



Phase I Geo-Environmental Desk Study

North East Cambridge Area
Cambridgeshire

Prepared for:

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NORTH EAST CAMBRIDGE


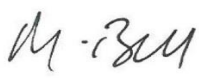
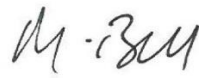
NON-TECHNICAL CLIENT SUMMARY

This report presents the findings of a Phase I Geo-Environmental Desk Study which was carried out to identify potential key current or former land uses to inform high-level feasibility discussions regarding potential land contamination constraints within the North East Cambridge planning process.

- The site currently comprises a large area of northeast Cambridge, approximately 174 hectares. The work was commissioned in order to provide initial feasibility in terms of risks posed by contaminated land for the North East Cambridge Area Action Plan, which is a proposed mixed use development to include homes, workplaces, services and social spaces.
- The site is reported to be partially underlain by superficial River Terrace Deposits (sand & gravel) across the majority of the area, with isolated pockets where superficial deposits are not recorded, most notably towards the western extent. The underlying bedrock comprises Gault Formation (mudstone).
- Based on a review of site history and current land use, the entire site has been broadly divided into seven key land uses / areas of concern, namely Cambridge Science Park, St Johns Innovation Park, the Sewage Treatment Works area, the Nuffield Road Industrial Estate area, Cowley Road Industrial Estate, Cambridge Business Park and the existing Cambridge North Station / former railway sidings. Milton Landfill has also been identified, which is located directly to the north of the western half of the site.
- The assessment has identified and broadly outlined the risks associated with each of these areas and given a general risk ranking to determine which areas of the site are likely to be contain the highest risk / liability associated with contamination. Moreover, a broad overview of the likely ground investigation requirements in each area has been provided, for redevelopment to take place safely and in compliance with current standards.
- In general terms, the majority of the challenges posed in terms of contamination at the North East Cambridge site are typical of brownfield redevelopment in England. With the possible exception of the Nuffield Road Industrial Estate area, there are unlikely to be any issues which would challenge the viability of such a large scheme. The majority of remedial measures, should they be deemed to be necessary to ensure safe redevelopment, will probably be aimed at human health and all relatively straightforward. It should be noted that whilst this report has provided an initial high level feasibility overview of the key areas of concern and associated risks, should redevelopment occur then more detailed assessments will be needed for the individual areas.

By their very nature, the above bullet points represent a simplified summary of our work and must not be relied upon to form the basis for key decisions for the proposed development. A full picture is provided in the following report, or alternatively give us a call and we'll talk you through it.

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| Project Reference: | UK21.5457 | |
| Title: | Phase I Geo-Environmental Desk Study - North East Cambridge | |
| Client: | South Cambridgeshire District Council | |
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| | Section 2.5 – Additional key land use | |
| | Section 3.2 – Additional source related to Nuffield Road area | |
| | Section 3.5.7 – New section detailing contaminant linkages for Nuffield Road Area | |
| | Section 3.5.8 – Updated risk ranking to include Nuffield Road Area | |
| | Section 4 – Updated Conclusions & Site Investigation table to include Nuffield Road Area | |

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The report has been written, reviewed and authorised by the persons listed above. It has also undergone EPS' in house quality management inspection. Should you require any further assistance regarding the information provided within the report, please do not hesitate to contact us.

The National Planning Policy Framework requires a competent person to prepare site investigation information, which is defined as a person with a recognised relevant qualification, sufficient experience in dealing with the type(s) of pollution or land instability, and membership of a relevant professional organisation. EPS considers that it fulfils these criteria and would welcome any request for staff CVs or case studies to demonstrate it.



As stated within DEFRA's Contaminated Land Statutory Guidance, with any complex risk assessment it is possible that different suitably qualified people may reach slightly different conclusions when interpreting the same information. EPS recognises this and considers the conclusions presented within this report to be robust and appropriate but input from the Local Authority and their judgement in line with this guidance would still be welcomed.

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1 INTRODUCTION

In June 2021, Environmental Protection Strategies Ltd (EPS) was commissioned by South Cambridgeshire District Council to complete a Phase I Geo-Environmental Desk Study on a large parcel of land across northeast Cambridge referred to as the North East Cambridge Area ('the site'); see Figure 1.

The work was commissioned in order to provide initial feasibility for the North East Cambridge Area Action Plan which is a proposed mixed-use development to include homes, workplaces, services and social spaces.

This report presents the findings, conclusions, and recommendations of the Phase I Desk Study undertaken for the site as instructed.

1.1 Objectives

The purpose of this desk study is to evaluate the potential contaminant linkages which may be active at the site in its current condition, or could become active in future, and to determine if any action is required to investigate them further or to break them.

This is achieved by carrying out the following activities:

- a) Examining the site history - late 1800s to present day, through collection of historical maps of the area, site records, records held by relevant local authorities, the Environment Agency and review of other information databases.
- b) Characterising the area's environmental and geological sensitivity through examination of existing geological, hydrogeological, topographical, and historical maps and aerial photographs of the area.
- c) Identifying Potential Areas of Concern (PAOCs) through a combination of historical map and data review.
- d) Consideration of any future plans for the site and the effects any proposed changes may have on contaminant linkages over time.
- e) Development of a broad Conceptual Site Model through a Preliminary Risk Assessment to evaluate the potential risks posed by the site and make recommendations for any further work that may be required to ensure suitability for use and safe development. In accordance with the Environment Agency's *Land Contamination: Risk Management* (2020) and the *National Planning Policy Framework*.

The approach to this assessment is not typical in that a Preliminary Risk Assessment/Conceptual Site Model would normally be developed for each specific development/parcel of land and this is anticipated in due course. This report is intended to inform high-level feasibility discussions regarding potential land contamination constraints within the North East Cambridge planning process and should be viewed in that context.

1.2 Project Limitations and Constraints

The purpose of this report is to present the findings of a Phase I Geo-Environmental Desk Study conducted at the location(s) specified. When examining the data collected from the investigations made during the assessment, EPS makes the following statements:

This report does not include specific investigation for the presence of either Potential Asbestos Containing Material (PACM) or Japanese Knotweed at the subject site however, if obvious evidence of either is observed during EPS site walkover, details will be provided in this report. Specialist contractors should be commissioned to make detailed assessments and recommendations if these materials are suspected.

2 GEO-ENVIRONMENTAL SETTING

The following section provides a summary of the information collected in relation to the site location and history.

2.1 Site Location and Description

| Detail | Description |
|------------------------------|---|
| Location | The site lies on the northeast extent of the city of Cambridge. |
| Topographic Elevation | The area lies at a topographic elevation of between 5m AOD (Above Ordnance Datum) towards the east and 13m AOD towards the west, sloping down gently from west to east. |
| Description of Site | <p>The site currently comprises a large area of northeast Cambridge, approximately 174 hectares in area. It is currently bounded by the A14 to the north and the railway line to the east. The southern/south-western boundary is predominantly the Cambridgeshire Guided Busway, although a section of the site extends south around Nuffield Road. Milton Road runs north-south through roughly the centre of the site. To the west of this road, the site is made up almost entirely of Cambridge Science Park, although Cambridge Regional College lies in the very western extent.</p> <p>Directly to the east of Milton Road and bounded by Cowley Road to the east, lies St John's Innovation Park, comprising various commercial and light industrial land uses. The remaining eastern half of the site is broadly made up of four land uses. The vast majority of the area, including the entirety of the land to the north comprises a Water Recycling Centre operated by Anglian Water. A waste transfer station, operated by Mick George lies on the western boundary of this part of the site, adjacent to Cowley Road. In the southwest corner of this section lies a Driving Range and a Park and Ride car park, with Cambridge Business Park adjacent to the south of it. As detailed above, Nuffield Road Industrial Area lies adjacent to the south of the guided busway and east of Milton Road, whilst a series of car showrooms also lie south of the busway but west of Milton Road.</p> <p>The most south-eastern area of the site comprises a further industrial estate, along with a mostly disused plot of land to the east of it which was formerly part of the railway sidings. Finally, the very south-eastern tip of the entire site comprises Cambridge North Railway Station and its associated car park.</p> |
| Surrounding Land Use | The land directly to the south of the entire site predominantly comprises residential estates associated with Cambridge, with occasional commercial or light industrial uses. The land to the east is predominantly undeveloped although a series of caravan parks lie beyond the railway line to the east of Cambridge Station. Beyond the A14, which marks the northern boundary of the site, the land use is split. To the north of the eastern half of the site lies the town of Milton, whilst to the west the land is undeveloped agricultural fields and a recycling centre formerly comprising Milton Landfill. |
| District Boundaries | The district boundary for Cambridge City and South Cambridgeshire District runs irregularly through the site. The Science Park, most of St Johns Business |

| | |
|--|---|
| | Park, the railway station, depot and sidings lie within South Cambridgeshire. Cambridge Business Park, the Water Recycling Centre and Cowley Road Industrial Estate lie within the City boundary. |
|--|---|

A plan showing the current site location / layout is detailed on Figure 1 and an aerial photograph is included as Figure 2. Relevant extracts of a Landmark Envirocheck report are included as Appendix A.

It should be noted that the Envirocheck searches are based on single points in the centre of three search windows (at NGRs 546260,261820, 547110,261820 & 547370,261240) and they may not necessarily represent the relevant data for all criteria within the redline boundary. For instance, the radon classes will apply to the three points but different classes may apply to land within the redline boundary and the following information should be viewed in that context.

2.2 Environmental Setting

| Detail | Description | |
|---------------------------------|---|--------------|
| Geology | Geological maps of the area indicate ground conditions to comprise superficial River Terrace Deposits (sand & gravel) across the majority of the area, with isolated pockets where superficial deposits are not recorded, most notably towards the western extent. The underlying bedrock comprises Gault Formation (mudstone). Information on the site’s geological context is included as Appendix B. | |
| British Geological Survey (BGS) | Various historic borehole logs were acquired from the British Geological Survey (BGS) across the site and consistently report a layer of superficial sandy gravel overlying stiff clays of the Gault Formation. Notably, correlating with the topography of the site, the thickness of the superficial gravel layer increases from east to west from around 2m to 6m. Groundwater appears to lie around 1-2m bgl. | |
| Geological Hazards | Hazard | On Site Risk |
| | Mining (non coal) | No Hazard |
| | Collapsible Ground | Very Low |
| | Compressible Ground | No Hazard |
| | Ground Dissolution | No Hazard |
| | Running Sand | Very Low |
| | Landslide | Very Low |
| | Shrinking / Swelling Clay | Moderate |
| Radon | The Envirocheck indicates the site to lie in a location where the percentage of homes above the radon action level is less than 1%. It further reports that the site will not require radon protection measures in the construction of new buildings. | |
| Hydrogeology | Groundwater vulnerability maps for the area show that the superficial geology is classified as a Secondary A Aquifer, however the underlying bedrock is classified as Unproductive Strata. The site does not lie within a Source Protection Zone for local groundwater abstraction. | |
| | A number of groundwater abstractions are recorded either within the site boundary and in the local area. These are mostly for general farming | |

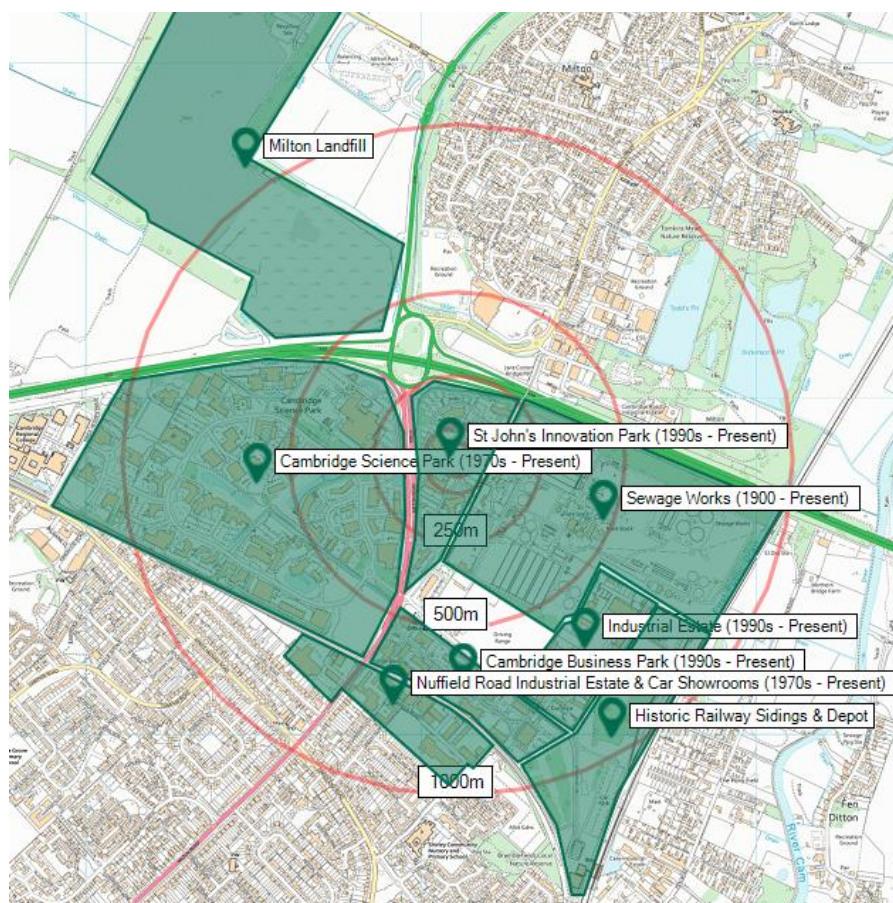
| Detail | Description |
|-----------------------------|---|
| | <p>purposes, although an abstraction for industrial processes is registered under Bard Pharmaceuticals.</p> <p>Groundwater vulnerability maps are included as Appendix C.</p> |
| Hydrology | <p>Two streams are present onsite. One flows directly from the centre of Cambridge Science Park in an easterly direction into the River Cam, which lies roughly 380m to the east of the site. The other splits off this stream within the site boundary and flows roughly northeast into the River Cam further to the north. A series of small to moderate sized ponds are also present within the Cambridge Science Park.</p> <p>The Envirocheck report lists a number of discharge consents across the site, mostly operated by Anglian Water and predominantly comprising sewage discharges associated with their works.</p> <p>A surface water abstraction is recorded within the site boundary, obtained from a stream in the Cambridge Science Park area by Trinity College for the purpose of spray irrigation, however it has been revoked.</p> <p>Review of the EA Flood Zone Map for the area indicates that the site lies within Flood Zone 1, which is defined as the area with a low potential risk of flooding from fluvial or tidal sources. It should be noted that the EA maps do not take into account the presence of flood defences or flooding from poor drainage, or groundwater. A copy of the flood map for the site and surrounding area is also included within Appendix C.</p> |
| Landfill & Waste | <p>An active landfill lies directly adjacent to the north of the A14 on the Cambridge Science Park side of the site. Milton landfill has received waste since the 1980's. Both hazardous and non-hazardous waste were accepted at Milton up to 2004 and only non-hazardous thereafter. The site accepts approximately 96,000 tonnes of waste per year, including transfer station waste, household waste, industrial and commercial waste, and soils. It is also in use as a licensed waste management facility.</p> <p>Landfill gas is extracted to a gas utilisation plant containing 3 engines producing electricity which is exported to the national grid. There are also leachate extraction wells across the site which collect into a 50m³ storage tank. This leachate is then removed by road tanker and taken to a water treatment plant.</p> <p>An historic landfill is also recorded roughly 385m north of the eastern half of the site, which received inert waste between 1974 and 1980.</p> <p>One area of infilled land is recorded within the site boundary, which relates to a large area of land directly to the north of the existing Cambridge North Station Car Park. A further large area of infilled land is recorded directly to</p> |

