



Lowgate, Gosberton
Phase 1 Desk Study & Phase 2 Intrusive Ground Investigation

Kirk Homes Ltd

May 2016

Phase 1 Desk Study and Phase 2
Intrusive Ground Investigation

R16008



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EXECUTIVE SUMMARY AND CONCEPTUAL SITE MODEL

SITE INFORMATION & SETTING	Purpose of This Report	Phase 1 & 2 desk study, ground investigation and risk assessment.
	Client	Kirk Homes Limited
	Site	Lowgate, Gosberton
	Site Location	The site is located off Lowgate, Gosberton at the approximate National grid reference 524140E 331870N
	Current Land Use & Description	The site covers approximately 0.13 ha and has been used for as a car maintenance and repair workshop. The building on the site is constructed of brick with asbestos cement board roofing. A caravan, boat and storage unit are located in the south-west of the site where gas bottles are also kept. An oil tank is located on the western boundary and an area of rubbish burning was noted in the south-east of the site. The boundary to the north is formed by Lowgate with residential properties opposite. The eastern and southern boundaries are defined by a stream / drainage ditch with a medical centre and residential beyond them respectively. The western boundary is a fence with residential properties beyond.
	Development	The proposed development is to comprise a single storey bungalow and a 2 storey chalet bungalow
PHASE 1 (DESK STUDY)	Site History	In summary, the map evidence indicates that the site was undeveloped until sometime prior to 1977 when the existing building was constructed. No further development has occurred on the site.
	Unexploded Ordnance	Zetica UXB map shows the site is not in an area affected by bomb risk. No further consideration of UXO is required.
	Geology	The site is underlain by superficial Tidal Flat Deposits over the solid geology of the Oxford Clay Formation.
	Mining/Mineral Extraction	None recorded on site
	Ground Stability	The site is not directly underlain at shallow depth by strata associated with soluble deposits. There is a moderate potential on site for compressible ground and running sands and a low risk from shrinking or swelling of clays.
	Hydrogeology	The site does not lie in a Source Protection Zone (SPZ). The Tidal Flat Deposits and Oxford Clay Formation which underlay the site are classified as non-productive strata.
	Hydrology	An unnamed stream / ditch is located adjacent to the eastern and southern boundaries of the site
	Flood Risk	The site is in Flood Zone 3.
	Environmental Sensitivity	The site lies in a groundwater nitrate vulnerable zone.
PHASE 2	Grange Geo Site Works	The Grange Geo Ground investigation comprised: 5 trial pits to a maximum depth of 1.8m bgl;

ASSESSMENT & CONCLUSIONS	Findings of the Ground Investigation	The geology of the site (from ground level, down) comprises: Made Ground Made Ground was encountered at all exploratory hole locations. Trial pits TP1, TP2 and TP4 encountered Made Ground to depths between 0.5m and 0.6m. The Made Ground comprised sandy silty gravelly clay with variable amounts of brick, pottery, concrete and flint. Trial pit TP3 encountered Made Ground to the full depth of investigation at 2.0m. It comprised a 0.3m surfacing of silty gravel over silty gravelly clay to 1.5m with a layer of clayey gravel including brick concrete, glass and leather to 2.0m. Tidal Flat Deposits The Tidal Flat Deposits were encountered below the Made Ground in trial pits TP1, TP2 and TP4. The deposits comprised silty clay and silty fine sand to the full depth of the trial pits at 1.5m. Further testing of the Made Ground from trial pit TP3 above 1.7m should be undertaken to ensure the levels of metals, semi-metals and PAH are below levels for a residential with plants end use. Leachate testing of the Made Ground, particularly where elevated levels have been found should be undertaken to assess the risk of migration of contaminants to surface waters to the east and south of the site. Additional investigation and testing should be undertaken in the vicinity of the above ground fuel tank, below the existing buildings floor slab and in the area of burning once demolition activities are commenced.
	Conclusions of Contamination Generic Risk Assessment	Human health: Elevated levels of Lead, Benzo[a]pyrene and Dibenzo[ah]anthracene were recorded from a single sample at 1.7m depth in trial pit TP3. The depth of the sample is well below development levels and a pathway to the contaminants is not considered to exist for the proposed residential end use of the site. Controlled Waters: Elevated levels of Lead, Benzo[a]pyrene and Dibenzo[ah]anthracene were recorded from a single sample at 1.7m depth in trial pit TP3. Potential for leaching of material to surface waters. Human health / property from ground gases: Current advice based on the BR 211 Report states that no radon protection is required for new buildings at this location.
	Outline Contamination Remediation Strategy	No specific remediation is considered necessary but further works should be considered.
	Recommendations	Given the potential for contamination to exist across the site, a watching brief should be undertaken during demolition and development. Any areas of potential contamination identified during the works should be assessed and tested to ensure the identified materials are suitable for a residential with plants end use. Given the presence of deep Made Ground at the site, the installation of gas monitoring wells is recommended to monitored of ground gases to establish any risk to the development.



This Executive Summary forms part of Grange GeoConsulting Limited report number R/16008/001 (Issue 1) and should not be used as a separate document.

1.0 INTRODUCTION

1.1 Terms of Reference

In March 2016, Grange GeoConsulting Limited (Grange Geo) was commissioned by Kirk Homes Ltd to undertake a desk study and initial ground investigation at Lowgate, Gosberton, Lincolnshire.

The site covers approximately 0.13ha and is currently a disused car maintenance and repair workshop.

The proposed development is to comprise a single storey bungalow and a 2 storey chalet bungalow.

A site location plan (Drawing 2618/001A) is presented in Appendix A.

1.2 Objectives

The objectives of this investigation are to assess the readily available information on the likely environmental constraints, ground and groundwater conditions to provide to carry out a preliminary risk assessment of potential chemical contaminants at the site.

1.3 Scope

The scope of work for this commission comprises:

- a desk study and site walk-over reconnaissance to determine the nature of the site and its surroundings including current and former land uses, geology, hydrogeology, hydrology and geo-environmental data.
- an initial ground investigation comprising trial pitting, laboratory chemical testing; and
- reporting on findings of the desk study, ground investigation, geo-environmental assessment of the site conditions and geotechnical interpretation of the ground and groundwater conditions.

1.4 Provided Information

The following has been provided to Grange Geo by Kirk Homes Ltd for use in the preparation of this report:

- Site Location Plan (Drawing 2618/001A), presented in Appendix A.

2.0 **PRELIMINARY INVESTIGATION (PHASE 1 STUDY)**

A number of desk study sources have been used to assemble the following information, including a proprietary environmental data report which has been obtained for the site (dated 16th May 2016) and is presented in Appendix C.

2.1 **Site Referencing**

The site is referenced in Table 2.1.

Table 2.1: Site Referencing Information

Item	Brief Description
Site name	Lowgate, Gosberton
Site location and grid reference	Off Lowgate, Gosberton, Lincolnshire. Approximate National Grid Reference 524140E 331870N.

A site location plan is provided in Appendix A (Drawing 2618/001A).

2.2 **Site Description and Walk-Over Survey**

The basic description of the current site conditions is summarised in Table 2.2.

Table 2.2: Site Description

Item	Brief Description
Site access	Via Lowgate
Land area	Approximately 0.13ha.
Elevation, topography etc.	The site is roughly level with falls to drainage ditches on the eastern and southern boundaries of the site
Site boundaries	The north of the site is bounded by Lowgate, east and south by ditches with a medical centre and residential properties beyond and to the west by residential properties
Geomorphic features	There was no evidence of erosion or mass movement on site or in the local Vicinity.
Present land use	Existing site uses include • Storage of caravan, boat and storage unit on southern part of site • Storage of gas bottles in south-west corner of site • Car maintenance and repair workshop in existing building • Oil storage tank on western boundary • Area of burning rubbish in south-east corner of site. • Asbestos cement board roofing to existing building
Vegetation	The site has a small tree adjacent to the entrance and a number of conifer tree on the western boundary. No invasive weeds were noted during the walkover

Item	Brief Description
Surrounding land	The surrounding area is predominately residential with agricultural field to the north and a medical centre with car parking to the east.

A walk-over reconnaissance survey was undertaken to confirm the findings of the desk study and assess visually any potential hazards and receptors. Photographs are presented in Appendix B.

2.3 Site History

A study of historical Ordnance Survey maps (Appendix C) has been undertaken to identify any former land uses at the site and surrounding areas which may have geotechnical or geo-environmental implications for the proposed development and is summarised in Table 2.3.

Table 2.3: Key Features from Historical Mapping

Map Edition and Scale	Key Features on Site	Key Features off Site
1888: 1:2,500 1887 - 1888: 1:10,560	The site is located in a rural and agricultural setting. The site appears to comprise a field with a boundary through its centre. A stream/ drainage ditch is located to south of the site.	The site is surrounded by agricultural fields
1973: 1:2,500 1977: 1:10,000	The map shows the site has had a building constructed on its western side. This is the location of the existing building on site.	Development of further residential properties has occurred to the west and north of the site.
1981: 1:2,500	No changes to the site are evident from the map.	Residential development has occurred to the south beyond the stream/drainage ditch.
2015: 1:10,000	No changes to the site are evident from the map.	A building is shown to the east of the site.

In summary, the map evidence indicates that the site was undeveloped until sometime prior to 1977 when the existing building was constructed. No further development has occurred on the site. Development of residential properties occurred from sometime before 1977 to the north and west then again to the south by 1988.

2.4 Unexploded Ordnance

In general accordance with CIRIA report C681 (Stone *et al* 2009) a non-UXO specialist screening exercise has been carried out for the site. This indicates:

- the Zetica UXB map (Lincolnshire) indicates the site to be in an area where the bomb risk is low (further action to mitigate the risk is considered prudent by Zetica, although not essential) . A copy of the map is presented in Appendix D.

2.5 Geology

The general geology of the site area is shown on the 1:50,000 geological map (Appendix D) and is summarised in Table 2.4.

Table 2.4: Geology

Location	Age	Stratigraphic Name	Description
On Site	Holocene	Tidal Flat Deposits	Clay and silt
On Site	Oxfordian – Callovian	Oxford Clay Formation	Mudstone

Due to the previous development of the site some Made Ground is anticipated across the site area.

2.1 Mining / Mineral Extraction

The site is not in an area affected by coal mining

One BGS recorded mineral sites is recorded within 500m of the site. It is located 481m east of the site for the extraction of clay and shale from the Oxford Clay formation. The site is recorded to have ceased activities.

2.2 Ground Stability

The Envirocheck report suggests there is no hazard from collapsible ground stability hazards or ground dissolution stability hazards.

It also records a moderate potential on site for compressible ground and running sands, a low risk from and shrinking or swelling of clays and a very low risk landslide ground stability hazards.

2.3 Hydrogeology

The aquifer designations given in Table 2.5 are based on the Environment Agency aquifer designation map.

Table 2.5: Hydraulic Characteristics of Strata

Stratum	Aquifer Designation	Hydraulic Characteristics
Tidal Flats Deposits	Unproductive strata	Drift deposits with low permeability that have negligible significance for water supply or river base flow.
Oxford Clay Formation	Unproductive strata	Solid geological units with low permeability that have negligible significance for water supply or river base flow.

The site is not within a Source Protection Zone (SPZ).

The site lies in an area where the groundwater is classified as a nitrate vulnerable zone.

There are 12 licensed groundwater abstractions within 1000m of the site. The closest is 564m north-west for general agricultural work.

2.4 **Hydrology & Flooding**

The surface water features in the vicinity of the site are listed in Table 2.6 and, where appropriate, are marked on the Site Zonation Plan in Appendix A.

Table 2.6: Surface Water Features

Feature	Location Relative to Site
Unnamed ditch	To the eastern and southern boundaries of the site

There are 3 discharge consents listed within 250m, 3 within 500m and 4 within 1km of the site. The nearest is 32m east into an unnamed tributary of the River Wed for final/treated effluent.

The site is in Flood Zone 3, with high/significant probability of flooding. Note that the probabilities of flooding and the risk designations differ between the Environment Agency and the Technical Guidance to the National Planning Policy Framework, DCLG March 2012) and that the published flood map only relates to flooding from rivers, estuaries and the sea and does not include other potential sources such as surface water, groundwater, sewers, canals and reservoirs. Note also that the presence on the map of flood defences, or areas benefiting from flood defences, should not be taken to imply that a proposed development in these areas is acceptable.

No further consideration of flood risk is undertaken in this report. Specialist flood risk advice should be sought with regards to drainage and flooding.

2.5 **Waste Management and Hazardous Substances**

There are no Integrated Pollution Controls, Integrated Pollution Prevention and Control or Local Authority Integrated Pollution Prevention and Control, Local Authority Pollution Prevention and Control Enforcement sites within 1km of the site.

These are 2 Local Authority Pollution Prevention and Control within 1km of the site. Both are located 509m south-east for a petrol filling station.

There are no BGS recorded landfill sites, historical landfill sites, registered landfill sites, Integrated Pollution Control Registered Waste Sites, Licensed Waste Management Facilities (Locations), licensed waste management facilities (Landfill boundaries), Local Authority Recorded Landfill Sites, Registered Waste Transfer Sites or Registered Waste Treatment or Disposal Sites within 1km of the site.

There is 1 registered landfill site within 1km of the site. It is located 942m west for a maximum input rate equal to or greater than 10,000 and less than 25,000 tonnes per year. There were no known restrictions on the waste. However, the license is listed as lapsed/cancelled in January 1988.

There are no records relating to the storage of radioactive materials within 1km of the site.

There is no Control of Major Accident Hazard sites (COMAH), Notification of installations handling hazardous substances (NIHHS) sites, explosive sites, or Planning Hazardous Substance consents or enforcements within 1km of the site.

There is 1 contemporary trade directory listed on the site for a car body and is listed as inactive.

A further entry is within 250m, an additional 2 within 251-500m and 12 more within 1km. However, as long as these have been operated in accordance with any applicable licence, no impact on the site is envisaged.

2.6 BR 211 Guidance on Radon

Reference to the Annex A maps in BR 211 (Scivyer 2007), based on the indicative atlas of radon in England and Wales (Miles *et al* 2007) indicates that the site is not in a radon affected area as it is in an area where less than 1% of properties in the area are above the action level. No radon protection measures are considered necessary.

3.0 PRELIMINARY CONCEPTUAL SITE MODEL

3.1 Preliminary Ground Model

The site has been used for as a car maintenance and repair workshop. The building on the site is constructed of brick with asbestos cement board roofing. A caravan, boat and storage unit are located in the south-west of the site where gas bottles are also kept. An oil tank is located on the western boundary and an area of rubbish burning was noted in the south-east of the site.

The findings of the historic map evidence indicate that the site was undeveloped until sometime prior to 1977 when the existing building was constructed. No further development has occurred on the site.

The site does not lie in a Source Protection Zone (SPZ).

The Tidal Flat Deposits and Oxford Clay Formation which underlay the site are classified as non-productive strata.

An unnamed stream / ditch is located adjacent to the eastern and southern boundaries of the site

The proposed development is to comprise a single storey bungalow and a 2 storey chalet bungalow.

3.2 Preliminary Exposure Model

The Preliminary Exposure Mode is used for geo-environmental hazard identification and establishing potential contaminant linkages in line with the Statutory Guidance to Part 2A of the Environmental Protection Act 1990, also known as a 'potential pollution linkages' in the Model Procedures of CLR11 (Environment Agency, 2004). This is based on the contaminant-pathway-receptor linkage approach.

3.2.1 Potential Contaminants

For the purpose of this assessment the potential contaminants have been separated according to whether they are likely to have originated from on-site or off-site sources.

Potential On-site Sources of Contamination

- Hydrocarbons fuels, oils, degreasing solvents and lubricants associated with car maintenance and body work activities.
- Metals and semi-metals associated with car maintenance and car breaking activities.
- Asbestos in ground from presence of asbestos cement board to roof to building.
- Made Ground from the historic development of the site possibly including metals, semi-metals, asbestos, polyaromatic hydrocarbons (PAH) and petroleum hydrocarbons (TPH).

- Metals and semi-metals, Hydrocarbons fuels, oils, and unburnt waste from burning activities in the south-east of the site
- Hydrocarbons fuels associated with the above ground fuel tank
- Ground gases (carbon dioxide and methane) from Made Ground and Tidal Flat Deposits.

Potential Off-site Sources of Contamination

- No potential off-site sources of contamination have been identified as the site was surrounded by open land since before 1977 then residential properties and a medical centre have been developed around the site.
- It should be noted that ground gases from offsite sources (such as other landfills) have been excluded as there are no significant landfills within 500m of the site.

3.2.2 Potential Receptors

- Humans (development workers, site end users, adjacent occupiers).
- Development end use (buildings, utilities and landscaping).
- Surface water: unnamed stream / ditch is located adjacent to the eastern and southern boundaries of the site

3.2.3 Potential Pathways

- Humans: Ingestion, skin contact, inhalation of dust and outdoor air.
- Buildings: Direct contact.
- Buildings: Ingress via permeable soils and/or construction gaps.
- Surface water: Surface drainage discharge from the site into adjacent stream / ditch
- Surface water: Migration of contaminants in shallow groundwater into adjacent stream / ditch

4.0 **GROUND INVESTIGATION**

4.1 **Investigation Rationale**

The ground investigation rationale based on the findings of the preliminary risk assessment is summarised in Table 4.1.

Table 4.1: Investigation Rationale

Exploratory Holes	Purpose
TP 1-5	To assess shallow ground conditions. To allow collection of samples for contamination testing.

Access to a location adjacent to the above ground fuel tank was not possible due to its location on the western boundary by the side of the existing building.

4.2 **Site Works**

The approximate position of site investigation locations (surveyed in using a tape measure from landmarks) are shown on the Ground Investigation Plan in Appendix E.

The site works undertaken for this investigation are summarised in Table 4.2. The logs, including details of ground conditions, soil sampling, *in situ* testing and any installations, are presented in Appendix F.

Table 4.2: Summary of Site Works

Activity	Method	No.	Max. / Range Depth	<i>In situ</i> tests	Installations / Notes
Drilling, pitting & probing					
Trial pits	Machine (JCB 3X)	5	2.0	None	

4.3 **Geo-Environmental Testing**

4.3.1 **Sampling Strategy and Protocols**

The dataset comprises:

- 3 No. samples from the Made Ground; and
- 1 No. samples from the natural deposits.

Samples were taken stored and transported in general accordance with BS 10175:2011.

4.3.2 **Laboratory Analyses**

The findings of the preliminary risk assessment have been used to scope the analyses of chemicals of potential concern as follows.

The following were performed on samples of **soil or other solids**:

- 4 No. samples for Grange Geo default suite of determinands for solids comprising:
Arsenic (As), Boron (B) (water soluble), Beryllium (Be), Cadmium (Cd), Chromium (Cr) (III), Cr(VI), Copper (Cu), Mercury (Hg) (inorganic), Nickel (Ni), Lead (Pb), Selenium (Se), Vanadium (V), Zinc (Zn), cyanide (free), pH, asbestos screen, speciated polycyclic aromatic hydrocarbons (PAH, by GC-MS), total phenols; and
- 1 No. sample for Polyaromatic hydrocarbons.

The chemical test results are provided in Appendix G.

5.0 GROUND INVESTIGATION DATA

5.1 Physical Ground Conditions

The ground conditions over the entire site as proven during the current works are in general accordance with the published geological literature and expectations from the desk study.

Details are provided in the logs in Appendix F, a summary is presented in Table 5.1 and the individual strata are described in the sections below.

Table 5.1: Strata Encountered

Stratum Description	Depth to Top (m bgl)	Depth to Base (m bgl)	Thickness (m)
Made Ground – silty gravelly clay	0.0	>2.0	>2.0
Tidal Flat Deposits – silty clay and silty sand	0.5	1.5	n/a
Oxford Clay Formation – not encountered	n/a	n/a	n/a

5.1.1 Made Ground

Made Ground was encountered at all exploratory hole locations. Trial pits TP1, TP2 and TP4 encountered Made Ground to depths between 0.5m and 0.6m. The Made Ground comprised sandy silty gravelly clay with variable amounts of brick, pottery, concrete and flint. Trial pit TP3 encountered Made Ground to the full depth of investigation at 2.0m. It comprised a 0.3m surfacing of silty gravel over silty gravelly clay to 1.5m with a layer of clayey gravel including brick concrete, glass and leather to 2.0m.

5.1.2 Tidal Flat Deposits

The Tidal Flat Deposits were encountered below the Made Ground in trial pits TP1, TP2 and TP4. The deposits comprised silty clay and silty fine sand to the full depth of the trial pits at 1.5m.

5.1.3 Oxford Clay Formation

The Oxford Clay Formation was not encountered during the ground investigation.

5.2 Visual and Olfactory Evidence of Contamination

Potential evidence of contamination was recorded in trial pit TP3 below 1.5m depth.

5.3 Groundwater

5.3.1 Groundwater Levels

Groundwater strikes encountered during the investigation are summarised in Table 5.22.

Table 5.2: Groundwater Strikes

Trial Pit	Depth to Groundwater (m bgl)	Notes
TP1	1.25	Slight seepage
TP2	1.40	Slight seepage
TP3	1.50	Strong inflow

6.0 **GENERIC QUANTITATIVE RISK ASSESSMENTS**

There are plausible contaminant linkages which require further consideration, either in the form of subsequent tiers of risk assessment against generic or site-specific assessment criteria, or by proceeding directly to some form of risk management strategy (including possible remedial actions).

