



Harborough Cemetery: Site Assessment, Site 8: Land off Leicester Lane

For: Harborough District Council

CRM.1287.002.P.R.004.A



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Harborough Cemetery: Site Assessment, Site 8: Land off Leicester Lane

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Plans

| Plan | Reference |
|--|-------------------------|
| Site location plan | CRM.1287.002.PL.D.005.1 |
| Site boundary plan | CRM.1287.002.PL.D.005.1 |
| Phase I Habitat Map | CRM.1287.002.EC.D.004 |
| Landscape and Arboricultural Appraisal | CRM.1287.002.L.D.003 |
| Visual Appraisal | CRM.1287.002.L.D.004 |

1 INTRODUCTION

1.1 Introduction

- 1.1.1 In April 2017, Enzygo Ltd were commissioned by Harborough District Council (HDC) to prepare detailed site assessments for four identified sites. The assessments were to evaluate the potential of each site for future development of a cemetery. The assessments took into account landscape and visual factors, highways and access factors, hydrological factors, ground conditions and ecological constraints.
- 1.1.2 An initial review of a large number of sites was undertaken by HDC, and the outcome of this review identified four sites to be considered in further detail.
- 1.1.3 This report provides a detailed site assessment for 'site 8', referred to as 'Land off Leicester Lane'. The site is located at postal code LE16 7HP, grid reference SP 73083 89073. Plan CRM.1287.002.PL.D.005.1 and CRM.1287.002.P.D.005.2 show the location of the site.

1.2 Background









- 1.2.1 In 2016, Enzygo Ltd undertook a review of cemetery capacity within HDC. This considered the existing cemetery capacity within the District, along with the forecasted requirement within the forthcoming Local Plan period (until 2031), based on the forecasted population and mortality rate. The report identified that additional cemetery capacity would be required in a number Parishes and within Market Harborough.
- 1.2.2 Based on the report findings, HDC are currently seeking to find a suitable site to allocated as a cemetery site within the forthcoming Local Plan, to provide cemetery capacity for Market Harborough. HDC have undertaken an initial review of a large number of sites. This review considered size of the site, the potential capacity, access, topography, potential visual and heritage impacts, management constraints, development costs, and the potential for the site to accommodate different religious denominations and non-conformists.
- 1.2.3 The initial review undertaken by HDC identified 4 potential sites. Enzygo Ltd have now been tasked with looking at these four sites in much more detail. The output of this should identify further potential constraints, if these exist, which could preclude a cemetery development from coming forward within the site.

1.3 Methodology

1.3.1 Within each technical chapter of this report (chapters 5-8), the methodology used to undertake the assessment is detailed. In most cases, this was based on a combination of a desk-top review of the site, available data relating to the site, and where possible and necessary, a site visit.

1.4 Report format

1.4.1 This report has the following format:

-  Chapter 2 provides an overview of the findings, provided in a table format for clarify, and using a traffic-light grading system;
-  Chapter 3 provides a more specific introduction to the site being assessed;
-  Chapter 4 provides a planning review of the site. This includes a consideration of local and national planning policy, relevant designations, current land use, surrounding land use, historic land use, and planning history for the site.
-  Chapter 5 provides an ecological assessment of the site, based on both a desk-top review, and where possible, a site walkover.
-  Chapter 6 considers the landscape, visual and arboricultural effects of the development of a cemetery within the application site.
-  Chapter 7 considers the effect of the development of a cemetery on hydrology, the water environment and flood risk.
-  Chapter 8 considers the potential highways, access, safety and sustainability effects of the development of a cemetery within the site.
-  Chapter 9 summarises the above information, and provides an overall conclusion

2 OVERVIEW OF FINDINGS

2.1 Introduction

2.1.1 This chapter provides an overview of the findings detailed within this report. For clarity, this is provided in a table format, using a traffic light system.

2.2 Overall findings

| Assessment considerations | Beneficial | Neutral | Adverse |
|--|------------|---------|---------|
| National Planning policy Current national planning policy | | | |
| Local Planning policy Current local planning policy designation, proposed designation | | | |
| Designations National/ local designations within/ adjoining the application site | | | |
| Current land use Current use of the land, impact of development on the current use of the site | | | |
| Surrounding land use Current use of the surrounding land, impact of the development on the surrounding land use | | | |
| Sensitive receptors Nearest residential and commercial receptors | | | |
| Historic land use Previous land uses within the site | | | |
| Planning history Planning history within the site. Details of any applications that have been refused, reasons for refusal | | | |
| Ecological constraints Current ecological value of the site and offsite ecological features. | | | |
| Landscape/ townscape Effects Impact on pattern/ density, tranquillity, culture and landcover/ layout. | | | |
| Arboricultural impacts Assessment of trees/ shrubs/ hedges within the site, and their quality | | | |
| Visual Effects Visual impacts on sensitive receptors within 1km of the site | | | |
| Water Environment – Groundwater Source Protection Zone (SPZ) 1 | | | |

| Assessment considerations | Beneficial | Neutral | Adverse |
|---|------------|---------|-----------------------|
| | | | |
| Water Environment -Groundwater abstraction/wells/springs supplying water for human use. | | | |
| Water Environment -Soil/ Superficial Deposit thickness =>1.8m to give =>1m cover over coffin/body Graves should not be dug in bedrock | | | Not known |
| Groundwater Table: => 1 metre clearance between the base of the grave and the top of the water table – they shouldn't have any standing water in them when dug [water table depth should be =>2.8m] | | | Not known |
| Water Environment – Surface water The site is at least 30m from any spring or watercourse not used for human consumption | | | |
| Water Environment – Historic and current industrial land use | | | |
| Water Environment – Off site or perimeter ditch drainage: Burial sites should be at least 10 metres from any field drain, including dry ditches | | | Not known |
| Water Environment -Field/ditch drainage | | | Not known |
| Water Environment -Highway drainage | | | Not known |
| Water Environment -Artificial pathways: Groundwater movement along sewerage alignments e.g. coarse backfills. | | | Not known |
| Flood risk - Fluvial | In FZ1 | | Adjacent to waterbody |
| Flood risk - Surface Water | | | |
| Flood risk - Tidal | | | |
| Flood risk - Groundwater | | | |
| Flood risk - Artificial Drainage Systems | | | |
| Flood risk - Infrastructure Failure | | | |
| Flood risk - Site Drainage | | | |
| Highways Potential for significant highways impacts associated with development | | | |
| Access Existing access into the site and the suitability of this | | | |
| Sustainability lighting, bus facilities, footpaths, cycle routes, | | | |

| Assessment considerations | Beneficial | Neutral | Adverse |
|---|------------|---------|---------|
| Highway Safety speed, parking on-street, lighting | | | |

3 INTRODUCTION TO SITE

3.1 Introduction

3.1.1 This chapter provides a detailed introduction into the site being assessed. Further detail regarding the site is provided within the following chapters, where relevant.

3.2 Site location

3.2.1 The site being considered within this report is located at postal code LE16 7HP (Grid Reference SP 73083 89073). The site is located approximately 1.7km north of Market Harborough, and approximately 430m north of the edge of the town. Plans CRM.1287.002.PL.D.005.1 and CRM.1287.002.P.D.005.2 show the location of the site.

3.2.2 The site lies south of Leicester Lane, which runs along the sites northern boundary (figure 1). A canal runs along the east and south of the site. The canal is situated at a lower level than the site itself, and there is a significant amount of vegetation between the site and the canal. The canal towpath runs on the opposite side of the canal than the site.



Figure 1. Leicester Lane, north of the site

3.2.3 Figures 2 and 3 show views into the site from the canal towpath. Figure 4 shows the view looking into the site from Leicester Lane, to the north of the site.



Figure 2. View from the towpath looking north.

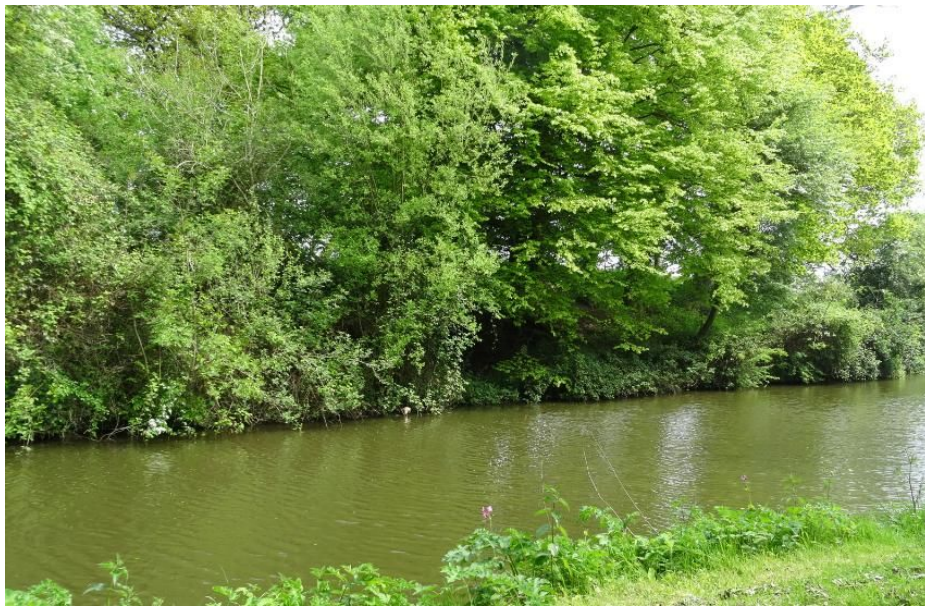


Figure 3. Screening between the site and the canal



Figure 4. View into the site from Leicester Lane, north of the site

3.3 Landownership

- 3.3.1 The landownership information for the site was obtained for the site from the Land Registry. The land owner was contacted using the postal address detailed on the Register. Access into the site was obtained, and therefore a detailed site walkover could be undertaken.

