

R. CARR GEOTECHNICAL SERVICES

Ref: 4081/23

**THE RAVENS, RHODODENDRON AVENUE,
CULVERSTONE, KENT DA13 0TT.**

PHASE I GEO ENVIRONMENTAL DESK STUDY AND PRELIMINARY RISK ASSESSMENT



October 2023

R. Carr Geotechnical Services, 9 The Mallows, Maidstone, Kent ME14 2PX

Tel: 07974 758617 Email: RONCARR200@aol.com

Contents

	Page
1. Introduction	1
2. Topography	1
3. Geology	1
4. Hydrology and Hydrogeology	2
5. Site History	2
6. Environmental Information Search	3
7. Site Inspection	4
8. Conceptual Site Model	5
9. Preliminary Risk Assessment	6
10. Discussion/Recommendations	8

Fig 1 Plan of Proposed Development

Plates 1- 8

Appendix A Site History

Appendix B Environmental Information Search

The Ravens, Rhododendron Avenue, Culverstone, Kent DA13 0TT.

1. Introduction

- 1.1 This report has been prepared on behalf of Amanda Thompson, prospective developer of the site known as The Ravens, Rhododendron Avenue, Culverstone.
- 1.2 The proposed development comprises the construction of a chalet bungalow to replace an existing stable block (Fig 1).
- 1.3 The purpose of this report is to identify and quantify contaminative and environment related issues which could affect the development, site workers and future users of the site.
- 1.4 This report provides a review of the history of the site and its surrounding area together with an environmental risk check and preliminary risk assessment in general compliance with the following guidelines:
 - Land Contamination Risk Management (LCRM) Environment Agency (2020)
 - National Planning Policy Framework (NPPF) (2021)

2. Topography

- 2.1 The site is located within a dry valley to the west of Rhododendron Avenue (OS Land Ranger map reference TQ 640 634). Ground level on the east side of the site is of a relatively level contour but rises steeply towards its west boundary.

3. Geology

- 3.1 Reference to the local Geological Survey sheet (no. 271: Dartford) has indicated that the site is located upon the Lewes Chalk member of the White Chalk subgroup (formerly referred to as the Upper Chalk).
- 3.3 The Lewes Chalk consists of soft, white, friable limestone that is 95% calcium

carbonate and contains hard nodular beds. The upper surface of the Chalk is often deeply convoluted and may contain solution pipes filled with more recent deposits.

4. Hydrology and Hydrogeology

- 4.1 No surface water features have been identified within 500m of the site.
- 4.2 The Chalk is the Principal Aquifer of the area with high groundwater vulnerability. A Principal Aquifer is defined by the Environment Agency as a “highly permeable formation with known or possible presence of significant fracturing”. These tend to be highly productive and capable of supporting public supply and other abstractions.

5. Site History

- 5.1 A search has been undertaken of historical Ordnance Survey Maps provided by the Kent County Archives and Promap websites. The following maps have been examined for the presence of on and off-site contamination, extracts of which are contained in Appendix A:
- 5.2 OS map scale 1:2500 1871-1890:
 - On site:* The site is undeveloped, comprising open agricultural land. A deciduous hedgerow encroaches onto the southeast section of the site.
 - Off site:* The area surrounding the site comprises mainly open agricultural land, with scattered deciduous hedgerows. Extensive woodland referred to as Scrubs Wood is in evidence within 50m to the southeast. A very small quarry is denoted in Scrubs Wood, within 200m to the southeast.
- 5.3 OS map scale 1:2500 1897--1902:
 - On site:* The hedgerow has been cleared from the southeast section of the site.
 - Off Site:* A footpath now passes along the east side of the site. The former quarry to the southeast is now overgrown with trees.
- 5.4 OS map scale 1:2500 1907-1923:
 - On site:* No significant change.

Off site: No significant change.

5.5 OS map scale 1:2500 1929-1952:

On Site: No significant change.

Off Site: The north end of the adjacent footpath has been diverted to the east, linking with Ridge Lane which has been developed to the east. A detached dwelling known as Little Beechfield has been constructed within 100m to the northwest.

5.6 OS map scale 1:10000 1961:

On site: No significant change.

Off site: No significant change.

5.7 OS map scale 1:10000 1978:

On site: The site boundaries are now denoted, though the site remains undeveloped.

Off site: Rhododendron Avenue has now been developed, discontinuous detached dwellings having been constructed on its east and west sides. Additional residential development has also occurred within the surrounding area, encroaching within 200m to the east of the site.

5.8 It is understood that the site was acquired by the current owner during the 1970's and has been since been used for equestrian purposes since.

6. **Environmental Information Search**

6.1 A search of environmental information has been carried out for the site by Landmark Information Group, who provide a database of environmental data. A summary of relevant information is provided as follows, full details of which are contained in Appendix C:

6.2 **Historical Land Use**

No potentially contaminative land use has been identified within 250m of the site.

6.3 **Waste/Landfill Sites**

None identified within 250m of the site.

6.4 **Authorised Industrial Processes**

None identified within 250m of the site.