Generic risk assessment is a two stage process. Firstly, the measured contaminant concentrations are compared to the relevant GACs.

In the absence of a complete regulatory set of screening values derived using the CLEA Framework, Grange Geo screening values are based on the following:

- △ Category 4 Screening Levels (C4SLs) published by DEFRA;
- △ The 2014 Land Quality Management (LQM) / Chartered Institute of Environmental Health (CIEH) Suitable for Use Levels for Human Health Risk Assessment (S4ULs);
- △ The guidance values produced by the Environmental Industries Commission (EIC), the Association of Geotechnical and Geoenvironmental Specialists (AGS) and Contaminated Land: Application in Real Environments (CL:AIRE) in December 2009; and
- △ In house Generic Screening Values (DS-GACs) derived by Grange Geo.

The second stage, Risk Evaluation, comprises an authoritative review of the findings with other pertinent information, in cases where the GACs are exceeded, in order to consider if exceedance may be acceptable in the particular circumstances.

6.1 **Scope**

The purpose of this risk assessment is to determine the potential contamination risks at the site for the proposed development. The aspects of risk from substances in the ground considered below are as follows:

- human health;
- pollution of surface waters; and
- ground gases.

6.2 **Human Health and Plant Life**

This is a Tier 2 assessment using soil screening values and involves generic human health risk assessment for the CLEA scenarios: **residential with plant uptake**.

In Appendix IE the soil chemical analysis results have been screened against guideline soil concentrations to provide an assessment of potential risks associated with contamination at the site. Justification for the criteria adopted for this risk assessment is given in Appendix HE. In the cases where all the samples tested for a given substance were below the GAC, no further consideration is necessary for that substance.

It should be noted that the term “further assessment required” is used to denote soil concentrations that are equal to, or exceed, a GAC. This does not necessarily mean that the soil is “contaminated”.

6.2.1 Risk Estimation

In this section the results are discussed for determinands for which the data set does not allow application of statistical analysis by virtue of low sample numbers and/or spatial distribution (e.g. where sampling is targeted at specific sources identified in the preliminary investigation).

Metals and Semi-metals

An elevated level of lead was found in a sample from trial pit TP3 at 1.7m. The lead was recorded at 1100mg/kg above the C4SL level of 310mg/kg for a residential with plants scenario.

Polyaromatic hydrocarbons (PAH)

Elevated levels of Benzo[a]pyrene and Dibenzo[ah]anthracene were found in the sample tested from trial pit TP3 at 1.7m. the levels were recorded at 5.5mg/kg and 0.47mg/kg above the C4SL and LQM levels of 5.5mg/kg and 0.31mg/kg respectively.

6.2.2 Risk Evaluation – Human Health

The screening exercise identified Lead, Benzo[a]pyrene and Dibenzo[ah]anthracene above their relevant GACs.

All the exceedances were from a sample tested from trial pit TP3 at 1.7m. The depth of the sample is well below the development ground level and below any level of potential excavation for normal residential garden activities, therefore, the pathway linkage is not be complete.

Two samples of Made Ground taken from higher levels from other trial pits have been tested and did not record any elevated levels above a residential with plants end use

6.2.3 Risk Evaluation – Surface Waters

The screening exercise identified Lead, Benzo[a]pyrene and Dibenzo[ah]anthracene above their relevant GACs. There is a risk of migration from the Made Ground to the surface waters on the east and south of the site by leaching of contaminants.

6.2.4 Radon

Reference to the Annex A maps in BR 211 (Scivyer 2007), based on the indicative atlas of radon in England and Wales (Miles *et al* 2007) indicates that the site is not in a radon affected area as it is in an area where less than 1% of properties in the area are above the action level. No radon protection measures are considered necessary.

7.0 PRELIMINARY RISK ASSESSMENT

7.1 Updated Ground Model

The preliminary conceptual site model initially developed from the desk study and walk-over survey (Section 3.1) has been updated using the findings of the ground investigation

The bedrock geology comprises Made Ground Overlying Tidal Flat Deposits.

7.2 Updated Exposure Model

Following the site investigation, the plausible contaminant sources and receptors identified in Section 0 have been updated or confirmed.

7.2.1 Sources

No potential sources have been removed from the exposure model.

7.2.2 Receptors

No potential receptors have been removed from the preliminary conceptual exposure models.

7.2.3 Pathways

No pathways have been removed from the exposure models.

Table 7.1: Final Conceptual Model and Residual Risks Following Risk Evaluation

Source(s)	Possible Pathway(s)	Receptor(s)	Probability	Consequence	Risk Level	Comments
Contaminants from historic site use for commercial activities Metals, semi-metals, PAH, TPH, oils, solvents, asbestos	Direct contact, inhalation or accidental ingestion especially during below ground works Runoff Dust	Humans (Development Workers and site end users) Surface water	Low	Moderate	Low	Elevated level of Lead, Benzo[a]pyrene and Dibenzo[ah]anthracene was recorded from a single sample at 1.7m depth. The depth is well below development levels and a pathway to the contaminants is not considered to exist for the proposed residential end use of the site. No other elevated levels of contaminants have been found in any of the other samples tested. Potential to encounter during below ground working but exposure likely to be short term. Normal personal protective equipment and health and safety procedures should minimise contact to soils and potential contaminants.
Potential contaminants in Made Ground Carbon dioxide/ Methane	Build up in below ground excavations and structures Migration into buildings via permeable strata and through services connecting into buildings	Humans (Development Workers and site end users)	Low	Severe	Moderate	Potential to encounter during below ground works. Normal health and safety procedures likely include controls of entry to below ground structures.
Spillage of construction fuel during redevelopment	Direct contact, inhalation or accidental ingestion Seepage through soil Runoff	Humans (construction workers) Surface water	Unlikely	Moderate	Very Low	Normal storage and handling practices and the relatively small volumes of fuel handled/stored at any given time should limit exposure to this hazard.

8.0 GEO-ENVIRONMENTAL CONCLUSIONS AND RECOMMENDATIONS

8.1 Human Health

Elevated levels of Lead, Benzo[a]pyrene and Dibenzo[ah]anthracene were recorded from a single sample at 1.7m depth in trial pit TP3. The depth of the sample is well below development levels and a pathway to the contaminants is not considered to exist for the proposed residential end use of the site.

Further testing of the Made Ground from trial pit TP3 above 1.7m should be undertaken to ensure the levels of metals, semi-metals and PAH are below levels for a residential with plants end use.

Leachate testing of the Made Ground, particularly where elevated levels have been found should be undertaken to assess the risk of migration of contaminants to surface waters to the east and south of the site.

Additional investigation and testing should be undertaken in the vicinity of the above ground fuel tank, below the existing buildings floor slab and in the area of burning once demolition activities are commenced.

8.2 During Demolition and Development

Given the potential for contamination to exist across the site, a watching brief should be undertaken. Any areas of potential contamination identified during the demolition and development of the site should be assessed and tested to ensure the identified materials are suitable for a residential with plants end use.

8.3 Precautions Against Ground Gases

8.3.1 Radon

Current advice based on the BR 211 Report states that no radon protection is required for new buildings at this location.

8.3.2 Permanent Gases

Given the presence of deep Made Ground at the site, the installation of gas monitoring wells is recommended to monitored for ground gases to establish any risk to the development from the deep Made Ground and underlying Tidal Flat Deposits

9.0 REFERENCES

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APPENDICES

Appendix A SITE LOCATION PLAN, PROPOSED DEVELOPMENT PLAN

Appendix B SITE PHOTOGRAPHS

Appendix C DESK STUDY RESEARCH INFORMATION

Appendix D ZETICA UXB MAP

Appendix E GRANGE GEO METHODOLOGY

Appendix F GROUND INVESTIGATION PLAN, EXPLORATORY HOLE LOGS

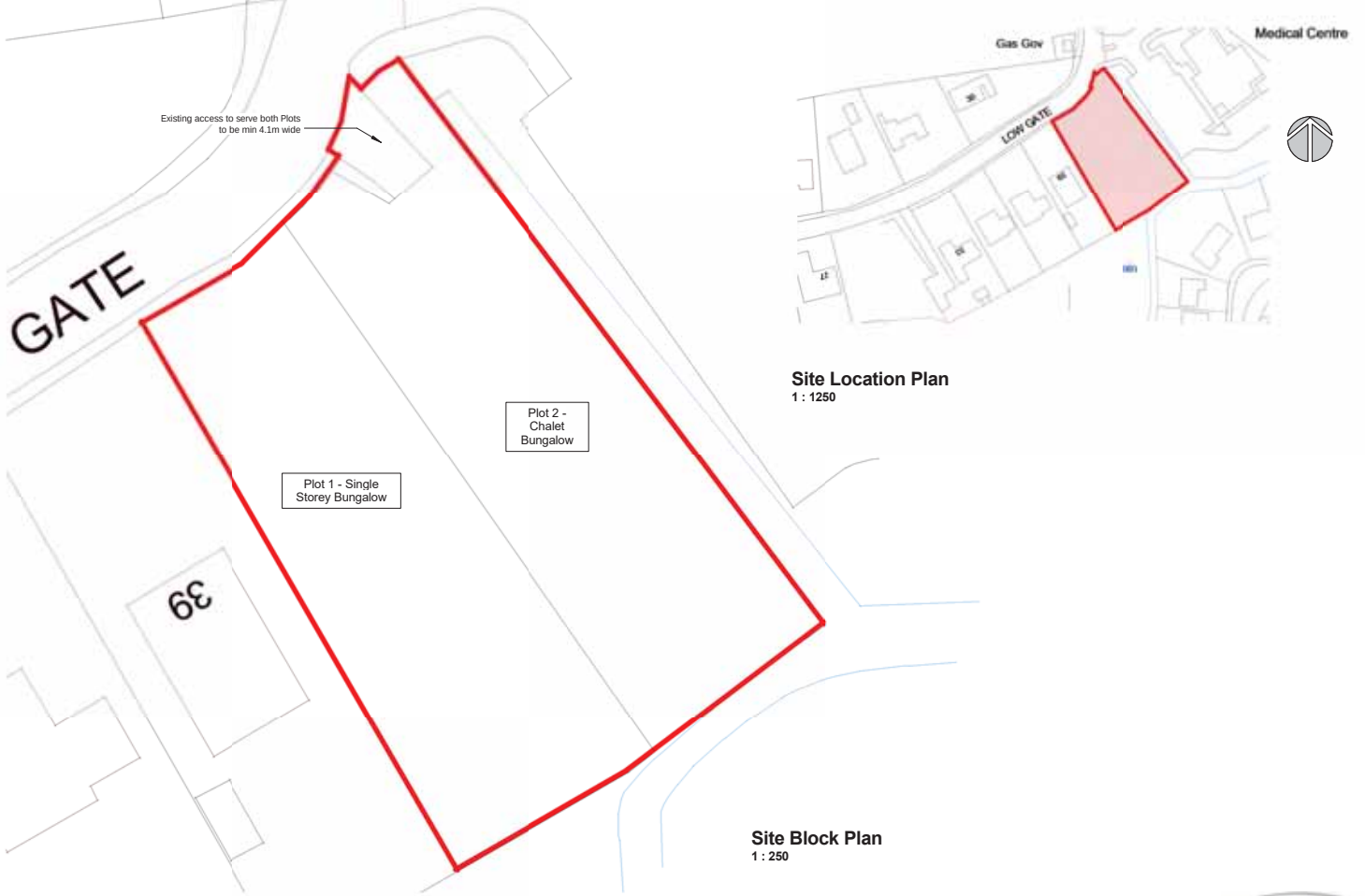
Appendix G CONTAMINATION TEST RESULTS

Appendix A

SITE LOCATION PLAN, PROPOSED DEVELOPMENT PLAN

Contractors are responsible for checking all dimensions on site prior to work commencing. Due to areas of the structure being covered, unexposed or otherwise inaccessible the notes / specifications of existing materials are subject to confirmation of site when it is feasible to expose the relevant areas of construction. All material schedules are given in good faith and for pricing purposes only. It is the responsibility of the contractor to check their accuracy before ordering any materials. Remway Design accepts no responsibility for the accuracy of these material schedules.

A3



Lowgate, Gosberton

Site Plans

Dwg No

2618/001A



Appendix B

SITE PHOTOGRAPHS



Figure 1: Site Entrance



Figure 2: View north drilling WS1



Figure 3: View west showing the retained Substation building



Figure 4: View north showing northern half of the site and basement excavation.



Figure 5: View west towards train line



Figure 6: View south towards station way



Figure 7: Location of WS4



Figure 8: View south west towards retained sub station.



Figure 9: Location of WS4

Appendix C

DESK STUDY RESEARCH INFORMATION

Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	MGR	Made Ground (Undivided)	Artificial Deposit	Holocene - Holocene

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	TFD	Tidal Flat Deposits	Clay and Silt	Holocene - Holocene

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	OXC	Oxford Clay Formation	Mudstone	Oxfordian - Callovian



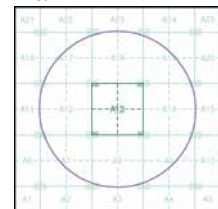
Geology 1:50,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps. The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID: 1
Map Sheet No: 144
Map Name: Spalding
Map Date: 1992
Bedrock Geology: Available
Superficial Geology: Available
Artificial Geology: Available
Faults: Not Supplied
Landslip: Not Available
Rock Segments: Not Supplied

Geology 1:50,000 Maps - Slice A



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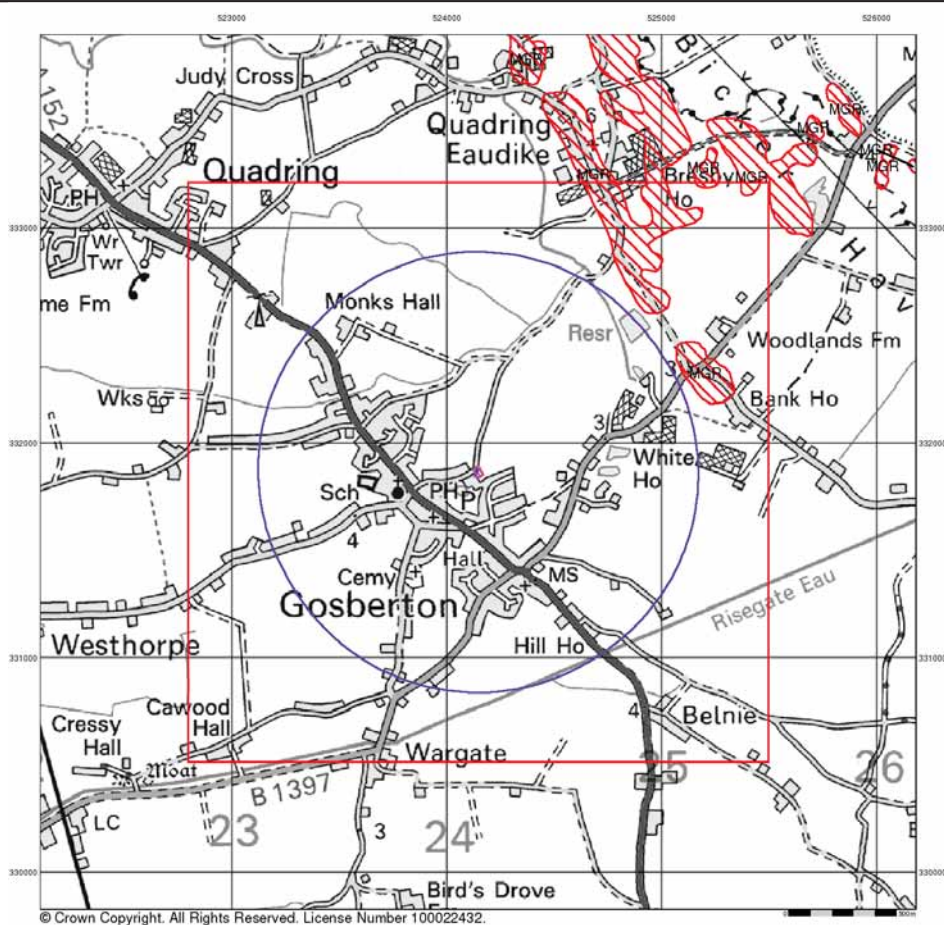
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Customer Reference: R16008
National Grid Reference: 524140, 331870
Slice: A
Site Area (Ha): 0.13
Search Buffer (m): 1000

Site Details:

Site at, Gosberton, Lincolnshire



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Fax: 0844 844 9953
Web: www.envirocheck.co.uk



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Artificial Ground and Landslip

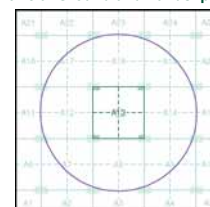
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes founded strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



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Order Number: 86654240_1_1
 Customer Reference: R16008
 National Grid Reference: 524140, 331870
 Slice: A
 Site Area (Ha): 0.13
 Search Buffer (m): 1000

Site Details:

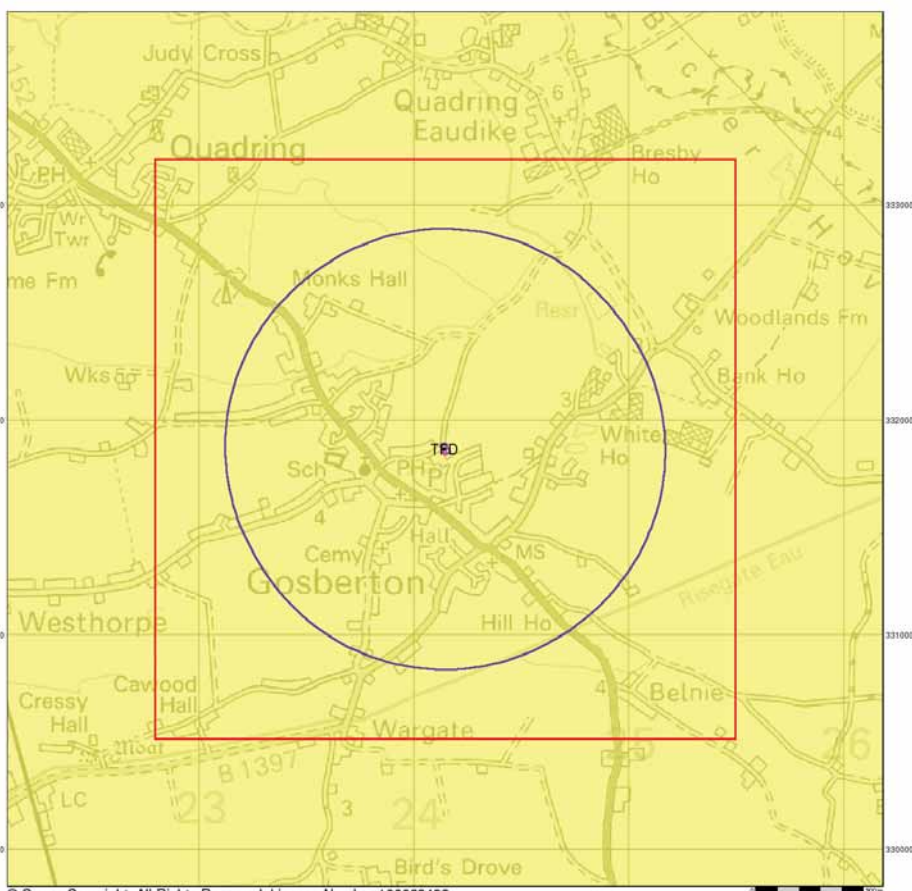
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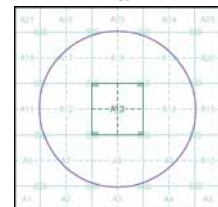
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



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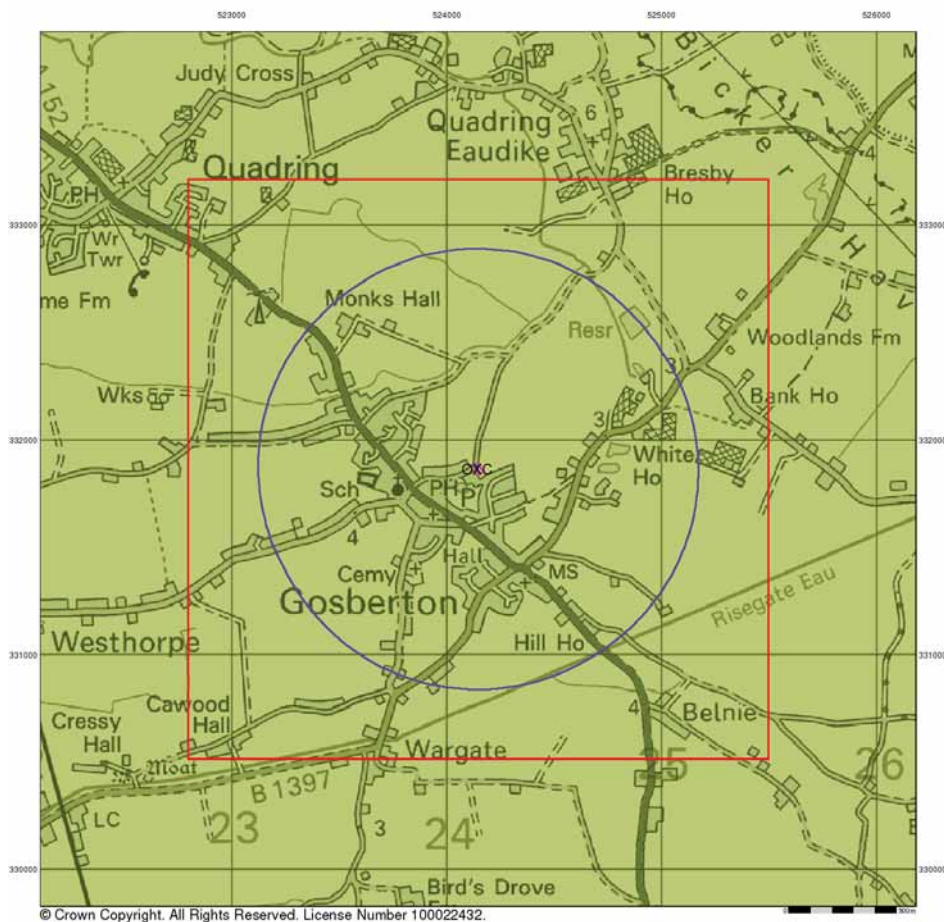
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Bedrock and Faults

Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

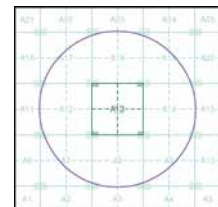
The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000

Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



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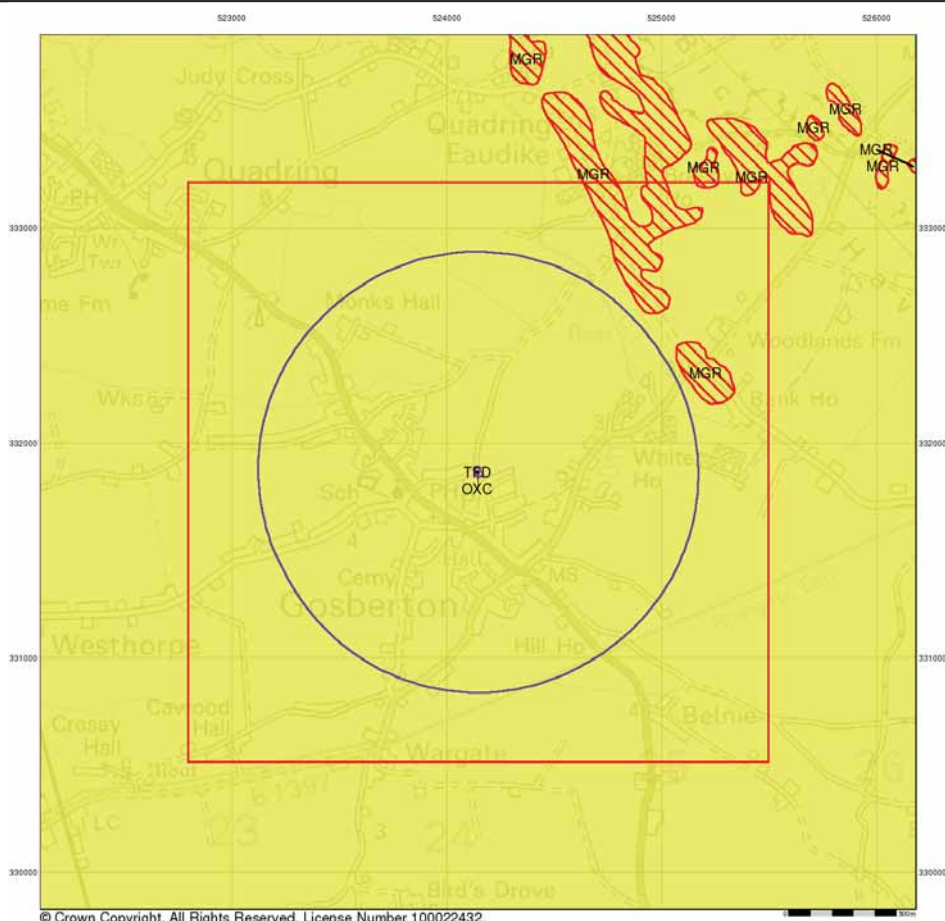
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Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

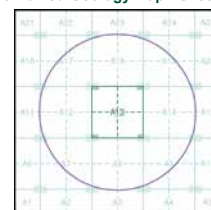
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A



Order Details:

Order Number:	86654240_1_1
Customer Reference:	R16008
National Grid Reference:	524440, 331870
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Site Area (Ha):	0.13
Search Buffer (m):	1000

Site Details:

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Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250	Large-Scale National Grid Data 1:2,500 and 1:1,250
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	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		507		Altitude at Trig. Station
	B.M. 325.9		342		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				
	Co. Berks. Bdy.				
	Co. Burgh Bdy.				
	B.P. B.S. Boundary Post or Stone		P.C.B.		Police Call Box
	B.R. B.R.		P		Pump
	E.P. Electricity Pylon		S.P.		Signal Post
	F.B. Foot Bridge		S.L.		Sluice
	F.P. Foot Path		Sp.		Spring
	G.P. Guide Post or Board		T.C.B.		Telephone Call Box
	M.S. Mile Stone		Tn.		Trough
	M.P. M.R. Mooring Post or Ring		W		Well

	Inactive Quarry, Chalk Pit or Clay Pit		Active Quarry, Chalk Pit or Clay Pit
	Rock		Boulders
	Cliff		Slopes
	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		Bracken
	Copice, Osier		Reeds
	Marsh, Saltings		Culvert
	Rough Grassland		Heath
	Direction of water flow		Bench Mark
	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 merging changes
BH	Bear House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capetan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D F	Drinking Fountain	Pp	Pump
ELP	Electricity Pylon 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	TCP	Telephone Call Box
LC	Level Crossing	TPC	Telephone Call Post
MH	Marshall	T	Trough
MP	Mill Post or Mooring Post	Wt Pt, Wt T	Water Point, Water Tap
MS	Mill Stone	W	Well
NLS	Normal Tidal Limit	WD Pp	Wind Pump

	Cliff		Slopes		Top
	Rock		Rock (scattered)		Boulders (scattered)
	Boulders		Scree		Non-Coniferous Tree (surveyed)
	Positioned Boulder		Coniferous Tree (surveyed)		Non-Coniferous Trees (not surveyed)
	Orchard Tree		Scrub		Bracken
	Copple, Oyster		Reeds		Marsh, Saltings
	Rough Grassland		Heath		Culvert
	Direction of water flow		Triangulation Station		Antiquity (site of)
	Electricity Transmission Line		Electricity Pylon		Bench Mark
	Roofed Building		Buildings with Building Seed		Glazed Roof Building
Civil parish/community boundary District boundary County boundary Boundary post/stone Boundary mering symbol (note: these always appear in opposed pairs or groups of three)					
	Barracks		Pillar, Pole or Post		Signal Box or Light
	Battery		Post Office		Public Convenience
	Cemetery		Pump		Pump Station
	Clarn		Place of Worship		Pumping Station
	Diamond Railway		Sewage Pumping Station		Electricity Pole, Pillar
	Electricity Generating Station		Signal Box or Light		Electricity Sub Station
	Fountain		Spring		Fountain / Drinking Pn.
	Gas Valve Compound		Trough		Gas Governor
	Guide Post		Wind Pump		Manhole
	Mile Post or Mile Stone		Works (building or area)		Well



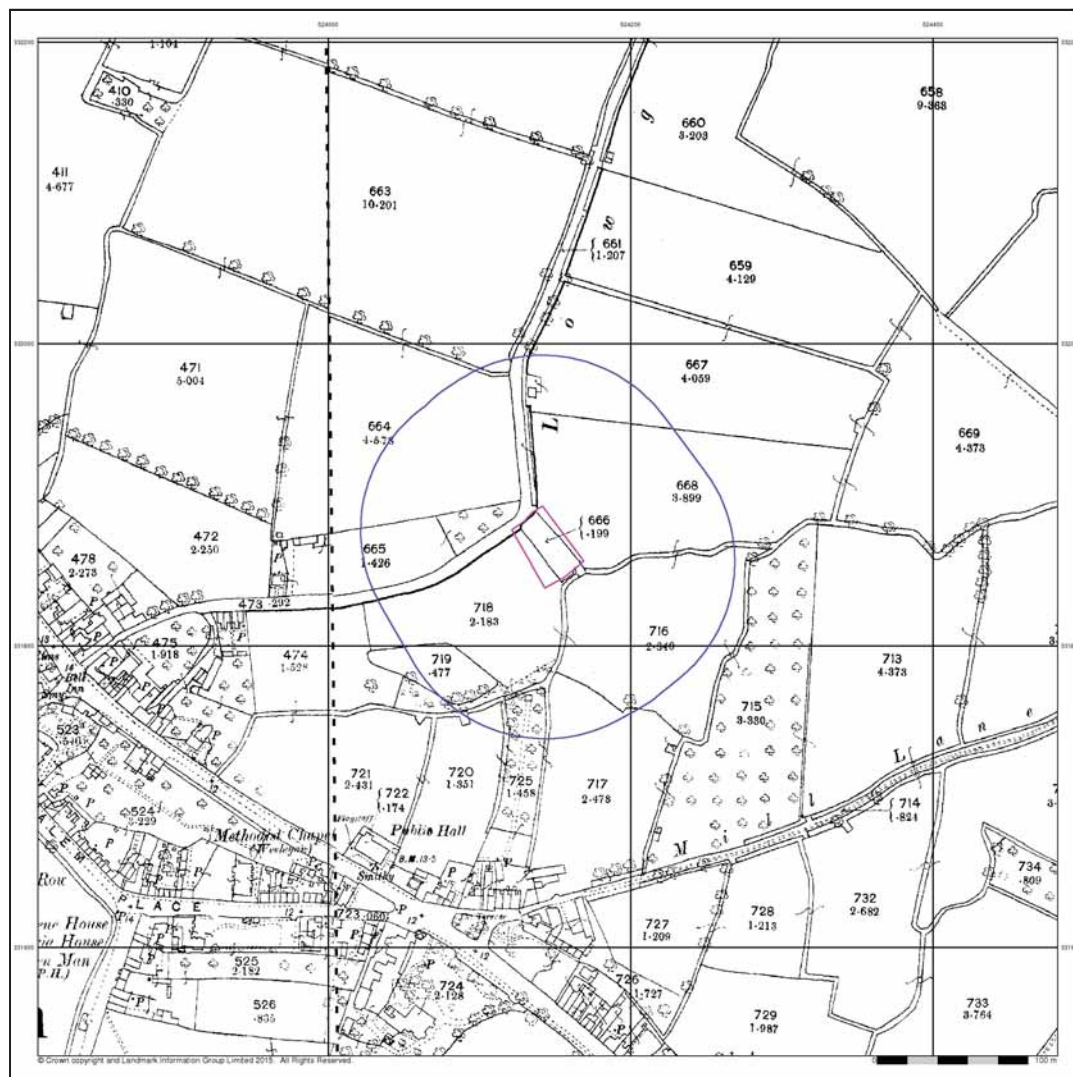
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Lincolnshire	1:2,500	1905	3
Lincolnshire	1:2,500	1932	4
Ordinance Survey Plan	1:2,500	1973	5
Additional SIMs	1:2,500 1981 - 1986		6
Additional SIMs	1:2,500 1967 - 1988		7
Large-Scale National Grid Data	1:2,500	1995	8

The figure shows a 5x5 grid of nodes. The columns are labeled A1, A2, A3, A4, A5 at the top. The rows are labeled A11, A12, A13, A14, A15 on the left. Node A13 is highlighted with a thick black border.

Order Number: 86654240_1_1
Customer Ref: R16008
National Grid Reference: 524140, 331870
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Search Buffer (m): 100

Site at, Gosberton, Lincolnshire





Lincolnshire

Published 1888

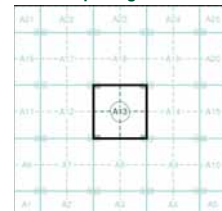
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1886 it covered the whole of what was considered 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

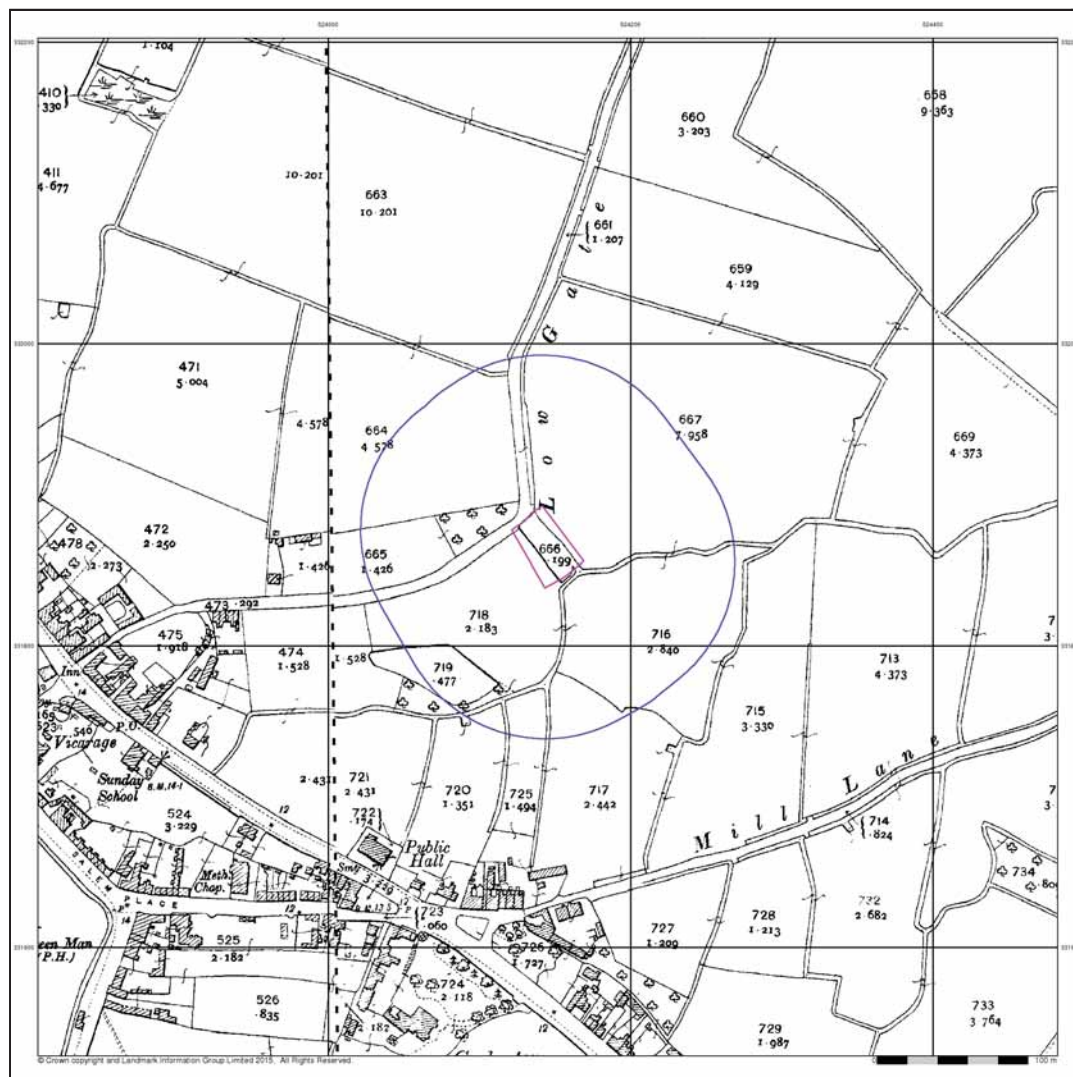
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Site Area (Ha): 0.13
Search Buffer (m): 100

Site Details

Site at, Gosberton, Lincolnshire



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Lincolnshire

Published 1905

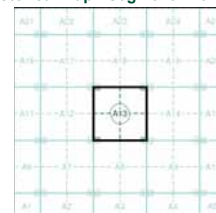
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Map Name(s) and Date(s)



Historical Map - Segment A13



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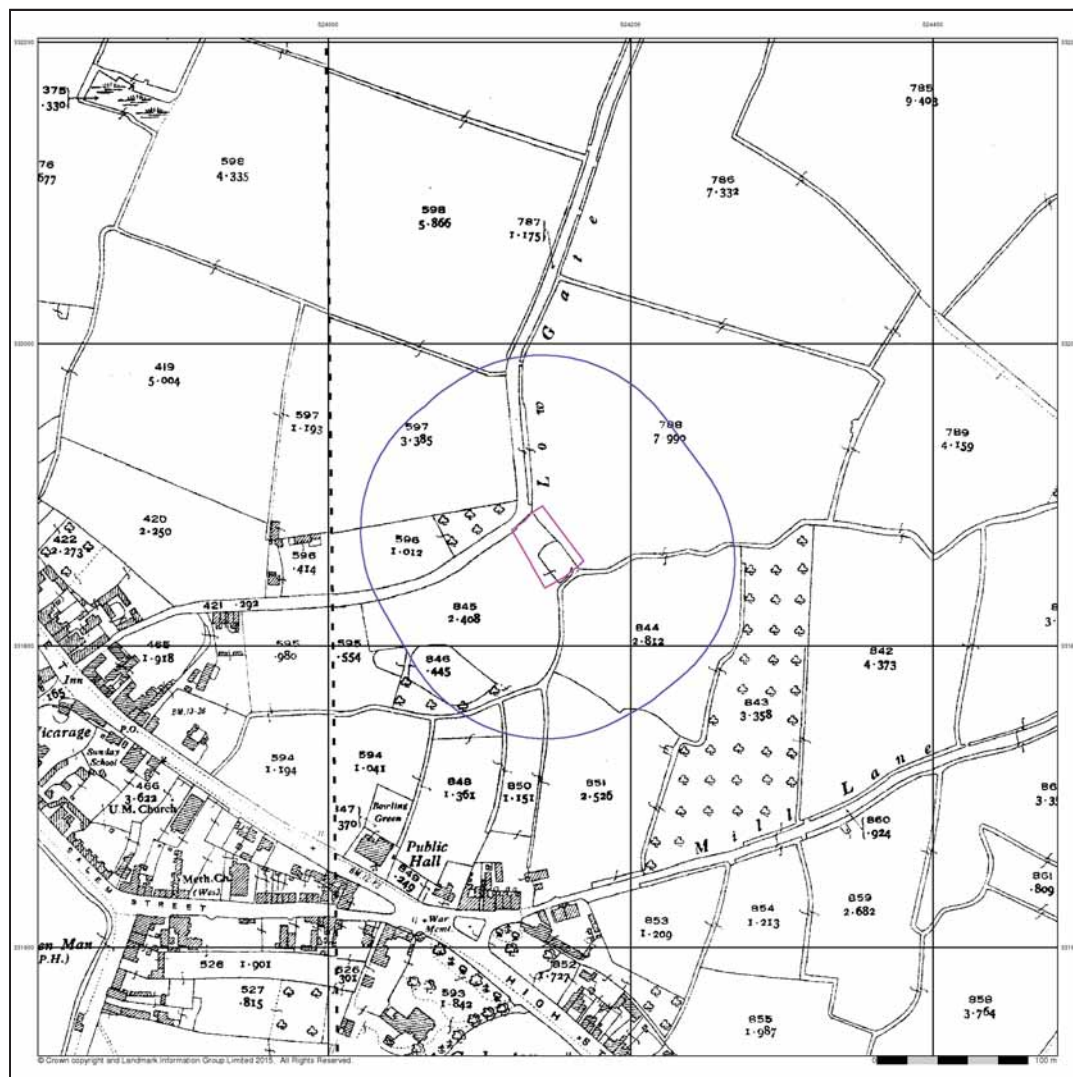
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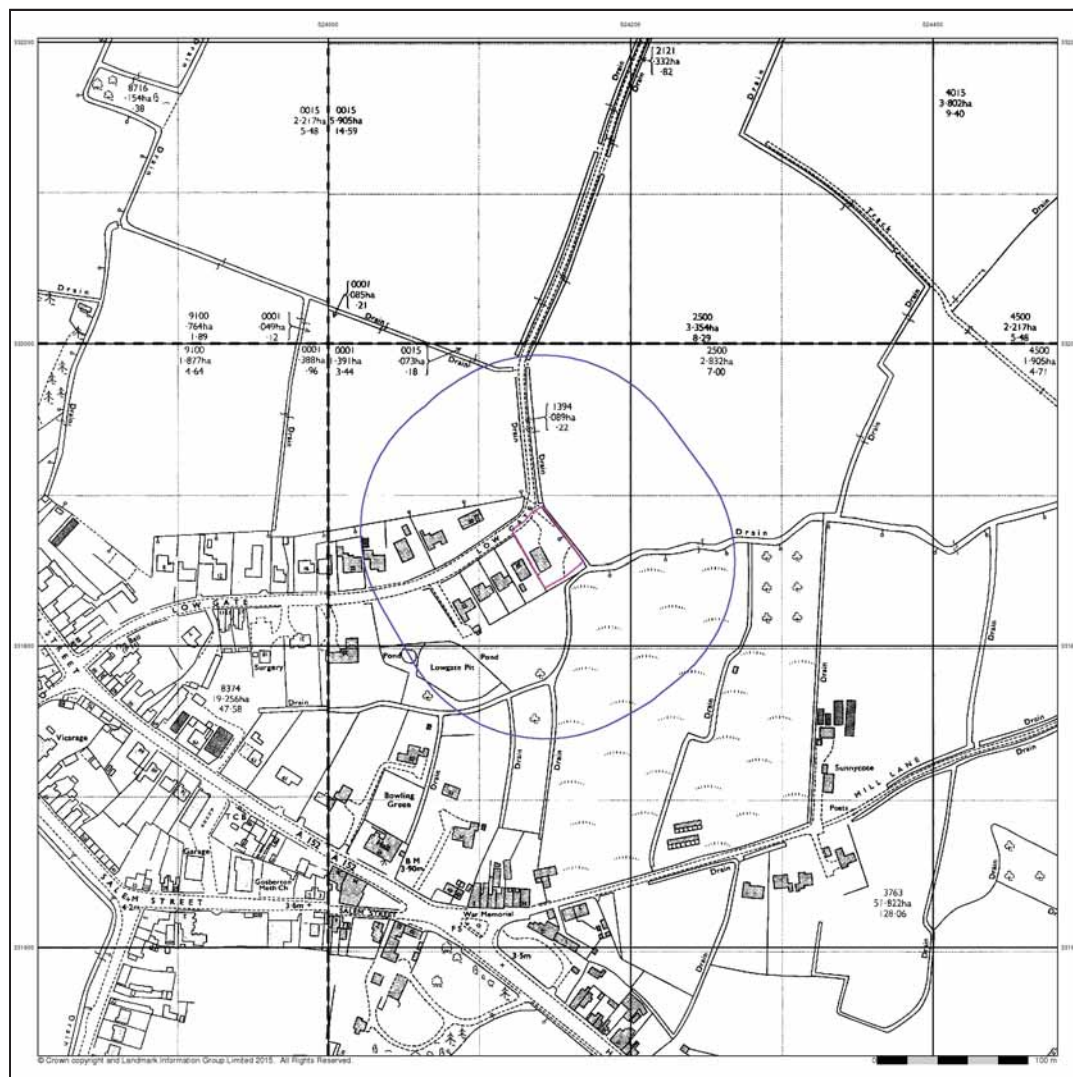
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Ordnance Survey Plan

