MINERAL RESOURCE ASSESSMENT

Land South of Chear Fen Boat Club, Twentypence Road, Cottenham

794-ENV-GDE-21115
V1
R0
30 January 2025

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Document status

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1 INTRODUCTION

1.1 Background

1.1.1 RPS Consulting Services Ltd (RPS) has been commissioned by Green Planning Studios Ltd (GPS) to produce a Mineral Resource Assessment (MRA) to support a S78 appeal for the refusal of planning permission ref. 22/01703/FUL. It is understood that the planning permission was for '*a material change of use of land through intensification to the stationing of caravans for residential purposes, nine dayrooms and the formation of hardstanding ancillary to that use*' on land to the south of Chear Fen Boat Club, Twentypence Road, Cottenham, Cambridgeshire (herein referred to as the Application Site). The redline boundary for the Application Site is outlined in Figure 1 below.

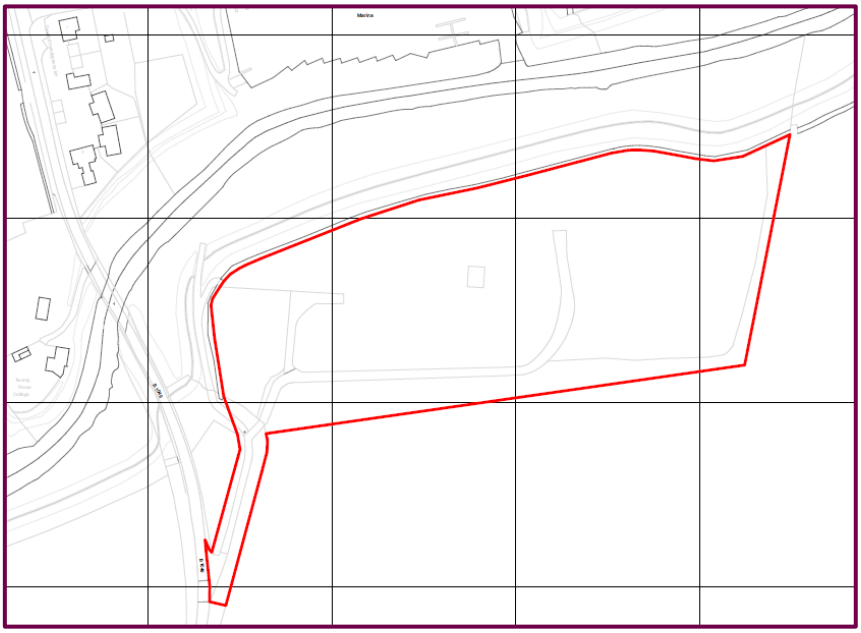

Figure 1 - S78 Appeal planning redline boundary ('Application Site')

1.1.2 The Decision Notice presented a number of reasons for refusal of the planning permission, a number of which related to minerals. Reason 4 of the Decision Notice stated that there was an "*absence of a statement demonstrating safeguarding of the Sand and Gravel Mineral Safeguarding Area, the proposal is contrary to Policy 5 of the Cambridgeshire and Peterborough Minerals and Waste Local Plan (June 2021)*." The Case Officer's report further adds that "as the application does not make reference to the safeguarded minerals, criteria (i) – (l) of Policy 5 have not been met" and therefore the council is "*not able to support the proposal without a statement that demonstrates compliance with one of the criteria (i), (j), (k) or (l). The County Council is of the view that given the proximity of the quarry, the likelihood of viable resource within the site is quite high*". This MRA seeks to address Reason 4 of the refusal.

1.1.3 It is understood that a Lawful Development Certificate (LDC) (ref. S/1346/16/LD) for the standing of a mobile home was granted on 11th October 2016. RPS has been made aware that there are ongoing discussions with respect to whether the LDC remains live for the Application Site or this site use has been abandoned. As a final position is yet to be established on this, the MRA considers two scenarios as follows:

1. The LDC is live and therefore for the purposes of the MRA there is a residential caravan located within the plot of land shown in within the redline boundary of Figure 1. Where the

LDC is deemed to be live, GPS has advised that the residential caravan can be located *anywhere* within the planning redline boundary.

2. The permitted use associated with the LDC has been abandoned. For the purposes of the MRA in this scenario, there is assumed to be no current residential receptor at the Application Site.

1.1.4 Whether the LDC is live or abandoned falls beyond the scope of this minerals assessment and is to be determined by others.

1.2 Site Setting and Proposed Development

1.2.1 The Application Site covers approximately 3.50 hectares (ha) of land and is located within an area of predominantly agricultural and minor light commercial land use. Twentypence Marine and Chear Fen Boat Club are located north of the Application Site, associated with the Great River Ouse flowing immediately north and north-west. Twentypence Road runs parallel to the west Application Site boundary, leading to residential properties beyond and a sideroad of Twentypence Road leading into the south of the Application Site. The Application Site is surrounded by mature trees and peripheral hedgerows, with agricultural land present to the immediate south and east.

1.2.2 As stated in Section 1.1, the planning application (ref. 22/01703/FUL) is for the permanent stationing of nine mobile homes for residential occupation. As indicated within Drawing 1 (ref. 21_1161B_003), the mobile homes are proposed to be sited upon loose bound permeable hardstanding: the same construction as the proposed access through the Application Site. The proposed development will result in the removal of a small number of existing trees in the central north and north-western areas of the Application Site, however new planting is proposed at intervals along pre-existing tree-lined boundaries and native hedgerows and tree planting is also proposed adjacent to each sited mobile home. The remainder of the development is to comprise soft landscaping for use as residential garden.

1.3 Report Structure

1.3.1 The remainder of this report is structured as follows:

- Section 2: *General Approach* – Provides a summary of the general approach adopted to deliver the agreed scope of works including a summary of all key data sources used in the MRA.
- Section 3: *Reviewing of Mineral Planning Policy* – Provides a summary of the National, Regional and Local planning policy context in relation to minerals. It also provides commentary on any supplementary planning documents relating to minerals.
- Section 4: *Site Setting* – Provides a summary of key aspects of the site setting, including a description of the geological and hydrogeological context for the assessment. This section describes the mineral designations relevant to the Application Site.
- Section 5: *Mineral Resource Assessment* – Provides the mineral resource assessment for the Application Site in terms of likely quantity and quality of mineral reserves and likely constrains on mineral extraction and an evaluation against mineral planning policies.
- Section 6: *Summary and Conclusions* – Summary of mineral resource assessment and evaluation of potential constraints for development resulting from criteria outlined in planning context applicable for the Application Site.

2 GENERAL APPROACH

2.1 Overview

2.1.1 This MRA utilises available geological and site setting information to evaluate the constraint that mineral resources present on the Application Site are likely to place on the proposed development, given local mineral planning policy. The MRA provides a resource assessment that defines the extent of viable (extractable) mineral resources present on the Application Site, principally in relation to designated Mineral Safeguarding Areas (MSAs) defined by the Mineral Planning Authority (MPA) of Cambridgeshire County Council. The available mineral resource is then evaluated against the mineral planning policy for the Application Site, with the viability and practicality of extraction and practicability of prior extraction of the safeguarded resource considered.

2.2 Data Sources

2.2.1 The geological setting for the Application Site has been determined from a review of publicly available data sources that includes:

- British Geological Survey (BGS), GeoIndex Onshore.