6.5 **Contemporary Trade Directory Entries**

Scrap Metal Merchants (Inactive)	151mNW
Garage Services (Active)	140mNW
Car Breakers & Dismantlers (Inactive)	196mNE
Commercial Cleaning Services (Inactive)	241mE

6.6 **Flooding**

A risk of flooding has not been identified to the site.

6.7 **Radon**

Radon Potential	Intermediate Probability
Radon Protection Measures	None required

6.8 **Environmental Constraints**

Ancient Woodland	48m
Ancient Woodland	177m

7. **Site Inspection**

7.1 An inspection of the site was undertaken on 5th October 2023 in clear, sunny weather conditions.

7.2 The site was situated within a semi-rural area on the west side of an unsurfaced track known as Rhododendron Avenue. Residential properties were present in the surrounding area to the north, south and west of the site.

7.3 Access into the site was gained from its southeast corner via a pair of padlocked steel gates.

- 7.4 The site comprised a disused paddock and exercise area for horses, its west section consisting of an area of sloping land overgrown with stinging nettles and other weeds (Plate 1).
- 7.5 The site's eastern section consisted of relatively level ground with patches of overgrown grass and exposed soil. A mound of sand and soil derived from an excavated manege was present in its central area (Plate 2 and Plate 3).
- 7.6 A rectangular stable block of timber construction under a tiled roof was present in the southwest corner of the site (Plate 4), a granular track leading from the site entrance up to the building. The stable was underlain by a concrete slab which protruded beyond the front of the structure to form a small patio. An empty rabbit hutch was present on the patio, together with items of rubbish and a section of plastic pipe (Plate 5).
- 7.7 The stable was divided into three compartments, two of which contained stored recreational equipment and domestic furniture (Plate 6 and Plate 7) whereas the third section of the building was in use as a store for hand tools and aluminium ladders (Plate 8).
- 7.8 The site was enclosed by panelled timber fences of approximately 1.5m to 2m in height. Discontinuous hedgerows containing deciduous trees which included mature Ash, Hawthorn and Maple were present along the site's north and west boundaries, a small area of Sycamore woodland being located to the south. Residential properties occupied adjacent land to the north and west of the site.
- 7.9 No visual or olfactory evidence of significant contamination was observed on or around the site during the course of the inspection.

8. Conceptual Site Model

- 8.1 Based upon the available information the site would appear to have comprised undeveloped land until it was purchased by the current owner in the 1970's and has since been used solely for equestrian purposes. The site is underlain by a Principal

Aquifer. A potential risk of flooding has not been identified to the site or its surrounding area. No potential sources of contamination have been identified on the site, therefore the site is considered to pose a low risk to receptors including human health, groundwater and plant life.

- 8.2 No historic potentially contaminative activities or installations have been identified within 250m of the site. Four relatively recent, commercial activities including a scrapyard, car breaker and garage have been identified between 140m and 241m to the northwest, northeast and east of the site, only the garage being currently active. All these enterprises are topographically remote from the site and are therefore unlikely to present a significant risk. A low risk has therefore been identified from off-site sources of potential contamination.
- 8.3 No areas of landfill or infilled ground have been identified within 250m of the site. The topography of the site does not indicate the presence of excessive quantities of made ground beneath the site surface and no radon protection measures are necessary within the proposed development. The risk to the site from both on and off-site emissions of ground gas is therefore considered to be low.

9. Preliminary Risk Assessment

- 9.1 A preliminary risk assessment has been defined utilising the available information. The risk from possible sources of contamination to receptors including the public, workers, future users and environment has been analysed using the Source – Pathway – Receptor model approach. The main receptors considered in the following assessment are:

- Future users
- Occupants of surrounding buildings and livestock
- Groundwater and associated abstractions
- Site workers
- Building fabric
- Plants

Source	Hazard	Receptor	Pathway	Severity of impact	Risk	Action required to clarify and define mitigation, if necessary
Organic contaminants as a result of contaminative activities and possibly present in made ground e.g. TPH, PAH	Toxic and carcinogenic	Future Users	Inhalation, ingestion and skin contact	Serious	Low	No contaminative activities identified on site. Presence of significant made ground not indicated by site topography.
		Adjoining site occupiers	Ditto	Moderate	Low	Minimise dust, avoid spillages.
		Site workers	Ditto	Serious	Low	Provision of appropriate protective clothing and equipment.
		Groundwater Drains & surface water	Leaching, permeable strata, drainage	Serious	Low	No evidence of contaminative activities on site. Appropriate precautions with storage of any contractor's fuel and lubricants during development.
Inorganic contaminants associated with contaminative activities and made ground e.g. arsenic, lead, etc.	Attack on plastic or rubber	Building Services and Fabric	Leaching and diffusion	Serious	Low	No evidence of potentially contaminative activities on site. Consult local water authority if in doubt over suitability of materials.
		Future users	Inhalation, ingestion and skin contact	Serious	Low	No evidence of contaminative activities or significant made ground on site.
		Local residents	Ditto	Moderate	Low	Minimise dust where possible
		Site Workers	Ditto	Moderate	Low	Provision of protective clothing/equipment. Minimise dust.
Phytotoxic metals e.g. copper, zinc.	Phytotoxic	Groundwater	Leaching, permeable strata, groundwater	Serious	Low	No evidence of contaminative activities on site.
		Plants	Uptake	Serious	Low	No evidence of contaminative activities or significant made ground on site. Existing vegetation of healthy appearance.
		Groundwater	Leaching, permeable strata, groundwater	Serious	Low	No evidence of contaminative activities on site.
		Future Users	Air inhalation	Serious	Low	Removal and disposal by experienced contractor if discovered on site.
Asbestos	Carcinogenic and Respiratory Irritant	Adjoining site occupiers	Ditto		Low	
		Site workers				
		Future Users	Service ducts	Serious	Low	No areas of biodegradable landfill or infilled ground identified within 250m of site. Radon protection measures not necessary.
		Adjoining site occupiers	Air inhalation			
Ground gases e.g. methane, carbon dioxide, radon.	Asphyxiant, explosive	Site workers				