Published 1973

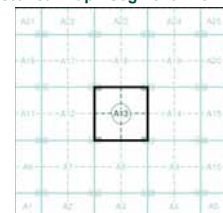
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1886 it covered the whole of what were considered 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)

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TF2331	1973	12.300	TF2431	1973	12.500

Historical Map - Segment A13



Order Details

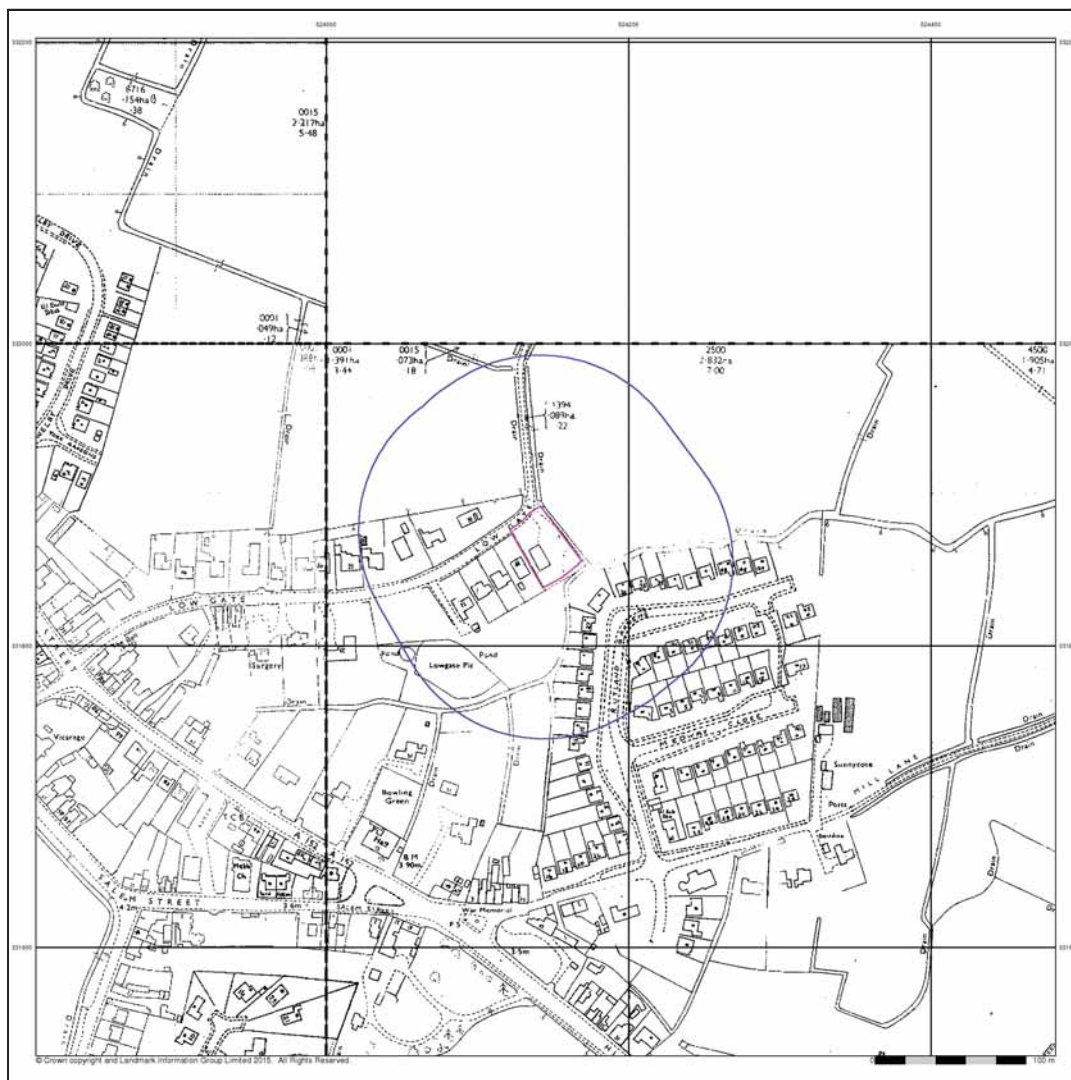
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 Customer Ref: R16008
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Site Details

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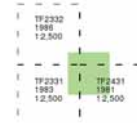
Additional SIMs

Published 1981 - 1986

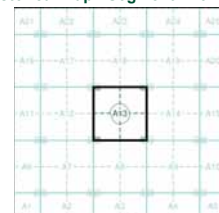
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The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. 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

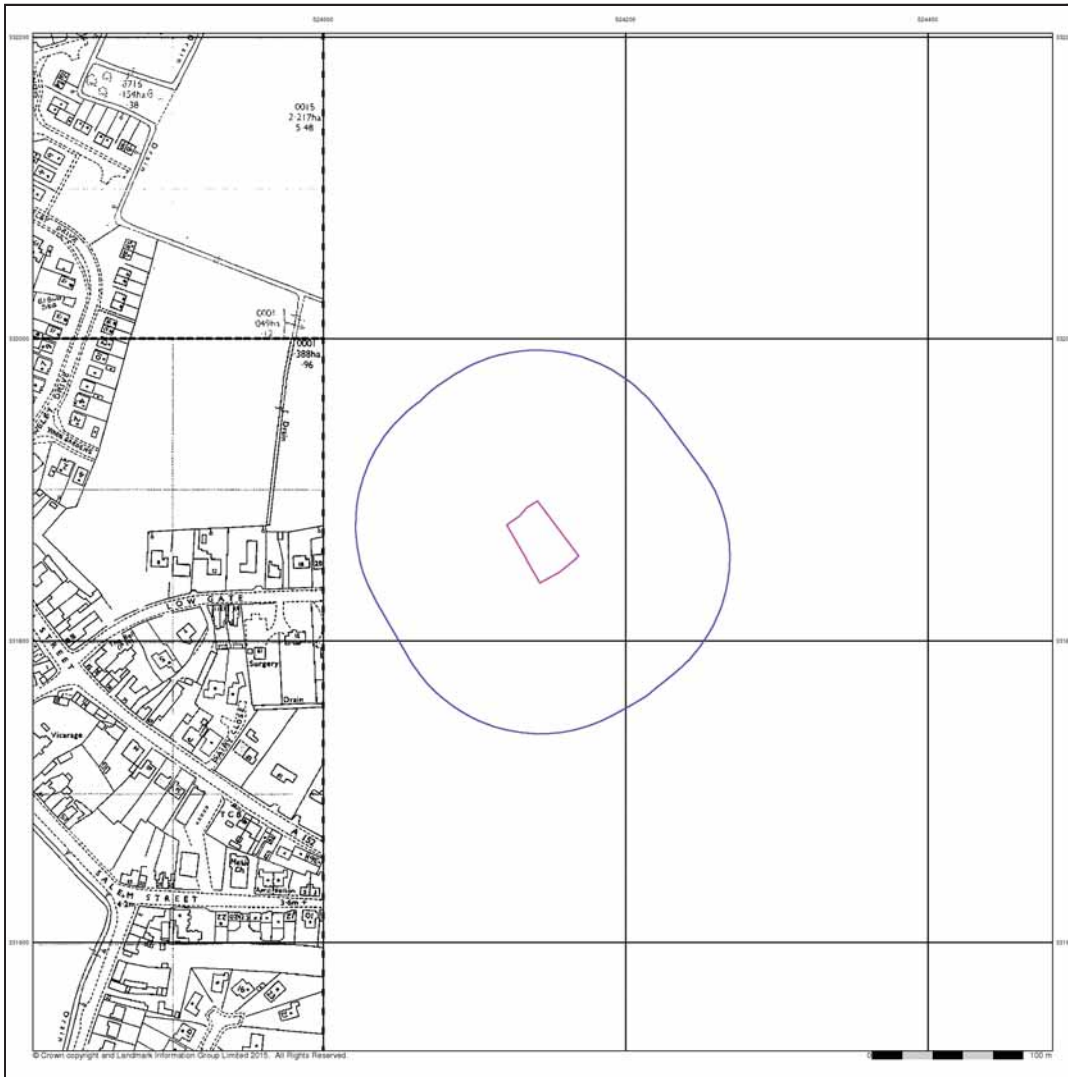
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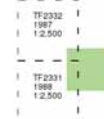
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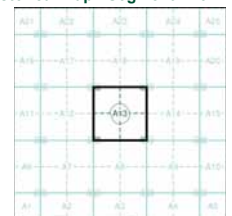
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The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



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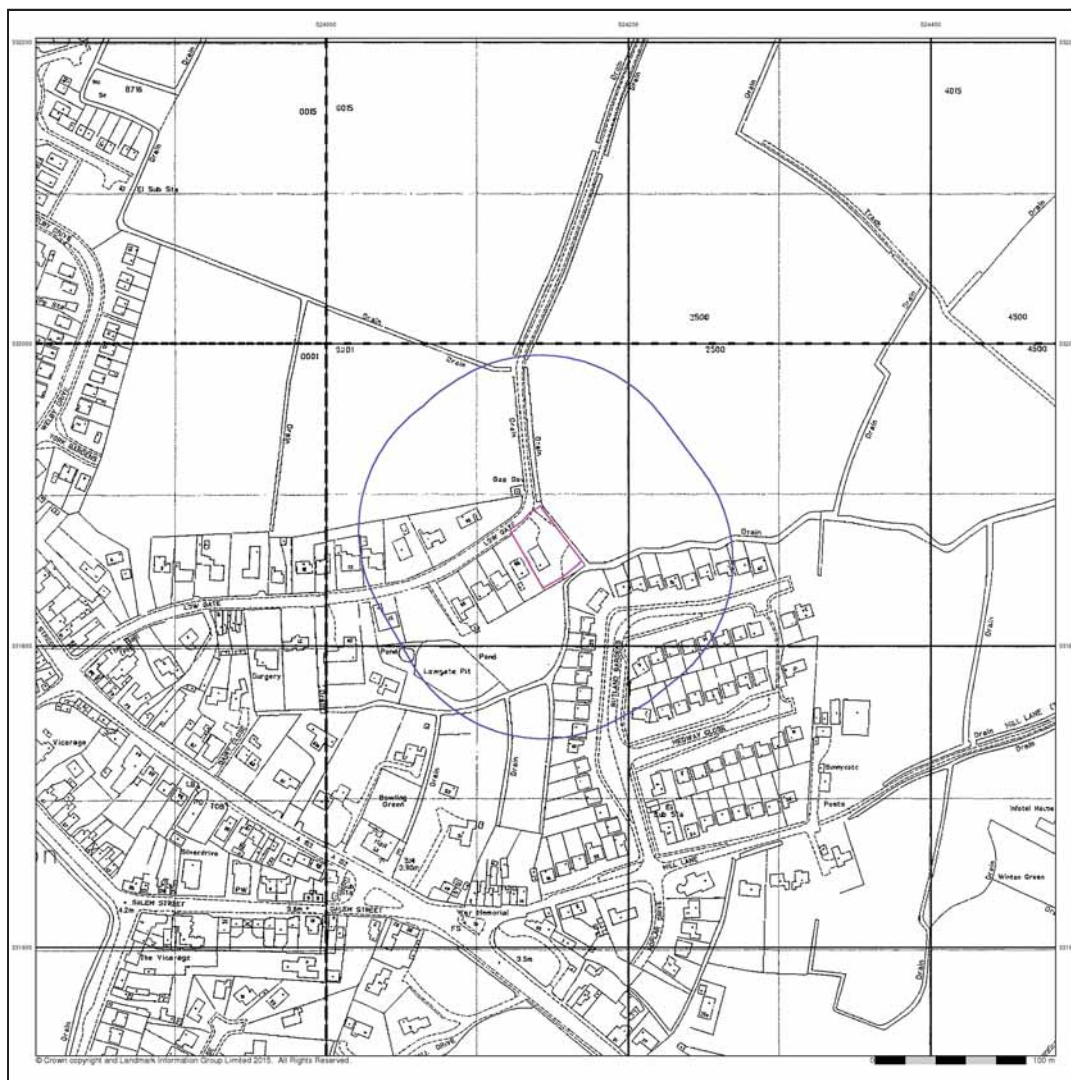
Order Number: 86654240_1_1
 Customer Ref: R16008
 National Grid Reference: 524140, 331870
 Slice: A
 Site Area (Ha): 0.13
 Search Buffer (m): 100

Site Details

Site at, Gosberton, Lincolnshire



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Large-Scale National Grid Data

Published 1995

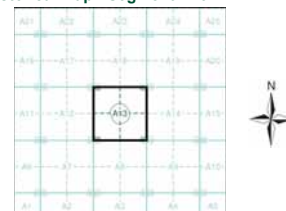
Source map scale - 1:2,500

'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 forerunners 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)

TF2332	TF2432
1995	1995
12,500	12,500
TF2331	TF2431
1995	1995
12,500	12,500

Historical Map - Segment A13



Order Details

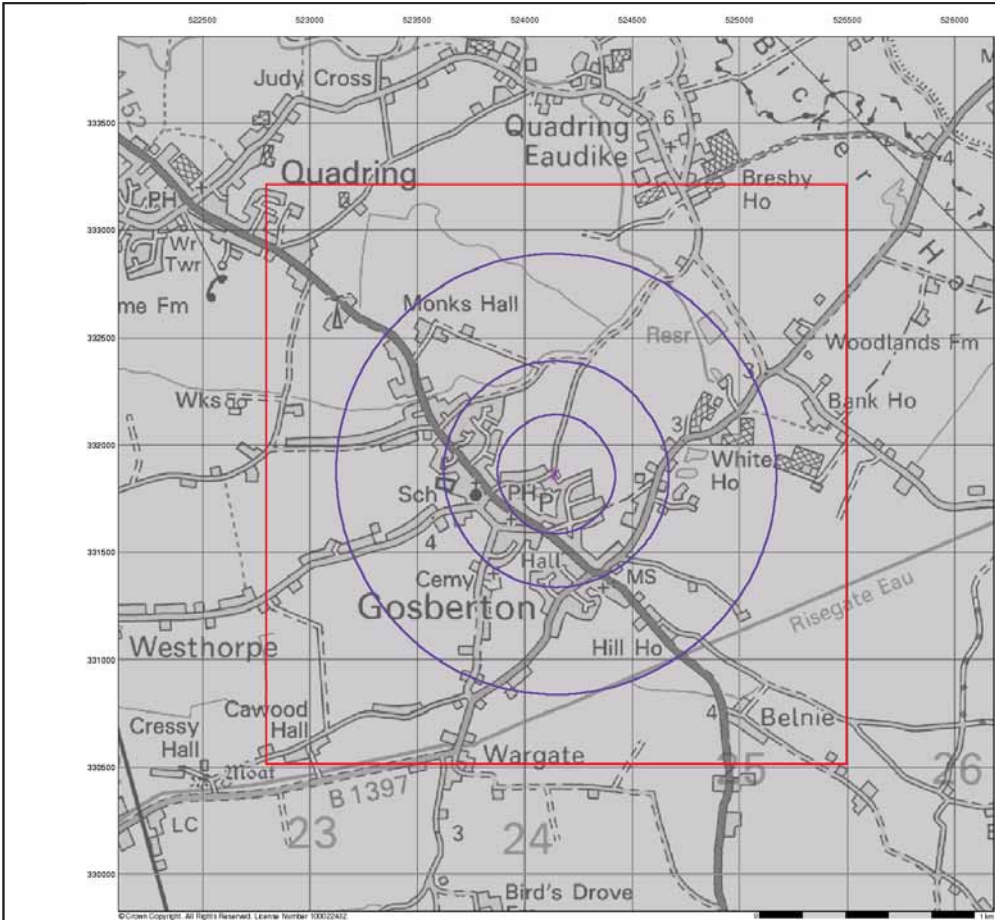
Order Number: 86654240_1_1
 Customer Ref: R16008
 National Grid Reference: 524140, 331870
 Slice: A
 Site Area (Ha): 0.13
 Search Buffer (m): 100

Site Details

Site at, Gosberton, Lincolnshire



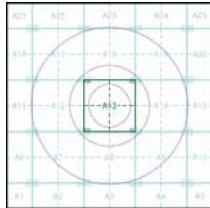
Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk



Bedrock Aquifer Designation

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

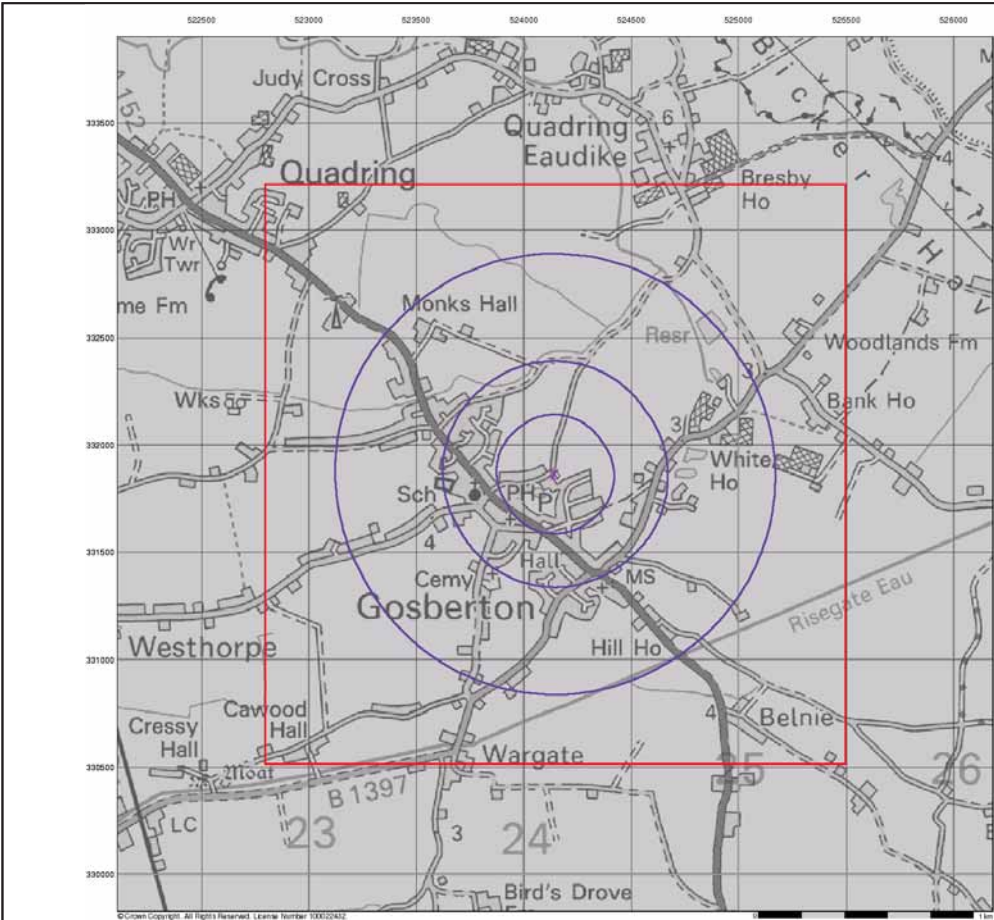
Order Number: 86654240_1_1
 Customer Ref: R16008
 National Grid Reference: 524140, 331870
 Slice: A
 Site Area (Ha): 0.13
 Search Buffer (m): 1000

Site Details

Site at: Gosberton, Lincolnshire



Tel: 0844 844 9952
 Fax: 0844 844 9953
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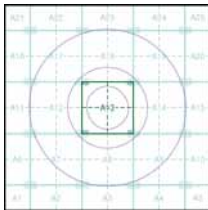
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Superficial Aquifer Designation

