

A47 Wansford to Sutton Dualling

Scheme Number: TR010039

Volume 6

6.3 Environmental Statement Appendices **Appendix 10.3 – Minerals impact assessment** **(MIA)**

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009

July 2021

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009**

A47 Wansford to Sutton
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Appendix 10.3 – Minerals impact assessment (MIA)

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Table of contents

Appendix 10.3 Mineral impact assessment (MIA)	2
10.1. Introduction	2
10.2. Need for the Proposed Scheme and further minerals assessment	3
10.3. Mineral resources	4
10.4. Practicability and environmental acceptability for the extraction of mineral reserves and infrastructure	8
10.5. Mineral infrastructure sites	12
10.6. Policy CS26 Test: Safeguarding mineral and waste sites and mineral resources	13
10.7. Conclusions	19
10.8. References	20

Figures

Figure 1 1:50,000 scale geological map- Superficial (British Geological Survey materials © UKRI [2020])	5
Figure 2 1:50,000 scale geological map-bedrock (British Geological Survey materials © UKRI [2020])	6
Figure 3 Proposals Map C: Mineral Safeguarding Areas	6
Figure 4 Areas of proposed new infrastructure which coincide with mapped RTD and ALV	9
Figure 5 Areas of proposed new infrastructure which coincide with mapped LL	10
Figure 6 PSD results of the granular Lincolnshire Limestone Formation (gLL)	16
Figure 7 PSD results of the granular River Terrace Deposits (gRTD)	17

Appendix 10.3 Mineral impact assessment (MIA)

10.1. Introduction

Minerals safeguarding policy

Legislative context

10.1.1. A summary of the legislative context of the Proposed Scheme and the requirement for an Environmental Impact Assessment (EIA) is provided in Section 1.4 of Chapter 1 (Introduction) of this Environmental Statement (ES) (**TR010039/APP/6.1**).

National planning policy context

10.1.2. A general summary of the national planning policy context is provided in Section 1.4.9 to 1.4.17 of Chapter 1 (Introduction) of this ES (**TR010039/APP/6.1**).

10.1.3. The National Policy Statements for National Networks (NPSNN) (published December 2014) set out the need for, and Government's policies to deliver, development of nationally significant infrastructure projects on the national road and rail networks in England. This includes requirements to consider sustainability within the development.

10.1.4. Consideration of mineral resources is included in paragraph 5.169 which states '*Applicants should safeguard any mineral resources on the proposed site as far as possible*' and Paragraph 5.182 which states '*Where a proposed development has an impact on a mineral safeguarding area, the Secretary of State should ensure that the applicant has put forward appropriate mitigation measures to safeguard mineral resources*'.

10.1.5. The National Planning Policy Framework (NPPF) was revised in February 2019. Section 17 of the NPPF outlines the planning policy mechanisms required to facilitate the sustainable use of minerals. The NPPF states that planning policies should '*safeguard mineral resources by defining mineral safeguarding areas, and adopt appropriate policies so that known locations of specific minerals resources of local and national importance are not sterilised by non-mineral development where this should be avoided*' and '*set out policies to encourage the prior extraction of minerals, where practical and environmentally feasible, if it is necessary for non-mineral development take place*'.

Local Planning Policy

10.1.6. The Cambridgeshire and Peterborough Minerals and Waste Development Plan was adopted by Cambridgeshire County Council and Peterborough City Council on 19 July 2011 and will run until 2026 (in line with Planning Policy Statement 12: Local Spatial Planning (PPS12)).

- 10.1.7. The Cambridgeshire and Peterborough Minerals and Waste Development Plan comprises two planning policy documents and a policies map:
- The Core Strategy Development Plan Document
 - Site Specific Policies
 - Proposals Maps Map C: Mineral Safeguarding Areas
- 10.1.8. The purpose of the Minerals and Waste Development Plan is to provide a series of policies used to plan for mineral extraction and associated development and waste management facilities in the most sustainable way in line with the Government's sustainable development strategy in Planning Policy Statement 1: Delivering Sustainable Development (PPS1).
- 10.1.9. The Core Strategy document sets out the spatial vision for future mineral extraction and associated development through a series of strategic objectives and policies.
- 10.1.10. Cambridgeshire County Council and Peterborough City Council are in the process of reviewing the joint Minerals and Waste Development Plan. The Core Strategy Development Plan Document and Site Specific Proposals are being reviewed and a single joint Minerals and Waste Local Plan covering the two authority areas is being produced to replace them. This review will extend the plan period to 2036.
- 10.1.11. The legislative and policy framework is summarised in ES Chapter 11 (Materials and waste) (**TR010039/APP/6.1**) section 11.3 and Appendix 11.1 (**TR010039/APP/6.3**).