10. Discussion/Recommendations

10.1 Part IIA of the Environment Protection Act 1990 defines contaminated land as: “any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that:-

- a) significant harm is being caused or there is a significant possibility of such harm being caused, or;
- b) pollution of controlled waters is being, or is likely to be, caused

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

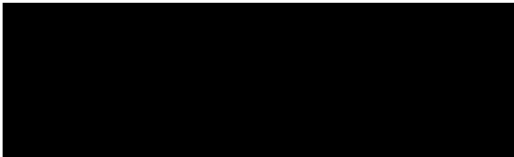
10.2 There are two steps in applying the definition of contaminated land:

- 1) Identification of a “contaminant”, a “pathway” (or pathways) and a “receptor” with respect to the land in question.
- 2) Identification of a pollutant linkage and that the pollutant linkage:
 - a) is resulting in significant harm being caused to the receptor in the pollutant linkage.
 - b) presents a significant possibility of significant harm being caused to that receptor.
 - c) Is resulting in the pollution of controlled waters
 - d) Is likely to result in such pollution.

10.3 Under the Groundwater Regulations Act 1998, it is an offence to allow List I substances to enter groundwater. It is also an offence to allow List II substances to enter groundwater without prior consultation with the local authority.

10.4 Based on the information currently available, there is no evidence to suggest that the site has been impacted by either on or off-site contaminative activities. No significant pollutant linkages have been identified, therefore a Category 4 classification as proposed by DEFRA publication SP1010 (March 2014) is considered applicable to the site (i.e. level of risk posed acceptably low).

- 10.5 Further action is therefore considered unnecessary, other than a general clear-up of the site to include the removal of excavated soil and subsequent demolition materials to appropriately licensed waste facilities.
- 10.6 Every precaution should be taken during the course of the development in order to prevent the escape and subsequent migration of pollutants into the underlying Principal Aquifer. Any fuel and/or lubricants utilised by contractors' plant during the course of the development should be stored in a secure, preferably bunded area of the site.
- 10.7 In the event that contamination not detected by the Desk Study is encountered on the site during the course of the development, the nature of the contamination should be adequately assessed and dealt with in an appropriate manner. Evidence of contamination may include discoloured or malodorous soil and the presence of ash, clinker or asbestos. In the event that contamination is identified, works should cease and an appropriate remediation strategy implemented.
- 10.8 Any asbestos- containing material discovered upon the site should be removed by an experienced contractor to a licensed depository.
- 10.9 If any topsoil is imported onto the site for use in garden areas within the development the material should be tested in order to ensure that it is free from contamination and suitable for its proposed use.
- 10.10 This report should be made available to the Contaminated Land Officer of the Local Planning Authority for due consideration prior to the commencement of the development.



