TP101 0.15 SOIL	07/09/20	GJ 250ml, PT 1L		
1725518	TP102 0.25 SOIL	08/09/20	GJ 250ml, PT 1L		
1725519	TP103 0.10 SOIL	08/09/20	GJ 250ml, PT 1L		
1725520	TP104 0.20 SOIL	08/09/20	GJ 250ml, PT 1L		
1725521	TP105 0.15 SOIL	08/09/20	GJ 250ml, PT 1L		
1725522	TP106 0.10 SOIL	08/09/20	GJ 250ml, PT 1L		
1725523	SH1/2 0.30 LEACHATE	07/09/20	GJ 250ml x2, PT 1L		
1725524	SH2/3 0.30 LEACHATE	07/09/20	GJ 250ml x2, PT 1L		
1725525	SH3/2 0.05 LEACHATE	07/09/20	GJ 250ml x2, PT 1L		
1725526	SH4/2 0.20 LEACHATE	08/09/20	GJ 250ml x2, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO ₄	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO ₄	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



APPENDIX F

SIRIUS GENERIC ASSESSMENT CRITERIA



SIRIUS GENERIC ASSESSMENT CRITERIA

Context

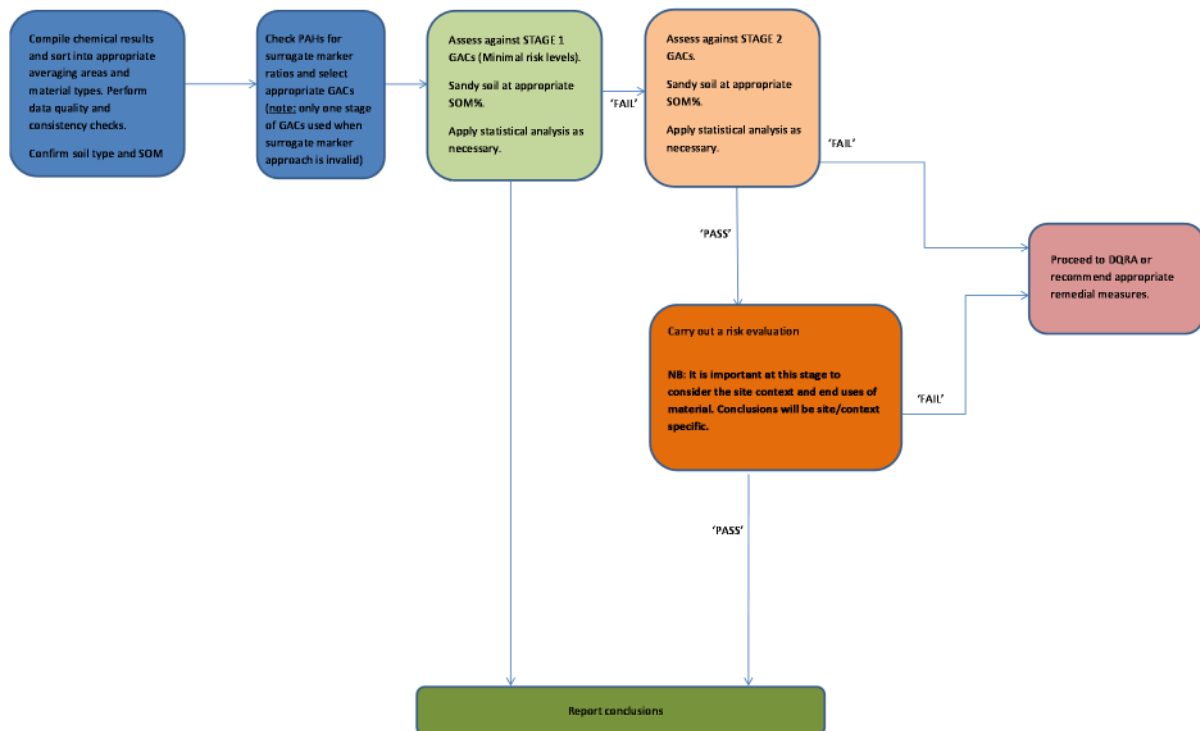
The framework for conducting site investigations, risk assessments and undertaking any necessary remedial works in the UK is provided by Environment Agency report CLR11 “Model Procedures for the Management of Contaminated Land”. This presents a phased approach to risk assessment, involving: identification and qualitative assessment of potential pollutant linkages (source-pathway-receptor relationships) by means of a Conceptual Site Model; Generic Quantitative Risk Assessment (GQRA) of potentially significant pollutant links by comparing contaminant concentrations with appropriate Generic Assessment Criteria (GAC) values; and, if required, a Detailed Quantitative Risk Assessment (DQRA) based on site-specific conditions.

