



# **Contaminated Land Inspection Report**

**Former Landfill Site  
Gap Farm  
Grimston Road  
King's Lynn  
PE30 3PE**

**July 2020**

**Reference no. 022229**

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## **Executive Summary**

The Borough Council of King's Lynn and West Norfolk (BCKLWN) has a statutory duty to inspect its district for potentially contaminated land under Part 2A of the Environmental Protection Act 1990 (Part 2A). The Borough Council's Part 2A inspection strategy identified the former Gap Farm (the site) as being of high priority due to the presence of a former landfill and potentially sensitive receptors.

Given the former site usage, an assessment of the site has been undertaken to assess the potential for harm to human health, property, ground/surface water and designated environmental receptors under Part 2A.

To gather information of the site's history a desk study and preliminary risk assessment were carried out by the Environmental Quality Team. This included a review of site investigation and remediation reports by environmental consultants employed when the site was developed for housing. From the evidence gathered during the desk study of the site history and a site walkover, the following can be stated: The site was historically a farm, clay pit and landfill. The pit was filled with waste and closed in the 1960's. The site's present use is housing and amenity areas. The site was landscaped during development. The public open space has been adopted by the borough council.

At the time of the housing development there was not a formal paid mechanism for recording discharge of conditions for the public record. Therefore, much of the information relating to the contaminated land investigation remains on the borough council's archive files. The information was retrieved for this report.

The site has been subject to a number of previous investigations before and during development for housing. The planning consent included conditions requiring a scheme for investigation of contamination and ground gas investigation and any necessary remediation. A desk study, site investigation and risk assessment were carried out by the developer's consultants and a remediation scheme agreed with the borough council and Environment Agency. Following remediation works the regulators 'signed off' the scheme regarding risks to controlled water and human health. As a result of the remediation, much of the source material was removed and no new pathways were introduced for exposure to contaminants.

From the contaminated land risk assessment, plausible source pathway receptor linkages were identified. A VERY LOW risk was assessed from contamination to human health, property, to the wider environment and surface water and groundwater.

There was no evidence of harm or of a significant possibility of significant harm to the receptors identified in the conceptual site model. As the risk posed is very low, the site would be classified as Category 4 as set out in the Statutory Guidance. Therefore, the site is not considered to be contaminated land under Part 2A of the Environmental Protection Act 1990.

## 1 Introduction

This report details a review of information and risk summary about land at Grimston Road, Kings Lynn and provides a conclusion on the risk to human health, property, groundwater and the wider environment.

The Contaminated Land Statutory Guidance (DEFRA, 2012) suggests that where the authority has ceased its inspection and assessment of land as there is little or no evidence to suggest that it is contaminated land the authority should issue a written statement to that effect. This report is the written statement.

## 2 Desk Study Information

### *Location*

The site is situated off Grimston Road approximately 3km to the north east of King's Lynn. The location is shown in Appendix B. The grid reference for the centre of the site is 564856 322466. The nearest postcode is PE30 3PE.

### *Previous investigation*

The site has been subject to a number of investigations both before and during development for housing. Table 1 below lists the reports and correspondence used in compiling this written statement.

<b>Table 1 Documents used in this report</b>			
Reference	Date	Author	Title
DMT/VG/45478	October 1992	May Gurney	Letter Report of Methane Spike Survey
96/2/WN/0236	January 1997	Environment Agency	Planning consultation (2/96/1489) response
E787	November 1995	Ken Rush Associates	Soil Investigation
11540	February 1997	Associated Laboratory Services Ltd	Letter Report – Summary of work to date
	February 2003	RSA	Proposed procedure for remediation works
EN8503DS	August 2003	Harrison Environmental Consulting (EC)	Desk Study (schematic section on page 7 – include in appendix)
EN9184/003/RA	March 2005	Harrison EC	Remediation Method Statement
EN9184	June 2005	Harrison EC	Site Investigation Report
05-0095	July 2005	Rolton Group	Report on Geotechnical and Geoenvironmental Investigation

