EIA SCOPING REPORT

LAND SOUTH OF CALVERT GREEN

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Contents

1 Introduction

Purpose

1.1 The purpose of this report is to inform a request for an Environmental Impact Assessment (EIA) Scoping Opinion from Aylesbury Vale District Council (AVDC) in relation to an outline planning application for a residential-led, mixed-use development of Land to the South of Calvert Green, OX27 0BJ (the 'Site'). This Scoping Report has been prepared by Quod on behalf of Highbarrow Holdings (the Applicant).

1.2 This report sets out the findings of an EIA scoping study undertaken by the project team and accompanies a request for a Scoping Opinion submitted to AVDC in accordance with Regulation 15 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017[1] (as amended)[2] ('EIA Regulations').

1.3 In line with the EIA Regulations, this report identifies the Site location, provides a brief description of the nature and purpose of the development and an explanation of its likely significant effects on the environment. The report also outlines the proposed content, approach and scope of the ES to accompany the planning application.

1.4 Figure 1.1 and Figure 1.2 show the Site's location and likely extent of the planning application. Brief descriptions of the Site and the Development are provided within Sections 2 and 3 respectively.

Figure 1.1: Site Location

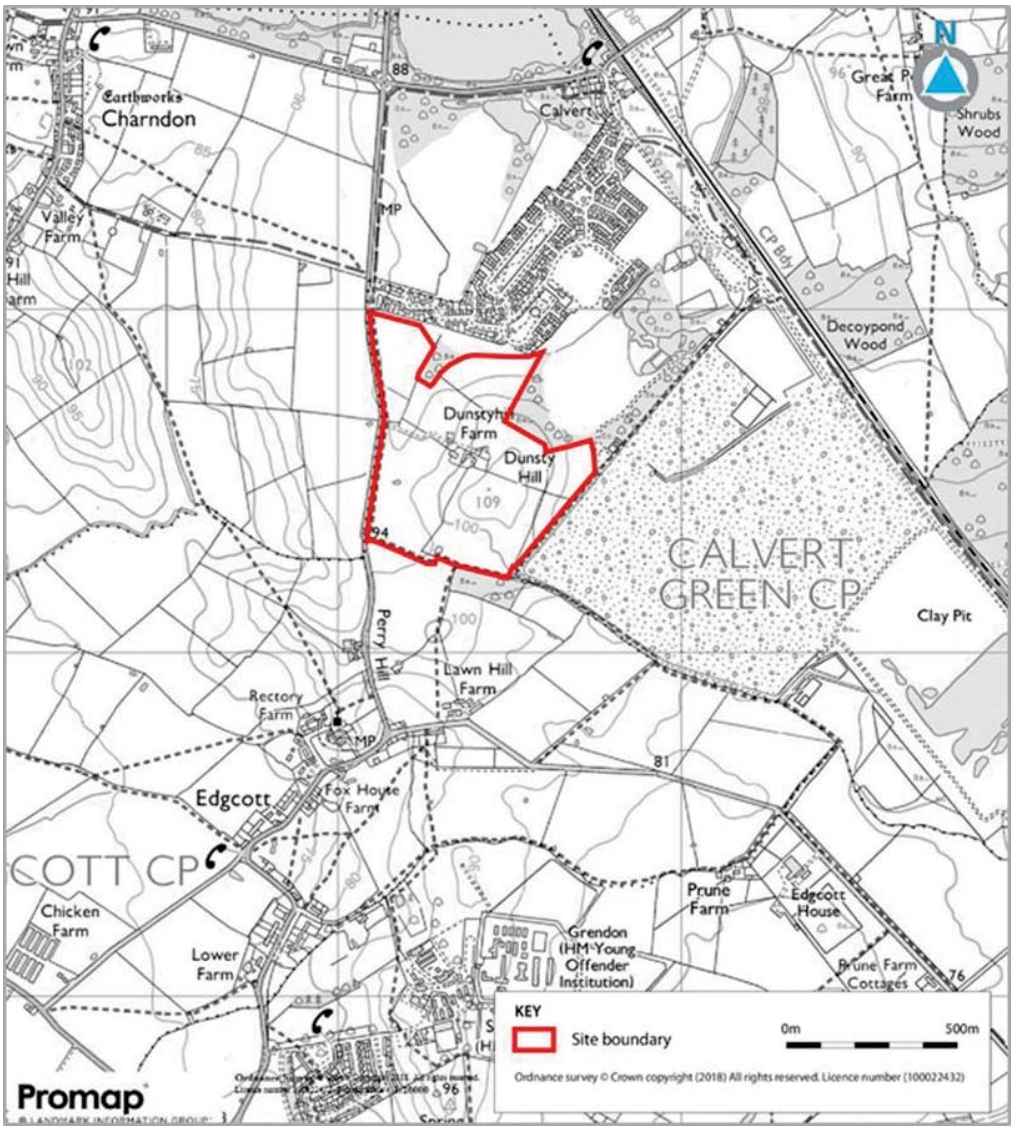
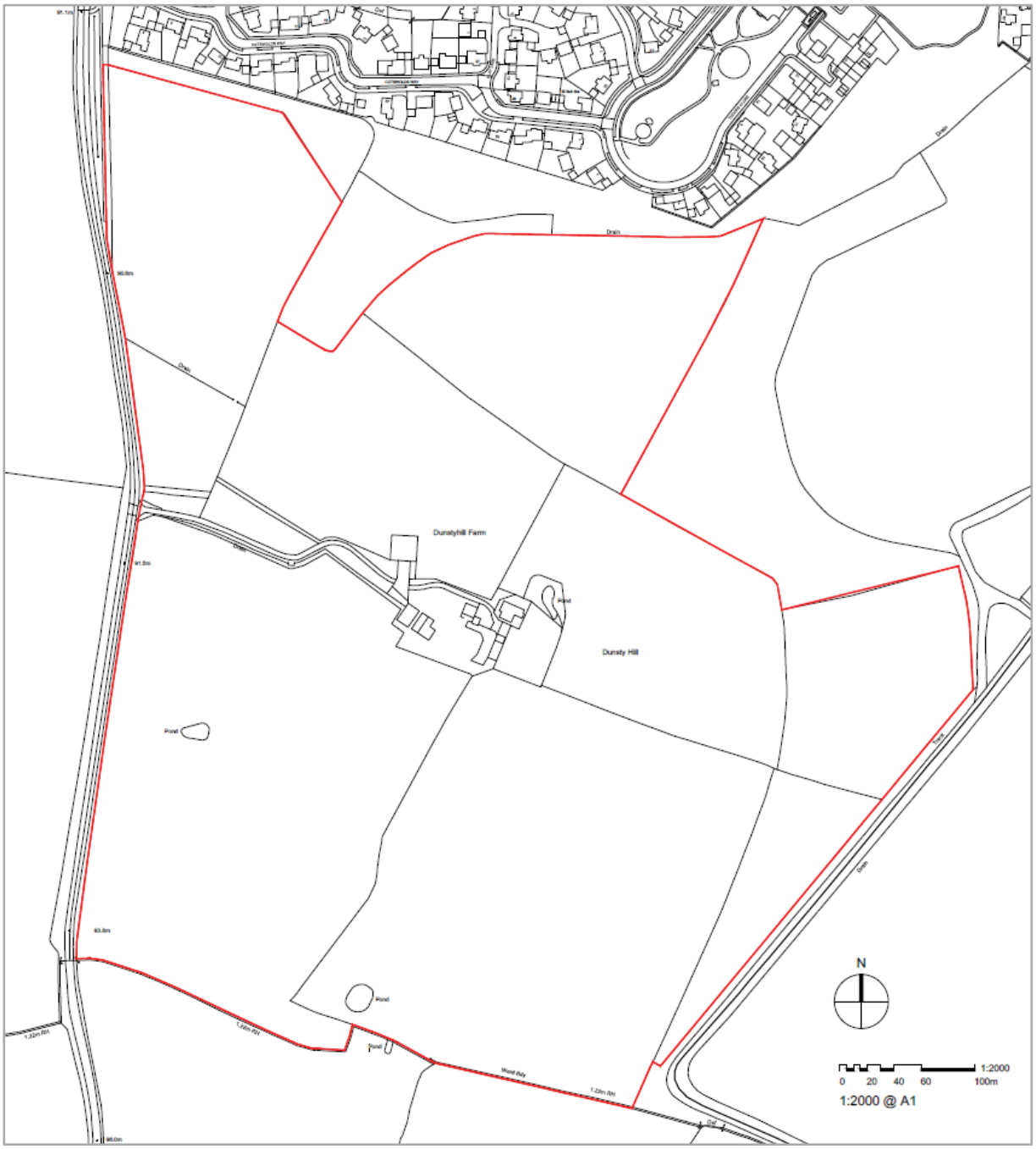


Figure 1.2: Site Boundary



Planning and EIA Context

1.5 The Site is located within the Cambridge-Milton Keynes-Oxford corridor, an area that the UK Government has aims for as a world-renowned centre for science, technology and innovation. Whilst Cambridge, Milton Keynes and Oxford are amongst the UK's most productive and successful cities, a number of challenges have been identified for the corridor, namely:

1.6 *"that a lack of sufficient and suitable housing will present a risk to the future economic growth and that, without a joined-up approach to planning for housing, jobs and infrastructure, the arc risks being left behind by its international competitors, damaging the UK's future competitiveness."* National Infrastructure Commission (NIC)[3]

1.7 The NIC's central finding when asked to provide options for maximising the growth of the corridor is that rates of house building will need to double if the corridor is to achieve its economic potential. It identifies the arc between Bicester and Bletchley as a key growth area, and the Site is located within this area. This Development can help support these infrastructure developments. In addition, a number of infrastructure schemes are proposed for delivery within the district, including the East West Rail development, Oxford to Cambridge Expressway and High Speed 2 (HS2) maintenance depot at Calvert/Steeple Claydon.

1.8 The Development falls within Category 10(b) of Schedule 2 of the EIA Regulations, which is applicable to 'urban development projects'. A formal screening opinion has not been requested from AVDC, given the Development has the potential to have significant effects on the environment by virtue of the scale of new uses and the Site's location adjacent an authorised landfill. Instead, the Applicant has committed to undertaking an EIA and submitting an ES with the planning application voluntarily.

1.9 An EIA is a systematic process that aims to prevent, reduce or offset the significant adverse environmental effects of development proposals, and enhance positive ones. It ensures that planning decisions are made considering the environmental effects and with engagement from statutory bodies, local and national groups and the public.

1.10 It should be noted that under the EIA Regulations, the ES will be prepared by competent experts (see below).

Project Team

1.11 The core team involved in the EIA and planning application are listed in Table 1.1.

Organisation	Role/Specialism
Quod	EIA Co-ordinators; Socio-economics
Vectos	Transport
Air Quality Consultants	Air Quality
AECOM	Noise
CgMs	Archaeology; Built Heritage
Hydrock	Ground Conditions and Contamination
Askew Land and Soils Ltd.	Agriculture and Soils
RPS	Flood Risk & Drainage
Middlemarch	Biodiversity
Arc	Landscape and Visual Impact Assessment
Troopers Hill	Accurate Visual Representations
Ingleton Wood	Architects and Masterplan Designer; Planning

1.12 As defined by paragraph 18 5(a) of the EIA Regulations, the ES must be prepared by competent experts. Each member of the project team is a suitably qualified professional. Quod will be the lead editor of the ES and author of certain chapters. Quod is a member of the Institute of Environmental Management and Assessment EIA Quality Mark Scheme, an accreditation scheme which sets high standards for EIA practice and demonstrates a commitment to excellence in EIA activities.

Structure of the Report

1.13 The remainder of the Scoping Report is structured as follows:

- Section 2: Site Description and Context;
- Section 3: Description of the Development;
- Section 4: EIA Methodology;
- Sections 5-11: Environmental Topics (to be scoped into the EIA);
- Section 12: Cumulative Effects; and
- Section 13: Non-Significant Topics.

1.14 The following appendices are also provided:

- Appendix 1.1 - Structure of the ES Technical Chapters;
- Appendix 9.1 - Preliminary Ecological Appraisal (2017);
- Appendix 10.1 - Phase 1 Preliminary Investigation Report (2018);
- Appendix 11.1 - Visual Receptors to be included within LVIA;
- Appendix 11.2 - LVIA Figures; and
- Appendix 13.1 - Archaeology Desk-Based Assessment (2018).

2 Site Description and Context

Site Location and Setting

2.1 The Site covers approximately 30 hectares (ha) of land within the administrative area of AVDC and is located on the south-western fringe of the village of Calvert Green. Aylesbury town centre is located approximately 6 kilometres (km) to the south, with the towns of Bicester and Bletchley located 10km west and 20km east respectively.

Figure 2.1: Aerial Photograph of Site

2.2 The Site comprises nine agricultural fields and the farmstead of Dunsty Hill Farm, which includes a vacant two storey farmhouse and five one-storey outhouses. An aerial photograph of the Site is provided in Figure 2.1. The centre of the Site lies at approximately 109 metres above ordnance datum (m AOD) within levels falling approximately 20m towards the boundaries of the Site, particularly to the north-east corner (at an elevation of 88m AOD). Drainage ditches follow a number of the on-site field boundaries and three small ponds can be found in the south, west and centre of the Site.

2.3 The Site is situated wholly within Flood Zone 1, which comprises land assessed as having a 'low' (less than 1 in 1,000) annual probability of flooding. It should be noted the Site is also located within a Drinking Water Safeguard Zones (Surface Water) and a Nitrate Vulnerable Zone.

2.4 The Site is accessed from Perry Hill Road. There is a network of secondary and tertiary roads in the area, with the A41 approximately 3.75km south of the Site. There are two bus stops approximately 220m north of the Site boundary on Cotswolds Way, providing services to local towns, Aylesbury and Buckingham. There are existing Public Rights of Way (PRoWs) bounding the eastern, western and southern Site boundaries respectively.

2.5 The Site is not located within a 'sensitive area' (as defined in Part 1 of the EIA Regulations). It is in close proximity to one statutory nature conservation site, with Sheephouse Wood Site of Special Scientific Interest (SSSI) located approximately 945m east of the Site boundary. The Site is not located within a Conservation Area and there are no statutory designated sites for heritage or listed buildings within the Site boundary. The Site is not in an Archaeological Notification Area.

Description of the Surrounding Area

2.6 The Site is in a predominantly agricultural area, with the wider landscape dominated by a mixture of agricultural fields interspersed with small conurbations and areas of woodland.

2.7 The village of Calvert Green is located immediately north of the Site. This conurbation was built in 2003 and contains approximately 300 – 400 homes. The villages of Steeple Claydon and Edgcott are located approximately 3km north and 1.2km south of the Site boundary respectively.

2.8 The nearest school is Grendon Underwood Combined School, approximately 2.5km south of the Site boundary. Steeple Claydon Surgery is approximately 3.1km north of the Site boundary while the closest hospital is Bicester Community Hospital approximately 10km west of the Site boundary. The nearest area of public open space and playspace are in Calvert Green, located circa 200m north of the Site boundary.

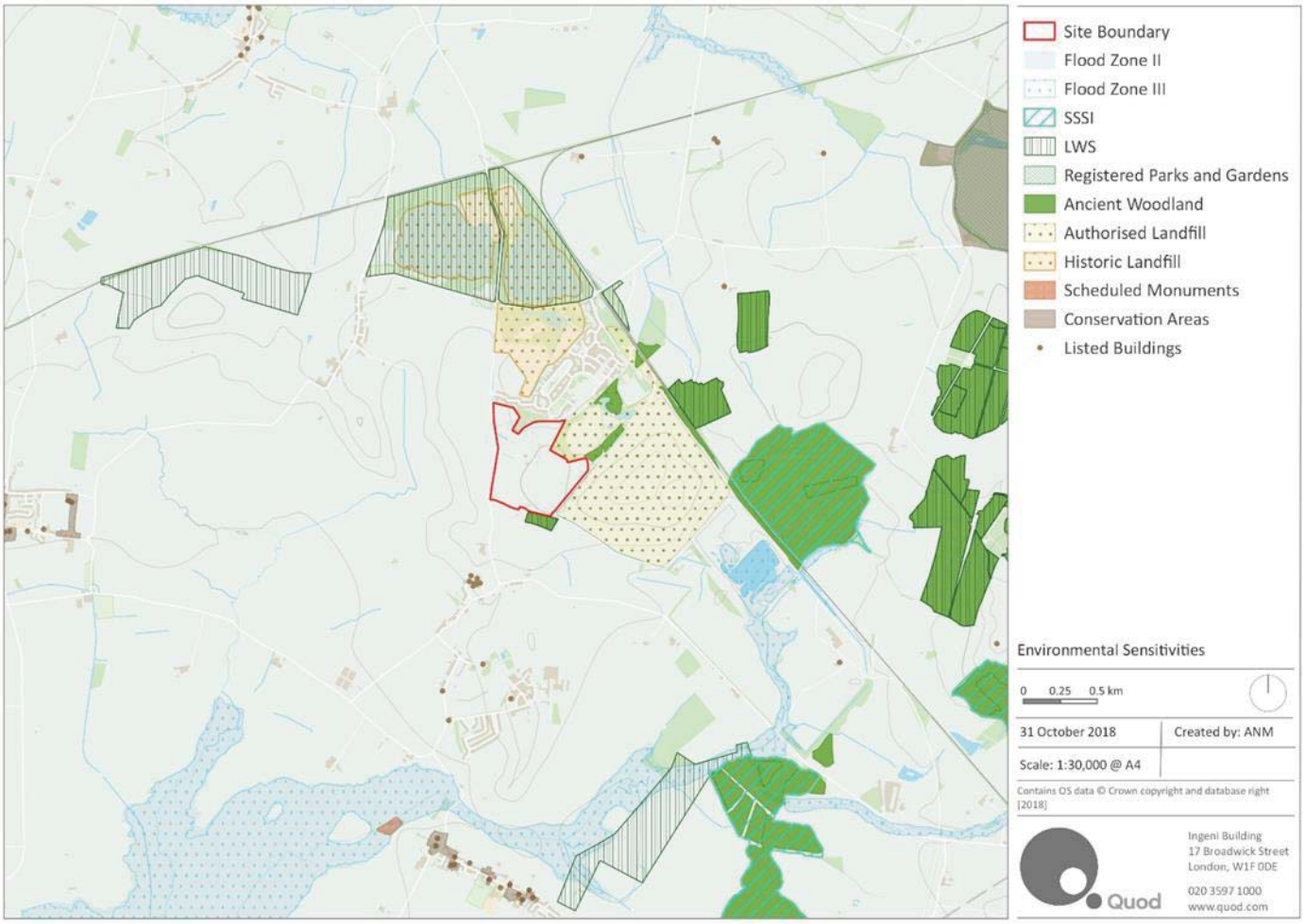
2.9 The Chiltern mainline railway is located approximately 760m north-east of the Site boundary; this is due to be upgraded to incorporate HS2 (see section 12 for further information). The operational Calvert Waste Management Facility is located to the east of the Site, which extends approximately 1.5km south-east. This facility accepts non-hazardous wastes and has been operational since 1987.

2.10 Aside from Sheephouse Wood SSSI, there are three additional statutory nature conservation sites within a 5km radius of the Site boundary, all of which are SSSIs. Grendon and Doddershall Woods, Finemere Wood, Ham Home-cum-Hamgreen Woods and Long Herdon Meadow are located 2km south, 3km south-east, 3.9km south and 4.3km south-west, respectively. The non-statutory Wood Between Lawnhill And Dunsty Hill Local Wildlife Site (LWS) is located adjacent to the southern boundary of the Site. There is no Ancient Woodland on-site, however some small clusters bound the Site to the south and east.

2.11 There are seven listed buildings situated approximately 1km south-west of the Site, within Edgcott. These are associated with the Church of St. Michael, Rectory Farmhouse and the Manor Farmhouse. These are all Grade II listed, with the exception of the Grade II* listed Church of St. Michael. Moated Site associated with St. Leonard's Church Scheduled Monument is located approximately 2.2km south of the Site boundary and Claydon Registered Park and Garden is located approximately 3km north-east of the Site boundary.

2.12 These designations and sensitivities are illustrated in Figure 2.2.

Figure 2.2: Environmental Constraints of Site and Surrounding Area



Future Baseline

2.13 As described above, a number of major infrastructure projects are proposed to be delivered within in the vicinity of the Site. These include HS2 which will follow the nearby existing railway line and the associated creation of a new maintenance depot in the locality, East West Rail and the Oxford to Cambridge Expressway. It is envisaged that the East West Rail route would intersect with HS2 route at Calvert, while the Oxford to Cambridge Expressway will approximately follow the East West Rail route.

2.14 Construction programmes for these projects are not yet all confirmed, however it is envisaged that the Western component of East West Rail would be complete and operational by 2023. HS2 is due to be complete by 2026 and the Oxford to Cambridge Expressway envisaged to be complete by 2030.

2.15 As construction of the Development is envisaged to commence in Quarter 4 (Q4) 2019 and expected to take complete in 2026, it is envisaged that East West Rail and HS2 (and its associated depot in Calvert/Steeple Clayton) would be complete and operational by this time. Further discussion is provided in Section 12 of this report.

3 Description of the Development

Overview

3.1 The Development proposals are at an early stage of design and will be developed following further technical analysis as part of the EIA process and in consultation with AVDC and other stakeholders. Proposals will also be subject at public consultation events before the planning application is submitted.

3.2 The planning application for the Development will be submitted in outline, with all matters reserved for future determination. The Development will be defined by a series of Parameter Plans and a Development Specification document which will set the framework for the future design by defining developable areas, principle means of access, maximum building heights and green infrastructure. The Development Specification document will define the amount and type of land uses to be provided together with other written principles. Together these parameters and principals will direct development of detailed design which will come forward for consideration by the AVDC through reserved matters applications.

3.3 Table 3.1 sets out the indicative total floorspace for Development as it is anticipated at this stage.

Table 3.1: Indicative Land Use Schedule

Land Use	Gross Internal Area (GIA) / Units
Housing (C3)	Up to 324 residential dwellings
Retirement Village (sui generis)	Up to 120 elderly residential dwellings
Retail (A1/A3/A4)	Up to 15,800m^2 including; *A1 (Convenience Retail) – Up to 6,500m^2* *A1 (Comparable Retail) – Up to 6,500m^2* *A3/4 (Drinking Establishments / Restaurants) – Up to 2,800m^2*
Commercial (B1(a)/(b)	Up to 3,800m^2 including; *B1(a) (Office) – Up to 1,400m^2* *B1(b) (Research and Development) – Up to 2,400m^2*
Non-residential Institutions (D1)	Up to 2,150m^2 including; *Primary School – Up to 2,050m^2* *General Practitioner – Up to 100m^2*
Assembly and Leisure (D2)	Up to 4,050m^2

3.4 Vehicular access points will be subject to further consultation with the relevant highways authorities, but it is currently envisaged that vehicular and pedestrian access to the Site will be achieved via two new access points off Perry Hill.

3.5 Parking spaces will be provided for each resident and to accommodate those working visiting and working at the Site. Car parking will be provided in accordance with Buckinghamshire County Council (BCC) parking standards with the ratio to be agreed with AVDC and BCC.

3.6 The tallest element of the Development is currently proposed to be up to 4 storeys**,** as will be defined by a Parameter Plan.

3.7 The three existing ponds on-Site will be retained, including the large pond in the centre of the Site which will be incorporated into the school grounds. Green buffers around the Site's boundaries will separate development from the road and surrounding area, and will provide green space for recreational use.

Demolition and Construction

3.8 The scheme will result in the demolition of all the existing buildings and structures on the Site. The Site will be levelled to allow for the construction of the Development.

3.9 At this stage, the indicative construction programme for the Development is expected to commence in Q4 2019, with construction expected to be complete in 2026. This represents a build out period of approximately 7 years.

3.10 The Applicant has committed to implementing the construction works in line with a Construction Environmental Management Plan (CEMP) as a means of avoiding, minimising and mitigating potential effects of construction on the environment and local community. The CEMP will be subject to approval by AVDC and secured through an appropriate planning condition(s).

4 EIA Methodology

Introduction

4.1 The ES will be prepared in compliance with the EIA Regulations. Reference will also be made to current EIA good practice guidance. This section outlines the general approach to the EIA process.

Consultation and Scoping Opinion

4.2 A programme of consultation with key stakeholders will be undertaken with statutory and non-statutory consultees throughout the development design and in the lead up to the planning application. Key stakeholders include AVDC, BCC, the Health and Safety Executive (HSE), Highways England, Historic England, Natural England, Anglian Water and the Environment Agency.

4.3 In line with the EIA Regulations, the ES will be 'based on' the Scoping Opinion provided by AVDC. Each ES topic chapter will set out key points made during scoping correspondence between the project team and stakeholders and will explain how these have been addressed by the EIA process.

Alternatives

4.4 Schedule 4 of the EIA Regulations require that the ES provides *"a description of the reasonable alternatives…. relevant to the proposed project and its specific characteristics which have been considered by the Applicant and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects".*

4.5 The ES will describe the reasonable alternatives to the Development which have been considered by the Applicant. Alternative sites have not been considered by the Applicant and as such will not be considered by the ES.

4.6 The reasonable alternatives to be considered in the ES are defined as:

- **'Do-nothing' scenario** - this will outline the consequences of no development taking place, and the Site remaining in its current undeveloped form;
- **Alternative designs** - these will include alternative layouts for developable areas, alternative uses (if considered), building heights, together with the justification for the selection of the final design; and

4.7 The rationale for the selection of the preferred option in environmental terms will also be included within the ES.

EIA Methodology

Significant and Non-Significant Effects

4.8 As highlighted by the UK Government Online Planning Practice Guidance[4] (PPG), where considering the scope of EIAs, local planning authorities *"should limit the scope of the assessment to those aspects of the environment that are likely to be significantly affected".*

4.9 With respect to identifying the likely significant environmental effects associated with the Development, consideration is given to potential effects associated with the demolition and construction phase and completed Development. These effects could be both beneficial and adverse and deemed to be 'significant' on the basis of:

- The value / importance of the resources and receptors that could be affected;

- The predicted magnitude of environmental change and / or impact experienced by these resources and receptors, accounting for their size, duration and spatial extent;
- The susceptibility or sensitivity of resources / receptors; and
- Options for avoiding, reducing, offsetting or compensating for any potentially significant adverse effects and the likely effectiveness of such mitigation measures.

4.10 Table 4.1 distinguishes those topics where likely significant effects are anticipated to arise in connection with the Development and therefore proposed for inclusion within the EIA, and those topics proposed to be 'scoped out' of further assessment.

Table 4.1: EIA Scoping Summary

Topic	Potential Construction Phase Effects	Potential Operational Phase Effects	Applicable Section of Scoping Report
Topics to be Scoped In			
Socio-Economics	✓	✓	See section 5
Traffic and Transport	✓	✓	See section 6
Air Quality	✓	✓	See section 7
Noise and Vibration	✓	✓	See section 8
Biodiversity	✓	✓	See section 9
Ground Conditions	✓	x	See section 10
Landscape and Visual Impacts	✓	✓	See section 11
Topics to be Scoped Out			
Archaeology	x	x	See section 13
Built Heritage	X	x	
Agriculture and Soils	x	x	
Water Resources and Flood Risk	x	x	
Daylight, Sunlight and Overshadowing	x	x	
Wind Microclimate	x	x	
Aviation	x	x	
Light Pollution and Solar Glare		x	
Waste	x	x	
Energy and Sustainability	X	x	
Vulnerability to Major Accidents and Disasters	x	x	
Climate Change and Greenhouse Gases	x	x	
Electronic Interference	x	x	

4.11 Sections 5 to 12 provides discussion on the aspects of the environment that that have the potential for significant effects to occur as a result of the Development. Potential effects deemed to be 'non-significant' within topics are also included within these Sections. Section 12 sets out the rationale for those issues that are unlikely to be significant and therefore will be scoped out of the ES.

Determining the Significance of Effects

4.12 Determining the significance of environmental effects is intended to inform decision making. The significance of the effects will be determined by specialists with reference to generic assessment criteria or subject-specific criteria for each environmental topic being considered. These criteria will apply a common terminology, classifying whether the effects are major, moderate or minor, as well as adverse, negligible or beneficial, temporary or permanent, in line with standard practice.

Study Area

4.13 The study area for each topic will be based on the geographical scope of the potential for significant effects relevant to the topic or the information required to assess the likely effects, as well as topics specific guidance and consultation with stakeholders.

Baseline Conditions

4.14 Baseline environmental conditions need to be established to enable an accurate assessment of potential changes to such conditions that may occur, and to assess the resultant environmental impacts of the Development. Understanding baseline conditions is also important in the identification of the most appropriate mitigation which could be employed to minimise any potentially significant effects.

4.15 Baseline information will be gathered to define and describe the existing environmental characteristics and receptors for each environmental topic.

4.16 A description of the current condition of the Site and its surroundings will be provided within the ES. For the purposes of the EIA, this description will be based upon surveys, datasets and site inspections from 2018. In the event that environmental information is not available for 2018, it may be necessary to use data which pre-dates 2018. The ES will set out what year the baseline data is sourced from.

4.17 In addition to the current baseline scenario, the EIA Regulations require an outline of the likely evolution of the baseline condition without implementation of the development, as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge (i.e. the EIA Future Baseline Scenario). The future baseline conditions will be described in each chapter.

Construction Effects

4.18 An indicative construction programme for the Development will be presented in the ES. The ES will outline the main activities associated with the indicative construction programme, together with the likely duration of each activity, and each topic assessment will consider the potential environmental effects associated with these construction activities (including the potential generation of dust, odour, noise, vibration, and traffic). Each topic assessment will consider the potential environmental effects associated with these construction activities (including the potential generation of dust, odour, noise, vibration, waste and traffic).

4.19 Details of phasing of the Development will not be known at the application stage, although the EIA will be informed by phasing principles (e.g. starting location, access and infrastructure delivery).

4.20 In line with IEMA best practice[5] , the CEMP can be defined as 'tertiary' mitigation which is defined as that which *"will be required regardless of any EIA assessment, as it is imposed, for example, as a result of legislative requirements and / or standard sectoral practices. For example, considerate contractor practices that manage activities which have potential nuisance effects."*

4.21 In-line with standard site practice, the Contractor will develop a CEMP in advance of the commencement of works on-site. Therefore, the assessment of construction effects will assume that standard measures, such as a CEMP will be in place and the basis for the EIA will therefore assume that this form of mitigation will be delivered. As such, any effects that might have arisen without this mitigation will not need to be identified as 'potential effects', as there should be no potential for them to arise. This should result in a simpler and proportionate ES.

4.22 An interim assessment, which considers the effects of the Development partway through construction, is not proposed although the assessment will consider the effects of construction on future receptors as appropriate.

Operational Effects

4.23 The timings of the operational phase of the Development (i.e. completed and occupied scheme) is uncertain as it is dependent on market demand. However, for the purposes of the assessment the Development will be assumed to be complete and occupied by 2026. Whilst the completion date for the Development may change, the date is unlikely to materially affect the significance of effects reported.

4.24 The outline planning application will be defined by a series of parameter plans together with a Development Specification document which will provide a sufficient level of detail to allow the likely significant effects of the Development to be identified, thus satisfying EIA requirements. The ES will include a full description of the Development.

4.25 In general, the EIA will assess the Development built out to the maximum land use and building heights defined by the parameter plans and Development Specification. This is to ensure the EIA does not underestimate the likely significant effects that could occur from construction and operation of the Development.

Cumulative Effects

4.26 Cumulative effects can occur either when different effects from the Development interact to exacerbate effects on sensitive receptors, or, when the magnitude of an effect is exacerbated by other existing or future neighbouring developments, thus creating a more significant effect on a receptor.

4.27 The potential for cumulative effects to arise will be considered in each technical chapter during both the construction and operational phases. Further details including the proposed cumulative schemes are provided in Section 12.

Structure of the ES Technical Chapters

4.28 Each environmental topic scoped into the EIA will be structured as set out in Appendix 4.1.

5 Socio-Economics

Baseline

5.1 Calvert Green is a new development of approximately 300 - 400 homes. There is minimal social infrastructure within Calvert Green, limited to a community centre, a small shop (which opened in 2016) and children's playspace.

5.2 The Site falls within Marsh Gibbon ward in the west of AVDC. According to the 2011 Census there are 3,410 residents living in Marsh Gibbon ward and 174,140 residents living in AVDC. More recent population projections estimate the 2018 population of the district at 198,700 residents (ONS 2016-based sub-national population projections). This data is unavailable at the ward level.

5.3 The age profile of the ward differs from AVDC at the district level and all other spatial levels[1] . The ward is home to a higher proportion of under 16s (24%) compared to 20% across the district. As a result, the proportion of working age residents (16 to 74 years) and over 75 years is lower at 71% and 5% respectively than the district.

5.4 Census data records the self-reported health status of the population. At the time of the 2011 Census the ward had higher levels of reporting very good health, 57% of all residents, than the averages for the district (53%) and region (52%).

5.5 Public Health England provides annual health profiles for each local authority. This profile provides an overview of health across a range of indicators compared to the rest of England. AVDC's Public Health Profile 2018 shows that none of the 32 health indicators considered are assessed to be 'significantly worse than England average'. 21 indicators are assessed to be 'significantly better than England average' including life expectancy (male and female), physically active adults, smoking prevalence in adults and obese children.

5.6 There are approximately 1,310 homes within the ward according to 2011 Census data. Of these, the majority (78%) are owned, which is higher than the district average (72%). As a result, there is a lower proportion of rented properties in the ward (both private and social rented) both comprising 10% of housing stock. This compares to 13% privately rented and 13% socially rented across the district.

5.7 According to the Business Register and Employment Survey (2017) data there are approximately 600 jobs within the ward. The largest sector is construction that comprises of 18% of all employment followed by Retail and Business administration and support services both representing 10% of employment in the ward.

5.8 Unemployment rates are low at the ward level with 0.3% claiming Jobseeker's Allowance in August 2018. This compares to 0.7% and 0.8% at the district and county levels.

Potential Effects

Likely Significant Effects

5.9 On the basis of the proposed uses, the Development is expected to generate a range of socio-economic effects, as follows:

- Generation of temporary employment during construction phase;
- Creation of permanent employment opportunities from any proposed commercial uses on-site;

[1] Including Buckinghamshire County and the South East Region

- Provision of new homes;
- Demand arising from the new population for social infrastructure (primary healthcare, schools and playspace); and
- Spending effects associated with the residents and employees brought to the Site by the Development.

Non-Significant Effects

5.10 In line with the EIA Regulations, the impacts of human health and wellbeing have also been considered in this scoping report. The EIA Regulations require the consideration of the potential effects on human and population health where significant effects are likely to occur. The assessment should be proportionate to the project being considered.

5.11 Aylesbury Vale currently reports good health and wellbeing across a number of indicators compared to the England average. Development would comprise residential and some commercial uses and, overall, these uses are considered unlikely to result in any significant direct adverse health impacts.

5.12 Where people live and work could have indirect impacts on their personal state of wellbeing, which may also be considered. Therefore, new developments could potentially have a beneficial or adverse effect on health, particularly in areas of with existing poor health conditions.

5.13 Poor health outcomes could arise from, for example, construction impacts such as dust or pollution from construction traffic. Poor design and access in end uses could also have effects on health outcomes. However, through appropriate mitigation and design these effects could be managed and potentially give rise to either neutral or indirect beneficial effects on human health.

5.14 At the system level, greater access to adequate housing and employment may be positively correlated with good health, but these effects will be uncertain and not measurable at the level of an individual site. The incidence of any such health effects will be very widely dispersed through marginal changes to the wider housing and employment markets, and so the effect is not significant at any level.

5.15 Despite the indirect links that have been identified between new development and health and wellbeing, the potential effects of a new development on the health and well-being of new and existing residents and workers would be largely determined by the way the Development's buildings and spaces are used (rather than constructed) and by lifestyle factors which cannot be accurately quantified or controlled at the planning stage.

5.16 New development cannot enforce how people ultimately use a development. These 'lifestyle factors' cannot be accurately quantified or controlled and are therefore considered to sit outside the role and scope of planning and EIA.

5.17 The following assessments within the EIA will consider the Development's indirect or secondary impacts that could have an effect on health and well-being:

- Socio-economic assessment;
- Air quality assessment;
- Noise and vibration assessment; and
- Transport and accessibility assessment.

5.18 The socio-economic aspects of a development that could potential affect health include the provision of housing and jobs, increased population and demand on community infrastructure. The assessment of these effects is already scoped into the socio-economic assessment.

5.19 Furthermore, the Applicant would commit to a CEMP to manage issues relating to health and wellbeing, including public safety, noise and vibration controls, and air and dust management during the construction phase.

5.20 The indirect health and well-being effects are already considered comprehensively in the ES as a whole where their assessment has been identified as being proportionate and/or potentially require mitigation. The inclusion of the requirement to consider population and human health effects in the EIA Regulations is met by the robust assessment of the topics listed above. Therefore, a separate health and wellbeing assessment is proposed to be scoped out of this EIA.

Assessment Methodology

5.21 A baseline assessment will be undertaken as part of the socio-economic ES chapter in order to establish the socio-economic conditions in the area surrounding the Site, particularly at the local and district level.

5.22 The socio-economic ES chapter would utilise data from sources including (but not limited to):

- 2011 Census data;
- Business Register and Employment Survey (2017);
- 2016-based subnational population projections (2018);
- Claimant Count (2018);
- Indices of Multiple Deprivation (2015);
- Annual Schools Census (2018) data and information from relevant Local Education Authority school admission documents; and
- Data on healthcare services form the NHS Choices (2018).

5.23 The assessment of effects would be undertaken using the following methodology and/or tools:

- Demolition and construction-related employment effects would be assessed using the Construction Industry Training Board Labour Forecasting Tool.
- The employment expected to be accommodated by the completed and operational commercial floorspace would be assessed by applying standard job density ratios (HCA 2015) supplemented by any locally specific information available.
- No policy or guidance is identified in relation to population and child yield following review of existing and draft AVDC documents. Unless provided by the Council, estimated resident population and child yield arising from the Development will be assessed using a model created by Quod using 2011 Census data.
- The assessment of open space and playspace will be assessed in line with Appendix 2 of Aylesbury Vale's Sport and Leisure Facilities SPG (August 2004)[6] and the Companion Document: Ready Reckoner (August 2005)[7] , in particular Table 4 making reference to public open space requirement per dwelling.
- An estimate of spending generated as a result of the completed Development would be calculated using average household spending figures and an average figure for daily worker spending.