Assessment of Risk to Human Health

Introduction

A staged approach to GQRA has been adopted by Sirius for the evaluation of soil concentration data, as shown schematically in Figure 1.

Figure 1. GQRA Process.





The first stage of GQRA comprises assessment of the data against GAC values derived using toxicological parameter values based on “minimum risk”. Any contaminants exceeding their GACs at this stage are further assessed against Stage 2 GACs, which have been derived using Low Level of Toxicological Concern (LLTC) criteria, where these are available.

With appropriate justification, a contaminant concentration that does not exceed the relevant Stage 2 GAC value may be considered to indicate that the land is “suitable for use”. The appropriate use of LLTC-based criteria within the planning regime is considered reasonable by government agencies, as most recently highlighted in the letter (dated 3rd September 2014) to all local authorities from Lord de Mauley, Parliamentary Under Secretary at DEFRA.

A narrative “risk evaluation” must therefore accompany any Stage 2 assessment to justify the conclusions drawn. Where appropriate, this may provide a basis for eliminating from further consideration those contaminants whose concentrations do not exceed the applicable Stage 2 GAC value.

For the specific case of lead, the Category 4 Screening Level criteria given in CL:AIRE (2014)¹ have been adopted directly as GACs, as these are considered to be based on expert interpretation of current toxicological evidence.

In some areas, background concentrations of lead, other metals and metalloids, and/or individual PAHs may exceed their respective GACs and it may be appropriate to consider relative site and background concentration data as part of a more detailed assessment of the data.

Derivation of GACs

Except where otherwise stated, GACs have been derived by Sirius using CLEA version 1.071.

The GAC values have been derived for a sandy soil type, which will be conservative for the majority of soils (including made ground) encountered on historically contaminated sites. For organic contaminants of concern, criteria have been derived for a number of Soil Organic Matter (SOM) contents.

Genotoxic PAHs are assessed by the “Surrogate Method” using benzo(a)pyrene. Further information on this approach is given below.

Unless specifically stated, chemical properties and Health Criteria Values (HCVs) were obtained from:

- Environment Agency Science Report SC050021 series;
- Nathanail *et al.* (2009) “The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment”, 2nd edition, Land Quality Press, Nottingham;
- CL:AIRE - AGS - EIC (2010) “Soil Generic Assessment Criteria for Human Health Risk Assessment”. CL:AIRE, London.

GACs for arsenic, benzene, benzo(a)pyrene, cadmium and chromium (VI) have been derived using the

¹ CL:AIRE (2014) “Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination”, Report SP1010, rev. 2.



Low Level of Toxicological Concern (LLTC) criteria given in CL:AIRE (2013). These criteria are considered a reasonable basis for assessment as they are still highly precautionary and definitely do not approach an intake level that could be defined as approaching Significant Possibility of Significant Harm to human health in the context of Part 2A of the Environmental Protection Act 1990. It must be further understood that the GACs derived will still incorporate a residual level of conservatism resulting from the exposure parameters used and the assumptions inherent in the model algorithms.

GACs for Genotoxic PAHs

Our approach to the assessment of genotoxic PAHs retains the use of benzo(a)pyrene as a surrogate marker. This approach for genotoxic PAHs is recommended by the HPA (2010)², which we consider to be the authoritative current guidance produced by a UK expert body and note that it was retained in the DEFRA Category 4 Screening Levels project (CL:AIRE, 2014).