4 PLANNING REVIEW

4.1 Introduction

4.1.1 This chapter provides a review of the site from a planning perspective. This considers the impacts of planning policies on the development potential of the site for cemetery use. This includes a consideration of local and national planning policy; current land use; surrounding land use; historic land use; and previous planning applications submitted within the site.

4.1.2 The table at the beginning of this chapter provides a summary of the findings. Further detail to support the table is provided within the chapter.

4.2 Overview of findings

4.2.1 The table below provides a summary of the findings within this chapter. Further detail is provided within the text following the table.

| Assessment considerations | Beneficial | Neutral | Adverse |
|---|--|---------|---------|
| National Planning policy Current national planning policy | The only direct reference to cemetery sites within national planning policy is not relevant to this site. Development within the site would not conflict with national planning policy. The development would constitute sustainable development, as is thus consistent with national policy | | |
| Local Planning policy Current local planning policy designation, proposed designation | The site is not allocated within local policy for any specific use. The site currently comprises open space. Policy CS8 | | |

| Assessment considerations | Beneficial | Neutral | Adverse |
|---|---|--|---|
| | supports the development of cemeteries and burial grounds in open space | | |
| Designations National/ local designations within/ adjoining the application site | | | There are no relevant planning designations that would either support or preclude the development of a cemetery within the site. However, the listed building to the east of the site would have to be considered as part of a planning application. |
| Current land use Current use of the land, impact of development on the current use of the site | | | The development would result in the loss of grade 3 agricultural land. However, this is unlikely to preclude development |
| Surrounding land use Current use of the surrounding land, impact of the development on the surrounding land use | | | There are a number of residential dwellings within close proximity of the site. Development of the site may raise concerns with neighbouring properties. |
| Sensitive receptors Nearest residential and commercial receptors | | | The site is in close proximity to a listed building and a number of residential receptors. |
| Historic land use Previous land uses within the site | | Historic maps do not show historic development within the site | |
| Planning history Planning history within the site. Details of any applications that | | There have been no historic planning applications within the site. The development would not impact upon | |

| Assessment considerations | Beneficial | Neutral | Adverse |
|--|------------|---|---------|
| have been refused, reasons for refusal | | surrounding historic planning applications. | |

4.3 National Planning Policy

- 4.3.1 The National Planning Policy Framework (NPPF) sets out the national planning policy for the country. Within the NPPF, the only reference to cemetery sites is within paragraph 89. This states that *'A local planning authority should regard the construction of new buildings as inappropriate in Green Belt. Exceptions to this are:... provision of appropriate facilities for outdoor sport, outdoor recreation and for cemeteries,...'*
- 4.3.2 Although this site is not within the Green Belt, and thus the above policy is not directly relevant, the NPPF does suggest that the development of cemeteries within open countryside is acceptable in principle.
- 4.3.3 Beyond this, the key focus of the NPPF is sustainable development. This must consider social, economic and environmental aspects of development. Environmental aspects are considered in detail within the following chapters of this report.
- 4.3.4 In terms of social impacts, an adequate supply of cemetery spaces is essential to ensure a sufficient supply of burial space for residents. The development of a cemetery within the site is unlikely to result in any adverse social impacts.
- 4.3.5 In terms of economic impacts, a good supply of burial space is essential to ensure residents can be buried or cremated within the local area. If there is insufficient burial space within the local area, residents are forced to bury their family/ friends further afield, which often results in significantly higher costs.
- 4.3.6 In addition, cemetery capacity supports other services which are dependent on cemeteries for their business. This includes funeral directors, hearse providers and drivers, florists etc. As such, a good local supply of cemetery capacity results in wider economic benefits. The development of a cemetery within the site is unlikely to result in any adverse economic impacts.
- 4.3.7 As such, the development of a cemetery within the application site would not conflict with national planning policy, and is considered to comprise sustainable development.

4.4 Local Planning Policy

4.4.1 The current adopted planning policy for Harborough District Council comprises the following:

- The District Local Development Framework Core Strategy (2006-2028)
- Retained policies from the Local Plan (2001)

4.4.2 Within the proposals map updated following the adopted of the Core Strategy, the site is not allocated for a specific use (see figure 5 below). Land surrounding the site is also not allocated for any specific use.

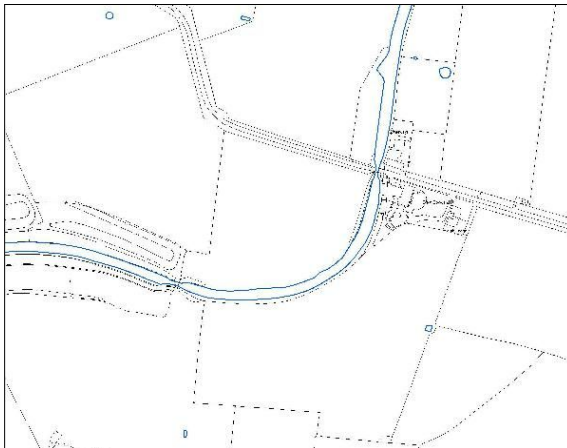


Figure 5. Site within the local policy proposals map

4.4.3 In addition, no land adjoining the site is allocated for a specific use. Policy CS8 within the Core Strategy relates to ‘Protecting and Enhancing Green Infrastructure’. Section C of this policy (open space, sport and recreation assets) states that *‘The contribution that open space, sport and recreation facilities make to the District’s Green Infrastructure network and the well-being of communities will be strengthened by... Securing new provision to help address identified deficiencies in existing open space provision, including cemeteries and burial grounds, both in quantity and quality...’*.

4.4.4 Policy CS12 relates to ‘Delivering Development and Supporting Infrastructure’. This states that *‘...Other community facilities not referenced in the Infrastructure Schedule (including facilities for Burials and Cremation, Places of Worship, Arts and Culture) will be supported subject to compliance with transport and design policies (Policies CS5 and CS11)...’* Policy CS5 relates to ‘Providing Sustainable Travel’ and policy CS11 considers ‘Promoting Design and Built Heritage’

4.4.5 The above policies are considered within the transport and landscape chapters of this report respectively.

4.4.6 The emerging Harborough District Local Plan does not set out any policies or land use designations which would conflict with the proposed development of this site for cemetery

use. Broad compliance with emerging local plan policies was a key part of HDC's stage one site review for the identification of potential cemetery sites. (MATTHEW – PLEASE CONFIRM)

4.5 Relevant designations and receptors.

- 4.5.1 A review of Defra's Magic mapping tool has been undertaken. Relevant ecological and landscape designations will be considered within the relevant chapters of this report.
- 4.5.2 Immediately to the east of the site, across the canal, lies Great Bowden Hall, a Grade II listed hall. This appears to comprise a number of separate residential dwellings and apartments. The impact of a cemetery development on the setting of the Grade II Listed Building would need to be considered as part of a planning application.
- 4.5.3 Figure 6 shows that there is a significant amount of vegetation between the listed building and the site being considered (to the left of the canal). As such, the development of a cemetery is unlikely to be clearly visible from the listed building shown within figure 6.



Figure 6. Screening between listed building and site being considered

- 4.5.4 In addition, there is residential development opposite Great Bowden Hall, across Leicester Lane. The development of a cemetery on the application site could raise some concerns from nearby residents. It is likely that given the relatively low impacts associated with a cemetery, concerns could be adequately addressed, particularly if trees and vegetation were retained along the canal corridor and site boundary. Nevertheless, it is likely that some form of consultation would be required.

4.6 Current and surrounding land use

- 4.6.1 The current land use comprises grade 3 agricultural land, with a canal running along the southern and eastern edge of the site, and vegetation running along the canal. Land to the west and south of the site (beyond the canal) also appears to be used for agricultural purposes.
- 4.6.2 Leicester Lane lies to the north of the application site, and beyond this, agricultural land. As detailed previously, Great Bowden Hall lies immediately beyond the canal, to the east of the site.
- 4.6.3 Excluding the small number of residential dwellings, the surrounding land is predominantly agricultural land and open countryside.
- 4.6.4 The development would not prevent the surrounding land from being used for its current purpose. Nor would it preclude future development on land surrounding the site.

4.7 **Historic land use**

- 4.7.1 A review of historic maps does not appear to show any previous development within the site.