2.2.2 In addition to material published by the BGS, the following mineral planning documentation produced by the MPA of Cambridgeshire County Council has been reviewed. This includes:

- Cambridgeshire and Peterborough Minerals and Waste Local Plan 2036 (adopted July 2021); and
- Cambridgeshire and Peterborough Local Aggregates Assessment (2023).

2.2.3 The following local policies have also been reviewed:

- South Cambridgeshire Local Plan (adopted September 2018).

2.2.4 The general environmental setting has been obtained from publicly available data sources including:

- Defra Magic Maps (hydrogeology and environmental sensitivity);
- Ordnance Survey mapping;
- Aerial photography; and
- Environment Agency dataset of historical sites in England.

2.2.5 GPS has also provided RPS with a Preliminary Ecological Appraisal and Biodiversity Net Gain report produced by Project Ecology in January 2025[1] that was commissioned for the Application Site as well as a Flood Risk Assessment produced by Geoff Beel Consultancy in May 2022[2].

2.2.6 RPS has also utilised relevant information obtained from available documentation on the South Cambridgeshire District Council and Cambridgeshire County Council website for planning applications within proximity of the Application Site. This includes a review of planning

[1] Project Ecology. Land off Twentypence Road, Wilburton – Retrospective Ecological Appraisal and Biodiversity Net Gain Assessment. 5 January 2025

[2] Geoff Beel Consultancy. Flood Risk Assessment for Proposed Residential Development at Twenty Pence Road, Cottenham, Cambs. May 2022.

documentation in support of S/0088/18/CM for a consented large-scale sand and gravel extraction on land to the south of the Application Site.

3 REVIEW OF MINERAL PLANNING POLICY

3.1 Mineral Planning Context

3.1.1 For England, the key national planning policies for minerals are set out in the National Planning Policy Framework (NPPF), updated in December 2024. The focus of the NPPF is a presumption in favour of sustainable development. The NPPF recognises that minerals are essential to support sustainable economic growth and our quality of life. It is therefore important that there is a sufficient supply of material to provide the infrastructure, buildings, energy and goods that the country needs, whilst ensuring that permitted mineral operations do not have unacceptable adverse impacts on the natural and historic environment or human health. The NPPF also recognises that, since minerals are a finite natural resource, and can only be worked where they are found, it is important to make best use of them and to secure their long-term conservation through the mechanism of mineral safeguarding.

3.1.2 In the context of local planning, the Application Site is situated within South Cambridgeshire District Council (SCDC) Local Authority area. SCDC lies within the administrative area of Cambridgeshire County Council (CCC), which oversees all mineral matters within the county. The principal documents and policies relating to strategic mineral planning within CCC are as follows:

- Cambridgeshire and Peterborough Minerals and Waste Local Plan 2036 (adopted July 2021); and
- Cambridgeshire and Peterborough Local Aggregates Assessment (2023).

3.2 Cambridgeshire and Peterborough Minerals and Waste Local Plan 2036 (adopted July 2021)

3.2.1 The Cambridgeshire and Peterborough Minerals and Waste Local Plan (CPMWLP) was adopted in July 2021 and covers the period up to 2036 and therefore represents the relevant mineral policies in relation to mineral resources and mineral safeguarding on the Application Site. The role of the CPMWLP is to ensure a steady, adequate but sustainable supply of minerals to meet current and projected future need.

3.2.2 **Mineral Policy 05 (Mineral Safeguarding Areas (MSAs)** is a key policy of the Plan, that states:

"Development within MSAs, not covered by an exception, will only be permitted where it has been demonstrated that:

(i) The mineral can be extracted where practicable prior to development taking place; or

(j) The mineral concerned is demonstrated to not be of current or future value; or

(k) The development will not prejudice future extraction of the mineral; or

(l) There is an overriding need for the development (where prior extraction is not feasible)."

3.2.3 Policy 05 seeks to ensure that the appropriate weight is accorded to the prior extraction of minerals, which would otherwise be sterilised by built/ non-mineral development. The CPMWLP does not stipulate specific thresholds, such as buffer zones. In the absence of specific buffer zones, this MRA will apply buffers in line with generally accepted guidelines.

3.2.4 To aid in the implementation of Policy 05, the MPA has defined Mineral Safeguarded Areas (MSAs) within the county. An extract from the CPMWLP, showing the MSA across the Application Site and wider area is presented in Figure 2.

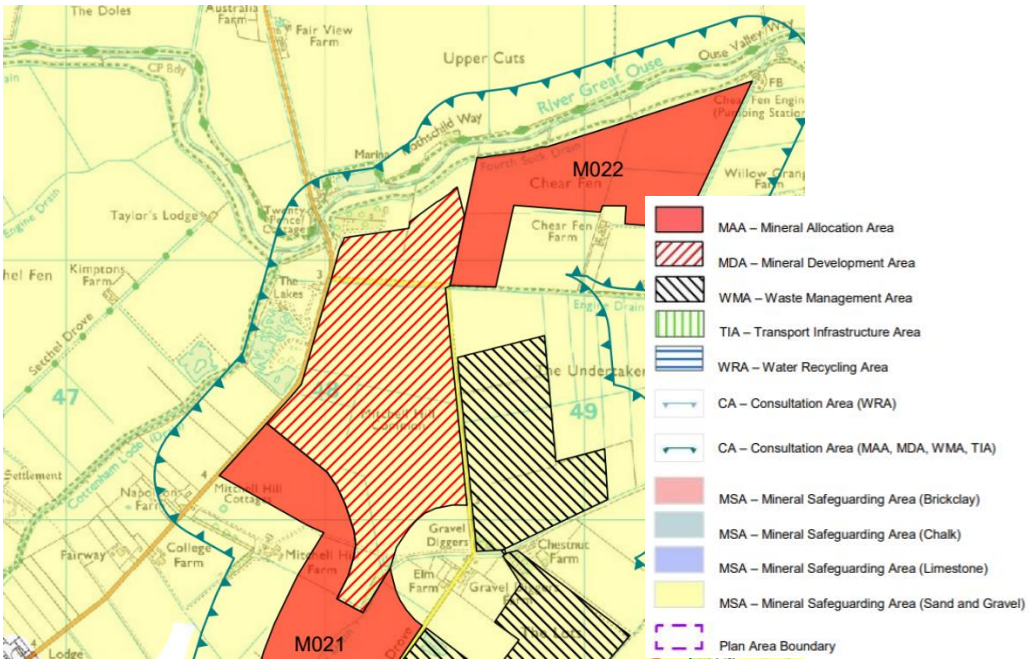

Figure 2 – Extract from Inset Map 5 of CPMWLP Policies Map (July 2021)

3.2.5 From a review of the Plan Policies Map (July 2021), the Application Site is also identified to fall within a Mineral Consultation Area (MCA). This is associated with a Mineral Development Area (MDA) and Mineral Allocation Area (MAA) immediately south and east of the Application Site. Policy 6 states that "*within a MAA, only development for which it is allocated for (including, where relevant, its restoration) will be permitted*".

3.2.6 The MPA defines MDAs and MAAs as follows:

- MDA: Existing operational sites and committed sites (i.e. sites with planning permission but which are not yet operational or are dormant).
- MAA: Areas not yet consented but allocated in this Plan for the future extraction of minerals.

3.2.7 The Application Site does **not** fall within either a MDA or MAA and is therefore not currently considered for mineral allocation with this Plan period.