The surrogate marker approach allows the assessment of the combined carcinogenic risk associated with all genotoxic PAHs³ present as a mixture within soil, even though detailed toxicological information for many of the individual compounds may be lacking. The approach is based on determining the risk posed by the genotoxic PAH mixture using the concentration of benzo(a)pyrene present as an indicator.

To use the GAC for benzo(a)pyrene as a surrogate marker, a number of requirements must be met (HPA, 2010):

- Benzo(a)pyrene must be present in all soil samples containing genotoxic PAHs for which this method of assessment is being used;
- A similar profile of the genotoxic PAHs relative to benzo(a)pyrene should be present in all of the samples being assessed;
- The PAH profile of PAHs in the soil samples should be similar to that present in the pivotal toxicity study on which toxicological criterion for benzo(a)pyrene was based (Culp et al., 1998⁴). Table 1 provides the basis for defining the acceptable range.

Data indicate that contaminated soils in the UK generally meet these criteria⁵ but the assessor must review their dataset before adopting this approach. If the above criteria are not met, then the surrogate marker approach must not be adopted and individual GAC or SSAC values are to be applied.

² HPA (2010) "Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)", version 5.

³ The genotoxic PAHs included in the USEPA PAH 16 analysis reported by analytical labs are: benz[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[g,h,i]perylene, benzo(a)pyrene, chrysene, dibenz[a,h]anthracene and indeno[1,2,3-c,d]pyrene.

⁴ Culp, S. *et al.* (1998) *Carcinogenesis*, 19, 117-124.

⁵ Bull, S. & Collins, C. (2013) *Environ. Geochem. Health*, 31, 101-109.



Table 1. Profile of Genotoxic PAHs Relative to Benzo(a)pyrene that are Considered Acceptable for Application of Benzo(a)pyrene as a Surrogate Marker.

PAH	Acceptable Ratio of PAH Concentration to Benzo(a)pyrene for Application of Surrogate Marker Assessment	
	Lower Limit	Upper Limit
Benz[a]anthracene	0.12	12.43
Benzo[b]fluoranthene	0.11	10.85
Benzo[k]fluoranthene	0.04	3.72
Benzo[g,h,i]perylene	0.08	8.22
Chrysene	0.12	11.61
Dibenz[a,h]anthracene	0.01	1.38
Indeno[1,2,3-c,d]pyrene	0.07	7.27

For further information see: HPA (2010).

Soil Criteria Set for Purposes Other Than Human Health Protection

The Sirius GACs for sulphate, total organic carbon (TOC) and calorific value are set on basis of risks other than human health and their exceedance does not indicate a potential risk to future site users:

- The GAC for sulphate content is based on potential detrimental effects on buried concrete⁶ and must be assessed with reference to the soil pH;
- The GAC for TOC content is provided for indicative assessment of disposal options if off-site landfill of soil were to be considered. This GAC is set at the 'Inert' waste threshold and should be considered as being applied for information purposes only;
- The GAC for calorific value is set to assist in an initial assessment of the potential fire risk posed by made ground or natural soils containing elevated concentrations of potentially combustible organic matter.

Assessment criteria more stringent than those for human health may be set for specific purposes, for example, elimination of nuisance odours or ensuring that potentially mobile free-phase organic products are not present.

Controlled Waters

The Environment Agency's "Remedial Targets Methodology" (2006) provides a framework for assessing the potential for pollution of controlled waters and for deriving remedial target concentrations in soil and groundwater.

There are no generic groundwater or surface water quality standards that are applicable to all sites. Drinking Water Standards and Environmental Quality Standards (EQS) are used by Sirius as assessment criteria where they are appropriate to the contaminant linkages under consideration. Given that these standards apply at the receptor point, this is a conservative approach for samples collected at a source or along a transport pathway.

⁶ BRE (2005) "Concrete in Aggressive Ground", Special Digest No. 1; 3rd Edition.



Soil Leachability

Sirius specifies that the analytical laboratory undertakes leachate preparation by BS EN 12475-2:2002. Where specific circumstances require a different method to be used, then this will be explained and justified within the report body text.

The results of leachate analysis are compared to the relevant GAC values for controlled waters.