4.8 **Planning History**

- 4.8.1 A review of HDC's planning application search has been carried out. This shows planning applications within the last five years. This review demonstrates that there have been no planning applications within the site boundary.
- 4.8.2 There are a number of historic applications associated with Great Bowden Manor to the east of the site, beyond the canal. These include works to trees (ref: 16/01542/TCA) and minor amendments to the existing flats and properties.
- 4.8.3 No historic planning applications are shown on other land surrounding the application site.

4.9 **Conclusion**





- 4.9.1 The above chapter considers the suitability of the site for a cemetery development, from a planning perspective. The development of a cemetery within the site appears to be consistent with national and local planning policy. The listed building to the east of the site, and its setting, would have to be considered as part of a planning application.
- 4.9.2 The site and surrounding land is currently used for agricultural purposes, and there are residential receptors within proximity to the site. A search of the sites planning history demonstrates that there are no historic applications within the site.

4.9.3 Overall, there do not appear to be any planning constraints which would preclude the development of a cemetery within the site.

5 ECOLOGICAL ASSESSMENT

5.1 Methodology

5.1.1 Desk study details were obtained from the following sources on the associated dates to provide background on ecological features in the vicinity of the site. Records over 10 years old for transient species and all species protected from sale only are excluded. In each case the search included the site and the specified area beyond the site boundary. The search radius was based on the professional judgement of the ecologist leading the appraisal, taking into account the scope of the proposed works and associated potential impacts, with reference to current guidelines for preliminary ecological appraisal (CIEEM, 2013). Records obtained included:

-  European statutory sites within a 5km radius, national statutory sites within a 2km radius, and England HPI identified as requiring action in the UK BAP (JNCC, 2015) and Ancient Woodland within a 0.5km radius (Natural England GIS Digital Boundary Database and Natural England Site Designations, on 30th May 2017);
-  TPOs and Conservation Areas within the immediate zone of influence (Leicestershire County Council, 30th May 2017);
-  Waterbodies within a 0.5km radius (Online mapping sources including: Google Maps; MAGIC; and Ordnance Survey Street View, 30th May 2017); and
-  Locally designated wildlife sites, Legally protected species, England SPI identified as requiring action in the UK BAP (JNCC, 2015), Local BAP Habitats/Species, any Notable species (which includes: Species of conservation concern and RDB species (JNCC, 2014a), BOCC (Eaton et al., 2015); and nationally rare and nationally scarce species (JNCC, 2014b)) and Invasive species within a 0.5km radius, and important hedgerows/veteran trees within the immediate zone of influence (Northamptonshire Biodiversity Records Centre, and Leicester and Rutland Environmental Records Centre, 31st May 2017).

5.1.2 The Extended Phase I Habitat Survey was undertaken on 18th May 2017 by a Consultant Ecologist from Enzygo (Kirsty Roger, MZool (Hons) Grad CIEEM) who satisfies all necessary field survey competencies as stipulated by the Chartered Institute for Ecology and Environmental Management (CIEEM). Weather conditions on the day of survey were dry, with 40% cloud cover, a light wind, and a temperature of 17°C.

- 5.1.3 Phase I Habitat Survey (JNCC, 2010) is a standard technique for obtaining baseline ecological information for large areas of land in which the main vegetation types present within the survey area are mapped using a standard set of habitat categories. In addition to mapping, each of the main habitats within the survey area was described; including details of component plant species abundances (recorded using the DAFOR scale: D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare). Incidental observations of Legally protected species, England SPI /Local BAP Species, any Notable species (which includes: Species of conservation concern and RDB species; BOCC; and nationally rare and nationally scarce species) and Invasive species, and the potential for such species to occur on site (and in the surrounding landscape where relevant) were also noted; however, no specific species surveys were undertaken.
- 5.1.4 Potential ecological constraints to development have been identified from desk study and field survey data. Where ecological constraints to development are identified, further survey requirements and/or avoidance, mitigation, compensation measures that are proportionate to the predicted degree of risk to biodiversity and to the nature and scale of the proposed works are described.
- 5.1.5 The English names of flora and fauna species are given in the main text of this report.
- 5.1.6 This document does not contain a comprehensive list of botanical species on site. Only plant species characteristic of each habitat and incidental observations of notable plant species were recorded. In addition, many plant species are only evident at certain times of the year and so some plant species may have gone undetected. Data held by consultees may not be exhaustive. The absence of evidence, does not indicate evidence of absence. Enzygo cannot take responsibility for the accuracy of external data sources and as such discrepancies and inaccuracies may occur. Natural England do not hold information on ancient woodland less than 2ha in size.

5.2 Overview of findings

| Assessment considerations | Beneficial | Neutral | Adverse |
|--|------------|---|---------|
| Ecological constraints Current ecological value of the site and offsite ecological features. | | The site is of low ecological value with a low number of Phase II surveys required (IF impacts cannot be avoided) which could require subsequent mitigation. Minor additional fee expenditure required, and/or seasonal timing constraints could be applicable. | |

5.2.1 Ecological features identified by the desk study and field survey are summarised along with any identified constraints in Table 1 below.

Table 1. Ecological features/constraints

| Ecological Feature | Details | Constraint |
|---|--|---|
| Statutory sites designated or classified under international conventions or European legislation | | |
| None | - | - |
| Statutory sites designated under national legislation (including IRZ) | | |
| Great Bowden Borrowpit SSSI, 1.2km NE | Tall fen plant community with unusual marsh flora | No (no aquatic runoff etc) |
| Locally designated wildlife sites | | |
| Grand Union Canal Harborough Arm LWS, S & E edge of site | Canal with stands of emergent vegetation | Yes – AVOID impacts (8m buffer from banks, no runoff into) |
| Great Bowden, Leicester Lane hedge LWS, 400m E | Roadside species-rich hedge, with standard trees | No (off-site) |
| Green Lane Ash Tree LWS, 500m E | Mature Ash tree | No (off-site) |
| England HPI, Local BAP Habitats, Ancient Woodland, Important Hedgerows, Veteran Trees, TPOs and Conservation Areas | | |
| Deciduous Woodland HPI | Off-site to south-west | No (off-site) |
| Hedgerow HPI (potentially Important) | Around site boundaries | Yes – AVOID impacts (need to retain and use existing gate) or survey required |
| Green/Blue Infrastructure & Dark Zones | | |
| Hedge network | Boundary hedgerows form part of the wider hedger network/ green infrastructure | Yes – AVOID impacts (retain) |
| Grand Union Canal | Off-site along southern boundary | Yes – AVOID impacts (8m buffer from bank) |
| Protected and Notable Species | | |

| | | |
|------------------------------|--|---|
| Bats | Records of 6 species in area. No buildings. Mature trees could contain Potential Roosting Features (PRFs). Boundary hedgerows and canal provide low-moderate bat suitability (Collins, 2016) | Yes – AVOID impacts (retain) or survey required |
| Badger | Several records in area. Potential for setts in dense scrub along edge of canal. | Yes – AVOID impacts (retain dense scrub areas) or survey required |
| Dormouse | Potential within boundary hedgerows, trees and scrub | Yes – AVOID impacts (retain boundary hedgerows, trees and scrub) or survey required |
| Otter | Records in area. Potential within Grand Union Canal | Yes – AVOID impacts (8m buffer from bank) |
| Water Vole | Records in area. Potential within Grand Union Canal | Yes – AVOID impacts (8m buffer from bank) |
| Other Protected Mammals | None | - |
| Specially Protected Birds | None | - |
| All Other Birds | Records of 24 species in area. General nesting opportunities within hedgerows, trees and scrub. | Yes – AVOID impacts (clearance outside nesting period or ECoW checks) |
| Common Reptiles | Several records in area. Limited potential around field edges and throughout scrub alongside canal | Yes – AVOID impacts (sensitive clearance of suitable habitat under ECoW) |
| Great Crested Newt | Large number of records in area. EPS Licences in area around Harborough. Waterbodies within 500m radius, and suitable terrestrial habitat | Yes – AVOID impacts (works to terrestrial habitats under PWMS) or survey and licence. |
| Other Protected Herpetofauna | None | - |
| White-clawed Crayfish | Records in area. Potential within Grand Union Canal | Yes – AVOID impacts (no disturbance/runoff to canal) |
| Fish/Marine | None | - |
| Protected Invertebrates | None | - |
| Protected Flora | None | - |

| | | |
|---|------|---|
| England SPI/Local BAP and Notable species | None | - |
| Invasive Flora | None | - |
| Invasive Fauna | None | - |