3.2.8 The MAA in closest proximity to the Application Site is identified as M022 (Chear Fen, Cottenham), approximately 210 m to the east, with estimated sand and gravel reserves of 820,000 tonnes over the Plan period. It is understood that the proposed start date for mineral extraction at the M022 designated site is 2030 and would form Phase 7 of consented extraction planning permission ref. S/0088/18/CM, granted in 2018. The Plan identifies that approximately 140,000 tonnes would be extracted per year from the M022 allocation site to 2036. It is important to note that the MPA has discounted any potential extraction expected to take place at any allocated site beyond 2036 and therefore the contributions of extracted reserves per site is based on estimated provisions over the Plan period.

Gravel Diggers Farm Quarry Extension Consent

3.2.9 Planning permission ref. S/0088/18/CM was consented in 2018 for the extraction of sand and gravel at Mitchell Hill Farm, which in effect, is the extension of Gravel Diggers Farm quarry to work sand and gravel resource to the immediate west at Mitchell Hill Farm. **Phases 1 to 7** of the permission are to be worked at Mitchell Hill Farm, to the south of the Application Site. It is estimated that approximately 1.7 million tonnes of sand and gravel reserve will be available for extraction under this consent.

Current Extraction Rates and Demand across the County

3.2.10 Based on annual sales, the Cambridgeshire MPA determined that an appropriate annual provision rate for sand and gravel for the Plan period is 2.6 million tonnes per annum (Mtpa) which equates to a landbank of 15.9 years, based on both designated MDAs and MAAs. The Plan identified that approximately 48.48 Mt of sand and gravel reserves would be required to maintain this supply from 2017. By the end of 2017, identified permitted reserves were at 41.43 Mt. To address the 7.05 Mt shortfall of reserve, 9 no. allocated sites were proposed in the county, which would provide a potential additional 17.625 Mt over the Plan period and therefore provide surplus sand and gravel and maintaining a greater than 7-year sand and gravel landbank.

3.2.11 Policy 02 **(providing for mineral extraction)** identifies both allocations, M021 and M022, within proximity of the Application Site, as sites that will contribute to the reserves over the Plan period between 2016 and 2036. M022 is believed to provide approximately 0.820 Mt of sand and gravel and M021 will provide 0.140 Mt. The other seven sites are at distance from the application site.

3.2.12 From a review of the table presented under Policy 2 of the CPMWLP, the two MAA's within closest proximity to the Application Site will contribute the smallest volumes of sand and gravel reserves to the County's supply over the Plan period.

3.3 Cambridgeshire and Peterborough Local Aggregates Assessment (2023)

3.3.1 The most up-to-date Local Aggregate Assessment (LAA) covers the calendar year of 2022. As of November 2023, the sand and gravel landbank of reserves was calculated to be 12.46 years and therefore remaining above the minimum landbank requirement for sand and gravel as set out by the NPPF. This however does not account for the additional 9 no. allocated sites put forward within the Plan. The report estimates that when both the permitted reserves and allocated reserves are considered together, the total reserves are estimated to be approximately 47.551 Mt. Based on an average provision of 2.6 Mtpa, this is equivalent to a landbank of 19 years.

3.3.2 The MPA also assesses the worst-case scenario within the LAA. With a rolling average provision of 3.113 Mtpa, based on 3 Years sales between 2012 and 2022, the landbank is estimated to be 15.3 years and therefore still well above the minimum sand and gravel reserve landbank NPPF requirement.

3.4 Summary of Current Permitted Reserves

3.4.1 The adopted CPMWLP has identified 9 no. mineral allocation sites that have been or pending consent for sand and gravel extraction to meet the required demand for the mineral resource across Cambridgeshire. Two of these sites are within close proximity to the Application Site.

3.4.2 The permitted and allocated reserves for the County is understood to provide a surplus of aggregate and maintain over double the required minimum sand and gravel landbank. This does not include additional allocations beyond the Plan period that the MPA are also considering post-2036.

3.4.3 Of the allocated sites, the two sites (M021 and M022) near the Application Site will contribute the least to the overall reserves with respect to anticipated extractable sand and gravel volumes.

3.4.4 Mitchell Hill Farm quarry, a MDA, is present immediately south of the Application Site with an estimated sand and gravel reserve of 1.7 Mt. M021 and M022 would, in effect, be extensions to the existing permitted Mitchell Hill Farm quarry site. Whilst available BGS mapping indicates that extensive River Terrace Deposits also underlie the Application Site, the Application Site itself has not been included within an allocation for mineral extraction.

4 GENERAL SITE SETTING OF THE APPLICATION SITE

4.1 Geological and Hydrogeological Setting

Regional Geology

4.1.1 The regional geological setting for the Application Site, as determined from publicly available sources of the BGS is summarised in the table below.

Table 1 – Regional Geology

Formation	Lithological Description	Thickness (m)	EA Aquifer Designation
Superficial Deposits River Terrace Deposits, 1 (underlying whole Application Site)	Typically comprises sand and gravel, locally with lenses of silt, clay or peat.	Variable	Secondary A
Bedrock Kimmeridge Clay Formation (underlying whole Application Site)	Typically comprises calcareous or kerogen-rich mudstones, thin siltstones locally with sand and silt.	< 500	Unproductive

4.1.2 The Application Site and local area is underlain by the bedrock of the Kimmeridge Clay Formation. The bedrock is overlain by unconsolidated superficial deposits comprising River Terrace Deposits (RTD). The BGS describe the RTD as predominantly comprising sand and gravel and are shown to cover the entirety of the Application Site.

4.1.3 Localised Made Ground is anticipated to be present across the Application Site, associated with previous and current occupation of the Assessment Site.

4.1.4 A review of available boreholes logs within 500 m of the Application Site has been undertaken and the encountered ground conditions are summarised in the table below.

Table 2 – Summary of Available BGS Borehole Records

BGS Borehole Ref	Distance and Direction to Application Site	Thickness of Topsoil / Overburden (m)	Thickness of RTD (m)	Thickness of Kimmeridge Clay (m)	Groundwater Strikes (m bgl*)
TL47SE8	205 m NW	1.00	3.20	> 1.00**	0.20
TL47SE11	420 m NE	0.70	1.50	> 1.00**	0.20

*metres below ground level

**base not proven

4.1.5 The overburden material was generally described as very dark greyish brown gravelly clay and identified as a topsoil unit overlying RTD. The RTD was generally described as sandy flint and chalk gravely with some quartz, quartzite, sandstone, ironstone and phosphatic nodules. The Kimmeridge clay was logged as stiff dark grey clay with a rare argillaceous limestone 0.1 m thick band at the boundary between the RTD and clay within TL47SE8.

4.1.6 Borehole ref. TL47SE11 was identified to prove 1.50 m of a mineral horizon however it was noted that 0.30 m of this comprised a clay bed and recorded as ‘waste’ between 0.70 m and 0.5 m horizons of mineral.

Safeguarded Mineral Resource

4.1.7 The River Terrace Deposits are considered to constitute the safeguarded mineral resource present on the Application Site as defined by the 'Sand and Gravel' MSA defined in Figure 2.

Site-Specific Geology

4.1.8 In the absence of site-specific geological data, a review has been undertaken of a Mineral Resource Assessment report undertaken by Key GeoSolutions Ltd[3] (KGS) for the planning application ref. S/0088/18/CM for sand and gravel extraction at Mitchell Hill Farm (extension of Gravel Hill Diggers quarry). The report utilised data from two phases of ground investigation, comprising 55 no. boreholes in 2009 and a further 13 no. boreholes in 2016. The 2009 boreholes were drilled on land to the south of Long Drove road, approximately 170 m south of the Application Site at the closest point whilst 7 no. of the 2016 boreholes (labelled G to M) were drilled on land to the north of Long Drove Road and therefore on land immediately south of the Application Site.