| Detail | Description | | |
|---|--|---|--|
| | the north of the stretch of A14 which bounds the existing sewage treatment works in the eastern half of the site. | | |
| Licensed Industrial Activity | A number of pollution and prevention controls are applied to various businesses across the site associated with various uses such as waste disposal; blending, packing, loading and use of bulk cement; printing; vehicle spraying; and organic chemical processing. A number of companies within Cambridge Science Park are either currently or were historically authorised to use radioactive substances. | | |
| Significant Onsite Industrial Land Uses | The Envirocheck reports list a very large number of commercial and industrial land uses across the site. Although it is beyond the scope of this report to identify and assess them all, the following table lists a number considered to be the most pertinent (either individually or as a collective). | | |
| | Land Use | Status | Approximate Location |
| | Cambridge North Station | Active (although historic sidings have been demolished) | Southeast tip of the site |
| | Water Recycling Centre (former sewage treatment works) operated by Anglian Water | Active | Large area across the northeast of the site. |
| | Waste Transfer Station (operated by Mick George) | Active | Located between Cowley Road and the WRC |
| | Cambridge Business Park | Active | Towards the south of the eastern half of the site. |
| | Cowley Road Industrial Estate | Active | To the north of Cambridge North Station |
| | St Johns Innovation Park | Active | Located between Cowley Road and Milton Road |
| | Cambridge Science Park | Active | Covers the majority of the land to the west of Milton Road |
| | Nuffield Road Industrial Estate | Active | South of the guided busway and east of Milton Road |
| Pollution Incidents | A number of pollution incidents to controlled waters are recorded within the site boundary, comprising a mixture of category 3 (minor) and category 2 (significant) incidents which have impacted Number 1 Public Drain, Kings Hedges Brook and groundwater, among others. One entry is made for the site within the substantiated pollution register, which pertains to an incident which had a significant impact to water in | | |

| Detail | Description |
|--|---|
| | August 2004. The released pollutant was gas and oil fuels and the incident occurred towards the southeast of Cambridge Science Park. |
| Previous Investigation or Remediation | A large number of intrusive investigations have occurred across the site associated with individual developments however it is beyond the scope of this investigation to assess them individually. |
| Part 2A | Based on the Envirocheck records and public registers for both SCDC and CCC, there are currently no determinations of land as 'contaminated' made under Part 2A of the Environmental Protection Act 1990 within the site boundary. The Councils will both hold lists of potentially contaminated sites which will include land within the site boundary though, and those sites may be subject to detailed assessments at some point in the future based on a risk-ranking process. |
| Sensitive Land Use | The site lies within a Nitrate Vulnerable Zone where surface water is identified as being at risk. The land to the north and east of the area is also an Area of Adopted Green Belt. |

2.3 Site History

A summary of historical map data from 1886 to 2021 is summarised below. Key points are highlighted and copies of relevant historic maps and any others examined during the investigation are included in this report as Appendix D.



- With regards to the area of land to the west of Milton Road, in the late 1800s it was almost entirely undeveloped apart from a few farm buildings, with a likely arable farming use. Aerial mapping from 1948 shows a significant change on site associated with its use by the army as a barracks and prisoner of war camp in World War 2. 'Histon Camp' comprised a large number of aligned structures to the southwest which were likely accommodation either for the army or prisoners of war. A large number of smaller buildings were also present to the northeast, likely associated with army activities. However, by the mid-1970s all structures associated with this army camp had been removed and the site appears once again to be in agricultural use, with an occasional small tank marked on the plans. In the early 1980s, the first few buildings associated with Cambridge Science Park were constructed in the very southeast corner of this area and its expansion continued throughout the 1980s and 1990s. Cambridge Regional College was constructed between 1992 and 2000 and little change has occurred to this area of the site since, apart from the occasional new building constructed for the science park.
- In the 1880s, the land to the east of Milton Road also comprised undeveloped agricultural land, however by 1903 a sewage farm is labelled towards the northwest of the area, including a number of sludge beds and appearing to extend east across the area, potentially as a series of 'lagoons'. Further expansion of the sewage farm had occurred by 1927 and it remained in a similar layout until the 1970s when a series of large filter beds, settling tanks, a pump house and water tanks were constructed in towards the west, by which point it was labelled a 'sewage works'. Continued development of the works occurred throughout the 1980s and 1990s and even in recent years when further tanks and treatment structures have been constructed in the eastern extent of the site. The 1990s also saw the construction of St John's Innovation Park in the plot of land between Milton Road and Cowley Road. The part of this area slightly to the

south now used as a driving range and park and ride was fairly undeveloped prior to these uses, although an agricultural machinery market was historically labelled on the driving range.

- The southern section of the land to the east of Milton Road, located to the south of the sewage works (now comprising the station, Cambridge Business Centre and an industrial estate) was also mostly agricultural land in the late 1800s, however the railway line was already in place bounding the area to the east and a very small station was present at the southern tip of the site. At this time another branch of the railway line ran through the south of the site, extending off to the west. In 1903, 'ballast pits' are labelled adjacent to the west of the railway line bounding the east of the site, which gave way to small railway sidings by 1927. These railway sidings continued to expand until they covered a large proportion of the southeast corner of the site. These sidings were demolished between 2006 and 2021 and replaced with a car park for Cambridge North Station to the south, whilst part of this area to the north is now disused. The industrial estate and business park currently located to the northwest / west of this area of railway sidings appeared to be developed on the previous agricultural land in the 1990s.
- The small section of land to the south of the Cambridgeshire Guided Busway (which now comprises Nuffield Road Industrial Estate to the east of Milton Road and car showrooms to the west) saw its initial developments around the 1970s when a factory was recorded where the showrooms are now and the industrial estate was in its beginnings. The industrial estate has continued to grow through the years.

2.4 Planning History & Regulatory Liaison

As part of this work, EPS contacted the contaminated land officers of both Cambridge City Council and South Cambridgeshire District Council in order to ask them of any pertinent knowledge they have regarding planning applications and contamination in the area. Both provided email responses outlining certain planning applications under their remit. A copy of their responses is provided as Appendix E.

With regards to the Cambridge City Council areas, review of the notes provided by Mr David Abiorwerth, along with a brief review of selected planning applications indicates that some low to moderate levels of contamination in shallow soils has been identified on redeveloped plots within the Cowley Road Industrial Estate, along with elevated concentrations of ground gases (carbon dioxide and methane).

Two recent planning applications for land adjacent to Cambridge North Station (S/2372/17/FL - Erection of 217-bed hotel with ancillary ground floor retail; S/2403/17/FL - Erection of building comprising office, ground floor retail and a 125-space car park) give some insight into ground conditions in this area. A series of geo-environmental desk studies and subsequent ground investigation reports have been undertaken by Mott MacDonald and Atkins for parts of this area which have identified elevated levels of PAHs and TPH in soil and/or leachate which could pose a risk to human health and controlled waters whilst some elevated concentrations of ground gas were encountered. No remedial strategy or verification work is available to ascertain if any land in this area has been remediated.

Previous work undertaken within the St Johns Innovation Park area does not appear to have identified significant contamination issues.

As relevant background, the client provided a Phase 1 Land Contamination Desk Study for the 'Cambridge North Fringe East (CNFE)' site, dated November 2019 prepared by Pell Frischmann.

This report covers the Swage Treatment Works and the golf driving range. Broadly the findings of this previous report are comparable to this EPS Desk Study, although certain pertinent details have been identified as summarised below:

- The report refers to a previous 2005 site investigation undertaken across the sewage works, which identified made ground to <2.5m, the River Terrace Deposits to <4.8m and then the Gault Clay was encountered. A reference on a BGS log to the origin of the made ground was described as ‘sewage residue’.
- An Unexploded Ordnance (UXO) risk map prepared for the site identified a low potential for UXO (World War 2 bombing).
- As part of the historical map review (1982), within the centre of the sewage works the report refers to two gasholders. Cambridge Gas Works was located in the Newmarket Road area, well away from this site and although a small-scale gas works is possible, given the date of the mapping and absence of other infrastructure, it is likely that these tanks were just used for natural gas storage, not earlier town gas.

Following the submission of Issue 1 of this report to the Client, feedback was received along with a virtual meeting on the 12th November 2021. The key request made by Cambridge City Council was to highlight the potential for significant contamination in the Nuffield Road industrial area and the car showrooms site on Milton Road. Specifically, this included a former landuse known to have caused contamination comprising chlorinated solvents, anecdotally referred to as ‘Cathodeon’. Although limited records are available for this contamination, it was considered sufficiently significant whereby it may limit the use of this area for sensitive landuses such as housing.

It obviously needs to be acknowledged that the site covers a vast area, and there will be extensive geo-environmental assessments for specific sections within it submitted through the planning process. For instance, individual plots on the Science Park have been subject to piecemeal investigations which are too numerous to summarise in detail, but generally quite similar in their findings. This report intends to identify the broader key issues and potential areas of concern.

2.5 Key Land Uses / Potential Areas of Concern

The review of the existing and historic land uses across the site, the following key land uses / potential areas of concern have been identified:

- Cambridge Science Park
- St John’s Innovation Park
- Sewage Treatment Works / Waste Transfer Station
- Cowley Road Industrial Estate
- Former Railway Depot / Sidings
- Cambridge Business Park
- Nuffield Road Industrial Estate / Car Showrooms

These areas are identified on Figure 3 and are used as the basis for the following conceptual model sections of this report in order to provide a practical way of assessing the potential risks across the site.

3 PRELIMINARY RISK ASSESSMENT & CONCEPTUAL SITE MODEL

In accordance with the Environment Agency's Land Contamination: Risk Management, there are three stages to managing contaminated land (Risk Assessment/Remedial Options Appraisal/Remediation and Verification). This section outlines the first tier of Stage 1, the Preliminary Risk Assessment.

The following section provides a review of the contaminant linkages that may be active at the site, whereby EPS have examined the potential sources that may be present as a result of historic and / or current site activities and where potential interaction between these sources and the identified human / environmental receptors may occur.

3.1 Background

A Desk Study comprises the first stage of any geo-environmental assessment, the purpose of which is to determine what potentially contaminative activities may have occurred at the property or the surrounding area which may pose an environmental or geological risk to site users, the surrounding environment or proposed development, either at present or in the future.

The method used in this investigation to assess the environmental risk posed is based on the concept of 'contaminant linkage', which considers the following three factors:

| | |
|-----------------|--|
| Source | The location from which an environmentally hazardous / contaminative substance is, (or was,) derived. |
| Pathway | A route or mechanism via which a source could come into contact with a receptor to cause significant harm. |
| Receptor | An environmentally sensitive object or condition e.g. person, property, controlled water, or ecological system, which may be present now or in future. |

If all three factors are identified, there is the potential for a 'contaminant linkage' to be active, which could result in significant harm being caused to the environment or human health.

3.2 Key Areas of Concern - Source Characterisation

The following potential contaminant sources have been identified at the site and in the surrounding area:

| Potential Source | Source Description | Principal Contaminants of Concern |
|---------------------------|---|--|
| Current / Former Site Use | In-fill material of unknown origin (Made Ground) used to level areas beneath the existing hardstanding. | PAH, Metals, ACM |
| | Use of the western half of the site as Cambridge Science Park | PAH, Metals, ACM, VOC |

| Potential Source | Source Description | Principal Contaminants of Concern |
|---|---|--|
| Current / Former Site Use Cont. | Former army barracks / POW camp located in the western half of the site. | TPH, PAH, Metals, ACM |
| | Use of land between Milton Road and Cowley Road as St John's Innovation Park | PAH, Metals, ACM |
| | Historic and current use of the land across much of the northeast of the site as a sewage treatment works and waste transfer station. | TPH, PAH, Metals, ACM, Ground Gas (CH ₄ , CO ₂), Pathogens |
| | Industrial estate to the south of the sewage treatment works. | VOC, SVOC, TPH, PAH, Metals, ACM |
| | Nuffield Road Industrial Estate & former factory south of the guided busway. | VOC (Inc. Chlorinated Solvents), SVOC, TPH, PAH, Metals, ACM |
| | Land in the southeast corner of the site currently used as Cambridge North Station and its associated car park, which formerly comprised large sidings and a depot for the station. | VOC, SVOC, TPH, PAH, Metals, ACM, Ground Gas (CH ₄ , CO ₂), |
| | Cambridge Business Park | PAH, Metals, ACM |
| Current and Historical Surrounding Land Use | Historic landfill (Milton Landfill) located adjacent to the north of the western half of the site and a large area of infilled land adjacent to the north of the eastern half. | Landfill Gas (CH ₄ , CO ₂) |
| | Current and historical industrial land use of the surrounding area including further industrial estates to the north, south and southeast. | VOC, TPH, PAH, Metals |

| | | | | |
|---------------|-----------------|----------------------------------|-----------------|---------------------------------|
| Notes: | PAH | Polycyclic Aromatic Hydrocarbons | ACM | Asbestos Containing Materials |
| | CH ₄ | Methane | CO ₂ | Carbon Dioxide |
| | TPH | Total Petroleum Hydrocarbons | SVOC | Semi-Volatile Organic Compounds |
| | VOC | Volatile Organic Compounds | | |
| | | | | |

3.3 Potential Receptors

A framework for the assessment of risks arising from the presence of contamination in soils has been produced by the Environment Agency and the Department for the Environment, Food and Rural Affairs (DEFRA) and is presented with the report: 'Using Science to Create A Better Place: Updated Technical Background to the CLEA Model – Science Report SC050021/SR3'. This guidance document defines a series of standard land-uses which have been further developed into six generic landuses in

the Category 4 Screening Levels project for Land Affected by Contamination (DEFRA/Contaminated Land: Applications in Real Environments (CL:AIRE) Project Report SP1010, 2014) which form a basis for the development of the Conceptual Site Model.

Risks posed to controlled waters have been considered in line with the Environment Agency's *approach to groundwater protection* (v1.2, 2018) and associated position statements.