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

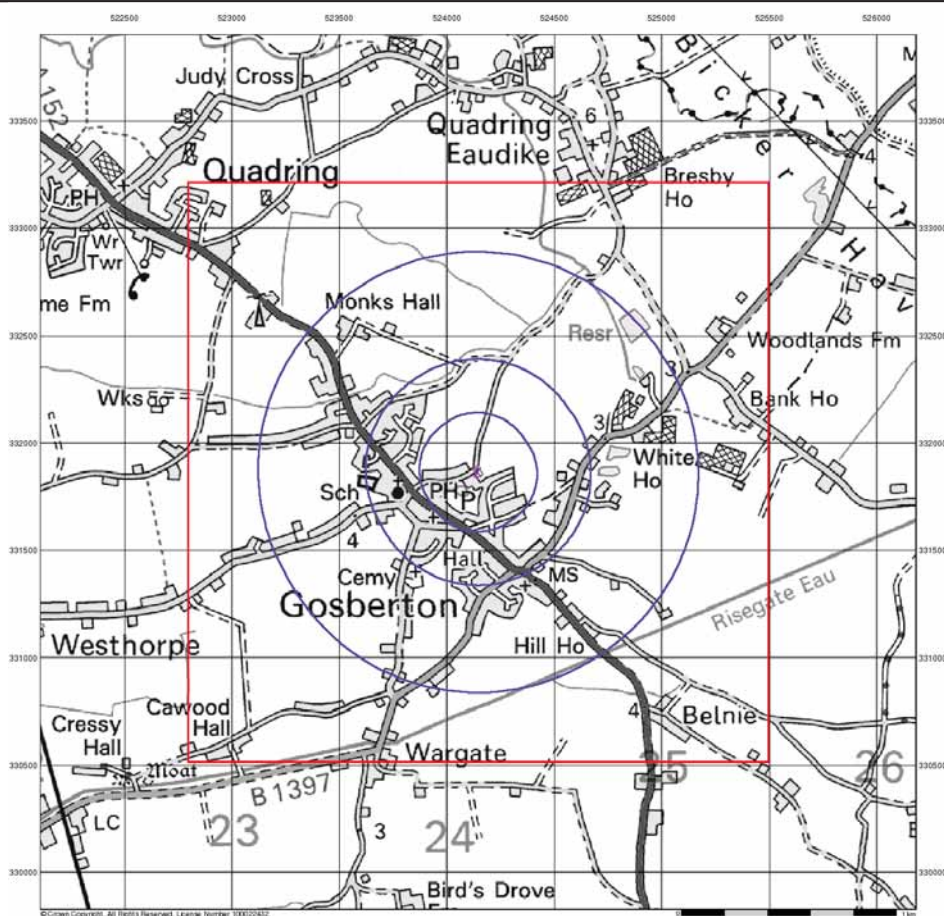
Order Number: 86654240_1_1
Customer Ref: R16008
National Grid Reference: 524140, 331870
Slice: A
Site Area (Ha): 0.13
Search Buffer (m): 1000

Site Details

Site at: Gosberton, Lincolnshire



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Source Protection Zones

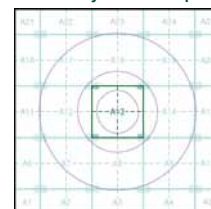
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Site
- 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)
- Source Protection Zone Borehole

Site Sensitivity Context Map - Slice A



Order Details

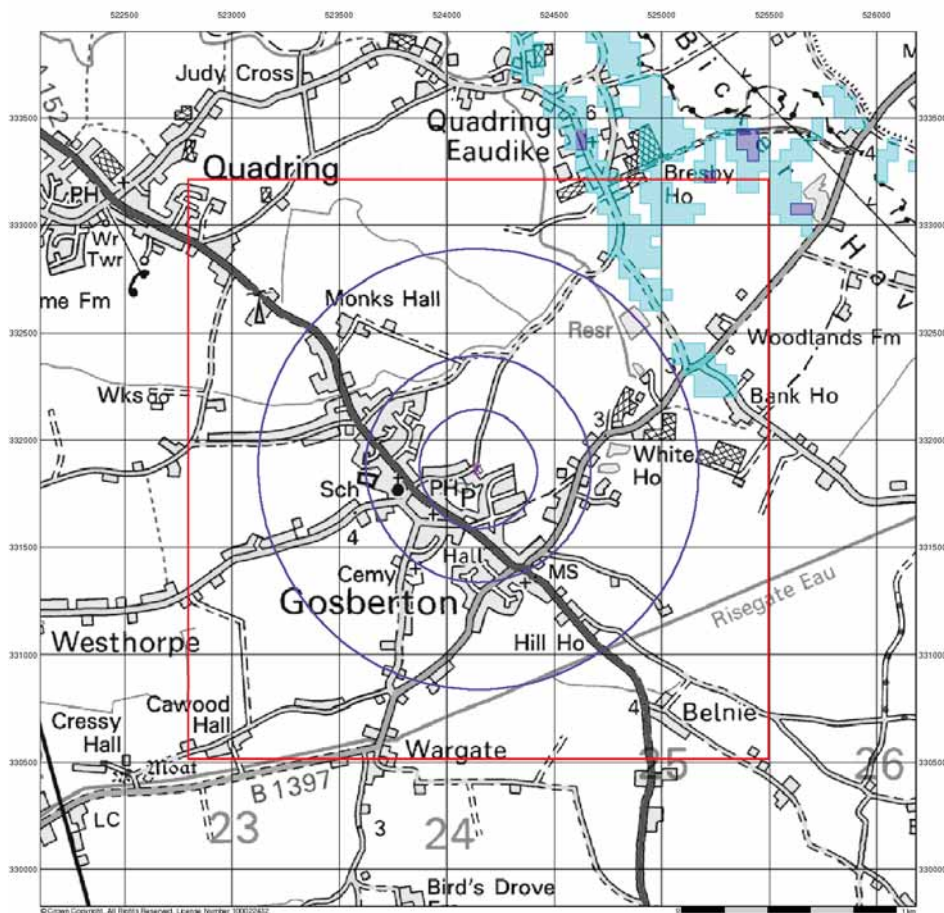
Order Number: 86654240_1_1
 Customer Ref: R16008
 National Grid Reference: 524140, 331870
 Slice: A
 Site Area (Ha): 0.13
 Search Buffer (m): 1000

Site Details

Site at: Gosberton, Lincolnshire



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BGS Flood GFS Data

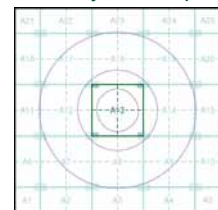
General

- 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: 86654240_1_1
 Customer Ref: R16008
 National Grid Reference: 524140, 331870
 Slice: A
 Site Area (Ha): 0.13
 Search Buffer (m): 1000

Site Details

Site at: Gosberton, Lincolnshire



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Envirocheck[®] Report:

Datasheet

Order Details:

Order Number:

86654240_1_1

Customer Reference:

R16008

National Grid Reference:

524140, 331870

Slice:

A

Site Area (Ha):

0.13

Search Buffer (m):

1000

Site Details:

Site at

Gosberton

Lincolnshire

Client Details:

Mr A Hare

Grange Geo Consulting Ltd

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Newark

Nottinghamshire

NG24 4AD

Prepared For:

Kirk Homes Ltd

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	13
Hazardous Substances	-
Geological	14
Industrial Land Use	15
Sensitive Land Use	17
Data Currency	18
Data Suppliers	22
Useful Contacts	23

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 the attached datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Report Version v50.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility					n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 1		3	4	4
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	pg 3				2
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 3	Yes			
Pollution Incidents to Controlled Waters	pg 4			3	1
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	pg 4				13 (*13)
Water Industry Act Referrals					
Groundwater Vulnerability	pg 11	Yes	n/a	n/a	n/a
Drift Deposits			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 11	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 11	Yes	n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences	pg 11	Yes	Yes	n/a	n/a
Flooding from Rivers or Sea without Defences	pg 11	Yes	Yes	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
Detailed River Network Lines					n/a
Detailed River Network Offline Drainage	pg 11		Yes	Yes	n/a

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 13	2	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Registered Landfill Sites	pg 13				1
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 14	Yes	n/a	n/a	n/a
BGS Recorded Mineral Sites	pg 14			1	
Brine Compensation Area			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				n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 14	Yes		n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 14	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 14	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 14	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 15	1	1	3	7
Fuel Station Entries	pg 16				2
Gas Pipelines					
Underground Electrical Cables					
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	pg 17	2			
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
1	Discharge Consents Operator: Medicx Properties V Limited Property Type: Domestic Property (Single) Location: Rutland Gardens No.33 Gosberton, Spalding, Lincs, Pe11 4hr Authority: Environment Agency, Anglian Region Catchment Area: Low River Welland (Spalding) Reference: Pmnf18877 Permit Version: 1 Effective Date: 4th February 2008 Issued Date: 28th January 2008 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Unnamed Tributary Of River Wed 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	A13SE (E)	32	2	524200 331860
2	Discharge Consents Operator: Mrs D E W Buckley Property Type: Not Supplied Location: Dwellinghouse At Low Gate, Gosberton, Spalding Authority: Environment Agency, Anglian Region Catchment Area: Not Supplied Reference: Pr5lf3598 Permit Version: 1 Effective Date: 15th May 1979 Issued Date: 15th May 1979 Revocation Date: 1st October 1996 Discharge Type: Unknown Discharge: Onto Land Environment: Receiving Water: Land Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989 Positional Accuracy: Located by supplier to within 100m	A13SW (SW)	58	2	524100 331800
3	Discharge Consents Operator: Anthony And Katherine J. Armstrong Property Type: Not Supplied Location: Nursery On Mill Lane, Gosberton, Spalding Authority: Environment Agency, Anglian Region Catchment Area: Not Supplied Reference: Pr5lf5094 Permit Version: 1 Effective Date: 31st October 1985 Issued Date: 31st October 1985 Revocation Date: 1st October 1996 Discharge Type: Unknown Discharge: Onto Land Environment: Receiving Water: Land Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989 Positional Accuracy: Located by supplier to within 10m	A13SE (E)	206	2	524360 331780
4	Discharge Consents Operator: Mr & Mrs D Cordner Property Type: Domestic Property (Single) Location: Infotel House Boston Road, Gosberton, Spalding, Lincolnshire, Pe11 4nu Authority: Environment Agency, Anglian Region Catchment Area: Low River Welland (Spalding) Reference: Pmnf12923 Permit Version: 1 Effective Date: 6th March 2003 Issued Date: 18th March 2003 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Tributary Of Risegate Eau 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	A13SE (SE)	341	2	524440 331650

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
5	Discharge Consents Operator: Mr. G.J. Sharples Property Type: Not Supplied Location: House At Boston Road Gosberton, Spalding, Lincs Authority: Environment Agency, Anglian Region Catchment Area: Not Supplied Reference: Pr5lf3844 Permit Version: 1 Effective Date: 10th August 1982 Issued Date: 10th August 1982 Revocation Date: 1st October 1996 Discharge Type: Unknown Discharge: Onto Land Environment: Receiving Water: Land Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989 Positional Accuracy: Located by supplier to within 10m	A13SE (SE)	403	2	524480 331600
6	Discharge Consents Operator: Mr D Williamson Property Type: Domestic Property (Single) Location: Bow House Boston Road, Gosberton, Spalding, Lincolnshire, Pe11 4nr Authority: Environment Agency, Anglian Region Catchment Area: Low River Welland (Spalding) Reference: Prmnf18084 Permit Version: 1 Effective Date: 15th December 2003 Issued Date: 23rd December 2003 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Trib Of Risegate Eau 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	A14SW (E)	415	2	524560 331720
7	Discharge Consents Operator: Mr G Sharples Property Type: Domestic Property (Single) Location: April Rise Boston Road, Gosberton, Spalding, Lincolnshire, Pe11 4nr Authority: Environment Agency, Anglian Region Catchment Area: Low River Welland (Spalding) Reference: Prmnf12472 Permit Version: 1 Effective Date: 17th August 2000 Issued Date: 1st September 2000 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Tributary Of Risegate Eau 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	A13SE (SE)	416	2	524450 331550
8	Discharge Consents Operator: Mr R Westlake Property Type: Domestic Property (Single) Location: Mataver House Boston Road, Gosberton, Spalding, Lincolnshire, Pe11 4nu Authority: Environment Agency, Anglian Region Catchment Area: Low River Welland (Spalding) Reference: Prmnf18053 Permit Version: 1 Effective Date: 3rd October 2003 Issued Date: 9th October 2003 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Trib Of Risegate Eau Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 100m	A14NW (E)	551	2	524700 332000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	Discharge Consents Operator: Gosberton Farm Produce Ltd Property Type: Not Supplied Location: Quadring Road Gosberton, Spalding, Lincs, Pe11 4nb Authority: Environment Agency, Anglian Region Catchment Area: Not Given Reference: Pmnf01235 Permit Version: 1 Effective Date: 19th July 1989 Issued Date: 19th July 1989 Revocation Date: 19th September 1996 Discharge Type: Discharge Of Other Matter-Surface Water Into And/Or Watercourse Environment: Unnamed Watercourse Receiving Water: Unnamed Watercourse Status: Post National Rivers Authority Legislation where issue date > 31/08/1989 Positional Accuracy: Located by supplier to within 100m	A12NW (NW)	746	2	523450 332200
10	Discharge Consents Operator: Monks Hall Farms Ltd Property Type: Arable Farming Location: Monks Hall Gosberton, Spalding, Lincs, Pe11 4nb Authority: Environment Agency, Anglian Region Catchment Area: Catchment 29 Unknown Detail Reference: Gwnlf40313 Permit Version: 1 Effective Date: 1st April 1999 Issued Date: 11th July 2000 Revocation Date: Not Supplied Discharge Type: Trade Discharge - Agricultural And Surface Discharge: Onto Land Environment: Groundwater Receiving Water: Groundwater Status: Deemed Groundwater Regulations Authorisation Positional Accuracy: Located by supplier to within 100m	A17NE (NW)	891	2	523600 332600
11	Discharge Consents Operator: Christopher Ernest Clark Property Type: Arable Farming Location: Beech Tree Farm 73 Westhorpe Road, Gosberton, Spalding, Lincolnshire, Pe11 4en Authority: Environment Agency, Anglian Region Catchment Area: Catchment 29 Unknown Detail Reference: Gwnlf40037 Permit Version: 1 Effective Date: 1st April 1999 Issued Date: 7th July 2000 Revocation Date: Not Supplied Discharge Type: Trade Discharge - Agricultural And Surface Discharge: Onto Land Environment: Groundwater Receiving Water: Groundwater Status: Deemed Groundwater Regulations Authorisation Positional Accuracy: Located by supplier to within 10m	A7NW (SW)	942	2	523310 331400
12	Local Authority Pollution Prevention and Controls Name: Wheel Rite Location: Spalding Road, Gosberton, SPALDING, Lincolnshire, PE11 4HL Authority: South Holland District Council, Environmental Services Permit Reference: Not Supplied Dated: Not Supplied Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station Status: Not Supplied Positional Accuracy: Automatically positioned to the address	A8NE (SE)	509	3	524356 331377
12	Local Authority Pollution Prevention and Controls Name: Ken Cars Location: Spalding Road, Gosberton, Spalding, Lincolnshire, PE11 4HL Authority: South Holland District Council, Environmental Services Permit Reference: Not Supplied Dated: Not Supplied Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station Status: Not Supplied Positional Accuracy: Automatically positioned to the address	A8NE (SE)	509	3	524356 331377
	Nearest Surface Water Feature	A13SE (SE)	0	-	524159 331848

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
13	Pollution Incidents to Controlled Waters Property Type: Not Given Location: Spalding District Authority: Environment Agency, Anglian Region Pollutant: Unknown Note: Not Supplied Incident Date: 6th June 1992 Incident Reference: 1343 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A12SE (SW)	419	2	523800 331600
14	Pollution Incidents to Controlled Waters Property Type: Not Given Location: Spalding District Authority: Environment Agency, Anglian Region Pollutant: Unknown Note: Main Drain Incident Date: 17th November 1993 Incident Reference: 1697 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18SW (N)	432	2	524000 332300
15	Pollution Incidents to Controlled Waters Property Type: Not Given Location: Spalding District Authority: Environment Agency, Anglian Region Pollutant: Unknown Note: Dyke Near A16 Incident Date: 27th April 1992 Incident Reference: 1307 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A9NW (SE)	487	2	524500 331500
16	Pollution Incidents to Controlled Waters Property Type: Not Given Location: Spalding District Authority: Environment Agency, Anglian Region Pollutant: Unknown Note: Dyke Incident Date: 23rd March 1993 Incident Reference: 1534 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A14SW (SE)	590	2	524700 331600
17	Water Abstractions Operator: R Bratley (Quadrang) Ltd Licence Number: 5/31/14/*S/0230 Permit Version: 101 Location: Coll Drain C At Quadrang Authority: Environment Agency, Anglian Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 October Permit Start Date: 21st July 1999 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17SE (NW)	564	2	523750 332300

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
17	Water Abstractions Operator: R Bratley (Quadrang) Ltd Licence Number: 5/31/14/*s/230 Permit Version: Not Supplied Location: Coll Drain, QUADRING, Lincolnshire Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 46 Yearly Rate (m3): 750000 Details: Status: Time Limit Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17SE (NW)	564	2	523750 332300
18	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 102 Location: Zigzag Drain, Gosberton-Point R Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 March Authorised End: 31 October Permit Start Date: 10th January 2014 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14SE (E)	881	2	525021 331633
18	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 102 Location: Zigzag Drain, Gosberton-Point R Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 November Authorised End: 31 March Permit Start Date: 10th January 2014 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14SE (E)	881	2	525021 331633
18	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 101 Location: Zigzag Drain, Gosberton-Point R Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 March Authorised End: 31 October Permit Start Date: 28th September 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14SE (E)	881	2	525021 331633

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
19	Water Abstractions Operator: R Bratley (Quadrang) Ltd Licence Number: 5/31/14/*s/230 Permit Version: Not Supplied Location: Marlode Drain, QUADRING, Lincolnshire Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Surface Daily Rate (m3): 46 Yearly Rate (m3): 750000 Details: Status: Time Limit Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A19SW (NE)	893	2	524800 332495
19	Water Abstractions Operator: R Bratley (Quadrang) Ltd Licence Number: 5/31/14/*S/0230 Permit Version: 102 Location: Marlode Drain At Quadrang Spalding Authority: Environment Agency, Anglian Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Quadrang Spalding Lincs Authorised Start: 01 April Authorised End: 31 October Permit Start Date: 30th June 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A19SW (NE)	896	2	524800 332500
19	Water Abstractions Operator: R Bratley (Quadrang) Ltd Licence Number: 5/31/14/*S/0230 Permit Version: 102 Location: Marlode Drain At Quadrang Authority: Environment Agency, Anglian Region Abstraction: General Agriculture: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Quadrang Spalding Lincs Authorised Start: 01 January Authorised End: 31 March Permit Start Date: 30th June 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A19SW (NE)	896	2	524800 332500
19	Water Abstractions Operator: R Bratley (Quadrang) Ltd Licence Number: 5/31/14/*S/0230 Permit Version: 101 Location: Marlode Drain At Quadrang Authority: Environment Agency, Anglian Region Abstraction: General Agriculture: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Status: Temporary Authorised Start: 01 January Authorised End: 31 March Permit Start Date: 1st January 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A19SW (NE)	896	2	524800 332500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
19	Water Abstractions Operator: R Bratley (Quadrang) Ltd Licence Number: 5/31/14/*s/230 Permit Version: Not Supplied Location: Marlode Drain, QUADRING, Lincolnshire Authority: Environment Agency, Anglian Region Abstraction: Recirculating/Compound Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 46 Yearly Rate (m3): 750000 Details: Status: Time Limit Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A19SW (NE)	897	2	524805 332495
20	Water Abstractions Operator: R Bratley (Quadrang) Ltd Licence Number: 5/31/14/*S/0230 Permit Version: 102 Location: Riseigate Eau D - E At Quadrang Authority: Environment Agency, Anglian Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Quadrang Spalding Lincs Authorised Start: 01 April Authorised End: 31 October Permit Start Date: 30th June 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A9SW (SE)	986	2	524710 331030
20	Water Abstractions Operator: R Bratley (Quadrang) Ltd Licence Number: 5/31/14/*S/0230 Permit Version: 101 Location: Riseigate Eau D - E At Quadrang Authority: Environment Agency, Anglian Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 October Permit Start Date: 21st July 1999 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A9SW (SE)	986	2	524710 331030
20	Water Abstractions Operator: R Bratley (Quadrang) Ltd Licence Number: 5/31/14/*s/230 Permit Version: Not Supplied Location: Riseigate Eau, QUADRING, Lincolnshire Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 46 Yearly Rate (m3): 750000 Details: Status: Time Limit Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A9SW (SE)	986	2	524710 331030