EN9184/VAL	August 2006	Harrison EC	Validation Report for Zone A
EN9184HOTSPOT VAL	November 2006	Harrison EC	Validation Report of Zones B & C
	27 November 2006	John Keenlyside, Environment Agency	Email report of gas protection site visit
GN9184/Zone B&C Hotspots	29 November 2006	Harrison EC	Letter to Taylor Woodrow Developments Limited re hotspot remediation zones B & C (+ plan)
05-0095-XF001	9 March 2007	Rolton Group	Fax re plots 126, 134, 141 validation
	13 March & 16 April 2008	Rolton Group	Plot validation 69 & 78-81 emails
	25 April 2008	Rolton Group	Plot validation 82-86 email
	29 April 2008	Rolton Group	Plot validation 71-77 email
	29 April 2008	Rolton Group	Plot validation 87-89 email
06-0045	April 2008	Rolton Group	Addendum Report on Landfill Investigation, 27 Grimston Rd
	16 July 2008	Rolton Group	Plot validation 90-93
	21 July 2008	Rolton Group	Plot validation 87-89
	6 August 2008	Rolton Group	Plot validation 90-93
	8 Sept 2008	Rolton Group	Plot validation 94-95
	10 November 2008	Rolton Group	Plot validation 96-99
	14 November 2008	Rolton Group	Plot validation 100-102
	April 2009	Rolton Group	Method Statement for Phase 2 remediation works, 27 Grimston Rd
	2 October 2009		Officer notes on site visit
	December 2009	Rolton Group	Remediation Closure Report

### ***Previous Site Use***

The site was historically Gap Farm and consisted of a farmyard, farm buildings and associated field & paddock and a landfilled clay pit.

### ***Present Site Usage***

The site's present use is housing, open space and a children's play area. The plan below (figure 1) shows the site which is now fully developed into a residential area and surrounded by housing. Photographs of the site are in appendix A.



***Figure 1: aerial photograph: site shown outlined in red, approximate extent of the former landfill shaded***

### ***Ownership***

The clay pit was leased by the South Wootton Parish Council to Freebridge Lynn Rural District Council for use as a refuse tip until the 1960s. The site was returned to the parish council when filling ceased and then was sold in 2002 to the developer. Individual home-owners now own the housing plots. The play area and public open space has been adopted by the borough council. This report will be made available to the site owners.

### ***Environmental Setting***

#### ***Geology***

Soils are described as sandy, naturally wet, very acid, sandy and loamy soils, usually associated with low natural fertility. The geological map indicates that bedrock geology is Leziate Member Sand sedimentary bedrock formed in the Cretaceous Period. Superficial geology is Lowestoft Formation Diamicton which can be a mixture of glacial clay, sand, gravel, and boulders.

The site is at approximately 15 metres above ordnance datum (m AOD). Previous investigations have shown the geological strata encountered to vary across the site, with superficial deposits absent in some locations as set out in table 2 below.

**Table 2: Geological strata encountered (from Ken Rush Associates report)**

Strata	Thickness range (m)	Average thickness (m)	Range of depth to top of stratum (m)
Topsoil	0.1 - 0.2	0.2	0
Boulder clay (diamicton)	2.1 - 10	6.0	0.2 - 0.9
Leziate member (sand)	4.7 - 4.9	4.8	0.1 - 2.3

### **Hydrogeology**

The bedrock geology, Leziate Member Sand sedimentary Bedrock is designated as a principal aquifer of high vulnerability. The superficial geology, Lowestoft Formation is designated a secondary aquifer. There are no known licensed water abstractions within 1km of the site.

### **Hydrology**

The nearest major water features are ponds over 300m from the site.

### **Local Authority Pollution Prevention and Control Regulations**

One process exists within 500m. Asda petrol filling station. There are no reported leaks or spills.

### **DEFRA MAGIC website records**

MAGIC website does not indicate that the site is an area designated as a SSSI, nature reserve or other land designation.

### **Historic Maps**

#### **E-map Explorer**

Tithe map circa 1840 – the site is shown as a series of fields and land in the south west is denoted as a clay pit. Roads corresponding to the current location of Grimston Rd and Castle Rising Road are shown to the south and west respectively. One building is shown directly to the north of the centre of the site. Ordnance Survey 1st Ed. 1879-1886 – Much of the south of the site is now shown to be a large pond in the location of the former clay pit and extending further the west.

#### **Historic Maps on file at the Borough Council of King's Lynn and West Norfolk**

Historic maps are presented in Appendix B and summarised below.

1843 – 1893: (Drawing 1) The nearby area within 200m contains some small semi-rural development including cottages, a farm, inn, smithy and saw pit. The outline of the pit is shown, and the pond area is denoted as marshland.

1891 – 1912: The site and surrounding area are shown with little change from the earlier map edition. The pit area is shown as a series of ponds and some pit sides still marked.