The proposed development plan for the site is part of the North East Cambridge Area Action Plan which is a proposed mixed use development to include homes, workplaces, services and social spaces. This development therefore effectively encompasses the majority of the standard land uses within the CLEA model, however on a conservative basis, this proposed land use has been considered as follows, although this would need to be refined in site-specific basis once each individual section of the area is redeveloped:

- Residential (with homegrown produce)

In view of the environmental setting, current and potential future land use of the site and surrounding sites, the potential receptors for any contaminant impact are discussed below:

| Receptor | Site Specific Description |
|---------------------------------------|--|
| Human | Future site users, site workers involved in the site redevelopment, and those working and living in the surrounding area have the potential to be at risk from exposure to potential contaminants of concern (CoCs). |
| Groundwater | The site is reported to be underlain by made ground then superficial River Terrace Deposits (sand & gravel) overlying Gault Formation clay, the former of which is defined by the EA as a Secondary 'A' Aquifer. Whilst the site does not lie within a SPZ for nearby groundwater abstraction, the underlying geology does have some resource potential and therefore groundwater should be considered as a potential receptor to site derived contaminants. |
| Surface Water | Two streams are present onsite, which flow directly into the River Cam. It is possible that site derived contaminants of concern may enter these watercourses by migration via overland flow, through unsaturated soils or entering shallow surface drainage. Therefore surface waters must also be considered as a sensitive receptor within the conceptual site model. |
| Flora and Fauna | The site does include large areas of soft landscaping and in proposals would likely also do so, including domestic garden areas. Some of the identified contaminants of concern are known to be phytotoxic and as such, the potential for this impact should be considered. |
| Buildings & Infrastructure | Subsurface structures are likely to be present at the site which may be adversely affected by the potential presence of the identified contaminants of concern. These include concrete used in building foundations, buried potable water supply pipes and other service lines and pipes. |
| Adjacent Land | Adjacent properties including private residential dwellings could be at risk from potential contaminants at the site. |

3.4 Potential Pathways

Where contaminants may be present in soil, there are a number of potential pathways that enable human receptors to come into contact with or be exposed to them. The most direct pathways, considered under current UK legislation, can be summarised as follows:

- Direct ingestion of contaminated soil
- Ingestion of household dust
- Ingestion of contaminated vegetables
- Ingestion of soil attached to vegetables
- Dermal contact with contaminated soil
- Dermal contact with household dust
- Inhalation of fugitive soil dust
- Inhalation of fugitive household dust
- Inhalation of vapours outdoors
- Inhalation of vapours indoors

Clearly, not all of these potential pathways apply for every standard land-use. For example, ingestion of contaminated vegetables will not apply to land uses other than residential with plant uptake and allotments.

However, in addition to direct exposure pathways, a number of physical transport mechanisms / pathways may also exist at a site that allow remote or less accessible contaminants in soil or groundwater to reach human or environmental receptors both at a site and beyond the site boundary. These include the following:

- Downward and lateral movement of contaminants in soil either by gravity or through being 'leached' by percolating rainwater.
- Lateral migration of contaminants dissolved in groundwater.
- Direct seepage or leaching of contaminants from soil into subsurface drains or supply pipework.
- Volatilisation of contaminants from groundwater or unsaturated soils into buildings or outdoor air.

Through examination of the standard land use and environmental setting at each site, the presence of pathways and transport mechanisms described above must be considered when assessing whether a contaminant linkage may plausibly be active, and therefore be included in the conceptual site model.

3.5 Summary of Contaminant Linkages

The following sections broadly outline the plausible contaminant linkages for the identified key land uses / potential areas of concern identified through the previous sections of this report, along with a risk ranking of the identified areas. The areas and associated contaminant linkages are outlined concisely within Figure 3, with the below adding further detail.

3.5.1. Former Railway Depot / Sidings

The land in the very southeast corner of the site currently comprises Cambridge North Station, its associated car park and some disused land further to the north. However, historically this area

comprised a large depot / siding for the railway. This land use could potentially have caused significant risks associated with hydrocarbon-based contamination and volatile compounds, although it was subject to detailed site-specific risk assessment as part of the station development. On this basis, various risks to human health have the potential to become active through any future development including direct contact with contaminated soils and through inhalation of dusts, direct uptake by plants and volatilisation of organic compounds to future buildings. Risks to controlled waters are also possible from more mobile contaminants. In addition to this, the land in the north of this area is suggested to have been historically infilled, which could pose a risk from ground gases.

3.5.2. *Cowley Road Industrial Estate (adjacent to former railway sidings)*

The existing industrial estate located to the west of the area formerly used as railway sidings was fairly undeveloped prior to its construction, however considering some of the land uses and the time period it was constructed in, there are plausible risks to both human health and controlled waters associated with interaction with shallow soils, volatilisation of organic compounds and leaching of more mobile contaminants to groundwater. Moreover, it lies directly adjacent to the area of infilled ground to the east, which could pose a risk from the onsite migration of ground gas.

3.5.3. *Cambridge Business Park Area*

This area was broadly undeveloped prior to the construction of the existing business park, which appears to comprise fairly low risk commercial entities. On this basis, plausible contaminant linkages are mostly associated with interaction of future site users with any made ground present.

3.5.4. *Sewage Treatment Works*

A large area of the land within the site to the east of Milton Road has comprised a sewage treatment works since the early 20th century, along with a small waste transfer station towards the west of this area. The sewage treatment works appears to have contained various settling tanks, filter beds and treatment infrastructure with residual deposition known to have taken place. On this basis a number of plausible contaminant linkages have the potential to be active or become active through development, including risks to human health associated with direct contact and through inhalation of dusts, direct uptake by plants and migration of ground gases to future buildings. Risks to controlled waters are also possible from more mobile contaminants.

3.5.5. *Cambridge Science Park Area*

The majority of the land to the west of Milton Road now comprises Cambridge Science Park, with the only main former use comprising part of an army barracks / prisoner of war camp during WW2. There is likely to have been some contamination to shallow soils associated with these uses and some of the specific sites contain licenses for contaminated materials however given the phased nature of construction on the science park (which has been heavily investigated as it has expanded) over the last 20-30 years, it is likely that any major contamination issues would have been picked up through the planning / development of new plots. Moreover, management of the existing uses is likely to be to a high standard, reducing the risk of any pollution incidents. Therefore, although it is not possible to completely dismiss a lot of the potential risks to future site users / controlled waters,

they are considered to be relatively low. It should also be noted that this area is the closest to Milton Landfill and therefore risks from onsite migration of ground gas should be considered.

3.5.6. *St John's Innovation Park*

Similar to the Cambridge Business Park area, this area was broadly undeveloped prior to the construction of the existing innovation park, which appears to comprise fairly low risk commercial entities. On this basis, plausible contaminant linkages are mostly associated with interaction of future site users with any made ground present, however it is in close proximity to the nearby Milton Landfill and therefore risks from ground gases should be considered.

3.5.7. *Nuffield Road Industrial Estate & Car Showrooms*

The industrial estate has generally grown since the initial buildings were constructed in the 1970s and it is understood through correspondence with the local authority (see Section 2.4) that contamination has been previously found in these areas, notably including chlorinated solvents in the industrial estate area. On this basis, there are plausible risks to both human health and controlled waters associated with interaction with shallow soils, volatilisation of organic compounds and leaching of more mobile contaminants to groundwater. Although limited records are available for this contamination, it was considered sufficiently significant by Cambridge City Council whereby it may limit the use of this area for sensitive landuses such as housing and hence is risk ranked accordingly.

3.5.8. *Key Areas of Concern Risk Ranking*

Based on the information obtained and reviewed above, the following table provides a rough ranking based on the level or contamination risk considered to be present in the above areas of the site (1=highest risk).

| Site Area | Risk Ranking |
|---|--------------|
| Nuffield Road Industrial Estate & Car Showrooms | 1 |
| Former Railway Depot/Sidings | 2 |
| Sewage Treatment Works | 3 |
| Cowley Road Industrial Estate | 4 |
| Cambridge Science Park | 5 |
| St John's Innovation Park | 6 |
| Cambridge Business Park | 7 |

4 CONCLUSIONS & RECOMMENDATIONS

This Phase I Desk Study has provided a feasibility assessment of a large area of northeast Cambridge which is being reviewed under the North East Cambridge Area Action Plan, a proposed mixed-use development to include homes, workplaces, services and social spaces. As a broad overview, the objective of this report was not to assess risks on a site-by-site basis but to provide an overview which allowed identification of the key areas of concern and the risks associated with them.

In general terms, the majority of the challenges posed in terms of contamination at the North East Cambridge site are typical of brownfield redevelopment in England. There are unlikely to be any issues which would challenge the viability of such a large scheme and the majority of remedial measures, should they be deemed to be necessary to ensure safe redevelopment, will probably be aimed at human health. This would typically entail measures such as a thickness of clean soil in garden areas (<600mm), soil gas-resistant geomembranes installed within buildings or barrier drinking water pipes which are all relatively straightforward. Given the nature of the land uses and the relatively low sensitivity of the area in terms of ground and surface water, it's unlikely that any significantly invasive and expensive deep in-situ groundwater treatment will be required, where such technology might be needed in aquifers such as the chalk south of Cambridge. There may still be a need for localised groundwater treatment though.

As stated in earlier sections, the possible exception to viability of housing may be the Nuffield Road Industrial Estate & Car Showrooms area, where contamination is known to have existed in the past. The contamination in this area may be sufficiently significant to limit its use to less sensitive landuses such as commercial.

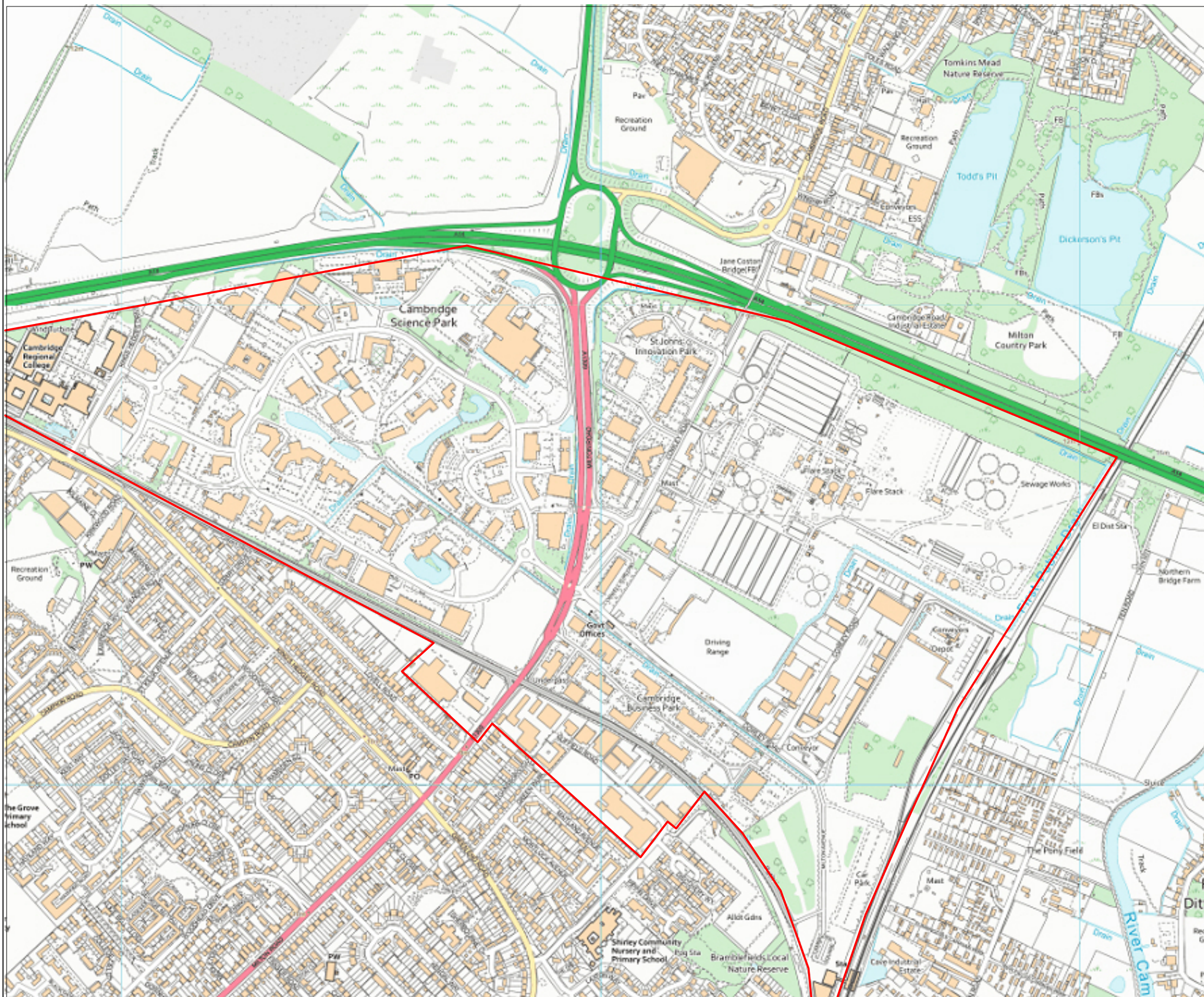
The report has sub-divided the site into seven general areas, with the risks and plausible contaminant linkages for each area outlined within Figure 3. On the basis of these risks, the following table outlines a broad idea of the site investigation work which would be required in each of these areas:

| Site Area | Typical Site Investigation Recommendations | | | | |
|---|--|---------------|------------------------------|-----------------------|-----------------------|
| | Boreholes / Trial Pits | Soil Sampling | Monitoring Well Installation | Groundwater Sampling* | Ground Gas Monitoring |
| Nuffield Road Industrial Estate & Car Showrooms | Y | Y | Y | Y | Y |
| Former Railway Depot/Sidings | Y | Y | Y | Y | Y |
| Sewage Treatment Works | Y | Y | Y | N | Y |
| Cowley Rd Industrial Estate | Y | Y | Y | N | Y |
| Cambridge Science Park | Y | Y | Y | N | Y |
| St John's Innovation Park | Y | Y | Y | N | Y |
| Cambridge Business Park | Y | Y | N | N | N |

*where N, it may be required if soil contamination is identified.

It should be noted that the above table provides likely requirements of ground investigations in each area however the final investigations for any plot of land should be subject to the findings of a more site-specific Phase I Desk Study as and when each section is redeveloped.