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*s/169 Permit Version: Not Supplied Location: Risegate Eau , GOSBERTON Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 100 Yearly Rate (m3): 6000000 Details: Status: Perpetuity Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A9SW (SE)	1006	2	524700 331000
	Water Abstractions Operator: R Bratley (Quadrang) Ltd Licence Number: 5/31/14/*S/0230 Permit Version: 102 Location: Coll Drain At Quadrang Spadling Authority: Environment Agency, Anglian Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Quadrang Spalding Lincs Authorised Start: 01 April Authorised End: 31 October Permit Start Date: 30th June 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A19NW (NE)	1053	2	524636 332822
	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 102 Location: Risegate Eau, Gosberton-Point F Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 March Authorised End: 31 October Permit Start Date: 10th January 2014 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A2NE (S)	1316	2	523700 330600
	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 102 Location: Risegate Eau, Gosberton-Point F Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 November Authorised End: 31 March Permit Start Date: 10th January 2014 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A2NE (S)	1316	2	523700 330600

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 101 Location: Risegate Eau, Gosberton-Point F Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 March Authorised End: 31 October Permit Start Date: 28th September 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A2NE (S)	1316	2	523700 330600
	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 100 Location: Risegate Eau, Gosberton Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Status: Perpetuity Authorised Start: 01 March Authorised End: 31 October Permit Start Date: 1st January 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A2NE (S)	1316	2	523700 330600
	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 102 Location: Risegate Eau, Gosberton-Point S Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 March Authorised End: 31 October Permit Start Date: 10th January 2014 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A10NE (E)	1581	2	525700 331465
	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 102 Location: Risegate Eau, Gosberton-Point S Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 November Authorised End: 31 March Permit Start Date: 10th January 2014 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A10NE (E)	1581	2	525700 331465

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 101 Location: Risegate Eau, Gosberton-Point S Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 March Authorised End: 31 October Permit Start Date: 28th September 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A10NE (E)	1581	2	525700 331465
	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 102 Location: Farm Drains-Gosberton-Point K Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 March Authorised End: 31 October Permit Start Date: 10th January 2014 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A1SE (SW)	1898	2	522876 330426
	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 102 Location: Farm Drains-Gosberton-Point K Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 November Authorised End: 31 March Permit Start Date: 10th January 2014 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A1SE (SW)	1898	2	522876 330426
	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 101 Location: Farm Drains-Gosberton-Point K Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 March Authorised End: 31 October Permit Start Date: 28th September 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A1SE (SW)	1898	2	522876 330426

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Geest Industries Ltd Licence Number: 5/31/14/*g/001 Permit Version: Not Supplied Location: Bore, Town Drove, QUADRING Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Well And Borehole Daily Rate (m3): 0 Yearly Rate (m3): 22730 Details: South Lincolnshire Limestone; Status: Revoked Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(W)	1926	2	522200 332000
	Groundwater Vulnerability Soil Classification: Not classified Map Sheet: Sheet 24 North Northamptonshire Scale: 1:100,000	A13SW (NW)	0	2	524144 331865
	Drift Deposits None				
	Bedrock Aquifer Designations Aquifer Designation: Unproductive Strata	A13SW (NW)	0	1	524144 331865
	Superficial Aquifer Designations Aquifer Designation: Unproductive Strata	A13SW (NW)	0	1	524144 331865
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial/Tidal Models Boundary Accuracy: As Supplied	A13SW (NW)	0	2	524144 331865
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13SW (S)	0	2	524144 331865
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13NE (N)	68	2	524166 331956
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13SW (NW)	0	2	524144 331865
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13NE (N)	205	2	524216 332083
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
	Detailed River Network Lines None				
21	Detailed River Network Offline Drainage River Type: Tertiary River Hydrographic Area: D005	A13NW (N)	16	2	524130 331904
22	Detailed River Network Offline Drainage River Type: Tertiary River Hydrographic Area: D005	A13SW (SW)	107	2	524093 331745
23	Detailed River Network Offline Drainage River Type: Tertiary River Hydrographic Area: D005	A13SW (S)	158	2	524110 331685

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
24	Detailed River Network Offline Drainage River Type: Tertiary River Hydrographic Area: D005	A13NE (NE)	295	2	524411 332025
25	Detailed River Network Offline Drainage River Type: Tertiary River Hydrographic Area: D005	A13SE (SE)	318	2	524438 331687
26	Detailed River Network Offline Drainage River Type: Tertiary River Hydrographic Area: D005	A13SE (SE)	332	2	524404 331622
27	Detailed River Network Offline Drainage River Type: Tertiary River Hydrographic Area: D005	A13SE (SE)	342	2	524439 331648
28	Detailed River Network Offline Drainage River Type: Tertiary River Hydrographic Area: D005	A8NE (SE)	374	2	524325 331512
29	Detailed River Network Offline Drainage River Type: Tertiary River Hydrographic Area: D005	A8NE (SE)	460	2	524434 331480

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Local Authority Landfill Coverage Name: South Holland District Council - Has no landfill data to supply		0	3	524144 331865
	Local Authority Landfill Coverage Name: Lincolnshire County Council - Had landfill data but passed it to the relevant environment agency		0	4	524144 331865
30	Registered Landfill Sites Licence Holder: A L Carter Licence Reference: L 73 Site Location: Old Pond, Bowgate, Gosberton, Spalding, Lincolnshire Licence Easting: 523090 Licence Northing: 332020 Operator Location: 57 Bowgate, Gosberton, Spalding, Lincolnshire Authority: Environment Agency - Anglian Region, Northern Area Site Category: Landfill Max Input Rate: Small (Equal to or greater than 10,000 and less than 25,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st January 1988 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the road within the address or location Boundary Accuracy: Not Applicable Authorised Waste: Lincs Cat. A -Sol.Inert * Prohibited Waste: Poisonous, Noxious, Polluting Wastes	A12NW (W)	942	2	523189 332006

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Kellaways Formation And Oxford Clay Formation (Undifferentiated)	A13SW (NW)	0	1	524144 331865
31	BGS Recorded Mineral Sites Site Name: Gosberton Brick & Tile Works Location: , Gosberton, Boston, Lincolnshire Source: British Geological Survey, National Geoscience Information Service Reference: 134972 Type: Opencast Status: Ceased Operator: Not Supplied Operator Location: Not Supplied Periodic Type: Jurassic Geology: Oxford Clay Formation Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A14NW (E)	481	1	524649 331870
	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: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (NW)	0	1	524144 331865
	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SW (NW)	0	1	524144 331865
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (NW)	0	1	524144 331865
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (NW)	0	1	524144 331865
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SW (NW)	0	1	524144 331865
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (NW)	0	1	524144 331865
	Radon Potential - Radon Affected Areas Affected Area: The property is in a lower probability radon area, as less than 1% of homes are above the action level Source: British Geological Survey, National Geoscience Information Service	A13SW (NW)	0	1	524144 331865
	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	A13SW (NW)	0	1	524144 331865

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
32	Contemporary Trade Directory Entries Name: A W & W G Waterfall Location: 41, Lowgate, Gosberton, Spalding, Lincolnshire, PE11 4NL Classification: Car Body Repairs Status: Inactive Positional Accuracy: Automatically positioned to the address	A13SW (S)	0	-	524142 331854
33	Contemporary Trade Directory Entries Name: Gillick Location: 2, Mill Lane, Gosberton, SPALDING, Lincolnshire, PE11 4NN Classification: Joinery Manufacturers Status: Inactive Positional Accuracy: Automatically positioned to the address	A13SW (S)	206	-	524095 331639
34	Contemporary Trade Directory Entries Name: Silverdrive Location: Salem Street, Gosberton, Spalding, Lincolnshire, PE11 4NQ Classification: Electric Motor Sales & Service Status: Inactive Positional Accuracy: Automatically positioned to the address	A13SW (SW)	272	-	523941 331658
35	Contemporary Trade Directory Entries Name: Loc King Location: Church St, Gosberton, Spalding, Lincolnshire, PE11 4NF Classification: Safes & Vaults - Suppliers & Installers Status: Inactive Positional Accuracy: Manually positioned to the road within the address or location	A12SE (W)	362	-	523762 331834
36	Contemporary Trade Directory Entries Name: Discount Motors Location: 17, High Street, Gosberton, Spalding, Lincolnshire, PE11 4NW Classification: Car Dealers - Used Status: Active Positional Accuracy: Automatically positioned to the address	A8NE (S)	381	-	524269 331479
37	Contemporary Trade Directory Entries Name: Ken Kars Location: Spalding Road, Gosberton, Spalding, Lincolnshire, PE11 4HL Classification: Petrol Filling Stations Status: Inactive Positional Accuracy: Automatically positioned to the address	A8NE (SE)	509	-	524356 331377
37	Contemporary Trade Directory Entries Name: Cpl Distribution Location: 3, Spalding Road, Gosberton, Spalding, Lincolnshire, PE11 4NP Classification: Coal & Smokeless Fuel Merchants & Distributors Status: Inactive Positional Accuracy: Automatically positioned to the address	A8NE (SE)	547	-	524384 331347
37	Contemporary Trade Directory Entries Name: Reeves Tyre Centre Ltd Location: Spalding Road, Gosberton, Spalding, Lincolnshire, PE11 4HL Classification: Tyre Dealers Status: Active Positional Accuracy: Automatically positioned to the address	A8NE (S)	557	-	524361 331326
38	Contemporary Trade Directory Entries Name: A P Location: 3, Godfrey Avenue, Gosberton, SPALDING, Lincolnshire, PE11 4HF Classification: Crane Hire, Sales & Service Status: Inactive Positional Accuracy: Automatically positioned to the address	A8NE (S)	560	-	524262 331292
39	Contemporary Trade Directory Entries Name: Morris Site Machinery Location: Belchmire Lane, Gosberton, Spalding, Lincolnshire, PE11 4HG Classification: Generators - Sales & Service Status: Active Positional Accuracy: Manually positioned to the road within the address or location	A8NW (S)	583	-	524143 331256
39	Contemporary Trade Directory Entries Name: Sandhurst On Power Ltd Location: Belchmire Lane, Gosberton, Spalding, Lincolnshire, PE11 4HG Classification: Generators - Sales & Service Status: Inactive Positional Accuracy: Manually positioned within the geographical locality	A8NE (S)	583	-	524157 331256
40	Contemporary Trade Directory Entries Name: Utopia Prepared Ltd Location: Quadring Rd, Gosberton, Spalding, Lincolnshire, PE11 4NB Classification: Food Products - Manufacturers Status: Inactive Positional Accuracy: Manually positioned to the road within the address or location	A17SW (NW)	894	-	523436 332450

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
41	Fuel Station Entries Name: Kenkars Location: Spalding Road, Gosberton, SPALDING, Lincolnshire, PE11 4HL Brand: Obsolete Premises Type: Not Applicable Status: Obsolete Positional Accuracy: Automatically positioned to the address	A8NE (SE)	509	-	524356 331377
41	Fuel Station Entries Name: Wheel-Rite Location: Spalding Road, Gosberton, Spalding, Lincolnshire, PE11 4HL Brand: Uk Premises Type: Petrol Station Status: Open Positional Accuracy: Manually positioned to the address or location	A8NE (SE)	536	-	524382 331359

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
42	Nitrate Vulnerable Zones Name: Not Supplied Description: Surface Water Source: Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	A13SW (NW)	0	5	524144 331865
43	Nitrate Vulnerable Zones Name: Not Supplied Description: Surface Water Source: Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	A13SW (NW)	0	5	524144 331865

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices South Kesteven District Council - Environmental Health Boston Borough Council - Pollutions Section, Environmental Health South Holland District Council - Environmental Services	April 2015 February 2015 October 2013	Annual Rolling Update Annual Rolling Update Annual Rolling Update
Discharge Consents Environment Agency - Anglian Region	April 2016	Quarterly
Enforcement and Prohibition Notices Environment Agency - Anglian Region	March 2013	As notified
Integrated Pollution Controls Environment Agency - Anglian Region	October 2008	Not Applicable
Integrated Pollution Prevention And Control Environment Agency - Anglian Region	April 2016	Quarterly
Local Authority Integrated Pollution Prevention And Control South Kesteven District Council - Environmental Health Boston Borough Council - Pollutions Section, Environmental Health South Holland District Council - Environmental Services	April 2014 December 2014 October 2014	Annual Rolling Update Annual Rolling Update Annual Rolling Update
Local Authority Pollution Prevention and Controls South Kesteven District Council - Environmental Health Boston Borough Council - Pollutions Section, Environmental Health South Holland District Council - Environmental Services	April 2014 December 2014 October 2014	Annual Rolling Update Annual Rolling Update Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements South Kesteven District Council - Environmental Health Boston Borough Council - Pollutions Section, Environmental Health South Holland District Council - Environmental Services	April 2014 December 2014 October 2014	Annual Rolling Update Annual Rolling Update Annual Rolling Update
Nearest Surface Water Feature Ordnance Survey	July 2012	Quarterly
Pollution Incidents to Controlled Waters Environment Agency - Anglian Region	September 1999	Not Applicable
Prosecutions Relating to Authorised Processes Environment Agency - Anglian Region	March 2013	As notified
Prosecutions Relating to Controlled Waters Environment Agency - Anglian Region	March 2013	As notified
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 - Anglian Region - Northern Area	April 2016	Quarterly
Water Abstractions Environment Agency - Anglian Region	January 2016	Quarterly
Water Industry Act Referrals Environment Agency - Anglian Region	April 2016	Quarterly
Groundwater Vulnerability Environment Agency - Head Office	April 2015	Not Applicable
Drift Deposits Environment Agency - Head Office	January 1999	Not Applicable
Bedrock Aquifer Designations British Geological Survey - National Geoscience Information Service	August 2015	As notified

Agency & Hydrological	Version	Update Cycle
Superficial Aquifer Designations British Geological Survey - National Geoscience Information Service	August 2015	As notified
Source Protection Zones Environment Agency - Head Office	April 2016	Quarterly
Extreme Flooding from Rivers or Sea without Defences Environment Agency - Head Office	February 2016	Quarterly
Flooding from Rivers or Sea without Defences Environment Agency - Head Office	February 2016	Quarterly
Areas Benefiting from Flood Defences Environment Agency - Head Office	February 2016	Quarterly
Flood Water Storage Areas Environment Agency - Head Office	February 2016	Quarterly
Flood Defences Environment Agency - Head Office	February 2016	Quarterly
Detailed River Network Lines Environment Agency - Head Office	March 2012	Annually
Detailed River Network Offline Drainage Environment Agency - Head Office	March 2012	Annually
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
Integrated Pollution Control Registered Waste Sites Environment Agency - Anglian Region	October 2008	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries) Environment Agency - Anglian Region - Northern Area	February 2016	Quarterly
Licensed Waste Management Facilities (Locations) Environment Agency - Anglian Region - Northern Area	April 2016	Quarterly
Local Authority Landfill Coverage Boston Borough Council - Pollutions Section, Environmental Health Lincolnshire County Council South Holland District Council - Environmental Services South Kesteven District Council - Environmental Health	May 2000 May 2000 May 2000 May 2000	Not Applicable Not Applicable Not Applicable Not Applicable
Local Authority Recorded Landfill Sites Boston Borough Council - Pollutions Section, Environmental Health Lincolnshire County Council South Holland District Council - Environmental Services South Kesteven District Council - Environmental Health	June 2003 May 2000 May 2000 May 2000	Not Applicable Not Applicable Not Applicable Not Applicable
Registered Landfill Sites Environment Agency - Anglian Region - Northern Area	March 2003	Not Applicable
Registered Waste Transfer Sites Environment Agency - Anglian Region - Northern Area	March 2003	Not Applicable
Registered Waste Treatment or Disposal Sites Environment Agency - Anglian Region - Northern Area	March 2003	Not Applicable

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH) Health and Safety Executive	February 2016	Bi-Annually
Explosive Sites Health and Safety Executive	February 2016	Bi-Annually
Notification of Installations Handling Hazardous Substances (NIHHS) Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements Boston Borough Council - Planning Department South Kesteven District Council South Holland District Council Lincolnshire County Council - Highways and Planning Department	February 2016 February 2016 January 2016 June 2010	Annual Rolling Update Annual Rolling Update Annual Rolling Update Annual Rolling Update
Planning Hazardous Substance Consents Lincolnshire County Council - Highways and Planning Department Boston Borough Council - Planning Department South Kesteven District Council South Holland District Council	August 2007 February 2016 February 2016 January 2016	Annual Rolling Update Annual Rolling Update Annual Rolling Update 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	May 2016	Bi-Annually
Brine Compensation Area Cheshire Brine Subsidence Compensation Board	August 2011	Not Applicable
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	As notified
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	June 2015	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	As notified
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	As notified

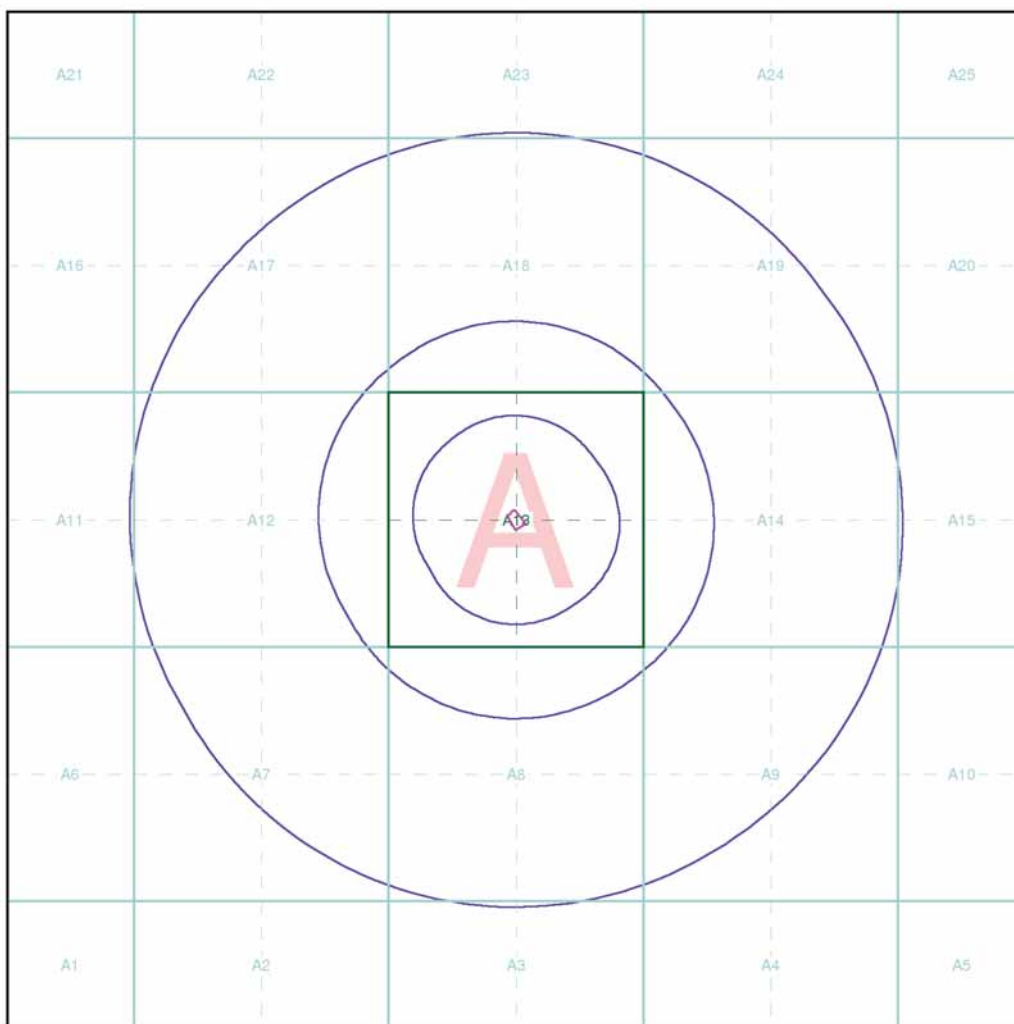
Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries Thomson Directories	March 2016	Quarterly
Fuel Station Entries Catalist Ltd - Experian	February 2016	Quarterly
Gas Pipelines National Grid	July 2014	Quarterly
Underground Electrical Cables National Grid	January 2016	Bi-Annually
Sensitive Land Use	Version	Update Cycle
Ancient Woodland Natural England	June 2015	Bi-Annually
Areas of Outstanding Natural Beauty Natural England	April 2016	Bi-Annually
Environmentally Sensitive Areas Natural England	April 2016	Annually
Forest Parks Forestry Commission	April 1997	Not Applicable
Local Nature Reserves Natural England	April 2016	Bi-Annually
Marine Nature Reserves Natural England	April 2016	Bi-Annually
National Nature Reserves Natural England	April 2016	Bi-Annually
National Parks Natural England	March 2016	Bi-Annually
Nitrate Sensitive Areas Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	April 2016	Not Applicable
Nitrate Vulnerable Zones Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	October 2015	Annually
Ramsar Sites Natural England	April 2016	Bi-Annually
Sites of Special Scientific Interest Natural England	April 2016	Bi-Annually
Special Areas of Conservation Natural England	April 2016	Bi-Annually
Special Protection Areas Natural England	April 2016	Bi-Annually
World Heritage Sites English Heritage - National Monument Record Centre	September 2015	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 NATURAL ENVIRONMENT RESEARCH COUNCIL
Centre for Ecology and Hydrology	 Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Peter Brett Associates	

Contact	Name and Address	Contact Details
1	British Geological Survey - Enquiry Service British Geological Survey, Kingsley Dunham 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	South Holland District Council - Environmental Services Council Offices, Priory Road, Spalding, Lincolnshire, PE11 2XE	Website: www.sholland.gov.uk
4	Lincolnshire County Council 4th Floor, City Hall, Lincoln, Lincolnshire, LN1 1DN	Telephone: 01522 552222 Fax: 01522 552288 Email: PublicRelations@lincolnshire.gov.uk Website: www.lincolnshire.gov.uk
5	Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA) Government Buildings, Otley Road, Lawnswood, Leeds, West Yorkshire, LS16 5QT	Telephone: 0113 2613333 Fax: 0113 230 0879
-	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.