4.1.9 An extract of the exploratory hole location plan for both phases of investigation has been included within Figures 3a and 3b below.

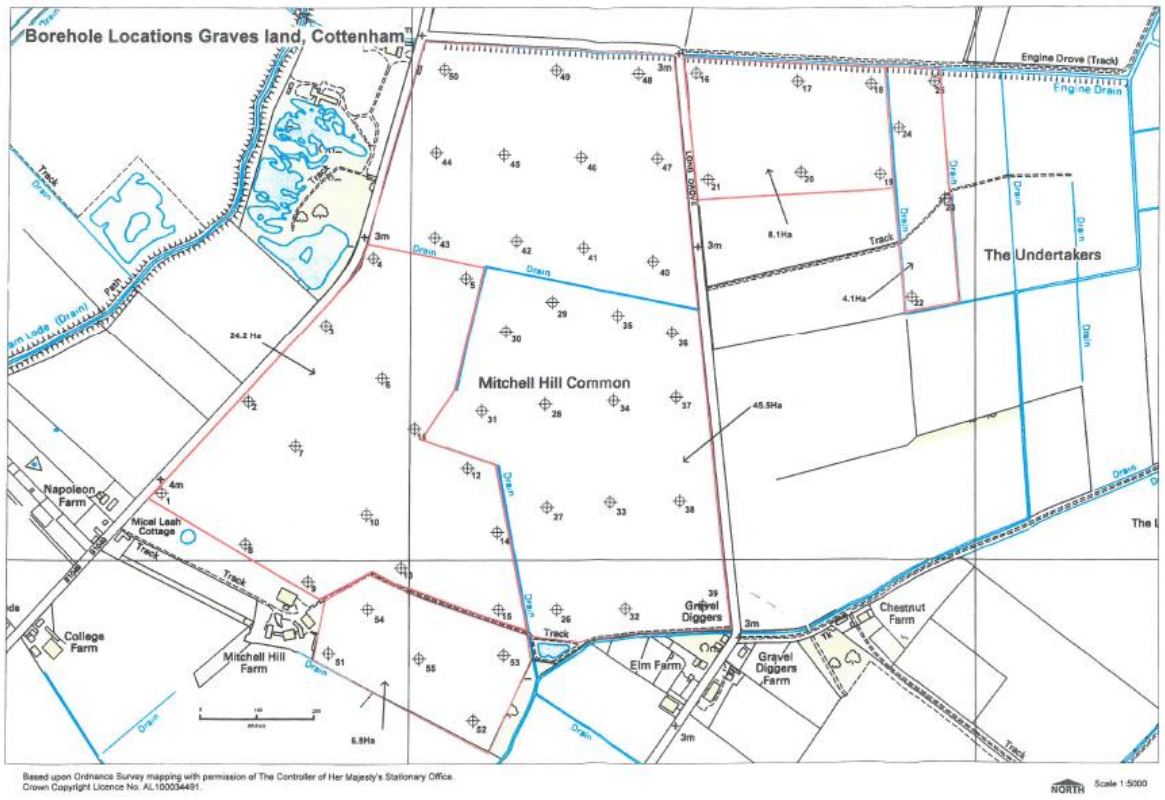

Figure 3a - Extract from KGS Preliminary Mineral Assessment Report ref. 17-358-R-001 (2017) – 2009 Borehole Location Plan

[3] Key GeoSolutions Ltd. Mitchell Hill Farm – Preliminary Mineral Assessment. Report No. 17-358-R-001. 21st November 2017.

Figure 3b – Extract from KGS Preliminary Mineral Assessment Report ref. 17-358-R-001 (2017) – 2016 Borehole Location Plan

4.1.10 KGS reported that the available data from both phases of investigation demonstrated that the RTD were generally uniform in quality, depth and lateral distribution within the area of investigation. Although the RTD has proven to be laterally continuous and in accordance with the unit's mapped extents on available BGS mapping. The KGS report consider a substantial area including areas substantially to the south of the Application site. The 2016 investigation does include 7 no. boreholes within 200 m of the Application Site (north of Long Drove Road), as detailed on Figure 3b. These are considered to be most representative of the ground conditions at the Application Site and have therefore been utilised for the purposes of this MRA.

4.1.11 It should be noted that the original ground investigation data has not been made available to RPS and therefore the findings of the KGS report has been utilised in this assessment. It should also be noted that RPS cannot vouch for the accuracy and validity of the KGS report or the third-party information utilised within their assessment.

4.1.12 A summary of the proven ground conditions identified within from the 7 no. closest boreholes is presented in Table 3 below.

Table 3 –Geological Thickness of Strata Encountered within Boreholes G to M (KGS, 2017)

Borehole ID	Topsoil/ subsoil (m)	Overburden Thickness (m)	RTD Sand & Gravel Thickness (m)*	Depth of Top RTD Sand & Gravel (m BGL)	Groundwater Strikes (m)	Additional Comments
Borehole G	0.70	0.20	1.80	0.90	2.00	-
Borehole H	0.60	0.20	1.70	0.80	2.00	-
Borehole I	0.70	0.40	1.40	1.10	1.60	RTD includes a silty clay band between

						1.50 and 1.80 m BGL
Borehole J	0.40	0.20	2.10	0.60	1.10	-
Borehole K	0.40	0.30	1.60	0.70	1.10	RTD includes a silty chalk clay band between 1.20 m and 1.70 m BGL
Borehole L	0.40	0.30	2.00	0.70	1.30	-
Borehole M	0.40	-	2.80	0.40	1.10	-

*KSG reported that the base of the RTD was proven in all boreholes.

4.1.13 From a review of the available 2016 logs for the 7 no. boreholes within Appendix 2 of the KGS report, the RTD generally comprises an upper sand layer overlying a sand and gravel layer. Within boreholes I and K, the RTD also comprises a silty clay band between 1.50 m and 1.80 m BGL and 1.20 m and 1.70 m BGL, respectively. This demonstrates that the mineral horizon is predominantly a clean, granular aggregate with the exception of localised clay bands.

4.1.14 The distribution of RTD thickness across the 7 no. boreholes is shown in Figure 4 below.

Figure 4 – RTD Thicknesses proven within boreholes G to M

4.1.15 A consistent groundwater body was identified within the 7 no. boreholes within the RTD horizon between depths of 1.10 m BGL and 2.00 m BGL. Based on the observed groundwater strikes, as presented within Table 3, the groundwater is shallows with reducing proximity to the Great River Ouse. The same pattern is observed for borehole Q to the east of the study area, which also encountered groundwater at 1.10 m BGL. Given the Application Site is located immediately south of the river, it is anticipated that groundwater depths will not exceed 1.10 m and are likely to be shallower. From the data presented within Table 3, it is considered likely that the vast majority of

mineral reserve within the Application Site will be below the water table, with only 0.6 to 0.7 m residing above the water table, based on the boreholes in closest proximity to the river (Borehole L and M).

4.1.16 To assess the likely average thickness of potential workable deposit at the Application Site, the borehole data for the 7 no. boreholes above have been utilised. Table 4 presents the calculated average thickness of overburden and mineral horizon that may be anticipated underlying the Application Site. For the purposes of this assessment, any topsoil/subsoil has been grouped with general overburden material to provide a total overburden thickness above the RTD.