1904 – 1939: The north of the site is shown as marshy grassland with a number of presumed farm buildings. The pit is depicted similarly to the earlier map edition. Additional houses are shown adjacent to the site to the east and west along Grimston Rd.



1919 – 1943: Not available.

1945 – 1970: (Drawing 2) The surrounding area to the north, west and south has been developed for housing. The farm buildings to the north have increased and are labelled 'Gap Farm'. A track leads from Gap Farm to the north east of the site to land labelled caravan site. The southwestern part of the site is denoted as 'refuse tip' and the south western pit area is denoted as 'pond' scrub and marshy grassland.

1970 – 1996: Not available

### **Aerial Photographs**

Aerial photographs are presented in Appendix B and summarised below.

1945 – 1946 MOD Aerial Photograph - the buildings of Gap Farm can be seen in the north of the site. Houses with gardens are shown to the east, south and west. The outline of the pit can be seen, and this also contains ponds and scrubland. The remainder of the site appears to be grassland.

1999 Aerial photograph (Drawing 3) –The site is similar to the earlier aerial photograph. Some of the trees around the pit have matured, the grassland adjacent to the west of the pits shows some yellowing. The site is surrounded by housing.

2006-2007 Aerial photograph (Drawing 4) –Much of the western side of the site has been developed for housing with open space in the centre of the site and an area in the west. The remainder of the site has development underway and building foundations, roads and the site compound can be seen.

2018 – The site is fully developed into housing and three areas of open space. A House to the east of the site has been demolished to extend the estate.

### **Planning History and remediation scheme**

There are 7 applications for redevelopment of the site which were permitted:

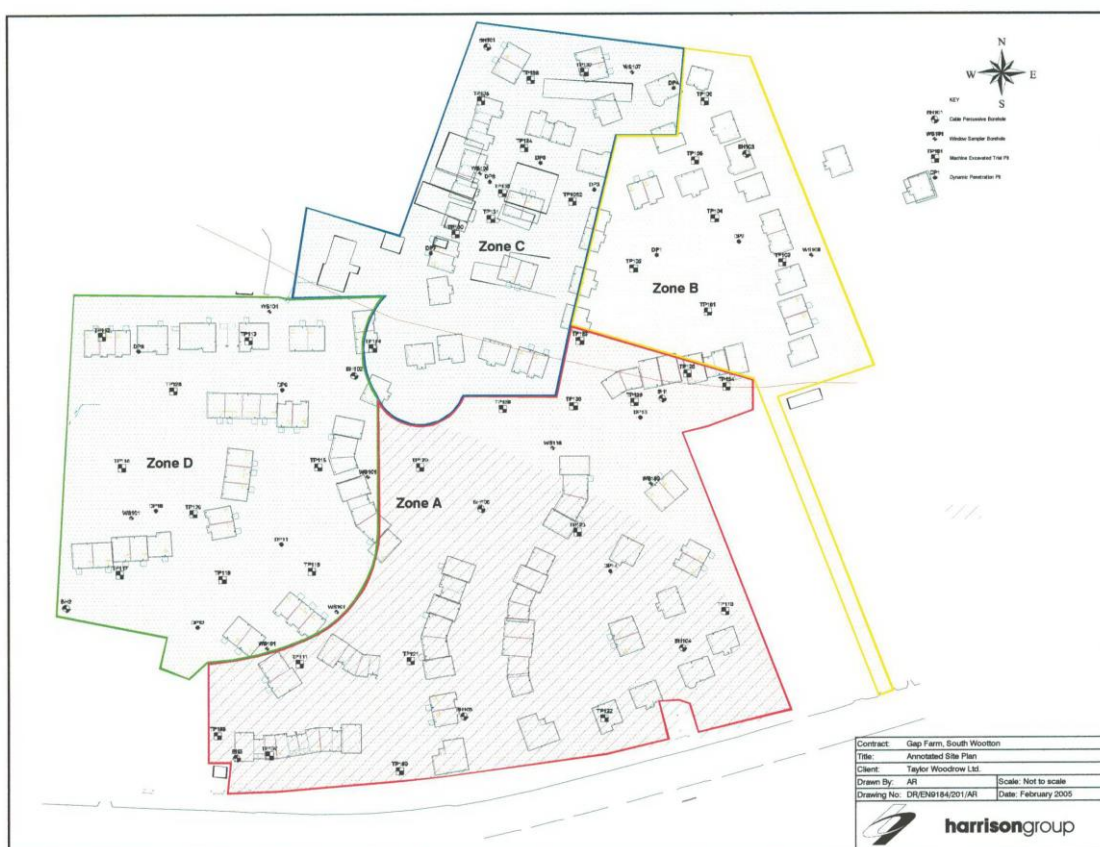
Year	Application ref	Description
2002	2/02/2201/F	Construction of 149 dwellings together with associated roads drainage open space and landscaping
2006	06/02373/FM	Demolition of existing house and construction of 16 dwellings including associated infrastructure
2008	08/02799/FM	Construction of 12 dwellings including associated infrastructure, Land at 27 Grimston Rd
2009	09/01514/F	Single garage, 10 Ancar Road
2014	14/01447/F	Extension & alterations, 4 Deas Road
2016	16/00674/F	Extension to the rear of the property, 29 Deas Rd
2018	18/00354/F	Extension to dwelling, 2 Barley Close
2020	20/00359/F	Single storey rear extension and internal alterations, 23 Deas Road