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.

Prepared For

Kirk Homes Ltd

Client Details

Mr A Hare, Grange Geo Consulting Ltd, 43 Winchelsea Avenue, Newark, Nottinghamshire, NG24 4AD

Order Details

Order Number: 86654240_1_1
Customer Ref: R16008
National Grid Reference: 524140, 331870
Site Area (Ha): 0.13
Search Buffer (m): 1000

Site Details

Site at, Gosberton, Lincolnshire

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 D

ZETICA UXB MAP

REGIONAL UNEXPLODED BOMB RISK

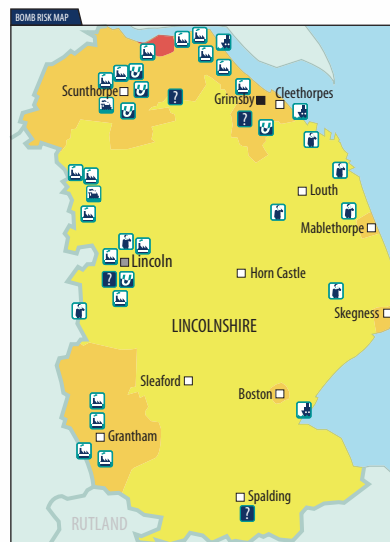
LINCOLNSHIRE

DENSITY OF BOMBS PER BOROUGH			
Borough	High explosive	Anti-personnel	Incendiary
Grimsby	335	0	162
Lincoln	25	0	7
Louth	634	0	78
Grantham	140	0	19
Skegness	98	0	7
Cleethorpes	69	0	27
Horncastle	305	0	8
Mablethorpe	51	0	27
Boston	257	0	8



BOMB TONNAGE	
>1000	Dark grey square
>500	Medium grey square
>100	Light grey square
> 0	White square
unverified	White square with border

BOMB RISK	
high	Red square
moderate	Orange square
low	Yellow square



The information in this regional UXB risk map is derived from a number of sources and should be read in conjunction with the "Users Guide" (printed overleaf). Zetica cannot guarantee the accuracy or completeness of the information or data.

This map covers regions of coast with beaches, estuaries and allie. Further consideration of the bomb risk is required in these areas. The often inaccessible nature and changing ground conditions (e.g. movement of silt that may contain ordnance) means that historical bombing records for these areas are often poor or inaccurate and further assessment of the bomb risk may be required as part of a site specific study.

A FOUR-STEP PROCESS



Risk assessment and method statement from a qualified explosive ordnance clearance (EOC) operative.



Surface geophysical survey to allow shallow groundwork.



MAGCON detects UXBs and obstructions on piling layout to the no-risk depth.



Detected UXBs can be dealt with by our EOC engineers and a Clearance Certificate issued for the site.

zetica

For more details on this and related services, telephone: +44 (0) 1993 886682 or visit our website: www.zetica.com

BOMB MAP USERS' GUIDE

Sources of information and explanation of bomb risk

Why?

Unexploded bombs (UXB) still present a risk to construction projects long after the end of the Second World War (WWII). UXBs often entered the ground unnoticed at high velocity and penetrated to a depth of several metres. Here they remain – vulnerable to disturbances from construction work. Beyond the depth of shallow excavation work, the greatest risk is to piling, drilling and probing crews. A piling rig could repeatedly hit a UXBs with considerable force before the crew realises an obstruction has been impacted. It could then be up to 72 hours before the detonator activates.

Who?

The responsibility for avoiding UXB risk usually lies with construction companies or house builders particularly those who are redeveloping urban sites. In addition, project engineering or environmental consultants are expected to advise their clients of a site's history. Other interested parties include those organisations whose employees are physically at most risk from intrusive works, normally piling companies, drillers or probing operators.

How?

UXB risk should be assessed for every site, but especially those in known heavily bombed areas or those situated near war-time strategic installations that were priority targets for enemy aircraft, for example, airfields. Zetica's regional bomb risk map is therefore a first point of reference from which the relative, potential abundance of UXBs can be judged. Consultants then advise their clients that an ordnance-risk desk study is required, which they may obtain from external sources. Construction companies or house builders who assess their own risk could choose to come direct to Zetica.

When?

Do not wait for the piling or drilling company to be on site before thinking about UXB risk – it will inevitably cause delays and higher costs. Request the regional bomb risk map from Zetica as soon as a site is being considered, and then use it to help you or your clients to decide if an ordnance-risk desk study is required.

Where?

Maps can be obtained for any county in England, Scotland, Wales or Northern Ireland – or for any London borough. They can help determine the areas that were most heavily bombed – but no part of the country should be considered 100% safe from UXB risk. Even remote rural areas can have a high risk if, for example, they were locations for decoy airfields or beacons that were lit to fool enemy pilots into thinking they had located a burning city that had been successfully hit by others in the raid.

How to use this regional map

This map is designed to give you an indication of the potential risk from UXBs in your area. If you are conducting work that involves excavation, piling or other disturbance of the ground, then you should use the map to identify the category of risk for your site.

The risk boundaries are a guide, compiled from data based on the political areas for which records are held; being just outside a high-risk area does not mean there is no UXB risk. You should use the map to assist in your decision of whether to investigate the UXB risk further.

Information on the regional risk remaining from UXBs in the UK

Zetica has built the largest UXB database of its kind in the UK. It includes a unique digital library of bomb census data, and maps showing key strategic points and bombing densities from the First and Second World Wars. The main sources of information include records from central government (Public Records Office), the Ministry of Defence, and the German Luftwaffe.

Using information from this database, Zetica has published maps of UXB risk on a regional, county and borough scale. The maps indicate relative degrees of UXB risk based on available records for bombing densities and known targeted areas for regions within the UK. The risk is broken down into individual boroughs, towns or cities. The data are based on the historical boroughs and are then overlaid onto the modern map. It is important to note that more-detailed research may be required for individual sites, particularly where proximity to a potential WWII target means the local risk may be higher.

High risk

Areas designated as high risk are those that show a high density of bombing hits (50+ bombs per 1000 acres) and abundant potential WWII targets. In high-risk regions, further action to mitigate UXB risk is considered essential.

Moderate risk

Moderate-risk regions are those that show a bomb density of between 11 and 50 bombs per 1000 acres and that may contain potential WWII targets. Action to mitigate the risk is considered essential, albeit more likely that a reduced scope of work is required compared with that needed for high-risk regions.

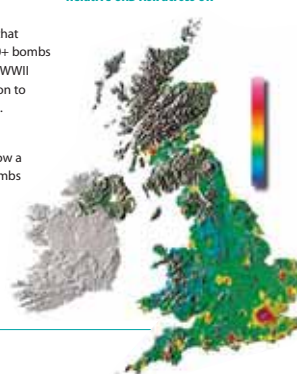
Low risk

Low-risk regions are those with a bombing density of up to 10 bombs per 1000 acres. These areas are considered to have a significant but low UXB risk. In general, further action to mitigate the risk is considered prudent, although not essential. Care is required when assessing the risk for specific sites where the risk may be higher because of local wartime activity.

Other WWII targets

Other regions with the risk of UXBs are key strategic points as defined by the government during WWII as representing potential enemy targets. Where these exist outside areas mapped as high, moderate or low risk, a site-specific assessment of the UXB risk may be required.

Relative UXB risk across UK



What to do if...

...you have a site that has a potential UXB risk

In the absence of current legislation requiring you to address the risk from UXBs, your responsibilities under health and safety legislation and regulations such as construction design and management require that you address all identified risks. The first stage is to request further advice from a professional adviser such as Zetica, or to gain more site-specific information by commissioning an ordnance-risk desk study. Then a strategy to deal with the risk can be established that is tailored to your proposed work.

...you find a suspect item or require advice

If during site works you find a suspect (ordnance-related) item, it is very important that you do not touch or move it (even if it has already been moved by an excavator). If it is clearly ordnance related, then dial 999 and ask for the police. Ensure that the area around the item is kept as clear as possible without placing yourself at risk. If you are unsure and do not wish to cause undue alarm, or you just require some advice, then you can call Zetica. We have experienced qualified UXB specialists on hand who can offer support and advice during any site works.

More-detailed procedures should be established in advance if you are in an area where the risk of finding a UXB is shown to be significant (moderate to high).

Site-specific desktop studies

Zetica is able to provide high-quality, site-specific UXB risk information for any residential, industrial or commercial property in the UK. These desktop studies provide details of the bombing density within an area and for the site itself, in order to indicate the risks of UXBs still being present. A risk assessment is provided to facilitate informed decision making on whether any further risk mitigation measures are required.

For more details on this and related services, telephone: +44 (0) 1993 886682 or visit our website: www.zetica.com

Appendix E

GRANGE GEO METHODOLOGY

RISK ASSESSMENT RATIONALE

The work presented in this report has been carried out in general accordance with recognised best practice as detailed in guidance documents such as in the CLR 11 Model Procedures (Environment Agency 2004), BS5930:2015 and BS10175:2011. Important aspects of the risk assessment process are transparency and justification. The particular rationale behind the risk assessments presented is given in this appendix.

A preliminary risk assessment is made of both geotechnical and geo-environmental hazards identified at the desk study stage and confirmed (or amended) at the ground investigation stage. This is based on a simple matrix of probability of occurrence versus the consequence, as explained below. In the case of geo-environmental hazards, the risk assessment process proceeds to the next level, the generic risk assessment, in which actual contaminant concentrations are considered.

Preliminary Risk Assessment (Geotechnical Risk Register)

The preliminary geotechnical risk register is compiled in accordance with the Highways Agency Design Manual for Roads and Bridges HD/02. This requires an estimation of the *probability* of an event happening multiplied by the *impact* or consequences of that event. Five levels of probability and impact are given scores and these are multiplied to give a risk rating and a qualitative risk level is assigned as in Table A, based on the terminology of Clayton (2001).

Table A: Geotechnical Risk Rating

Assessment of Geotechnical Risks (Risk Register)				
Probability (P)	Impact (I)	Impact in terms of cost or time (% of construction cost or time)	Risk Rating (R = P x I)	Risk Level
Very likely (5)	Very High (5)	>25%	17 to 25	Intolerable
Likely (4)	High (4)	10 to 25%	13 to 16	Intolerable
Probable (3)	Medium (3)	4 to 10%	9 to 12	Substantial
Unlikely (2)	Low (2)	1 to 4%	5 to 8	Tolerable
Negligible (1)	Very Low (1)	<1%	1 to 4	Trivial

Preliminary Risk Assessment (Geoenvironmental Consequences and Probability)

In line with the CLR 11 Model Procedures (Environment Agency 2004), the Preliminary Risk Assessment includes a geo-environmental Hazard Identification, which seeks to list all the suspected contaminant **sources**, the **receptors** that might be harmed by those sources and the **pathways** via which the sources might reach the receptors to cause the harm. The source-pathway-receptor concept is known as a pollution linkage, and only when a linkage is complete is there any possibility of risk of harm arising.

The Hazard Identification evaluates all the **possible** pollution linkages in tabular form. Professional judgement is then used to evaluate which of these pollution linkages may be considered as **plausible**. Plausible pollution linkages are unacceptable risks in terms of the current contaminated land regime legal framework and require either remediation or further

assessment. These are normally addressed via intrusive ground investigation and the chemical analysis of soil and water samples.

Where no plausible linkage is identified the linkage is classed as 'no linkage' in the summary table and no further action is required. If a linkage is plausible, a comparison is made of consequence against probability in general accordance with the guidance given in CIRIA Report C552 (Rudland *et al* 2001). Classification of consequences and probability are given in CIRIA C552 Tables 6.3 and 6.4, respectively, but there are a number of inconsistencies in the original Table 6.3, in particular relating to 'significant harm or significant possibility of significant harm' (SH/SPOSH). Consequently, the table has been updated by Grange Geo in line with current practice and is given in Table B below. Also added are scores from 1 to 4 for each category.

The basis of the classification is that 'severe' and 'major' are likely to result in SH/SPOSH as defined by the EPA 1990, Part 2A, with 'severe' resulting in acute harm. 'Moderate' lies below the level of SH/SPOSH but above the level of 'no harm' as implied by the relevant Generic assessment criterion (GAC, see below). Minor lies below the 'no harm' level.

Table B: Classification of Consequences of Geo-environmental Risks

Classification of Consequences for Geo-environmental Risks		
Classification	Definition	Examples
Severe (4 points)	Concentration of contaminants is likely to (or is known from previous data to) exceed that indicative of unacceptable intake or contact. I.e. >>SH/SPOSH, concentrations are high enough to cause acute (short-term) effects.	Human health: short-term (acute) effects likely to result in significant harm. E.g. high conc. of cyanide on a the surface of an informal recreational area. Planting: complete and rapid die-back of landscaped areas. Controlled waters: short-term pollution, e.g. major spillage into controlled water. Buildings etc.: catastrophic damage, e.g. explosion causing collapse. Ecosystems: short-term risk to a particular ecosystem or organism forming part of that ecosystem in a designated protected area, e.g. by contamination spillage. Site workers: risk assessment required to determine PPE and this may involve USEPA Level A, B or C protection.

Classification of Consequences for Geo-environmental Risks		
Classification	Definition	Examples
Major (3 points)	Concentration of contaminants is likely to (or is known from previous data to) exceed that indicative of unacceptable intake or contact. I.e. >SH/SPOSH.	Human health: long-term (chronic) effects likely to result in significant harm. E.g. high conc. of contaminants close to the surface of a development site. Planting: stressed or dead plants in landscaped areas. Controlled waters: pollution of sensitive water resources, e.g. leaching into major or minor aquifers or rivers. Buildings etc.: damage renders unsafe to occupy. Ecosystems: death of species in a particular ecosystem in a designated protected area, e.g. by contamination spillage. Site workers: risk assessment required to determine PPE and this may involve USEPA Level B, C or D protection.
Moderate (2 points)	Concentration of contaminants is likely to (or is known from previous data to) exceed that indicative of no harm but not unacceptable intake or contact. I.e. >GAC but <SH/SPOSH.	Human health: harm but probably not significant harm unless particularly sensitive individual within the receptor group. May be aesthetic/olfactory impacts. Planting: damage to plants in landscaped areas, e.g. stunted growth, discoloration. Controlled waters: pollution of non-sensitive water bodies e.g. leaching into non-classified groundwater or minor ditches. Buildings etc.: damage to sensitive buildings etc. Ecosystems: minor change in a particular ecosystem in a designated protected area, but not significant harm. Site workers: risk assessment required to determine PPE and this may involve USEPA Level C or D protection.
Minor (1 point)	Concentration of contaminants is likely to (or is known from previous data to) be less than that indicative of no harm. I.e. /GAC.	No measurable effects, but simple PPE required (USEPA Level D protection, i.e. overalls, boots, goggles, hard hat).

CIRIA Table 6.4 is reproduced as Table C below, but also with the addition of scores from 1 to 4. This provides an estimate of the probability that the event described by the pollution linkage will occur. For example, the likelihood that pollution of groundwater will occur by leaching of metals into the aquifer.

Table C: Classification of Probability of Geo-environmental Risks

Classification of Probability of Geo-environmental Risks	
Classification	Definition
High (4 points)	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Medium (3 points)	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.

Classification of Probability of Geo-environmental Risks	
Classification	Definition
Low (2 points)	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is no means certain that even over a longer period such event could take place, and is less likely in the shorter term.
Unlikely (1 point)	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

The perceived level of risk for each pathway is then derived from the probability versus consequences matrix, modified after CIRIA C552 Table 6.5, given in Table D below. The scores are summed accordingly and the result assigned a risk level by dividing the range between the minimum score of 1 and the maximum score of 16 equally into 5 categories i.e. 1 to <4 is very low risk, 4 to <7 is low risk, 7 to <10 is moderate risk, 10 to <13 is high risk and 13 to 16 is very high risk.

Table D: Qualitative Risk Level from Consequence and Probability

Probability	<i>product</i>	Consequence			
		Severe (4)	Major (3)	Moderate (2)	Minor (1)
	High (4)	16 = Very high risk	12 = High risk	8 = Moderate risk	4 = Low risk
	Medium (3)	12 = High risk	9 = Moderate risk	6 = Low risk	3 = Very low risk
	Low (2)	8 = Moderate risk	6 = Low risk	4 = Low risk	2 = Very low risk
	Unlikely (1)	4 = Low risk	3 = Very low risk	2 = Very low risk	1 = Very low risk

This approach assumes an equivalence between probability and consequences and ignores the difficulty that can arise where to probability of occurrence appears to be almost negligible but the consequences are very severe. In such conditions there is a degree of subjectivity in assessing the level of risk and it could be low, moderate or high. Such risks may require specialist consideration beyond the scope of this standard report.

Finally, a description of the classified risks and the likely action required can be determined from Table E below.

Table E: Description of the Classified Risks and Likely Action Required

Description of Classified Risks and Likely Action Required	
Very High Risk	A significant pollution linkage, including actual evidence of significant harm or significant possibility and significant harm, is clearly identifiable at the site (e.g. from visual or documentary evidence) under current conditions, with potential for legal and/or financial consequences for the site owner or other Responsible Person. Remediation advisable based on acute impacts being likely. Immediate action should be considered.
High Risk	A pollution linkage is identifiable at the site under current and future use conditions. Although likely, there is no obvious actual evidence of significant harm or significant possibility and significant harm under current conditions. Extent of risk is therefore subject to confirmation by investigation and risk assessment and most likely to be deemed significant. Remediation required for redevelopment and may also be required under Part 2A for existing receptors.
Moderate Risk	A pollution linkage is identifiable at the site under current and future use conditions. However, it is not likely to be a significant linkage under current conditions. Actual extent of risk subject to confirmation by additional investigation and risk assessment and most likely to lie between no possibility of harm (under current conditions) and significant possibility of significant harm (under conditions created by new use). Remediation may be required for redevelopment.
Low risk	Potential pathways and receptors exist but history of contaminative use or site conditions indicates that contamination is likely to be of limited extent and below the level of no possibility of harm. Precautionary investigations and risk assessment advisable on change of use.
Very Low Risk	No pollution linkage likely to exist under current or future conditions. Site not capable of being determined under Part 2A (in accordance with PPS23) where the Local Authority inspects the site. No further action recommended.

Contaminant Analysis of Samples

The Model Procedures of CLR 11 provide guidance on key information sources with respect to potential contamination arising from past land uses of a site. In particular, CLR 8 (Environment Agency 2002b), the DoE Industry Profile documents and ISO10381-5 provide good summaries of priority pollutants for UK sites. Additionally, the Environment Agency has produced a list of priority pollutants for ecological risk assessment in a consultation document (Environment Agency 2003a). These documents have been used, with the findings of the Phase 1 investigation, to scope the analyses of chemicals of potential concern.

Grange Geo considers there to be a minimum requirement for soil chemical analysis, even for Greenfield sites, in order to satisfy the 'suitable for use' criterion of the planning regime.

The GACs adopted by Grange Geo for the Station Way Site are given in the following tables.

Guidance Notes – Using Human Health Soil Screening Values

A tiered risk assessment approach is used for the assessment of soil analysis results considering the 'pollutant linkages' on the basis of a 'source-pathway-receptor' relationship.

The following tables present conservative Tier 1 generic screening assessment criteria (GAC) used by Grange Geo to provide an initial assessment of risk to Human Health in the context of the proposed redevelopment of the Site.

GACs are intended to assess:

- △ Chronic (long-term) on-site exposure risk to contaminants in the soil to future users and occupiers of the Site.
- △ Concentrations below the GAC considered tolerable or to pose a minimal risk to human health, or low risk in relation to the Category 4 Screening Levels (C4SLs).

GACs are not relevant for assessing:

- △ Acute (short-term) exposure risks (e.g. construction workers during development);
- △ Non-human receptors such as controlled waters, ecosystems, buildings and services, animals, domestic pets or plants;
- △ Aesthetic issues which may render a soil unsuitable for use such as odour or colour;
- △ GACs do not take account of other non-soil based sources of contamination such as contamination in groundwater or surface waters; and
- △ GACs are not suitable for assessing whether a soil provides a suitable growing medium for crops or plants.

Exceedences of Generic Assessment Criteria

An exceedence of a GAC:

- △ Is not an indicator of a significant risk to human health;
- △ Is an indication that the contaminant *may* pose a possibility harm to human health and, therefore, further consideration is required.

In assessing the significance of an exceedence consideration should be given to:

- △ The *nature* of the contaminant (e.g. volatile or non-volatile contaminants)
- △ Site design and potential exposure *pathways* (e.g. hard cover, buildings, landscaping)
- △ The *distribution* of exceedences (widespread or localised, numerous or few exceedences – **NB: Consider data limitations – site coverage and gaps in data.**)
- △ The *margin* of the exceedence(s);
- △ The *duration* and *frequency* of exposure; and

- △ Any other *site specific* factors.