Table 4 – Total Average Thickness of Overburden and RTD

Average Thickness of Overburden (m)	Average Thickness of RTD (m)
0.74	1.91

4.1.17 It is therefore anticipated that the estimated thickness of mineral deposit at the Application Site is approximately 1.90 m with an overburden of approximately 0.75 m. The majority of the mineral deposit will be below the water table.

4.2 Topography and Hydrology

4.2.1 The Application Site is generally level ranging between approximately 4 m Above Ordnance Datum (AOD) in the east to 6 m AOD in the west.

4.2.2 There are several surface water features within proximity of the Application Site, the closest of which is identified as the Fourth Sock Drain that runs adjacent to the northern boundary of the Application Site. The River Great Ouse runs parallel with the Fourth Sock Drain, approximately 35 m north at its closest point to the Application Site. Twentypence Marina and Chear Fen Boat Club is located approximately 65 m to the north of the Application Site.

4.2.3 Flood Risk Assessment (FRA) report[4], available via the South Cambridgeshire District Council planning portal, commissioned to support the planning application (ref. 22/01703/FUL) for residential development at the Application Site, indicates that the Application Site is located within a Flood Zone 1 and within the catchment area of the Old West Internal Drainage Board. A small area in the north-east of the Application Site is also identified to be within Flood Zones 2 and 3. As identified within Figure 5 below, Fourth Sock Drain is a designated flood defence and one of the Old West Internal Drainage Board's main drains.

4.2.4 The FRA report states that the Application Site is situated within a passive defended floodplain, as defined by the Environment Agency (EA), and concluded that the probability of the land flooding from the localised drainage systems is very low. It further states that the probability of the Application Site flooding with water from any EA system is less than 1%.

4.2.5 It should be noted that the above conclusion is based on the continued protection afforded by the existing flood defences (The Fourth Sock Drain) which is maintained by the Internal Drainage Board. It is noted that the currently consented mineral extractions in the areas (S/0088/18/CM) have suggested that a 50 m buffer is required to drains of this nature to allow ongoing maintenance.

[4] Geoff Beel Consultancy. Flood Risk Assessment for Proposed Residential Development at Twentypence Road, Cottenham, Cambs. May 2022.

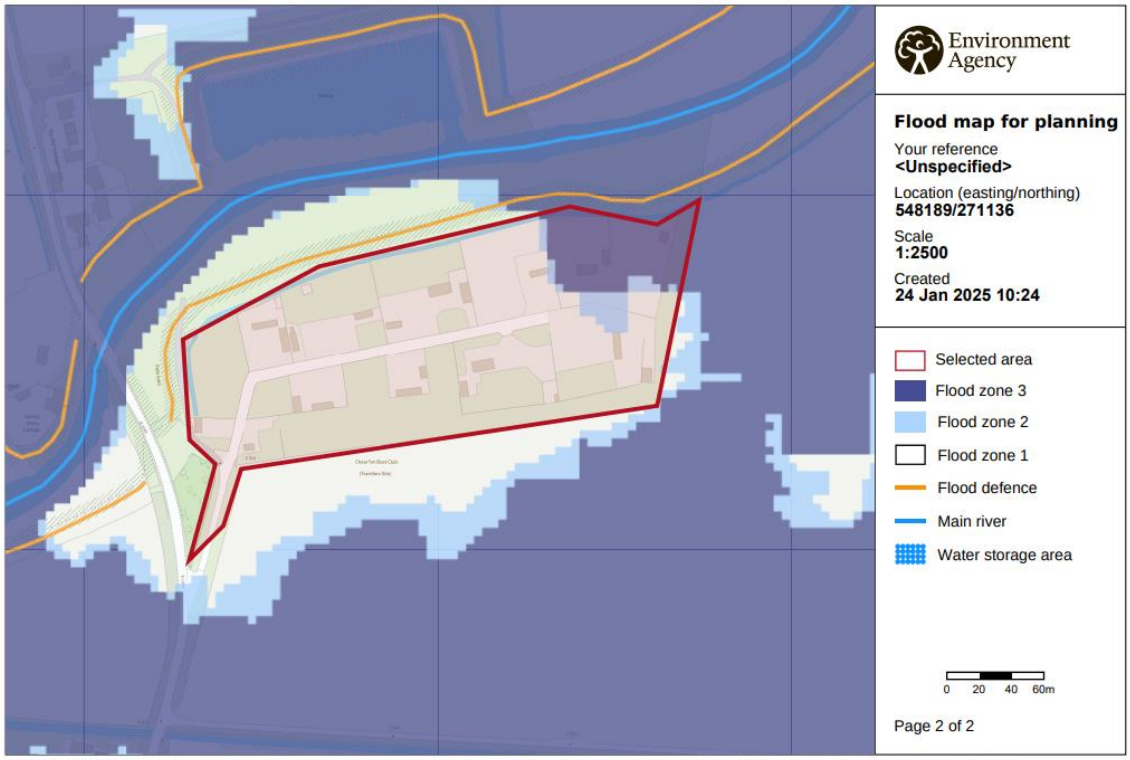

Figure 5 – EA Flood Zone Map

4.3 Ecological Sensitivity

4.3.1 A Retrospective Ecological Appraisal (REA) and Biodiversity Net Gain Assessment (BNG)[5] produced by Project Ecology in January 2025 has been commissioned by the Client to seek to address one of the reasons of an Enforcement Notice issued for the Application Site. Although this report was not produced for planning purposes, the findings of the report remains relevant for the purposes of this MRA with respect to the determination of ecologically sensitive sites and / or protected species at the Application Site.

4.3.2 The Application Site is located within the following designations:

- SSSI Impact Risk Zone for Upware South Pit, Upware North Pit and Cam Washes.
- Green Risk Zone for Great Crested Newts – moderate habitat for GCN to be present.

4.3.3 The report identifies three County Wildlife Sites (CWS) within 770 m of the Application Site. The River Great Ouse forms the closest CWS, adjacent to the northern boundary of the Application Site as shown in Figure 6[6], and is also considered to be a Priority Habitat. A further Priority Habitat is identified in the west of the Application Site, attributed to the presence of the broadleaved woodland. Project Ecology reported an area of broadleaved woodland had also been lost to the development at the Application Site. This Priority Habitat is understood to be formally identified within the Cambridge City Council Local Biodiversity Action Plan as a target habitat.

[5] Project Ecology. Retrospective Ecological Appraisal and Biodiversity Net Gain Assessment – Land off Twentypence Road, Wilburton. Report ref. PE.1777. 2nd January 2025.

[6] Ward Associates. Ecological Assessment of Land at Mitchell Hill, Cottenham, Cambs. January 2018.