FIGURES



KEY:

— Approximate Site Boundary

Fig No: 1

Title: Current Site Layout Plan

Project: Northeast Cambridge

Scale: NTS - For Illustration purposes only

Drawn By: MJ

Job No: UK21.5457

Dwg No: NortheastCambridge/1121/01

Date: November 2021





KEY:

— Approximate Site Boundary

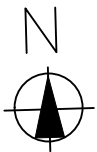
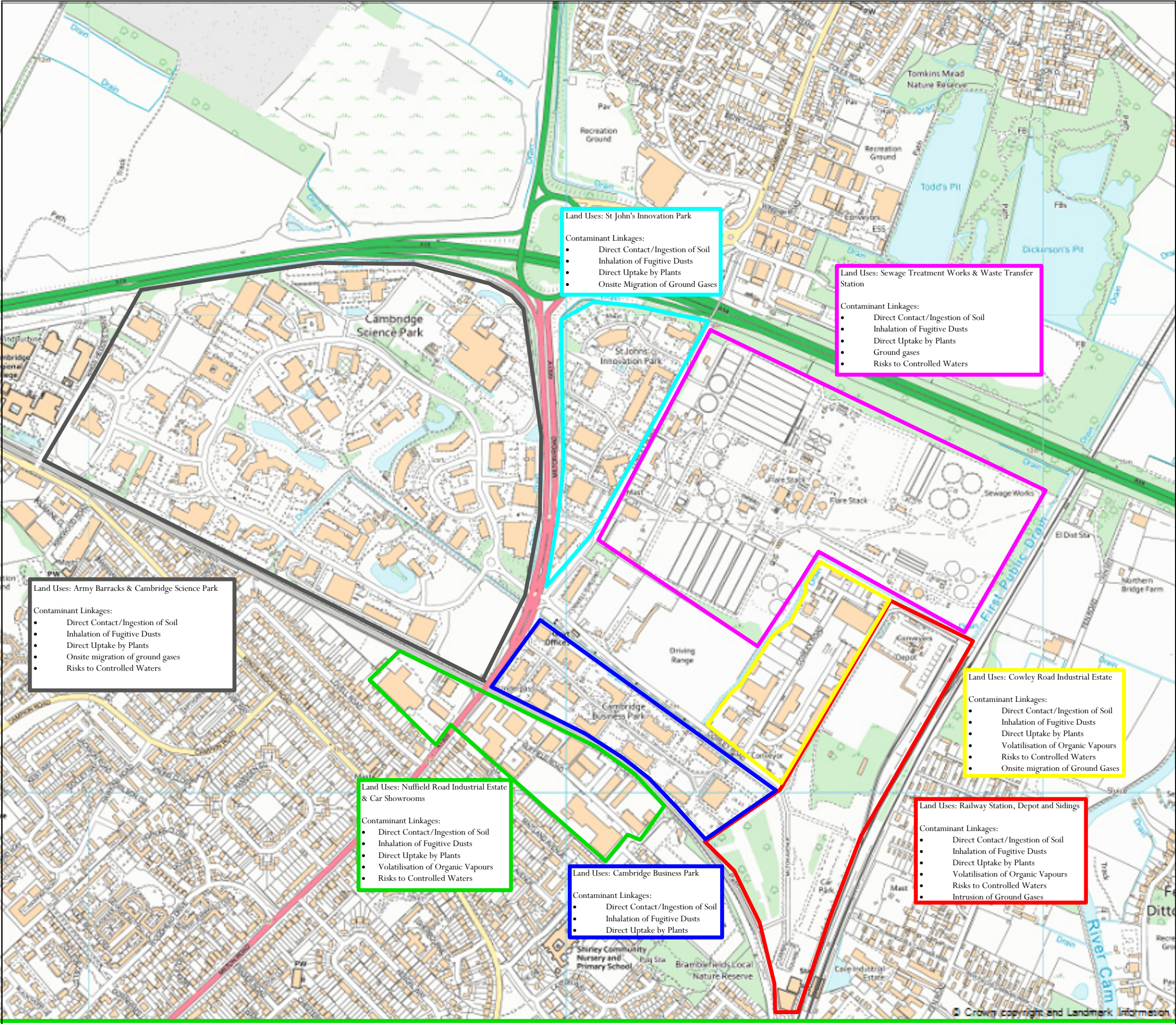
Fig No: 2

Title: Aerial Photograph

Project: Northeast Cambridge

Scale: NTS - For illustration purposes only
Drawn By: MJ
Job No: UK21.5457
Dwg No: NortheastCambridge/1121/02
Date: November 2021





KEY:



Approximate Key Land Use Boundaries

Fig No: 3

Title: Key Land Uses Plan

Project: Northeast Cambridge

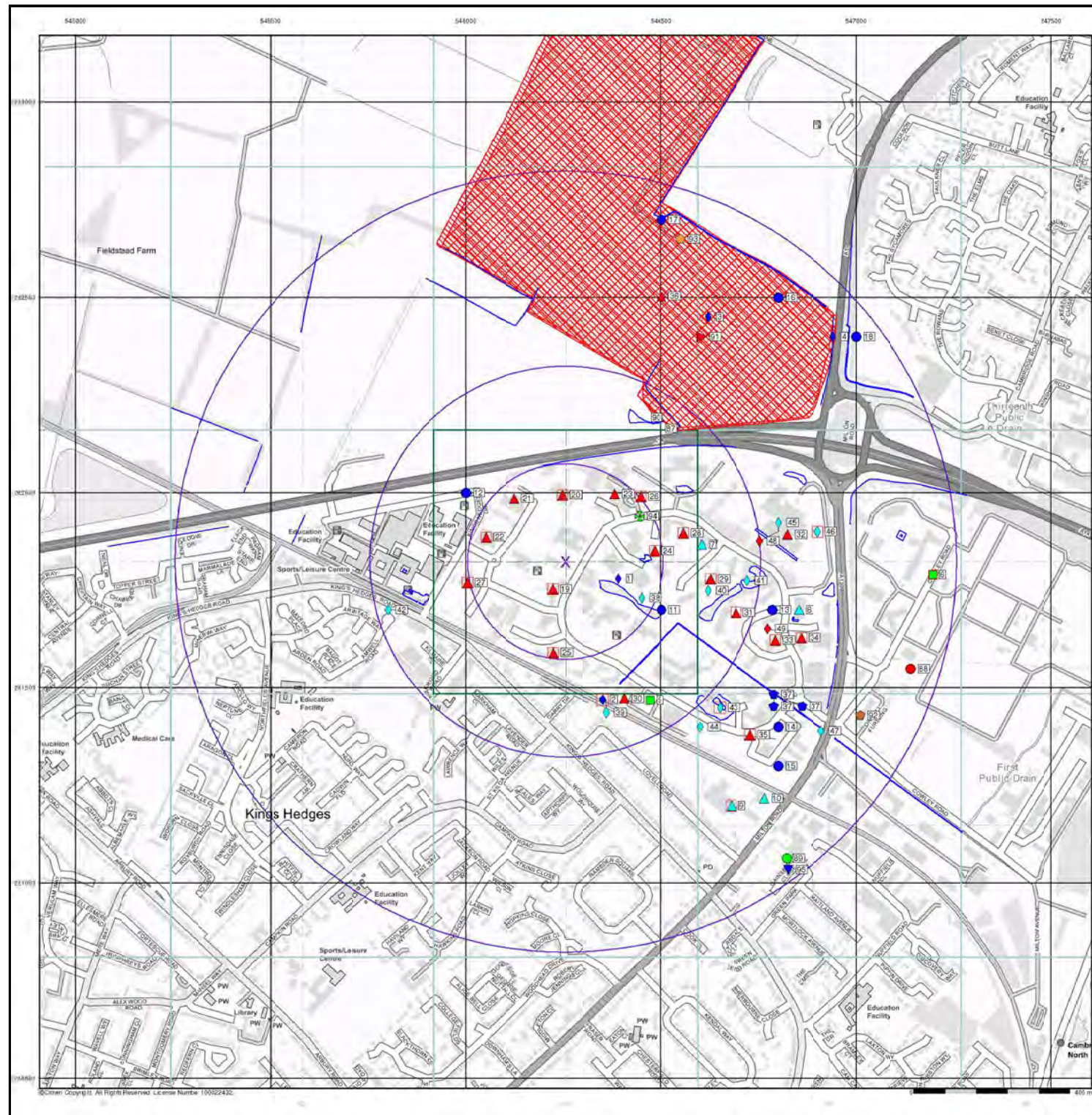
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Drawn By: MJ
Job No: UK21.5457
Dwg No: NortheastCambridge/1121/03
Date: November 2021



APPENDICES

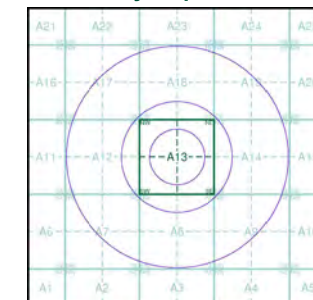
APPENDIX A

Surrounding Land Use



- General**
- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Map ID
- Agency and Hydrological**
- Contaminated Land Register Entry or Notice (Location)
 - Contaminated Land Register Entry or Notice
 - Discharge Consent
 - Enforcement or Prohibition Notice
 - Integrated Pollution Control
 - Integrated Pollution Prevention and Control
 - Local Authority Integrated Pollution Prevention and Control
 - Local Authority Pollution Prevention and Control
 - Local Authority Pollution Prevention and Control Enforcement
 - Pollution Incident to Controlled Waters
 - Prosecution Relating to Authorised Processes
 - Prosecution Relating to Controlled Waters
 - Registered Radioactive Substance
 - River Network or Water Feature
 - River Quality Sampling Point
 - Substantiated Pollution Incident Register
 - Water Abstraction
 - Water Industry Act Referral
- Hazardous Substances**
- COMAH Site
 - Explosive Site
 - NIHS Site
 - Planning Hazardous Substance Consent
 - Planning Hazardous Substance Enforcement
- Geological**
- BGS Recorded Mineral Site
- Waste**
- BGS Recorded Landfill Site (Location)
 - BGS Recorded Landfill Site
 - EA Historic Landfill (Buffered Point)
 - EA Historic Landfill (Polygon)
 - Integrated Pollution Control Registered Waste Site
 - Licensed Waste Management Facility (Landfill Boundary)
 - Licensed Waste Management Facility (Location)
 - Local Authority Recorded Landfill Site (Location)
 - Local Authority Recorded Landfill Site
 - Potentially Infilled Land (Non-water)
 - Potentially Infilled Land (Non-water)
 - Potentially Infilled Land (Water)
 - Potentially Infilled Land (Water)
 - Potentially Infilled Land (Water)
 - Registered Landfill Site
 - Registered Landfill Site (Location)
 - Registered Landfill Site (Point Buffered to 100m)
 - Registered Landfill Site (Point Buffered to 250m)
 - Registered Waste Transfer Site (Location)
 - Registered Waste Transfer Site
 - Registered Waste Treatment or Disposal Site (Location)
 - Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Slice A



Order Details

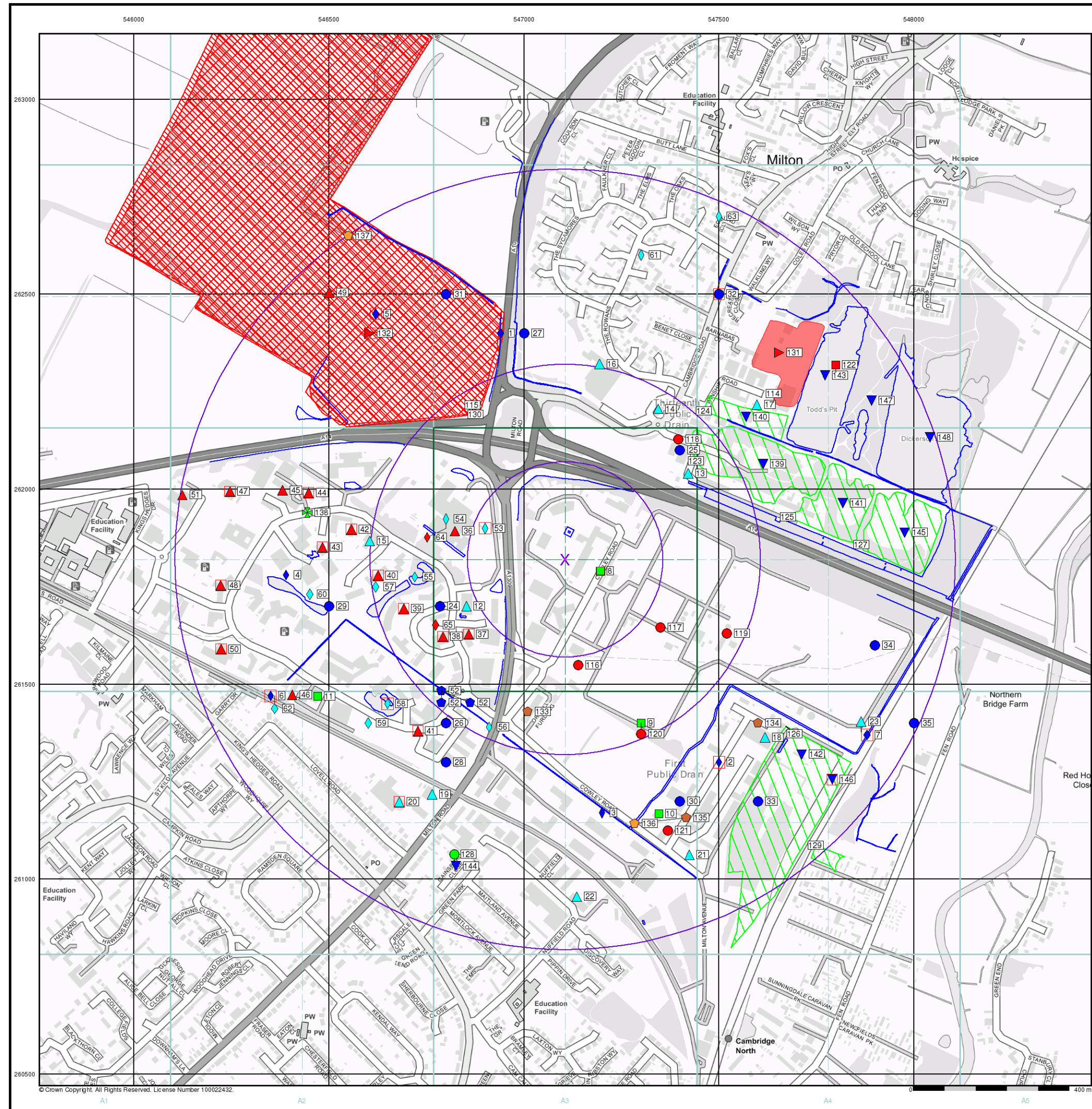
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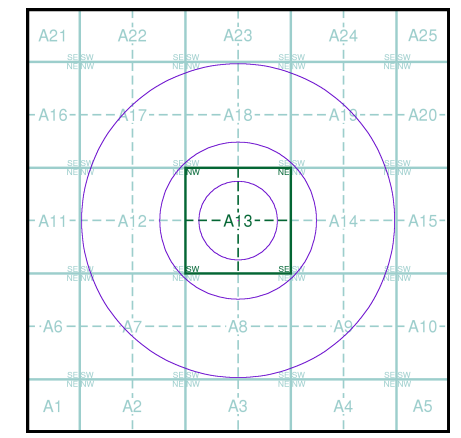


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 - Registered Landfill Site (Location)
 - Registered Landfill Site (Point Buffered to 100m)
 - Registered Landfill Site (Point Buffered to 250m)
 - Registered Waste Transfer Site (Location)
 - Registered Waste Transfer Site
 - Registered Waste Treatment or Disposal Site (Location)
 - Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Slice A