October 2023



Plate 1

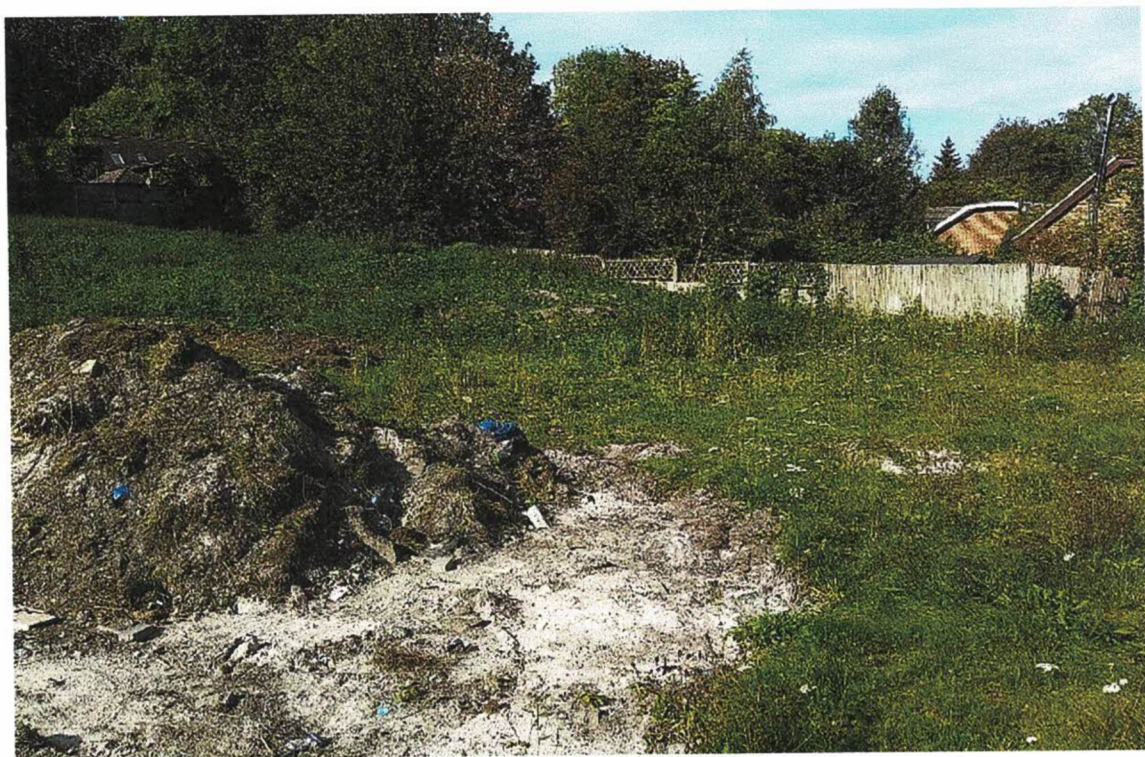


Plate 2



Plate 3



Plate 4



Plate 5



Plate 6