The main development took place under the 2002 planning consent. The planning consent included conditions requiring a scheme for investigation and remediation of contamination and ground gas investigation and any necessary remediation. A Desk Study, Site Investigation and risk assessment were carried out by Harrison Environmental Consulting (Harrison EC).

The site was divided by Harrison EC into 4 zones based on past use as shown in Figure 2 below. As well as documentary research, Harrison EC carried out

intrusive investigation, laboratory analysis of selected samples and sampling for hazardous ground gas. Based on the investigation and risk assessment the risk assessment and remediation scheme were as follows:

- Zone A (landfill): Due to the physical and chemical nature of the fill and potential to generate hazardous ground gas it was decided to excavate and remove the waste material and re-instate with clean soil.
- Zone B (grassland/marsh grass): No major remediation required except potential hotspot removal.
- Zone C (farm): No major remediation required except potential hotspot removal.
- Zone D (field): No remediation required.



**Figure 2: Site zones and exploratory hole locations (from Harrison EC report, June 2005)**

*Zone A – former landfill*

*Zone B – rough grassland, marshgrass and access road*

*Zone C – Farm yard and buildings*

*Zone D – Open field*

The remediation scheme was implemented, and the verification reports were reviewed by both the Environment Agency and BCKLWN Environmental Quality Team. Several meetings and site visits also took place to check the work carried out. Some of the landfill material remains at the boundary of the site where excavation may have undermined trees, the road or other structures. However, barrier materials were installed to restrict mobilisation of contaminants in shallow groundwater.

The 2006 consent was for adjacent land at 27 Grimston Rd to the east of the original site and involved demolition of the original residential property to extend the 2002 development site. It was discovered that the landfill material extended under a part of this site and needed to be removed. Therefore, the planning consent included conditions requiring a site investigation and risk assessment, remediation scheme and verification report. The original house was demolished in 2007 and the development design was altered in 2008 by a subsequent application. The same contaminated land conditions applied to the 2008 consent. The approved remediation scheme was carried out and reported in a remediation closure report. The final plot validation was carried out in 2010.

The regulators 'signed off' the scheme regarding risks to controlled water and human health. As a result of the remediation works, much of the source material was removed and no new pathways were introduced for exposure to contaminants.

Subsequent planning applications have been for alterations to the 2002/2008 development. No specific action regarding contamination has been required for these planning consents.

At the time of the main development there was not a formal paid mechanism for recording discharge of conditions for the public record. Therefore, much of the information relating to the contaminated land investigation remains on the borough council's un-indexed archive files but was retrieved for this report.

### **3 Site Walkover**

The site is now fully developed for housing and public open space. A site walkover was carried out in 2014 as part of the borough council's strategic contaminated land inspections. Photographs are presented in Appendix A. A walkover in July 2020 has shown no significant change to the site and no visible signs of residual contamination or vegetative stress were noted.

### ***Location of Receptors***

#### *Humans*

There are houses on the site together with recreational open space. So, the land is used by residents (children and adults) living on the site and also visiting the open spaces for recreation and exercise.

#### *Property*

There are houses on the site, a play area adopted by the borough council, an electricity substation and a sewage pumping station.

#### *Environment*

There are no relevant types of receptor as set out in Table 1 of the statutory guidance within 1km of the site.