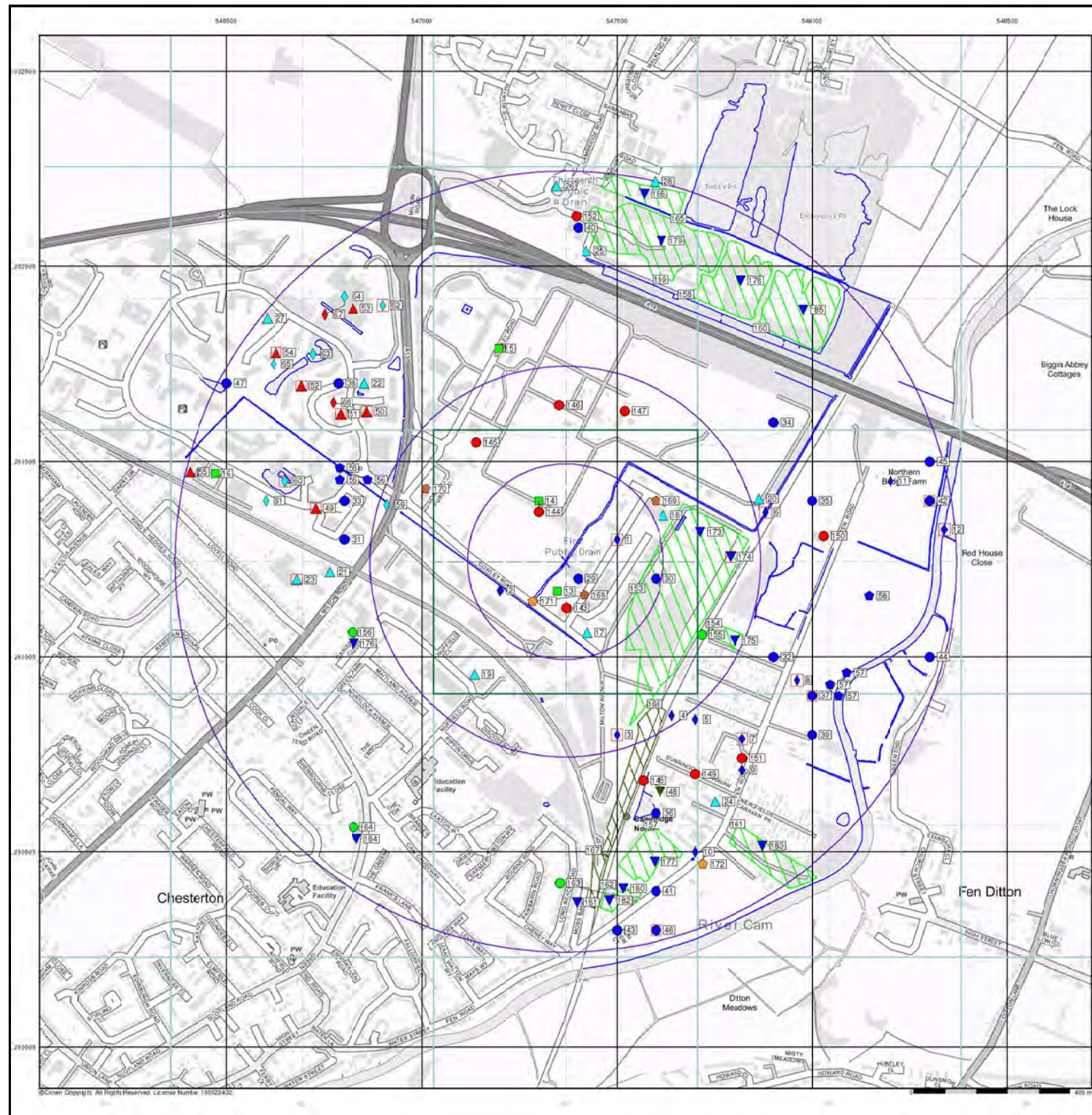


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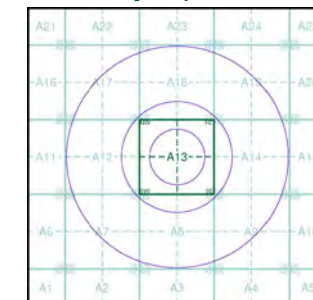
Site Details

Site at 547100, 261810



- General**
- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Map ID
- Agency and Hydrological**
- Contaminated Land Register Entry or Notice
 - Discharge Consent
 - Enforcement or Prohibition Notice
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 - Integrated Pollution Prevention and Control
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 - Registered Landfill Site (Location)
 - Registered Landfill Site
 - Registered Waste Transfer Site (Location)
 - Registered Waste Transfer Site
 - Registered Waste Treatment or Disposal Site (Location)
 - Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Slice A



Order Details

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Site Details

Site at 547370, 261250

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APPENDIX B



Geological Context

Geology 1:50,000 Maps Legends

Superficial Geology

| Map Colour | Lex Code | Rock Name | Rock Type | Min and Max Age |
|---|----------|---------------------------|-----------------------------|---------------------------|
|  | ALV | Alluvium | Clay, Silt, Sand and Gravel | Not Supplied - Holocene |
|  | RTD3 | River Terrace Deposits, 3 | Sand and Gravel | Not Supplied - Quaternary |
|  | RTD2 | River Terrace Deposits, 2 | Sand and Gravel | Not Supplied - Quaternary |
|  | RTD4 | River Terrace Deposits, 4 | Sand and Gravel | Not Supplied - Quaternary |
|  | RTD1 | River Terrace Deposits, 1 | Sand and Gravel | Not Supplied - Quaternary |

Bedrock and Faults

| Map Colour | Lex Code | Rock Name | Rock Type | Min and Max Age |
|---|----------|------------------------------------|-----------|---------------------------|
|  | WMCH | West Melbury Marly Chalk Formation | Chalk | Not Supplied - Cenomanian |
|  | GLT | Gault Formation | Mudstone | Not Supplied - Albian |



Geology 1:50,000 Maps

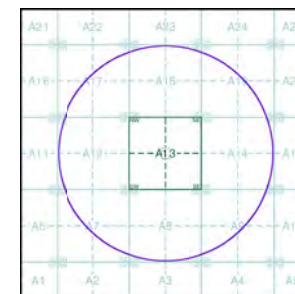
This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published 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: 188
 Map Name: Cambridge
 Map Date: 1981
 Bedrock Geology: Available
 Superficial Geology: Available
 Artificial Geology: Not Available
 Faults: Not Supplied
 Landslip: Not Available
 Rock Segments: Not Supplied

Geology 1:50,000 Maps - Slice A



Order Details:

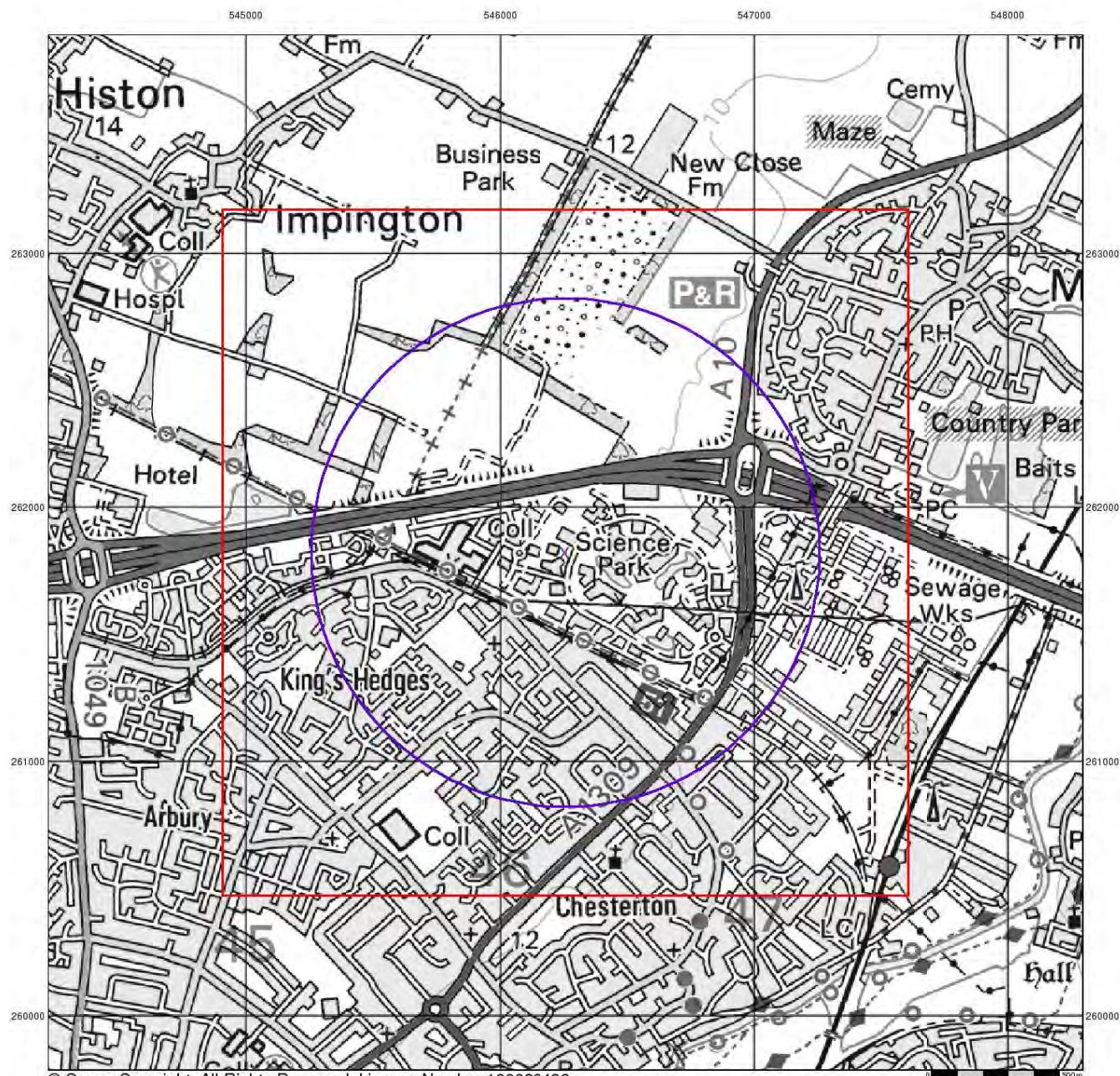
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 Slice: A
 Site Area (Ha): 0.01
 Search Buffer (m): 1000

Site Details:

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Artificial Ground and Landslip

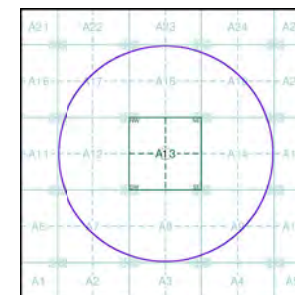
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions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

Artificial Ground and Landslip Map - Slice A



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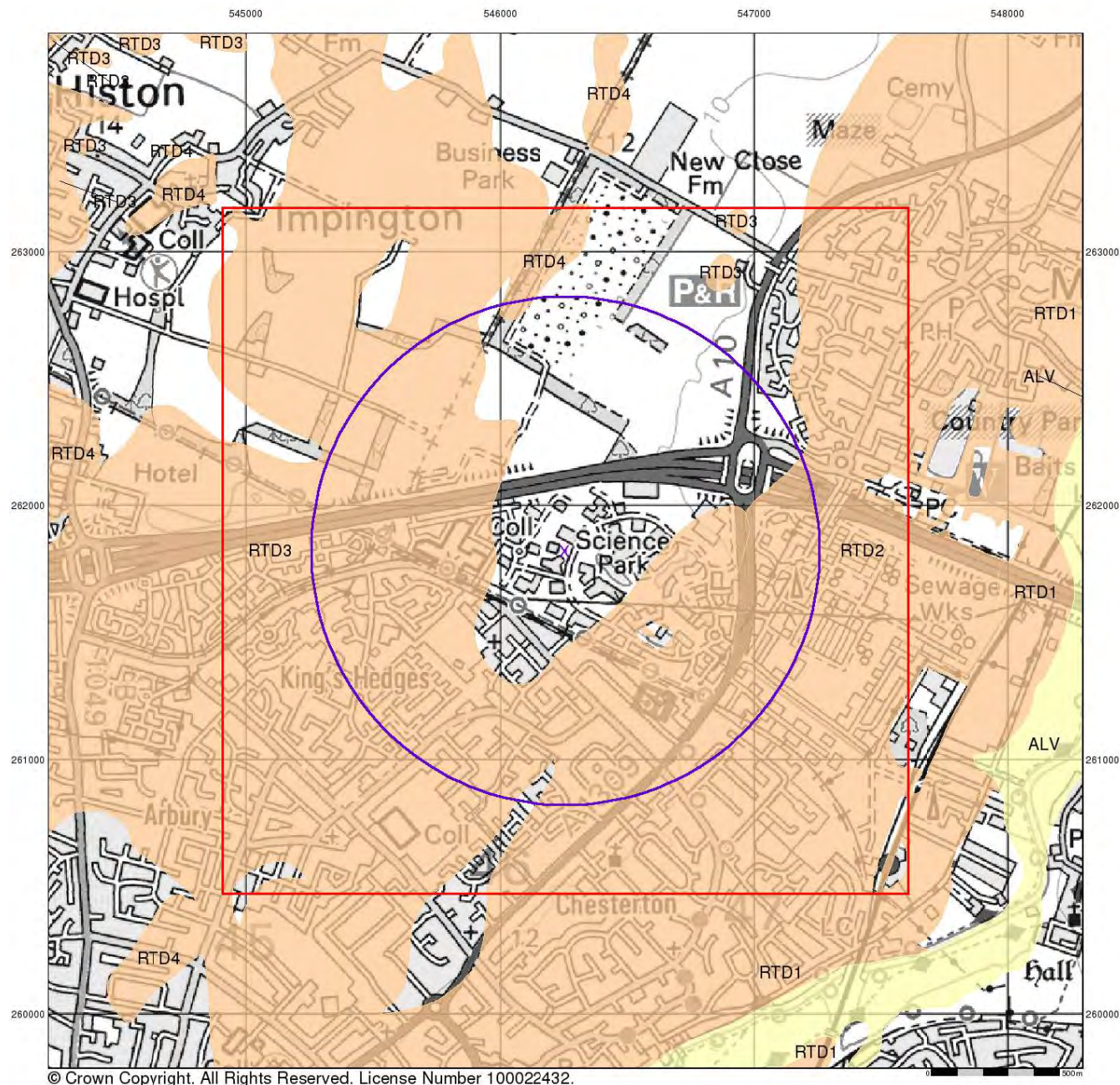
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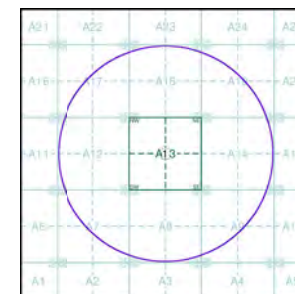
Superficial Geology