5.24 The assessment of socio-economic effects will be made with reference to the standard EIA significance criteria terminology.

6 Transport and Access

Baseline

6.1 Access to the Site is currently from a private road that extends off Perry Hill. This connects to a local network of 'C' and 'D' roads, with the closest 'A 'road (the A41) located approximately 3.75km south of the Site. The A413 and the A4421 are approximately 7.4km north and 8.45km north and north-west of the Site respectively.

6.2 There are two bus stops approximately 220m north of the Site boundary on Cotswolds Way, providing services to local towns, Aylesbury and Buckingham. There are no other notable public transport facilities, including train stations or tram routes, within the vicinity of the Site. The closest train station is Bicester North, located approximately 9.4 km west of the Site.

6.3 There are three existing PRoWs bounding the eastern, western and southern Site boundaries respectively. There are no public footpaths or cycle routes passing through the Site. National Cycle Route 51 runs on an approximate east-west alignment circa 2km north of the Site boundary, providing a high quality cycle route between Bicester and Bletchley.

Potential Effects

Likely Significant Effects

Construction

6.4 Construction of the Development will generate construction traffic. The impacts of construction traffic, including that resulting from site workers and movement of spoil, will be assessed within the ES. Any overlap in construction programme with the construction of other developments in the locality will also be assessed in terms of cumulative impacts.

6.5 The potential likely significant effects to be addressed during the construction phase are on:

- Users of the local highway network due to the movement of construction vehicles and temporary changes to local access arrangements, including parking;
- Nearby properties and amenities due to the temporary changes to servicing access arrangements. This relates principally to properties within Calvert Green; and
- Pedestrians due to potential temporary closure or diversion of footways or PRoWs directly around the Development.

Operational

6.6 The principal source of transport effects from the completed Development would be from residents, employees, visitors and deliveries on the local road network. The assessment will assess the potential likely significant effects of Development-related traffic on users of the local highway network (i.e. pedestrians, cycles and other road users) that may arise due to increased traffic flows, including consideration of traffic from other cumulative schemes.

Non-Significant Effects

6.7 Effects of ecology, dust, dirt, noise and vibration, and visual effects as a result of traffic will be considered elsewhere in the ES, primarily within the Ecology, Air Quality and Noise and Vibration ES Chapters and Volume II – Landscape and Visual Impact Assessment and will not be considered in the Transport and Access Chapter.

6.8 Traffic related environmental effects which are set out in the IEMA publication 'Guidelines for Environmental Impact Assessment' (2004)[8] (IEMA Guidelines) which are not considered relevant to this assessment of the completed Development include Hazardous Loads and Heritage and Conservation.

6.9 The 'hazardous loads' criterion defined by the IEMA Guidelines will not be considered within the assessment as it is not expected that the construction or operational phases would generate any hazardous loads.

Assessment Methodology

6.10 A Transport Assessment (TA) will be undertaken, forming part of the EIA, to assess the potential impacts of the Development on the surrounding transport network. In addition, a Travel Plan (TP) will be completed to encourage sustainable travel and to help reduce the impact of vehicular traffic associated with the Development proposals. This work will be completed in close liaison with BCC and Highways England.

6.11 For both construction and operational effects, the IEMA Guidelines will provide the assessment criteria for this study. The key areas which would be assessed are as follows:

- Severance;
- Driver delay;
- Pedestrian delay and amenity;
- Fear and intimidation; and
- Accidents and road safety.

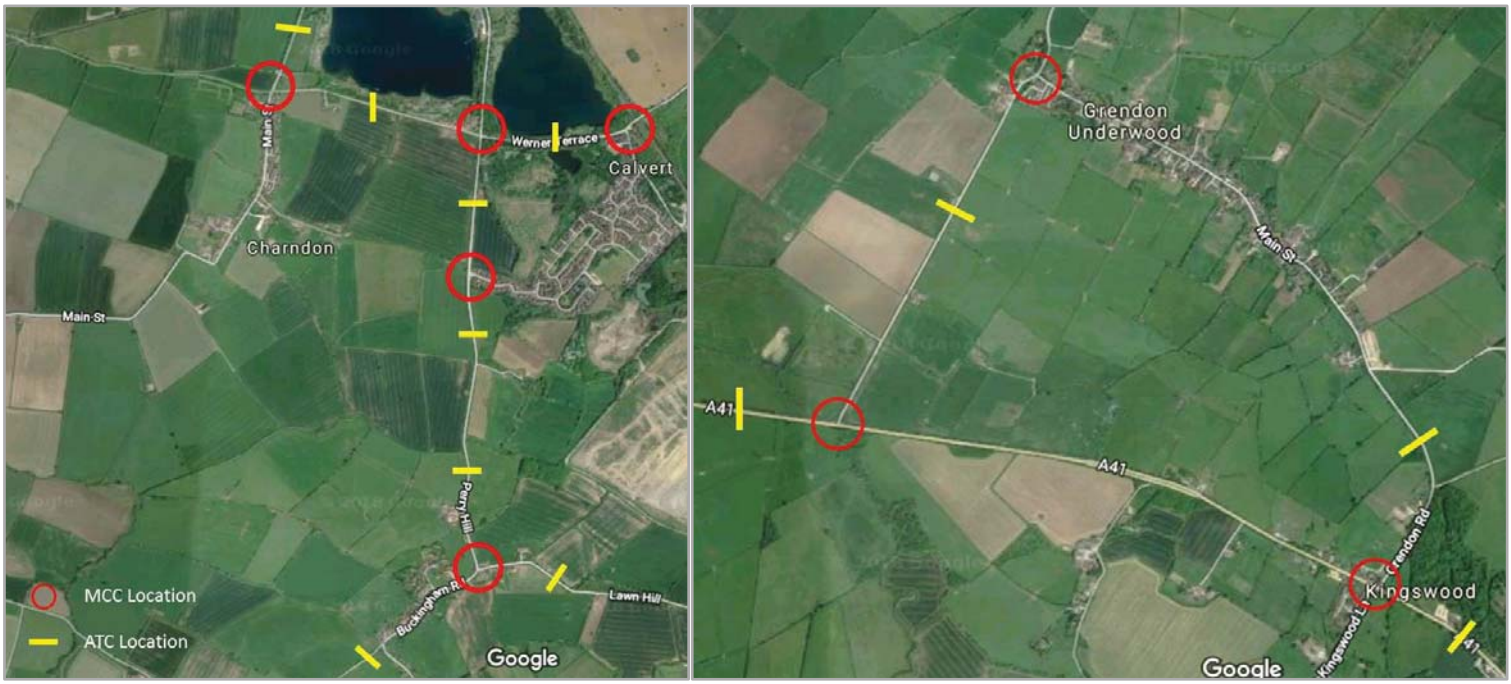
Study Area

6.12 The assessment area of the Development is to be confirmed through pre-application scoping discussions with AVDC, BCC and Highways England.

Baseline Survey

6.13 Baseline information will be obtained through available datasets and traffic surveys undertaken in the locations identified in Figure 6.1. This will include an evaluation of the accessibility of the Site by public transport and highway network. Baseline conditions will be established for all transport modes.

Figure 6.1: Indicative Traffic Survey Locations



NB: MCC = Manual Classified Count; ATC = Automatic Traffic Count

6.14 Baseline traffic data will be extrapolated to the relevant assessment years using the TEMPro software. Traffic increases will then be compared against future 'Do Nothing' scenario to establish the scale of impact on relevant receptors.

Trip Generation

6.15 The net trip generation of the Site will be established by utilising previously approved trip rates for comparable nearby sites. These will be reviewed against available trip rates within the TRICS database to ensure that they are the most appropriate.

6.16 Similar trip rates will be applied to the existing land uses to establish a base trip generation against which the net increase in trips will be derived.

Mode share

6.17 The mode share will be established using Census data for the local area reflecting local tendencies and behaviour. This is anticipated to require manual adjustment depending upon the level of car parking required to reflect the maximum number of car trips that may be generated by the Site.

Trip distribution and assignment

6.18 The distribution and assignment of trips will be based upon existing local traffic distribution and local traffic orders. This distribution will be based upon survey data or existing data if available.

6.19 The assessment of individual environmental elements will be carried out in accordance with the IEA 'Guidelines for the Environmental Assessment of Road Traffic' (1993)[9], and where appropriate, the 'Design Manual for Roads and Bridges – Environmental Assessment'[10]. The IEA Guidelines suggest two broad rules to identify the appropriate extent of the assessment area, as follows:

- Links with all vehicle or heavy duty vehicle traffic flow increases in any assessment year of +30%; and

- Links with medium or high sensitivity receptors with flow increases greater than 10%.

6.20 The potential effect of cumulative schemes will be added to the future scenarios for inclusion in the assessment.

6.21 If the maximum forecast traffic is within 10% of baseline traffic flows, then this would be considered to be within normal daily fluctuations in traffic levels, and the potential effect is considered to be 'negligible'. If greater than a 10% increase in traffic flows is forecast, then the effect is considered to warrant further consideration, and mitigation measures.

6.22 It is considered likely that there are relatively low flows of traffic on the local highway network and therefore it is anticipated that many links are likely to experience uplifts of more than 10% during both the construction and operations phases.

7 Air Quality

Baseline

7.1 Calvert Waste Management Facility is located adjacent to the east of the Site, which is a notable source of odour and dust and point sources such as landfill gas emissions.

7.2 The Site is not within an Air Quality Management Areas (AQMA), with the closest being located in Bicester, 9km west of the Site, for exceedances of the annual mean nitrogen dioxide (NO_2) objective (see Figure 8.1). In terms of particulate matter (PM_{10}), both AVDC and neighbouring Cherwell District Council (CDC) have concluded that there are no exceedances of the objectives. It is, therefore, reasonable to assume that existing PM_{10} levels do not exceed the objectives within the study area.

7.3 The nearest local authority NO_2 monitoring sites are located in Bicester and Winslow, 9km west and north east of the Site, respectively. Measured concentrations show air quality in urban areas is generally good with concentrations at the majority of locations well below the objective. In rural locations, such as the Site, concentrations can be expected to be well below the objectives.

7.4 Estimated background concentrations in the study area have been determined for 2018 using Defra's background maps (Defra 2018b). The background concentrations are set out in Table 8.1. The background concentrations are all well below the objectives.

Table 8.1: Estimated Annual Mean Background Pollutant Concentrations in 2018 (µg/m^3)

Year	NO_2	PM_{10}	$PM_{2.5}$
2018	5.8-12.5	10.9-15.6	7.6-10.1
Objectives	40	40	25 [a]

N/A = not applicable. The range of values is for the different 1x1 km grid squares covering the study area.

a The $PM_{2.5}$ objective, which is to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

7.5 The Site is set back away from any main roads and is in a location where pollutant concentrations are expected to be close to background levels. Future residents and users of the Development can, therefore, be expected to experience good air quality.

Potential Effects

Likely Significant Effects

Construction

7.6 The principal likely significant effect to be addressed by the EIA for the construction phase is the potential for short-term localised increases in traffic-related emissions during construction works as a result of vehicles operating on the Site and local road network. In particular, the assessment will consider existing properties in Calvert Green and any emerging schemes in close proximity to the Site.

Operational

7.7 The Development will generate additional traffic on the local road network, and will be subject to potential effects from the adjacent waste processing facility. There is the potential for significant air quality effects, and the ES will need to include an air quality assessment.

7.8 The air quality assessment will consider the key potential air quality effects associated with the Development, and will address the following:

- Long-term changes in located air quality, particularly in relation to NO_2, PM_{10} and $PM_{2.5}$ due to road traffic emissions associated with the operation of the completed Development. In particular, the assessment will consider existing properties in Calvert Green, future residents and any emerging schemes in close proximity to the Site;
- Plant emissions from the energy/data centre;
- Dust and odours from the adjacent waste management facility on future residents of the Development; and
- Point source emissions from the adjacent waste facility on future residents of the Development.

Non-Significant Effects

7.9 The Development has the potential to generate dust emissions from excavations and demolition, increasing dust soiling and concentrations of PM_{10} during the construction period. The IAQM's Guidance advises that, with appropriate mitigation in place, the effects of construction dust will be 'not significant'. A standalone assessment is therefore considered appropriate to determine the appropriate level of mitigation to be applied so as to ensure that effects will normally be 'not significant', and construction dust effects can be scoped out of the ES.

7.10 Emissions from construction plant will be controlled through good site construction practice and emission control measures set out in the CEMP. This will ensure that no significant adverse effects will result from the use of construction plant and these effects can be scoped out of further assessment.

7.11 Construction works will generate a number of HGV movements but these will be temporary and are not considered to be significant in number. Typical traffic volumes generated by the Development during the construction works will also be considerably lower than the operational traffic generation, thus the worst-case traffic emissions-related impacts of the Development will occur in the year of opening, which is to be assessed in detail.

Assessment Methodology

Construction

7.12 Depending on the confirmed number of construction vehicle trips, a qualitative or quantitative assessment will be carried out to determine the potential air quality effect associated with the movement of vehicles to/from the Site during the construction phase.

Completed Development

Road Traffic

7.13 Once operational, the key air quality effects of the Development will be related to road traffic emissions. The assessment will comprise the following:

- Identification of receptors both within, and close to, the Development, including ecological sites. Receptors will be selected to represent worst-case exposure and agreed with the Environmental Health Officer at AVDC.
- Application of the ADMS-Roads air quality dispersion models to assess the likely effects of emissions from traffic and data centre generated by the Development on local air quality. This will assess the likely effects of changes in NO_2 concentrations at existing and future sensitive receptors near to the data centre and in proximity to the road network affected by the Development, and to assess the likely air quality conditions that would be experienced at the proposed residential units, commercial and community uses, and public open space to be introduced as part of the Development.
- Model verification against local monitoring data.

- Predict existing baseline pollutant concentrations and the likely concentrations in the opening year of the scheme, both without and with the Development. If relevant, a sensitivity test will be applied to consider the potential for elevated real-world NO_2 emissions from diesel vehicles, providing a reasonable worst-case upper-bound to the assessment
- Comparison of the predicted pollutant concentration with the Air Quality Strategy Objectives;
- Determination of significance of impacts at individual receptors following the Environmental Protection UK and IAQM Guidance on Planning for Air Quality[11]. The overall significance of the air quality effects will then be determined following this guidance and applying professional judgement; and
- Where necessary, appropriate mitigation measures will be recommended to ensure that there are no significant effects.

Odours

7.14 The odour assessment will utilise three approaches: an odour risk assessment, an odour desk study and a field odour survey, which will be based on 'sniff tests'. The field odour survey will incorporate a minimum of three visits to the Site.

7.15 The overall significance of the air quality effects will be determined following the IAQM's Guidance on the Assessment of Odours for Planning[12]. Where necessary, appropriate mitigation measures will be recommended to minimise any significant effects and would be embedded into the masterplan design.

Dusts

7.16 A dust risk assessment will be undertaken using the methodology set out in the IAQM's Guidance on the Assessment of Mineral Dust Impacts for Planning[13]. If the Development is within the screening criteria a more detailed assessment will be undertaken which will examine the dust generating potential of the waste management site and will estimate the risk of dust impacts at the Development based on the potential for dust emissions, the effectiveness of the pathway between the source and the receptors, and the perceived sensitivity of the receptors themselves. The results will be used to determine the significance of dust impact at the Development, and if mitigation is required this would feed into the masterplan design for the scheme.

Operational Plant and Point Sources

7.17 The power source for the data centre is currently unconfirmed. Should it powered by combustion plant or if there are backup generators, then an assessment of their emissions would be carried out to assess the air quality effects for future residents and site users. Furthermore, an assessment of the potential for emissions from point sources within the landfill site to impact upon air quality for future residents and site users of the Development will be undertaken.

7.18 These will be carried out either qualitatively; taking account of point source emission parameters and locations and published screening criteria; or quantitatively, using the ADMS-5 model (if deemed necessary and if sufficient information to undertake dispersion modelling is available). The assessment method will be determined once further information on the operational plant and point source emissions at the landfill site is available.

8 Noise and Vibration

Baseline

8.1 The noise climate around the Site is considered to be dominated by road traffic noise along Perry Hill to the west of the Site and noise from the Calvert landfill to the east of the Site. Additional noise sources are likely to include rail movements along the Chiltern mainline railway which is located approximately 760m to the north-east of the Site boundary. This is also a principal source of vibration to the Site.

Potential Effects

Likely Significant Effects

Construction

8.2 Likely significant effects throughout the construction phase would include:

- Noise due to site enabling and construction work activities; and
- Noise from construction Heavy Goods Vehicle (HGV) movements along the local road network.

8.3 The noise impacts are likely to be greatest during the early stages of the works programme, in particular ground works when heavier plant is likely to be used. In practice, construction work noise levels and resulting effects are likely to vary during the different construction phases depending upon the location of work sites and proximity of receptors.

8.4 The key considerations in relation to the noise assessment will be the effects on existing residential properties in Calvert Green to the north as well as future sensitive receptors.

Completed Development

8.5 Likely significant effects during operation of the Development are likely to include:

- Changes to road traffic noise levels along the local road network due to Development traffic; and
- Noise from the introduction of fixed plant and building services, as well as noise breakout from the proposed commercial/retail/cinema uses on adjacent dwellings in Calvert Green. However, it is expected that these can be controlled using conditional noise limits set in accordance with BS4142:2014[14] to ensure that any operational noise effects will be negligible.

8.6 The operation of the completed Development has a potentially significant impact on traffic flows on local roads around the Site. DMRB Volume 11 Section 3 Part 7[15] advises that a change in road traffic noise levels of 1dB (a discernible change) is equivalent to a 25% increase or a 20% decrease in traffic flows, assuming other factors remain unchanged. Provided that increases to traffic flows along the local road network are limited to no more than 25%, discernible increases in road traffic noise are not expected. Further consideration of this will be carried out within the ES, and appropriate mitigation and design measures incorporated as required to reduce any potentially adverse effects.

Non-Significant Effects

Construction

8.7 While construction activities lead to differing vibration levels based on a number of factors, adverse vibration effects are typically limited to within 20m of heavy ground works (e.g. piling activities). Based on the indicative layout of the Development, and the separation distance between nearest proposed buildings and existing residential receptors, it is considered that there will not be any significant effects due to construction-related vibration. Therefore, it will not be considered for further assessment.

Completed Development

8.8 No major vibration sources are envisaged to be introduced as part of the Development and operational vibration will therefore have no impact. Therefore, it will not be considered for further assessment.

Assessment Methodology

Baseline Noise Survey

8.9 Baseline noise monitoring will be carried out to establish the noise environment around the Site boundary and representative of surrounding noise sensitive receptors. The monitoring procedures will follow guidance from BS 7445-1:2003[16]. It is proposed to undertake long-term monitoring around the Site boundaries at positions representative of the typical noise environment, for a period of minimum five days to include weekday and weekend periods. The locations and methodology for monitoring will be agreed with the Environmental Health Officer at AVDC.

8.10 At this stage, envisaged locations of baseline noise monitoring are presented in Figure 9.1. Measurements are proposed at the following locations:

- Location 1: Along Perry Hill to the west of the Site;
- Location 2: Along the south-east boundary of the Site, adjacent to Calvert landfill; and
- Location 3: Along the north of Site next to the nearby village, Calvert Green.

Figure 8.1: Proposed Baseline Noise Monitoring Location

Impact Assessment Methodology

8.11 Noise levels associated with construction works will be assessed (at chosen sensitive receptors) using the data and procedures given in BS 5228:2009+A1:2014[17].

8.12 The temporary and permanent changes in road traffic noise levels along the local road network will be calculated based on 'Calculation of Road Traffic Noise' (CRTN)[18] methodology and assessed in-line with Institute of Environmental Management (IEMA) guidance[19]. The predictions will be based on baseline and with development traffic data prepared as part of the TA.

8.13 The impact of proposed plant and any operational activities associated with the proposed commercial/retail/cinema uses will be assessed following guidance from BS 4142, based on information on the operating conditions and the levels of noise generated by the plant, as provided by the client.

Suitability of Site for Proposed Uses

8.14 A technical report will accompany the planning application to determine the Site's suitability for the proposed uses, which includes residential properties, commercial/retail/cinema units, a school, and a GPs. This will be assessed in accordance with the NPPF, NPSE and associated PPG. Reference will be made to relevant internal and external amenity noise level guidance such as those given in BS 8233:2014[20], World Health Organisation 'Guidelines for Community Noise'[21], ProPG on Planning & Noise (2017)[22], Building bulletin 93[23], and Health Technical Memorandum 08-01(2013)[24]. Outline mitigation measures will be provided in order to achieve relevant criteria for amenity noise levels.

9 Biodiversity

Baseline

9.1 Desk study data and a suite of ecological surveys completed by Middlemarch Environmental Ltd between 2015 and 2018 have provided baseline information on ecological receptors within the Site boundary and within its potential Zone of Influence (ZOI).

9.2 There are no European statutory sites within 5km, one UK statutory site and six non-statutory sites within 1km of the Site boundary. The closest statutory site is Sheephouse Wood SSSI, located 945m east of the Site. The closest non-statutory site is Wood Between Lawnhill And Dunsty Hill LWS, adjacent to the southern boundary. There are seven areas of Ancient Woodland within a 2km radius of the Site, with two located adjacent to the Site boundary.

9.3 A Preliminary Ecological Appraisal was carried out for the Site in 2017 and is provided as **Appendix 9.1**. This identified hedgerows and standing water as on-site habitats meeting the criteria to be classed as Habitats of Principal Importance.

9.4 The Site was found to have moderate suitability to support foraging and commuting species of bat, due to a mosaic of habitats including grassland, tree-lines, ponds and hedgerows, with two bat roosts identified on the Site. A large active badger sett was identified adjacent to the Site boundary and the habitats on and adjacent to the Site provide suitable sett-building and foraging habitat for badger. The breeding bird assemblage is considered to be of local value with six bird species of principal importance identified on-site, four of which were on the RSPB Red List and two on the RSPB Amber List. Great crested newt (GCN) were recorded in thirteen ponds within and in the vicinity of the Site. Further details on species recorded on-site can be found in Appendix 9.1.

Potential Effects

Likely Significant Effects

Construction

9.5 The key considerations in relation to biodiversity during construction works are as follows:

- **Designated Sites** – Direct or indirect effects on Sheephouse Wood SSSI and Wood Between Lawnhill And Dunsty Hill LWS due to emissions (air quality, noise and vibration, light pollution) associated with construction works;
- **Badger** – Direct harm to adjacent badger sett and increased severance of local population and foraging habitat from construction works or traffic;
- **Bats** – Loss of the farmhouse and on-site trees that support roosting bats along with foraging and commuting habitat. Prior to any works being undertaken which are likely to result in a breach of the legislation, a development licence must be obtained from Natural England;
- **Great Crested Newts** – Loss of suitable breeding and terrestrial habitat for populations of great crested newts in nearby ponds as a result of the Development. The clearing of vegetation could also result in the potential killing or injuring of great crested newt populations during construction works. Prior to any works commencing on-site a Natural England great crested newt development licence will be required; and
- **Reptiles** – Loss of suitable reptile habitat and the potential for direct harm. A reptile mitigation strategy will be required which should be agreed with the local authority ecologist and / or Natural England prior to any works commencing.

Completed Development

9.6 The key considerations in relation to biodiversity once the Development is completed and operational are as follows:

- **Designated Sites** – Direct or indirect effects on Sheephouse Wood SSSI and Wood Between Lawnhill And Dunsty Hill LWS due to emissions (air quality, noise, light pollution) or increased recreational pressure from residents, visitors and vehicle trips associated with the completed Development;
- **Badger** – Direct harm to adjacent badger sett and increased severance of local population and foraging habitat; and
- **Bats** – Potential effects on commuting and foraging habitat from light pollution.

Non-Significant Effects

9.7 The following potential effects are not likely to be significant and as such will not be considered further assessment:

- **Birds** – No significant concentrations of breeding species were recorded on-site. Therefore, breeding birds are not a significant consideration in relation to the Development and they can be scoped out of the EIA.
- **Invertebrates** – None of the species assemblages recorded on-site are regarded as significant even in a local context. Therefore, it is considered that there will be no significant adverse effects on invertebrates and they can be scoped out of the EIA; and
- **Water Vole** – No suitable habitat for water vole is present on-site. As such, water voles are not a notable consideration in relation to the Development and they can be scope out of the EIA.

Assessment Methodology

9.8 The assessment will be undertaken in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland[25] (herein referred to as the 'CIEEM Guidelines').

9.9 The methodology comprises the following:

- Consultation with relevant stakeholders to agree the scope of the survey works and to determine any mitigation that may be required as part of the proposals;
- Determination of the ecological baseline including a desk study, an extended Phase 1 Habitat Survey and, where relevant, further surveys for legally protected species and Species of Principal Importance;
- Identification of important ecological receptors within the ZOI;
- An assessment of the likely significant effects on important ecological receptors from the construction and operational phases of the Development; and
- Recommendations for mitigation avoid, mitigate and compensate potentially adverse impacts and assessment of residual effects.

10 Ground Conditions

Baseline

10.1 This section of the report is supported by a Phase 1 Preliminary Investigation Report (PIR), provided as **Appendix 10.1**.

10.2 Historical mapping and records indicate that the Site has been occupied by agricultural land through its history. There are four small ponds located on the Site; three to the west and one near the centre of farm. A drainage system is situated on the west of the Site, running from the Site to the Gubbinshole and Broadmoor Ditch towards the south-western corner of the Site. There are eight other ponds in the vicinity of the Site. Section 12 provides more information on surface water features on the Site and in the surrounding area.

10.3 The Site is underlain by Unproductive Strata corresponding to the Oxford Clay Formation. This is underlain by the Kellaways Formation, a silty sandstone with a clay base layer. BGS borehole SP62SE/3 (NGR 468510, 223410) recorded the clay and shales of the Oxford Clay Formation and Kellaways Formation to 45m below ground level (bgl), superseded by the Great Oolite Series until termination at 70.1m bgl. The Site is not within a groundwater Source Protection Zone.

10.4 The Oxford Clay Formation is moderately susceptible to shrink/swell. Two areas with moderate potential of landsliding have been identified on-site.

10.5 The active Calvert Landfill Site (non-hazardous) is located adjacent to the eastern Site boundary, which dates back to 1987. Calvert Brick Works (now demolished) was present directly north-east of the Site from the mid 1940's to 1990's during clay quarrying operations. This site is now disused with only Made Ground remaining. Historic railways are seen on historical maps at the brick works.

10.6 Three historic landfills (non-hazardous) are also present in the vicinity of the Site:

- Calvert Landfill Site, Pit No. 1: operational from 1947 to 1991 (approx. 100m north);
- Buckinghamshire Rural District Council Refuse Tip: operational from 1957 to an unknown date (approx. 680m north); and
- Aylesbury Borough Refuse Tip: operational from 1963 to an unknown date (approx. 840m north east).

10.7 There is no evidence of mining within the Site boundary. However, clay was quarried off-site for the brick works and three large, man-made ponds at this location are a product of the open cast mine.

10.8 The PIR identifies a number of possible sources of ground contamination on and in the vicinity of the Site, including those associated with farming activities (e.g. agrochemicals, manure/sewage waste, and asbestos in the farm buildings) and activities associated with the historical brickworks and railways, quarrying, landfilling and infilling. A number of potential contaminant linkages were considered relevant to the Site, including direct contact, plant uptake, surface water and perched groundwater. The Site is located in low risk area for encountering Unexploded Ordnance (UXO).

Potential Effects

Likely Significant Effects

10.9 Potential effects to be addressed through the construction phase and for the completed Development will include:

- Potential for human health effects due to asbestos exposure;
- Potential for human health effects on site end users and neighbouring properties due to contaminant exposure from pesticides and/or from the vehicles used on-site (e.g. via inhalation of vapours, direct contact, ingestion);
- Potential for human health effects due to ground/landfill gas exposure;
- Potential for effects on controlled waters from leachable contamination in soils;
- Potential for effects on ecological receptors due to direct uptake of surface water runoff;
- Potential for effects on ecosystems, aquatic ecosystems and local consumers of local produce due to potential contamination of local drainage systems through runoff of contaminated surface water;
- Potential for human health effects on site end users from direct contact/ingestion of organic chemicals associated with quarry backfill and landfills; and
- Potential for effects on new structures and ecosystems from exposure to ground/landfill gas.

Non-Significant Effects

10.10 The following potential effects are not likely to be significant and as such will not be considered further assessment:

- Potential for human health effects on site end users and neighbours due to contaminant exposure from organic chemicals associated with quarry backfill and landfills;
- Potential for human health effects on site end users from direct contact/ingestion of metals associated with quarry backfill and landfills;
- Potential for degradation of buried plastic building materials in contaminated soils;
- Potential for damage to concrete foundations in direct contact with dissolved sulphates present in pyritic Oxford Clay;
- Potential for effects on non-classified drainage systems due to potential contamination of local drainage systems through runoff of contaminated surface water; and
- Risk on human and ecological receptors from UXO.

Assessment Methodology

10.11 Environmental issues related to ground contamination have been considered by preliminary risk assessment of pollution linkages. The potential for effects of ground contamination will be undertaken using the 'source-pathway-receptor' contaminant linkage concept. A qualitative risk assessment will be undertaken to confirm the magnitude of the assessed impacts to identified potential receptors which are likely to include human receptors (e.g. construction workers, people living and working nearby, site workers), as well as controlled waters and ecology.

10.12 The potential effects resulting from the construction and operational phases of the Development will be assessed based on the Preliminary Conceptual Model of geo-environmental site conditions. Impacts will be then identified and options for mitigating any significant adverse effects from the scheme construction and operation described.

11 Landscape and Visual Impacts

Baseline

11.1 The Site is dominated by a hill, with the topography rising to circa 109 m AOD within the centre of it. This provides extensive panoramic views to the west and south, with those to the north and east screened by vegetation. Further information on Site topography is provided in Section 2 of this report.

11.2 The Site is located on the edge of the Aylesbury Vale Landscape Character Assessment character types "LCT07 Wooded Rolling Lowlands" and "LCT08 Vale". This is reflected in the Site and surrounding areas landform, with the "LCT07 Wooded Rolling Lowlands" undulating topography broadly reflected within the Site and the land to the north and east, extending down to Edgcott in the south. The land to the west and south is the low-lying floodplain of the upper reaches of the River Thame.

11.3 The Site and study areas do not contain or fall within a Registered Park and Garden, Area of Outstanding Natural Beauty or any other landscape designations.

11.4 The visual study area contains a number of built heritage assets (see Section 13 for more information) including the Church of St. Michael and Church of St. Leonard, with the Marsh Gibbons Conservation Area located approximately 3km to the west of the Site. Claydon Registered Park and Garden is located approximately 3km north-east of the Site boundary.

Potential Effects

Likely Significant Effects

Construction

11.5 The permanent effect on the removal of the Site's hedgerows and field trees during the construction stage of the Development, along with the change in land use from agricultural fields to a mixed-use development and change in site topography, is likely to have a significant effect on the landscape receptors within the Site.

11.6 As the Development is built out the temporary construction works will be a visual intrusion on both the study area's landscape character receptors and within the views from the visual receptors shown in Figure 11.3.

Completed Development

11.7 The change in function of the Site and scale of the Development's new buildings has the potential to have a permanent significant effect on the existing landscape receptor and the landscape character receptors. The completed Development is also likely to have a significant effect on the views from the visual receptors identified in Figure 11.3.

11.8 The visual receptors that the Development is likely to have significant effects on and will be considered within the LVIA are provided in **Appendix 11.1.**

Non-Significant Effects

Completed Development

11.9 The following visual receptors that fall within the 3km study area will be scoped out at both the construction and operation stage of the LVIA due to having non-significant effects. This includes visual receptors that have no or a limited visible linkage with the Site and/or Development.

- Claydon Registered Park and Garden;

- Public rights of way:
  - Footpaths between Edgcott and Grendon Underwood not identified in Appendix 11.1;
  - Footpaths and bridleways to the north, between 1km and 3km of the Site; and
  - Footpaths and bridleways to the east of the study area, between 1km and 3km of the Site.
- Residential properties or farmsteads:
  - Properties in Calvert;
  - Properties in Edgcott; and
  - Other farmsteads and individual houses not identified in Appendix 11.1.
- Roads:
  - Roads outside the ZTV within Calvert Green and Calvert;
  - Grendon Road and Buckingham Road;
  - Edgcott Road and Grendon Underwood's Main Street;
  - Main Street, running between Marsh Gibbon and Chardon;
  - Werner Terrace; and
  - Three Points Lane.

Assessment Methodology

11.10 To acknowledge the landscape and visual impacts of the Development, a Landscape and Visual Impact Assessment (LVIA) will be carried out to identify the Site's landscape elements (landscape receptors) and the landscape character areas (landscape character receptors) within the landscape study area. The assessment will also provide an analysis of the Development from the visual amenity experienced by people (visual receptors) within the visual study area.

11.11 The landscape study area for the LVIA will include both the Site and its wider context at a 1km radius, whilst the visual study area will include the Site and the wider context at a 3km radius. These are shown in Figure 11.1.

11.12 Both study areas have been determined through considering the likely Zone of Theoretical Visibility (ZTV) of the Development. This ZTV is based on the areas landform and the Development having buildings of up to 12 metres ridge height. It is noted that due to its existing landform and the maximum height of proposed buildings, the Site and/or Development may be visible from outside the visual study area. However, it is considered that that the Development will not affect the visual receptors in a significant manner, due to it being read in the background of such views and, within some views, as part of a wider landscape that includes existing scattered settlements.

11.13 As part of a desk and field study potential visual receptors, defined as areas where people are likely to be able to view the Site from within the surrounding area, have been identified. These are shown in Figure 11.3. Subject to the sensitivity of the visual receptor and its visibility to the Development, Accurate Visual Representations (AVRs) will be undertaken from a selection of the representative viewpoints.

11.14 Whilst the LVIA will consider heritage assets in determining the value of the landscape character receptors and visual receptors, it will not assess their significance and setting. This will be addressed in the Heritage Statement, submitted as a discrete standalone document with the planning application. Representative views will also be provided from select heritage assets as appropriate. The LVIA will be undertaken by the

ARC Landscape Design and Planning Ltd. and the AVRs will be prepared by Troopers Hill. The location of the representative views is shown in Figure 11.4.

11.15 The LVIA will:

- Identify the existing landscape receptors and landscape character receptors along with the visual amenity of the Site and surrounding area through desk-based analysis and field study;
- Include a series of representative views based on the sensitivity of locations and the likelihood of visibility. This will enable a 360-degree assessment of the scale of the Development. The location of the representative viewpoints will be agreed with AVDC to inform the assessment and draft locations are set out in Figure 11.4 and include verified views from a selection of them; and
- Identify and assess potential changes to the landscape elements, landscape character areas and visual receptors in accordance with relevant policy and guidance. This assessment will be supported through the selected and agreed representative views, in which independent visualisers will insert accurate outline representations of the Development's parameters.

11.16 The assessment will take into account the Development's interaction with the existing landscape character areas (landscape receptors) and the effect of the Development and visual amenity experienced by people (visual receptors). This will be supported through a series of representative views.

11.17 The LVIA will establish the sensitivity of the landscape receptors and visual receptors and their capacity to accommodate the Development. The landscape character assessment will also consider the findings of Aylesbury Vale Landscape Character Assessment[26]. It will consider the likely effects associated with both the construction and operational (post completion) stages of the Development. The assessment will also take into consideration any potential mitigation measures included to determine the significance of any residual effects.

11.18 The LVIA will be undertaken with reference to GLVIA and other relevant guidance including, IEMA's Guidelines for Landscape and Visual Impact Assessment[27] and An Approach to Landscape Character Assessment[28]. Structured, informed and reasoned professional judgement will be used to take account of quantitative and qualitative factors. This is widely accepted as best practice and is based on analysis of desk-based research and field assessment.

11.19 The magnitude of the change to the existing landscape receptors, landscape character receptors and visual receptors as a result of the Development will take account of factors including the proximity, scale and contribution to these receptors. Where the effect is minor, moderate or major, good design may reduce or remove potential harm or provide enhancement and design quality is likely to be the main consideration in determining the balance of harm and benefit.

12 Cumulative Effects

12.1 The EIA Regulations require that, in assessing the effects of a particular development proposal, consideration should also be given to the likely significant effects arising from the *"cumulation with other existing and / or approved projects"* (Schedule 4, 5(e)).

12.2 Two types of cumulative effects will be considered in the assessment. These are:

- **Combined effects** – intra-project effects which occur when two or more different environmental effects from the Development (e.g. dust, noise, traffic etc.) act together to produce a different level of effect/ impact experienced by a particular receptor. These combined effects (or 'Intra-Project') can be additive or synergistic such that the sum of the impacts can be less or more than the individual impacts (i.e. because they may exacerbate or neutralise one another); and
- **Cumulative effects** - inter-project effects, which are those that accrue over time and space from a number of different development activities and projects in geographical proximity to one another, which individually might be insignificant, but when considered together, could create a significant cumulative effect (also referred to as 'Inter-project' effects).