6 LANDSCAPE/ VISUAL/ARBORICULTURAL EFFECTS

6.1 Introduction and Methodology

- 6.1.1 Any potential effects on the local landscape and the landscape of the site itself, the visual amenity and any arboricultural features on and around the site (trees and hedgerows) were broadly examined in a desk study and during a visit of the site carried out on 11th May 2017.
- 6.1.2 The desk study established the type of land use and landscape character of the location and created a list of potential visual receptors which may be sensitive to any changing views of the site. The online Magic Map Application provided by the Department for Environment, Food and Rural Affairs (DEFRA) has also been checked for any landscape designations within a 1km radius of the site which may be affected by development of the site.
- 6.1.3 To establish the legal status of any arboricultural features on site, i.e. trees, tree groups, woodland and hedgerows, Enzygo have liaised with Harborough District Council to confirm whether there are any Tree Preservation Orders (refer to *Town and Country Planning Act 1990* and the *Town and Country Planning (Tree Preservation) (England) Regulations 2012*) protecting any trees within or around the site boundary and whether there are any Conservation Areas (refer to *Section 211* of the *Town and Country Planning Act 1990*) affecting the site. It is further highlighted that hedgerows within and around the site may be protected (refer to *The Hedgerow Regulations 1997*).
- 6.1.4 Following the desk study, the site was visited to describe the landscape character of both the site and its surroundings using a number of parameters, including the landscape pattern and density, tranquillity, cultural aspects and landcover and layout of the site. The value and sensitivity of any arboricultural features to development were also assessed. As access into the site was not permitted at the time, the assessment was carried out from publicly accessible points along the site boundaries.
- 6.1.5 In a final step, the potential views established in the desk study were broadly assessed for their potential sensitivity and quality by visiting visual receptors where access allowed this.
- 6.1.6 The findings of the desk-study and the site visits are shown in plans CRM.1287.002.L.D.003 and CRM.1287.002.L.D.004.
- 6.1.7 The assessments were broadly based on recommendations made in *Guidelines For Landscape And Visual Impact Assessment* by the Landscape Institute and British Standard *BS 5837:2012 Trees in relation to design, demolition and construction*.

6.2 Overview of findings

6.2.1 Based on the findings of both the desk-study and the site visit, the following broad assessments have been made of the effects the development would have on the local landscape, views, trees and hedgerows:

| Assessment considerations | Beneficial | Neutral | Adverse |
|--|------------|---|---------|
| Landscape/ townscape Effects Impact on pattern/ density, tranquillity, culture and landcover/ layout. | | The total loss of agricultural land would have a significant effect on the land use of the site. However, the enclosed, green and tranquil character of the site is not expected to change. A change of the wider landscape character is unlikely due to the dense and tall vegetation surrounding the site to the north, east and west. | |
| Arboricultural impacts Assessment of trees/ shrubs/ hedges within the site, and their quality | | There are no trees within the centre of the site. There are mature hedgerows and trees of moderate and high value along the site boundary and in the south-west corner of the site. Sensitive design and construction methodologies can keep the impact on existing features to a minimum. Where possible, new hedgerow and tree planting within the site and along the boundary can improve the site. | |
| Visual Effects Visual impacts on sensitive receptors within 1km of the site | | The dense vegetation surrounding the site limits the views into the site from potentially sensitive receptors which are invariably located to the south and east of the site, including the Grand Union Canal and its towpath which form a section of the site boundary and which are protected by the Grand Union Canal Conservation Area. Great Bowden Hall, a Grade II Listed Building, is located immediately to the east of the site but its setting is largely characterised by the canal, its wooded embankments and the wider landscape to the east of the site. No discernible deterioration or improvement in the existing views is expected. | |

6.3 The Landscape/ Arboricultural/ Visual Effects

6.3.1 The site is an arable field enclosed by dense and tall native vegetation which separates it from Leicester Lane in the north and the Grand Union Canal in the east and south. To the west, the site opens into an agricultural landscape which is characterised by a traditional pattern of fields and straight hedgerows with scattered hedgerow trees. The site is flat in the west, with minor level changes along the canal embankment in the east. Due to its relative distance to any significant settlements and Leicester Lane being a relatively quiet country lane, the site

feels enclosed, small and tranquil, with its character being influenced only by the surrounding vegetation and the open field to the west.

- 6.3.2 The southern and eastern site boundary lies within the Grand Union Canal Conservation Area. A Grade II Listed Building, Great Bowden Hall, is located immediately to the east of the site, on the opposite side of the canal.
- 6.3.3 The site is characterised by mature vegetation along its boundaries, comprising mature trees and shrubs of predominantly native origin which form an almost continuous screen along the north, east and south. The most important arboricultural feature is a group of mature, healthy and native trees which fill the south-east corner of the site. This continues to the east to become an informal and fragmented belt of native vegetation which encloses the site in the east and south, with some early mature trees developing a significant screen between the site and the canal including Great Bowden Hall. Both the mature tree group and the tree and shrub belt are likely to fall within the Grand Union Canal Conservation Area and would therefore be protected. Along Leicester Lane in the north, native shrubs and two scattered mature trees form a tall hedgerow which is typical for field boundaries in the local area. It is expected that the development of the site could have some impact on the arboricultural features unless sensitive design solutions are prepared and adequate protection is provided.
- 6.3.4 Due to the dense vegetation enclosing the site, views into the site are limited. The most sensitive receptors are the Grade II Listed Building in the east and the users of both the canal and the towpath in the east and south. The northern fringe of Harborough is within the 1km search area but the local landform and vegetation blocks any views of the site. Similarly, views from the network of footpaths in the north and east are very limited. There are some glimpsed views from Leicester Lane, however, the users of the road are not considered sensitive receptors.
- 6.3.5 The setting of the Grade II Listed Building is mainly influenced by the canal, the vegetation along its edges and the relatively open landscape to the east and it is therefore not expected to be influenced by the form of development considered for the site in the west. However, partial and glimpsed views into the site are possible from the first-floor windows.
- 6.3.6 There are partial views into the site from relatively short sections of the canal and the towpath, only blocked by the scattered vegetation and ground levels which are generally lower on the towpath. Where views are possible, the landscape design of the site could mitigate any adverse effects, including boundary tree and shrub planting.

7 HYDROLOGY/ WATER ENVIRONMENT AND FLOOD RISK

7.1 Introduction

7.1.1 This chapter provides a qualitative assessment of the site’s baseline hydrology, flood risk and drainage characteristics and assesses the risk of the proposed cemetery development to groundwater and groundwater-fed surface waters. The appraisals have been undertaken through desk-based study and site walkover surveys. This includes a qualitative appraisal to understand the risk of flooding to the Site and the potential impacts the development may present to risks of flooding onsite and/or offsite if flooding is not effectively managed.

7.2 Overview of findings

7.2.1 The table below provides a summary of the findings within this chapter.

| Assessment considerations | Beneficial | Neutral | Adverse |
|--|--|---------|---|
| Water Environment – Groundwater Source Protection Zone (SPZ) 1 | The Site is outside SPZ 1. | | |
| Water Environment -Groundwater abstraction/wells/springs supplying water for human use. | The Site is more than 250m away from any well, borehole or spring. | | |
| Water Environment -Soil/ Superficial Deposit thickness =>1.8m to give =>1m cover over coffin/body Graves should not be dug in bedrock | | | Soil/ superficial deposit thickness and depth to bedrock not known. This does not preclude cemetery development but further Tier 2 investigation is required. |
| Water Environment – Groundwater Table: => 1 metre clearance between the base of the grave and the top of the water table – they shouldn’t have any standing water in them when dug [water table depth should be =>2.8m] | | | Groundwater table depth not known. This does not preclude cemetery development but further Tier 2 investigation is required. |
| Water Environment – Surface water: The site is at least 30m from any spring or watercourse not used for human consumption | | | The Site is less than 30m from a watercourse. |

| | | | |
|--|---|--|---|
| Water Environment – Historic and current industrial land use | The historic and current land uses of the site and surrounding area are highly unlikely to have introduced significant pollution. | | |
| Water Environment – off site or perimeter ditch drainage. Burial sites should be at least 10 metres from any field drain, including dry ditches | | | On site drainage not known. Further investigation is required. |
| Water Environment -Field/ditch drainage | | | Distance from field drains/ dry ditches not known. |
| Water Environment -Highway drainage | | | Off-site highway drainage into site not known. |
| Water Environment -Artificial pathways: Groundwater movement along sewerage alignments e.g. coarse backfills | | | Artificial subsurface pathways (e.g. land drains) not known. |
| Flood risk - Fluvial | The Site is within Flood Zone 1, at low risk of fluvial flooding | | The Site is bounded to the east and west by the Grand Union canal |
| Flood risk - Surface Water | | | Approximately 15% of the site and sections of the access route are at risk of surface water flooding associated with the Grand Union canal and a surface water flow pathway |
| Flood risk - Tidal | The Site is at negligible risk from tidal flooding | | |
| Flood risk - Groundwater | The Site is at negligible risk from groundwater flooding | | |
| Flood Risk - Artificial Drainage Systems | There are no reports of sewer flooding at the Site in the SFRA | | |

| | | | |
|--|---|--|---|
| Flood risk - Infrastructure Failure | There are no reports of infrastructure failure causing flooding at the Site in the SFRA | | |
| Flood Risk - Site Drainage | The nearest surface and foul sewer networks to the Site are public | | The Site is underlain by slowly permeable seasonally wet soils. The closest public sewer networks are over 600m from the Site and the bedrock beneath the Site is of low to moderate permeability. Surface water flooding may indicate poor drainage. |

7.2.2 The flood risk at the Site is qualitatively assessed based on a desktop review including:

- Review of available flood mapping, sewer asset plans, the Strategic Flood Risk Assessment (SFRA), and any other relevant data and documentation;
- Assessment of flood risk from all sources, including; tidal, fluvial, surface water, groundwater, sewer, and infrastructure failure;
- Assessment of flood risk against NPPF/PPG ID:7 guidance documents.