The Sirius Group Stage 1 Generic Assessment Criteria for Soils

Revision:

24 January 2020

Parameter	Residential (mg/kg, unless otherwise stated)						Commercial / Industrial (mg/kg, unless otherwise stated)			Note
	With Homegrown Produce			Without Homegrown Produce			1% SOM	2.5% SOM	5% SOM	
	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM				
Metals/Metalloids										
Arsenic (inorganic)	37			40			630			[1]
Cadmium	11			85			190			[2]
Chromium (III)	910			4000			8600			
Chromium (VI)	6.0			6.1			33			[3]
Copper	200			7100			68000			[4]
Lead	200			310			2300			[5]
Mercury (inorganic)	40			56			1100			[6]
Nickel	130			180			980			[7]
Selenium	250			430			12000			
Vanadium	410			1200			9000			
Zinc	450			40000			750000			[4]
Other Inorganics										
pH	<5 or >9			<5 or >9			<5 or >9			
Total Sulphate	2400			2400			2400			[8]
Water-Soluble Sulphate	0.5 g/l			0.5 g/l			0.5 g/l			[8]
Free Cyanide	34			34			1400			[9]
Organics										
PAHs										
Acenaphthene	200	490	920	2000	3600	4900	75000	92000	100000	
Acenaphthylene	170	400	760	2000	3600	4900	76000	93000	100000	
Anthracene	2300	5300	9400	30000	34000	36000	520000	540000	540000	[10]
Benzo(a)anthracene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Benzo(a)pyrene	2.1	2.1	2.2	2.3	2.3	2.3	27	27	27	[11]
Benzo(b)fluoranthene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Benzo(k)fluoranthene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Benzo(g,h,i)perylene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Chrysene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Dibenzo(a,h)anthracene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Fluoranthene	280	560	820	1500	1600	1600	23000	23000	23000	
Fluorene	170	390	730	2200	3400	4000	60000	67000	70000	
Indeno(1,2,3-c,d)pyrene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Naphthalene	1.0	2.3	4.6	1.0	2.4	4.7	110	260	510	
Phenanthrene	95	220	380	1300	1400	1500	22000	22000	23000	
Pyrene	620	1200	1900	3700	3800	3800	54000	54000	54000	
BTEX and related										
Benzene	0.063	0.13	0.24	0.16	0.30	0.38	15	28	49	
Toluene	100	240	460	370	830	1100	33000	68000	110000	
Ethylbenzene	26	62	120	34	81	110	3200	7400	14000	
Xylenes (total)	28	67	130	33	78	110	3200	7700	15000	[12]
1,2,4-trimethylbenzene	0.22	0.53	1.1	0.24	0.58	1.2	39	93	170	
Iso-propylbenzene	6.6	16	32	6.8	17	33	1300	3100	6100	
Propylbenzene	21	51	100	23	57	110	3800	9100	17000	
Styrene	6.9	16	32	21	49	93	3100	6100	9500	
TPH										
Aliphatic EC 5-6	24	41	68	24	41	68	2400	4100	6900	
Aliphatic EC >6-8	53	110	210	53	110	210	5300	11000	21000	
Aliphatic EC >8-10	13	31	61	13	31	61	1300	3100	6000	
Aliphatic EC >10-12	62	150	300	62	150	300	6100	15000	28000	
Aliphatic EC >12-16	510	1200	2300	510	1200	2300	43000	72000	85000	
Aliphatic EC >16-35	41000	70000	90000	42000	70000	90000	>1E6	>1E6	>1E6	[13]
Aromatic EC >5-7	53	110	200	150	300	538	15000	28000	48000	
Aromatic EC >7-8	100	240	460	370	820	1500	33000	68000	110000	
Aromatic EC >8-10	20	48	94	22	54	100	2200	5200	9800	
Aromatic EC >10-12	63	150	290	120	290	560	11000	22000	30000	
Aromatic EC >12-16	140	320	570	1100	1900	2200	35000	37000	37000	
Aromatic EC >16-21	260	540	840	1800	1900	1900	28000	28000	28000	
Aromatic EC >21-35	1100	1500	1700	1900	1900	1900	28000	28000	28000	