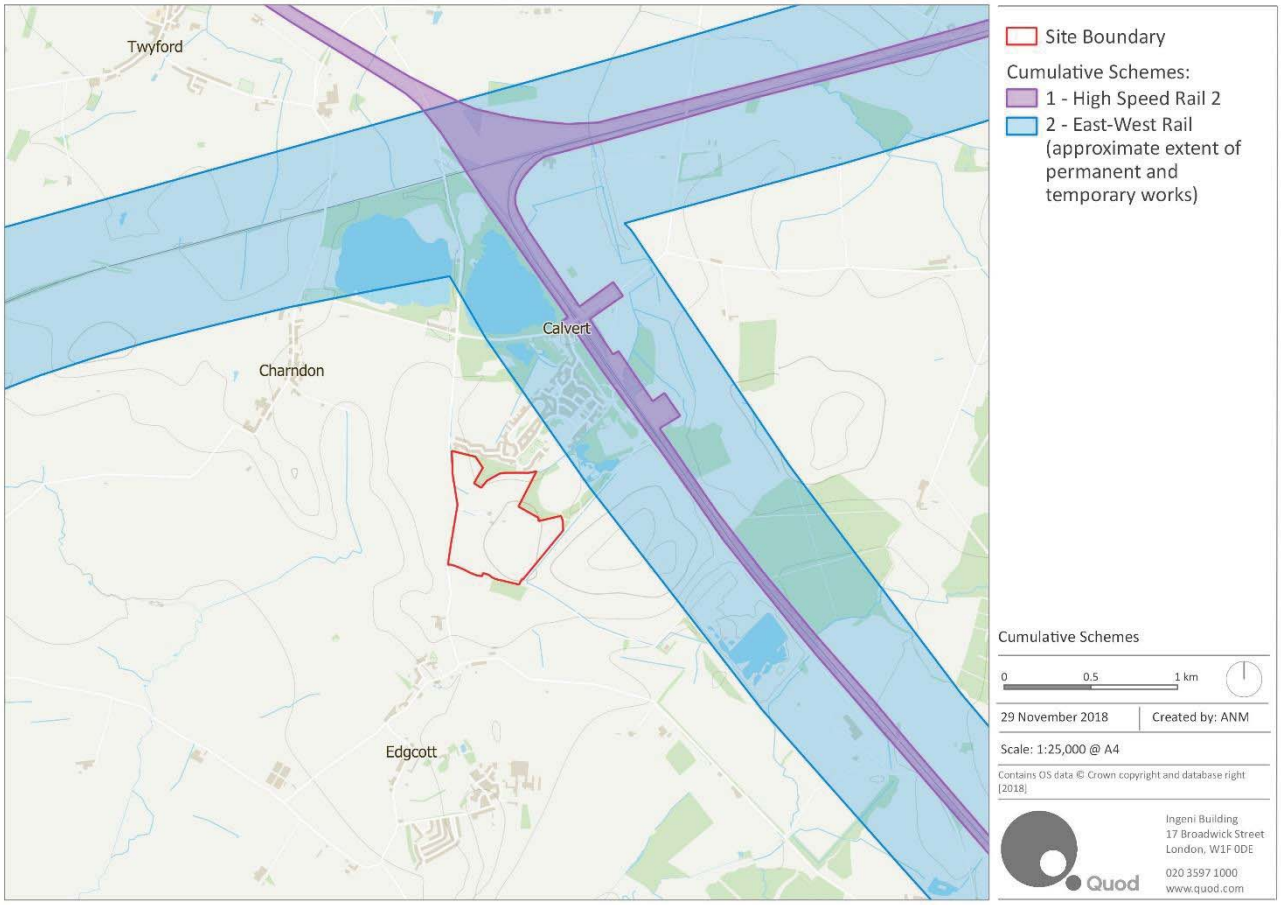
12.3 The EIA will consider cumulative effects from notable schemes within 3km of the Site boundary (as of November 2018). These are listed in Table 12.1 and shown in Figure 12.1.

Table 12.1: Cumulative Schemes

Map Reference No.	Development and address	Application Reference No.	Description of the Development	Status	Distance from Site
1	N/A	High Speed Rail (London - West Midlands) Act 2017	High Speed 2 Phase One: New railway between London Euston and Staffordshire, with a spur to Birmingham.	Granted February 2017. Construction due to commence in 2019.	Maintenance depot approx. 1.8km north
2	N/A	Network Rail (East West Rail Bicester to Bedford Improvements) Order	East West Rail: Upgrade and reconstruction of existing sections of railway line that link Bedford with Bicester, Milton Keynes and Princes Risborough.	Submitted July 2017. Under Consideration	Intersection with HS2 approx. 1.6km north of Site boundary.

12.4 While no application has yet been submitted for the Oxford to Cambridge Expressway, with an indicative commencement date of 2025 and completion date of 2030, there is the potential for it to overlap with the construction programme of the Development. Consideration of this infrastructure project will be reviewed for the EIA should more information come available on the construction programme.

Figure 12.1: Cumulative Schemes



12.5 As discussed in Section 2 of this report, construction programmes for these projects are not yet all finalised, however it is envisaged that the Western component of East West Rail would be operational by 2023, HS2 would be operational by 2026 and the Oxford to Cambridge Expressway would be operational by 2030.

12.6 With construction of the Development envisaged to commence in Quarter 4 (Q4) 2019 and expected to take complete in 2026, the construction programme of these infrastructure projects is likely to overlap with the Development.

12.7 However, it is assumed that these major infrastructure schemes would apply good site practice and environmental management through adherence to a CEMP and Construction Logistics Plan such that significant cumulative effects are unlikely.

13 Non-Significant Topics (to be scoped out of EIA)

Introduction

13.1 Consideration has been given during the scoping study to ensure the EIA is focused on the likely significant effects of the Development. Accordingly, the following topics are proposed to be scoped out from detailed consideration within the ES as the Development is not expected to give rise to significant effects on these issues or related receptors.

Archaeology

13.2 The Applicant has commissioned CgMs to undertake an Archaeological Desk Based Assessment (DBA) to provide an assessment of the archaeological potential of the Site along with a preliminary impact assessment based on the likely proposals for new development. This is provided as Appendix 13.1.

13.3 The DBA identifies that the Site does not lie within an Archaeological Notification Area as defined by the AVDC. The Site has remained undeveloped farmland throughout its documented history and an initial review of historical records has not identified a high likelihood of significant buried heritage assets on the Site. The Site can be considered likely to have a generally low/unknown archaeological potential for all past periods of human activity.

13.4 Where the Site has previously been subject to construction activity (i.e. buildings in the centre of the Site), the construction of these buildings within the Site would have removed or truncated any archaeological deposits or features buried beneath these areas of the Site, if present. It is therefore concluded that there is a low potential for archaeological remains to be present within these areas of the Site that have been previously developed, and any significance of effect from future development within these areas would be negligible. Furthermore, agricultural/horticultural activities over time are considered likely to have truncated or removed any archaeological assets.

13.5 In view of the Site's perceived low/unknown archaeological potential, and the perceived local/regional significance of that potential, the Development proposals are considered unlikely to have a significant or widespread adverse effect on archaeology. However, it is envisaged that the BCC Archaeological Service will require further archaeological surveys and/or mitigation measures in advance of any construction works on-site. These measures will be agreed with BCC in advance of the commencement on-site works. As such, the Development is unlikely to give rise to significant effects on archaeology and it is therefore considered appropriate to scope out this aspect from the EIA.

13.6 The Development proposals are still evolving with the need for boring/piling works and degree of excavation still to be confirmed. However, it is assumed that construction works will not be significant, and this assessment can be scoped out of the EIA. An Archaeology DBA report will be provided as part of the planning application.

Built Heritage

13.7 A preliminary Built Heritage Statement has been undertaken by CgMs Heritage (part of the RPS Group), in accordance with standards and guidance provided by relevant bodies including Historic England (HE) and the Institute of Historic Building Conservation (IHBC). This baseline report assessed the key built heritage sensitivities associated with the Site for proposed mixed-use development. It assessed the significance of built heritage assets with potential to be affected, making appropriate recommendations in terms of mitigation measures, where appropriate.

13.8 The Site contains no designated built heritage assets. A late nineteenth-century farmhouse, Dunsty Hill Farm, is situated within the Site boundary and is considered of sufficient architectural and historic interest

to warrant status as a non-designated heritage asset. The building is considered to be of low sensitivity, with its importance primarily derived from the low level of architectural and historical interest embodied in its form and fabric. The building has been subject to a number of unsympathetic modern alterations, including the installation of uPVC windows, which has eroded its importance to some degree.

13.9 There are eight listed buildings within a 1km radius of the Site boundary with the closest being the Grade II listed Church of St. Michael and All Angels, approximately 540m south of the Site boundary. A Scheduled Monument – a moated site associated with St. Leonard's Church – is located approximately 2.3km south-west of the Site boundary.

13.10 The demolition of Dunsty Hill Farm, a low sensitivity asset, would be directly affected by the construction of the Development but it is not considered that its demolition would not result in a significant effect on this asset. Notwithstanding, a programme of building recording be carried out on this asset and further details on this would be discussed within the Demolition and Construction chapter of the ES.

13.11 Due to the distance, intervening buildings, local topography, or road layout, the majority of these built heritage assets share no inter-visibility or apparent functional relationship with the Site and are unlikely to incur significant direct or indirect effects as a result of the Development. This is illustrated by the ZTV provided in **Appendix 11.2**. Only the Grade II* listed Church of St Michael and All Angels and Grade II listed Manor Farmhouse and Manor Farm Cottages are considered to have any inter-visibility and therefore relationship to the Site. The Grade II* listed Church of St Michael is located circa 3.4km north east of the Site boundary in Steeple Clayton and, due to the elevated position of the Site, has inter-visibility and the potential to be indirectly affected by the proposals. However, it is of sufficient distance from the Site that the Development will not have a material effect on the setting of the asset.

13.12 A standalone Built Heritage Statement will be submitted with the planning application to provide a detailed appraisal of these assets and the potential impacts of the Development.

Agriculture and Soils

13.13 The Site is currently in use as agricultural land comprised of nine inter-linked fields. Review of the online MAGIC map service[29] demonstrates that the quality of agricultural land at the site is provisionally classified (pre-1988 Agricultural Land Classification (ALC) information) as Grade 3. There is no definitive (post-1988) ALC survey covering the Site. The land at the Site is underlain by mudstone in the Stewartby and Weymouth Mudstone Member (no superficial deposits). From a provisional Soil Survey of England Wales (SSEW) soil map of South East England (1:250,000), the soils formed over the mudstone are heavy, clayey, slowly permeable and seasonally waterlogged soils in the Evesham 2 and Denchworth Association. These clayey and seasonally waterlogged soils are unlikely to give rise to Best and Most Versatile (BMV) land (i.e. ALC Grades 1, 2 and 3b).

13.14 The construction of the Development will result in soils being disturbed over much of the Site. Potential effects on soil would be managed through standard measures, including a CEMP, which will ensure that soils needing to be removed during the development process are handled and stored in accordance with BS 3882:2007[30]. Soils removed from the Development areas will be retained on the Site for use in landscaped areas. Whilst some land would be lost to agriculture, it is unlikely to be BMV land and due to the scale of the loss, the effects are not considered to be significant.

Water Resources and Flood Risk

13.15 For the purposes of this scoping exercise the study area is considered to include all watercourses and water features on-site and within a 1km radius of the Site. There are four small ponds located on the Site; three

to the west and one near the centre of farm. A drainage system is situated on the west of the Site and wet ditches border some edges of the Site underlying hedgerows.

13.16 Three large, man-made ponds are located approximately 250m north east of the Site boundary on the site of the former brick works and five further ponds are located within a 500m radius of the Site boundary. These large ponds are connected to a drainage system that appears to travel northwards following the route of existing drains/watercourses before likely discharging into Padbury Brook located approximately 2.5km north of the Site boundary. Other ponded areas are present on the Site boundary between the previously worked land and Calvert Landfill Site.

13.17 The nearest watercourse is a tributary of the River Ray, located approximately 1.5km south-east of the Site boundary. Calvert Jubilee Nature Reservoir and Grebe Lake are located approximately 750m north of the Site boundary.

13.18 The Site is located in Environment Agency Flood Zone 1, which comprises land assessed as having a low (less than 1 in 1000) annual probability of river or sea flooding (<0.1 %) and a zone in which all uses of land are considered appropriate. As the Site is over 1 ha, a site-specific Flood Risk Assessment (FRA) will be undertaken in line with the NPPF and AVDC's requirements and will be submitted with the planning application. This FRA will assess the Site's flood risk from all sources and demonstrate how any flood risk to Site and surrounding areas would be managed, taking into account climate change allowances in accordance with the latest Environment Agency guidance document[31].

13.19 The Environment Agency's online Surface Water Flood Map indicates that the western area of the Site has a low risk (less than 1 in 1,000) of surface water flooding. The mapping indicates that surface water flows northwards within the western area of the Site before ponding in the north western corner. Surface water flows are also identified in the eastern area of the Site, adjacent to the watercourse along the western boundary of the Site.

13.20 As part of the FRA, a drainage strategy will be produced to confirm that both surface and foul water discharge from the Site can be managed appropriately. This will be designed in consultation with BCC (as Lead Local Flood Authority) and Anglian Water to ensure that the Development will not result in an increase to flood risk anywhere off-site.

13.21 At present, the Site is undeveloped greenfield land therefore the drainage strategy will seek to restrict surface water run-off rates from the Development to the greenfield run-off rate. The use of Sustainable Drainage Systems (SuDS) will be considered within the drainage strategy taking into account the nature of the Development. The strategy will also consider the treatment of surface water run-off to ensure that there is no detrimental impact on the receiving watercourse. In addition, maintenance of proposed SuDS techniques will also be considered.

13.22 The Development would lead to an increase in potable water demand and foul water discharge from the Site. A pre-development enquiry will be submitted to Anglian Water to confirm whether they have adequate capacity to accommodate the flows from the Site. The need for this will be set out within the drainage strategy and will be taken into account as part of the detailed design work post-planning, to ensure that appropriate connections and reinforcement works are undertaken, if required.

13.23 Based on the above, it is considered that flood risk and drainage can be scoped out of the EIA. The FRA and Drainage Strategy will ensure that the proposed development is safe from flooding and does not result in an increase in off-site flood risk or have a detrimental impact on the environment. The additional potable water demand and foul water discharge associated with the Development is not considered to be significant

assuming reinforcement works are undertaken, if required. It is therefore considered appropriate to scope out this aspect from the EIA.

Climate Change and Greenhouse Gas Emissions

13.24 The EIA Regulations requires an ES to consider *"the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change".*

13.25 Projected changes to average climatic conditions, as a result of climate change, and an increased frequency and severity of extreme weather events (such as heavy and / or prolonged precipitation, storm events and heatwaves) have the potential to impact the ability of the surrounding natural environment to adapt to climate change. The key parameters of climate change are: changing temperature, changing rainfall quantities and frequency, wind strength and sea level rise.

13.26 It is not anticipated that the greenhouse gas emissions resulting from vehicular movements would be significant. The main in-combination impact of the climate change parameters and the Development is considered to be the potential for an increase in surface water run-off and drainage issues. Measures to address this aspect of climate change will be addressed through an appropriate drainage strategy. Other general adaptation measures will also be considered as part of the design, including: selection of climate resilient construction materials, on-site attenuation and landscaping to minimise the impact on the local drainage network and incorporation of sustainable drainage systems (SuDS) into the design.

13.27 Climate change and greenhouse gas emissions as a stand-alone topic is therefore proposed to be scoped out of the EIA, although the EIA will comment on the Development's adaption and resilience to climate change scenarios. Future impacts of climate for drainage and flooding will be considered as part of the FRA.

Electronic Interference

13.28 Interference to certain telecommunications systems (e.g. television, mobile phones and radio) can arise from buildings physically blocking and absorbing associated signals. Therefore, a loss or degradation of the reception of such systems can result from the introduction of new buildings and is often referred to as 'electronic interference', with the affected area referred to as the 'shadow area'.

13.29 For assessment purposes, domestic dwellings where TV is watched or radio is listened to as an amenity are identified as sensitive receptors. Public services, such as health and emergency, or public transport are also identified as sensitive receptors. Places where the provision of TV or radio form part of a commercial premises (e.g. hotels, offices and shops) are not identified as sensitive receptors32.

13.30 Due to radio signals being at lower frequencies, they can 'bend' to a greater extent around buildings (or other obstruction) when compared to TV signals. Radios are also able to make construction use of reflected signals. Notwithstanding, no tall buildings are proposed within the Development proposals. Therefore, radio reception (both analogue and digital) is not considered to be at risk of degradation as a result of the Development. No likely significant effects to radio reception (both analogue and digital) are therefore anticipated as a result of the Development.

13.31 It is considered that there will be no significant electronic interference effects as a result of the Development.

Daylight, Sunlight and Overshadowing

13.32 The closest residential dwelling is approximately 17m from the Site boundary on Tudors Close. However, aside from residential dwellings and open spaces on the southern edge of Calvert Green and emerging development, there are no other sensitive receptors in proximity to the Site that would be potentially

affected by the Development. The scale of the Development proposals are of a similar building height to that of surrounding built form, such as the residential dwellings in Calvert Green, and no tall buildings are proposed on the Site. Consequently, these are of sufficient proximity from the Development that significant daylight, sunlight and overshadowing effects are unlikely to occur.

13.33 As such, daylight, sunlight and overshadowing effects are not considered to be significant and further assessment is proposed to be scoped out of this EIA.

Wind Microclimate

13.34 The wind climate in the local area is reasonably consistent with prevailing winds blowing from a broad south-westerly sector throughout the year. Winds from other directions do occur but tend to be lighter and less frequent than winds from the prevailing sector.

13.35 The principal wind microclimate effects concern the relative comfort and safety of Site users and users of the areas surrounding the Site on completion of the Development. While there are some residential dwellings and public open spaces in close proximity to the northern Site boundary in Calvert Green and future receptors associated with the Development itself, the Development will comprise low-medium rise buildings, the potential height and scale of which is not expected to generate significant wind effects on or in the vicinity of the Site. As such, wind effects are not considered to be significant and further assessment is proposed to be scoped out of this EIA.

Aviation

13.36 The Site does not lie within an Airport Safeguarding Zone. The nearest airport to the Site is London Oxford Airport, located approximately 21km south-west of the Site. The Development, at a proposed maximum height of up to 4 storeys, will be marginally taller than surrounding built form. But given the heights of existing structures in the vicinity of the Site and proximity to the nearest airfield, no significant effects are likely to arise in relation to aviation, either during the construction phase, or when the Development is complete and operational.

Light Pollution and Solar Glare

13.37 **Solar glare**: Owing to the mainly residential nature of the scheme, it is unlikely that the Development will be highly glazed. In addition, it is not expected that there will be areas of highly glazed commercial space which are usually considered problematic in terms of solar glare.

13.38 **Light pollution**: It is not envisaged that any artificial light emitted from the Development will materially affect neighbouring residential properties or other sensitive receptors.

Waste

13.39 Waste generation will occur as a result of the construction and operation of the Development. Waste produced during all activities on Site will be subject to the 'Duty of Care' under the Environmental Protection Act[33].

13.40 Waste materials will be disposed of by the contractor/s to appropriate recycling facilities or appropriately licensed landfills. The appropriate landfill for the disposal of any contaminated material off-site will depend on the waste classification determined from the chemical analysis or Waste Acceptance Criteria testing as necessary. During construction, the Construction Site Manager will audit waste carriers and disposal facilities and maintain documentary evidence that these requirements are being met, including a register of waste carriers, disposal sites (including transfer stations) and relevant licensing details for each waste stream.

13.41 It is not expected that the operation of the Development will generate potentially hazardous materials. Materials used during construction works such as oil, chemicals, cement, cleaning materials and paint have the potential to cause serious pollution. Therefore, relevant guidance will be followed during the handling, storage and use of such materials.

13.42 Sensitive receptors relating to waste and recycling during the construction phase are identified as being: excavation and construction site works; neighbouring users / occupiers of local commercial / retail property; and the local waste management infrastructure.

13.43 Sensitive receptors relating to waste and recycling for the operational phase are identified as being: future on-site-users, neighbouring users / occupiers of local commercial / retail property; and the local waste management infrastructure.

13.44 The 'elimination of waste' such as consideration of the volume of waste generated during construction will be considered with respect to the number of vehicle movements and associated emissions, in the relevant technical assessments of the ES (e.g. Transport, Air Quality). Taking account of the above, it is considered that there would be no significant waste effects and as such, the topic of 'Waste' would be scoped out of the EIA.

Energy and Sustainability

13.45 The planning application will be supported by a standalone Sustainability Statement in accordance with AVDC policy. This negates the need for a further sustainability assessment within the ES and accords with the Department of Communities and Local Governments (DCLG) consultation paper on EIA Good Practice[34] (2006) which states:

"there is no requirement to include a sustainability appraisal within the Environmental Statement. If such an assessment is required by the Local Planning Authority, it should be provided as a separate document supporting the planning application."

13.46 The main sustainability features of the scheme (e.g. SuDS strategy, energy strategy) will be summarised in the description of the Development included in the ES. As such, all technical assessments will inherently test the principle sustainability design features sought as part of the planning application.

Vulnerability to Major Accidents or Disasters

13.47 With reference to Regulation 4(4) and Schedule 4 of the EIA Regulations, this Scoping Report also considers whether there are likely to be any significant effects on the environment or the project arising from the vulnerability of the Development to major accidents or disasters. The EIA Regulations require the ES to consider the inclusion of *"a description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and / or disasters which are relevant to the project concerned".*

13.48 Overall, the vulnerability of the Development to risks of major accidents and / or disasters is considered to be low. Flood risk is considered to be negligible assuming appropriate drainage design is in place. Risks to fire can also be assumed to be low provided the detailed design and fire strategy is developed in line with the latest fire safety guidance.

13.49 No significant environmental effects relating to the vulnerability of the Development to major accidents and disasters have been identified for further assessment within the EIA.

References

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[5] Institute of Environmental Management & Assessment (November 2015), Environmental Impact Assessment Guide to Shaping Quality Development.
[6] Aylesbury Vale District Council (August 2004). "Sport and Leisure Facilities SPG"
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[8] Institute of Environmental Management and Assessment (2004). Guidelines for Environmental Impact Assessment.
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[16] British Standards Institute (2003) BS 7445 – Description and measurement of environmental noise. Part 1: Guide to quantities and procedures, BSi, London
[17] British Standards Institute (2008) BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Noise
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[25] CIEEM (September 2018). Guidelines for Ecological Impact Assessment in the UK and Ireland
[26] Aylesbury Vale Borough Council (2008) Aylesbury Vale Landscape Character Assessment
[27] The Landscape Institute and the Institute for Environmental Management and Assessment (2013) Guidelines for landscape and Visual Impact Assessment, 3rd Edition
[28] Natural England (2014) An Approach to Landscape Character Assessment Guidance
[29] https://magic.defra.gov.uk/MagicMap.aspx
[30] BSI (2007). BS 3882:2007 Specification for Topsoil and Requirements for Use
[31] Environment Agency (February 2016), Flood risk assessments: climate change allowances
[32] This differentiation has been consistently used by the relevant United Kingdom (UK) government agencies (currently Office of Communications (OFCOM)) since the inception of TV services in the UK.
[33] Environmental Protection Act (1990), Section 34 'Duty of care etc. as respects waste'
[34] Department of Communities and Local Government (DCLG), 2006. Environmental Impact Assessment, EIA Good Practice, 2006

Appendix 4.1: Structure of the ES Technical Chapters

Introduction

The introduction will provide a brief summary of what is considered in the chapter and will state the author and/or relevant technical contributor and their competence.

Legislation, Planning Policy and Guidance

This section will summarise the relevant planning policy, legislation and guidance that form the context for the topic in bullet point form to minimise length. A detailed review of relevant planning policy, legislation and guidance will be provided as an Appendix to the Chapter or within the supporting technical report within Volume III of the ES.

Assessment Methodology

The assessment methodology section in each chapter will provide an explanation of methods used in undertaking the technical assessment and the prediction of effects. Reference will be made to published standards, professional guidelines and best practice of relevance to the particular topic.

This section will also describe any topic-specific significance criteria applied in the assessment, particularly where these differ from common or generic criteria applied elsewhere in the ES. However, wherever possible, a common scale and language for assessing effects will be applied.

Consultation undertaken as part of the assessment to agree scope or methodology will be set out in the chapter. Where appropriate, it will describe the assumptions and limitations related to the assessment of the topic and any constraints to undertaking the assessment.

Baseline Conditions

A description of the environmental conditions that exist in the absence of the Development both now and, where relevant, those that are projected to exist in the future will be provided. The results of baseline surveys and desktop research will be summarised in this section.
Relevant receptors to the specific topic-based effects (e.g. noise, air quality) will be described, together with an indication of the relative sensitivity of these receptors to such effects. Comment will also be made on the future baseline conditions as required by the EIA Regulations.

Scheme Design and Management

This section will present the embedded design and / or management measures that will form part of the Development to avoid, prevent, reduce or offset environmental effects. These measures will be clearly defined to ensure transparency and to ensure that the impact assessment does not assess a scenario that is unrealistic in practice.

Demolition and Construction

This section will present the assessment of potential effects/ impacts that are predicted to occur during the construction phase. Mitigation measures, over and above those included in the Framework CEMP will also be presented, together with residual effects.

Completed Development

This section will present the assessment of potential effects that are predicted to occur once the Development is complete and occupied together with the mitigation and residual effects.

Cumulative Effects

This section will present the assessment of potential cumulative effects with other projects in the vicinity that are predicted to occur during both the construction and completed Development phases together with the mitigation and residual effects.

Summary

This section will include a tabulated summary of the potential effects, mitigation measures and residual effects. The potential mechanisms by which the proposed mitigation measures will be implemented (e.g. CEMP, specific planning conditions or Section 106 obligations) will be specified, where appropriate.

Appendix 9.1: Ecological Appraisal

DUNSTY HILL FARM, BICESTER

PRELIMINARY ECOLOGICAL APPRAISAL

A Report to: JNP Developments

Report No: RT-MME-124420-01

Date: December 2017

Revised: February 2018

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REPORT VERIFICATION AND DECLARATION OF COMPLIANCE

This study has been undertaken in accordance with British Standard 42020:2013 "Biodiversity, Code of practice for planning and development".

Report Version	Date	Completed by:	Checked by:	Approved by:
Rev A	5/2/2018	Victoria Worrall MSc (Senior Ecological Consultant) and Ella Robinson (Ecological Consultant)	Dr Katy Read CEcol CEnv MCIEEM MCIWEM C.WEM DipSM (Executive Director)	Dr Philip Fermor CEnv MCIEEM (Managing Director)
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The information which we have prepared is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

DISCLAIMER

The contents of this report are the responsibility of Middlemarch Environmental Ltd. It should be noted that, whilst every effort is made to meet the client's brief, no site investigation can ensure complete assessment or prediction of the natural environment.

Middlemarch Environmental Ltd accepts no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned and prepared.

VALIDITY OF DATA

The findings of this study are valid for a period of 24 months from the date of survey. If works have not commenced by this date, an updated site visit should be carried out by a suitably qualified ecologist to assess any changes in the habitats present on site, and to inform a review of the conclusions and recommendations made.

NON-TECHNICAL SUMMARY

Middlemarch Environmental Ltd was commissioned by JNP Developments to carry out a Preliminary Ecological Appraisal at the site of a proposed development at Dunsty Hill Farm in Bicester. To fulfil this brief an ecological desk study and a walkover survey (in accordance with Phase 1 Habitat Survey methodology) were undertaken.

The desk study exercise identified no European statutory sites within 5 km of the survey area, one UK statutory site and one ancient woodland within 2 km and six non-statutory sites within 1 km. The site is not located within 10 km of a statutory site designated for bats. The closest statutory site is Sheephouse Wood located 945 m east. The closest non-statutory site is Wood between Lawn Hill and Dunsty Hill which is located adjacent to the southern boundary. An unidentified ancient woodland is also located adjacent to the northern boundary. The desk study also provided records of protected and notable species including bats, badger, brown hare, hedgehog, polecat, amphibians, reptiles, birds and invertebrates.

The walkover survey was undertaken on 5th April 2017 by Victoria Worrall, Senior Ecological Consultant. At the time of the survey, the site comprised farm buildings and adjacent agricultural fields associated with Dunsty Hill Farm, with an access road running east to west from Perry Hill road. Several hedgerows with associated ditches were present along the boundaries, with scattered trees of varying ages throughout the site. Three ponds were present on site and areas of scrub vegetation were noted throughout.

In order to ensure compliance with wildlife legislation and relevant planning policy, the following recommendations are made:

- Consultation with Natural England regarding Sheephouse Wood Site of Special Scientific Interest;
- Consultation with Local Planning Authority ecologist regarding Wood between Lawn Hill and Dunsty Hill Local Wildlife Site and Unidentified Ancient Woodland, and Natural England Standing Advice for Ancient Woodlands should be taken into consideration during site design, specifically with regards to buffer zones;
- In accordance with the provision of Chapter 11 of the National Planning Policy Framework (Conserving and Enhancing the Natural Environment) and Local Planning Policy, biodiversity enhancement measures should be incorporated into the landscaping scheme of any proposed works to maximise the ecological value of the site;
- Production of a Hedgerows Regulations Survey;
- Retention and protection of the standing water and trees on site;
- Bat Activity Surveys should be undertaken to allow a profile of site usage by bats to be compiled;
- Production of a reptile survey of suitable habitats on site;
- Wintering and breeding bird surveys of the survey area;
- Terrestrial invertebrate surveys should be undertaken at the site to ascertain the importance for this species;
- Clearance of vegetation undertaken at appropriate times of the year to ensure nesting birds are not impacted;
- Covering of excavations that are to be left overnight or fitted with mammal ramps and any open pipework is covered at the end of each working day to prevent animals entering.

This report is accompanied by a Confidential Badger Annex (Appendix 3), which should be referred to for recommendations regarding badgers.

A Preliminary Bat Roost Assessment (RT-MME-124420-02) and a Great Crested Newt survey report (RT-MME-125177) have also been compiled for the site. Recommendations within these reports must be followed.

CONTENTS

1. INTRODUCTION

1.1 PROJECT BACKGROUND

JNP Developments commissioned Middlemarch Environmental Ltd to undertake a Preliminary Ecological Appraisal of the site of a proposed development at Dunsty Hill Farm in Bicester. This assessment is required to inform a planning application.

To assess the existing ecological interest of the site an ecological desk study was carried out, and a walkover survey was undertaken on 5th April 2017. In addition, Middlemarch Environmental Ltd has been commissioned to undertake the following assessments of the site:

- Preliminary Bat Roost Assessment (RT-MME-124420-02); and,
- Pre-development Arboricultural Survey (RT-MME-124420-03).

A Great Crested Newt Survey (RT-MME-125177) was also undertaken for the site, which included a larger site boundary with the adjacent landfill also included.

1.2 SITE DESCRIPTION AND CONTEXT

The site under consideration is the existing Dunsty Hill Farm, located adjacent to Perry Hill in Bicester, Oxfordshire. The site is irregular in shape, extends to approximately 30 ha in size, and is centred on Ordnance Survey Grid Reference SP 6804 2295.

At the time of the survey, the site comprised farm buildings and adjacent agricultural fields associated with Dunsty Hill Farm, with an access road running east to west from Perry Hill road. Several hedgerows with associated ditches were present along the boundaries, with scattered trees of varying ages throughout the site. Four ponds were present on site and areas of scrub vegetation were noted throughout.

The site extends to abut agricultural fields in all directions, with the western boundary partially defined by Perry Hill road. The wider landscape is dominated by a mixture of agricultural fields and residential development, interspersed with recreational grounds and areas of woodland.

1.3 DOCUMENTATION PROVIDED

The conclusions and recommendations made in this report are based on information provided by the client regarding the scope of the project. Documentation made available by the client is listed in Table 1.1.

Document Name / Drawing Number	Author
OS Location Plan: 5837/001	Morton Wykes Kramer Ltd
Zoning Diagram and Accommodation: SK01 Rev A	Ingleton Wood

Table 1.1: Documentation Provided by Client

2. METHODOLOGIES

2.1 DESK STUDY

An ecological desk study was undertaken to determine the presence of any designated nature conservation sites and protected species in proximity to the site. This involved contacting appropriate statutory and non-statutory organisations which hold ecological data relating to the survey area. Middlemarch Environmental Ltd then assimilated and reviewed the desk study data provided by these organisations.

The consultees for the desk study were:

- Natural England - *MAGIC* website for statutory conservation sites; and,
- Buckinghamshire and Milton Keynes Environmental Records Centre.

The desk study included a search for European statutory nature conservation sites within a 5 km radius of the site (extended to 10 km for any statutory site designated for bats), UK statutory sites within a 2 km radius and non-statutory sites and protected/notable species records within a 1 km radius.

The data collected from the consultees is discussed in Chapter 4. Selected raw data are provided in Appendix 1. In compliance with the terms and conditions relating to its commercial use, the full desk study data is not provided within this report.

The desk study also included a review of relevant local planning policy with regard to biodiversity and nature conservation (see Chapter 3).

2.2 PHASE 1 HABITAT SURVEY

The walkover survey was conducted following the Phase 1 Habitat Survey methodology of the Joint Nature Conservation Committee (JNCC, 2010) and the Institute of Environmental Assessment (IEA, 1995). Phase 1 Habitat Survey is a standard technique for classifying and mapping British habitats. The aim is to provide a record of habitats that are present on site. During the survey, the presence, or potential presence, of protected species was noted.

Whilst every effort is made to notify the client of any plant species listed on Schedule 9 of the Wildlife and Countryside Act (1981, as amended) present on site, it should be noted that this is not a specific survey for these species.

Data recorded during the field survey are discussed in Chapter 5.

3. LEGISLATION AND POLICY

This chapter provides an overview of the framework of legislation and policy which underpins nature conservation and is a material consideration in the planning process in England. The reader should refer to the original legislation for the definitive interpretation.

3.1 GENERAL BIODIVERSITY LEGISLATION AND POLICY

Conservation of Habitats and Species Regulations 2017 (The Habitats Regulations 2017)
The Habitats Regulations 2017 consolidate and update the Habitats Regulations 2010 (as amended). The Habitat Regulations 2017 are the principal means by which the EEC Council Directive 92/43 (The Habitats Directive) as amended is transposed into English and Welsh law.

The Habitats Regulations 2017 place duty upon the relevant authority of government to identify sites which are of importance to the habitats and species listed in Annexes I and II of the Habitats Directive. Those sites which meet the criteria are, in conjunction with the European Commission, designated as Sites of Community Importance, which are subsequently identified as Special Areas of Conservation (SAC) by the European Union member states. The regulations also place a duty upon the government to maintain a register of European protected sites designated as a result of EC Directive 79/409/EEC on the Conservation of Wild Birds (The Birds Directive). These sites are termed Special Protection Areas (SPA) and, in conjunction with SACs, form a network of sites known as Natura 2000. The Habitats Directive introduces for the first time for protected areas, the precautionary principle; that is that projects can only be permitted having ascertained no adverse effect on the integrity of the site. Projects may still be permitted if there are no alternatives, and there are imperative reasons of overriding public interest.

The Habitats Regulations 2017 also provide for the protection of individual species of fauna and flora of European conservation concern listed in Schedules 2 and 5 respectively. Schedule 2 includes species such as otter and great crested newt for which the UK population represents a significant proportion of the total European population. It is an offence to deliberately kill, injure, disturb or trade these species. Schedule 5 plant species are protected from unlawful destruction, uprooting or trade under the regulations.

The Wildlife and Countryside Act (WCA) 1981 (as amended)
The WCA, as amended, consolidates and amends pre-existing national wildlife legislation in order to implement the Bern Convention and the Birds Directive. It complements the Habitat Regulations 2017, offering protection to a wider range of species. The Act also provides for the designation and protection of national conservation sites of value for their floral, faunal or geological features, termed Sites of Special Scientific Interest (SSSIs).

Schedules of the act provide lists of protected species, both flora and fauna, and detail the possible offences that apply to these species.

The Countryside and Rights of Way (CRoW) Act 2000
The CROW Act, introduced in England and Wales in 2000, amends and strengthens existing wildlife legislation detailed in the WCA. It places a duty on government departments and the National Assembly for Wales to have regard for biodiversity, and provides increased powers for the protection and maintenance of SSSIs. The Act also contains lists of habitats and species (Section 74) for which conservation measures should be promoted, in accordance with the recommendations of the Convention on Biological Diversity (Rio Earth Summit) 1992.

The Natural Environment and Rural Communities (NERC) Act 2006
Section 40 of the NERC Act places a duty upon all local authorities and public bodies in England and Wales to promote and enhance biodiversity in all of their functions. Sections 41 (England) and 42 (Wales) list habitats and species of principal importance to the conservation of biodiversity. These lists superseded Section 74 of the CRoW Act 2000.

The Hedgerow Regulations 1997
The Hedgerow Regulations make provision for the identification of important hedgerows which may not be removed without permission from the Local Planning Authority.

UK Post-2010 Biodiversity Framework

The UK Biodiversity Action Plan (BAP), published in 1994, was the UK Government's response to signing the Convention on Biological Diversity (CBD) at the 1992 Rio Earth Summit. The new UK Post-2010 Biodiversity Framework replaces the previous UK level BAP. The UK Post-2010 Biodiversity Framework covers the period 2011-2020 and forms the UK Government's response to the new strategic plan of the United Nations Convention on Biological Diversity (CBD), published in 2010 at the CBD meeting in Nagoya, Japan. This includes five internationally agreed strategic goals and supporting targets to be achieved by 2020. The five strategic goals agreed were:

- Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society;
- Reduce the direct pressures on biodiversity and promote sustainable use;
- To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity;
- Enhance the benefits to all from biodiversity and ecosystem services; and,
- Enhance implementation through participatory planning, knowledge management and capacity building.

The Framework recognises that most work which was previously carried out under the UK BAP is now focused on the four individual countries of the United Kingdom and Northern Ireland, and delivered through the countries' own strategies. Following the publication of the new Framework the UK BAP partnership no longer operates but many of the tools and resources originally developed under the UK BAP still remain of use and form the basis of much biodiversity work at country level. In England the focus is on delivering the outcomes set out in the Government's 'Biodiversity 2020: a Strategy for England's Wildlife and Ecosystem Services' (DEFRA, 2011). This sets out how the quality of our environment on land and at sea will be improved over the next ten years and follows on from policies contained in the Natural Environment White Paper.