7.2.3 The objectives of the Tier 1 groundwater risk assessment are to:

- Provide information on the environmental quality of the ground present on the site;
- and
- To assess the potential environmental risks posed by the site to the groundwater.

7.2.4 The risk of pollution to groundwater at the Site is assessed by following Environment Agency Guidance on groundwater risk assessments for cemeteries and burial sites (14 March 2017¹) which supersedes all previous guidance.

7.2.5 The assessment follows the recommended tiered approach. This means that the greater the risk of groundwater pollution, the more detailed assessment is required. The risk assessment can be stopped at any stage should enough information be obtained to demonstrate that the activity does not pose a pollution risk to groundwater.

¹ <https://www.gov.uk/guidance/cemeteries-and-burials-groundwater-risk-assessments>

7.2.6 This assessment is a Tier 1 assessment comprising qualitative risk screening to investigate what the risks are, whether more detailed assessment is needed, and what that assessment would need to focus on (risk prioritisation).

7.2.7 The Tier 1 assessment is undertaken in view of the Environment Agency’s groundwater position statement² L 1- *Locating cemeteries close to a water supply used for water supply for human consumption*, which is that the Environment Agency will normally object to the locating of any new cemetery or the extension of any existing cemetery, within SPZ1, or 250 metres from a well, borehole or spring used to supply water that is used for human consumption, whichever is the greater distance.

7.2.8 Position Statement L3: *Cemeteries: protecting groundwater in highly sensitive locations* also places a high priority on protecting groundwater within principal aquifers and groundwater catchments used for drinking water supply, and new larger cemetery developments in such areas might not be appropriate.

7.2.9 *Cemeteries and burials guidance on preventing groundwater pollution*³ provides more detail, in that to meet minimal groundwater protection a burial site must be:

- outside a source protection zone 1 (SPZ1);
- at least 250 metres from any well, borehole or spring supplying water for human consumption or used in food production – for example at farm dairies;
- at least 30 metres from any spring or watercourse not used for human consumption or not used in food production; and
- at least 10 metres from any field drain, including dry ditches.

All graves must:

- have at least 1 metre clearance between the base of the grave and the top of the water table – they shouldn’t have any standing water in them when dug;
- not be dug in bedrock or areas susceptible to groundwater flooding; and
- be deep enough so at least 1 metre of soil will cover the top of the coffin or body.

7.2.10 Proposals for new cemetery developments for greater than 100 burials per year are considered high-risk even in a lower sensitivity groundwater scenario. Such proposals will only

² The Environment Agency’s approach to groundwater protection March 2017 Version 1.0

³ <https://www.gov.uk/guidance/cemeteries-and-burials-prevent-groundwater-pollution>


be agreed by the Environment Agency where a developer can demonstrate through detailed risk assessment that, given the site-specific setting and the engineering methods proposed, groundwater pollution will be avoided.


7.2.11 It is noted that that all cemetery developments and burials must maintain an unsaturated zone below the level of the base of the grave(s). The Environment Agency will work with local authorities to identify alternative site and burial options where necessary.

7.2.12 It is noted that Market Harborough Council assume a rate of 3000 burials per ha (25% full burials and 75% ashes burials) and that deaths per annum for the Market Harborough population is estimated as 177⁴.


7.3 Sources of Information

7.3.1 The following information was used in preparation of the hydrology/flood risk assessment:

-  Ordnance Survey 1:25,000 mapping (Explorer 223 Northampton & Market Harborough);


-  Environment Agency online flood maps ((Flood Map for Planning⁵, Long Term Flood Risk Assessment for Locations in England⁶ and Environment Agency – What’s in Your Backyard⁷);

-  Harborough District Strategic Flood Risk Assessment (SFRA) and associated mapping;

-  National Soils Resources Institute: Soilscales online mapping⁸;

-  British Geological Survey [BGS] online mapping: Geology of Britain Viewer⁹;

-  Landmark Promap: Flood Data Package: Additional flood mapping;

-  Geosmart 1 in 100-year groundwater flood risk map;

-  Anglian Water Asset Plans.

7.3.2 The following information was used in the preparation of the Tier 1 Qualitative Groundwater Risk Assessment:

⁴ A site assessment study for the Market Harborough new cemetery








⁵ <https://flood-map-for-planning.service.gov.uk/>

⁶ <https://flood-warning-information.service.gov.uk/long-term-flood-risk/>

⁷ http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

⁸ <http://www.landis.org.uk/soilscales/>

⁹ <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

-  Environment Agency – What’s in Your Backyard? – online resources; (Groundwater Source Protection Zones, BGS Aquifer Maps, Groundwater Vulnerability Maps)³;
-  National Soils Resources Institute: Soilscales online mapping⁴;
-  British Geological Survey (BGS) online map resources⁵;
-  Environment Agency guidance on preventing hazardous and non-hazardous substances from entering groundwater¹⁰;
-  Cemeteries groundwater pollution guidance^{11,12};
-  Groundsure MapInsight, GeoInsight and Envirolnsight reports (www.emapsite.com)¹³;
-  Consultation with the local authority on any private or unlicensed wells boreholes within 1km.

7.4 Site Walkover

- 7.4.1 Enzygo staff conducted a walkover of the Site on the 11th May 2017, during which a photographic record was made.
- 7.4.2 The site is currently used as an agricultural field.
- 7.4.3 Historically the site has always been an open agricultural field.

7.5 Catchment Hydrology

- 7.5.1 Environment Agency online mapping (Figure 8) and Ordnance Survey mapping shows no ‘main rivers’ or ‘ordinary watercourses’ within or near to the Site.
- 7.5.2 The Grand Union Canal flows around the Site. Flow direction was unable to be determined.
- 7.5.3 It is unclear whether or not field drains are present on the site.

7.6 Water Assets

- 7.6.1 Anglian Water asset plans (Figure 7), show no sewer assets within the Site boundary. The closest sewer asset is a public foul water sewer within Leicester Lane approximately 625m east

¹⁰ <https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution/>

¹¹ <https://www.gov.uk/guidance/cemeteries-and-burials-prevent-groundwater-pollution>

¹² <https://www.gov.uk/guidance/cemeteries-and-burials-groundwater-risk-assessments>

¹³ www.emapsite.com

of the Site. There is also a public surface water network within Leicester Lane approximately 700m to the east of Site.



Figure 7. Anglian Water asset plans

7.7 Hydrogeology

Soils

- 7.7.1 The site is underlain by ‘Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils’.

Superficial Deposits

- 7.7.2 BGS mapping does not record superficial deposits on site, and the nearest superficial deposits are 94m south (Mid Pleistocene Till – Diamicton).

Bedrock

- 7.7.3 The Dyrham Formation bedrock is predominantly clays and silts. it forms a Secondary (undifferentiated) aquifer unit, assigned where it is not possible to assign category A or B to a rock type. In general, these layers have been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.
- 7.7.4 The overall site bedrock permeability is assessed as Low to Moderate, and of ‘Mixed’ flow type.
- 7.7.5 There are no permeable aquifer units within 90m of the site.

Surface and groundwater abstractions

- 7.7.6 Environment Agency online mapping shows there are no groundwater Source Protection Zones (SPZ) within 500m of the site.
- 7.7.7 There are no groundwater or potable water abstractions within 1500m of the Site, according to EA records. The Local Authority (Harborough District Council) was consulted as to the presence of private groundwater abstraction/supply, but no further information was available.
- 7.7.8 The only surface watercourse within 500m of the site is the Grand Union Canal, which is 4m south.
- 7.7.9 The nearest BGS borehole to the site is approximately 650m to the east, and is situated in different geology. Therefore, the borehole record is not relevant to this site.
- 7.7.10 Groundwater levels at Site are controlled by the permeability of the bedrock. Flow is likely to occur in the fissured clay mudstone intervals within the Dyrham Formation, and following the Site topography which falls slightly south and south-eastward.

7.8 Historical Sources of Contamination

- 7.8.1 Table 2 records potential sources of historical ground contamination from 1:2,500 and 1:10,000 scale mapping, aerial photography and online resources, both on site and within 250m.