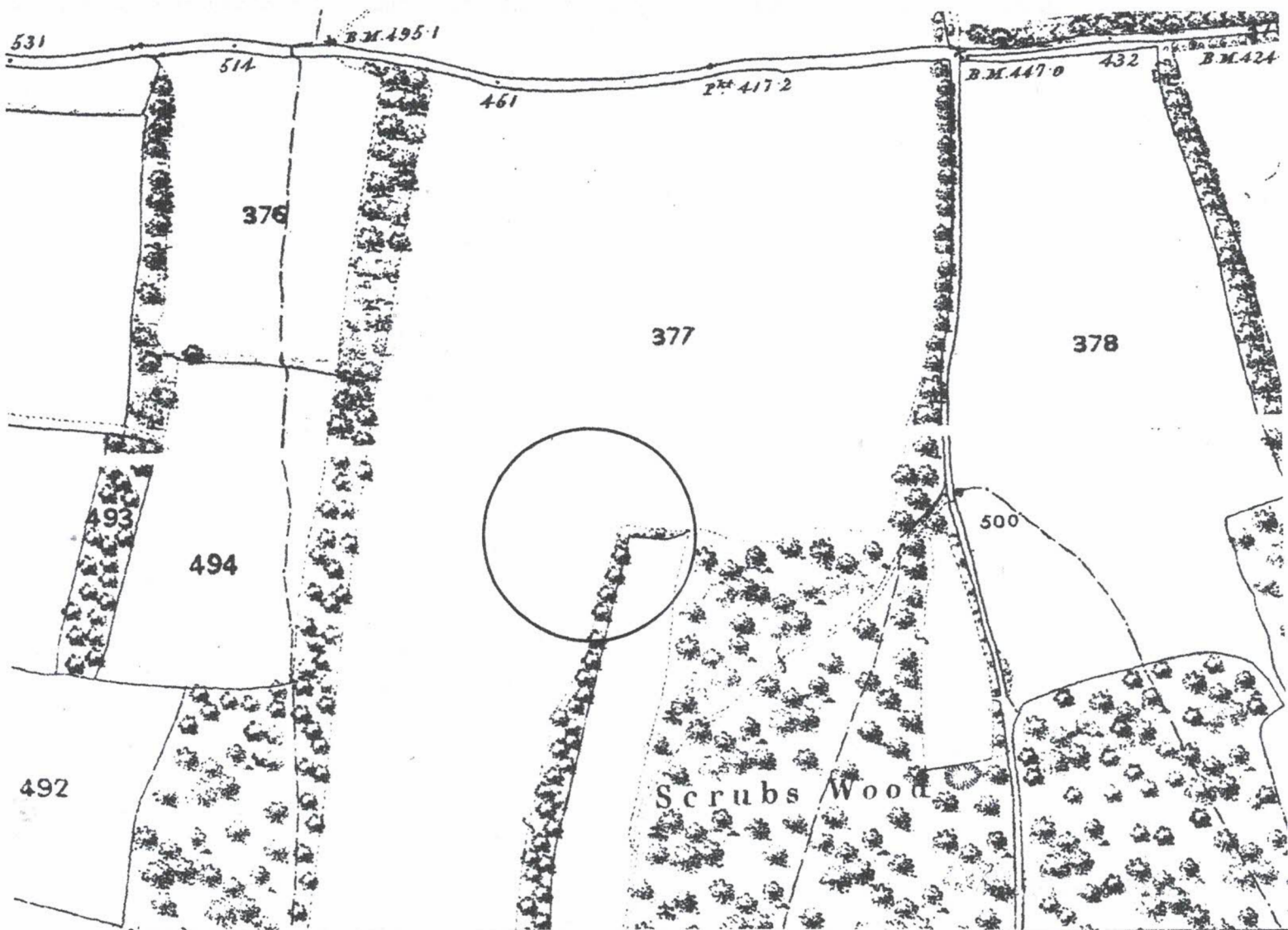
Plate 7



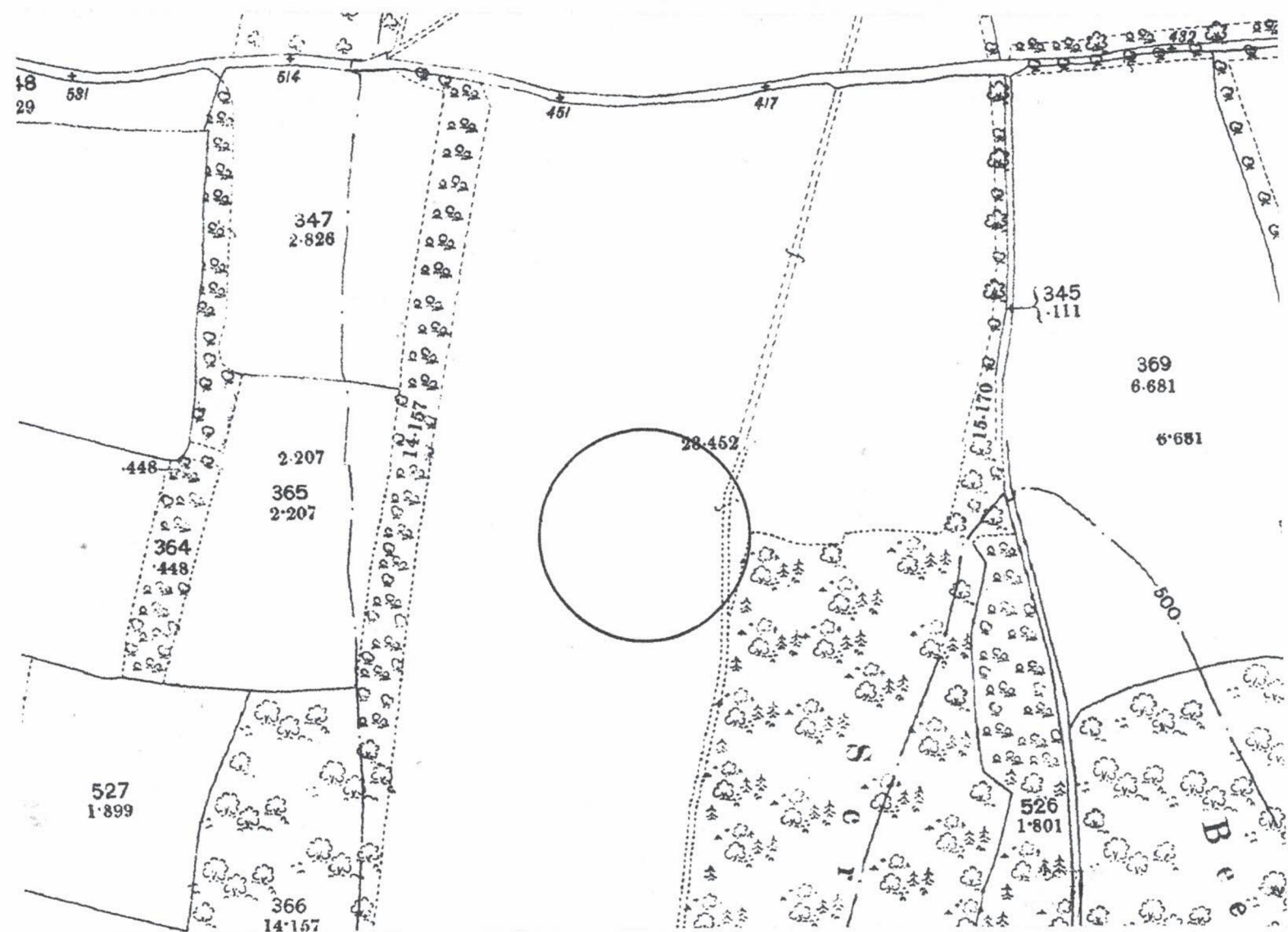
Plate 8

Appendix A

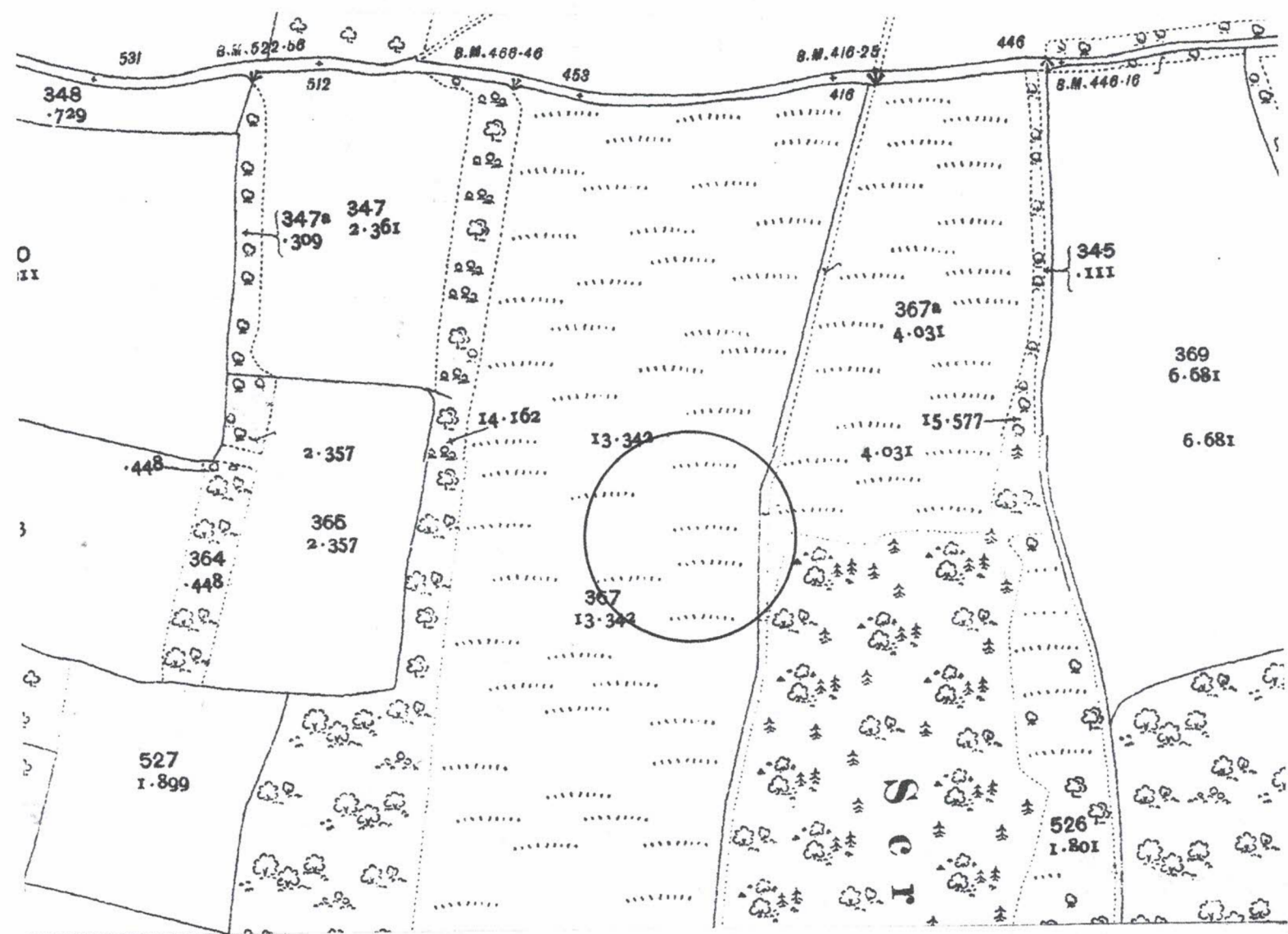