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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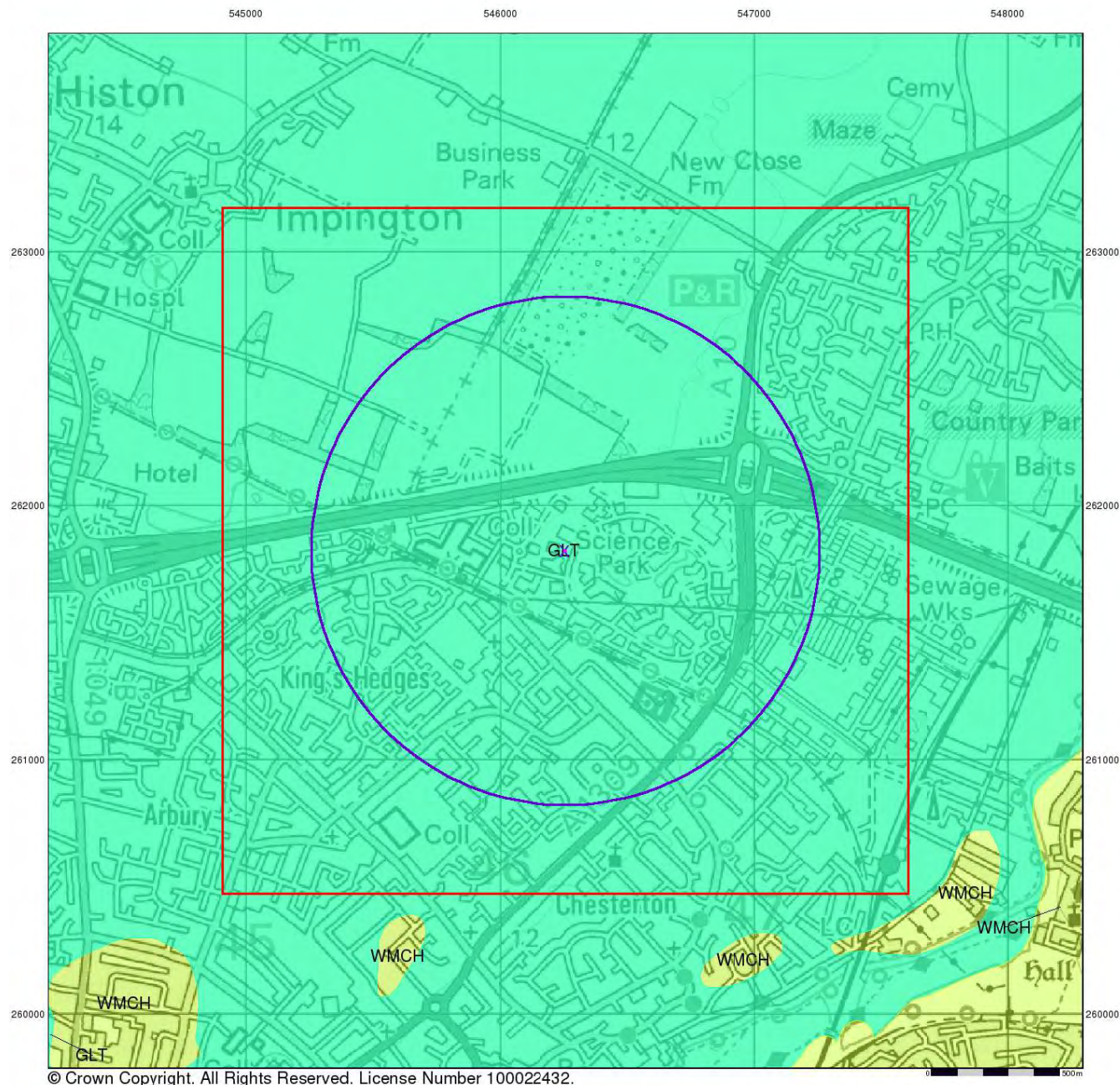
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Bedrock and Faults

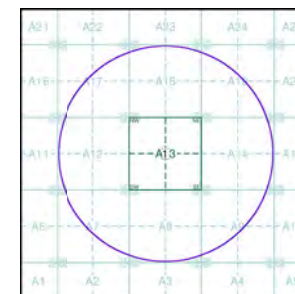
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

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



Order Details:

Order Number: 280852431_1_1
 Customer Reference: UK21.5457
 National Grid Reference: 546260, 261820
 Slice: A
 Site Area (Ha): 0.01
 Search Buffer (m): 1000

Site Details:

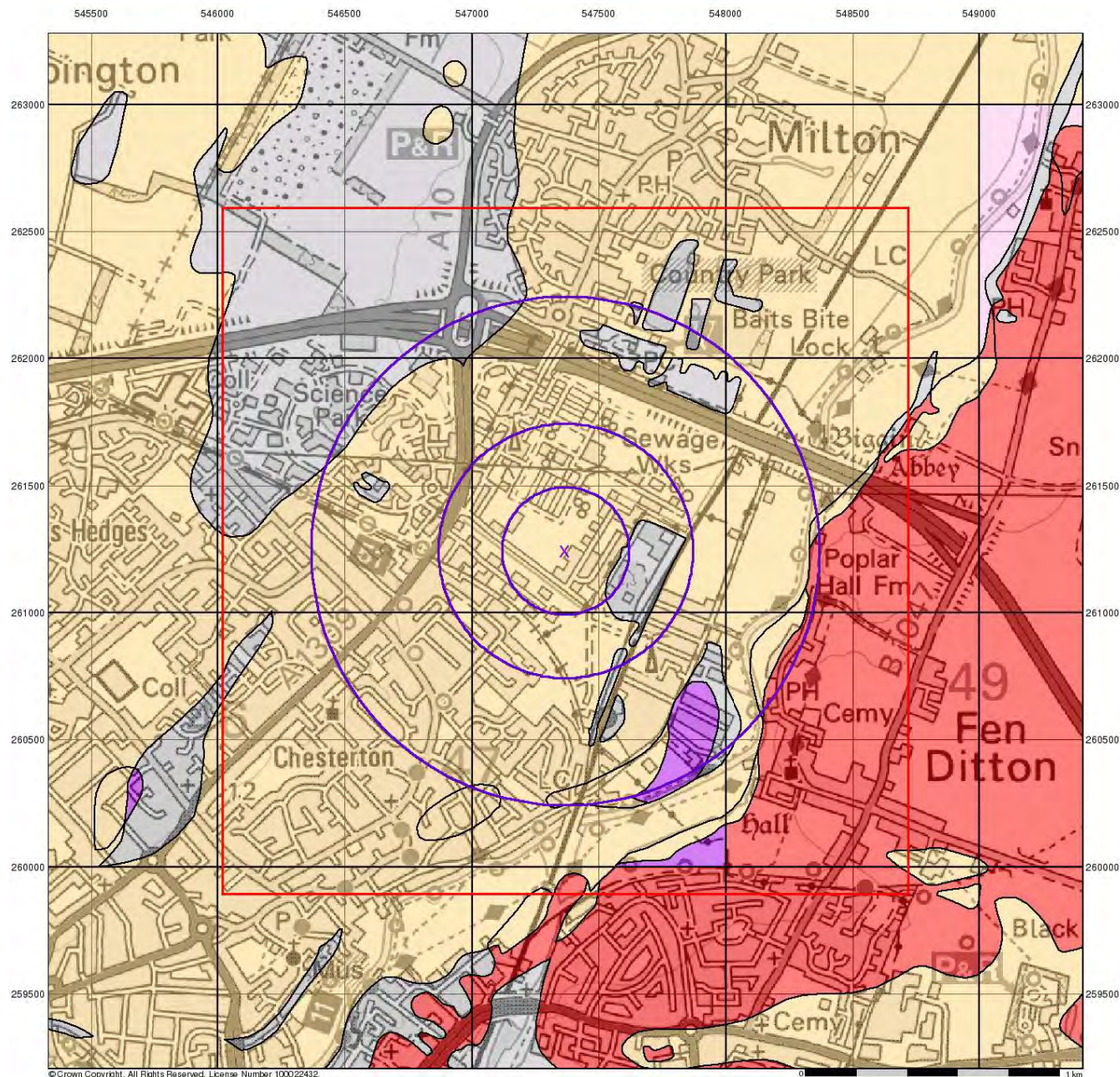
Site at 546250, 261790



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 Web: www.environmentcheck.co.uk

APPENDIX C

Groundwater Vulnerability and Flood Maps



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Groundwater Vulnerability

General

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

Agency and Hydrological

Bedrock Aquifers

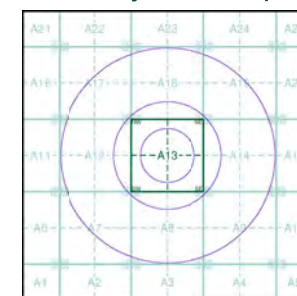
- High Vulnerability, Principal Aquifer
- High Vulnerability, Secondary Aquifer
- Medium Vulnerability, Principal Aquifer
- Medium Vulnerability, Secondary Aquifer
- Low Vulnerability, Principal Aquifer
- Low Vulnerability, Secondary Aquifer

Superficial Aquifers

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

- Unproductive Aquifer
- Soluble Rock

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 280856681_1_1
 Customer Ref: UK21.5457
 National Grid Reference: 547370, 261240
 Slice: A
 Site Area (Ha): 0.01
 Search Buffer (m): 1000

Site Details

Site at 547370, 261250



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0 1 km



Bedrock Aquifer Designation

General

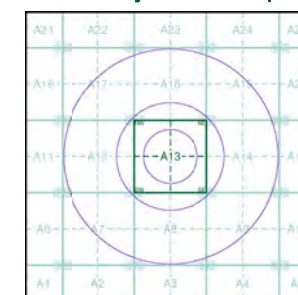
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Geological Classes

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

Site Sensitivity Context Map - Slice A



Order Details

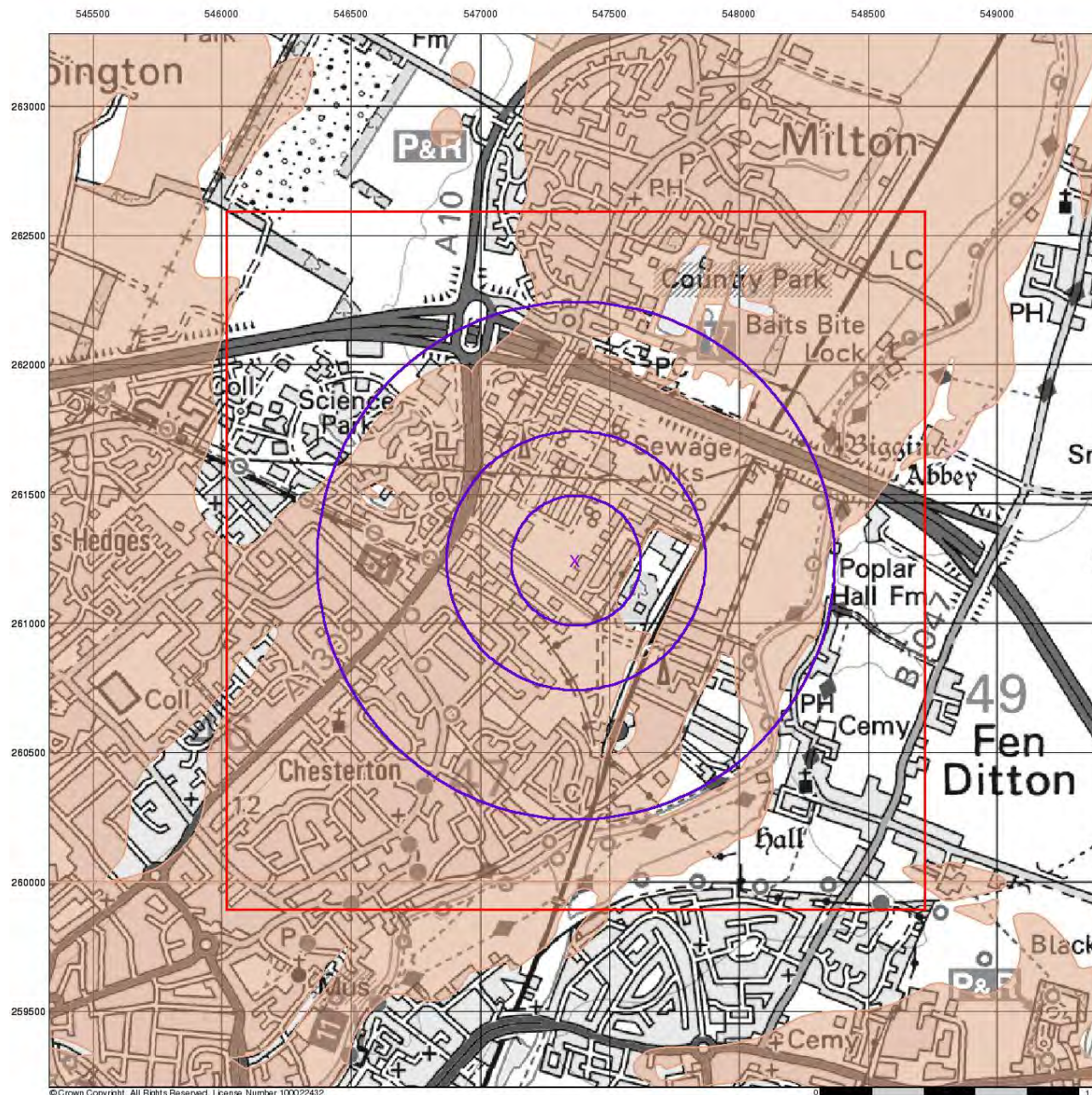
Order Number: 280856681_1_1
 Customer Ref: UK21.5457
 National Grid Reference: 547370, 261240
 Slice: A
 Site Area (Ha): 0.01
 Search Buffer (m): 1000

Site Details

Site at 547370, 261250



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0 1 km



Superficial Aquifer Designation

General

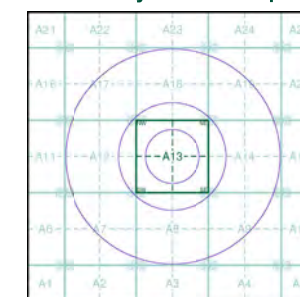
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Geological Classes

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

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 280856681_1_1
 Customer Ref: UK21.5457
 National Grid Reference: 547370, 261240
 Slice: A
 Site Area (Ha): 0.01
 Search Buffer (m): 1000

Site Details

Site at 547370, 261250



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



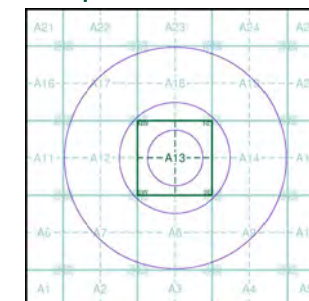
General

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

Agency and Hydrological (Flood)

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

Flood Map - Slice A



Order Details

Order Number: 280856681_1_1
Customer Ref: UK21.5457
National Grid Reference: 547370, 261240
Slice: A
Site Area (Ha): 0.01
Search Buffer (m): 1000

Site Details

Site at 547370, 261250

Landmark
INFORMATION GROUP

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Web: www.envirocheck.co.uk

APPENDIX D

A Selection of Historic Maps



Historical Aerial Photography

Published 1948

Source map scale - 1:10,560

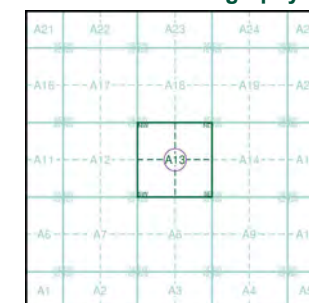
The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

© Landmark Information Group and/or Data Suppliers 2010.