Species and Habitats of Material Consideration for Planning in England

Previous planning policy (and some supporting guidance which is still current, e.g. ODPM Circular 06/2005, now under revision), refers to UK BAP habitats and species as being a material consideration in the planning process. Equally many local plans refer to BAP priority habitats and species. Both remain as material considerations in the planning process but such habitats and species are now described as Species and Habitats of Principal Importance for Conservation in England, or simply priority habitats and priority species under the UK Post-2010 Biodiversity Framework. The list of habitats and species remains unchanged and is still derived from Section 41 list of the Natural Environmental and Rural Communities (NERC) Act 2006. As was previously the case when it was a BAP priority species hen harrier continues to be regarded as a priority species although it does not appear on the Section 41 list.

3.2 NATIONAL PLANNING POLICY FRAMEWORK AND PRACTICE GUIDANCE

In early 2012, the National Planning Policy Framework (NPPF) replaced much previous planning policy guidance, including Planning Policy Statement 9: Biological and Geological Conservation. The government circular 06/05: Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System, which accompanied PPS9, still remains valid. A presumption towards sustainable development is at the heart of the NPPF. This presumption does not apply however where developments require appropriate assessment under the Birds or Habitats Directives.

Chapter 11, on conserving and enhancing the natural environment, sets out how the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and, where possible, provide net gains in biodiversity. Opportunities to incorporate biodiversity gains into a development should be encouraged.

If a proposed development would result in significant harm to the natural environment which cannot be avoided (through the use of an alternative site with less harmful impacts), mitigated or compensated for (as a last resort) then planning permission should be refused.

In March 2014 the Department for Communities and Local Government released guidance to support the National Planning Policy Framework (NPPF), known as the National Planning Practice Guidance (NPPG).

This has been produced to provide guidance for planners and communities which will help deliver high quality development and sustainable growth in England. The guidance includes a section entitled 'Natural Environment: Biodiversity, ecosystems and green infrastructure' which sets out information with respect to the following:

- the statutory basis for minimising impacts on biodiversity and providing net gains where possible;
- the local planning authority's requirements for planning for biodiversity;
- what local ecological networks are and how to identify and map them;
- the sources of ecological evidence;
- the legal obligations on local planning authorities and developers regarding statutory designated sites and protected species;
- the considerations for local (non-statutory) designated sites;
- definition of green infrastructure;
- where biodiversity should be taken into account in preparing a planning application;
- how development can enhance biodiversity;
- how policy is applied to avoid, mitigate or compensate for significant harm to biodiversity and how mitigation and compensation measures can be ensured; and,
- the consideration of ancient woodlands and veteran trees in planning decisions.

3.3 LOCAL PLANNING POLICY

https://www.aylesburyvaledc.gov.uk/section/planning-policy

Aylesbury Vale District Local Plan (AVDLP) 2004
After 27 September 2007, legislation meant that policies in AVDLP ceased to have effect unless 'saved' by a Direction from the Secretary of State. Those 'saved' policies relevant to ecology include:

Policy GP39 Existing Trees and Hedgerows states that 'in considering applications for development affecting trees or hedges the Council will:
a) require a survey of the site and the trees and hedges concerned;
b) serve tree preservation orders to protect trees with public amenity value; and
c) impose conditions on planning permissions to ensure the retention or replacement of trees and hedgerows of amenity, landscape or wildlife importance, and their protection during construction.'

Policy GP40 Retention of Existing Trees and Hedgerows states that 'in dealing with planning proposals the Council will oppose the loss of trees, particularly native Black Poplars, and hedgerows of amenity, landscape or wildlife value.'

Policy GP66 Access to corridors and buffers adjacent to watercourse states that 'in riverside or canalside development proposals, the Council will require access corridors and buffers adjacent to the watercourse to:

- conserve and enhance existing areas of landscape or wildlife value;
- promote public access and provide recreational opportunity; and
- protect or enhance the environment and habitat of those watercourses.'

Vale of Aylesbury Local Plan (VALP)
Work has currently begun on a new Plan which will be known as Vale of Aylesbury Local Plan (VALP). This will include the overall strategy for the district, alongside site allocations (where needed), and development management policies. The proposed adoption date for the new Local Plan is January 2018.

4. DESK STUDY RESULTS

4.1 INTRODUCTION

The data search was carried out in August 2017 by Buckinghamshire and Milton Keynes Environmental Records Centre. All relevant ecological data provided by the consultees was reviewed and the results from these investigations are summarised in Sections 4.2 to 4.4. Selected data are provided in Appendix 1.

4.2 NATURE CONSERVATION SITES

Statutory and non-statutory nature conservation sites located in proximity to the survey area are summarised in Table 4.1.

Site Name	Designation	Proximity to Survey Area	Description
UK Statutory Sites			
Sheephouse Wood	SSSI and ARW	945 m east	Sheephouse Wood is a large, well-structured block of ancient pedunculate oak woodland carrying a wide range of stand types, some of which are relatively uncommon in the region. The site has a characteristically diverse woodland flora, a typical range of breeding birds and is of particular interest for its invertebrate fauna which includes notable and local species.
Non-statutory Sites			
Wood between Lawn Hill and Dunsty Hill	LWS / ASNW	Adjacent to southern boundary	This small woodland north of Edgecott is beside an area which was cleared of ancient woodland for mineral workings. It is also on the edge of a great expanse of countryside to the west which is void of wood. The wood is alive with all sorts of other wildlife including birds like wren and robin with mammals including muntjac deer and fox.
Area northwest of Calvert Brickworks	BNS	235 m north-east	No information provided.
Calvert Jubilee Nature Reserve	LWS	680 m north	This deep lake area is part of a large, disused clay pit. It is especially important as an overwintering site for wildfowl, with bird counts running into four figures. The range of invertebrates on this site includes butterflies like green hairstreak, dingy and grizzled skippers and numerous dragonflies.
Calvert Brick Pits, Great Moor Sailing Club	LWS	700 m north-west	Calvert Brick Pits is a large lake surrounded by a mosaic of scrub with grassland glades owned by Great Moor Sailing Club.
Decoypond Wood	LWS / ASNW	740 m north-east	The woodland is a mix of wet ash and relic hazel coppice with oak, birch and field maple.
Calvert Railway Station	LWS	810 m north	The site is wet grassland on clay, supporting many species which favour these conditions including several which are rare to the County: carnation sedge *Carex panicea*, betony *Stachys officinalis* and sneezewort *Achillea ptarmica*.
Ancient Woodland Sites			
Unidentified Ancient Woodland (Theme ID 1502908)	ASNW	Adjacent to the northern boundary	No information provided.
Key: SSSI: Site of Special Scientific Interest LWS: Local Wildlife Site BNS: Biological Notification Site ARW: Ancient Replanted Woodland			

Table 4.1: Summary of Nature Conservation Sites

A further six Ancient Semi-Natural Woodland were identified within a 2 km radius of the survey area; however, no information was provided about these sites.

The survey area was also identified to be within the SSSI impact risk zone of Sheephouse Wood SSSSI, which is detailed in Table 4.1.

4.3 PROTECTED / NOTABLE SPECIES

Table 4.2 and the following text provide a summary of protected and notable species records within a 1 km radius of the study area. It should be noted that the absence of records should not be taken as confirmation that a species is absent from the search area.

Species	No. of Records	Most Recent Record	Proximity of Nearest Record to Study Area	Species of Principal Importance?	Legislation / Conservation Status
Mammals - bats					
Common pipistrelle *Pipistrellus pipistrellus*	14	2015	420 m south	-	ECH 4, WCA 5, WCA 6
Leisler's bat *Nyctalus leisleri*	2	2015	590 m south	-	ECH 4, WCA 5, WCA 6
Pipistrelle *Pipistrellus* sp.	2	2015	630 m north-east	#	ECH 4, WCA 5, WCA 6
Daubenton's bat *Myotis daubentonii*	2	2011	660 m east	-	ECH 4, WCA 5, WCA 6
Unidentified bat *Chiroptera* sp.	2	2015	670 m north	#	#
Bechstein's bat *Myotis bechsteinii*	3	2011	720 m north-east	✓	ECH 2, ECH 4, WCA 5, WCA 6
Soprano pipistrelle *Pipistrellus pygmaeus*	4	2015	740 m north-east	✓	ECH 4, WCA 5, WCA 6
Brown long-eared bat *Plecotus auritus*	1	2011	810 m east	✓	ECH 4, WCA 5, WCA 6
Whiskered bat *Myotis mystacinus*	1	2011	810 m east	-	ECH 4, WCA 5, WCA 6
Noctule *Nyctalus noctula*	1	2015	Potentially within a 1 km radius*	✓	ECH 4, WCA 5, WCA 6
Mammals - other					
Badger *Meles meles*	5	2015	†	-	WCA 6, PBA
Brown hare *Lepus europeaus*	1	2011	850 m north-east	✓	-
Hedgehog *Erinaceus europaeus*	1	2011	880 m south	✓	WCA 6
Polecat *Mustela putorius*	1	2011	Potentially within a 1 km radius*	✓	WCA 6
Amphibians					
Great crested newt *Triturus cristatus*	10	2016	On site	✓	ECH 2, ECH 4, WCA 5
Smooth newt *Lissotriton vulgaris*	14	2010	On site	-	WCA 5 S9(5)
Palmate newt *Lissotriton helveticus*	1	2008	20 m south	-	WCA 5 S9(5)
Common frog *Rana temporaria*	1	2010	210 m north-east	-	WCA 5 S9(5)
Common toad *Bufo bufo*	4	2010	210 m north-east	✓	WCA 5 S9(5)
Reptiles					
Grass snake *Natrix natrix*	1	2012	350 m north	✓	WCA 5 S9(1) WCA 5 S9(5)
Common lizard *Zootoca vivipara*	1	1996	890 m north	✓	WCA 5 S9(1) WCA 5 S9(5)

Table 4.2: Summary of Protected/Notable Species Records Within 1 km of Survey Area (continues)

Species	No. of Records	Most Recent Record	Proximity of Nearest Record to Study Area	Species of Principal Importance?	Legislation / Conservation Status
Birds					
Red kite *Milvus milvus*	4	2015	40 m north	-	WCA1i
Barn owl *Tyto alba*	7	2016	140 m north	-	WCA1i
Black necked grebe *Podiceps nigricollis*	1	2013	140 m north	-	WCA1i
Black-tailed godwit *Limosa limosa*	2	2015	140 m north	✓	WCA1i
Cetti's warbler *Cettia cetti*	2	2011	140 m north	-	WCA1i
Goldeneye *Bucephala clangula*	2	2012	140 m north	-	WCA 1i
Green sandpiper *Tringa ochropus*	2	2016	140 m north	-	WCA1i
Greenshank *Tringa nebularia*	2	2015	140 m north	-	WCA1i
Greylag goose *Anser anser*	2	2014	140 m north	-	WCA1ii
Eurasian hobby *Falco subbuteo*	3	2016	140 m north	-	WCA1i
Little ringed plover *Charadrius dubius*	3	2016	140 m north	-	WCA1i
Mediterranean gull *Larus melanocephalus*	1	2009	140 m north	-	WCA1i
Osprey *Pandion haliaetus*	1	2003	140 m north	-	WCA1i
Peregrine *Falco peregrinus*	2	2016	140 m north	-	WCA1i
Pintail *Anas acuta*	1	2013	140 m north	-	WCA1ii
Wood sandpiper *Tringa glareola*	2	2011	140 m north	-	WCA1i
Fieldfare *Turdus pilaris*	3	2010	210 m north-east	-	WCA1i
Redwing *Turdus iliacus*	2	2010	500 m south	-	WCA1i
Merlin *Falco columbarius*	1	2006	720 m north-west	-	WCA1i

Table 4.2 (continued): Summary of Protected/Notable Species Records Within 1 km of Survey Area (continues)

Species	No. of Records	Most Recent Record	Proximity of Nearest Record to Study Area	Species of Principal Importance?	Legislation / Conservation Status
Birds (continued)					
Ruff *Calidris pugnax*	1	2011	750 m east	-	WCA1i
Whimbrel *Numenius phaeopus*	1	2011	750 m east	-	WCA1i
Kingfisher *Alcedo atthis*	1	1999	Potentially within a 1 km radius*	-	WCA1i

Key:
†: Badger records are confidential and therefore proximity is not provided within the report.
#: Dependent on species.
*: Grid reference provided was four figures only.

ECH 2: Annex II of the European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora. Animal and plant species of community interest whose conservation requires the designation of Special Areas of Conservation.
ECH 4: Annex IV of the European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora. Animal and plant species of community interest in need of strict protection.
PBA: Protection of Badgers Act 1992.

WCA 1i: Schedule 1 Part 1 of Wildlife and Countryside Act 1981 (as amended). Birds protected by special penalties at all times.
WCA 1ii: Schedule 1 Part 2 of Wildlife and Countryside Act 1981 (as amended). Birds protected by special penalties during close season.
WCA 5: Schedule 5 of Wildlife and Countryside Act 1981 (as amended). Protected animals (other than birds).
WCA 5 S9(1): Schedule 5 Section 9(1) of Wildlife and Countryside Act 1981 (as amended). Protected animals (other than birds). Protection limited to intentional killing, injury or taking.
WCA 5 S9(5): Schedule 5 Section 9(5) of Wildlife and Countryside Act 1981 (as amended). Protected animals (other than birds). Protection limited to selling, offering for sale, processing or transporting for purpose of sale, or advertising for sale, any live or dead animal, or any part of, or anything derived from, such animal.
WCA 6: Schedule 6 of Wildlife and Countryside Act 1981 (as amended). Animals which may not be killed or taken by certain methods.

Species of Principal Importance: Species of Principal Importance for Nature Conservation in England.

Note. This table does not include reference to the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats), the Bonn Convention on the Conservation of Migratory Species of Wild Animals or the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Table 4.2 (continued): Summary of Protected/Notable Species Records Within 1 km of Survey Area

Birds
The desk study also provided records of nineteen species of bird listed as Species of Principal Importance including starling *Sturnus vulgaris,* lesser redpoll *Carduelis cabaret* and grasshopper warbler *Locustella naevia.*

Further records of notable bird species include six species of bird listed on the RSPB redlist and a further 32 species listed on the RSPB amber list.

Invertebrates
The desk study provided records of twelve species of moths and butterflies listed as Species of Principal Importance, including grizzled skipper butterfly *Pyrgus malvae*, brown hairstreak butterfly *Thecla betulae* and wall butterfly *Lasiommata megera*. Further records of notable invertebrates include black hairstreak butterfly *Satyrium pruni,* which is noted to be listed on Schedule 5 Section 9(5) of the Wildlife and Countryside Act 1981 (as amended).

4.4 INVASIVE SPECIES

The desk study provided no records of invasive species within a 1 km radius of the survey area. It should be noted that the absence of records should not be taken as confirmation that a species is absent from the search area.

5. PHASE 1 HABITAT SURVEY

5.1 INTRODUCTION

The results of the Phase 1 Habitat Survey are presented in the following sections. An annotated Phase 1 Habitat Survey Drawing (Drawing C124420-01-01) is provided in Chapter 8. This drawing illustrates the location and extent of all habitat types recorded on site. Any notable features or features too small to map are detailed using target notes. Photographs taken during the field survey are presented in Chapter 9.

The survey was carried out on 5th April 2017 by Victoria Worrall, Senior Ecological Consultant. Table 5.1 details the weather conditions at the time of the survey.

Parameter	Condition
Temperature (ºC)	15
Cloud (%)	20
Wind (Beaufort)	F1
Precipitation	Dry

Table 5.1: Weather Conditions During Field Survey

5.2 SURVEY CONSTRAINTS AND LIMITATIONS

No significant constraints were experienced at the time of survey.

5.3 HABITATS

The following habitat types were recorded on site during the field survey:

- Buildings;
- Dense scrub;
- Dry ditch;
- Fence;
- Hardstanding;
- Hedgerows;
- Improved grassland;
- Scattered scrub;
- Scattered trees;
- Standing water;
- Tall ruderal vegetation; and,
- Wet ditch.

These habitats are described below. They are ordered alphabetically, not in order of ecological importance.

Buildings
Six buildings were present within the survey area, five farm buildings and a farm house (Plate 9.1). The farm house was a two-storey brick built structure with a pitched slate-covered roof. The roof of this building had many slipped and missing slates and gaps around the chimneys. The remaining buildings were a mix of brick-built single storey structures with slate roofs and more modern breezeblock and corrugated sheet barns. The brickwork of the barns had some gaps, cracks and crevices.

For more information regarding the buildings on site, please refer to the Preliminary Bat Roost Assessment, as detailed in RT-MME-124420-02.

Dense scrub
Areas of dense scrub were present throughout the site including around the edges of the buildings and around the edges and scattered throughout some of the improved grassland. A dense bank of bramble *Rubus fruticosus* agg scrub dominated the area to the east of the pond and around several of the barns. The scrub extended to approximately 1.5 m in height. Species included nettle *Urtica dioca*, cleavers *Galium*

aparine, red dead-nettle *Lamium purpureum*, hedge mustard *Sisymbrium officinale*, dock *Rumex* sp., lesser celandine *Ranunculus ficaria* and cow parsley *Anthriscus sylvestris*.

Dry ditch
A dry ditch was present along the northern side of Hedgerow 3. This ditch was approximately 1m in width with gently sloping banks. It was heavily shaded and colonised by grasses and leaf litter.

A second dry ditch extended south from the access road. This ditch had similar dimensions to the first; however, some areas of hard rush *Juncus inflexus* were present which indicated it was wet in areas. Dry ditches also acted as boundaries between some of the improved grassland fields.

Fence
Fences were present along many of the site and field boundaries and also around the residential property (Plate 9.2). These comprised post and sheep net fence, wooden post and rail fence and decorative iron fencing. These fences where approximately 1.2 m high, were in good condition and supported no notable vegetation.

Hardstanding
This habitat comprised concrete slabs and a gravel access track. Some vegetation had started to colonise the gaps in the concrete slabs including moss species and some scrub including elder *Sambucus nigra*.

Hedgerows
Nine hedgerows were present within the survey area (Plate 9.3). These are labelled as H1-H9 on Drawing C124420-01-01 in Chapter 8 and further described as such below:

H1: Hedgerow H1 was present along the southern boundary of the site. It was unmanaged and sparse in areas and approximately 6 m in height. Species included hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, English oak *Quercus robur*, ash *Fraxinus excelsior* and elm *Ulmus* sp.

H2: This was a defunct, unmanaged hedgerow, which acted as a boundary between the two fields in the south of the site. It measured up to 3 m in height, with species such as blackthorn and hawthorn within.

H3: Hedgerow H3 was present close to the access track in the centre of the site. It was intact, unmanaged and measured up to approximately 3 m in height. Species included blackthorn, elm, ash, hawthorn and cherry *Prunus* sp.

H4: This was an unmanaged hedgerow along the southern boundary of the site. It was approximately 3 m in height, with species including blackthorn, goat willow *Salix caprea,* English oak and ash.

H5: An intact, managed hedgerow was present along the western boundary of the site, which measured up to 2 m in height. Species within this hedgerow comprised blackthorn, hawthorn, field maple *Acer campestre* and ash.

H6: Hedgerow H6 was present along the norther section of the western boundary of the site. It was intact, managed and up to approximately 2 m in height. Species included blackthorn, hawthorn and field maple.

H7: This hedgerow acted as a boundary between two fields in the north of the site. It was unmanaged, with species including blackthorn and goat willow.

H8: Hedgerow H8 was a further defunct hedgerow dividing two fields in the north of the site, with species including blackthorn and ash.

H9: This defunct hedgerow was present along the northern boundary of the site, with species including blackthorn, hawthorn, goat willow and elm.

Improved grassland
This habitat dominated the majority of this site (Plate 9.4). It had been previously been grazed, the sward was up to approximately 20 cm in height; however some areas surrounding the barns are more overgrown. Species present included: meadow grass, perennial rye-grass *Lolium perenne*, Yorkshire-fog *Holcus lanatus*

and cock's-foot *Dactylis glomerata*, with minor amounts of spear thistle *Cirsium vulgare*, dandelion *Taraxacum officinale* agg. and speedwell *Veronica* sp.

Scattered scrub
Scattered scrub was present around the edges of the hedgerows, ponds, buildings and grassland. Species included nettle, lords-and-ladies *Arum maculatum*, white dead-nettle *Lamium album*, bristly oxtongue *Helminthotheca echioides*, colt's-foot *Tussilago farfara* and forsythia *Forsythia x intermedia*.

Scattered trees
The majority of the trees were located to the east of the farm house, forming old hedgerow lines (Plate 9.5). These trees were predominantly early mature and mature ash measuring between 9 - 21 m in height. A number of these trees were in poor condition with areas of decay and woodpecker holes noted. A group of young and early mature ash, field maple *Acer campestre* and sycamore *Acer pseudoplatanus* were located within the centre of the site, adjacent to a farm building (4 - 12 m in height). Mature goat willow, crack willow *Salix fragillis*, oak and ash were situated within the overgrown hedgerows. The remaining specimens comprise scattered early mature and mature hawthorn and goat willow (3 – 6 m in height).

Standing water
Three ponds were located on site (Plate 9.6). These are labelled as P1–P3 on Drawing C124420-01-01 and further described as such below:

P1: A medium sized L-shaped pond approximately 50 m^2 in area with some emergent vegetation noted. This was located adjacent to farmhouse, surrounded by scrub and trees.

P2: This pond was medium sized oval shaped pond, approximately 10 m in diameter, in the centre of an agricultural field. It was approximately 50 m from hedgerow, surrounded by improved grassland.

P3: This was a medium sized pond located close to the edge of the southern boundary, completely choked with rushes.

Tall ruderal vegetation
There are several patches of this habitat present on site, one in the south-east adjacent to some barns and a second adjacent to a larger barn in the north of the site. Additionally, a thin strip of ruderal vegetation was present along the wet ditch south of the access track. Species within the habitat include: common nettle *Urtica dioica*, dock *Rumex* sp. and willowherb *Epilobium* sp.

Tall ruderal vegetation was present within the grassland and around the farm buildings. It was up to approximately 40 cm in height. Predominant species included nettle and bramble.

Wet ditch
Several wet ditches were present on site. They varied between 0.5 m and 1 m in width and had a mixture of gently sloping banks and steeper banks. The wet ditches ran adjacent to the access track and throughout the hedgerows present on site. There was some vegetation, such as soft-rush *Juncus effusus* and grasses present.

5.4 FAUNA

During the survey field signs of faunal species were recorded. The time of year at which the survey is undertaken will affect species or field signs directly recorded during the survey.

Birds
The bird species observed on site at the time of survey are detailed in Table 5.2:

Common name	Latin name	Conservation status
Blue tit	*Cyanistes caeruleus*	-
Canada goose	*Branta canadensis*	-
Carrion crow	*Corvus corone*	-
Chaffinch	*Fringilla coelebs*	-
Dunnock	*Prunella modularis*	Amber List, Species of Principal Importance
Great tit	*Parus major*	-
Greylag goose	*Anser anser*	WCA1i, Amber List
Grey heron	*Ardea cinerea*	-
Jackdaw	*Corvus monedula*	-
Kestrel	*Falco tinnunculus*	Amber List
Magpie	*Pica pica*	-
Pheasant	*Phasianus colchicus*	-
Pied wagtail	*Motacilla alba*	-
Red kite	*Milvus milvus*	WCA1i
Robin	*Erithacus rubecula*	-
Skylark	*Alauda arvensis*	Red List, Species of Principal Importance
Wren	*Troglodytes troglodytes*	-

Key:
WCA 1i: Schedule 1 Part 1 of Wildlife and Countryside Act 1981 (as amended). Birds protected by special penalties at all times.
Red List - species are those that are globally threatened, whose population or range has declined rapidly in recent years (i.e. by more than 50% in 25 years), or which have declined historically and not recovered.
Amber List- Amber list species are those whose population or range has declined moderately in recent years (by more than 25% but less than 50% in 25 years), those whose population has declined historically but recovered recently, rare breeders (fewer than 300 pairs), those with internationally important populations in the UK, those with localised populations, and those with an unfavourable conservation status in Europe.
Species of Principal Importance: Species of Principal Importance for Nature Conservation in England.

Table 5.2: Bird Species Observed during the Field Survey

Badger
This report is accompanied by a Confidential Badger Appendix (see Appendix 3). Please refer to this for further information.

5.5 INVASIVE PLANT SPECIES

There were no invasive plant species observed on site at the time of survey.

6. DISCUSSIONS AND CONCLUSIONS

6.1 SUMMARY OF PROPOSALS

It is understood that the proposals involve the construction of a residential development with a retirement village, school and leisure area. However, the exact nature of the proposed plans are currently unknown. Therefore, a precautionary approach has been adopted when discussing the potential for impacting nature conservation sites and which habitats and species are notable considerations. The discussions and recommendations should be reviewed and amended, where appropriate, once the proposals are finalised.

6.2 NATURE CONSERVATION SITES

The desk study exercise identified no European statutory sites within 5 km of the survey area, one UK statutory site and seven ancient woodlands within 2 km and six non-statutory sites within 1 km. The site is not located within 10 km of a statutory site designated for bats. The significance of these sites to the proposed development is discussed below.

UK Statutory Sites
Sheephouse Wood SSSI is located 945 m east of the survey area. The survey area was also found to be within the SSSI impact risk zone of this conservation site. All planning applications fall into the risk categories of this conservation site (please see Appendix 1 for more information). It is therefore considered that the proposed development could potentially indirectly impact this conservation site. Therefore, UK statutory sites are a notable consideration in relation to the proposed development and a recommendation has been made in Section 7.1.

Non-Statutory Sites
Wood between Lawn Hill and Dunsty Hill LWS / ASNW is located adjacent to the southern boundary of the survey area. A further unidentified ancient woodland is located adjacent to the northern boundary of the survey area. As the exact nature of the proposed development is unknown, the exact impacts of the development on these conservation sites cannot be determined. There may be indirect impacts, such as an increase in pollution, run-off, etc. There may also be operational phase impacts, such as an increase in recreational pressure. Therefore, these non-statutory conservation sites are a notable consideration in relation to the proposed development and a recommendation has been made in Section 7.1.

The remaining conservation sites are located 235 m or more from the survey area. As the exact nature of the proposed plans is currently unknown, the potential impacts of the development on these conservation sites is unknown. However, it is considered that due to the distance between the conservation sites and the survey area and providing the recommendation for the protection of the conservation sites is followed (within Section 7.1), it is considered unlikely that these remaining conservation sites will be adversely impacted as a result of the proposed development.

6.3 HABITATS

The ecological importance of the habitats present on site is determined by their presence on the list of Habitats of Principal Importance in England and on the Local BAP. It also takes into account the intrinsic value of the habitat. Those habitats which are considered to be of intrinsic importance and have the potential to be impacted by the site proposals are highlighted as notable considerations.

A discussion of the implications of the site proposals with regard to the habitats present on site is provided in the text below. A separate discussion of the value of the habitats on site to protected or notable species is provided in Section 6.4.

Hedgerows
'Hedgerows' are a Habitat of Principal Importance for Nature Conservation in England if they measure over 20 m in length and less than 5 m in width, consist predominantly of at least one woody UK native species, and any gaps measure less than 20 m in width. It is considered likely that the hedgerows on site will satisfy these criteria and are therefore Habitats of Principal Importance. The wet and dry ditches associated with these hedgerows are considered to form part of the hedgerows and therefore fall within the Habitat of Principal Importance category. It is currently unknown if these hedgerows are to be impacted by the

proposed development. If all of the hedgerows are to be retained, there is potential for these hedgerows to be indirectly impacted during the construction phase of the development, such as through root compaction by machinery, etc. Therefore, hedgerows are a notable consideration in relation to the proposed development and a recommendation has been made in Section 7.2.

Scattered trees
The mature and semi-mature trees on site are of intrinsic value as they cannot be easily replaced in the short to medium term. It is unknown if any of these trees are to be removed to facilitate the proposed works. If they are to be retained, the proposed works could result in indirect impacts, such as root compaction, etc. Therefore, scattered trees are a notable consideration in relation to the proposed development and a recommendation has been made in Section 7.2.

Standing water
'Ponds' are a Habitat of Principal Importance for Nature Conservation in England if they meet one or more of the relevant criteria (e.g. contain species of high conservation importance, such as great crested newt). A Great Crested Newt Presence/Absence Survey (RT-MME-125177) was undertaken of these ponds on site and great crested newts were found to be using this pond. The ponds on site are therefore Habitats of Principal Importance. It is unknown if these ponds are to be removed to facilitate the proposed development. If they are to be retained, there may be indirect impacts such as an increase in pollution, run-off, etc. A recommendation has therefore been provided in Section 7.2 in regards to the protection of this habitat.

Wet ditch
The wet ditches associated with hedgerows are considered to fall within the Habitat of Principal Importance category. Those that aren't associated with hedgerows, although not considered to be Habitats of Principal Importance, are considered to provide valuable connectivity between hedgerows and ditches onsite. They also provide corridors to offsite habitats. It is unknown if these habitats are to be retained as part of the proposed works. A recommendation for the retention and protection of these habitats has therefore been made in Section 7.2.

Buildings, dense scrub, dry ditch, fence, hardstanding, improved grassland, other habitat, scattered scrub and tall ruderal vegetation
The remaining habitats are well represented locally, have low species diversity or can be easily recreated post development. Any loss of these habitats would be considered to have minimal impact on the ecology of the local area. These habitats are therefore not considered to be notable consideration.

Habitats considered to be of relevance to the proposed development are summarised in Table 6.1.

Habitat Type	Habitat of Principal Importance?	Local BAP Habitat?	Summary of Potential Impacts
Hedgerows	✓	✓	Habitat loss, indirect impacts such as root compaction by machinery, etc
Scattered trees	-	-	Habitat loss, indirect impacts such as root compaction by machinery, etc
Standing water	✓	✓	Run-off, dust, pollution, etc
Wet ditch	-	-	Run-off, dust, pollution, etc

Table 6.1: Summary of Potential Impacts on Notable Habitats

6.4 PROTECTED/NOTABLE SPECIES

The following paragraphs consider the likely impact of the site proposals on protected or notable species. This is based on those species highlighted in the desk study exercise (Chapter 4) and other species for which potentially suitable habitat occurs within or adjacent to the survey area.

Mammals
Bats
The desk study provided records of at least eight species of bat within a 1 km radius of the survey area. The closest record is of a common pipistrelle, located approximately 420 m south. The trees and buildings on site were subject to a Preliminary Bat Roost Assessment, as detailed in RT-MME-124420-02. Potential bat roosting features were noted within some of these trees and the buildings on site. A bat roost is also known

to be present within one of the buildings on site. If these buildings are to be demolished or the trees to be removed as part of the proposed development, this could result in direct harm/injury and a loss of habitat for roosting bats. Therefore, roosting bats are a notable consideration in relation to the proposed development and a recommendation has been made in Section 7.3.

The desk study revealed three recent records of Bechstein's bat within a 1 km radius of the survey area, the nearest of which was located 720 m to the north-east. The Bechstein's bat is very rare in the UK, with its range currently thought to extend over southern Wales and parts of southern England (Bat Conservation Trust, 2010). Therefore, specific consideration would need to be given to potential impacts on this species as a result of any local habitat loss. It is recommended that the site should be subject to bat activity surveys in order to allow a profile of site usage by bats to be compiled. A recommendation regarding these further surveys has been made in Section 7.3.

Badger
The desk study provided five records of badger within a 1 km radius of the survey area. This report is accompanied by a Confidential Badger Appendix (see Appendix 3). Please refer to this for further information.

Brown hare
The desk study provided a record of a brown hare within a 1 km radius of the survey area, located approximately 850 m north-east. It is considered likely that the survey area provides suitable habitat for brown hare, with connectivity to suitable habitat in the wider landscape. If there are to be any excavations required as part of the proposed works, brown hare could fall in and become trapped, resulting in direct harm/injury. Therefore, brown hare are a notable consideration and a recommendation in regards to the protection of this species has been made in Section 7.3.

Hedgehog
The desk study provided a record of hedgehog within a 1 km radius of the survey area, located approximately 880 m south. The areas of dense scrub and tall ruderal vegetation may provide suitable habitat for hedgehog, with the hedgerows and surrounding woodland providing connectivity to habitat in the wider landscape. If there are to be any excavations required as part of the proposed works, brown hare could fall in and become trapped, resulting in direct harm/injury. Therefore, hedgehog are a notable consideration and a recommendation in regards to the protection of this species has been made in Section 7.3.

Polecat
The desk study provided a record of a polecat potentially within a 1 km radius of the survey area. Due to the agricultural nature of the survey area and immediate surrounding habitats, it is considered that polecats will pass through the site. A recommendation has therefore been made in Section 7.3 in regards to the protection of polecat.

Water vole
The desk study provided no records of water vole. The wet ditches on site were not considered to provide suitable habitat for water vole, due to their lack of connectivity to offsite habitats and small volumes of water within the ditch, it is considered unlikely that the wet ditches provide suitable habitat for water vole. Therefore, water vole are not a notable consideration in relation to the proposed development.

Amphibians
The desk study provided records of five species of amphibians, great crested newt, smooth newt, palmate newt, common frog and common toad, within a 1 km radius of the survey area. Records of great crested newt and smooth newt were identified on site. The standing water on site provides suitable breeding habitat, with the hedgerows, grassland and scrub providing suitable terrestrial habitat for amphibians.

Ponds on site and within a 500 m radius of Dunsty Hill Farm and the adjacent landfill area were subject to great crested newt presence/absence surveys. Four populations of great crested newts were identified within the survey area, comprising one small population, two medium populations and one large population. It is unknown if the ponds on site are to be retained as part of the proposed development. However, due to the presence of these populations, it is likely that the development will result in a breach of legislation. Great crested newts are therefore a notable consideration in relation to the proposed development and a recommendation has been made in Section 7.3.

Reptiles
The desk study provided records of two species of reptile, grass snake and common lizard, within a 1 km radius of the survey area. The closest record of a grass snake is located 350 m north. The scrub, hedgerows and rubble piles provide suitable refugia and hibernacula for reptiles. Suitable foraging habitat was also present, such as grassland, scrub and hedgerows and areas of scrub around the ponds. As it is considered likely that these habitats will be cleared to facilitate the proposed development, the works could result in loss of suitable habitat as well as direct harm/injury to reptiles. Therefore, reptiles are a notable consideration and a recommendation has been made in Section 7.3.

Birds
The desk study provided records of twenty-two species of birds listed as Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) within a 1 km radius of the survey area. It is considered that due to the large area of agricultural land that may be lost as a result of the proposed development, Schedule 1 breeding and overwintering birds may be adversely impacted as a result of the proposed development. A recommendation has therefore been provided in Section 7.3.

Numerous other notable bird species were also identified within the desk study, as well as various bird species being observed on site at the time of survey. The trees, hedgerows and buildings provide suitable habitat for nesting birds within the survey area. If the proposed works are undertaken in the bird nesting season then there is potential for impact upon nesting birds and as such, a recommendation has been made in Section 7.3. Due to the limited extent of potential nesting and foraging habitat to be removed and the presence of alternative features within the local vicinity, it is considered that the works should not adversely impact birds in the long-term. Nevertheless, as some loss of habitat will occur, enhancement recommendations are provided within Section 7.2.

Invertebrates
The desk study provided numerous records of notable invertebrates within a 1 km radius of the survey area. Brown and black hairstreak butterflies, as well as glow worms *Lampyris noctiluca,* are known to be present in the vicinity of the survey area. It is considered that these invertebrates are therefore likely to be utilising the survey area , due to the presence of suitable habitat, and therefore, proposed developments would likely result in a loss of suitable habitat. A recommendation for further survey work to ascertain the importance of the site for these species has been made in Section 7.2.

Other Species
The following protected species are not considered to be material considerations due to the lack of desk study records and absence of suitable habitats within the development site and its surroundings: dormouse and otter.

Summary
Species considered to be of relevance to the proposed development are summarised in Table 6.2.

Species / Species Group	Species of Principal Importance?	Summary of Potential Impacts
Bats	#	Loss of suitable habitat, direct harm/injury
Badger	-	Loss of suitable habitat, direct harm/injury
Brown hare	✓	Direct harm/injury
Hedgehog	✓	Direct harm/injury
Polecat	✓	Direct harm/injury
Great crested newts	✓	Loss of suitable habitat, direct harm/injury
Reptiles	#	Loss of suitable habitat, direct harm/injury
Birds	#	Loss of suitable habitat
Terrestrial Invertebrates	#	Loss of suitable habitat
#: Species dependent		

Table 6.2: Summary of Potential Impacts on Notable Species

6.5 INVASIVE PLANT SPECIES

The desk study provided no records of invasive plants within a 1 km radius of the survey area and none were noted on site at the time of survey. Therefore, invasive plant species are not a notable consideration in relation to the proposed development.

7. RECOMMENDATIONS

All recommendations provided in this section are based on Middlemarch Environmental Ltd's current understanding of the site proposals, correct at the time the report was compiled. Should the proposals alter, the conclusions and recommendations made in the report should be reviewed to ensure that they remain appropriate.

The ecological mitigation hierarchy should be applied when considering development which may have a significant effect on biodiversity. The ecological mitigation hierarchy, as set out in the National Planning Policy Framework (NPPF), and the National Planning Practice Guidance (NPPG) should follow these principles:

- **Avoidance** – development should be designed to avoid significant harm to valuable wildlife habitats and species.
- **Mitigation** – where significant harm cannot be wholly or partially avoided, it should be minimised by design or through the use of effective mitigation measures.
- **Compensation** – where, despite whatever mitigation would be effective, there would still be significant residual harm, as a last resort, compensation should be used to provide an equivalent value of biodiversity.

7.1 NATURE CONSERVATION SITES

The following recommendation are made regarding nature conservation sites:

R1 **Sheephouse Wood Site of Special Scientific Interest:** The proposed works could potentially directly or indirectly impact upon Sheephouse Wood which is designated as a Site of Special Scientific Interest. As such, Natural England should be consulted prior to any works commencing to determine how works may proceed without adversely impacting this site.

R2 **Wood between Lawn Hill and Dunsty Hill Local Wildlife Site and Unidentified Ancient Woodland:** The proposed works could potentially indirectly impact upon adjacent non-statutory nature conservation sites. As such, the Local Planning Authority ecologist should be consulted prior to any works commencing to determine how works may proceed without adversely impacting these sites. Natural England Standing Advice for Ancient Woodlands should be taken into consideration during site design, specifically with regards to buffer zones. It is anticipated that the construction phase impacts of these works will be minimised by the production of a Construction Ecological Management Plan (CEcMP); however, this approach should be agreed with the Local Planning Authority prior to commencement.