Table 2. Potential Contaminative Historical Land Use/Ground Working Features

| Map/Imagery Date and scale | On Site | Surrounding Area (within 250m) |
|-------------------------------|--|--|
| 1885 (1:10,000) | Site is used as an agricultural field which borders on to the Grand Union Canal. No historic potentially contaminative features are noted. | A large red brick house (Great Bowden Hall) with landscaped gardens is immediately opposite the site on the east canal bank, with a brick bridge. Leicester Lane borders the site to the north. Boat House 44m north, Unspecified Ground Workings 146m west. |
| 1886 (1:2,500) | No significant changes. | No significant changes. |
| 1901 (1:10,000) | No significant changes. | Unspecified Tank 41m north-east. |
| 1904 (1:2,500) | No significant changes. | Small pond immediately north of Leicester Lane. |
| 1924-28 (1:10,000) | No significant changes. | No significant changes. |
| 1929 (1:2,500) | No significant changes. | No significant changes. |
| 1950 (1:10,000) | No significant changes. | No significant changes. |
| 1958 (1:10,000) | No significant changes. | No significant changes. |

| | | |
|-----------------------|-------------------------|--|
| 1960 (1:2,500) | No significant changes. | No significant changes. |
| 1961 (1:2,500) | No significant changes. | No significant changes. |
| 1967-68 (1:10,000) | No significant changes. | No significant changes. |
| 1973-76 (1:2,500) | No significant changes. | Pond immediately north of Leicester Road has been backfilled. Unspecified Heaps 43m & 244m west. |
| 1982-83 (1:2,500) | No significant changes. | No significant changes. |
| 1985 (1:2,500) | No significant changes. | No significant changes. |
| 1993 (1:2,500) | No significant changes. | No significant changes. |
| 2002 (1:2,500) | No significant changes. | No significant changes. |
| 2010 (1:2,500) | No significant changes. | No significant changes. |
| 2014 (1:2,500) | No significant changes. | No significant changes. |

7.8.2 There are unlikely to be any significant sources of contamination, based on the historical land use. The Unspecified Tank 41m north-east identified in the 1901 map represents a very low risk.

7.8.3 There are a no potentially contaminative current industrial land uses identified within 500m of the site.

7.8.4 There are no active or historical landfill or waste disposal sites within 1000m of the site.

7.8.5 Overall it is highly unlikely that any contamination from off-site has migrated into the site.

7.9 Flood Risk Appraisal (Hydrology)

Environment Agency Flood Map

7.9.1 The Environment Agency flood map (Figure 8) shows the entire Site is located within Flood Zone 1; outside the extent of the 1 in 1000-year (0.1% AEP) risk of fluvial (river) and tidal (sea) flooding, and therefore at 'low' risk of fluvial flooding.



Figure 8. Fluvial Flooding

- 7.9.1 The Environment Agency online surface water flood map (Figure 9) shows that the majority of the Site is located outside the mapped extent of surface water flooding. However, there is a risk of surface water ponding within the central and southern extents of the Site, associated with a 1 in 1000-year surface flooding event.
- 7.9.2 There is also a risk of a surface water flow path related to the Grand Union Canal, associated with a 1 in 75-year surface flooding event. The 1 in 75-year and 1 in 1000-year surface water flooding events associated with this surface water flow pathway cause surface water flooding along Leicester Lane, a potential access road to the Site.

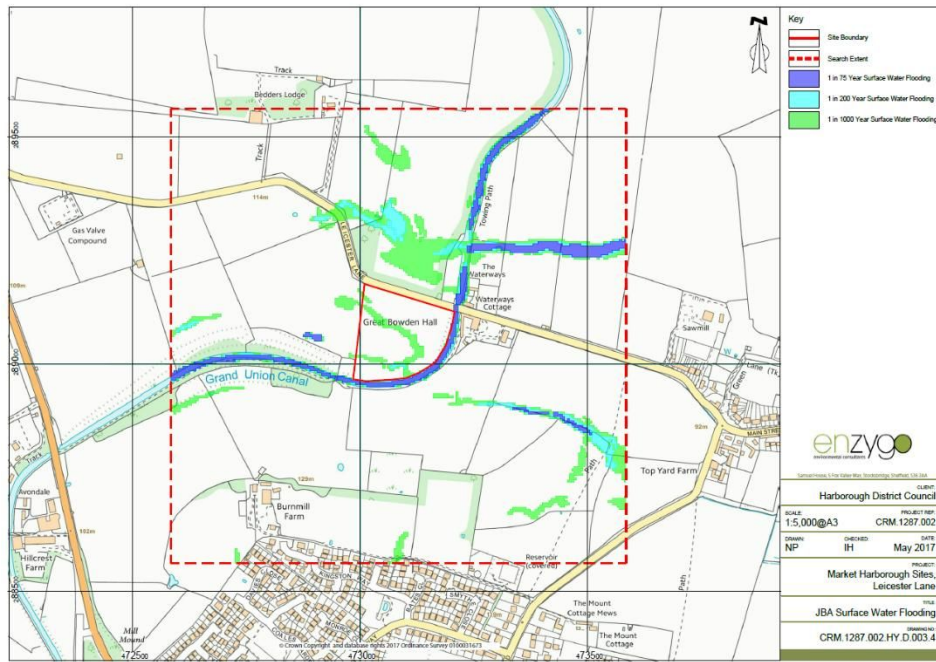


Figure 9. Surface Water Flooding

Tidal Flooding Sources

7.9.3 The Site is not located close to any tidally affected flooding sources. Therefore, flooding from this source is considered negligible.

Flooding from Rising / High Groundwater

7.9.4 Groundwater flooding tends to occur sporadically in both location and time. It tends to affect low-lying areas, below surface infrastructure and buildings (for example, tunnels, basements and car parks) underlain by permeable rocks (aquifers) at outcrop or near-surface.

7.9.5 The BGS Groundwater Flooding Susceptibility Map (Figure 10) indicates that the Site is not susceptible to groundwater flooding.

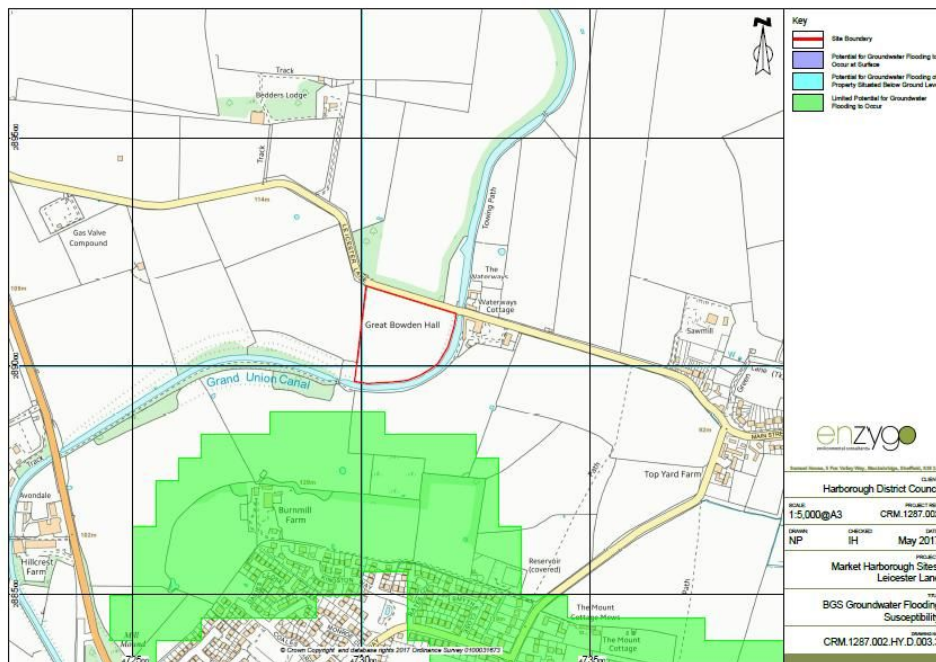


Figure 10. BGS Groundwater Flooding Susceptibility Map

7.9.6 The SFRA states that no records of groundwater flooding were found. However, this does not mean that groundwater flooding does not occur within the area, more that it has not been reported. Following periods of sustained rainfall, there may be potential for groundwater flooding to occur, which should be considered in the planning process of any new developments within the district.

Flooding from Artificial Drainage Systems

7.9.7 Sewer flooding occurs when urban drainage networks become overwhelmed and maximum capacity is reached. This can occur due to blockages in the network or where inflows exceed flow capacity.

7.9.8 Modern sewers are built to the guidelines within Sewers for Adoption¹⁴. These sewers have a design standard to the 1 in 30-year flood event and therefore most sewer systems will surcharge during rainstorm events with a return period greater than 30 years (e.g. 100 years).

7.9.9 Anglian Water is responsible for the disposal of waste water within the area. Information with regards to sewer and water main flooding contained within the SFRA has been reviewed as part of this FRA together with their statutory DG5 Flood Register of properties/areas which are at risk of flooding from public sewerage.

¹⁴ WRC (2012) Sewers for Adoption 7th Edition.

7.9.10 There are no sewer assets located within the Site boundary. The closest sewer asset is a public foul sewer within Leicester Road approximately 625m east of the Site. There is also a network of public surface sewers within Leicester Road approximately 700m east of the Site. Based on a review of the SFRA, there are no recorded sewer flooding incidents located within or to the immediate vicinity the Site.