Generic Assessment Criteria used by Grange Geo

In the absence of a complete regulatory set of screening values derived using the CLEA Framework, Grange Geo screening values are based on the following:

- △ Category 4 Screening Levels (C4SLs) published by DEFRA;
- △ The 2014 Land Quality Management (LQM) / Chartered Institute of Environmental Health (CIEH) Suitable for Use Levels for Human Health Risk Assessment (S4ULs);
- △ The guidance values produced by the Environmental Industries Commission (EIC), the Association of Geotechnical and Geoenvironmental Specialists (AGS) and Contaminated Land: Application in Real Environments (CL:AIRE) in December 2009; and
- △ In house Generic Screening Values (DS-GACs) derived by Grange Geo.

Contaminants for which Generic Assessment Criteria are Unavailable

Insufficient toxicological data is available to derive GAC for a number of potential contaminants of concern and GAC cannot be derived for mixtures of compounds (e.g. total petroleum hydrocarbons). In such cases Grange Geo will endeavour to use conservative surrogate GAC values to provide an initial screening assessment based on the known chemical and physical properties of the contaminant.

Notes and References used in the Tables

Generic Assessment Criteria Source	
DS-GAC	Grange Geo Generic Assessment Criteria derived using CLEA V.1.06.
C4SL	Category 4 Screening Levels, DEFRA December 2014
LQM	LQM/CIEH Suitable for Use Levels for Human Health Risk Assessment (S4UL), November 2014. (Copyright Land Quality Management Limited, reduced with permission; Publication Number S4UL3087. All rights reserved).
EIC	EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment derived using CLEA V.1.06.
Abbreviations	
Units	All values mg/kg unless otherwise stated.
SOM	Soil Organic Matter – GAC have been derived for a range of soil organic matter content – 1%, 2.5 or 3% and 6%. In the absence of site specific data or robust soil characterisation the most conservative value of 1% soil organic matter should be used as the initial screening value.
(##)	GAC exceed soil saturation concentration (given in brackets). Soil concentrations above the soil saturation may indicate that non-aqueous phase liquid (NAPL) is present. Risks from NAPL may need to be considered separately.

Use of C4SLs as Screening Criteria

Only the lead C4SL should be used as an initial screening level, as there is no 'minimal risk' screening value available. Though primarily designed for assessing the risk of land being determined as 'contaminated' under Part 2A, Defra have confirmed¹ that the C4SL could be used under the planning regime. Where applicable, the 'minimal risk' level should be used as the initial screening level and where exceedances are identified reference to, and consideration of the C4SL levels may be made in the risk assessment process.

¹ Defra/Lord de Mauley letter to all Local Authorities dated 3rd September 2014.

Metals

ΔCompound	1% SOM	Source	Highest Value from Lowgate, Gosberton Site
Antimony	550	EIC	-
Arsenic	40	LQM	35
Arsenic	40	C4SL	35
Barium	1,300	EIC	-
Beryllium	51	LQM	3.3
Boron	11000	LQM	14
Cadmium	85	LQM	3.6
Cadmium	150	C4SL	3.6
Chromium (III)	910	LQM	30
Chromium (VI)	6	LQM	<4
Chromium (VI)	21	C4SL	<4
Copper	7100	LQM	130
Lead	310	C4SL	1100
Mercury (Elemental)	0.2	DS-GAC	-
Mercury (Elemental)	-	-	-
Mercury (Inorganic)	56	LQM	2.3
Mercury (Methyl)	8.4	DS-GAC	-
Mercury (Methyl)	-	-	-
Molybdenum	670	EIC	-
Nickel	180	LQM	35
Selenium	430	LQM	<1.0
Vanadium	1200	LQM	61
Zinc	40000	LQM	620

Italics– These values were derived based on a 6% SOM, however, the supporting documentation indicates that SOM has a negligible influence for these metals.

Petroleum Hydrocarbons

Δ Compound	1% SOM	Source	Highest Value from Lowgate, Gosberton Site
Aliphatic EC5-EC6	42	LQM	<0.1
Aliphatic >EC6-EC8	100	LQM	<0.1
Aliphatic >EC8-EC10	27	LQM	<0.1
Aliphatic >EC10-EC12	130	LQM	2.1
Aliphatic >EC12-EC16	1100	LQM	29
Aliphatic >EC16-EC21	65000	LQM	33
Aliphatic >EC21-EC35	65000	LQM	200
Aromatic >EC5-EC7	370	LQM	<0.1
Aromatic >EC7-EC8	860	LQM	<0.1
Aromatic >EC8-EC10	47	LQM	<0.1
Aromatic >EC10-EC12	250	LQM	1.1
Aromatic >EC12-EC16	1800	LQM	6.6
Aromatic >EC16-EC21	1900	LQM	66
Aromatic >EC21-EC35	1900	LQM	200

Polycyclic Aromatic Hydrocarbons (PAH)

Δ Compound	1% SOM	Source	Highest Value from Lowgate, Gosberton Site
Naphthalene	2.3	LQM	0.6
Acenaphthylene	2900 (86.1)	LQM	0.57
Acenaphthene	3000 (57)	LQM	0.25
Fluorene	2800 (30.9)	LQM	0.36
Phenanthrene	1300 (36)	LQM	3.4
Anthracene	31000 (1.17)	LQM	1.2
Fluoranthene	1500	LQM	12
Pyrene	3700	LQM	11
Benzo[a]anthracene	11	LQM	5.7
Chrysene	30	LQM	5.2
Benzo[b]fluoranthene	3.9	LQM	6.3
Benzo[k]fluoranthene	110	LQM	2.8
Benzo[a]pyrene	3.2	LQM	5.5
Benzo[a]pyrene	5.3	C4SL	5.5
Indeno[123-cd]pyrene	45	LQM	2.7
Dibenz[ah]anthracene	0.31	LQM	0.47
Benzo[ghi]perylene	360	LQM	3.0

C4SL for benzo(a)pyrene is based on 6% SOM only, however, the published C4SL Final Project Report indicates that SOM has a negligible influence for this compound.

Volatile Organic Compounds (VOC)

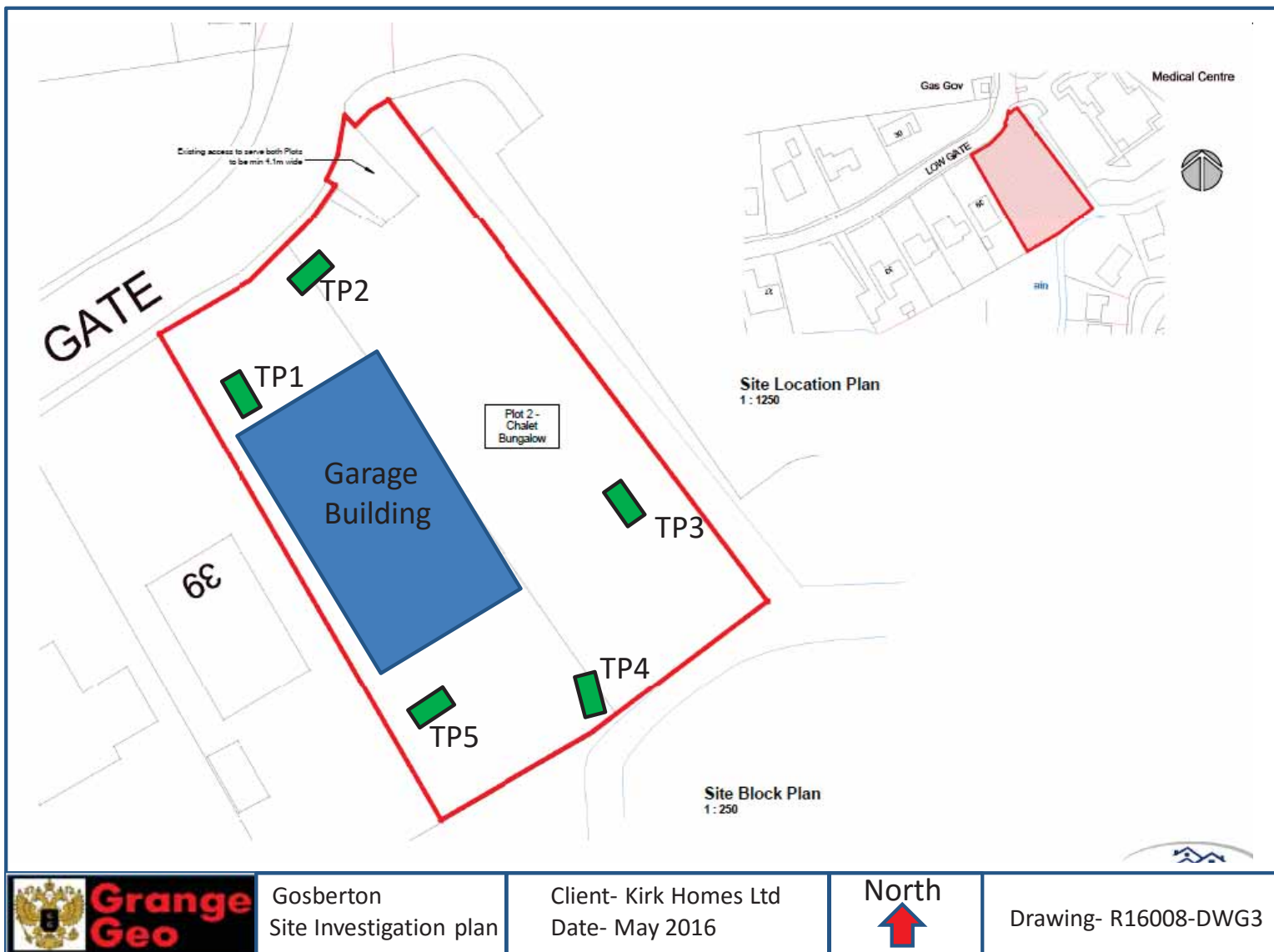
Compound	1% SOM	Source	Highest Value from Lowgate, Gosberton
BTEX/MTBE			
Benzene	0.38	LQM	<0.1
Benzene	0.89	C4SL	-
Toluene	880 (869)	LQM	<1.0
Ethylbenzene	83	LQM	<1.0
o-Xylene	88	LQM	<1.0
m-Xylene	82	LQM	<1.0
p-Xylene	79	LQM	<1.0
Methyl <i>tert</i> -butyl ether	73	EIC	<1.0
Chlorinated Solvents			
Vinyl Chloride (Chloroethene)	0.00077	LQM	-
Trichloromethane (Chloroform)	1.2	LQM	-
1,2-Dichloroethane (1,2-DCA)	0.0092	LQM	-
Trichloroethene (TCE)	0.017	LQM	-
1,1,1-Trichloroethane	9	LQM	-
Tetrachloroethene (PCE)	0.18	LQM	-
1,1,1,2-Tetrachloroethanes	1.5	LQM	-
1,1,2,2-Tetrachloroethane	3.9	LQM	-
Tetrachloromethane	0.026	LQM	-
1,1,2 Trichloroethane	0.88	EIC	-
1,1-Dichloroethane	2.5	EIC	-
1,1-Dichloroethene	0.23	EIC	-
<i>Cis</i> 1,2-Dichloroethene	0.12	EIC	-
<i>Trans</i> 1,2-dichloroethene	0.19	EIC	-
Benzenes			
Chlorobenzene	0.46	LQM	-
1,2,4-Trimethylbenzene	0.41	EIC	-
Iso-propylbenzene	12	EIC	-
Propylbenzene	40	EIC	-
Other			
Bromobenzene	0.91	EIC	-
Bromodichloromethane	5.2	EIC	-
Carbon Disulphide	0.14	LQM	-
Chloroethane	8.4	EIC	-
Chloromethane	0.0085	EIC	-
Dichloromethane	2.1	EIC	-
1,2-Dichloropropane	0.024	EIC	-
Hexachlorobutadiene	0.32	LQM	-
Styrene	35	EIC	-

Semi-Volatile Organic Compounds (SVOC) and Other Organic Compounds

Compound	1% SOM	Source	Highest Value from Lowgate, Gosberton Site
Chlorobenzenes			
1,2-Dichlorobenzene	24	LQM	-
1,3-Dichlorobenzene	0.44	LQM	-
1,4-Dichlorobenzene	61	LQM	-
1,2,3-Trichlorobenzene	1.5	LQM	-
1,2,4-Trichlorobenzene	2.6	LQM	-
1,3,5-Trichlorobenzene	0.33	LQM	-
1,2,3,4-Tetrachlorobenzene	24	LQM	-
1,2,3,5-Tetrachlorobenzene	0.75	LQM	-
1,2,4,5-Tetrachlorobenzene	0.73	LQM	-
Pentachlorobenzene	19	LQM	-
Hexachlorobenzene	4.1 (0.2)	LQM	-
Phthalates			
Bis (2-ethylhexyl)phthalate	2,700 (8.68)	EIC	-
Diethyl phthalate	1,800 (13.7)	EIC	-
Di- <i>n</i> -butyl phthalate	450 (4.65)	EIC	-
Di- <i>n</i> -octyl phthalate	3,400 (32.6)	EIC	-
Butyl benzyl phthalate	42,000 (26.3)	EIC	-
Phenols			
Phenol (see end notes)	750	LQM	-
2,4-Dimethylphenol	210	EIC	-
Total Cresols (2-, 3- and 4-methylphenol)	3,700	EIC	-
Chlorophenols			
Chlorophenols (except Pentachlorophenol)	94	LQM	-
Pentachlorophenol	27 (16.4)	LQM	-
Other			
Biphenyl	220 (34.4)	EIC	-
Bromoform	0.019	EIC	-
2-Chloronaphthalene	3.8	EIC	-
2,4-Dinitrotoluene	170 (141)	EIC	-
2,6-Dinitrotoluene	78	EIC	-
Hexachloroethane	0.22	EIC	-
Tributyl tin oxide	1.4	EIC	-

Appendix F

Ground Investigation Plan, Exploratory Hole Logs



Trial Pit Log

TP No: 1

Client: Kirk Homes Ltd
Project: Lowgate, Gosberton

Sheet: 1 of 1
Method: Excavation with JCB 3CX



Sample		S. Vane kN/m ²	Description	Depth mBGL	Legend
Depth (m)	Type				
			Made Ground, dark brown, slightly gravelly, silty CLAY. Gravels of fine to coarse angular to subrounded brick and flint. Live roots to 0,40.		
0.50			Firm to stiff, brown, silty CLAY. (Tidal Flat Deposits)	0.50	- - - -
1.00				1.00	- - - -
1.50			Grey brown, silty fine SAND. (Tidal Flat Deposits)	1.50	
2.00			End of pit.	2.00	
2.50				2.50	
3.00				3.00	
General Comments:				Date: 12/04/2016	
1. Pit walls stable				Logged by: AH	
2. Slight groundwater seepage at 1.25m				Checked: AH	
3. No visible or olfactory evidence of contamination				Job No: R16008	

Trial Pit Log

TP No: 2

Client: Kirk Homes Ltd
Project: Lowgate, Gosberton

Sheet: 1 of 1
Method: Excavation with JCB 3CX



Sample		S. Vane kN/m ²	Description	Depth mBGL	Legend
Depth (m)	Type				
			Made Ground, dark brown, slightly gravelly, silty CLAY. Gravels of fine to coarse angular to subrounded brick and flint. Live roots to 0.30.		
0.50			Made Ground, brown, firm, slightly gravelly, silty CLAY. Gravel of fine to medium, sub angular brick, pottery and coal.	0.50	
1.00			Firm to stiff, brown, silty CLAY. (Tidal Flat Deposits)	1.00	
1.50			Grey brown, silty, fine SAND. (Tidal Flat Deposits)	1.50	
2.00			End of hole.	2.00	
2.50				2.50	
3.00				3.00	
General Comments:				Date: 12/04/2016 Logged by: AH Checked: AH Job No: R16008	
1. Pit walls stable 2. Slight seepage of water at 1.40m 3. No visible or olfactory evidence of contamination					

Trial Pit Log Client: Kirk Homes Ltd Project: Lowgate, Gosberton	TP No: 3 Sheet: 1 of 1 Method: Excavation with JCB 3CX	
---	---	---

Client: Kirk Homes Ltd Sheet: 1 of 1
 Project: Lowgate, Gosberton Method: Excavation with JCB 3CX

TP No: 3

Sheet: 1 of 1 

Method: Excavation with JCB 3CX

[illegible]

Grange Geo Consulting Ltd, 43 Winchilsea Avenue, Newark, NG24 4AD
Tel: 07773529385

Trial Pit Log

Client: Kirk Homes Ltd
Project: Lowgate, Gosberton

TP No: 4
Sheet: 1 of 1
Method: Excavation with JCB 3CX



Sample		S. Vane kN/m ²	Description	Depth mBGL	Legend
Depth (m)	Type				
0.50			Made Ground, slightly sandy, gravelly, CLAY. Gravel of fine to course, angular, brick, pottery and concrete.	0.50	
1.00			Brown, firm, silty CLAY (Tidal Flat Deposits)	1.00	- - - -
1.50				1.50	- - - -
2.00			End of hole.	2.00	
2.50				2.50	
3.00				3.00	

General Comments: 1. Pit walls stable 2. No groundwater encountered 3. No visible or olfactory evidence of contamination	Date: 12/04/2016 Logged by: AH Checked: AH Job No: R16008
---	--

Trial Pit Log

Client: Kirk Homes Ltd
Project: Lowgate, Gosberton

TP No: 5
Sheet: 1 of 1
Method: Excavation with JCB 3CX



Sample		S. Vane kN/m ²	Description	Depth mBGL	Legend
Depth (m)	Type				
			Made Ground, brown, gravelly CLAY with abundant limestone cobbles.		
0.50			Firm, brown, silty CLAY	0.50	- - - -
1.00				1.00	- - - -
1.50				1.50	- - - -
2.00				2.00	
2.50				2.50	
3.00				3.00	

General Comments: 1. Pit walls stable 2. Slight groundwater seepage at 1.30m 3. No visible or olfactory evidence of contamination	Date: 12/04/2016 Logged by: AH Checked: AH Job No: R16008
--	--

Appendix G

Contamination Testing Results



Andrew Hare
Grange Geo Consulting Ltd
43 Winchilsea Avenue
Newark
Notts
NG24 4AD

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
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Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

e: andrew.hare@grangegeo.co.uk

Analytical Report Number : 16-16043

Project / Site name:	Gosberton	Samples received on:	25/04/2016
Your job number:	R16008	Samples instructed on:	25/04/2016
Your order number:		Analysis completed by:	04/05/2016
Report Issue Number:	1	Report issued on:	04/05/2016
Samples Analysed:	4 soil samples		

Signed:


Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Signed:


Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 16-16043

Project / Site name: Gosberton

Lab Sample Number				564780	564781	564782	564783	
Sample Reference				TP1	TP2	TP3	TP4	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				1.30	0.50	1.70	0.30	
Date Sampled				22/04/2016	22/04/2016	22/04/2016	22/04/2016	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	18	17	43	15	
Total mass of sample received	kg	0.001	NONE	0.42	0.36	0.45	0.42	

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	
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General Inorganics

pH	pH Units	N/A	MCERTS	8.6	8.2	8.4	8.3	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Sulphide	mg/kg	1	MCERTS	< 1.0	1.2	150	< 1.0	
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	15	1100	< 5.0	

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.60	< 0.05	
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.57	< 0.10	
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.25	< 0.10	
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.36	< 0.10	
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	0.42	3.4	0.28	
Anthracene	mg/kg	0.1	MCERTS	< 0.10	0.12	1.2	< 0.10	
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	1.5	12	0.98	
Pyrene	mg/kg	0.1	MCERTS	< 0.10	1.2	11	0.89	
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	0.65	5.7	0.49	
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.66	5.2	0.43	
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	0.88	6.3	0.58	
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	0.34	2.8	0.24	
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	0.70	5.5	0.45	
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	0.37	2.7	0.24	
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.47	< 0.10	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.38	3.0	0.26	

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	7.22	61.3	4.84	
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.1	29	35	16	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.7	1.4	3.3	0.9	
Boron (water soluble)	mg/kg	0.2	MCERTS	1.4	3.6	14	2.9	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	3.6	< 0.2	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	30	29	24	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	6.4	13	130	15	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	14	350	1100	45	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	2.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	30	35	25	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	36	60	61	50	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	48	110	620	73	

Analytical Report Number: 16-16043

Project / Site name: Gosberton

Lab Sample Number				564780	564781	564782	564783	
Sample Reference				TP1	TP2	TP3	TP4	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				1.30	0.50	1.70	0.30	
Date Sampled				22/04/2016	22/04/2016	22/04/2016	22/04/2016	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Benzene	ug/kg	1	MCERTS	-	-	< 1.0	-	
Toluene	ug/kg	1	MCERTS	-	-	< 1.0	-	
Ethylbenzene	ug/kg	1	MCERTS	-	-	< 1.0	-	
p & m-xylene	ug/kg	1	MCERTS	-	-	< 1.0	-	
o-xylene	ug/kg	1	MCERTS	-	-	< 1.0	-	
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	-	-	< 1.0	-	

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	2.3	-	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	29	-	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	33	-	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	200	-	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	270	-	

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	1.1	-	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	6.6	-	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	66	-	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	200	-	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	270	-	



Analytical Report Number : 16-16043

Project / Site name: Gosberton

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
564780	TP1	None Supplied	1.30	Brown clay and sand.
564781	TP2	None Supplied	0.50	Brown clay and sand with gravel.
564782	TP3	None Supplied	1.70	Black loam and clay with gravel.
564783	TP4	None Supplied	0.30	Brown loam and clay with gravel and vegetation.



Analytical Report Number : 16-16043

Project / Site name: Gosberton

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 dphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.