7.2 HABITATS

The following recommendations are made regarding the habitats present on site:

R3 **Habitat Loss and Enhancement:** In accordance with the provision of Chapter 11 of the National Planning Policy Framework (Conserving and Enhancing the Natural Environment) and Local Planning Policy, biodiversity enhancement measures should be incorporated into the landscaping scheme of any proposed works to maximise the ecological value of the site:

- Planting of habitats which will be of value to wildlife, such as:
  - native seed/fruit bearing species to provide foraging habitat for mammals and birds;
  - nectar-rich species to attract bees, butterflies and moths;
  - wildflower grassland margins to provide larval food for caterpillars and to attract butterfly and moth species; and,
  - species which attract night flying insects which will be of value to foraging bats, for example: evening primrose *Oenothera biennis*, goldenrod *Solidago virgaurea*, honeysuckle *Lonicera periclymenum* and fleabane *Pulicaria dysenterica*.
- Inclusion of hedgehog passes under any fence lines to allow connectivity between the site and the wider area.

- Provision of nesting/roosting habitat, such as installation of nest boxes for species such as house sparrow, dense scrub for species such as song thrush, and bat boxes for species such as pipistrelle.

R4 **Hedgerows Regulations Survey:** A hedgerow regulations survey should be undertaken to assess the hedgerows to be directly impacted by the proposed works. These will be assessed for their significance against the 'criteria for determining "important" hedgerows' as detailed in The Hedgerows Regulations 1997.

R5 **Standing water:** The ponds on site are Habitats of Principal Importance and therefore should be retained and protected. All works should be undertaken in accordance with best practice, e.g. the Environment Agency's Pollution Prevention Guidelines, to ensure that the waterbodies within the survey area are not adversely impacted by the proposed works.

R6 **Trees and Hedgerows:** The trees and hedgerows on site should be retained as part of the works. Any trees and hedgerows on site, or overhanging the site, which are to be retained as a part of any proposed works should be protected in accordance with British Standard 5837: 2012 "Trees in relation to design, demolition and construction - recommendations". Protection should be installed on site prior to the commencement of any works on site.

7.3 PROTECTED / NOTABLE SPECIES

To ensure compliance with wildlife legislation and relevant planning policy, the following recommendations are made:

R7 **Bats:** A Preliminary Bat Roost Assessment has been undertaken of the buildings and trees on site (RT-MME-124420-02) and all recommendations within this report should be followed. Specific consideration is likely to be needed for Bechstein's bats due to recently discovered local populations. Bat Activity Surveys should be undertaken to allow a profile of site usage by bats to be compiled. These surveys can be completed in suitable weather in accordance with the Bat Conservation Trust Guidelines (Collins, 2016).

R8 **Badgers:** This report is accompanied by a Confidential Badger Appendix (Appendix 3). Please refer to this document for more information.

R9 **Great Crested Newts:** A Great Crested Newt survey report has been produced for this site (RT-MME-125177) and all recommendations within this report should be followed.

R10 **Reptiles:** A reptile survey should be undertaken of suitable habitats within the proposed development site. Reptile surveys can be completed in suitable weather conditions between April and September (inclusive).

R11 **Wintering and Breeding Birds:** Due to the high numbers of records of Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) within the desk study and the suitability of the habitats present on site, it is considered that a wintering bird survey and a breeding bird survey should be undertaken of the site.

R12 **Terrestrial Invertebrates:** Due to the known presence of protected invertebrates within the vicinity of the survey area, such as brown and black hairstreak butterfly, a terrestrial invertebrate survey should be undertaken to ascertain the importance of the site for these species.

R13 **Nesting Birds:** Vegetation and building clearance should be undertaken outside the nesting bird season. The nesting bird season is weather dependent but generally extends between March and September inclusive (peak period March-August). If this is not possible then any vegetation/buildings to be removed or disturbed should be checked by an experienced ecologist for nesting birds immediately prior to works commencing. If birds are found to be nesting any works which may affect them would have to be delayed until the young have fledged and the nest has been abandoned naturally, for example via the implementation of an appropriate buffer zone (species dependent) around the nest in which no disturbance is permitted until the nest is no longer in use.

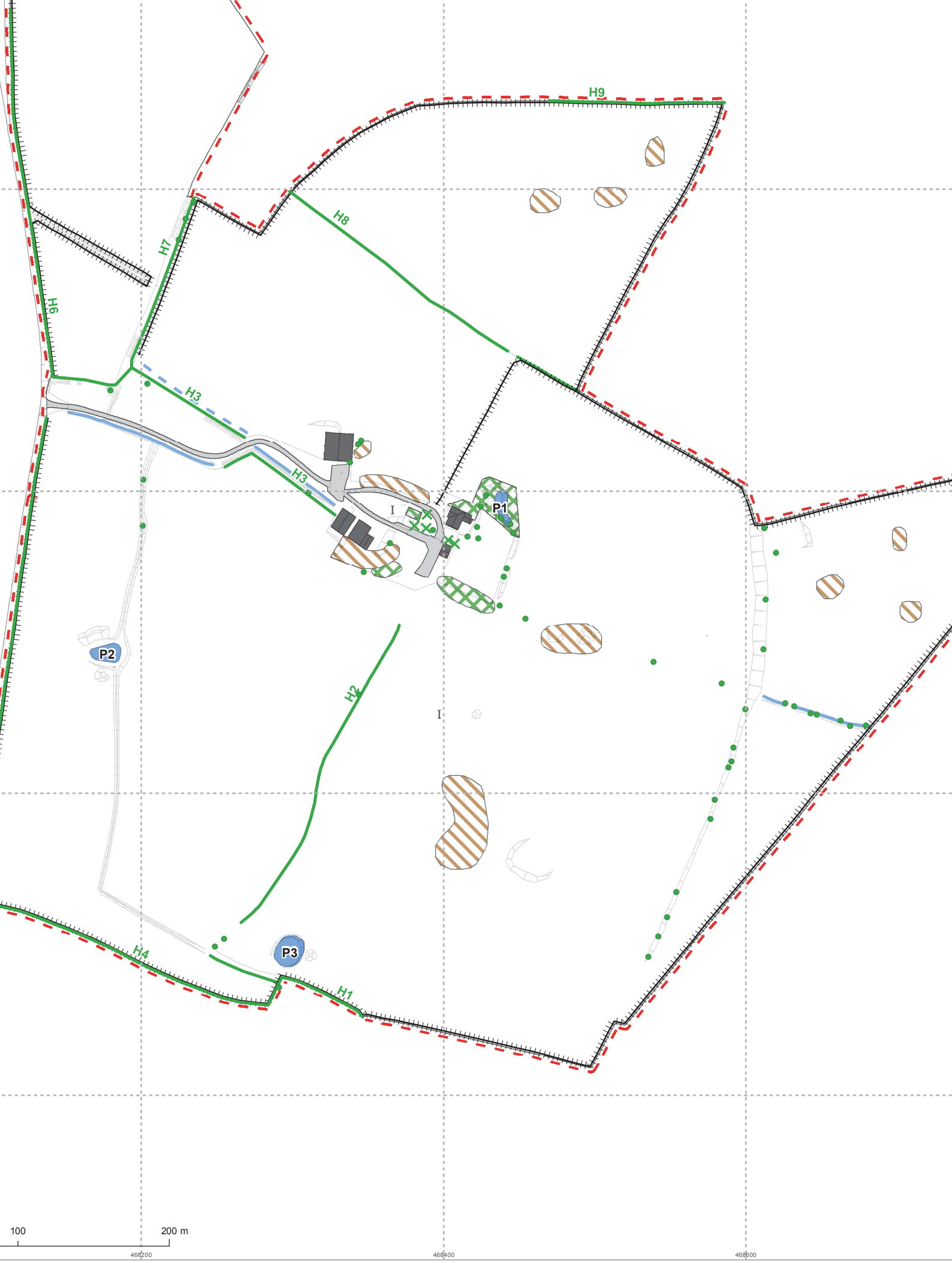
R14 **Terrestrial Mammals including Badger, Hedgehog and Polecat:** Any excavations that need to be left overnight should be covered or fitted with mammal ramps to ensure that any animals that enter can safely escape. Any open pipework with an outside diameter of greater than 120 mm must be covered at the end of each work day to prevent animals entering/becoming trapped.

7.4 INVASIVE PLANT SPECIES

No recommendations are made in regard to invasive plant species.

8. DRAWINGS

Drawing C124420-01-01 – Phase 1 Habitat Map



Project	Dunsty Hill Farm
Drawing	Phase 1 Hab
Client	

9. PHOTOGRAPHS

Plate 9.1: Farm house

Plate 9.2: Fence

Plate 9.3: Example of a hedgerow

Plate 9.4: Improved grassland

Plate 9.5: Scattered trees

Plate 9.6: Example of standing water

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APPENDICES

APPENDIX 1: Summary of Statutory Nature Conservation Sites

APPENDIX 2: Overview of Relevant Species Specific Legislation

APPENDIX 3: Confidential Badger Annex

APPENDIX 1

Summary of Statutory Nature Conservation Sites

Site Check Report
Report generated on Thu Aug 10 2017
Centroid Grid Ref: SP684236
The following features have been found in your search area:

Ramsar Sites (England)
No Features found

Special Areas of Conservation (England)
No Features found

Special Protection Areas (England)
No Features found

Ancient Woodland (England)
Wood Name
Theme Name: Ancient & Semi-Natural Woodland
Theme ID: 1502976
Area (Ha): 8.136612

Wood Name
Theme Name: Ancient & Semi-Natural Woodland
Theme ID: 1503054
Area (Ha): 1.402757

Wood Name
Theme Name: Ancient & Semi-Natural Woodland
Theme ID: 1503055
Area (Ha): 1.857239

Wood Name
Theme Name: Ancient & Semi-Natural Woodland
Theme ID: 1503012
Area (Ha): 8.880236

Wood Name
Theme Name: Ancient & Semi-Natural Woodland
Theme ID: 1503013
Area (Ha): 53.834928

Wood Name
Theme Name: Ancient & Semi-Natural Woodland
Theme ID: 1502905
Area (Ha): 0.922624

Wood Name
Theme Name: Ancient & Semi-Natural Woodland
Theme ID: 1502906
Area (Ha): 1.833696

Wood Name
Theme Name: Ancient & Semi-Natural Woodland
Theme ID: 1502907
Area (Ha): 1.542004

Wood Name
Theme Name: Ancient & Semi-Natural Woodland
Theme ID: 1502908
Area (Ha): 0.579832

Wood Name
Theme Name: Ancient & Semi-Natural Woodland
Theme ID: 1502935
Area (Ha): 0.825249

Wood Name
Theme Name: Ancient & Semi-Natural Woodland
Theme ID: 1502936
Area (Ha): 0.336269

Wood Name
Theme Name: Ancient Replanted Woodland
Theme ID: 1503100
Area (Ha): 2.539048

Wood Name
Theme Name: Ancient Replanted Woodland
Theme ID: 1503101
Area (Ha): 1.978975

Sites of Special Scientific Interest (England)
Name: Sheephouse Wood SSSI
Reference: 1000562
Natural England Contact: SAM MERRELL
Natural England Phone Number: 0845 600 3078
Hectares: 58.82
Citation: 1001671
Hyperlink: http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1001671

Local Nature Reserves (England)
No Features found

National Nature Reserves (England)
No Features found

SSSI Impact Risk Zones - to assess planning applications for likely impacts on SSSIs/SACs/SPAs & Ramsar sites (England)
1. DOES PLANNING PROPOSAL FALL INTO ONE OR MORE OF THE CATEGORIES BELOW?
2. IF YES, CHECK THE CORRESPONDING DESCRIPTION(S) BELOW. LPA SHOULD CONSULT NATURAL ENGLAND ON LIKELY RISKS FROM THE FOLLOWING:
All Planning Applications: All planning applications outside or extending outside existing settlements/urban areas affecting greenspace, farmland, semi natural habitats or landscape features such as trees, hedges, streams, rural buildings/structures.
Infrastructure: Airports, helipads and other aviation proposals.
Air Pollution: Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, pig & poultry units, slurry lagoons > 200m² & manure stores > 250t).
Combustion: General combustion processes >20MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.
Waste: Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill.
Composting: Any composting proposal with more than 500 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.

1. DOES PLANNING PROPOSAL FALL INTO ONE OR MORE OF THE CATEGORIES BELOW?
2. IF YES, CHECK THE CORRESPONDING DESCRIPTION(S) BELOW. LPA SHOULD CONSULT NATURAL ENGLAND ON LIKELY RISKS FROM THE FOLLOWING:
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Waste: Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill.
Composting: Any composting proposal with more than 75000 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.

1. DOES PLANNING PROPOSAL FALL INTO ONE OR MORE OF THE CATEGORIES BELOW?
2. IF YES, CHECK THE CORRESPONDING DESCRIPTION(S) BELOW. LPA SHOULD CONSULT NATURAL ENGLAND ON LIKELY RISKS FROM THE FOLLOWING:
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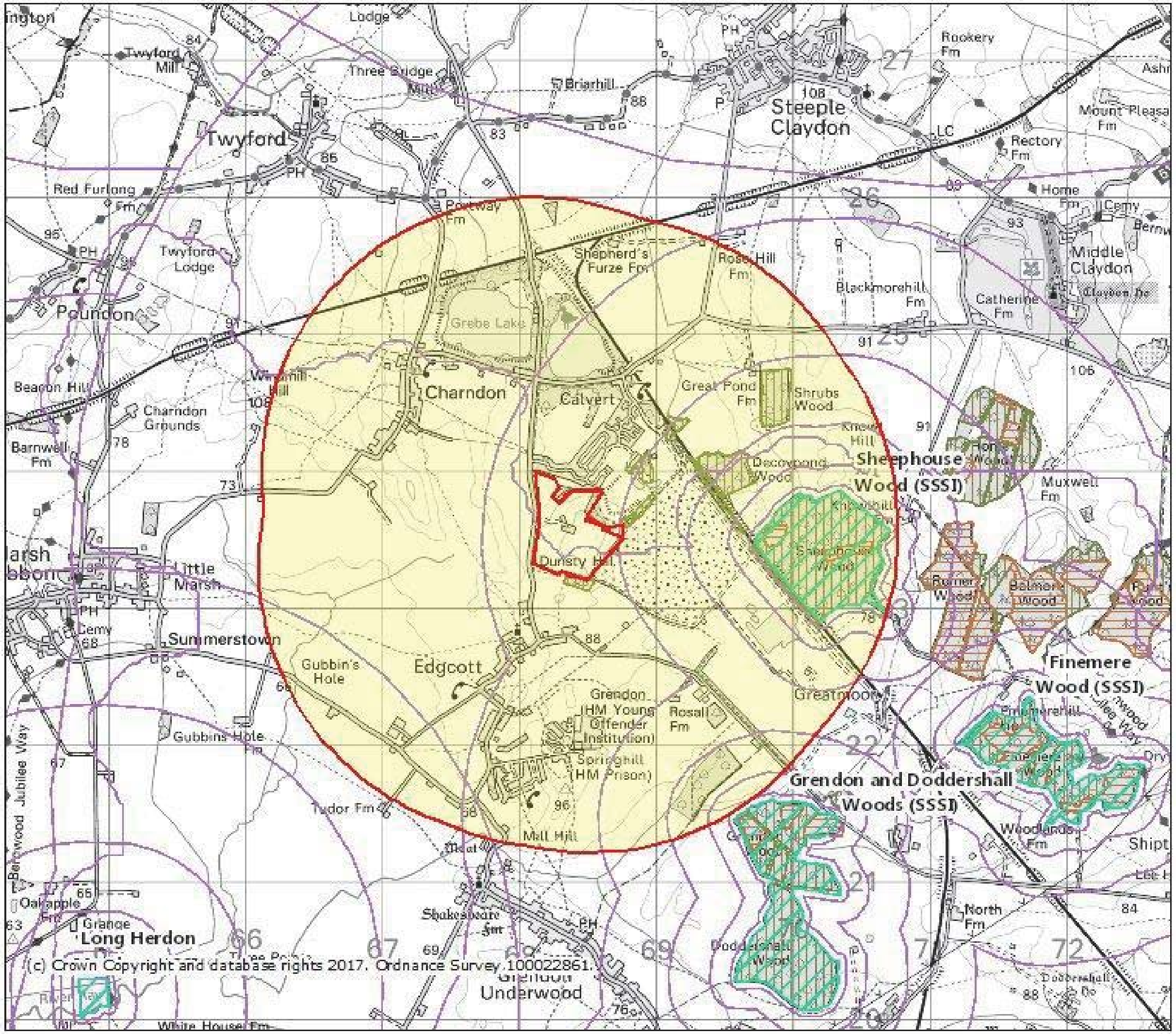
Combustion: General combustion processes >20MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.
Waste: Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill.
Composting: Any composting proposal with more than 75000 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.
Discharges: Any discharge of water or liquid waste of more than 20m³/day to ground (ie to seep away) or to surface water, such as a beck or stream (NB This does not include discharges to mains sewer which are unlikely to pose a risk at this location).

Notes
GUIDANCE – How to use the Impact Risk Zones
/Metadata_for_magic/SSSI IRZ User Guidance MAGIC.pdf

MAGIC

Dunsty Hill Farm - 2 km search



Legend

- Local Nature Reserves (England)
- National Nature Reserves (England)
- Sites of Special Scientific Interest (England)
- SSSI Impact Risk Zones - to assess planning applications for likely impacts on SSSIs/SACs/SPAs & Ramsar sites (England)

Ancient Woodland (England)

- Ancient and Semi-Natural Woodland
- Ancient Replanted Woodland

Projection = OSGB36
xmin = 457700
ymin = 218300
xmax = 479300
ymax = 229000
Map produced by MAGIC on 10 August, 2017.

APPENDIX 2

Overview of Relevant Species Specific Legislation

The reader should refer to the original legislation for the definitive interpretation.

Badger
Badgers and their setts are protected under the Protection of Badgers Act 1992. The Protection of Badgers Act 1992 is based primarily on the need to protect badgers from baiting and deliberate harm or injury, badgers are not protected for conservation reasons. The following are criminal offences:

- To intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it.
- To wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so.

A badger sett is defined in the legislation as *'Any structure or place that displays signs indicating current use by a badger'*. 'Current use' is not synonymous with current occupation and a sett is defined as such (and thus protected) as long as signs of current usage are present. Therefore, a sett is protected until such a time as the field signs deteriorate to such an extent that they no longer indicate 'current usage'.

Badger sett interference can result from a multitude of operations including excavation and coring, even if there is no direct damage to the sett, such as through the disturbance of badgers whilst occupying the sett. Any intentional or reckless work that results in the interference of badger setts is illegal without a licence from Natural England. In England, a licence must be obtained from Natural England before any interference with a badger sett occurs.

Bats
Bats and the places they use for shelter or protection (i.e. roosts) receive European protection under The Conservation of Habitats and Species Regulations 2017 (Habitats Regulations 2017). They receive further legal protection under the Wildlife and Countryside Act (WCA) 1981, as amended. This protection means that bats, and the places they use for shelter or protection, are capable of being a material consideration in the planning process.

Regulation 41 of the Habitats Regulations 2017, states that a person commits an offence if they:

- deliberately capture, injure or kill a bat;
- deliberately disturb bats; or
- damage or destroy a bat roost (breeding site or resting place).

Disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or in the case of animals of a hibernating or migratory species, to hibernate or migrate; or to affect significantly the local distribution or abundance of the species to which they belong.

It is an offence under the Habitats Regulations 2017 for any person to have in his possession or control, to transport, to sell or exchange or to offer for sale, any live or dead bats, part of a bat or anything derived from bats, which has been unlawfully taken from the wild.

Whilst broadly similar to the above legislation, the WCA 1981 (as amended) differs in the following ways:

- Section 9(1) of the WCA makes it an offence to *intentionally* kill, injure or take any protected species.
- Section 9(4)(a) of the WCA makes it an offence to *intentionally or recklessly** damage or destroy, *or obstruct access to*, any structure or place which a protected species uses for shelter or protection.
- Section 9(4)(b) of the WCA makes it an offence to *intentionally or recklessly** disturb any protected species *while it is occupying a structure or place which it uses for shelter or protection*.

*Reckless offences were added by the Countryside and Rights of Way (CRoW) Act 2000.

As bats re-use the same roosts (breeding site or resting place) after periods of vacancy, legal opinion is that roosts are protected whether or not bats are present.

The following bat species are Species of Principal Importance for Nature Conservation in England: Barbastelle Bat *Barbastella barbastellus*, Bechstein's Bat *Myotis bechsteinii*, Noctule Bat *Nyctalus noctula*, Soprano Pipistrelle *Pipistrellus pygmaeus*, Brown Long-eared Bat *Plecotus auritus*, Greater Horseshoe Bat *Rhinolophus ferrumequinum* and Lesser Horseshoe Bat *Rhinolophus hipposideros*.

Birds
The Conservation of Habitats and Species Regulations 2017 places a duty on public bodies to take measures to preserve, maintain and re-establish habitat for wild birds.

Nesting and nest building birds are protected under the Wildlife and Countryside Act WCA 1981 (as amended).

Subject to the provisions of the act, if any person intentionally:
- kills, injures or takes any wild bird;
- takes, damages or destroys the nest of any wild bird while that nest is in use or being built; or
- takes or destroys an egg of any wild bird, he shall be guilty of an offence.

Some species (listed in Schedule 1 of the WCA) are protected by special penalties. Subject to the provisions of the act, if any person intentionally or recklessly**:**
- disturbs any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; or
- disturbs dependent young of such a bird, he shall be guilty of an offence.

Several bird species are Species of Principal Importance for Nature Conservation in England, making them capable of being material considerations in the planning process.

Great crested newt
Great crested newts (GCN) and the places they use for shelter or protection receive European protection under The Conservation of Habitats and Species Regulations 2017, (Habitats Regulations 2017). They receive further legal protection under the Wildlife and Countryside Act (WCA) 1981, as amended. This protection means that GCN, and the places they use for shelter or protection, are capable of being a material consideration in the planning process.

Regulation 41 of the Habitats Regulations 2017, states that a person commits an offence if they:
- deliberately capture, injure or kill a GCN;
- deliberately disturb GCN;
- deliberately take or destroy eggs of a GCN; or
- damage or destroy a GCN breeding site or resting place.

Disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or in the case of animals of a hibernating or migratory species, to hibernate or migrate; or to affect significantly the local distribution or abundance of the species to which they belong.

It is an offence under the Habitats Regulations 2017 for any person to have in his possession or control, to transport, to sell or exchange or to offer for sale, any live or dead GCN, part of a GCN or anything derived from GCN, which has been unlawfully taken from the wild. This legislation applies to all life stages of GCN.

Whilst broadly similar to the above legislation, the WCA 1981 (as amended) differs in the following ways:
- Section 9(1) of the WCA makes it an offence to *intentionally* kill, injure or take any protected species.
- Section 9(4)(a) of the WCA makes it an offence to *intentionally or recklessly** damage or destroy, *or obstruct access to*, any structure or place which a protected species uses for shelter or protection.
- Section 9(4)(b) of the WCA makes it an offence to *intentionally or recklessly** disturb any protected species *while it is occupying a structure or place which it uses for shelter or protection*.

*Reckless offences were added by the Countryside and Rights of Way (CRoW) Act 2000.

Hedgehog
Hedgehogs receive some protection under Schedule 6 of the Wildlife and Countryside Act 1981 (as amended); this section of the Act lists animals which may not be killed or taken by certain methods, namely traps and nets, poisons, automatic weapons, electrical devices, smokes/gases and various others. Humane trapping for research purposes requires a licence.

Hedgehogs are a Species of Principal Importance for Nature Conservation in England and are thus capable of being material considerations in the planning process.

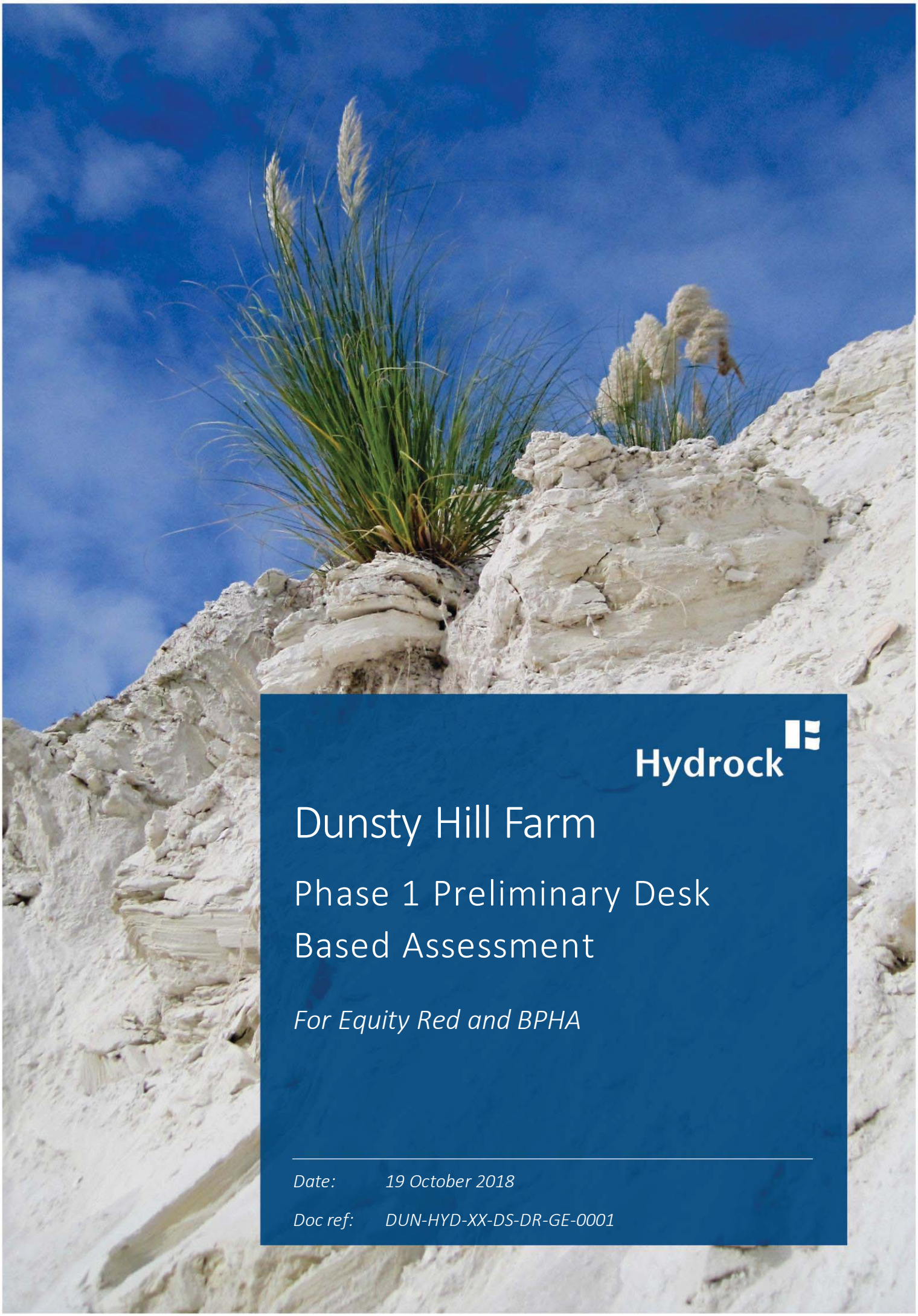
Reptiles
All of the UK's native reptiles are protected by law. The two rarest species – sand lizard (*Lacerta agilis*) and smooth snake (*Coronella austriaca*) – benefit from the greatest protection; however, these two species are not known to occur within Buckinghamshire. Common lizard (*Zootoca vivipara*), slow-worm (*Anguis fragilis*), adder (*Vipera berus*) and grass snake (*Natrix natrix*) are protected under the Wildlife and Countryside Act 1981 as amended from intentional killing or injuring.

In England and Wales, this Act has been amended by the Countryside and Rights of Way Act 2000 (CRoW), which adds an extra offence, makes species offences arrestable, increases the time limits for some prosecutions and increases penalties. The Natural Environment and Rural Communities (NERC) Act 2006 places a duty on Government Departments to have regard for the conservation of biodiversity and maintains lists of species and habitats which are of principal importance for the purposes of conserving biodiversity in England and Wales. All native reptile species are included on these lists.

This is a simplified description of the legislation. In particular, the offences mentioned here may be absolute, intentional, deliberate or reckless. Note that where it is predictable that reptiles are likely to be killed or injured by activities such as site clearance, this could legally constitute intentional killing or injuring.

APPENDIX 3
Confidential Badger Annex

Appendix 10.1: Phase 1 Preliminary Investigation Report



Hydrock

Dunsty Hill Farm

Phase 1 Preliminary Desk Based Assessment

For Equity Red and BPHA

Date: *19 October 2018*

Doc ref: *DUN-HYD-XX-DS-DR-GE-0001*

DOCUMENT CONTROL SHEET

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Project no.	C-09015-C	
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Hydrock Consultants Limited has prepared this report in accordance with the instructions of the above-named client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.

CONTENTS

Tables

Appendices

Executive Summary and Conceptual Site Model

SITE INFORMATION AND SETTING	
Report Purpose	Phase 1 desk study and preliminary risk assessment.
Client	Equity Red in association with BPHA
Site Name and Location	Dunsty Hill Farm, Edgcott Road, Calvert Green, Buckinghamshire OX27 0BJ. NGR 468488, 223640
Proposed Development	A predominately residential, mixed-use development, including commercial buildings, a healthcare facility, school and retirement village.
PHASE 1 (DESK STUDY + WALK-OVER)	
Current Land Use and Description	Largely agricultural in a rural area with some residential land immediately to the northwest. The site is currently farmland, with the associated farm house and buildings located in the centre of the site. Telegraph cables run across the fields, running northeast to southwest close to the buildings. An active landfill (Calvert Landfill Site) is situated next to the eastern site boundary.
Site History	The site has been occupied by agricultural land throughout recorded history. An active landfill exists adjacent to the eastern border of the site, which dates back to 1987. The area directly northeast of the site was previously occupied by Chardon Wood. Calvert Brick Works (now demolished) subsequently worked the area from the mid 1940's to 1990's during their clay quarrying operations. This previously worked land is now disused. Historic railways are seen on the historical maps at Calvert Brick Works.
Unexploded Ordnance	A non-specialist UXO assessment indicates low bomb risk. No further consideration of UXO is required, but may be prudent (e.g. a preliminary risk assessment in accordance with CIRIA Report C681, Chapter 5)
Geology	The available geological sources indicate the site to be underlain by the Oxford Clay Formation, with the Stewartby Member outcropping at the surface. The Weymouth Member outcrops in the east of the site. BGS borehole SP62SE/3 (NGR 468510, 223410) recorded the clay and shales of the Oxford Clay Formation and Kellaways Formation to 45m below ground level (bgl), superseded by the Great Oolite Series until termination at 70.1m bgl. A large area of Made Ground is seen off site (northeast) on the previously worked land associated with the historical brick works. Constituents observed in this material includes brick, wood, tiles, rubber tubes and plastic pipes.
Mining or Mineral Extraction	There is no evidence of mining within the site boundary, however, clay was quarried off site (directly northeast) and in the surrounding area for Calvert Brick Works. The large ponds on the neighbouring land are understood to be a product of the open cast mine.
Ground Stability	The Oxford Clay Formation is moderately susceptible to shrink/swell. Two areas with moderate potential of landsliding have been identified on site.
Hydrogeology	The Oxford Clay Formation is classified by the Environment Agency as unproductive strata. The site is not within a groundwater source protection zone.
Hydrology	Four small ponds exist on the farmland- three to the west and one near the centre of farmland. A drainage system is situated on the west of the site, running from the farmland to the Gubbinshole and Broadmoor Ditch. Three large, manmade ponds are located off site on the worked land (approximately 250m northeast). These large ponds are connected to a drainage system that travels southwards along the eastern site boundary towards the active Calvert Landfill Site (directly east). More ponded areas are seen at the boundary between the farmland, previously worked land and active landfill. Much of the flat areas of the site were boggy during the walkover survey conducted in March 2018.
Flood Risk	The site is in Flood Zone 1.
Waste Management	The active Calvert Landfill Site (non-hazardous) is located less than 10m to the east of the site. Three historic landfills exist to the north of the site:

and Hazardous Substances	• Calvert Landfill Site, Pit No. 1, operational from 1947 to 1991 (100m north). • Buckinghamshire Rural District Council Refuse Tip, operational from 1957 to an unknown date (680m north). • Aylesbury Borough Refuse Tip operational from 1963 to an unknown date (840m northeast). These are all listed as non-hazardous sites.
Previous Site Data	A historical Phase 1 Desk Study was undertaken by Wesson Environmental for an unnamed client in December 2014 to assess the potential risk to human health, controlled water receptors and the wider environment from the naturally occurring features and the past land use of the site. The data from this report, whilst useful as general site information, has not been considered further in this assessment.
Radon	No radon protective measures are necessary according to current guidance.
Natural Soil Chemistry (mg/kg)	As 15-25; Cd <1.8, Cr 90-120, Pb <100, Ni 30-45.
Geotechnical Hazards from Desk Study	• Shrink/swell of the clay geology. • Slope instability on the steeply dipping slopes. • Attack of buried concrete due to the pyrite in the Oxford Clay Formation.
Possible Contaminant Linkages of Moderate or Greater Risk Level - From Desk Study	The possible pollutant linkages on an un-remediated site determined by desk study and walk-over are summarised below for risk levels of moderate or greater.

Source(s)	◄ potential Impact on ►	Receptor(s)
Asbestos in the existing farm buildings.		Future occupiers Neighbours
Organic chemicals from activities on site (pesticides, hydrocarbon fuels from farm vehicles etc.)		Future occupiers Neighbours Surface water and aquatic life Plant life and ecosystems
Ground Gases from landfill and quarry backfill (directly east and north).		Future occupiers Neighbours Proposed buildings Ecosystems
Organic chemicals, particularly hydrocarbons, within the quarry backfill or from the historic landfills.		Future occupiers Neighbours Surface water and aquatic life Plant life and ecosystems
Metals and other in-organics within the quarry backfill/landfills.		Future occupiers Neighbours Surface water and aquatic life Plant life and ecosystems

ASSESSMENT AND CONCLUSIONS	
Conclusions	Based on historic land uses and its current operational use, the overall risk from land contamination at the site is considered to be moderate for a residential led re-developed site. The scale of the development however means that this potential risk is not consistent across the whole site and is focused on the areas formally worked and in close proximity to the current and historic landfills. In areas of the site not impacted by the worked areas and localised landfills, the risk from land contamination at the site is considered to be low for a residential led re-development. This would need to be confirmed by appropriate intrusive investigation, testing and assessment of the results of the investigation. It is considered that it is unlikely that the site would be classified as Contaminated Land under Part 2A of the EPA 1990. Based on the available desk study and walk-over information, the following geotechnical issues need to be addressed in an exploratory investigation: determine the depth of Made Ground in the northern part of the site; • Assess the risk from the offsite quarry backfill.

	• Assess the risk of slope failure across the site, particularly on the steep sided slopes to the north. • Assess the risk from landfill leachate and ground gas. • Assess the sulphate concentration with depth in the natural stratum (Oxford Clay).
FUTURE CONSIDERATIONS	
Uncertainties and Limitations	The risk of slope failure must be assessed on the steep slopes across site. Leachate and ground gas impact on the land is unknown. The effect of agrochemicals and farm-associated contamination on the land should be evaluated. The sulphate content is uncertain. Telegraph lines run across the site which may limit construction works.
Further Work	In order to confirm the actual risks to receptors and confirm the ground conditions with respect to potential geotechnical and geo-environmental risks, an appropriate intrusive investigation will need to be undertaken. Based on the current data, this site investigation should comprise: - The excavation of trial pits in strategic places across the site in order to collect samples for geotechnical and chemical analysis. Trench stability, over break potential and "diggability" can be assessed using the trial pits. Soil infiltration rate testing may be necessary to formulate drainage options following the sampling and logging. Dynamic Cone Penetration tests could be performed to correlate CBRs to aid in pavement design where necessary. - Cable percussive boreholes along the eastern and northern perimeter to allow the installation of gas and groundwater monitoring equipment. This will measure any leachate or ground gas flowing to the site from the backfilled area and landfill sites. Deeper soil samples can also be taken for geotechnical and chemical analysis. In situ SPT testing can be performed during the percussion drilling to derive the geotechnical parameters of the clay, which will aid in the foundation design process.

This Executive Summary forms part of Hydrock Consultants Limited document DUN-HYD-XX-DS-DR-GE-0001 and should not be used as a separate document

1. INTRODUCTION

1.1 Terms of reference

In January 2018, Hydrock Consultants Limited (Hydrock) was commissioned by Equity Red in association with BPHA (Equity Red) to undertake a desk study at Dunsty Hill Farm on Edgcott Road, Calvert Green, Buckinghamshire, OX27 0BJ. The approximate National Grid Reference is 468197E, 223354N.

The site covers approximately 31ha and is currently agricultural land, with associated farm buildings at the centre.

The proposed development is primarily residential, comprising 439 dwellings (flats and houses) ranging from 1-5 storeys high. These properties will be served by a healthcare facility, a school and a commercial development. An additional 120 residential units are planned, designed for the elderly. The remainder of the site will be landscaped, using both hard and soft designs.

A site location plan (Aerial Map with Site Location) and proposed development layout (Preliminary Proposal Masterplan Option 1, drawing number: SK05) is presented in Appendix A.

1.2 Objectives

The objectives of this assessment are to evaluate the readily available information on the likely ground conditions at the site. This will be used to produce a Preliminary Conceptual Ground Model, highlighting the geo-environmental site conditions and any potential risks to the proposed development. Findings from this study will then assist in the initial stages of planning and scheme development.