Map Name(s) and Date(s)



Historical Aerial Photography - Slice A



Order Details

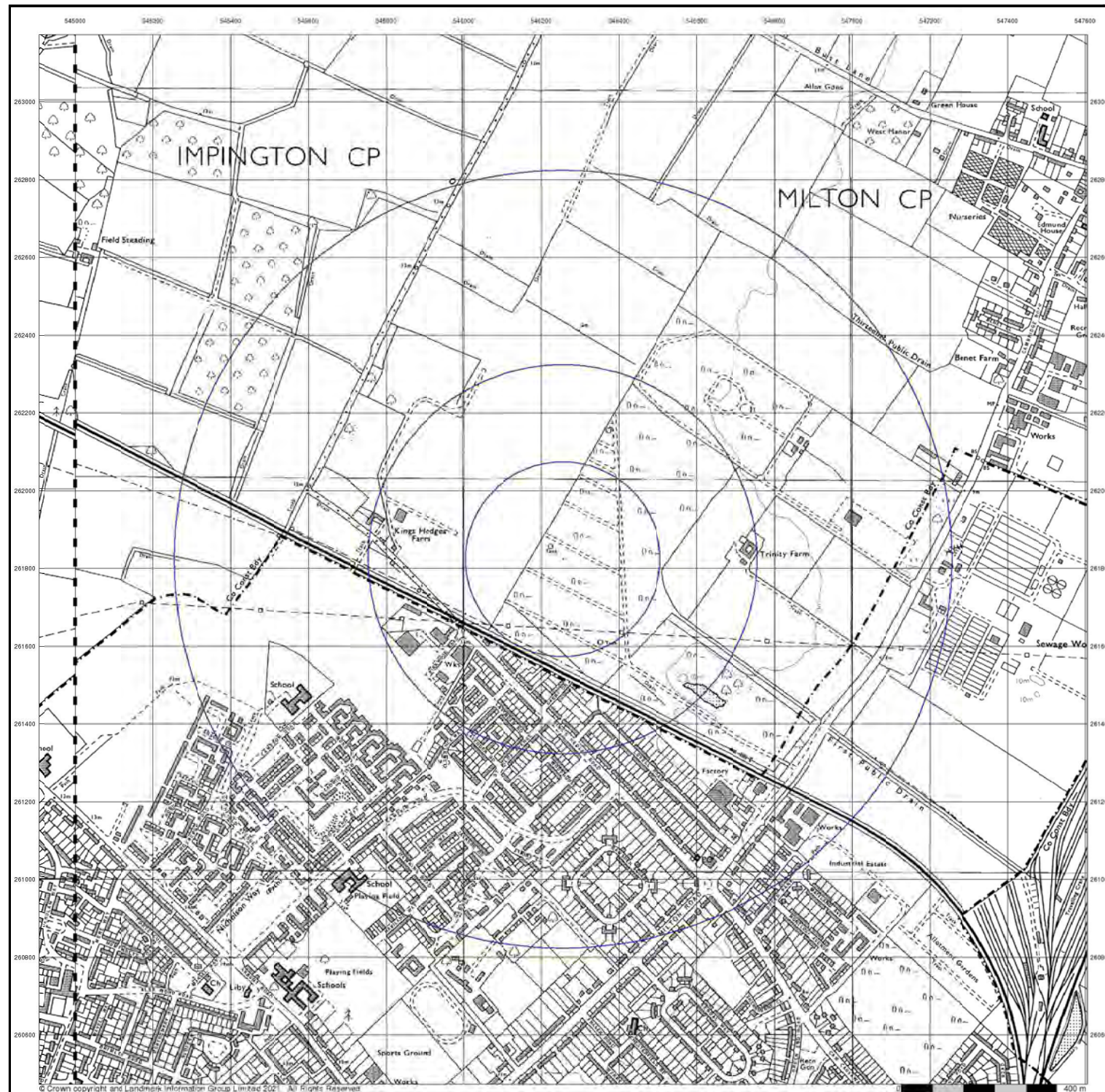
Order Number: 280852431_1_1
Customer Ref: UK21.5457
National Grid Reference: 546260, 261820
Slice: A
Site Area (Ha): 0.01
Search Buffer (m): 1000

Site Details

Site at 546250, 261790

Landmark
INFORMATION GROUP

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



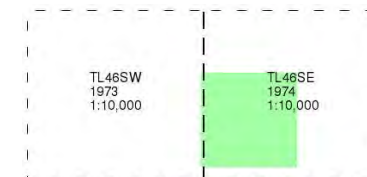
Ordnance Survey Plan

Published 1973 - 1974

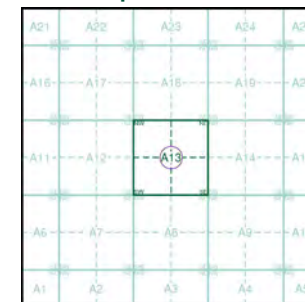
Source map scale - 1:10,000

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 280852431_1_1
 Customer Ref: UK21.5457
 National Grid Reference: 546260, 261820
 Slice: A
 Site Area (Ha): 0.01
 Search Buffer (m): 1000

Site Details

Site at 546250, 261790

Landmark
 INFORMATION GROUP

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



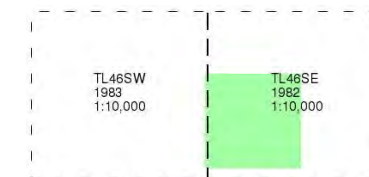
Ordnance Survey Plan

Published 1982 - 1983

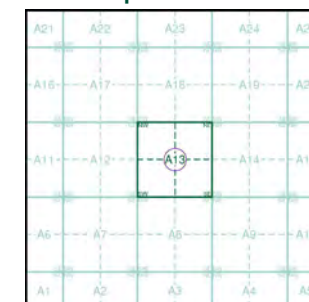
Source map scale - 1:10,000

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 280852431_1_1
Customer Ref: UK21.5457
National Grid Reference: 546260, 261820
Slice: A
Site Area (Ha): 0.01
Search Buffer (m): 1000

Site Details

Site at 546250, 261790

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Cambridgeshire & Isle Of Ely

Published 1886 - 1888

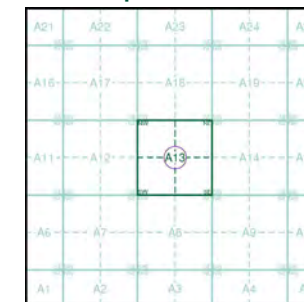
Source map scale - 1:10,560

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

Map Name(s) and Date(s)

| | |
|---------------------------|---------------------------|
| 040NW 1888 1:10,560 | 040NE 1888 1:10,560 |
| 040SW 1888 1:10,560 | 040SE 1888 1:10,560 |

Historical Map - Slice A



Order Details

Order Number: 280856681_1_1
Customer Ref: UK21.5457
National Grid Reference: 547370, 261240
Slice: A
Site Area (Ha): 0.01
Search Buffer (m): 1000

Site Details

Site at 547370, 261250

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INFORMATION GROUP

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Cambridgeshire & Isle Of Ely

Published 1927

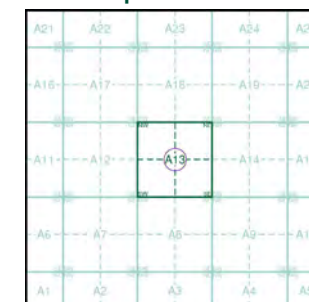
Source map scale - 1:10,560

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

Map Name(s) and Date(s)

| | |
|---------------------------|---------------------------|
| 040NW 1927 1:10,560 | 040NE 1927 1:10,560 |
| 040SW 1927 1:10,560 | 040SE 1927 1:10,560 |

Historical Map - Slice A



Order Details

Order Number: 280856681_1_1
Customer Ref: UK21.5457
National Grid Reference: 547370, 261240
Slice: A
Site Area (Ha): 0.01
Search Buffer (m): 1000

Site Details

Site at 547370, 261250

Landmark
INFORMATION GROUP

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



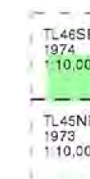
Ordnance Survey Plan

Published 1973 - 1974

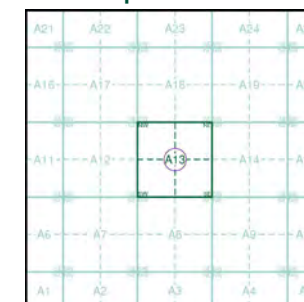
Source map scale - 1:10,000

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 280856681_1_1
Customer Ref: UK21.5457
National Grid Reference: 547370, 261240
Slice: A
Site Area (Ha): 0.01
Search Buffer (m): 1000

Site Details

Site at 547370, 261250



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Web: www.envirocheck.co.uk



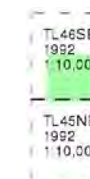
Ordnance Survey Plan

Published 1992

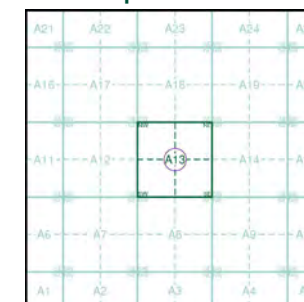
Source map scale - 1:10,000

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 280856681_1_1
Customer Ref: UK21.5457
National Grid Reference: 547370, 261240
Slice: A
Site Area (Ha): 0.01
Search Buffer (m): 1000

Site Details

Site at 547370, 261250



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VectorMap Local

Published 2021

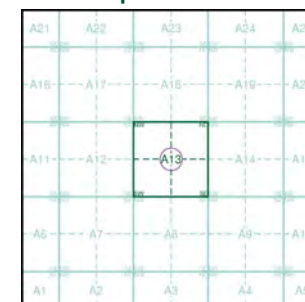
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities), 1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)

| | |
|----------------------------|----------------------------|
| TL46SW 2021 Variable | TL46SE 2021 Variable |
|----------------------------|----------------------------|

Historical Map - Slice A



Order Details

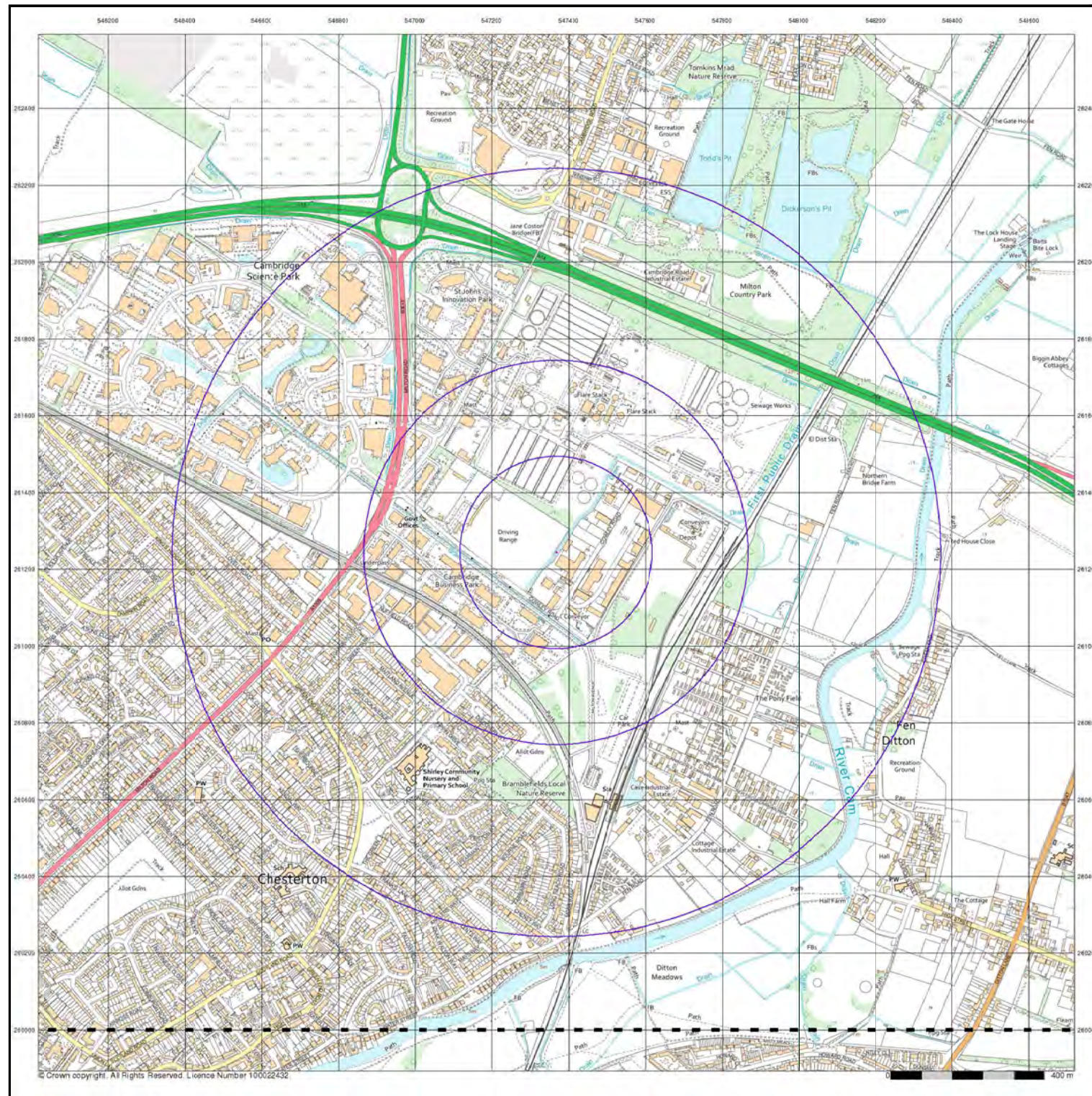
Order Number: 280852431_1_1
Customer Ref: UK21.5457
National Grid Reference: 546260, 261820
Slice: A
Site Area (Ha): 0.01
Search Buffer (m): 1000

Site Details

Site at 546250, 261790

Landmark
INFORMATION GROUP

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Web: www.envirocheck.co.uk



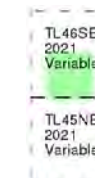
VectorMap Local

Published 2021

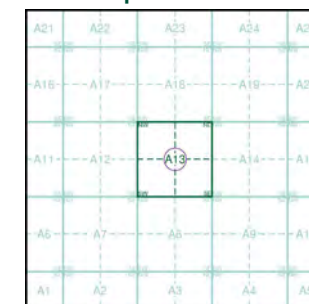
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities), 1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 280856681_1_1
 Customer Ref: UK21.5457
 National Grid Reference: 547370, 261240
 Slice: A
 Site Area (Ha): 0.01
 Search Buffer (m): 1000

Site Details

Site at 547370, 261250



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

APPENDIX E

Contaminated Land Officer Correspondence

Michael Judson

From: David Abiorwerth <David.Abiorwerth@cambridge.gov.uk>
Sent: 16 July 2021 13:50
To: Michael Judson; Adam Finch
Cc: Marcus Bell
Subject: RE: NEC AAP - Land Contamination
Attachments: Cowley Road 59 Report.pdf

Hi Michael

Unfortunately I do not have the time to go through all of the planning applications associated with the NEC AAP site. However I've gone through our old records that cover the period c.2006 – 2016 and I've signposted a few relevant planning applications below and attached. It's unlikely that there is any readily accessible information available for the period prior to 2006, and anything after 2016 will be available on the Public Access website. My advice is to search the planning record via this map link:

<https://applications.greatercambridgeplanning.org/online-applications/spatialDisplay.do?action=display&searchType=Application>

Before zooming in on the site, turn off the planning layer and zoom in as far as possible. Turn the planning layer back on and use the slide rule to choose how far back in time you go – I would recommend 5 years, anything longer is unlikely to yield any meaningful information.