Flooding from Infrastructure Failure

i. Highway Drainage

7.9.11 Based on the SFRA, there are no recorded historic highway flooding incidents within the vicinity of the Site.

ii. Reservoir

7.9.12 Based on a review of the Environment Agency online flood mapping, the Site is not at risk of reservoir flooding.

7.10 Tier 1 Qualitative Risk Assessment

Contaminant Source-Pathway-Receptor Model

7.10.1 To constitute an environmental risk, there must exist a source of contamination, a receptor or receptors (such as a groundwater body/aquifer, or river); and a pathway (pollutant linkage) for contaminants to travel along linking the source and receptor.

On-site Sources of Contamination

7.10.2 The undeveloped site is considered uncontaminated.

7.10.3 The proposed development is a cemetery for the burial of human remains. This activity can result in the variety of substances and micro-organisms being released into local ground, and potentially into groundwater/ groundwater-fed rivers. These pollutants are typically dissolved and gaseous organic compounds and ammoniacal nitrogen, along with other nitrogenous compounds. There is also the potential for elevated pH locally because of high calcium levels.

7.10.4 A typical human corpse comprises 64% water, 20% protein, 1% carbohydrate, 5% mineral salt and ~10% fat. The composition in terms of elements is summarised in Table 3:

Table 3. Elemental components of a typical human body “Assessing the Groundwater Pollution Potential of Cemetery Developments, Ref: SCHOO404BGLA-E-A, April 2004”.

| Element | Mass (g) | Element | Mass (g) |
|---------|----------|----------|----------|
| Oxygen | 43,000 | Chlorine | 95 |

| | | | |
|-------------|--------|-----------------|---------|
| Carbon | 16,000 | Magnesium | 19 |
| Hydrogen | 7,000 | Iron | 4.2 |
| Nitrogen | 1,800 | Copper | 0.07 |
| Calcium | 1,100 | Lead | 0.12 |
| Phosphorous | 500 | Cadmium | 0.05 |
| Sulphur | 140 | Nickel | 0.01 |
| Potassium | 140 | Uranium | 0.00009 |
| Sodium | 100 | Total Body Mass | 70,000 |

7.10.5 A summary of the main decomposition products of the decay of human remains is summarised in the Environment Agency (EA) guidance ¹⁵. A typical human corpse, approximately 70kg in weight, normally decays completely within 10-12 years.

7.10.6 It is estimated that over half of the pollutant load leaches within the first year and reduces by half in each subsequent year, so that less than 0.1% of the original pollutant loading remains after 10 years. Details are shown in Table 4 below:

Table 4. Source: Table 4 Potential contaminant release (kg) from a single 70kg burial “Assessing the Groundwater Pollution Potential of Cemetery Developments, Ref: SCHOO404BGLA-E-A, April 2004”.

| Year | TOC | NH ₄ | Ca | Mg | Na | K | P | SO ₄ | Cl | Fe |
|------|------|-----------------|-------|--------|--------|--------|--------|-----------------|--------|--------|
| 1 | 6.00 | 0.87 | 0.56 | 0.010 | 0.050 | 0.070 | 0.250 | 0.210 | 0.048 | 0.020 |
| 2 | 3.00 | 0.44 | 0.28 | 0.005 | 0.025 | 0.035 | 0.125 | 0.110 | 0.024 | 0.010 |
| 3 | 1.50 | 0.22 | 0.14 | 0.003 | 0.013 | 0.018 | 0.063 | 0.054 | 0.012 | 0.005 |
| 4 | 0.75 | 0.11 | 0.07 | 0.0001 | 0.006 | 0.009 | 0.032 | 0.027 | 0.006 | 0.003 |
| 5 | 0.37 | 0.05 | 0.03 | <0.001 | 0.003 | 0.004 | 0.016 | 0.012 | 0.003 | 0.001 |
| 6 | 0.19 | 0.03 | 0.02 | <0.001 | 0.002 | 0.002 | 0.008 | 0.006 | 0.002 | <0.001 |
| 7 | 0.10 | 0.01 | 0.01 | <0.001 | 0.001 | 0.001 | 0.004 | 0.003 | <0.001 | <0.001 |
| 8 | 0.05 | <0.01 | <0.01 | <0.001 | <0.001 | <0.001 | <0.001 | 0.002 | <0.001 | <0.001 |
| 9 | 0.02 | <0.01 | <0.01 | <0.001 | <0.001 | <0.001 | <0.001 | 0.001 | <0.001 | <0.001 |
| 10 | 0.01 | <0.01 | <0.01 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |

7.10.7 Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/Fs), and heavy metals may also result from the interment of cremated remains (review in Mari & Domingo, 2010).

¹⁵ Assessing the Groundwater Pollution Potential of Cemetery Developments, Ref.: SCHOO404BGLA-E-A, April 2004).

7.10.8 Formaldehyde may result from the embalming process and from the burial of certain types of coffin.

7.10.9 According to EA guidance¹⁵, the following hazardous substances must not be allowed to enter groundwater:

- 🏭 Some pesticides;

- 🏭 Oils;

- 🏭 Petrol and diesel;

- 🏭 Solvents;

- 🏭 Arsenic;

- 🏭 Mercury;

- 🏭 Chromium VI.

7.10.10 Non-hazardous substances should be limited so that they do not cause groundwater pollution. A non-hazardous pollutant is defined as ‘any pollutant other than a hazardous substance’, and includes ammonia and nitrates.

7.10.11 The mudstone bedrock of the Dyrham Formation has a low-moderate permeability and will therefore significantly retard pollutant transport, the significant clay content will attenuate certain pollutants through cation exchange processes. Its permeability is typically low, ranging from 9.4E-06m/day to 6.9E-04m/day in limited pump tests across England¹⁶

7.10.12 The historic land uses on, and within 250m of the site, pose a negligible risk of contamination. The pond immediately north of Leicester Lane was backfilled over 40 years ago, so it is unlikely to be a source of ground gas.

7.10.13 Contaminants are only likely to be present as a because of the use of plant and machinery and will most likely relate to small spillages. Such substances can include: petroleum hydrocarbons, PAH, Volatile Organic Compounds (VOC) and Semi-Volatile Organic Compounds (SVOCs) and BTEX.

7.11 Potential Off-site Sources of Contamination

¹⁶ The physical properties of minor aquifers in England and Wales, EA R&D Publ. 68, 2000, Table 6.2

7.11.1 There is a very low risk of fuel-based pollution (petroleum hydrocarbons, PAH, Volatile Organic Compounds VOC, SVOCs, BTEX) in runoff entering the site from the Leicester Lane roadway immediately north of the site, as any pollutants running off the roadway are likely to be significantly attenuated in the low-permeability subsurface. There are negligible risks of contamination from other off-site sources.

7.12 Potential Pathways for Contaminant Migration

7.12.1 The permeability of the soil beneath the Site is assessed as low to moderate, based on the Groundsure data procured for the site.


7.12.2 Anthropogenic (artificial) pathways for contaminant migration may be present on-site in the form of land drains. However, as there are no obvious significant sources of potential contamination identified from mapping and other resources, the risk to nearby receptors is considered very low.


7.12.3 The only significant pathway for contaminant migration from this site is near surface groundwater flow with the topography south and south eastward.

7.13 Potential Receptors

7.13.1 A burial site must be:

-  outside a source protection zone 1 (SPZ1).

-  at least 250 metres from any well, borehole or spring supplying water for human consumption or used in food production – for example at farm dairies.

-  at least 30 metres from any spring or watercourse not used for human consumption or not used in food production.

-  at least 10 metres from any field drain, including dry ditches.

7.14 Groundwater Risk Assessment

7.14.1 The site is located on unproductive moderate to low permeability bedrock (former ‘non-aquifers’).

7.14.2 EA records show that the site is not within any defined Groundwater Source Protection Zone (SPZ) and so is outside SPZ 1.

7.14.3 The site is more than 250 metres from any recorded well, borehole or spring.

7.14.4 The nearest surface watercourse immediately borders the site (Grand Union Canal). Therefore, on this basis, this site cannot be considered suitable as a potential cemetery site.

7.14.5 It is not known whether or not there are dry ditches within or on the perimeter of the site, based on the walkover photos.

7.14.6 It is also not known whether or not there are field drains within or passing through the site.

7.15 Recommendations/Tier 2 Assessment Objectives

7.15.1 This section is not applicable, given that the site is less than 30m from a watercourse.

7.16 References

7.16.1 1. Mari, M. & Domingo, J. L. (2010). Toxic emissions from crematories: A review. *Environment International* 36, pp. 131-137.

8 HIGHWAYS, ACCESS, SAFETY AND SUSTANABILITY

8.1 Introduction

- 8.1.1 The investigation into potential traffic impacts at the potential cemetery site was based on a combination of a desk-top review of the site, previous similar development experience, available data relating to the site and a site visit.
- 8.1.2 The potential impact of the proposed development, particularly in terms of highway safety and traffic impact, has been estimated through site observation and also by interrogating previous planning history of developments in the vicinity of the proposed site. This investigation was to identify if the new development will be of any detriment to the local highway network.
- 8.1.3 Site access feasibility has been undertaken to determine if a safe and suitable access to the site can be achieved for all modes, and if transport infrastructure improvements could/would be necessary to serve the new development, in order to allow existing transport networks to continue to perform their identified functions.
- 8.1.4 The desk study explored background information to determine the availability and frequency of public transport services to and from the proposed development site, if wider sustainability and health choices can be promoted, and if people are provided with a real choice on how they travel. The study also identified if the proposed development location includes appropriate provision for pedestrians (including those with special access and mobility requirements) and cycling, in addition to public transport.