1.3 Scope

The scope of work for this commission comprises:

- a desk study and site walk-over reconnaissance to determine the nature of the site and its surroundings including the current and former land uses, geology, hydrogeology, hydrology and geo-environmental data.
- reporting on findings, including a Preliminary Conceptual Site Model identifying the potential pollutant linkages/any ground related constraints, and a qualitative risk assessment for the proposed development.

See Appendix E for detailed reporting methodology.

1.4 Provided information

The following has been provided to Hydrock by Equity Red for use in the preparation of this report:

- Ingleton Wood. 10th April 2018. "Preliminary Proposal Masterplan Option 1", drawing number SK05, client High Barrow Developments.
- "Aerial Map with Site Location" (unknown author and date).
- Wesson Environmental. December 2014. "Dunsty Hill Farm Phase 1 Site Investigation", project number 002CORE110.
- Ingleton Wood. 13th April 2017. "Redline Plan 13.04.17", job number 85252, drawing number 000, scale 1: 2500, client High Barrow Developments.

- Groundsure. 1st December 2014. "Historical Maps for Grid Reference 468125, 223600- Small Scale", report reference FND-1793253, maps 1882 (scale 1: 10,560), 1900 (scale 1: 10,560), 1923 (scale 1: 10,560), 1951 (scale 1: 10,560), 1957 (scale 1: 10,560), 1982 (scale 1: 10,000), 2002 (scale 1: 10,000), 2010 (scale 1: 10,000) and 2014 (scale 1: 10,000), client FIND.
- Groundsure. 28th November 2014. "Groundsure EnviroInsight for Dunsty Hill Farm, Charndon, Bicester, OX27 0BJ", reference FND-1783254, client FIND.
- Groundsure. 28th November 2014. "Groundsure GeoInsight for Dunsty Hill Farm, Charndon, Bicester, OX27 0BJ", reference FND-1793255, client FIND.
- Quod. 2017. "Dunsty Hill Farm: Briefing Note for RFP", project Q080165 - Dunsty Hill, Aylesbury.

1.5 Approach

The work has been carried out in general accordance with recognised best practice as detailed in guidance documents such as the CLR 11 Model Procedures (Environment Agency 2004). The technical details of the approach and the methodologies adopted are given in Appendix E.

A recognised phased approach has been followed and this Phase 1 desk study and walk-over provides a preliminary assessment of the site conditions and the important factors that may require further investigation to reduce uncertainty. Recommendations for further work are listed at the end.

2. PRELIMINARY INVESTIGATION (PHASE 1 STUDY)

A number of desk study sources have been used to assemble the following information, including a proprietary environmental data report which has been obtained for the site (dated 8th October 2018) and these are presented in Appendix D.

2.1 Site referencing

The site is referenced in Table 2.1.

Table 2.1: Site referencing information

Item	Brief Description
Site name	Dunsty Hill Farm
Site location and grid reference	Dunsty Hill Farm, Calvert Green, Buckinghamshire OX27 0BJ. Approximately 8km east of Bicester and 14km northwest of Aylesbury. Approximate National Grid Reference 468197E, 223354N.

A site location plan (Aerial Map with Site Location) and proposed development layout (Preliminary Proposal Masterplan Option 1, drawing number: SK05) is presented in Appendix A.

2.2 Site description and walk-over survey

A walk-over survey was undertaken on the 20th March 2018 to visually assess potential hazards and receptors. A basic site description is presented in Table 2.2 and selected walk-over photographs are presented in Appendix B.

Table 2.2: Site description

Item	Brief Description
Site access	Access to the main farm buildings via Perry Hill on the western boundary.
Site area	Approximately 31ha.
Present land use	The site is occupied by multiple agricultural fields. Farm buildings are present towards the centre, comprising a farmhouse and five outbuildings (Plate 1). Telegraph cables run across the fields, running northeast to southwest close to the buildings (Plate 7).
Elevation, topography and any geomorphic features	The site is on a hill which peaks towards the centre of the land. The farm buildings sit on top of a hill on a plateau approximately 103m above sea level. Ridge and furrow features can be seen on this plateau (Plate 2). The hill dips steeply towards the residential buildings to the north-northwest (Plate 3), gently to the west and south and has a slightly stepped slope to the east. Four small surface water features can be seen within the farmland area, three to the west and one next to the farm buildings.
Vegetation	Trees and hedgerows separate the individual fields within the farmland area. A couple of sporadic trees are also present within the field to the southeast. Woodland clusters border the site to the northwest, northeast and southeast.
General site sensitivity	The area is generally rural, with agricultural land dominating the region. A residential estate is adjacent to the northern site boundary. Ancient woodlands are recorded on site and within 250m of the site. Sheephouse Wood, around 700m east- southeast of the site, is a designated SSSI. The Upper Thames Tributaries, which lie approximately 1km to the southeast of the site, are designated as an environmentally sensitive area. Drainage systems on the site are within the Oxon Ray catchment, which eventually discharges to the River Thames. The site is recorded to be in a Nitrate Vulnerable Zone.

Item	Brief Description
Site boundaries and surrounding land	Hedgerows and trees mark the boundary of the site. Drainage channels were seen following these features. The southern site boundary backs directly onto farmland. The western site boundary is defined by Perry Hill road, which separates Dunsty Farm and more agricultural land. An unnamed track is present along the eastern site boundary. This leads to Brackley Lane to the north of the site. Calvert Landfill Site (Plate 7) is in operation directly east of the road, less than 10m away from the eastern site boundary. Woodland clusters are present along the northern site boundary. Beyond the vegetation is a housing estate to the northwest and an area of previously worked land northeast. A ponded area is present at the northeast boundary, in between the farmland and worked land. The worked land to the northeast has an uneven topography ranging from approximately 90-100m above sea level (Plate 4 and 5). Boggy areas occupied the lower regions of this area, dominated by tall, golden coloured reeds and grass (Plate 6 and 12). Three large surface water ponds (approximate surface area: eastern pond- 4,780m^2; western pond- 6,660m^2; smaller pond 970m^2) are located north of the uneven ground (Plate 6). Two large metal tanks (Plate 12) and a metal pipe (Plate 13) were noted on this land.

2.3 Site history

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

Table 2.3: Key features from historical mapping

Map Edition and Scale	Key Features on Site	Key Features off Site
1885 1: 10,560	Agricultural land divided into multiple fields. A farmhouse and associated buildings are present at the centre of the site. A small road runs east to west, connecting the buildings to the unnamed road on the western site boundary. Four small ponds are seen on the farmland (two near the farmhouse and two to the south).	The site is directly surrounded by farmland. A small woodland cluster is present to the southwest, along the southern site boundary. Charndon Wood is present to the northeast and east of the site. This meets the site boundary in a small area to the northeast. The residential area of Edgcott is 500m south.
1900 1: 10,560	The road running along the western site boundary is labelled Perry Hill.	The Great Central Railway line has been constructed directly to the northeast (less than 750m away), running northwest to southeast.
1951 1: 10,560 1958- 1: 10,560	No significant change.	Calvert Brick Works has been constructed next to the northern site boundary. The brick works is connected to the main railway line by a small tramway. Three clay pits are present: 100m north (approximate area 150,000m^2); 700m north (approximate area 200,000m^2); and 850m northwest (full extent not shown). The pits are connected to the brick works via a tramline running almost parallel to the existing railway.
1978 1: 2,500	No significant change.	Part of the clay pit to the north is being used as a refuse tip.
1982 1: 10,000	An additional building has been added to the northwest of the farmhouse. Water	The brick works has expanded. A new clay pit has been opened directly to the east of the site boundary. The two

Map Edition and Scale	Key Features on Site	Key Features off Site
	drainage channels are mapped running across the site from the centre of the farmland to Perry Hill.	northernmost clay pits in the north have been infilled with water and are now labelled as Grebe Lake (NW) and a nature reserve (N). The closest northern pit has been infilled with solid material. The area to the east previously occupied by Charndon Woods is now being quarried. A track surrounds the "worked" area.
2002 1: 10,000	No significant change.	The brick works has been demolished. The area is now listed as disused workings. A landfill site occupies the old claypit directly east of the site. Three large ponds are present to the northeast on the area of disused workings (less than 500m away). A drainage channel connects these features then runs along the eastern boundary. The channel eventually runs west into newly constructed ponds to the east and south of the landfill.
2010 1: 10,000	No significant change.	The ponds to the eastern side of the landfill site are no longer mapped. A new housing estate has been built on top of the old brick works where the disused workings were listed (less than 10m north).
2014 1: 10,000	No significant change.	No significant change.

In addition to the Ordnance Survey mapping, aerial photography was used to fill gaps within the timescale. The images were located on Google Earth.

Table 2.4: Key features from aerial mapping

Photograph	Key Features on Site	Key Features off Site
December 1945	Farmland covers the site. Farm buildings are present in the centre of the fields.	Calvert Brick Works can be seen on the map, along with a clay pit to the north. Woodland occupies the north-eastern area.
December 2003	No significant change.	A large proportion of the housing estate to the north has been constructed, with some building still under construction. A barren area of worked land is present to the northeast. Surface water ponds occupy part of this land. The landfill to the east is operational. Lakes are present where the old coal pits used to be in the north.

In summary, the maps, photographs and walkover reconnaissance indicate that the site and the land to the west and south has remained agricultural land throughout recent history.

Contrastingly, the land directly to the north of the site has been altered. This area, which was previously part of Charndon Woods, was deforested and worked to accommodate clay extraction. The clay mining operation was associated with Calvert Brick Works, which occupied the neighbouring land from the mid 1940's to the 1990's. It is believed these former clay pits were backfilled with unknown material.

The area to the east of the site was also mined for clay. Clay excavation continued until the decommissioning of the brickworks in the 1980's. In 1987, permission was granted to fill the open pit

with refuse, following the same procedure executed on similar pits just to the north. The landfilling of the pit to the east is still in progress, operating under the management of FCC Environment.

2.4 Unexploded ordnance/bombs

In general accordance with CIRIA Report C681 (Stone et al 2009) non-specialist UXO screening exercise has been carried out for the site. There is no indication of former military use from the desk study. Screening against the Zetica regional bomb risk map (Buckinghamshire) indicates the site to be in an area where the bomb risk is low. A copy of the Zetica map is presented in Appendix D.

Since the available records of aerial bombing are interpreted by Zetica as low bomb risk, this suggests no further consideration of UXO is required. If undertaken, any further consideration should start with a preliminary risk assessment in accordance with CIRIA Report C681, Chapter 5.

2.5 Geology

The general geology of the site area is shown on the British Geological Survey (BGS) 1:50,000 geological map of Buckingham (Sheet 219) and is summarised in Table 2.5

Table 2.5: Geology

Location	Age	Stratigraphic Name	Description
On site (at the surface)	Middle Jurassic	Stewartby Member (Oxford Clay Formation)	Prodeominately pale to medium grey, variably silty, calcareous mudstones that are commonly smooth and poorly fossiliferous. Subordinate beds of silty mudstones with immature bivalve shells. Thin calcareous siltstones in the upper parts, potentially containing pyritised ammonite fossils. Calcareous material may dissolve when weathered. Pyritic components may create sulphuric conditions when weathered.
On site (at depth)	Middle Jurassic	Peterborough Member (Oxford Clay Formation)	Mostly brownish-grey, fissile, bituminous mudstones containing shelly fauna. Subordinate beds of pale to medium grey blocky mudstone. Several bands of cementstone nodules. Basal beds commonly silty and shell rich. Calcareous material may dissolve when weathered.
On site (the surface towards the east and at depth)	Upper Jurassic	Weymouth Member (Oxford Clay Formation)	Pale grey, blocky, smooth, calcareous mudstones that are very slightly silty. Thin, dark grey, carboniferous beds with interburrowing at intervals. Thin calcareous siltstones may occur. Poorly fossiliferous, however, ammonite fauna may be pyritised. Calcareous material may dissolve when weathered. Pyritic components may create sulphuric conditions when weathered.

Made Ground is anticipated on the previously worked area directly northeast of the site. This is believed to have been backfilled by the historic brick works. Bricks, wood, rock, rubber and plastic fragments were observed in yellow clay material during the walkover survey (Plate 8). The clay seen at the surface could be described as soft and saturated.

2.6 Mining or mineral extraction

Mining is not believed to have occurred on site, however, the Oxford Clay Formation has been quarried extensively in the surrounding area. This material was used for brick manufacture at the neighbouring Calvert Brick Works. Whilst the brick works is no longer operational, the area directly east of the site is still being actively backfilled as part of the Calvert Landfill.

In the environmental report, the large surface water ponds in the disused area (approximately 250m northeast) are listed as "voids" in the geology section. They are described as worked ground, clarifying that they are a product of the open cast clay mining operation that occurred historically.

2.7 Ground stability

The whole site is underlain by the Oxford Clay Formation, which is at moderate risk of shrink-swell. Expert advice should be requested before the removal of vegetation on site.

A moderate landslide risk has been identified in two areas on site. These are associated with the steep slopes to the north of the site.

2.8 Hydrogeology

The aquifer designations given in Table 2.6 are based on the Environment Agency interactive aquifer designation map.

Table 2.6: Hydraulic characteristics of strata

Stratum	Aquifer Designation	Hydraulic Characteristics
Oxford Clay Formation	Unproductive Strata	Dominated by low permeability clay. The significance of water supply within this stratum is negligible.

Due to the bedrocks incapacity to store or transmit significant volumes of water, the geology is unlikely to contribute to the migration of any contaminants potentially existing on the land.

The Unproductive Strata retains negligible volumes of water, therefore is not placed within a groundwater Source Protection Zone (SPZ) and is not subjected to licensed groundwater abstraction within 1000m of the site. The soil leaching potential has not been assessed by the Environment Agency.

2.9 Hydrology and flooding

The surface water features in the vicinity of the site are listed inTable 2.7.

Table 2.7: Surface water features

Feature	Location Relative to Site
Four small ponds	On site (three to the west and one near the centre of farmland). The largest of these ponds has a surface area of approximately 320m^2.
Ponded area	On site (east, at the boundary between the farmland, disused land and active landfill). This is seen as four ponds on aerial imagery, but during the walkover survey one large pond existed, overflowing into the farmland and wooded area.
Three large ponds	Approximately 250 northeast on the worked land. The eastern pond is approximately 4,780m^2, the western pond 6,660m^2 and the smaller western pond 970m^2.
Lake/reservoirs	To the north (700m, 850m, 1000m) and to the southeast (1500m).
Drainage systems	On site, heading from the farmland towards Perry Hill. On site, connecting the three large ponds before heading southeast then west towards Calvert Landfill Site, following the sites eastern border. On site, channelling water from the farmland to the reservoirs in the far north. On site, channelling water from the farmland to the drainage along Perry Hill to the west. Approximately 800m northeast of the northern boundary (across the railway track). This drains into the Padbury Brook Catchment and eventually the River Ouse. 600m west of the site boundary, taking water from the north and channelling it westwards along the Gubbinshole Ditch towards the River Ray.

The surface water features were at capacity during the walkover study, some of them overflowing onto the surrounding land (Plate 9). The water within them was still and in some areas gave a stagnant odour. Drainage channels were generally less than a metre wide, with a varying depth from around 10-40cm in most places. Waste; including bricks, plastic and metal; was seen at the bottom of the shallow channels.

An extensive bright green sheen was seen in the long channel running along the north-northwest site boundary. This green sheen was also seen across the two of the large ponds on the neighbouring worked area (Plate 6). The channels to the east and north had an orange sheen, which seemed to stain the leaves floating in the water (Plate 10). The same orange sheen was seen in the ponded area to the east. The smallest of the three large ponds did not have a sheen. This water was dark, and the base of the pond could not be seen, suggesting a deep feature with steep bank sides. A green algal bloom is seen in a small area of the northern channel (Plate 11).

There are no active surface water abstraction licenses recorded within 2000m of the site. There is no available water quality data on this area.

The desk study information indicates the proposed development is in Flood Zone 1 (with low probability of flooding) and the area is greater than 1 ha so consultation with the Environment Agency is required with a Flood Risk Assessment (FRA). As drainage channels currently exist on site, it is likely that surface water runoff is an issue in the area.

The environmental data report indicates a high risk of groundwater flooding within the superficial deposits of the area. This is a direct effect of the poor permeability of the underlying geology. Oversaturation of the superficial deposits will therefore result in runoff.

Runoff from the site will likely flow in a multitude of directions due to the topography of the site. Excess water on the farmland is likely to travel downhill from the crest near the farm house to the drainage channels along the northwest, south and east boundary. It may also fill the small ponds situated on the farmland or flow to the fields at the southern border.

The Made Ground directly northeast of the site likely has a varying permeability. Water may be held within this material, rather than flowing overland as runoff, creating small, perched groundwater bodies. However, when saturated or in areas of low permeability, ponding may occur, aided by the uneven topography of the area. This was seen in the walkover survey, as low lying or flat areas were boggy and flooded.

Some runoff water around the disused Made Ground may be directed to the three ponds that occupy the worked area. This flow would then filter into the drainage system that runs along the eastern boundary and towards the landfill site.

Drainage should be assessed prior to construction, as alterations to the drainage system may cause hazards downstream. Sediment-rich water from the construction process should be considered within this evaluation, as the over-silting of small drainage channels increase the risk of localised flooding.

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

2.10 Waste management and hazardous substances

There are four waste management sites recorded within 250m of the site, as listed in Table 2.8.

Table 2.8: Waste management sites

Site Name and Location	Details
Calvert Landfill Site (including Pits 4, 5 and 6), Brackley Lane, Calvert, Buckinghamshire, MK18 2HF. Less than 10m to the east of the site.	Status: Open. Operational dates: 1955 to present. Size: large, accepting 65,000t per month. Wastes accepted: non-hazardous waste, including household waste, local industrial and commercial waste, transfer station waste, soils and other cover material. Prohibited wastes: hazardous waste and biodegradable products, including whole tyres, liquid waste, chemical waste such as laboratory waste, animal flesh, foodstuffs, liquids and sludges, paper, plasterboard/plaster, sawdust, textiles, vegetable matter, or any waste likely to form polluting leachate.
Calvert Pit No. 1, Werner Terrace, Calvert, Buckingham, MK18 2HQ. Around 100m to the north of the site.	Status: Closed. Pit 1 operational from 1947 to 1991. Operational dates: 1955 to present. Size: large, accepting 65,000t per month. Wastes accepted: non-hazardous waste, including household waste, local industrial and commercial waste, transfer station waste, soils and other cover material. Prohibited wastes: not recorded.
Buckinghamshire Rural District Council Refuse Tip, Werner Terrace, Calvert, Buckingham, MK18 2HQ. Around 680m north of the site.	Status: Closed. Operational dates: 1957 - unknown. Wastes accepted: industrial and commercial waste, excluding waste from mines, quarries and agriculture. Prohibited wastes: not recorded.
Aylesbury Borough Refuse Tip, School Hill, Bicester Buckinghamshire, OX27 0BQ. Around 840m north-northeast of the site.	Status: Closed. Operational dates: 1963 - unknown. Wastes accepted: commercial waste, excluding household waste and industrial waste. Prohibited wastes: not recorded.

Though the worked area to the northeast of the site is not recorded as a known historic landfill, there is still evidence suggesting waste was used to backfill the quarried ground. The steep hillside is described as Made Ground in the environmental report. This was confirmed in the walkover inspection. Along with the overgrown piles of potential waste material, two large tanks were also noted (see Plate 12). A much smaller drum was also seen just to the north of the disused land (Plate 11). A metal pipe was seen sticking out of the ground on top of one of the potential waste mounds (Plate 13).

There are no records relating to the storage of radioactive materials within 500m of the site.

There are no records of prosecutions relating to authorised processes in the vicinity of the site.

There is no Local Authority Pollution Prevention and Controls, COMAH sites, NIHHS sites, or Planning Hazardous Substance consents or enforcements within 500m of the site.

There are a number of industrial processes operating in the surrounding area, including Calvert Landfill Site. However, as long as these have been operated in accordance with any applicable permit, no impact on the site is envisaged.

2.11 Previous evidence of known contamination events

There are a number of recorded incidents regarding environmental effects of the nearby Calvert Landfill. These are largely related to landfill odour.

Red List Discharge Consents were given to the Calvert Landfill Site in May 1992. This allowed the discharge of potentially harmful process effluent into the Padbury Brook Catchment. This water system eventually drains into the River Ouse.

The landfill also held licensed discharge consents to release fluid into the tributary Claydon Brook. From 1985 to mid-2005, the landfill discharged process effluent into the system. Unspecified trade discharges entered the system between 1985 to 1992.

Charndon Sewage Works, to the northwest, discharged sewage into the Gubbinshole Ditch under a license from late-1989 to 1997.

2.12 Natural soil chemistry

Information contained within the environmental data report (Appendix D) gives indicative natural concentration values (estimated) for the natural soils at the site for a selection of Contaminants of Potential Concern (CoPC). These have been reproduced in Table 2.9 below.

Table 2.9: Natural soil chemistry

Element	Arsenic	Cadmium	Chromium	Lead	Nickel
Concentration (mg/kg)	15 - 25	<1.8	90 - 120	<100	30 - 45

2.13 Radon

The radon risk has been assessed in the environmental data report. This indicates that the site is not in a Radon Affected Area and no radon protection measures are required.

2.14 BGS Borehole Archive

A borehole log from the BGS archive have been reviewed and indicate the following.

SP62SE/3, located at Dunsty Hill Farm (NGR 468510, 223410), drilled to a depth of 70.1m, recorded clay from the surface to approximately 24m below ground level (bgl), shale from 24m bgl to 45m bgl with some sandy horizons, the Cornbrash Formation (upper horizon of the Great Oolite Series) from 45m bgl to 63m bgl, the Stonesfield Formation from 63m bgl to 70m bgl and lias to the end of the hole at 70.1m bgl.

The clays and shales belong to the Oxford Clay Formation and the Kellaways Formation. The Great Oolite Group underlies these stratums. Its upper horizon is marked by the Cornbrash Formation, which is seen 45m bgl.

2.15 Previous Site Investigations or Other Reports

The following previous Phase 1 Desk Study investigation has been undertaken at the site and the main findings are summarised in Table 2.10. Reference to this report should be made if further information is required.

Table 2.10: Summary of previous reports

2.15.1 Suitability of Previous Data

Findings

Wesson Environmental. December 2014. Dunsty Hill Farm, Phase 1 Site Investigation. Project No. 002CORE110.

Ground conditions predicted:

- Artificial/Made Ground outside of the site boundaries to the east and north. The closest is recorded 4m north of the site and is described as landscaped ground.
- Alluvium consisting of clay, silt, sand and gravel to the west of the site.
- Stewartby Member (mudstone) likely underlies the majority of the site.
- Peterborough Member (mudstone) likely underlies part of the west.
- Weymouth Member (mudstone) likely underlies part of the southeast.
- The superficial deposits are a Secondary A aquifer.
- The bedrock is classified as Unproductive Strata.
- A detailed river network lies within 500m of the site. 14 smaller surface water features are within 250m of the site, 5 of which are inside the site boundary.
- Identified potential or actual contaminant linkages:

Potential sources of contamination include:

1. Heavy metals, associated with pesticides, fertilisers, agrochemicals, manure, sewage sludge etc.
2. Arsenic and lead compounds, associated with pesticides used in orchards.
3. Organic contaminants, associated with pesticides and petroleum hydrocarbons.

These contaminants may be encountered via soil ingestion (including the consumption of home grown produce), dermal contact and from the inhalation of soil in the form of dust.

Humans, controlled water and the wider environment were designated receptors in this study.

Conclusions/Recommendations:

The desk study indicated that there was a moderate likelihood of a pollutant linkage arising. This was due to the low hydraulic conductivity of the underlying mudstone underlying the entire site. Any potential linkage would affect only the shallow alluvium soils in a limited area of the site. Contamination from sources outside of the working farm could not be ruled out. Further investigation was recommended, especially if the sites use changes.

The data from this report, whilst useful as general site data, is not considered suitable for inclusion in this assessment. The northern branch of the site is not included in this study, therefore does not take into consideration the hazards associated with the disused brick works and the potential waste heaps. The evaluation only deliberates the sites current use as agricultural land and does not make comment on the effects of developing the area for residential use. Further investigation and detail is still required to assess the potential for contaminant linkages across the entire site with reference to the proposed development.

3. PRELIMINARY CONCEPTUAL SITE MODEL

3.1 Geo-environmental exposure model

The preliminary exposure model is used for geo-environmental hazard identification and establishing potential contaminant linkages based on the contaminant-pathway-receptor approach.

3.1.1 Potential Contaminants

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

Potential On-Site Sources of Contamination

- Agrochemicals used on the farmland, likely containing nitrates, heavy metals and harmful organic compounds.
- Manure and sewage waste from the farm may contain metals.
- Asbestos in the farm buildings.

Potential Off-Site Sources of Contamination

- Quarry backfill on the worked land directly northeast of the site, possibly including elevated metals, metalloids, asbestos, polycyclic aromatic hydrocarbons (PAH compounds - often associated with coals, tars and burning fossil fuels) and petroleum hydrocarbons.
- Whilst worked area to the north has not been labelled a refuse site, landfill waste may have been used to infill the area. This could include household, commercial and industrial waste. Metals, metalloids and asbestos may be present.
- Hydrocarbon fuels, lubricant and chlorinated solvents associated with the neighbouring brick works (bitumen, coal) historic railways (creosote) and farmyard vehicles (petroleum hydrocarbons).
- Ground gases (gases carbon dioxide and methane) from organic materials potentially present in the worked area to the northeast.
- Landfill leachate and ground gas from Calvert Landfill Site, which is located less than 10m away from the east boundary of the site. Contamination from the landfill would be associated with carbon dioxide, methane gas and dissolved solids such as: organics, salts, heavy metals, chlorides, ammonia and sulphates.
- Landfill leachate and ground gas from the historic landfills to the north. Waste in these landfills was likely unregulated, meaning hazardous waste may have been buried there. Contamination form this site could therefore include components such as asbestos, chemical waste and organic material not permitted on a modern site. Carbon dioxide, methane gas and dissolved solids are again likely to be present.
- Sewage from the nearby sewage works in Charndon, potentially including metals, organic pollutants and pathogens.

3.1.2 Potential Receptors

- Humans (neighbours, site end users).
- Development end use (buildings, utilities and landscaping).

- Surface water: ponds on the farmland, large ponds on the worked land, on-site drainage ditches and the catchments they feed.
- Agricultural land to the west and south.
- Ecology: any ecosystems and aquatic ecosystems and within the surrounding farmland and drainage basins.

It should be noted that health and safety risks to site contractors and maintenance workers have not been assessed during these works and will need to be considered separately.

3.1.3 *Potential Pathways*

- Humans: ingestion of contaminated material, soil or water.
- Humans: direct skin contact with contaminated substance, soil or water.
- Humans: inhalation of dust.
- Humans: inhalation of contaminated outdoor air following the migration of the substance through the soil/made ground.
- Humans: inhalation of contaminated indoor air following the migration of the substance through the building materials.
- Buildings: direct contact with substances deleterious to building materials, particularly sulphur and organic chemicals.
- Buildings: methane ingress via permeable soils and/or construction gaps.
- Plant life: root uptake.
- Plant uptake: methane ingress to the root zone from the landfill site.
- Surface water: overland flow.
- Surface water: drainage discharge.
- Perched groundwater in Made Ground: groundwater flooding.

3.1.4 *Summary of Potential Contaminant Linkages*

Table 3.1 lists the plausible contaminant linkages which have been identified. These are considered as potentially unacceptable risks in line with guidelines published in CLR 11 and additional risk assessment is required.

Linkages has been assessed in general accordance with guidance in CIRIA Report C552 (Rudland et al 2001) but with the addition of a 'no linkage' category. More details are given in Appendix E including descriptions of typical examples of probability and consequences.

It should be noted that whilst the risk assessment process undertaken in this report may identify potential risks to site demolition and redevelopment workers, consideration of occupational health and safety issues is beyond the scope of this report and need to be considered separately in the Construction Phase Health and Safety Plan.

Table 3.1: Exposure model – preliminary risk assessment of source-pathway-receptor contaminant linkages

Source(s)	Possible Pathway(s)	Receptor(s)	Probability	Consequence	Risk Level	Comments
On site sources:						
Nitrates associated with agrochemicals in the surface water and soil.	Runoff of contaminated surface water.	Aquatic ecosystems	Likely	Mild	Low	Nitrate rich water may migrate in surface water runoff, causing algal blooms and anaerobic conditions downstream.
Asbestos or asbestos-containing-materials in the old buildings.	Inhalation of dust.	Site end users	Likely	Severe	High	Asbestos fibres have the potential to be disturbed during demolition. An asbestos survey may be required prior to demolition. If found, specialist removal will be necessary.
		Neighbours	Low likelihood	Severe	Moderate	
Organic chemicals (including hydrocarbon fuels, PAH compounds, etc.) on the farmland from pesticides and/or from the vehicles used on site.	Inhalation of vapours in outdoor and indoor air.	Site end users	Likely	Medium	Moderate	Vapours could migrate through pore space within the Made Ground into the outdoor air. They may also migrate through cracks in building materials into the indoor air.
		Neighbours				
	Ingestion. Direct contact.	Site end users	Likely	Medium	Moderate	Organic chemicals may migrate into garden and landscaping soil, making them accessible to site end users. If found in concentrations exceeding threshold values, contaminated soil may need to be removed or capped with a protective geotextile membrane to break the pollutant linkage.
		Plastic building materials (degradation)	Likely	Mild	Low	Plastic underground services emplaced in contaminated soil may degrade. Alternative materials or design alterations may need to be considered if high concentrations of organic chemicals are found.
	Plant uptake. Crop uptake.	Landscaping	Likely	Minor	Very low	Organic chemicals may leach into the garden and landscaping soil in the proposed development. Clean cover topsoil may be required to prevent contact.
		Ecosystems	Likely	Medium	Moderate	
	Runoff of contaminated surface water.	Consumers of the produce from neighbouring farms.	Likely	Medium	Moderate	Organic chemicals may have the potential to migrate into local aquatic ecosystems and the surrounding fields. Capping or removing contaminated material may prevent transport of toxins via runoff.
		Aquatic ecosystems	Likely	Mild	Low	
		Non-classified drainage systems				

Source(s)	Possible Pathway(s)	Receptor(s)	Probability	Consequence	Risk Level	Comments
Sulphates present in the pyritic Oxford Clay.	Direct contact with dissolved sulphates.	Buried concrete	Likely	Mild.	Low	Foundations constructed in sulphate-rich conditions may become damaged. Resistant concrete should be considered for these conditions.
Off-site sources:						
Metals and metalloids from the quarry backfill and landfills.	Ingestion. Direct contact. Inhalation	Site end users	Low likelihood	Medium	Low	The landfills and backfilled area lie downgradient of the site. The underlying low permeability Oxford Clay will also limit the potential for migration through groundwater processes.
		Neighbours				
	Plant uptake. Crop uptake.	Landscaping	Low likelihood	Minor	Very low	
		Ecosystems	Likely	Medium	Moderate	Surface water runoff has the potential to transport contaminants into local aquatic ecosystems. Further assessment and investigation is necessary to confirm the potential pollutant linkage.
		Consumers of the produce from neighbouring farms.	Likely	Medium	Moderate	
	Runoff of contaminated surface water.	Aquatic ecosystems	Likely	Medium	Moderate	
		Non-classified drainage systems	Likely	Mild	Low	
Organic chemicals (including hydrocarbon fuels, PAH compounds, etc.) in the quarry backfill and landfills.	Inhalation of vapours in outdoor and indoor air.	Site end users	Low likelihood	Medium	Low	Vapours could migrate through pore space within the Made Ground into the outdoor air. Vapour concentrations will dissipate whilst migrating, and are unlikely to be great enough to affect the site and neighbours.
		Neighbours				
	Ingestion. Direct contact.	Site end users	Unlikely	Medium	Moderate	Organic chemicals are unlikely to reach the soils on site as the features are downhill and the natural geology has a low permeability. Contaminants will therefore not migrate to the site via surface water runoff or via groundwater processes. However, they may migrate via runoff to the surrounding land, affecting local ecosystems.
		Plastic building materials (degradation)	Unlikely	Mild	Very low	
	Plant uptake. Crop uptake.	Landscaping	Unlikely	Minor	Very low	
	Runoff of contaminated surface water.	Aquatic ecosystems	Likely	Mild	Low	
		Non-classified drainage systems				

Source(s)	Possible Pathway(s)	Receptor(s)	Probability	Consequence	Risk Level	Comments
Elevated concentrations of ground gases (methane & carbon dioxide) from any biodegradable matter in the backfill material, operational Calvert Landfill Site and historic landfills.	Inhalation of gas in outdoor and indoor air.	Site end users Neighbours	Low likelihood	Severe	Moderate	Ground gas has the potential to migrate through the Made Ground into the outdoor air. It may also migrate through building materials and into the indoor air, however, the low permeability of the clay geology will limit migration through the soil to the site. Further assessment and investigation is necessary to confirm the potential for gas migration and accumulation.
	Ingress to plant roots.	Landscaping	Low likelihood	Minor	Low risk	The low permeability of the surrounding geology should minimise migration of ground gas to the site from the neighbouring features.
		Ecosystem	Low likelihood.	Severe	Moderate risk	

3.2 Geotechnical hazard identification

Potential geotechnical hazards based on the expected ground conditions are listed below.

- Attack of buried concrete by aggressive ground conditions – the Oxford Clay Formation may contain pyritic constituents.
- Shrink / swell of clay – settlement / heave of foundations when located within the influence of trees and vegetation.
- Slope instability - landslide risk has been identified on the steep slopes on site. Typical instability is caused by inappropriate cutting at the toe or loading at the crest of marginally stable slopes or re-activation of relict slip surfaces.

4. DESK STUDY CONCLUSIONS

Table 4.1 is a summary of the geo-environmental risks identified and the overall risk associated with the site has been designated using qualitative judgement according to the risk categories given in Table 4.1.

Based on historic land uses and its current operational use, the overall risk from land contamination at the site is considered to be moderate low for the proposed development if the correct remedial solutions are not in place. However, this is based mainly on predictions. Contaminant linkages would need to be identified in the field to confirm this, using the appropriate intrusive investigation, testing and assessment of the results of the investigation.

It is considered that it is unlikely that the site would be classified as Contaminated Land under Part 2A of the EPA 1990 as there is not significant potential for significant harm. However, contamination is likely to exceed the Generic Assessment Criteria (GAC), meaning remediation will be required for redevelopment.

Table 4.1: Assessed overall risk categories for the site from land contamination

Risk Category	Definition
Very High Risk	A significant contaminant linkage, including actual evidence of significant harm or significant possibility and significant harm, is clearly identifiable at the site (e.g. from visual or documentary evidence) under current conditions, with potential for legal and/or financial consequences for the site owner or other Responsible Person. Remediation advisable based on acute impacts being likely. Immediate action should be considered.
High Risk	A contaminant linkage is identifiable at the site under current and future use conditions. Although likely, there is no obvious actual evidence of significant harm or significant possibility and significant harm under current conditions. Extent of risk is therefore subject to confirmation by investigation and risk assessment and most likely to be deemed significant. Realisation of the risk is likely to present a substantial liability to the site owner or other Responsible Person. Remediation required for redevelopment and may also be required under Part 2A for existing receptors.
Moderate Risk	A contaminant linkage is identifiable at the site under current and future use conditions. However, it is not likely to be a significant linkage under current conditions. It is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Actual extent of risk subject to confirmation by additional investigation and risk assessment and most likely to lie between no possibility of harm (under current conditions) and significant possibility of significant harm (under conditions created by new use). Remediation may be required for redevelopment.
Low Risk	Potential pathways and receptors exist but history of contaminative use or site conditions indicates that contamination is likely to be of limited extent and below the level of possibility of harm. It is unlikely that the site owner or other Responsible Person would face substantial liabilities from such a risk. Precautionary investigations and risk assessment advisable on change of use. Any subsequent remedial works are likely to be relatively limited.
Very Low Risk	No contaminant linkage likely to exist under current or future conditions, but this cannot be completely discounted. If harm is realised, it is likely at worst to be mild or minor. Site not capable of being determined under Part 2A where the Local Authority inspects the site. Precautionary investigations and risk assessment advisable on change of use. Otherwise no further action recommended.
No Risk	No contaminant linkage exists.

5. UNRESOLVED ISSUES, UNCERTAINTIES AND LIMITATIONS

5.1 Site-specific comments

The Phase 1 investigation has highlighted a number of issues that require intrusive investigation and assessment to inform the design of the proposed development.

The telegraph line that cross the site may hinder the construction process. The relevant authority must be contacted prior to any work surrounding the lines to minimise damage.

The working farm that occupies the site may have contaminated the land by using agrochemicals, manure and hydrocarbon fuelled vehicles on the land. These substances could have contaminated the shallow soil, which harm the site end users and local ecosystems if left in place. The constituents of the soil across site should therefore be analysed prior to development.

The Oxford Clay Formation may contain elements of pyrite, which can produce sulphate-rich soil conditions. This can attack buried concrete structures, resulting in foundation failure. The composition of the bedrock must be confirmed to prevent damage to the proposed buildings. Options for alternative building materials can then be discussed if necessary.

In the Preliminary Conceptual Model, the potential for migration of leachate and ground gas from historic landfill sites and the operational Calvert Landfill Site has been generally classified as low risk (see Section 3.2.4). Nevertheless, this risk classification must be confirmed, as the effects of these hazards could result in significant harm.

The risk of slope failure has been identified in this study on the steep sides of the hill towards the north of the site. Further evaluation of this issue must be undertaken to prevent loading on/building next to unstable slopes.

Made Ground occupies the area that was previously worked directly east of the site, which was backfilled when Calvert Brick Works was decommissioned. It has been deemed unlikely that potential contamination from this feature will migrate to the site, however, this must be proven by intrusive investigation.