Site History



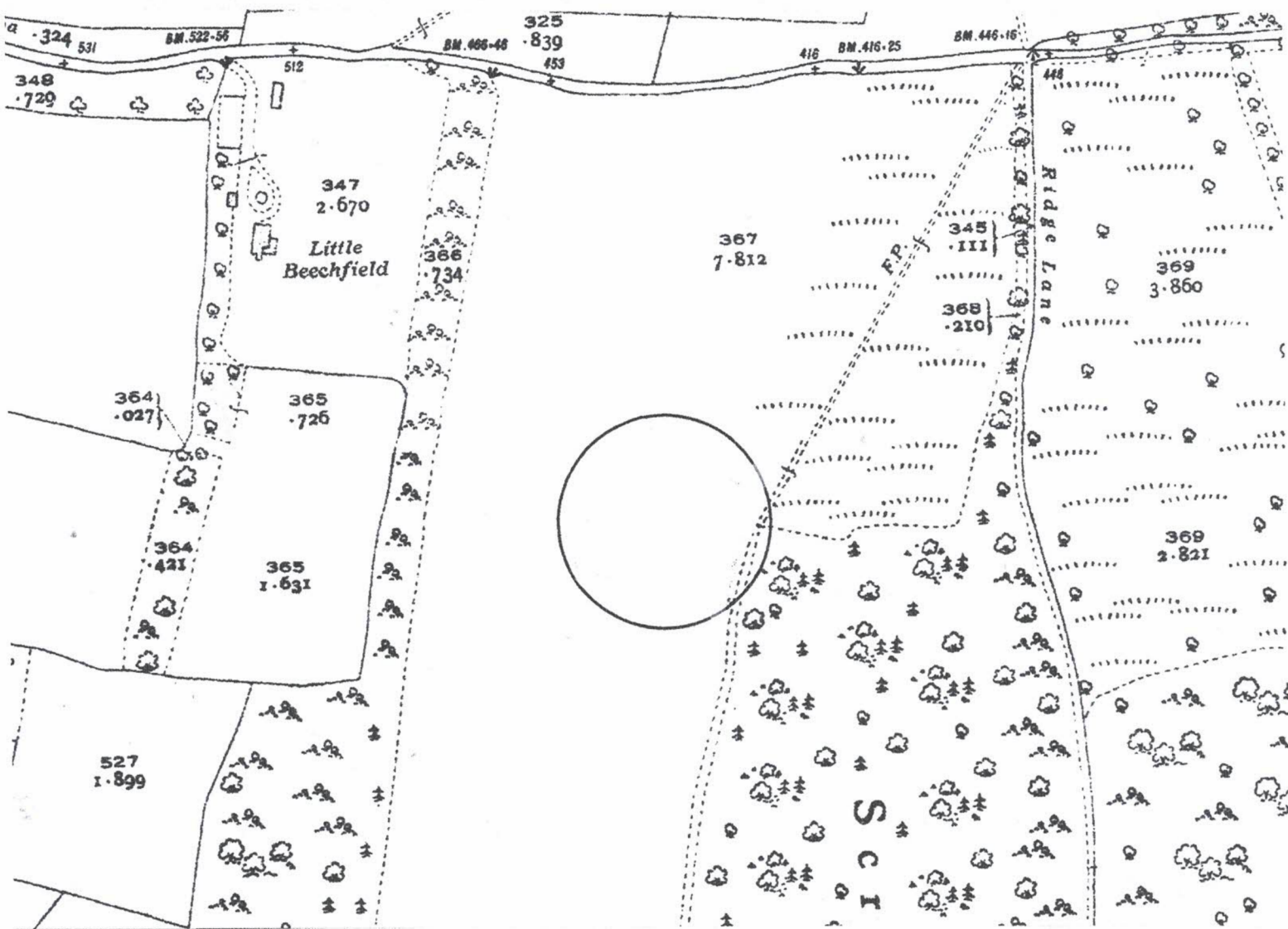
The Ravens, Rhododendron Avenue, Culverstone.
OS map scale 1:2500: 1871-1890.