Parameter	Residential (mg/kg, unless otherwise stated)						Commercial / Industrial (mg/kg, unless otherwise stated)			Note
	With Homegrown Produce			Without Homegrown Produce			1% SOM	2.5% SOM	5% SOM	
	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM				
Chlorinated Organics										
Chlorobenzene	0.19	0.44	0.86	0.19	0.45	0.87	31	71	140	
Dichloromethane (DCM)	0.47	0.78	1.2	1.2	1.7	2.4	250	340	470	
1,1-dichloroethane (DCA)	1.4	2.4	4.0	1.4	2.4	4.1	260	420	690	
1,2-dichloroethane (DCA)	0.0031	0.0048	0.0076	0.0035	0.0053	0.0084	0.34	0.51	0.81	
1,1-dichloroethene (DCE)	0.15	0.26	0.45	0.15	0.26	0.46	24	43	74	
cis-1,2-dichloroethene (DCE)	0.066	0.12	0.20	0.069	0.12	0.21	14	23	38	
trans-1,2-dichloroethene (DCE)	0.11	0.21	0.38	0.12	0.22	0.39	21	37	65	
Pentachlorophenol	0.21	0.52	1.0	27	30	31	400	400	400	
1,1,1,2-tetrachloroethane	0.56	1.3	2.6	0.63	1.5	2.9	59	140	270	
1,1,2,2-tetrachloroethane	0.98	2.1	4.0	1.6	3.4	6.3	150	310	570	
Tetrachloroethene (PCE)	0.074	0.17	0.32	0.07	0.17	0.33	10	23	45	
Tetrachloromethane (CT)	0.011	0.024	0.046	0.011	0.024	0.046	1.6	3.6	6.9	
1,1,1-trichloroethane (TCA)	3.7	7.8	15	3.8	7.9	15	370	770	1400	
1,1,2-trichloroethane (TCA)	0.39	0.85	1.6	0.51	1.1	2.0	89	180	320	
Trichloroethene (TCE)	0.0070	0.015	0.028	0.0071	0.015	0.028	1.5	2.8	44	
Trichloromethane (CF)	0.43	0.80	1.4	0.48	0.89	53	98	170	300	
Vinyl Chloride	0.00034	0.00045	0.00062	0.00037	0.00048	0.00066	0.038	0.049	0.068	
Miscellaneous Organics										
Carbon disulphide	0.066	0.13	0.25	0.066	0.13	0.25	6.7	14	25	
Di-(2-ethylhexyl)-phthalate	290	660	1100	3900	4000	4100	85000	85000	8600	
MTBE	31	55	94	39	68	120	7400	12000	19000	
Phenol	110	190	330	420	440	440		440		[14]
Methylphenols (cresols), total	78	170	330	5600	8200	9900	160000	170000	18000	[15]
2,4-dimethylphenol (m-xylene)	18	43	82	200	430	720	15000	23000	28000	
Other Parameters										
TOC	3% w/w			3% w/w			3% w/w			[16]
Calorific Value	2 MJ/kg			2 MJ/kg			2 MJ/kg			[17]
Asbestos	Fibres present			Fibres present			Fibres present			

All concentration-based criteria are rounded to 2 significant figures.

The criteria assume a sandy soil type, which will be conservative for the great majority of soils (including made ground) encountered on historically contaminated sites.

Except where otherwise stated, criteria have been derived by Sirius using CLEA version 1.06. Parameters for the land use cases are consistent with those given in Environment Agency (2009) "Updated Technical Background to the CLEA Model", report SC050021/SR3 but updated (where relevant) for respiration rate, exposure frequency for dermal contact outdoors, soil adherence factors for children, and plant uptake concentration factors given in CL:AIRE (2014) and Nathanail et al., (2015). No correction has been made for the "Top Two" crop types in the Residential with Homegrown Produce land use and the criteria will therefore be conservative in this regard.

Health Criteria Values (HCVs) and (except where specifically noted) chemical property data were obtained from:

- Environment Agency Science Report SC050021 Series;
- Nathanail et al. (2015);
- CL:AIRE-AGS-EIC (2010).