5.2 General comments

Hydrock Consultants Limited (Hydrock) has prepared this report in accordance with the instructions of Equity Red (the Client), by email dated January 2018 under the terms of appointment for Hydrock. Hydrock shall not be responsible for any use of the report or its contents for any purpose other than that for which it was prepared and provided. Should the Client require to pass copies of the report to other parties for information, the whole of the report should be so copied, but no professional liability or warranty shall be extended to other parties by Hydrock in this connection without the explicit written agreement thereto by Hydrock. The report may be assigned by the Client by way of absolute legal agreement to a purchaser of all or part of the site to which the report refers ("The Site") without the consent of Hydrock being required and such assignment shall be effective upon written notice thereof being given to Hydrock. No further assignments shall be permitted, unless expressly agreed in writing by Hydrock. In the event of the Client entering into a legal joint venture to develop The Site, the report can be regarded as having been issued by Hydrock jointly in favour of the Client and the joint venture partner, and in respect of the report Hydrock would owe the joint venture partner the same duty of care that Hydrock owed to the Client when Hydrock was instructed to prepare the report subject to all the matters contained or referred to in the report.

This report details the findings of work carried out in March 2018. The report has been prepared by Hydrock on the basis of available information obtained during the study period. Although every reasonable effort has been made to gather all relevant information, all potential environmental constraints or liabilities associated with the site may not have been revealed.

Information provided by third parties has been used in good faith and is taken at face value; however, Hydrock cannot guarantee its accuracy or completeness. It is assumed that previous reports provided have been assigned to the Client and can be relied upon. Should this not be the case Hydrock should be informed immediately as additional work may be required.

The work has been carried out in general accordance with recognised best practice. The various methodologies used are explained in Appendix A. Unless otherwise stated, no assessment has been made for the presence of radioactive substances or unexploded ordnance. Where the phrase 'suitable for use' is used in this report, it is in keeping with the terminology used in planning control and does not imply any specific warranty or guarantee offered by Hydrock.

The preliminary risk assessment process may identify potential risks to site demolition and redevelopment workers. However, consideration of occupational health and safety issues is beyond the scope of this report.

Please note that notwithstanding any site observations concerning the presence or otherwise of archaeological sites, asbestos-containing materials or invasive weeds such as Japanese knotweed, this report does not constitute a formal survey of these potential hazards.

Any site boundary line depicted on plans does not imply legal ownership of land.

6. RECOMMENDATIONS FOR FURTHER WORK

In order to confirm the actual risks to receptors and confirm the ground conditions with respect to potential geotechnical and geo-environmental risks, an appropriate intrusive investigation will need to be undertaken. Based on the current data, this site investigation is proposed to comprise:

- The excavation of trial pits in strategic places across the site in order to collect samples for geotechnical and chemical analysis. Trench stability, over break potential and "diggability" can be assessed using the trial pits. Soil infiltration rate testing may be necessary to formulate drainage options following the sampling and logging. Dynamic Cone Penetration tests could be performed to correlate CBRs to aid in pavement design where necessary.
- Cable percussive boreholes along the eastern and northern perimeter to allow the installation of gas and groundwater monitoring equipment. This will measure any leachate or ground gas flowing to the site from the backfilled area and landfill sites. Deeper soil samples can also be taken for geotechnical and chemical analysis. In situ SPT testing can be performed during the percussion drilling to derive the geotechnical parameters of the clay, which will aid in the foundation design process.

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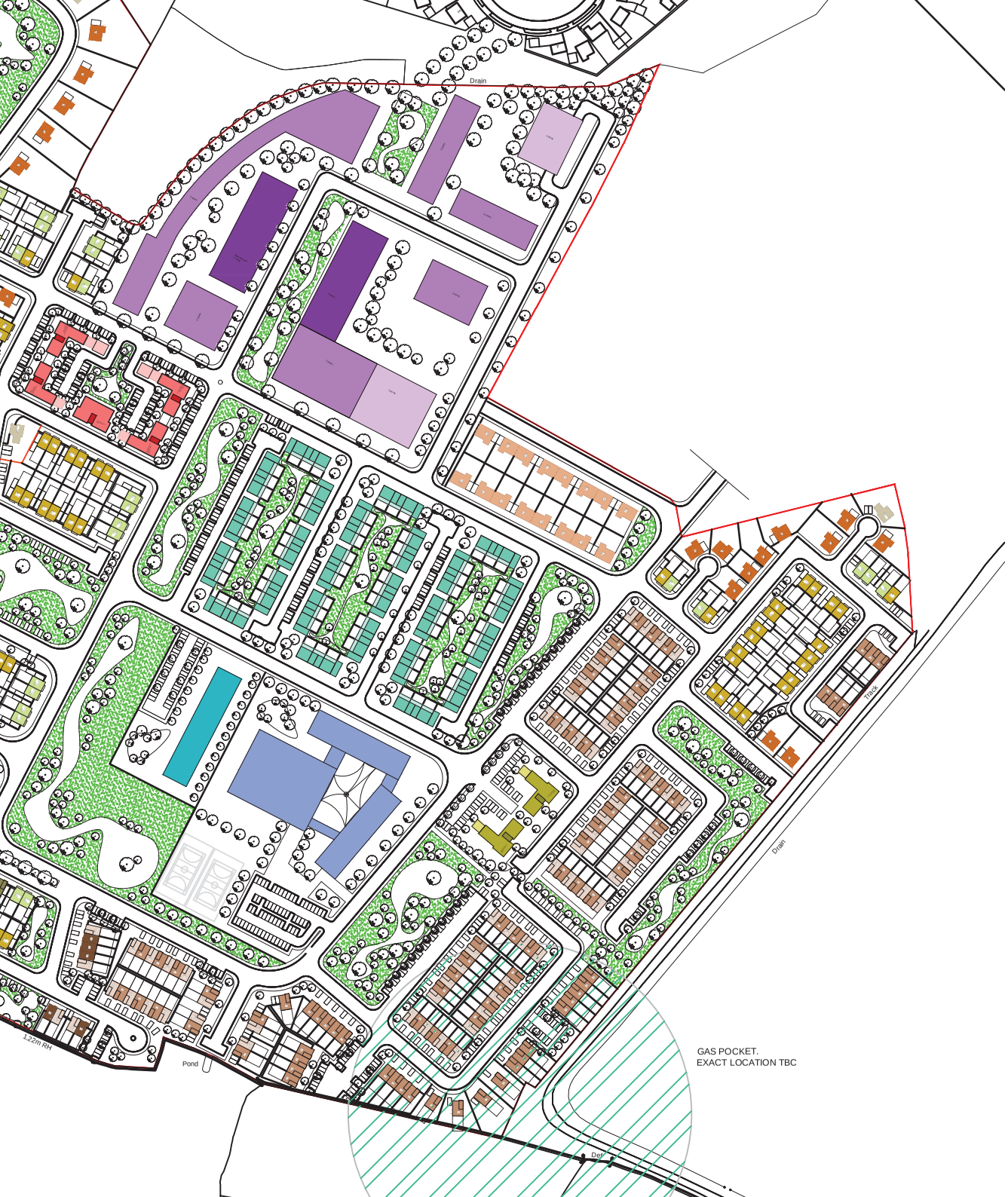
Appendix A

Drawings

Aerial Map with Site Location



1 storey
2 storey
3 storey

Commercial/Retail/Cinema etc
GIA 32254sqm
(Estimated area 31586 from schedule in drawing SK01 Rev E)

NOTE:
All car parking to be underground
All areas between buildings to be hard landscaped and pedestrian only.

Type 5 - PFS
4bed/7p - GIA 120

Type 5a - PFS
5bed/8p - GIA 120

Type 3a T.House - PFS
3bed/5p - GIA 100

Type 3 T.House - PFS
3bed/6p - GIA 110

Type 1 House - S/O
3bed-4p - GIA 99 sqm

1 storey
4 storey
5 storey

4 storey Block of Flats PFS
32 No of 2bed-4p GIA 55sqm
32 No of 1bed-2p GIA 75sqm
Total units 64

Type 1a - Aff
2bed-4p - GIA 79sqm

Type 1b - Aff
1bed-2p - GIA 50sqm

Type 1b - Aff
3bed-4p - GIA 99sqm

1 storey
3 storey
4 storey

3 storey Block of Flats S/O
17 No of 2bed-4p GIA 70sqm

2 storey
1 storey

2 storey Block of Flats
Elderly Units
3X2bed-4p GIA 73sqm
2X3bed-5p GIA 82sqm
per block

Landscaped/park areas

New tree

Appendix B

Site Walkover Photographs

Plate 1: Looking southwards to the farm buildings, including the farmhouse (top left) and outbuildings.

Plate 2: Potential ridge and furrow features, seen just to the north of the farm buildings.

Plate 3: The steeply sloping land heading from the agricultural land to the existing residential development in the north (from the hill, looking northwest).

Plate 4: The uneven ground of the previously worked area (facing northwest from a lower area of the hilly ground).

Plate 5: The uneven ground of the previously worked area (facing southwest at the top of the hill). Young trees are seen planted on the side of the hills.

Plate 6: One of the large pond occupying the disused area of the site. This is the western pond, as seen from the hillside looking northward. A green sheen is present on two of the three large ponds. A similar sheen is seen in some of the drainage channels.

Plate 7: The large hill in the distance is the active Calvert Landfill Site, as seen from the farmland (facing southeast). The boundary between the two sites are marked by the distant row of trees and an unseen road. Telegraph cables can be seen to the left of the image, cutting across the fields. Sporadic trees are the only remains of the old field boundaries (the hedgerows were likely removed previously).

Plate 8: A small outcrop of Made Ground in an ephemeral stream channel, containing bricks, wood and rocks. Plastic and rubber products were seen in similar outcrops across the disused area.

Plate 9: Boggy and ponded ground were seen where surface water features had overflown. A ponded area to the right of the fence had flooded into the farmland. The water had a slight orange sheen.

Plate 10: An orange sheen is seen on the water in the channels connecting the three large lakes. Dark material surrounds the water, suggesting an anaerobic environment.

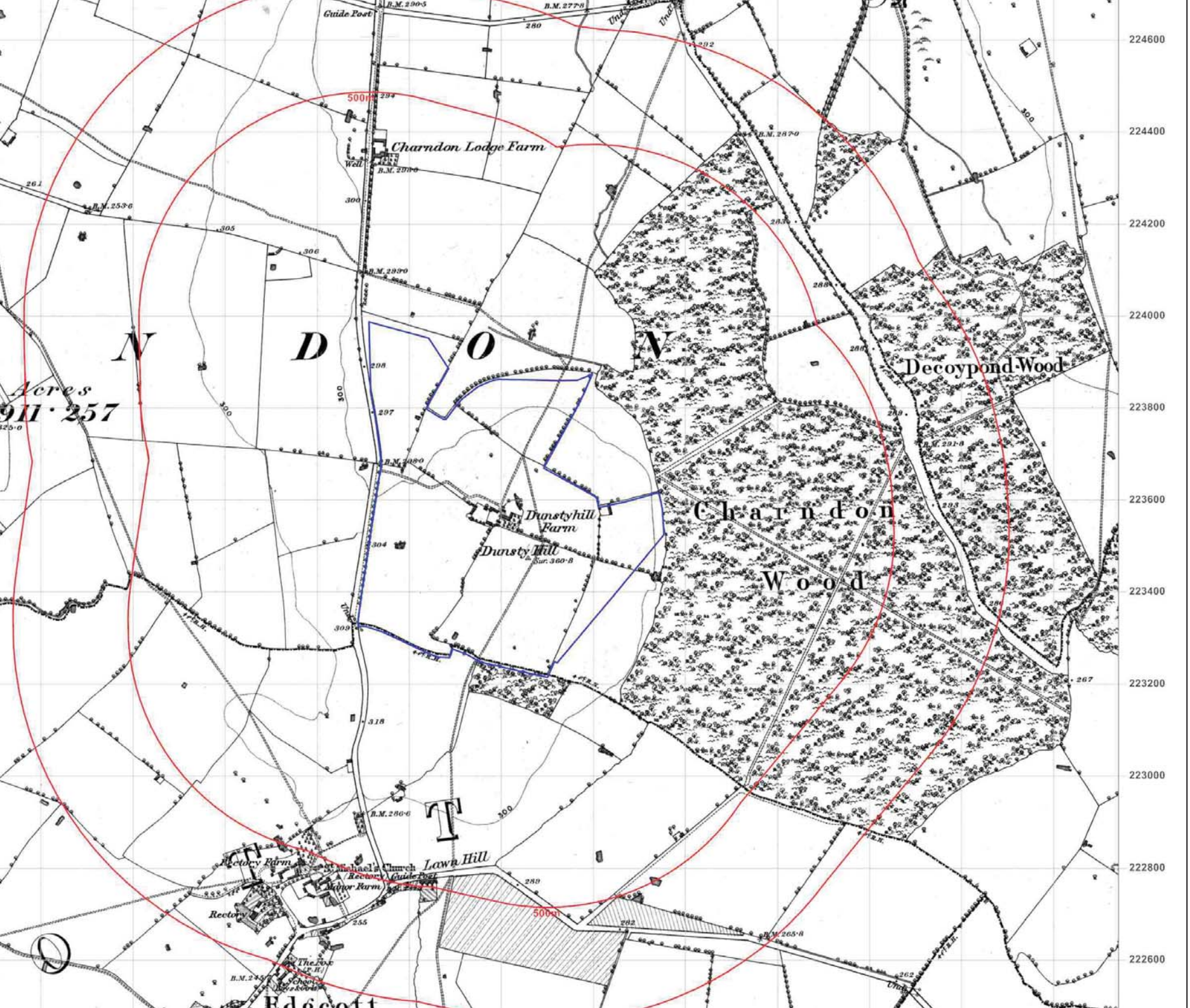
Plate 11: Green algae occupies this drainage channel, located close to the existing housing development. Dark material is seen in the channel suggesting anaerobic conditions. A metal drum is seen towards the end of the channel, along with a traffic cone and other litter. The previous contents of the drum are unknown.

Plate 12: Two large, metal tanks were found on the disused area of the site. The tanks were empty, and their previous contents unknown.

Plate 13: A metal pipe seen sticking out of the ground in the disused area, on the top of a potential waste piles.

Appendix C

Historical Ordnance Survey Maps



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Grid Ref:	468421, 22

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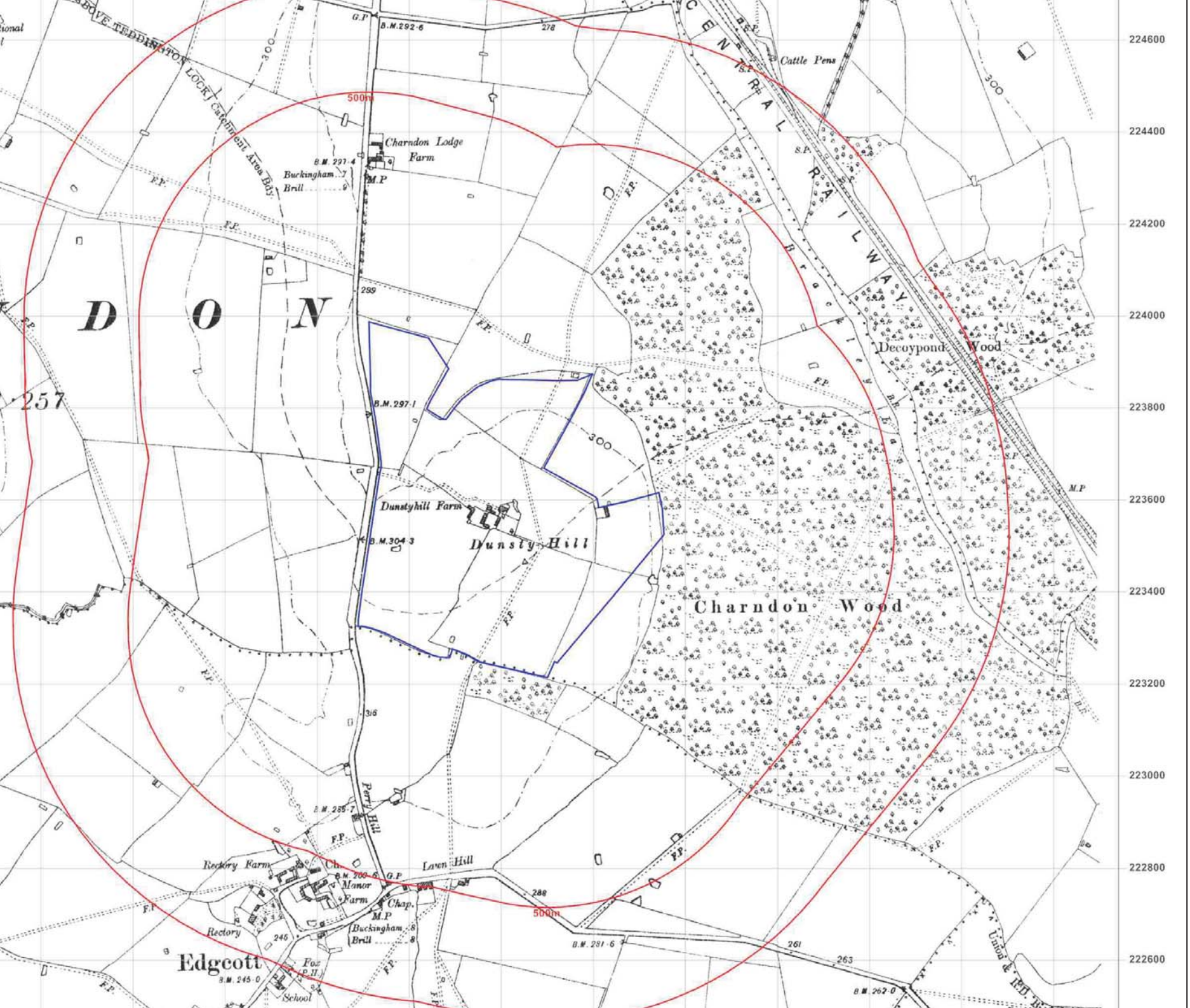

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Edition 1927
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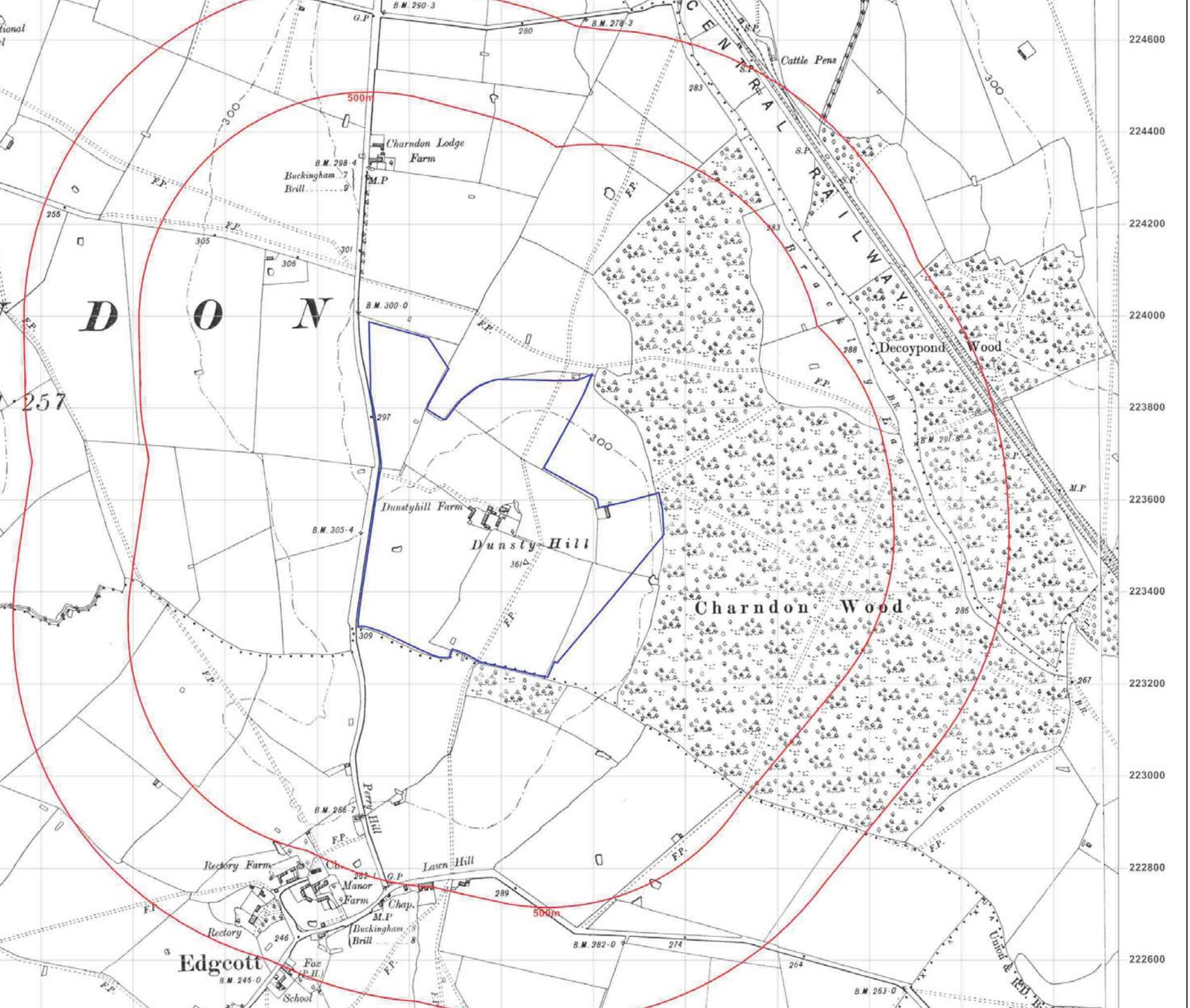

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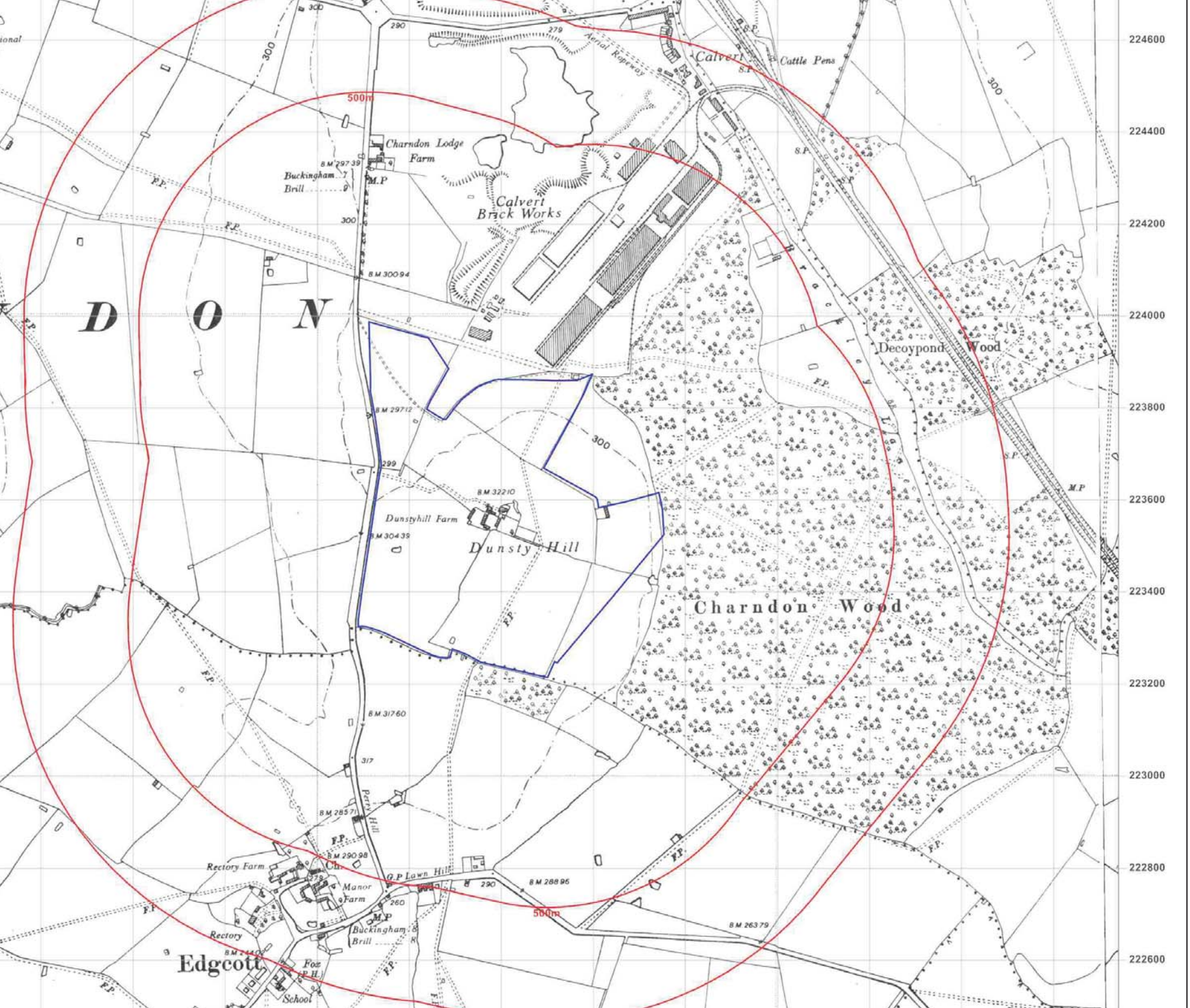

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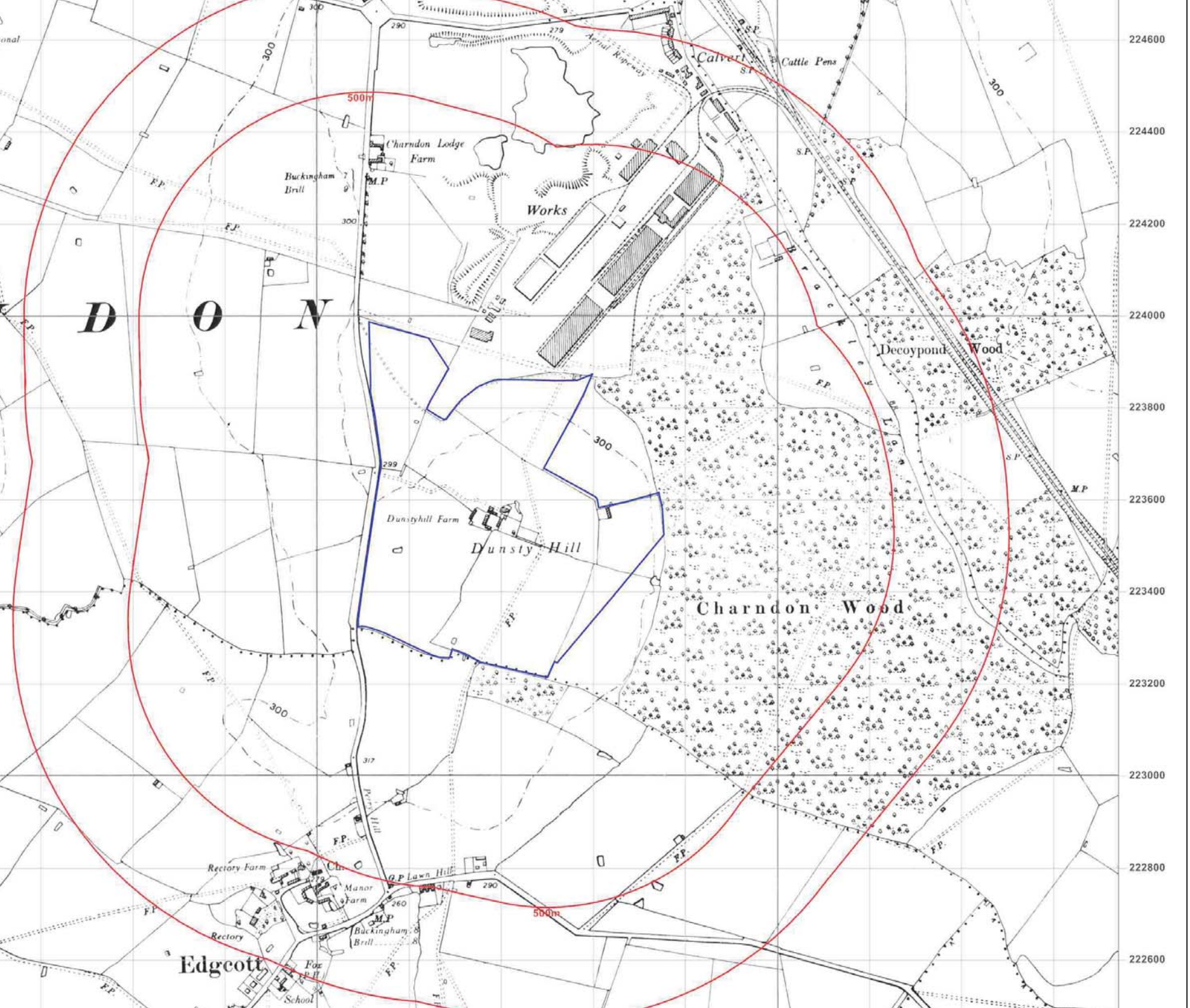

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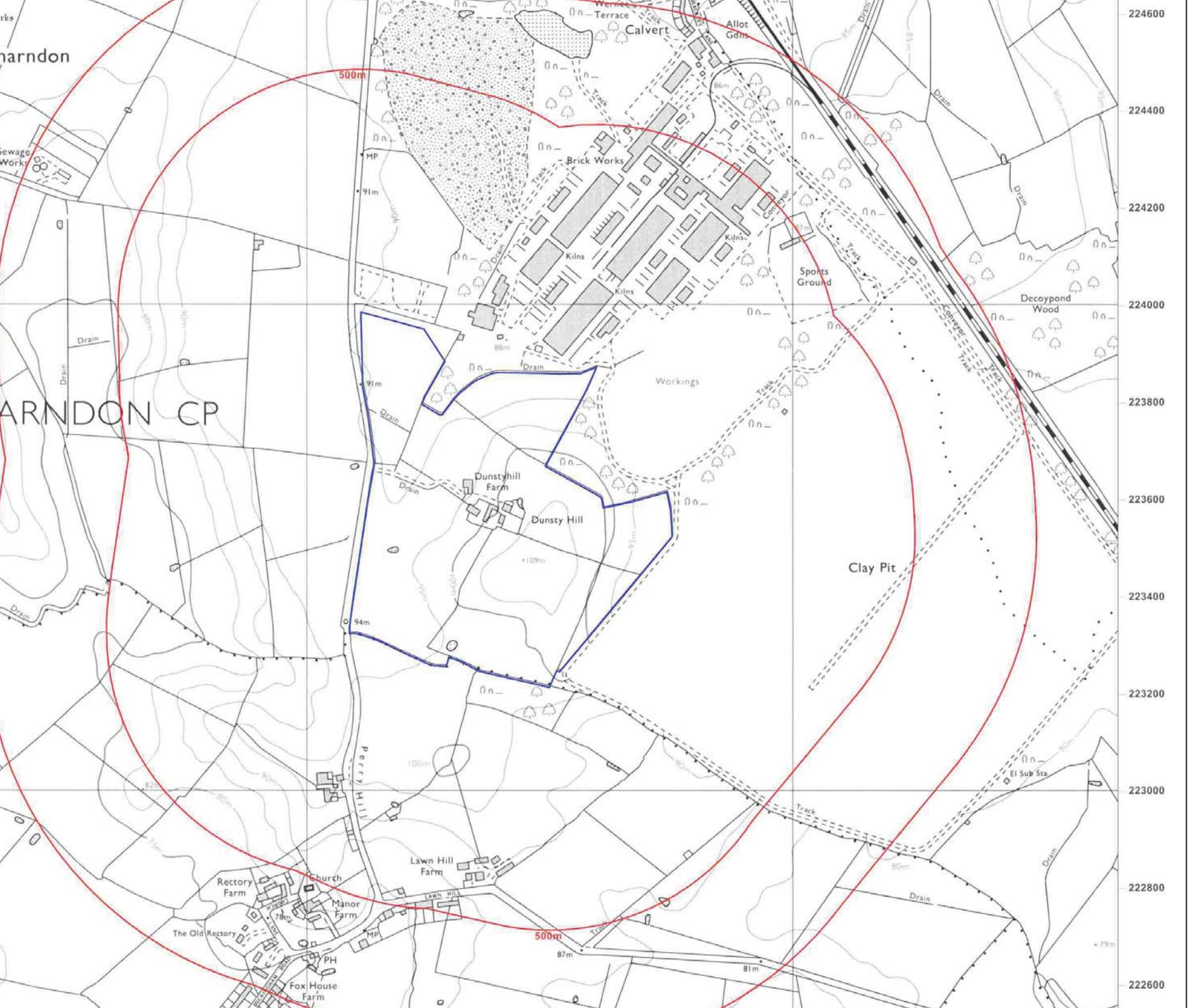

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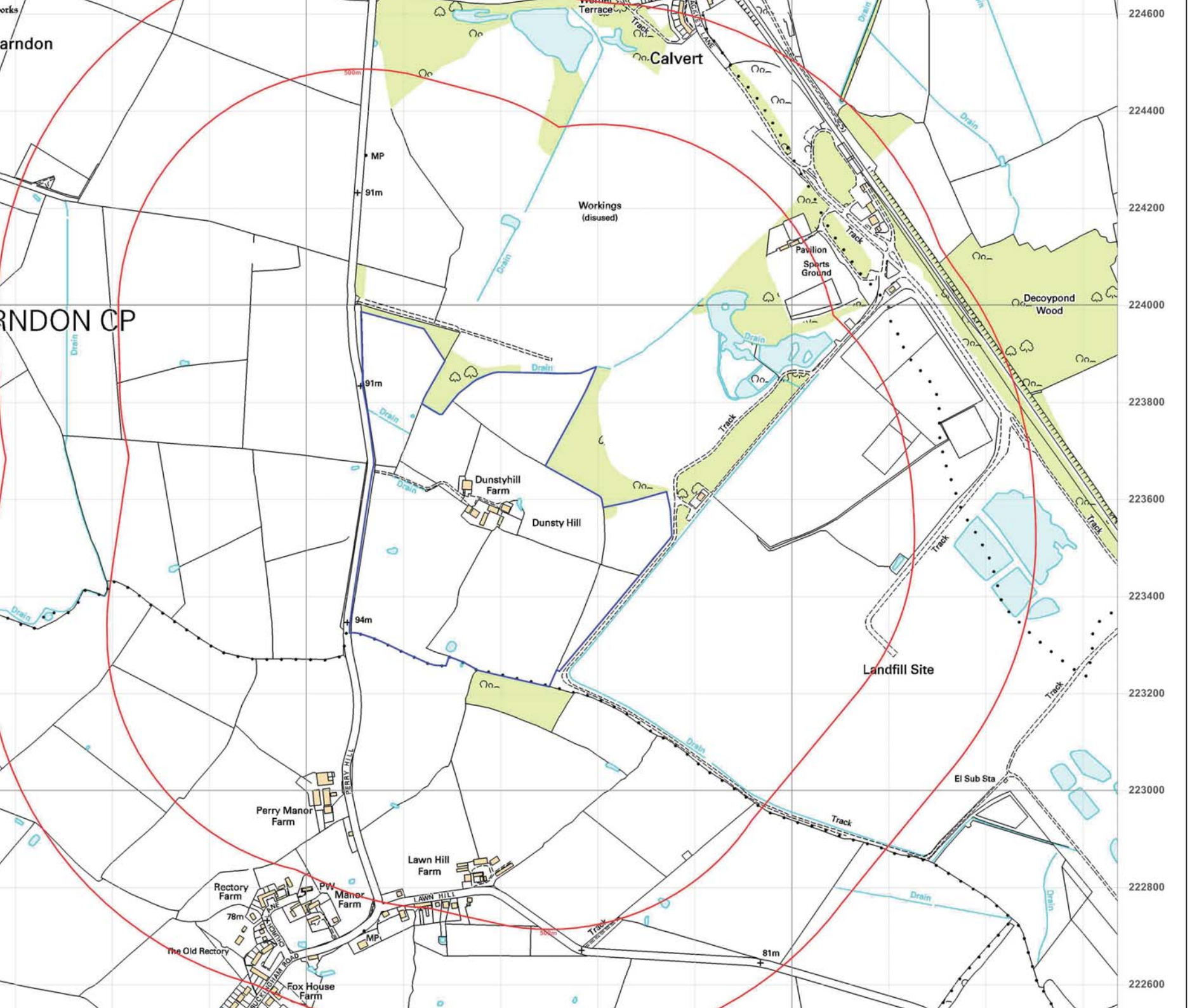