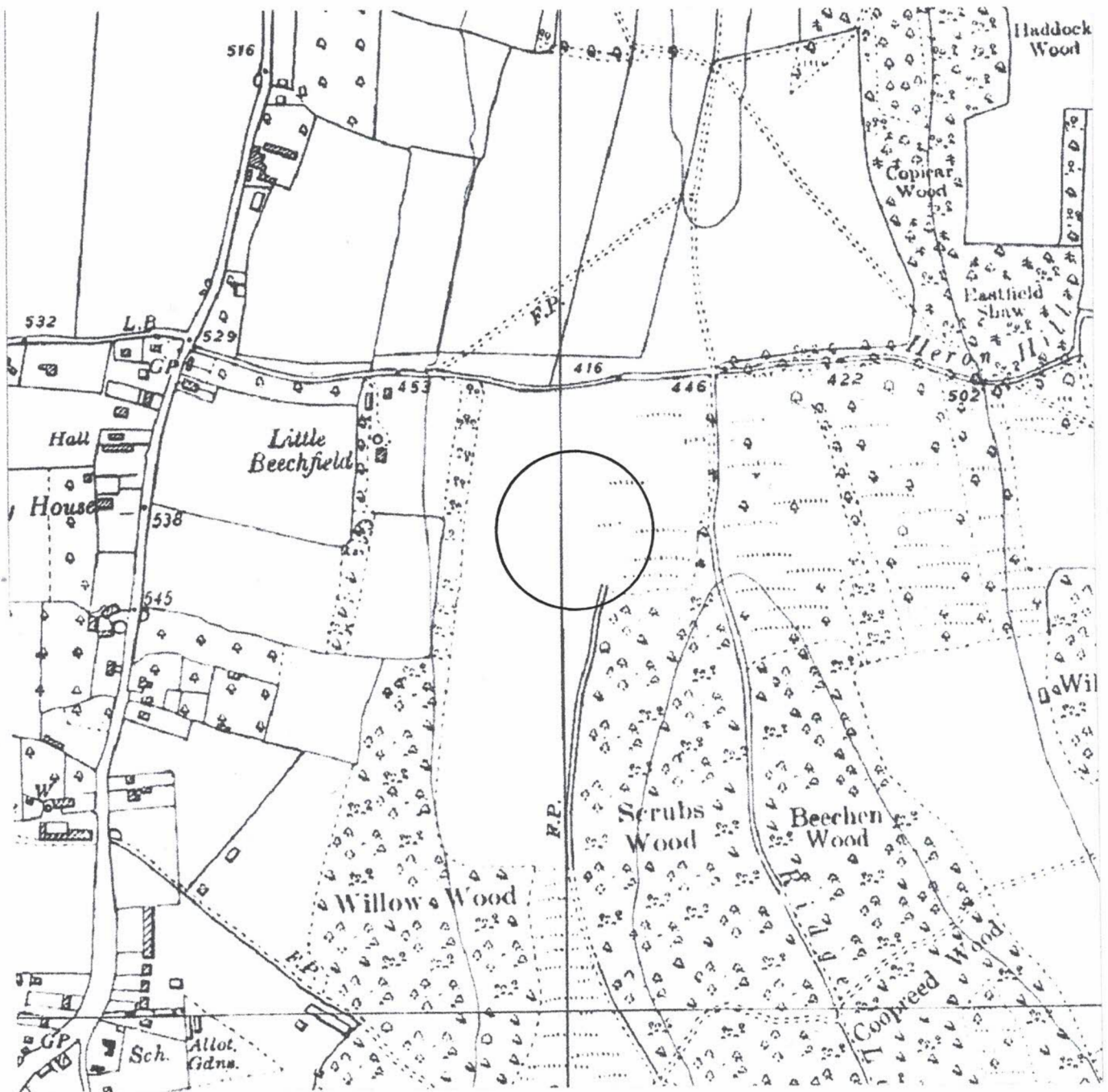
**The Ravens, Rhododendron Avenue, Culverstone.
OS map scale 1:2500: 1897-1900.**