8.2 Overview of findings

- 8.2.1 The following table summarises the findings of the assessment:

| Assessment considerations | Beneficial | Neutral | Adverse |
|---|------------|---|---------|
| Highways Potential for significant highways impacts associated with development | | It is predicted that the highest cemetery vehicle trips will not impact on the peak hour highway flows although the junction immediately to the west of the site could need mitigation measures due to increased flows on the network. The development is likely to have a moderate impact on the | |

| | | | |
|---|--|---|---|
| | | surrounding highway network. However, there is the ability to accommodate the traffic generated with small infrastructure modifications | |
| Access Existing access into the site and the suitability of this | | | The site has a moderate access although visibility is sub standard and there is not a clear location for a new access to be located. Development of an access would require a significant amount of development, and may require agreement from third parties. |
| Sustainability lighting, bus facilities, footpaths, cycle routes, | | | Sustainability is very poor, there is no street lighting and there are no bus stops or footways in the vicinity of the site, however National Cycle Network 6 that runs alongside the canal can be accessed at the canal bridge. The site could only reasonably be accessed by private car. |
| Highway Safety speed, parking on-street, lighting | | | Poor visibility, national speed limit and the increase in traffic flows, mean that the development could present highway safety concerns. |

8.3 The Site Location

- 8.3.1 The proposed site is located on the southern side of Market Harborough off Harborough Rd, Market Harborough, LE16 7HP within Harborough District Council. The site lies approximately 28km north of Northampton, 21km south-east of Leicester, 17km west of Corby and 19km east of Lutterworth.
- 8.3.2 The site, which is irregular in shape, primarily comprises arable land. The is approximately 1.1 hectares and is bound to the north by Leicester Lane, hedgerows, trees, and a canal extend east to south, and agricultural fields lie to the west.
- 8.3.3 The landscape is an area of open, relatively flat land sloping southwards that is primarily screened by trees and vegetation from Leicester Ln. The plot appears to be used for agricultural use.

8.3.4 The nearest residential properties are situated (approx.) 24m to the east of the site on the opposite side of the Grand Union Canal where a Grade II Listed building has been converted into 13 residential units. There are further residential dwellings 600m to the east of the proposed site in the village of Great Bowden. Local amenities and facilities within Market Harborough are located to the south of the site.

8.4 Highway Impact

8.4.1 Peak hour flows to and from the cemetery site typically fall on a Sunday. The highest cemetery vehicle trips therefore will not impact on the peak hour highway flows which are assumed to be during the hours of 08:00 – 09:00 and 17:00 – 18:00 Monday to Friday. As the development site is relatively small, high levels of traffic from the cemetery site are not anticipated along the residential routes.

8.4.2 A planning search of the site revealed an application for 50 dwellings on a plot 400m to the east of the proposed cemetery site, was submitted on 30/11/2016 (planning reference: 16/01942/OUT). This application was for erection of up to 50 dwellings with public open space, associated landscaping and sustainable drainage system (SuDS) and vehicular access point from Leicester Lane (all matters reserved except for means of access) on land North of Leicester Lane, Great Bowden, Leicestershire.

8.4.3 Development trips of 26 No. trips in the 2 way AM and PM Peak periods were predicted for the committed development. It would not be envisaged for peak hour movements generated by the cemetery site to generate this level of peak hour traffic. Assessments of local junctions were undertaken to determine the capacity of these junctions. Assessments identified that Gallow Field Road is predicted to reach 0.83 RFC in the 2021 AM peak period with and without the proposed development (16/01942/OUT) flows. This could be a concern and mitigation measures could be a possibility.

8.4.4 Therefore overall, the development is likely to have a moderate impact on the surrounding highway network. However, there is the ability to accommodate the traffic generated with small infrastructure modifications.

8.5 Access

8.5.1 A single entrance point is located along the northern boundary of the site directly off Leicester Lane, currently in use by agricultural vehicles, therefore no third party agreements would be required. There are no other formal entrance points into the application site.

- 8.5.2 Highway safety could be a concern at this site due to the limited visibility, national speed limit and alignment of Leicester Lane.
- 8.5.3 The preferred option would be to utilise this access point, however visibility is constrained by the canal bridge to the east and by the alignment of Leicester Lane to the west. This lack of visibility for the proposed access would mean that siting an access for a cemetery site at this location is not an option. Visibility splays can only be achieved here for a road with a speed limit of 30mph, and Leicester Lane is a national speed limit road. Undoubtedly traffic would not be travelling at 60mph along this stretch of Leicester Lane due to the highway alignment. However, even with speed surveys being undertaken it is unlikely that an 85th percentile speed of less than 30mph would be achieved.
- 8.5.4 The site has a moderate access although visibility is sub standard and there is not a clear location for a new access to be located. Development of an access would require a significant amount of development, and may require agreement from third parties.

8.6 Sustainability

- 8.6.1 Leicester Lane provides a link to the B6047 Harborough Road approximately 1.0km west of the site, and to the A6 via Main Street 2.2km to the east of the proposed site.
- 8.6.2 Leicester Lane has no footways and there are no street lights present. There are no bus stops or cycle routes in the vicinity of the site however, National Cycle Network 6 runs adjacent to the canal which is accessible via the canal bridge 130m to the east of the site. NCN 6, which links to Market Harborough Rail Station and passes through, Watford, Luton, Milton Keynes, Northampton, Market Harborough, Leicester, Derby, Nottingham, Worksop, Sheffield, Manchester, Blackburn, Preston, Lancaster, Kendal and Windermere. Additionally, National Route 64 begins in Market Harborough and runs to Lincoln via Melton Mowbray and Newark-on-Trent. The closest bus stop lies 950m to the east of the site on Main Street in Great Bowden.
- 8.6.3 The proposed site is located approximately 2.0km north-west from Market Harborough railway station. The station has a 24 hour car park, which has 219 spaces. Sheltered cycle storage is also available at the station. The station lies on the Nottingham to London line, which operates Monday to Sunday with a frequency of two trains per hour in both directions. Interchange is possible at Leicester and Nottingham Stations to access larger cities including London, Sheffield and Birmingham.

8.6.4 Sustainability at this site location is very poor, the site could only reasonably be accessed by private car.

8.7 Highway Safety

8.7.1 Highway safety in the vicinity of the proposed site access location is good, there has only been one recorded in the last 5 years. The collision was of slight severity and occurred 140m to the west of the site boundary on Leicester Lane where the road bends.

8.7.2 It is predicted that the introduction of a new access off the southern edge of Leicester Lane has the potential to exacerbate highway safety issues. This is due to the other field access along the section of Leicester Lane being used by agricultural vehicles, which would increase the likelihood of overtaking vehicles with an increase in traffic along Leicester Lane. This, with the combination of poor visibility and the national speed limit of Leicester Lane could increase the possibility of collisions.

8.7.3 There is the possibility that these issues could be mitigated with the implementation of streetlighting and signage.

8.7.4 On this basis, it is concluded that the could present highway safety concerns.

9 CONCLUSION

9.1 Conclusion

- 9.1.1 This report considers the potential for the development of a cemetery site at 'Land at Leicester Lane'. HDC have previously considered the development potential based on the size of the site, capacity, access, topography, potential visual and heritage impacts, management constraints, development costs, and the potential for the site to accommodate different religious denominations and non-conformists.
- 9.1.2 This report provides a more detailed consideration of potential planning constraints; ecological constraints; landscape/ visual/ arboricultural constraints; hydrological/ flood risk constraints; and highways/ access constraints.
- 9.1.3 From a planning perspective, there are no significant constraints within the application site. However, the listed building to the east of the site would have to be considered as part of a planning application. In addition, there are residential receptors in close proximity to the site. Although the site is well screened, public consultation is likely to be required.
- 9.1.4 In terms of ecology, the site is of low ecological value, although a small number of additional surveys would be required as part of a planning application.
- 9.1.5 In terms of landscape/ visual and arboricultural constraints, the development of a cemetery within the site is considered to have neutral impacts.
- 9.1.6 In terms of hydrological/ flood risk constraints, the site is largely outside of areas of flood risk, although part of the site is at risk from surface water flooding. In addition, the site is located outside of groundwater source protection zones and areas of water used for human consumption.
- 9.1.7 The main constraints associated with the site relate to impacts on the surrounding highway network. The report identifies that the site has moderate access although visibility is sub-standard. There is not a clear location for a new access to be located. Development of an access would require a significant amount of development. In addition, the access is not considered sustainable from an access perspective, and development of a cemetery could cause highway safety concerns.



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