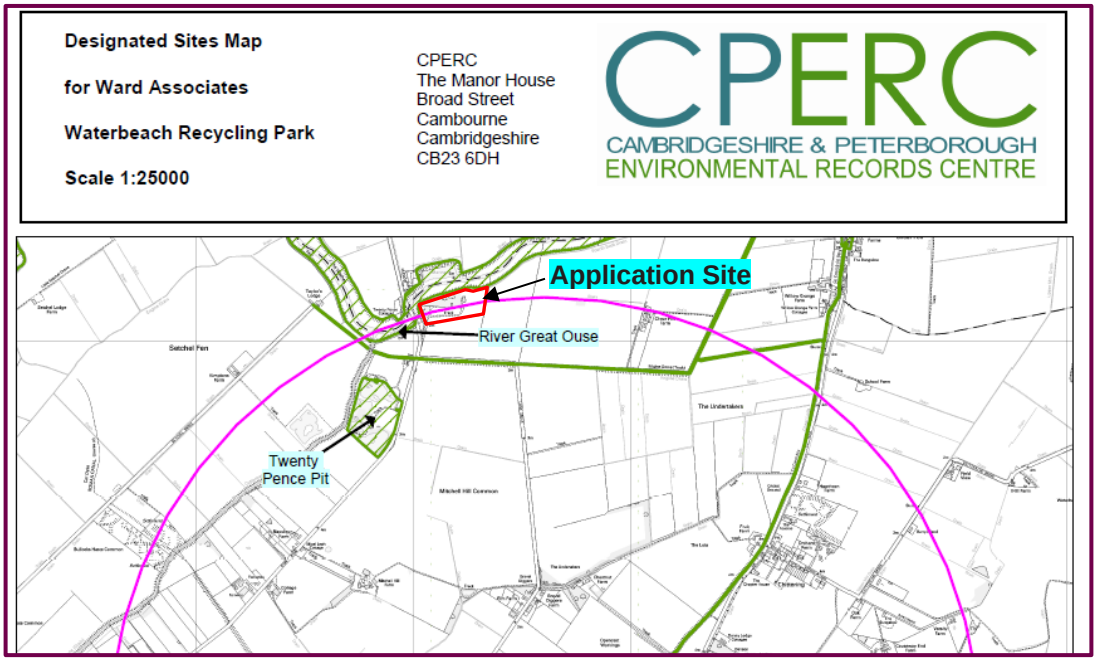

Figure 6 – Extract of Figure 2 of Ward Associates Ecological Assessment of Land at Mitchell Hill report, dated Jan 2018 in support of the planning application for the extraction to the south of the Application Site

4.3.4 Project Ecology considered there were unlikely to be direct impacts on the CWS bordering the northern Application Site boundary given the current occupation of the site is relatively small-scale and low impact. They also concluded the following:

- Modified grassland habitat considered to be of low – moderate ecological value.
- Tall forbs within the area of development is considered to be of low – moderate ecological value.
- Replacement planting required given the loss of existing priority habitat (broadleaved woodland).
- Habitat mitigation is to be maximised to account for loss of tall forbs and foraging and dispersal habitats.
- The proposed/existing site plan does not mitigate for habitat loss on site and therefore the development would need to seek mitigation to meet the >7.42 habitat units, >0.06 hedgerow units and >0.16 watercourse units required to meet the 10% gain.
- Recommendation for 3 no. bat boxes and 3 no. bird boxes to be installed on suitable retained trees on site and for 2 no. amphibian hibernacula are created within mixed scrub on site, adjacent to ditch.

4.3.5 It should be noted that whilst the proposed development at the Application Site will not impact the designated sites, the extraction may. The current consented mineral extractions in the area rely upon installation of a clay cut off wall to allow dewatering and abstraction below the water table. This will impact the hydrogeological regime and the conditions within the River Ouse designated site, which is designated to be a major river and County Wildlife Site owing to its coastal and floodplain grazing marsh habitats.

5 MINERAL RESOURCE ASSESSMENT

5.1 Extent of potentially viable mineral resource on the Application Site

Total volume of potentially viable mineral resource

5.1.1 The data reviewed within KGS' Mineral Assessment in support of planning for an extension to sand and gravel mineral extraction at Mitchell Hill Farm demonstrates that the safeguarded mineral resource of the River Terrace Deposits is likely to be a predominantly clean granular aggregate. The available evidence indicates that minerals of a similar 'quality' extend below the Application Site. Where this is the case it is reasonable to conclude that mineral resource of useable quality exists on the Application Site that could be of commercial interest for mineral extraction.

5.1.2 Table 3 demonstrates that the RTD sand and gravel resource horizon is situated beneath a clay-rich layer of overburden and topsoil that is typically 0.75 m thick.

5.1.3 From the available logs, it has been demonstrated that the mineral resource horizon is a relatively 'clean' aggregate that is of potential commercial interest and therefore it is reasonable to expect that:

1. Some mineral resource would be lost during excavation/removal of overburden by an over-dig into the mineral resource horizon;
2. Some mineral will not be suitable due to the presence of clay rich horizons / pockets with the River Terrace Deposits; and
3. Some mineral resource will be left in place at the base of each excavation to ensure underlying clay is not intercepted during extraction.

5.1.4 Given that a proportion of the mineral resource will therefore be lost or left in situ following excavation, it is reasonable to consider that the viable mineral resource present on the Application Site is represented by those areas where at least 1 m of laterally continuous sand and gravel mineral resource is present. Where the sand and gravel resource horizon is thin and discontinuous, or thick over a small, localised area, it is considered to represent a non-viable mineral resource. Based on these assumptions, an estimate of the volume of potentially viable mineral resource on the Application Site has been calculated and summarised in Table 5.

5.1.5 The calculations assume that the resource thickness is greater than 1 m across the Application Site based on the available logs within the vicinity. The calculations also assume excavation below the water table (which will require groundwater controls) and extraction over the entire Application Site boundary. In this context these volumes will reduce when appropriate buffers are applied to sensitive receptors and the practicalities of abstraction are considered.

Table 5 – Volume of Potentially viable Sand and Gravel mineral resource

Site Area	Estimated Area (m^2)	Average Resource Thickness (m)#	Volume of Resource (m^3)	Volume of Resource Less 'Lost Resource' (m^3)
Total Area of Application Site	35,000	1.90	66,500	52,500*
28% of Site with 0.40 m non-viable clay band	9,800	0.40	3,920**	-
Total Potential Resource Volume	-	-	-	48,580

#Based on data for relevant boreholes presented in Table 4

*Based on the assumption that up to 40 cm of lost resource (i.e. 20 cm of resource below overburden and above clay).
**Allows for a clay rich horizon of 0.4 m thickness with the River Terrace Deposits over 28% of the Application Site.

5.1.6 The calculations presented in Table 5 suggest there is less than 49,000 m^3 of continuous, potentially viable (i.e. extractable) Sand and Gravel mineral resource on the Application Site. This volume accounts for a 0.40 m clay horizon within the resource deposit across circa 28% of the Application Site, as inferred from the available adjacent borehole data. The clay horizon does not constitute viable sand and gravel safeguarded material and therefore this has been reflected in the calculated potential total volume of viable mineral resource at the Application Site.

Buffer Zones and Constraints on Mineral Extraction

5.1.7 The estimate of potentially viable Sand and Gravel resource presented in Table 5 does not consider other limitations to mineral extraction that may reasonably be expected to apply given the site setting and nature of the extraction process. As described in *Mineral safeguarding in England: good practice advice* (BGS, 2011), buffer zones are commonly applied around safeguarded mineral areas and used in the consideration of the extent of viable resources. Buffer zones limit the area of potentially extractable resource, by defining those areas where the extraction of safeguarded mineral resources would not be expected due to:

- Proximity to existing sensitive development that could be adversely affected by the effects of extraction (i.e. noise, dust, visual impact, transport and/or vibration as per paragraph 224 (c) of the NPPF, 2024), most notably:
  - Schools, hospitals and nurseries.
  - Residential development and supporting infrastructure (e.g. parks and amenity areas).
  - Community centres.
- The requirement to protect sensitive environmental receptors protected under paragraph 224 (a) of the NPPF (2024) that could be impacted by extraction and include:
  - Designated sites (e.g. SSSI).
  - Ancient Woodland.
- Strategic infrastructure including:
  - Roads and highways.
  - Flood defences.
  - Above and below ground utilities and services.
  - Geotechnical and operational considerations associated with mineral excavation, most notably securing a geotechnically sound site boundary.