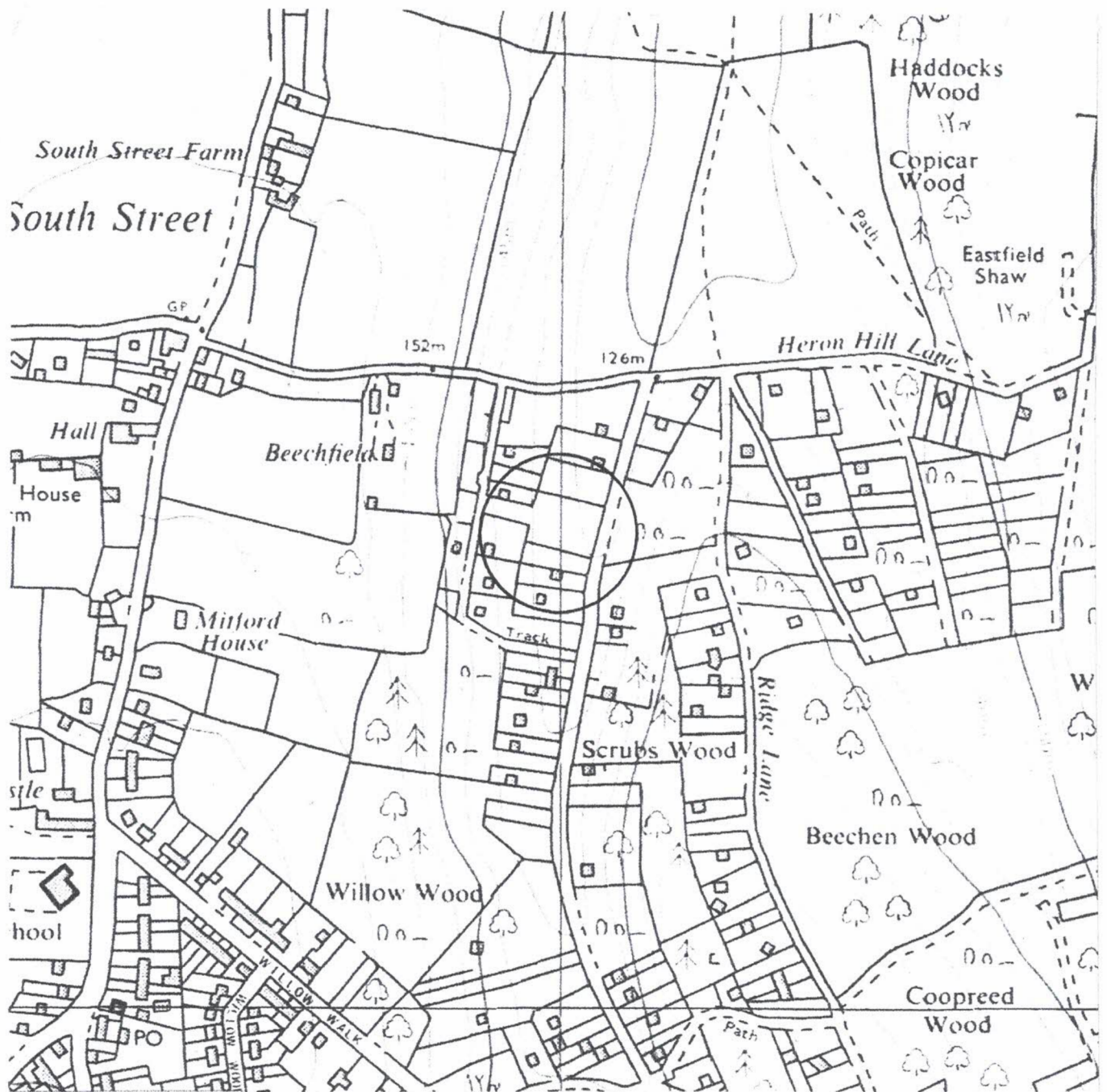
The Ravens, Rhododendron Avenue, Culverstone.
OS map scale 1:2500: 1907-1923.



The Ravens, Rhododendron Avenue, Culverstone.
OS map scale 1:2500: 1929-1952.



**The Ravens, Rhododendron Avenue, Culverstone.
OS map scale 1:10000: 1961.**



**The Ravens, Rhododendron Avenue, Culverstone.
OS map scale 1:10000: 1978.**