Footnotes

[1] Based on oral GAC as this is the lower GAC and reflects a cancer risk many orders of magnitude greater than for inhalation.

[2] Determined for lifetime exposure. Plant uptake concentration factors applied were as given in CL:AIRE (2014). The GAC values are based on data for soils having a pH value in the range 6-8; caution should be applied in applying them at pH values outside this range, especially at pH values <5.

[3] Both oral and inhalation HCVs are based on local toxicological effects and therefore the lowest (oral) GAC value is adopted.

[4] For the Residential with Homegrown Produce land use, the GAC values for Cu and Zn are based on potential phytotoxic effects and have been set at the maximum allowable concentrations for sewage sludge-amended soils presented in the "Sludge (Use in Agriculture) Regulations" (SI 1263/1989); these criteria may also be applied in any land use where plants are to be grown. The equivalent GAC values for human health protection in the Residential with Homegrown Produce land use are around an order of magnitude greater.

[5] The Category 4 Screening Levels for lead defined in CL:AIRE (2013) have been adopted directly to provide an acceptable basis for initial assessment of data. Where background concentrations of lead exceed the GAC value, then site-specific evaluation will be required.

[6] The SGV for mercury is based on inorganic mercury which represents the most common form encountered within the environment. This is considered appropriate for most sites as: "...the SGV for inorganic mercury can normally be compared with chemical analysis for total mercury content because the equilibrium concentrations of elemental and methylmercury compounds are likely to be very low" (Environment Agency report SC050021/Mercury SGV). Analysis and specific assessment for elemental or methylated forms of mercury will need to be considered if historical land use or site-specific factors indicate that these forms of mercury are likely to be present.

[7] Toxicological effects by inhalation are localised, therefore the lower of the GAC values for oral and inhalation HCVs have been adopted.

[8] BRE (2005). Sulphate is not considered to pose a potential risk to human health under normal circumstances – this GAC applies to construction cases only and is set at the upper limit for DS-1 Design Sulphate Class concrete.

[9] GAC calculated for acute risk. Further information can be provided upon request.

[10] The genotoxic PAHs (benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene) are routinely assessed using benzo(a)pyrene as a surrogate (HPA (2010) "Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)", version 5). Separate information on this approach is provided.

[11] Calculated using a 'minimum risk' oral index dose derived from the application of a 10,000x safety factor to the BMD10 presented in CL:AIRE (2014) for benzo(a)pyrene as a surrogate marker and the inhalation index dose specified in CL:ARE (2014) and Nathanail et al. (2015). As a conservative measure, the GAC is based on combined exposure pathways to account for systemic carcinogenic effects. Further information on the derivation can be provided upon request.

[12] For screening purposes, a single GAC has been set for total xylene. This is the lowest of the values calculated for the three individual xylene isomers.

[13] "No GAC" indicates that no value has been specified for this land use as the TDSI cannot be exceeded at achievable soil concentrations.

[14] 440mg/kg is the minimum concentration that is protective for direct skin contact with phenol (See Environment Agency SR050021/Phenol SGV) and is adopted where GACs for chronic exposure are higher.

[15] For screening purposes, a single GAC has been set for total methylphenol. This is the lowest of the values calculated for the three individual methylphenol isomers.

[16] The Hazardous Waste (England and Wales) Regulations 2005. TOC content in itself does not represent a potential risk to human health. This GAC is provided for indicative assessment of disposal options, in the case that off-site landfill of soil is undertaken. This GAC is specified at the 'Inert' waste threshold and should be considered as for information purposes only.

[17] ICRC (1986) Guidance Note 61/84, 2nd Edition, Notes on the Fire Hazards of Contaminated Land. Calorific value is not an indication of direct human health risk but may be useful in assessment of the potential fire risk posed by made ground or natural soils containing elevated concentrations of potentially combustible organic matter.

Sirius Geotechnical Ltd.

Russel House
Mill Road
Langley Moor
Durham
DH7 8HJ
t. 0191 378 9972
f. 0191 378 1537

4245 Park Approach
Century Way
Thorpe Park
Leeds
LS15 8GB
t. 0113 264 9960
f. 0113 264 9962