5.1.8 The width of protective buffer zones that may potentially be applied are not prescribed in the planning policies reviewed as they would typically be determined as part of the planning process for a mineral extraction proposal. Furthermore, the detailed quantitative assessment required to determine impacts and define buffer zones are beyond the scope of an MRA. However, it is noted that industry guidance does provide some indication of possible standoffs that may be required, for example the *Environmental Effects of Dust from Surface Mineral Workings* (Department of the Environment Minerals Division, 1995) states that in the absence of a quantitative dust assessment a minimum standoff of 100 – 200 m is recommended from significant dust sources.

5.1.9 RPS has also undertaken a review of available supporting documentation to planning permission ref. S/0088/18/CM for the consented extraction of sand and gravel at Mitchell Hill Farm to the south of the Application Site to establish the buffers applied. Phasing plans and associated reporting, available on the Cambridgeshire County Council website, demonstrate the

buffers/standoffs, that are being and are to be implemented for the consented extraction. These are as follows and are relevant from the point of extraction, not the site boundary:

- 10 m standoff from existing / retained trees and hedgerows[7];
- 130 m standoff from sensitive noise receptors*; and
- 50 m standoff from an IBD recognised drain / flood defence.

*Only soil stripping and stockpiling activities may be undertaken within 130 m of a sensitive noise receptor i.e. residential properties.

5.1.10 A number of residential properties were identified within the planning consent, however the Application Site was not considered a sensitive receptor for that application.

5.1.11 For the purposes of this MRA, the following buffer zones are considered reasonable and have been initially applied to further evaluate the distribution, extent and volume of viable mineral resource and its associated economic viability as a resource:

- 10 m standoff from existing trees and / or peripheral hedgerows (see next paragraph);
- 10 m standoff from priority habitat – broadleaved woodland;
- 100 m standoff from residential dwellings;
- 50 m standoff from Fourth Sock Drain / flood defence; and
- 10 m Cut Off Wall allowance in the north and east.

5.1.12 The commissioned retrospective ecological appraisal report produced by Project Ecology (January 2025) for the Application Site identified that the broadleaved woodland priority habitat is considered of the most ecological value at the site and any impacts to this priority habitat, as formally identified within the local BAP, are at a local level, rather than site-level. A 10 m standoff has therefore been adopted for the remaining broadleaved woodland at the Application Site.

5.1.13 The consented mineral application to the south, identifies that groundwater will be controlled through excavation of trench keying into the underlying clay materials (circa 2 m depth) and back backfilling with clay (known as a Cut Off wall). This feature will require a circa 10 m zone where not sheet pilled. In this context a further 10 m buffer has been applied to allow for construction of a cut off wall on the northern and eastern boundaries.

Potentially extractable mineral resources on the Application Site

5.1.14 As stated within Section 1.1, RPS has been requested to consider two scenarios within this MRA. The first scenario is that the Application Site benefits from a live LDC and there is a residential caravan located within the planning redline boundary and the second scenario is that the LDC has been abandoned and therefore no lawful use for residential mobile homes have yet been established. The two scenarios are considered below.

Scenario 1: Live Lawful Development Certificate

5.1.15 Where it is determined that the LDC is live, it is understood that the Application Site benefits from a residential lawful use for the stationing of a mobile home. GPS has advised RPS that where this is the case, the residential caravan can be located anywhere within the planning redline boundary. In this scenario, the mobile home represents a sensitive receptor at the Application Site to any mineral extraction.

[7] Ward Associates. Ecological Assessment of Land at Mitchell Hill, Cottenham, Cambs. January 2018.

5.1.16 As illustrated within Drawing 2 (ref. DWG-001, RPS 2025), the Application Site occupies an area of approximately 305 m east to west by 120 m north to south. With the application of a conservative 100 m buffer for residential development, this would render much of the Application Site unviable for mineral extraction. With the addition of further reasonable buffers for the protection of periphery hedgerows, remaining priority habitat and the Fourth Sock Drain, this would increase the area of which mineral extraction could not occur and therefore rendering the majority of the Application Site unviable for sand and gravel mineral extraction.

Scenario 2: Abandoned Lawful Development Certificate

5.1.17 Where it is determined that the LDC has been abandoned and a lawful residential use has not yet been established for the Application Site, there would be no consideration of a residential-related sensitive receptor at the Application Site. However, the buffers associated with the periphery hedgerows and Fourth Sock Drain still need to be considered and adopted to establish the area for potentially viable extractable mineral resource.

5.1.18 By applying the relevant buffers defined under paragraph 5.1.11 (residential buffer excluded) and the further 10 m allowance for the cut of wall, the area of possible mineral extraction on the Application Site is reduced and hence the volume of viable resource also reduced as shown in Drawing 3 (ref. DWG-002, RPS 2025).

5.1.19 Potentially extractable resource outside the buffers, shown in Drawing 3, cover an area of approximately 9,100 m^2, and is largely restricted to the central part of the Application Site. The volume calculations of potentially viable mineral resources presented in Table 5 have therefore been revised to reflect the application of buffers and are presented in Table 6. The volume of viable mineral resource is calculated to be approximately 12,630 m^3. Based on these revised calculations, it is considered that the Sand and Gravel resource of the RTD does not represent a viable mineral resource on the Application Site given the volumes available for extraction.

Table 6 – Revised volume of potentially viable mineral resource following application of buffers

Site Area	Estimated Area (m^2)	Average Resource Thickness (m)#	Volume of Resource (m^3)	Volume of Resource Less 'Lost Resource' (m^3)
Total Area of Application Site **with buffers applied**	9,100	1.90	17,290	13,650*
28% of Site with 0.40 m clay band	2,548	0.4	1,020**	-
Total Potential Resource Volume	-	-	-	12,630

#Based on data for relevant boreholes presented in Table 4

*Based on the assumption that up to 40 cm of lost resource (i.e. 20 cm of resource below overburden and above clay).
**Allows for a clay rich horizon of 0.4 m thickness with the River Terrace Deposits over 28% of the Application Site.

5.1.20 The revised calculated volume also does not account for topsoil and subsoil bunds required around the periphery of extraction areas, in line with phasing plans available as part of the consented extraction to the south of the Application Site. The plans for planning ref. S/0088/18/CM identify that extraction will only take place outside of the bunds and therefore the footprint of required screening bunds reduce the area for extraction even further.

5.2 Further Consideration

5.2.1 An additional factor to consider is the environmental impact of a mineral activity. The Application Site is close to the River Ouse which is a Designated County Wildlife Site. The mineral operation is only possible with creation of groundwater barriers and dewatering which will alter the hydrogeological regime with the River Terrace Gravels and subsequently within the River Ouse.

This issue would require careful consideration where a mineral operation persists, and possible mitigation.

5.2.2 The proximity of the Application to the River Ouse, and likely hydrogeological continuity means that the contamination status of any backfill materials will require careful consideration to avoid impact to the water course. This will constrain the commercial and practical viability of any mineral operation.

5.2.3 Any mineral operation would be required to meet the statutory biodiversity enhancements (10%). Wholesale removal of the mineral will significantly reduce biodiversity and require mitigation, further impacting on viability.