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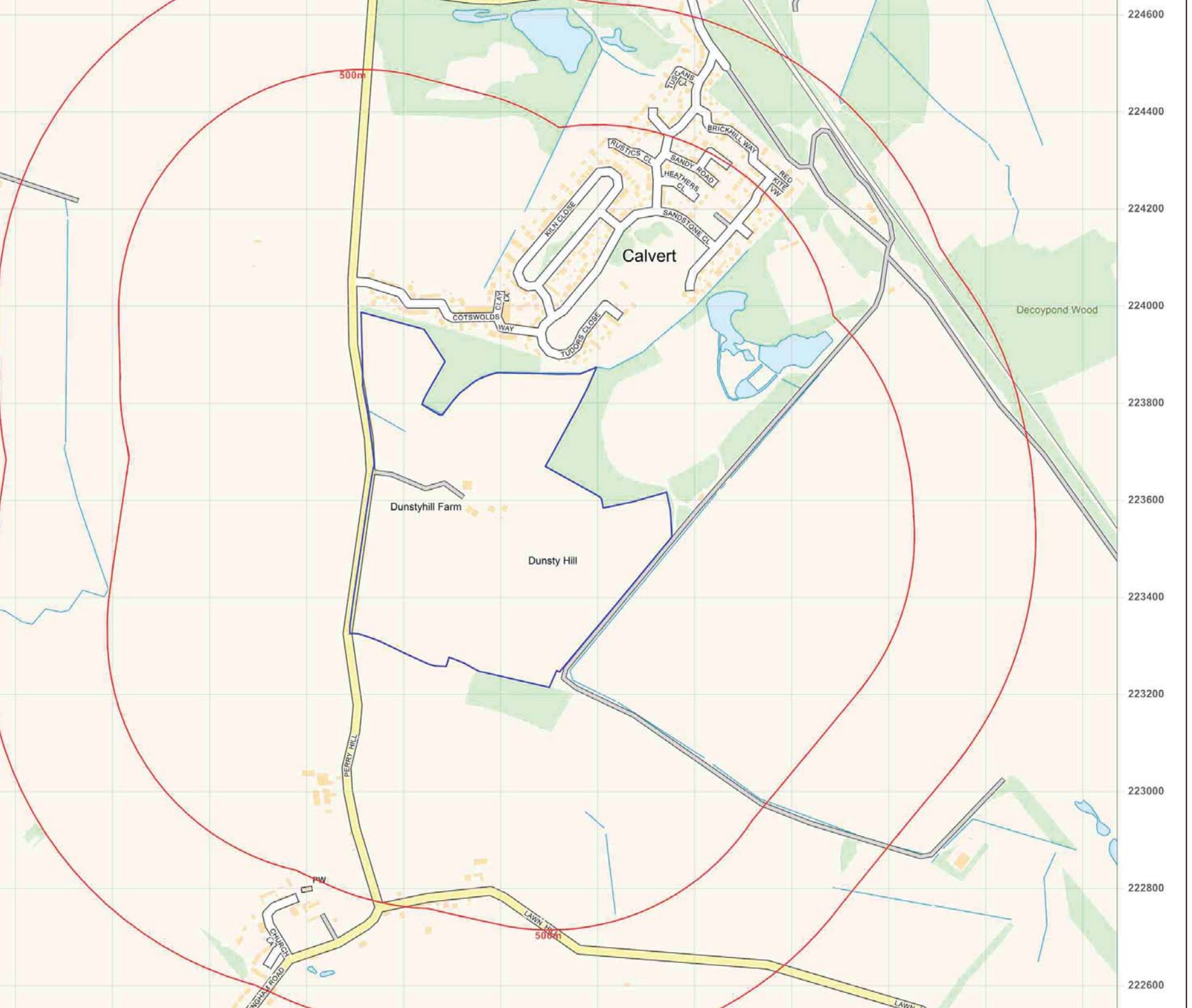

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Appendix D

Desk Study Research Information

Hydrock

22, LONG ACRE,
LONDON, WC2E 9LY

Groundsure Reference:	GS-5511440
Your Reference:	C-09015-C__POP024478
Report Date	8 Oct 2018
Report Delivery Method:	Email - pdf

Enviro Insight

Address: DUNSTY HILL FARM, EDGCOTT ROAD, CALVERT GREEN, OX27 0BJ

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Enviro Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,

Managing Director
Groundsure Limited

Enc.
Groundsure Enviroinsight

Enviro Insight

Address:	**DUNSTY HILL FARM, EDGCOTT ROAD, CALVERT GREEN, OX27 0BJ**
Date:	**8 Oct 2018**
Reference:	**GS-5511440**
Client:	**Hydrock**

NW N NE

W E

SW S SE

Aerial Photograph Capture date:	06-Sep-2015
Grid Reference:	468197,223345
Site Size:	30.99ha

Report Reference: GS-5511440
Client Reference: C-09015-C__POP024478

Contents Page

Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	1	4	8	7
1.2 Additional Information – Historical Tank Database	0	0	0	3
1.3 Additional Information – Historical Energy Features Database	0	0	0	1
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	0	0
1.6 Historical military sites	0	0	0	0
1.7 Potentially Infilled Land	0	2	4	10

Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	0	0
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	0	1	1
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	2	6	7	5
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	1	0	0	0	2	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	0	0	1	0	2	0
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	1
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	0
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	0	0	11	0

Section 4: Current Land Use

	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	1	1	3	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	0	0
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology

5.1 Records of Artificial Ground and Made Ground present beneath the study site	Identified
5.2 Records of Superficial Ground and Drift Geology present beneath the study site	None identified
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology

	0-500m
6.1 Records of Strata Classification in the Superficial Geology within 500m of the study site	Identified
6.2 Records of Strata Classification in the Bedrock Geology within 500m of the study site	Identified

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	0	0	#250GWV#	#500GWV#	Not searched	Not searched

Section 6: Hydrogeology and Hydrology

	0-500m					
	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site	No	No	No	No	No	No
6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site	10	12	24	38	Not searched	Not searched
6.11 Surface water features within 250m of the study site	Yes	Yes	Yes	Not searched	Not searched	Not searched

Section 7: Flooding

7.1 Enviroment Agency Zone 2 floodplains within 250m of the study site	None identified
7.2 Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	None identified
7.3 Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site	Very Low
7.4 Flood Defences within 250m of the study site	None identified
7.5 Areas benefiting from Flood Defences within 250m of the study site	None identified
7.6 Areas used for Flood Storage within 250m of the study site	None identified
7.7 Maximum BGS Groundwater Flooding susceptibility within 50m of the study site	Potential at Surface
7.8 BGS confidence rating for the Groundwater Flooding susceptibility areas	High

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	1	1
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	1	1	2	0	6	3
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	1

Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	2	0	0	0	0	2
8.14 Records of Green Belt land	0	0	0	0	0	0

Section 9: Natural Hazards

9.1 Maximum risk of natural ground subsidence	Moderate
9.1.1 Maximum Shrink-Swell hazard rating identified on the study site	Moderate
9.1.2 Maximum Landslides hazard rating identified on the study site	Low
9.1.3 Maximum Soluble Rocks hazard rating identified on the study site	Negligible
9.1.4 Maximum Compressible Ground hazard rating identified on the study site	Moderate
9.1.5 Maximum Collapsible Rocks hazard rating identified on the study site	Very Low
9.1.6 Maximum Running Sand hazard rating identified on the study site	Very Low
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

Section 10: Mining

10.1 Coal mining areas within 75m of the study site	None identified
10.2 Non-Coal Mining areas within 50m of the study site boundary	None identified
10.3 Brine affected areas within 75m of the study site	None identified

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licences, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

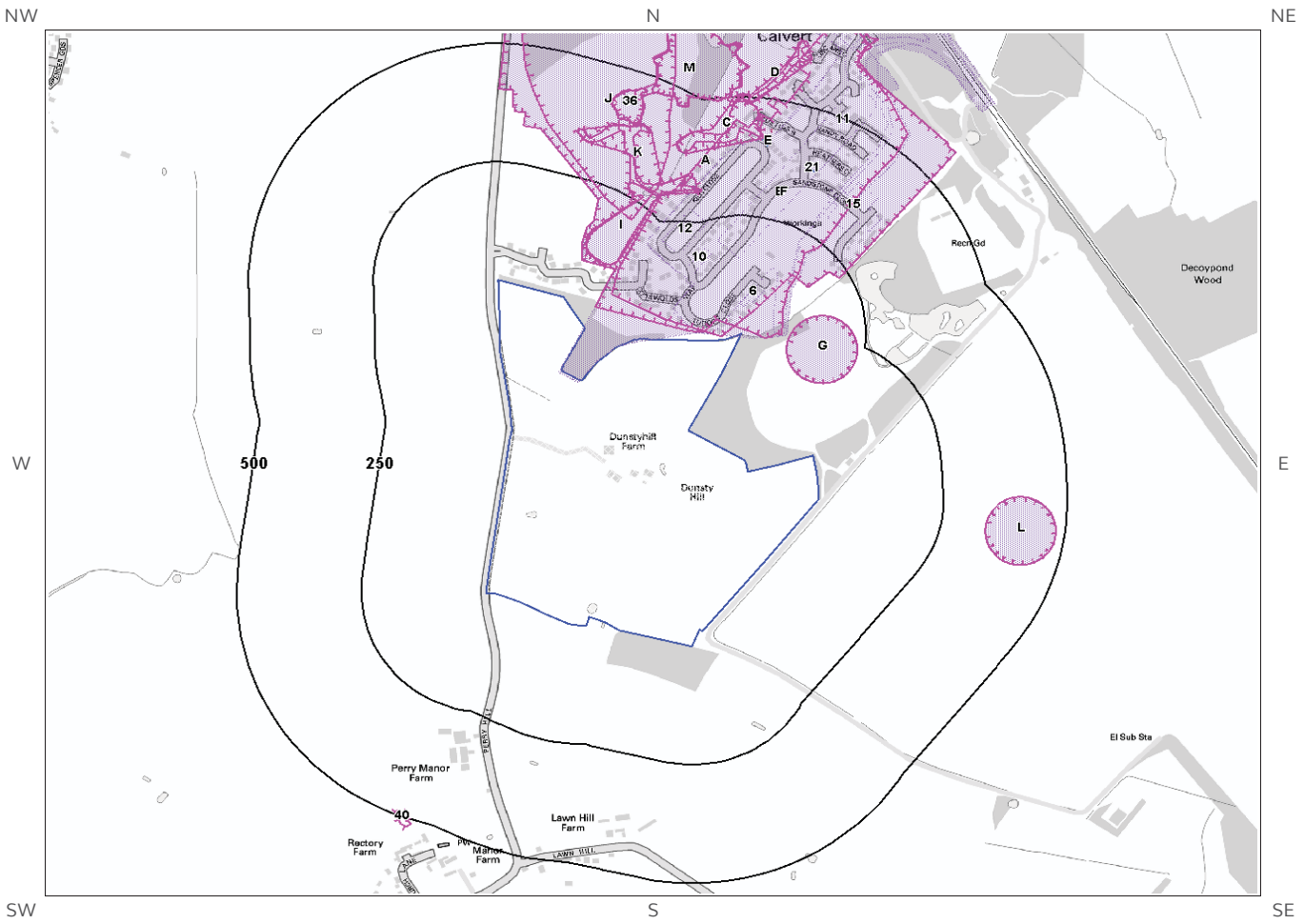
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier “A” on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as “Not Shown”.

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Historical Land Use



Site Outline

250
500
Search Buffers (m)

Historical 1:10,000 and 1:10,560 scale mapping

Industrial Land Use

Potentially Infilled Land

Historical 1:2,500, 1:1,250 and 1:500 scale mapping

Energy Features

Petrol Stations

Historical military sites

Tanks

Garages

1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 20

ID	Distance [m]	Direction	Use	Date
1A	0	On Site	Unspecified Works	1957
2F	9	N	Brick Works	1982
3A	12	N	Brick Works	1951
4B	12	N	Railway Sidings	1951
5B	14	N	Railway Sidings	1957
6	59	N	Unspecified Kilns	1982
7G	95	E	Unspecified Workings	1982
8H	101	NE	Unspecified Ground Workings	1951
9I	104	NE	Unspecified Heap	1957
10	141	N	Unspecified Kilns	1982
11	161	N	Railway Sidings	1982
12	179	N	Unspecified Kilns	1982
13J	211	NE	Refuse Heap	1982
14K	283	NE	Unspecified Heaps	1957
15	301	NE	Unspecified Kilns	1982
16L	340	E	Clay Pit	1982
17C	387	NE	Unspecified Pit	1951
18C	388	NE	Unspecified Heap	1957
19D	483	N	Refuse Heap	1951
20D	486	N	Refuse Heap	1957

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary: 3

ID	Distance (m)	Direction	Use	Date
21	372	NE	Unspecified Tank	1938
22E	400	N	Tanks	1938
23E	411	N	Tanks	1938

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary: 1

ID	Distance (m)	Direction	Use	Date
24E	431	N	Electricity Substation	1978

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary: 0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 0

Database searched and no data found.

1.6 Historical military sites

Certain military installations were not noted on historic mapping for security reasons. Whilst not all military land is necessarily of concern, Groundsure has researched and digitised a number of Ordnance Factories and other military industrial features (e.g. Ordnance Depots, Munitions Testing Grounds) which may be of contaminative concern. This research was drawn from a number of different sources, and should not be regarded as a definitive or exhaustive database of potentially contaminative military installations. The boundaries of sites within this database have been estimated from the best evidence available to Groundsure at the time of compilation.

Records of historical military sites within 500m of the search boundary: 0

Database searched and no data found.

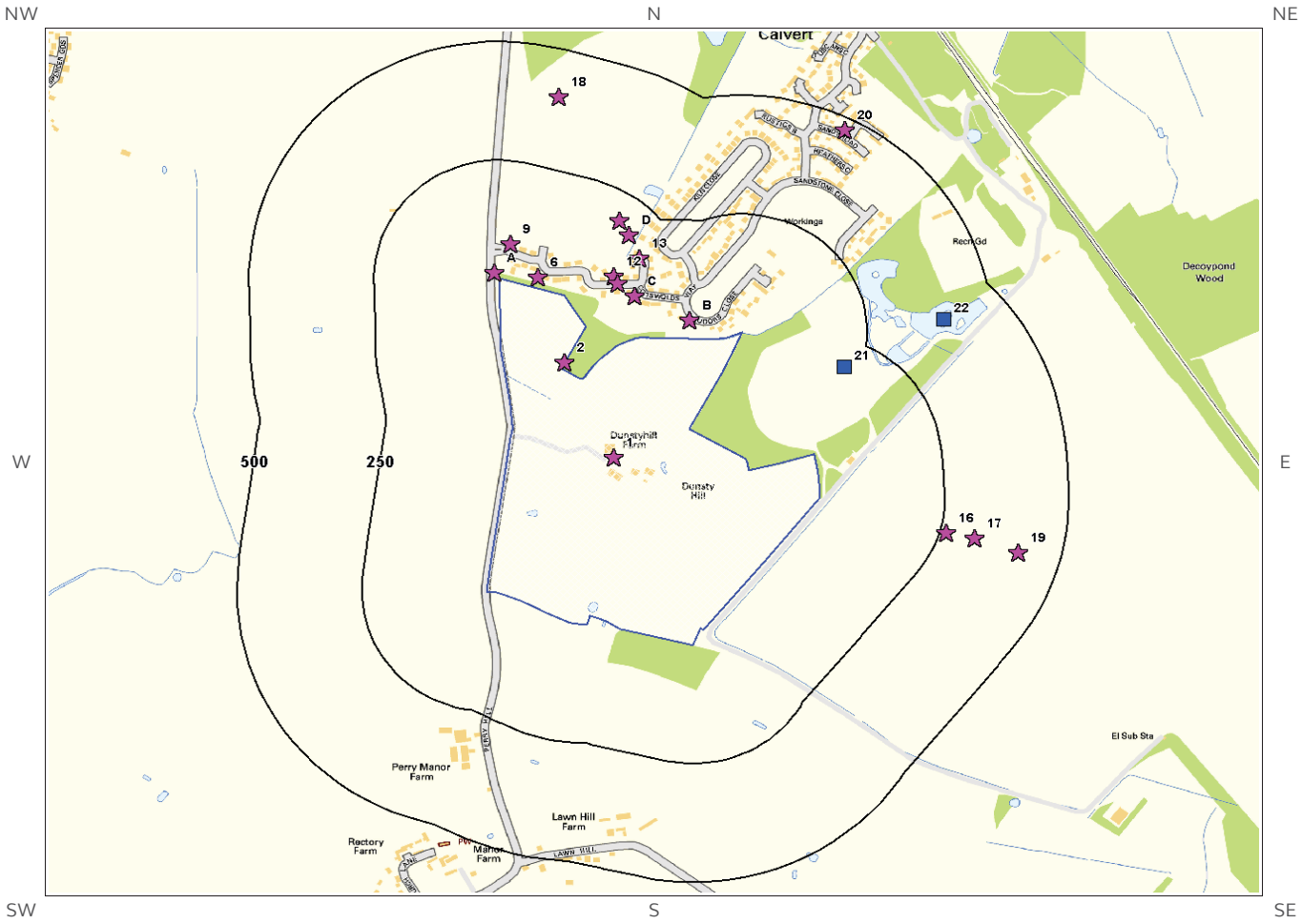
1.7 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 16

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
25F	9	N	Brick Works	1982
26A	12	N	Brick Works	1951
27G	95	E	Unspecified Workings	1982
28H	101	NE	Unspecified Ground Workings	1951
29I	104	NE	Unspecified Heap	1957
30J	211	NE	Refuse Heap	1982
31K	283	NE	Unspecified Heaps	1957
32L	340	E	Clay Pit	1982
33C	387	NE	Unspecified Pit	1951
34C	388	NE	Unspecified Heap	1957
35M	392	N	Water Bodies	1957
36	393	N	Pond	1951
37M	466	NE	Water Body	1951
38D	483	N	Refuse Heap	1951
39D	486	N	Refuse Heap	1957
40	489	S	Pond	1882

2. Environmental Permits, Incidents and Registers Map



- Site Outline
- 250 / 500 Search Buffers (m)
- Recorded Pollution Incident
- Dangerous Substances (List 1)
- Dangerous Substances (List 2)
- Water Industry Referrals
- Licenced Discharge Consents
- Red List Discharge Consents
- RAS 3 & 4 Authorisations
- Part A(1) Authorised Processes and Historic IPC Authorisations
- Part A(2) and Part B Authorised Processes
- COMAH / NIHHS Sites
- Sites Determined as Contaminated Land
- Hazardous Substance Consents and Enforcements

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

2

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
21	193	N	468800 223800	Address: CALVERT LANDFILL SITE, BUCKS. Effluent Type: TRADE DISCHARGES - UNSPECIFIED Permit Number: PR1NF1826 Permit Version: 1	Receiving Water: Trib Claydon Brook Status: PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY) Issue date: 30/01/1985 Effective Date: 30-Jan-1985 Revocation Date: 01/10/1990
22	384	NE	469000 223900	Address: CALVERT LANDFILL SITE, BUCKINGHAMSHIRE Effluent Type: TRADE DISCHARGES - UNSPECIFIED Permit Number: PR1NF3478 Permit Version: 1	Receiving Water: Trib Claydon Brook Status: PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY) Issue date: 31/08/1988 Effective Date: 31-Aug-1988 Revocation Date: 22/03/1992

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

20

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
1	0	On Site	468340 223610	Incident Date: 10-Feb-2003 Incident Identification: 135859 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
2	0	On Site	468240 223810	Incident Date: 20-Feb-2003 Incident Identification: 138264 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
3A	18	NW	468100 224000	Incident Date: 09-Nov-2002 Incident Identification: 119835 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
4A	18	NW	468100 224000	Incident Date: 09-Nov-2002 Incident Identification: 119827 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
5A	18	NW	468100 224000	Incident Date: 03-Mar-2003 Incident Identification: 140506 Pollutant: Other Pollutant Pollutant Description: Other	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
6	24	N	468188 223991	Incident Date: 20-Dec-2002 Incident Identification: 126970 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
7B	40	N	468490 223900	Incident Date: 23-Dec-2002 Incident Identification: 127449 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
8B	40	N	468490 223900	Incident Date: 23-Dec-2002 Incident Identification: 127449 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
9	76	N	468133 224060	Incident Date: 13-Nov-2002 Incident Identification: 120612	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact)

ID	Distance (m)	Direction	NGR	Details	
				Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Air Impact: Category 3 (Minor)
10C	89	N	468380 223950	Incident Date: 03-Mar-2003 Incident Identification: 140503 Pollutant: Other Pollutant Pollutant Description: Other	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
11C	101	NE	468346 223977	Incident Date: 13-Nov-2002 Incident Identification: 120606 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
12	104	NE	468340 223992	Incident Date: 28-Nov-2002 Incident Identification: 123690 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
13	167	NE	468390 224030	Incident Date: 17-Aug-2004 Incident Identification: 260284 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Effects on Humans	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 2 (Significant)
14D	182	NE	468370 224080	Incident Date: 21-Nov-2003 Incident Identification: 202717 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
15D	192	NE	468350 224110	Incident Date: 21-Oct-2003 Incident Identification: 197352 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
16	262	E	469004 223450	Incident Date: 06-Feb-2007 Incident Identification: 467819 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 2 (Significant)
17	319	E	469060 223440	Incident Date: 21-Feb-2003 Incident Identification: 138337 Pollutant: Organic Chemicals/Products Pollutant Description: Other Organic Chemical or Product	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
18	401	N	468230 224370	Incident Date: 31-Oct-2002 Incident Identification: 118036 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
19	414	E	469150 223410	Incident Date: 04-Nov-2002 Incident Identification: 118741 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
20	473	NE	468801 224300	Incident Date: 12-Oct-2007 Incident Identification: 538108 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Landfill Odour	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 2 (Significant)

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

Database searched and no data found.

2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

Records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site 0

Database searched and no data found.

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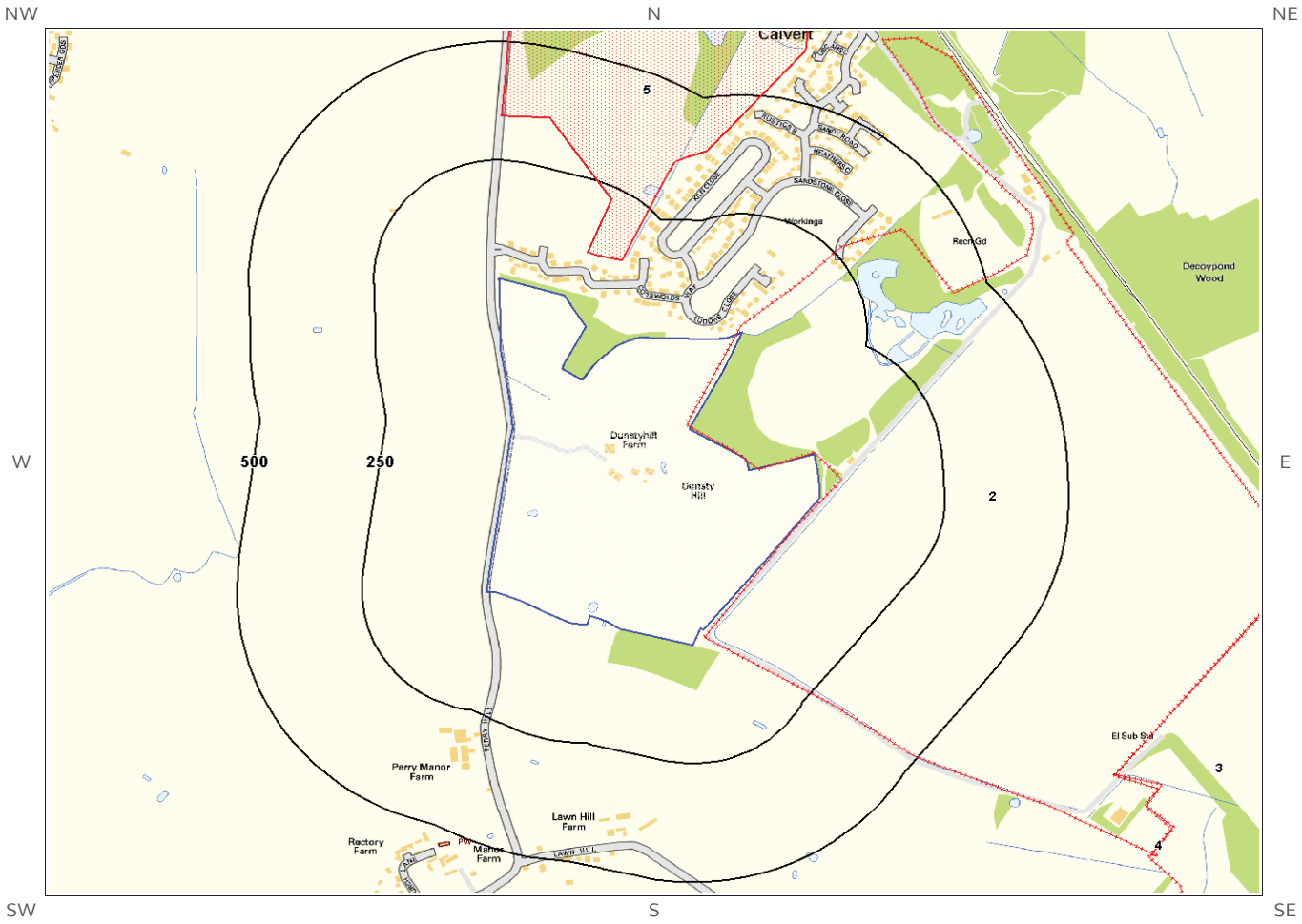
3. Landfill and Other Waste Sites Map



Site Outline

250
500
Search Buffers (m)

EA/NRW Active Landfill

EA/NRW Historic Landfill

BGS / DoE Survey Landfill

Historic and Planned Waste Sites

EA/NRW Licensed Waste Site

Local Authority/Historical Mapping Landfill Records

3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

3

The following Environment Agency/Natural Resources Wales landfill records are represented as polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
2	0	On Site	468780 224620	Address: BRACKLEY LANE, CALVERT, BUCKINGHAM, MK18 2HF Landfill Reference: 0.0 Environmental Permitting Regulations (Waste) Reference: - Landfill Type: WASTE LANDFILLING; >10 T/D WITH CAPACITY >25,000T EXCLUDING INERT WASTE	Operator: FCC Waste Services (UK) Limited Status: Effective IPPC Reference: EPR Reference:
3	829	SE	468800 224600	Address: Pit 6, Brackley Lane, Calvert, BUCKINGHAM, MK18 2HF Landfill Reference: 0.0 Environmental Permitting Regulations (Waste) Reference: - Landfill Type: WASTE LANDFILLING; >10 T/D WITH CAPACITY >25,000T EXCLUDING INERT WASTE	Operator: FCC Waste Services (UK) Limited Status: Effective IPPC Reference: EPR Reference:
4	991	SE	468780 224620	Address: BRACKLEY LANE, CALVERT, BUCKINGHAM, MK18 2HF Landfill Reference: 0.0 Environmental Permitting Regulations (Waste) Reference: - Landfill Type: WASTE LANDFILLING; >10 T/D WITH CAPACITY >25,000T EXCLUDING INERT WASTE	Operator: FCC Waste Services (UK) Limited Status: Effective IPPC Reference: EPR Reference:

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

3

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
5	103	NE		Site Address: Calvert Pit No.1, Calvert Waste Licence: Yes	Licence Issue: 31-Aug-1977 Licence Surrendered: 04-Apr-1993

ID	Distance (m)	Direction	NGR	Details	
				Site Reference: WDA/119 Waste Type: Inert, Industrial, Commercial, Household Environmental Permitting Regulations (Waste) Reference: -	Licence Holder Address: - Operator: - Licence Holder: London Brick Company Limited First Recorded: 01-Jan-1947 Last Recorded: 11-Sep-1991
Not shown	683	N		Site Address: Buckingham Rural District Council Refuse Tip, Bicester, Oxfordshire Waste Licence: - Site Reference: - Waste Type: Industrial, Commercial Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: Buckingham Borough Council Licence Holder: - First Recorded: 31-Dec-1957 Last Recorded: -
Not shown	843	N		Site Address: Aylesbury Borough Refuse Tip, Brill Road, Twyford, Buckinghamshire Waste Licence: - Site Reference: - Waste Type: Commercial Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: Alyesbury Borough Council Licence Holder: - First Recorded: 31-Dec-1963 Last Recorded: -

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

1

The following landfill records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1218	N	468000.0 225200.0	Address: Aylesbury Bor Tip, Brill Rd, Twyford, Bucks BGS Number: 204.0	Risk: Risk to major and minor aquifer Waste Type: N/A

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

0

Database searched and no data found.

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

0

Database searched and no data found.

3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

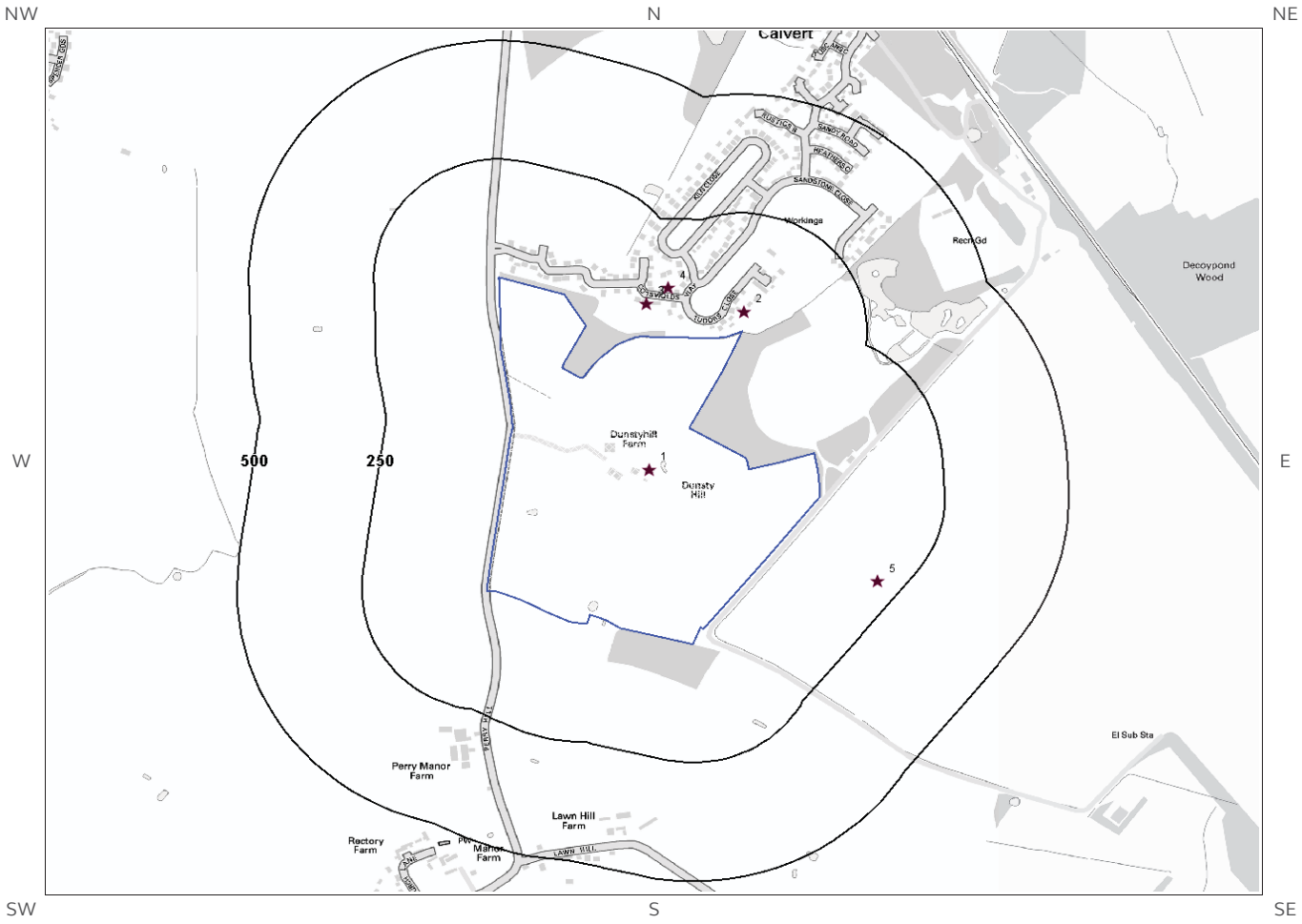
The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
Not shown	769	N	468780 224620	Site Address: Calvert Landfill, Brackley Lane, Calvert, Bucks, MK18 2HF Type: Physical Treatment Facility Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: WRG027 EPR reference: EA/EPR/BS8605IQ/V008 Operator: F C C Waste Services (U K) Ltd Waste Management licence No: 104048 Annual Tonnage: 20000.0	Issue Date: 27/07/2012 Effective Date: - Modified: 17/09/2012 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Calvert Landfill Correspondence Address: -
Not shown	769	N	468780 224620	Site Address: Calvert Landfill, Brackley Lane, Calvert, Buckinghamshire, MK18 2HF Type: Physical Treatment Facility Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: WRG027 EPR reference: EA/EPR/BS8605IQ/V008 Operator: F C C Waste Services (U K) Ltd Waste Management licence No: 104048 Annual Tonnage: 20000.0	Issue Date: 27/07/2012 Effective Date: - Modified: 17/09/2012 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Calvert Landfill Correspondence Address: -
Not shown	956	E	469700 223400	Site Address: Calvert Pit 4, Calvert Brickworks, Calvert, Milton Keynes, Bucks Type: Co-Disposal Landfill Site Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SHA019 EPR reference: - Operator: Shanks Waste Services Ltd Waste Management licence No: 75026 Annual Tonnage: 0.0	Issue Date: 28/03/1980 Effective Date: - Modified: 01/11/1999 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Shanks Waste Services - Calvert Pit 4 Correspondence Address: Dunedin House, Auckland Park, Mount Farm, Milton Keynes, Bucks, MK1 1BU
Not shown	956	E	469700 223400	Site Address: Calvert Pit 4, Brackley Lane, Calvert Brickworks, Calvert, Bucks, MK18 2HF Type: Co-Disposal Landfill Site Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SHA019 EPR reference: - Operator: W R G Waste Services Limited Waste Management licence No: 75026 Annual Tonnage: 150000.0	Issue Date: 28/03/1980 Effective Date: - Modified: 01/11/1999 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: IPPC Site Name: W R G Waste Services - Calvert Pit 4 Correspondence Address: Ground Floor West, 900, Pavilion Drive, Northampton Business Park, Northampton, NN4 7RG
Not shown	956	E	469700 223400	Site Address: Calvert Pit 6, Brackley Lane, Calvert, Milton Keynes, Buckinghamshire, MK18 2HF Type: Biological Treatment Facility Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SHA018 EPR reference: EA/EPR/YP3092NG/A001 Operator: Waste Recycling Group Ltd Waste Management licence No: 75029 Annual Tonnage: 75000.0	Issue Date: 04/06/1992 Effective Date: - Modified: 02/05/1995 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: To PPC Site Name: W R G Waste Services - Calvert Pit 6 Correspondence Address: -

ID	Distance (m)	Direction	NGR	Details	
Not shown	956	E	469700 223400	Site Address: Calvert Pit 6, Brackley Lane, Calvert, Milton Keynes, Bucks, MK18 2HF Type: Biological Treatment Facility Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SHA018 EPR reference: - Operator: W R G Waste Services Limited Waste Management licence No: 75029 Annual Tonnage: 75000.0	Issue Date: 04/06/1992 Effective Date: - Modified: 02/05/1995 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: IPPC Site Name: W R G Waste Services - Calvert Pit 6 Correspondence Address: Ground Foor West, 900, Pavilion Drive, Northampton Business Park, Northampton, NN4 7RG
Not shown	956	E	469700 223400	Site Address: Calvert Pit 6, Brackley Lane, Calvert, Milton Keynes, Bucks, MK18 2HF Type: Biological Treatment Facility Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SHA018 EPR reference: - Operator: W R G Waste Services Limited Waste Management licence No: 75029 Annual Tonnage: 0.0	Issue Date: 04/06/1992 Effective Date: - Modified: 02/05/1995 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: W R G Waste Services - Calvert Pit 6 Correspondence Address: 3, Sidings Court, White Rose Way, Doncaster, S Yorkshire, DN4 5NU
Not shown	956	E	469700 223400	Site Address: Calvert Pit 4, Brackley Lane, Calvert Brickworks, Calvert, Buckinghamshire, MK18 2HF Type: Co-Disposal Landfill Site Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SHA019 EPR reference: EA/EPR/DP3192NC/V002 Operator: W R G Waste Services Ltd Waste Management licence No: 75026 Annual Tonnage: 25000.0	Issue Date: 28/03/1980 Effective Date: - Modified: 01/11/1999 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: To PPC Site Name: W R G Waste Services - Calvert Pit 4 Correspondence Address: -
Not shown	956	E	469700 223400	Site Address: Calvert Pit 4, Brackley Lane, Calvert Brickworks, Calvert, Bucks, MK18 2HF Type: Co-Disposal Landfill Site Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SHA019 EPR reference: - Operator: W R G Waste Services Limited Waste Management licence No: 75026 Annual Tonnage: 150000.0	Issue Date: 28/03/1980 Effective Date: - Modified: 01/11/1999 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: IPPC Site Name: W R G Waste Services - Calvert Pit 4 Correspondence Address: 3, Sidings Court, White Rose Way, Doncaster, South Yorkshire, DN4 5NU
Not shown	956	E	469700 223400	Site Address: Calvert Pit 6, Brackley Lane, Calvert, Milton Keynes, Bucks Type: Biological Treatment Facility Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SHA018 EPR reference: - Operator: Shanks Waste Services Ltd Waste Management licence No: 75029 Annual Tonnage: 0.0	Issue Date: 04/06/1992 Effective Date: - Modified: 02/05/1995 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Shanks Waste Services - Calvert Pit 6 Correspondence Address: Dunedin House, Auckland Park, Mount Farm, Milton Keynes, Bucks, MK1 1BU
Not shown	956	E	469700 223400	Site Address: Calvert Pit 4, Brackley Lane, Calvert Brickworks, Calvert, Bucks, MK18 2HF Type: Co-Disposal Landfill Site Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SHA019	Issue Date: 28/03/1980 Effective Date: - Modified: 01/11/1999 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified

ID	Distance (m)	Direction	NGR	Details	
				EPR reference: - Operator: W R G Waste Services Limited Waste Management licence No: 75026 Annual Tonnage: 0.0	Site Name: W R G Waste Services - Calvert Pit 4 Correspondence Address: Dunedin House, 3, Sidings Court, White Roe Way, Doncaster, S Yorkshire, DN4 5NU

4. Current Land Use Map



Site Outline

Search Buffers (m)
250
500

Current Industrial Sites

Petrol & Fuel Sites

Electricity Transmission Cables

Gas Transmission Pipelines

4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: 5

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	0	On Site	D J Balderson	468410 223583	Dunsty Hill Farm, Charndon, Bicester, OX27 0BJ	Livestock Farming	Farming
2	43	N	C C R Cooling Ltd	468600 223916	10, Tudors Close, Calvert, Buckingham, MK18 2FE	Cooling and Refrigeration	Industrial Products
3	71	N	G M H Cash Registers	468404 223933	30, Cotswolds Way, Calvert, Buckingham, MK18 2FH	Office and Shop Equipment	Industrial Products
4	105	N	Electricity Sub Station	468448 223966	MK18	Electrical Features	Infrastructure and Facilities
5	202	SE	Landfill Site	468868 223347	HP18	Refuse Disposal Facilities	Infrastructure and Facilities

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 0

Database searched and no data found.

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site: 0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site: 0

Database searched and no data found.