From our records:

Cowley Road Land Use Area (yellow)

09/0842/FUL - 59 Cowley Road, Cambridge CB4 0DN

Gas proof membrane installed.

No SI was undertaken but there was a desk study, although I am unable to locate it. There is anecdotal evidence of elevated levels of methane (up to 11.8% v/v) and carbon dioxide (up to 9.9% v/v) at a nearby site (Stagecoach Depot, 100 Cowley Road) that required a proprietary high spec gas proof membrane system (Visqueen GX Membrane) with a Geocomposite ventformer – see below.

09/0714/FUL – 100 Cowley Road, Cambridge CB4 0DN

Desk study and SI available – go to <https://applications.greatercambridgeplanning.org/online-applications/> and search 09/0714/FUL. Reports are under the *documents* tab (the first report is a noise report, the phase 1 and 2 reports appear after)

09/0842/FUL – 59 Cowley Road, Cambridge CB4 0DN

No info on website but desk study attached.

Cambridge Business Land Use Park Area (dark blue)

11/0774/FUL - Cavendish House, Cambridge Business Park, Cambridge CB4 0WZ

Desk study available - go to <https://applications.greatercambridgeplanning.org/online-applications/> and search 11/0774/FUL. Report is split into 3 parts under the *documents* tab.

St Johns Innovation Park Land Use area (light blue)

This area crosses the boundary between CCC and SCDC – you may get duplicate info from SCDC.

12/0928/FUL – St Johns Innovation Park, Cowley Road, Cambridge CB4 0WS

Desk study available - go to <https://applications.greatercambridgeplanning.org/online-applications/> and search 12/0928/FUL. Report is split into 5 parts and labelled as 'contamination report' under the *documents* tab. Please note that the label 'desk study' is a dead link.

16/0215/FUL – St Johns Innovation Park, Cowley Road, Cambridge CB4 0WS

Desk study available - go to <https://applications.greatercambridgeplanning.org/online-applications/> and search 16/0215/FUL. Report is labelled as 'desk study' under the *documents* tab and is in 7 parts.

Site investigation report available – search 16/0215/COND4.

I hope this proves useful and once again apologies for not being able to provide you with more.

Regards

David

David Abiorwerth

Scientific Officer

Environmental Quality & Growth Team

Cambridge City Council
T: 01223 457661
M: 07968 343185
david.abiorwerth@cambridge.gov.uk

From: Michael Judson <MJudson@epstrategies.co.uk>

Sent: 12 July 2021 14:49

To: Adam Finch <Adam.Finch@cambridge.gov.uk>; Sproats Claire <Claire.Sproats@scambs.gov.uk>; David Abiorwerth <David.Abiorwerth@cambridge.gov.uk>; Bord Helen <Helen.Bord@scambs.gov.uk>

Cc: Marcus Bell <MBell@epstrategies.co.uk>

Subject: NEC AAP - Land Contamination

Good Afternoon All,

I have been working on the Phase I Report for this site and just wanted to send you a draft of the attached plan in case you have any thoughts or comments prior to issue of the report. We have attempted to divide the site into various areas based on historic land uses and the likely risks/contaminant linkages each will pose. Obviously, you may know more about these areas which may be pertinent and affect the conclusions / outputs so please let me know if you do. Our report is likely to follow a fairly normal template for a Phase I however instead of listing contaminant linkages for each area in the report and provide a CSM for each, it will contain a discussion of each area in written form, with the attached included as an appendix.

Also, with regards to a planning review, obviously there is an enormous number of applications across there area so I was wondering if either of you knew of any pertinent ones for us to look over that may impact the findings/conclusions for any of the areas outlined.

Basically, any information you have which you think is pertinent and warrants inclusion in our report would be useful.

Kind Regards

Michael Judson MCIWEM

Senior Consultant



M 07860 941952

T 01954 710666

E mjudson@epstrategies.co.uk

W www.epstrategies.co.uk



EPS Ltd | 7B Caxton House | Broad Street | Cambourne | Cambridge | CB23 6JN

Company Registration No.: 4330320

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Michael Judson

From: Sproats Claire <Claire.Sproats@scambs.gov.uk>
Sent: 20 July 2021 08:41
To: Michael Judson
Cc: Marcus Bell
Subject: RE: NEC AAP - Land Contamination

Hi Michael,

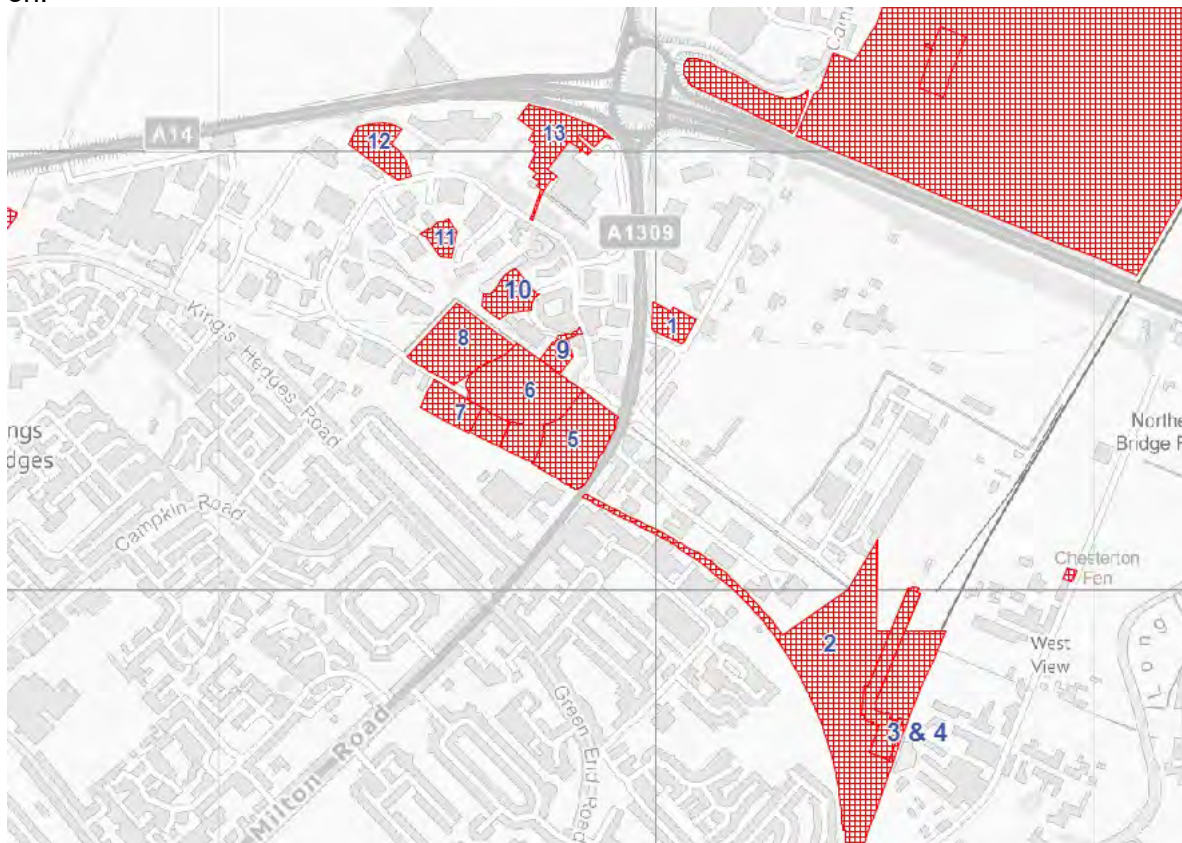
Regarding land uses for each of your identified areas, our records indicate the following within SCDC's area:

Cambridge Science Park – Former military land including and area of infilled land in the south

St John's Innovation Park – Former Military land

Railway station, Depot and Sidings – As name suggests

I have reviewed our database of reports/information held and can provide you with the following list of contaminated land reports for the parcels of land shown in the plan below. The majority of reports should be available on the planning portal under the stated references. However if there is a report that is of interest and it isn't on there (a fair few of the older ones are not) then let me know and I can forward them on.



1. St Johns Innovation Park

S/3085/16/DC Contaminated Land Desk Study. Ramboll February 2016

Ground Contamination Factual and Interpretative Report. Ramboll March 2014

Ground Contamination Factual and Interpretative Report. Ramboll July 2016

2. Railway sidings/Station

S/1236/15/FL Draft Ground Investigation Report and Land Contamination Assessment. Atkins March 2013

Various other reports for discharge of conditions on S/1236/15/FL that don't appear to be uploaded to planning portal, but can be available on request, including:

CW DQRA Technical Note Atkins April 2015,

GQRA Technical Note Atkins October 2015,

Gas Protection Measures Technical Note Atkins November 2015

3. Plot H1/Hotel

S/2372/17/FL Phase I Geotechnical and Geoenvironmental PRA. Mott Macdonald June 2017

(S/0249/19/DC) Ground Investigation Report. Mott Macdonald Nov 2017
 Remediation Method Statement. CGL Jan 2019
 (S/2372/17/COND28) CW DQRA. CGL May 2020
 Verification report. CGL May 20

4. Plot O1 Office Building
 S/2750/19/DC Phase I Geotechnical and Geoenvironmental PRA. Mott Macdonald June 2017
 Ground Investigation Report Mott MacDonald December 2017
 Factual Report on Ground Investigation Socotec November 2017
 Remediation Method Statement. Mott MacDonald August 2019
 Cambridge Science Park

5. Plots 1-21
 S/2436/17/FL Contaminated Land and Geotechnical Desk Study. Ramboll December 2016
 Contaminated Land Interpretative Report. Ramboll June 2017
 S/1169/19/DC Remediation Plan. SDC Undated

6. Trinity Centre
 S/4629/18/FL Contamination Assessment. MLM March 2018
 Geoenvironmental Assessment. MLM May 2018

7. Plots 26-27
 S/1191/15/FL Phase 2 Geoenvironmental Assessment Report. MLM January 2015

8. Plot 29
 S/1257/08/FL Site Investigation Report. STATS February 2008
 S/1405/16/FL Phase I Contamination Assessment Report. MLM February 2016
 Phase 2 Geoenvironmental Assessment Report MLM July 2016
 S/3425/16/DC Remediation and Verification Plan. MLM December 2017
 S/0187/19/DC Remediation Verification of Asbestos Contaminated Soils. MLM June 2017
 Remediation Verification Report of the Placement of Clean Capping Soils March 2019

9. Plot 127
 20/03444/FUL Site Investigation Report. Ground Engineering November 2019

10. Plot 184
 S/1693/15/FL Phase I Contamination Assessment. MLM April 2015
 Phase II Geoenvironmental Assessment. MLM April 2015

11. Plot 216
 S/2433/16/FL Phase I Geoenvironmental Desk Study. Wardell Armstrong August 2016
 Preliminary Site Investigation Report. Wardell Armstrong December 2017
 S/1171/18/DC Site Investigation Report. Wardell Armstrong March 2018

12. Plot 270
 S/0630/15/FL Phase I Geoenvironmental Desk Study. Mott MacDonald February 2014
 S/3641/16/DC Report on Ground Investigation. AF Howland July 2015
 Report on Ground Investigation. AF Howland August 2015
 Report on Ground Investigation. AF Howland September 2016
 Remediation Strategy and Verification Plan. LEE Environmental October 2016 & February 2017 Revision
 S/2304/17/DC Works Method Statement Phase 1A. Sanctus April 2017
 Contract Completion Report Phase 1A. Sanctus June 2017
 S/0452/18/DC Works Method Statement Phase 1B. Sanctus October 2017
 Contract Completion Report Phase 1B. Sanctus December 2017

13. Napp Pharmaceuticals
 S/1136/18/FL Phase I Geoenvironmental Desk Study. Scott Wilson September 2010
 Phase II Geoenvironmental Report. Scott Wilson February 2011
 Addendum Technical Note for Contaminated Land Assessment. RPS October 2017

Kind Regards

Claire Sproats | Scientific Officer (Contaminated Land), Shared Waste & Environment

(Please note my working days are generally Monday, Tuesday & Thursday 9 - 3)

Pronouns: she/her - [Why have I put this?](#)



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From: Michael Judson <MJudson@epstrategies.co.uk>

Sent: 12 July 2021 14:49

To: Adam Finch <Adam.Finch@cambridge.gov.uk>; Sproats Claire <Claire.Sproats@scambs.gov.uk>; David Abiorwerth <David.Abiorwerth@cambridge.gov.uk>; Bord Helen <Helen.Bord@scambs.gov.uk>

Cc: Marcus Bell <MBell@epstrategies.co.uk>

Subject: NEC AAP - Land Contamination

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Good Afternoon All,

I have been working on the Phase I Report for this site and just wanted to send you a draft of the attached plan in case you have any thoughts or comments prior to issue of the report. We have attempted to divide the site into various areas based on historic land uses and the likely risks/contaminant linkages each will pose. Obviously, you may know more about these areas which may be pertinent and affect the conclusions / outputs so please let me know if you do. Our report is likely to follow a fairly normal template for a Phase I however instead of listing contaminant linkages for each area in the report and provide a CSM for each, it will contain a discussion of each area in written form, with the attached included as an appendix.

Also, with regards to a planning review, obviously there is an enormous number of applications across there area so I was wondering if either of you knew of any pertinent ones for us to look over that may impact the findings/conclusions for any of the areas outlined.

Basically, any information you have which you think is pertinent and warrants inclusion in our report would be useful.

Kind Regards

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