5.3 Practicability of Prior Extraction

5.3.1 Notwithstanding the assessment of the extent of viable resource on the Application Site and the economic viability for its commercial extraction, the practicability of the prior extraction of safeguarded mineral reserves, in advance of any proposed development, should also be considered. Prior extraction could involve either:

- Full extraction of safeguarded reserves in advance of, or in parallel with, construction.
- Incidental extraction – the extraction of safeguarded reserves by virtue of activities required as part of development construction activities (e.g. foundations, services, site reprofiling etc.).

Full Prior Extraction

5.3.2 The prior extraction of Sand and Gravel is not considered practicable on the Application Site for either LDC scenarios considering:

- The absence of ‘viable’ resources across the Application Site after the application of reasonable buffers;
- The questionable economic viability of that mineral resource given the relatively small volume of viable sand and gravel resource and high cost associated with the need for excavation backfill and restoration to current ground level using imported infill materials of an appropriate quality to enable future development.
- Restrictions on chemical quality of any backfill.
- Consistent groundwater body within the sand and gravel mineral resource horizon that would require substantial dewatering efforts throughout excavation to minimise the potential for flooding excavation voids both during and post extraction and to prevent outflow of flooding water from excavations into the Fourth Sock Drain and major river, River Great Ouse.

Incidental extraction

5.3.3 Given the nature of the proposed development at the Application Site, it is unlikely that there will be substantial excavations required as part of development. However there are likely to be small localised excavations for any subsurface utilities and drainage where required, and therefore the potential for incidental extraction of safeguarded sand and gravel resources to occur. Such material can be reused on site as part of the development works and / or exported off-site into the local market.

6 SUMMARY AND CONCLUSION

6.1.1 The finding of the mineral resource assessment presented above has been evaluated against the mineral planning policies relevant to the Application Site and described in Section 3. This summary is presented in Table 7 below.

Table 7 – Assessment against mineral planning policies

Policy	Planning Condition / Position Statement	Summary of Assessment
Cambridgeshire and Peterborough Minerals and Waste Local Plan 2036 (Adopted July 2021)		
Policy 5: Mineral Safeguarding Area (MSAs)	Development within MSAs which is not covered by exception will only be permitted where it has been demonstrated that:	-
	(i) The mineral can be extracted where practicable prior to development taking place; or	**Not Applicable.** Site-wide prior extraction of sand and gravel is not considered practicable on the Application Site for either LDC scenarios considering the following: a. The absence of 'viable' resources across the Application Site after the application of conservative reasonable buffers; b. The questionable economic viability of that mineral resource given the relatively small volume of viable sand and gravel resource, as explained within point (j) below, and high cost associated with the need for excavation backfill and restoration to current ground level using imported infill materials of an appropriate quality to enable development. c. Consistent groundwater body within the sand and gravel mineral resource horizon that would require substantial dewatering efforts throughout excavation to minimise the potential for flooding excavation voids both during and post extraction and to prevent outflow of flooding water from excavations into the Fourth Sock Drain and major river, River Great Ouse. Incidental extraction would be possible during development works should sand and gravel mineral resource be encountered during localised small-scale excavations. Such material would be reused on the Application Site for development purposes or exported off-site into the local market.
	(j) The mineral concerned is demonstrated to not be of current or future value; or	**Applicable:** The lawful use of a residential mobile home present at the Application Site renders the majority of the site non-viable for potential mineral extraction. This is based on the area that the Application Site occupies and adoption of a 100 m standoff for residential development. Where the LDC is found to be abandoned and a residential receptor is not considered at the Application Site, the application of other buffers for the protection of the Fourth Sock Drain, periphery hedgerows and existing priority habitat reduces the area potentially available for mineral extraction. The area of potential extraction is limited to approximately 9,100 m^2 which equates to a potential mineral resource volume of less than 13,000 m^3. By applying a conversion factor of 1.65t/m^3 (as utilised by KGS for the

		extraction to the south planning application), this equates to 20,840 tonnes of potential mineral resource which is not considered to be viable. Therefore, the extraction of less than 21,000 tonnes is considered unlikely to be economically viable and as such, the Application Site is not considered to contain a workable mineral deposit.
	(k) The development will not prejudice future extraction of the mineral; or	**Applicable:** If the LDC for the stationing of one mobile home at the Application Site is considered to be live, then that lawful use has already prejudiced any future mineral extraction at the Application Site. Where it is considered that the LDC is abandoned, the proposed use of mobile homes may be considered a temporary development, with few permanent infrastructure that would prejudice future mineral extraction and minimal sterilisation to potential mineral resources. As provided within points (i) and (j) above, there is not considered to be a viable resource at the Application Site and therefore it is unlikely that the Application Site would be put forward for a mineral allocation in the future. It should be noted that the consented extraction at Mitchell Hill Farm does not consider a residential receptor at the Application Site and where the LDC is deemed to be live, a 100 m buffer from the lawful residential use would encroach the extraction areas of Phases 6 and 7 of the consented extraction to the south and east. It is understood that the potential impact of lawful residential use of the Application Site with respect to the existing consented extraction has been assessed under separate report.
	(l) There is an overriding need for the development (where prior extraction is not feasible).	**Not Applicable.**

Drawing 1 21_1161B_003

Drawing 2 DWG-001

Drawing 3 DWG-002

MINERAL RESOURCE ASSESSMENT

Land South of Chear Fen Boat Club, Twentypence Road, Cottenham

2025-01-30

794-ENV-GDE-21115

V1

R0

Contact

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+44 1454 853 000

Notes:

LEGEND

- Proposed mobile home
- Proposed utility/day room
- Proposed touring caravan
- Proposed loose bound permeable hardstanding
- Residential gardens
- Grassed area
- Additional native hedge & tree planting
- Existing hardstanding
- Existing hedgerow
- Soakaway
- Proposed tree planting
- Existing trees
- Proposed foul drainage
- Proposed package treatment plant e.g. Biodigester T6
- Existing buildings/structures
- Existing post & rail timber fence
- Existing close boarded timber fence
- Proposed post & rail timber fence
- Proposed close boarded timber fence
- 9m buffer from existing watercourse drainage
- Existing Watercourse
- Proposed tarmacadam surface
- Overhead powerline and telegraph poles
- Indicative turning space
- Indicative parking space
- Proposed bin storage
- Proposed gate
- Existing gate

Rev.	Date	Amendments	Author
A	12.05.2022	Addition of 9m buffer from northern drainage	KL

GreenPlanningStudio

Client:

Drew Price and James Ball

Project title:

Chear Fen Boat Club,
Twentypence Road,
Cottenham,
Cambridgeshire,
CB6 8PX

Drawing title:

Proposed Block Plan

Scale @ A1:	Date of first issue:	Drawn:
1:500	April 2022	KL

Project No.	Issue Status
21_1161B	Planning

Drawing No.	Revision:
21_1161B_003	A

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Site Redline Boundary

Site Measurements

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Client Green Planning Studio Ltd

Project Twentypence Road, Cottenham

Title Redline Site Boundary

Status	Drawn By	PM/Checked by
DRAFT	EL	LD
Job Ref	**Scale @ A3**	**Date Created**
794-ENV-GDE-21115		January 2025
Figure Number		**Rev**
DWG-001		0

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- Site Redline Boundary
- Fourth Sock Drain Buffer Zone
- Priority Habitat and Peripheral Hedgerow Buffer Zone
- Cut Off Wall Buffer Zone

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Title Mineral Safeguarding Area Constraints

Status	Drawn By	PM/Checked by
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