#### *Controlled Water - Groundwater & Surface water*

There are no watercourses within 300m of the site. The site is underlain by a principal aquifer.

## **4 Contaminated Land Risk Assessment**

The Council has used a process adapted from CIRIA C552 (Contaminated Land Risk Assessment, a guide to good practice) to produce the conceptual site model and estimate the risks to defined receptors. This involves the consideration of the probability, nature and extent of exposure and the severity and extent of the effects of the contamination hazard should exposure occur. Further explanation is provided in Appendix C.

The validation reports submitted as part of the planning consents confirm that sources of contamination were removed from the site and suitable fill materials put in place. The depth and chemical quality of imported garden and other soft-landscaping soils were verified.

### ***Assessment of probability of a contamination event***

From the information gathered it is considered that following the remediation work carried out, it is unlikely that sources of contamination will be present.

#### ***Human health, property***

There are people and property on site but as the sources of contamination have been removed the probability of a contamination event affecting human health or property is considered UNLIKELY.

#### ***Controlled water – Groundwater and surface water***

Groundwater is present at shallow levels and the site is underlain by a principal aquifer. However, as the source of contamination have been removed the probability of a contamination event to groundwater and surface water is assessed as UNLIKELY.

#### ***Environment***

In considering environmental receptors, the statutory guidance states that the authority should only regard certain receptors (described in Table 1 of the Statutory Guidance) as being relevant for the purposes of Part 2A. Harm to an ecological system outside that description should not be considered to be significant harm. The site and surrounding area do not contain any of the receptors stipulated in Table 1 of the Statutory Guidance.

### ***Assessment of Hazard***

#### ***Human health, property, controlled water***

Validation sampling of site soils has shown that contaminants of concern were below the relevant assessment criteria. Therefore, the hazard to human health, property, and controlled water is assessed as LOW

### ***Conceptual site model***

The conceptual site model (Table 3) shows the sources, pathways and receptors identified and the subsequent risk classification.

Table 3: Conceptual site model

Source	Pathway	Receptor	Probability	Hazard	Risk
Contaminant source materials removed during remediation	Direct contact, ingestion, dust inhalation, plant uptake and consumption of garden produce	Humans (adults and children)	Unlikely	Low	Very low risk
	Direct contact	Property (buildings)	Unlikely	Low	Very low risk
	Direct contact	Environment*	Unlikely	Low	Very low risk
	Direct contact	Controlled water (surface and groundwater)	Unlikely	Low	Very low risk

Moderate/Low risk - It is possible that harm could arise to a designated receptor from an identified hazard. However, if any harm were to occur it is more likely that harm would be relatively mild.

Low risk - It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.

Very low risk - There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is unlikely to be severe.

\*Ecological systems as set out in Table 1 of the contaminated land statutory guidance

## **5 Outcome of Preliminary Risk Assessment**

### ***Conclusion***

No plausible source pathway receptor linkages were identified and a VERY LOW risk from contamination to human health, VERY LOW risk to property, VERY LOW risk to the wider environment and VERY LOW risk was identified to surface water and groundwater.

There was no evidence of harm or of a significant possibility of significant harm to the receptors identified in the conceptual site model. As the risk posed is very low, the site would be classified as Category 4 as set out in the Statutory Guidance (Appendix D contains the categorisations from the Statutory Guidance).

No evidence was noted of significant pollution of controlled waters or of the significant possibility of such pollution.

### ***Part 2A status***

Statutory Guidance states that 'If the authority considers there is little reason to consider that the land might pose an unacceptable risk, inspection activities should stop at that point.' In such cases the authority should issue a written statement to that effect. This report forms that written statement.

On the basis of its assessment, the authority has concluded that the land does not meet the definition of contaminated land under Part 2A and is not considered contaminated land.

### ***Further Action***

This assessment is based on the site's current use and is valid providing no changes are made to the soil or vegetation cover material, to surface water conditions or to the site's use.

No further assessment of the site is considered necessary under Part 2A unless additional information is discovered.

## Appendices



## Appendix A: Site Photographs



Figure 3: Location of photographs



Photograph 1: Anglian Water pumping compound





Photograph 2: Central open space



Photograph 3: Central open space



Photograph 4: Central children's play area



Photograph 5: Deas Rd looking south to Grimston Rd



Photograph 6: Electricity substation



Photograph 7: Housing fronting Grimston Rd



Photograph 8: View west along Grimston Rd



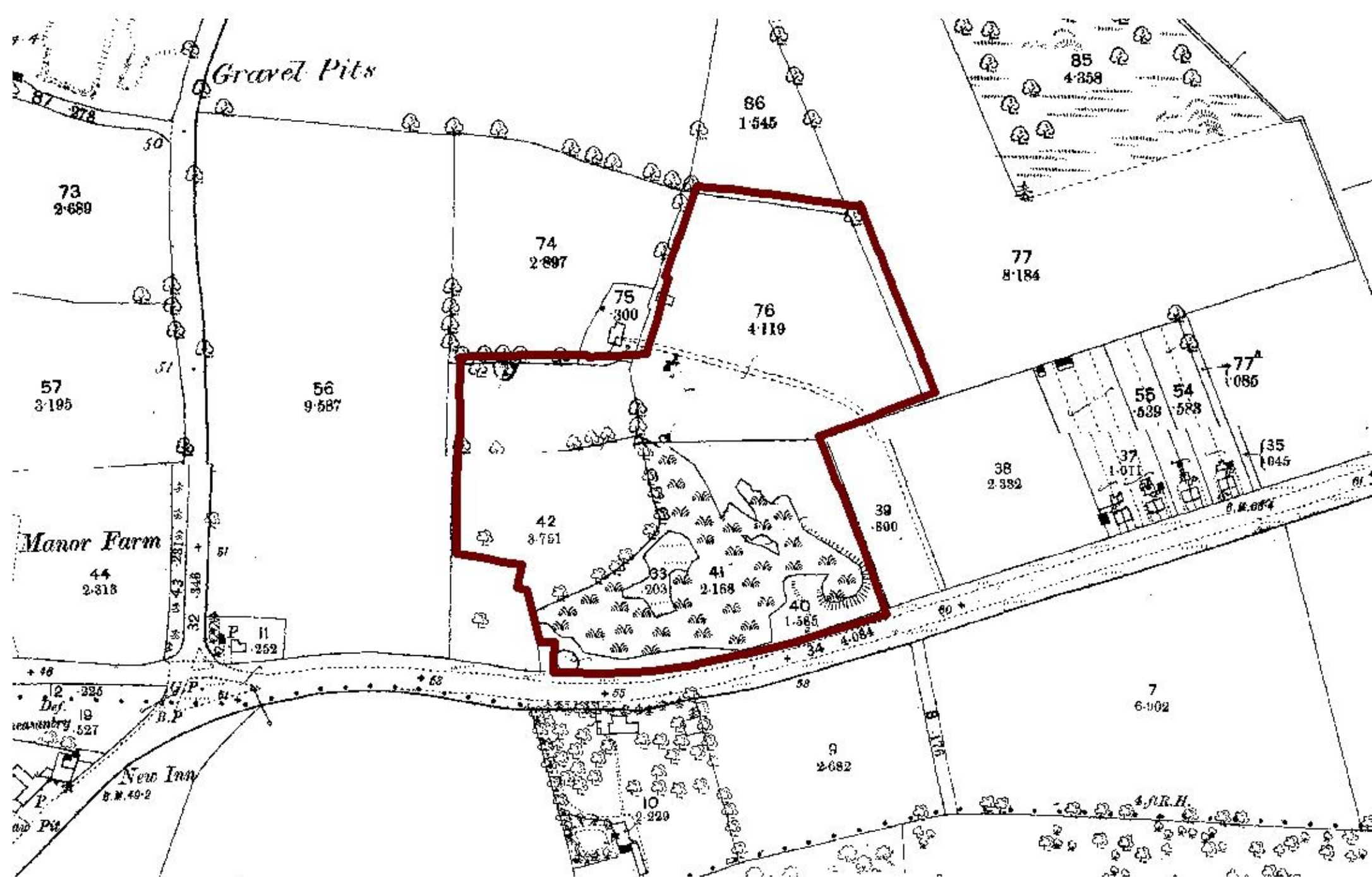
Photograph 9: View east along Grimston Rd



Photograph 10: View to north of estate

## *Appendix B: Drawings*





Borough Council of  
King's Lynn &  
West Norfolk



Title  
Gap Farm  
Historic OS Map  
1843-1893

Project / Details  
Part 2A

Drawn by Date Scale  
FAP July 2020 1:2,500  
Drawing / Reference Number  
DWG 1

## Legend

 Gap Farm Site



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