10.2. Need for the Proposed Scheme and further minerals assessment

- 10.2.1. The requirement for the Proposed Scheme is discussed in Chapter 2 (The Proposed Scheme) (**TR010039/APP/6.1**).
- 10.2.2. This chapter has been written in accordance with Design Manual for Roads and Bridges (DMRB) LA 110 Material assets and waste (DMRB LA 110) (Published August 2019). Potential sterilisation of mineral resources is one element of the assessment methodology. This mineral impact assessment report will be used to illustrate that greater than or equal to one mineral safeguarding site will not be sterilised during the construction of the Proposed Scheme.

10.3. Mineral resources

- 10.3.1. The BGS 1:50,000 scale geological map indicates that sections of the Proposed Scheme are underlain by superficial deposits of sands and gravels attributed to River Terrace Deposits (RTD) and Alluvium (ALV) (Figure 10.1).
- 10.3.2. The mapping also indicates sections of the Proposed Scheme are underlain by limestone bedrock attributed to the Upper Lincolnshire Limestone Member (ULL) and Lower Lincolnshire Limestone Member (LLL). For the purposes of classification and assigning engineering parameters, the Lincolnshire Limestone (LL) has been considered as a whole, including the ULL and LLL members (Figure 10.2).
- 10.3.3. The RTD, ALV and LL have been designated as a Mineral Safeguarding Area (MSA) as part of the adopted Minerals and Waste Development Plan (Figure 10.3).
- 10.3.4. The inclusion of land in a MSA does not necessarily mean that planning permission would be granted for mineral extraction and there may be sound planning reasons why proposals would be rejected. Designation of these areas is intended to ensure that mineral interests are taken into account at the appropriate time.
- 10.3.5. For example, circumstances may arise where it may appropriate to undertake mineral extraction in advance of development. MPS1 (paragraph 13) states that planning authorities should encourage the prior extraction of minerals, where practicable, if it is necessary for non-mineral development to take place in MSAs.

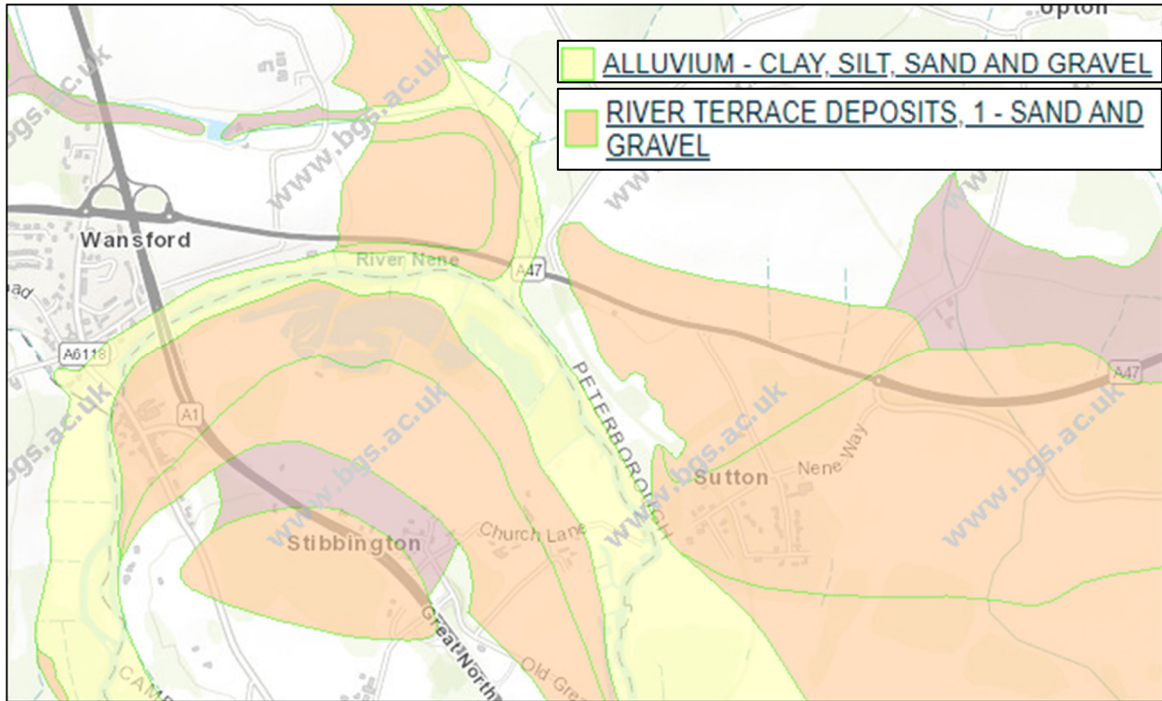


Figure 10.1 1:50,000 scale geological map- Superficial (British Geological Survey materials © UKRI [2020])

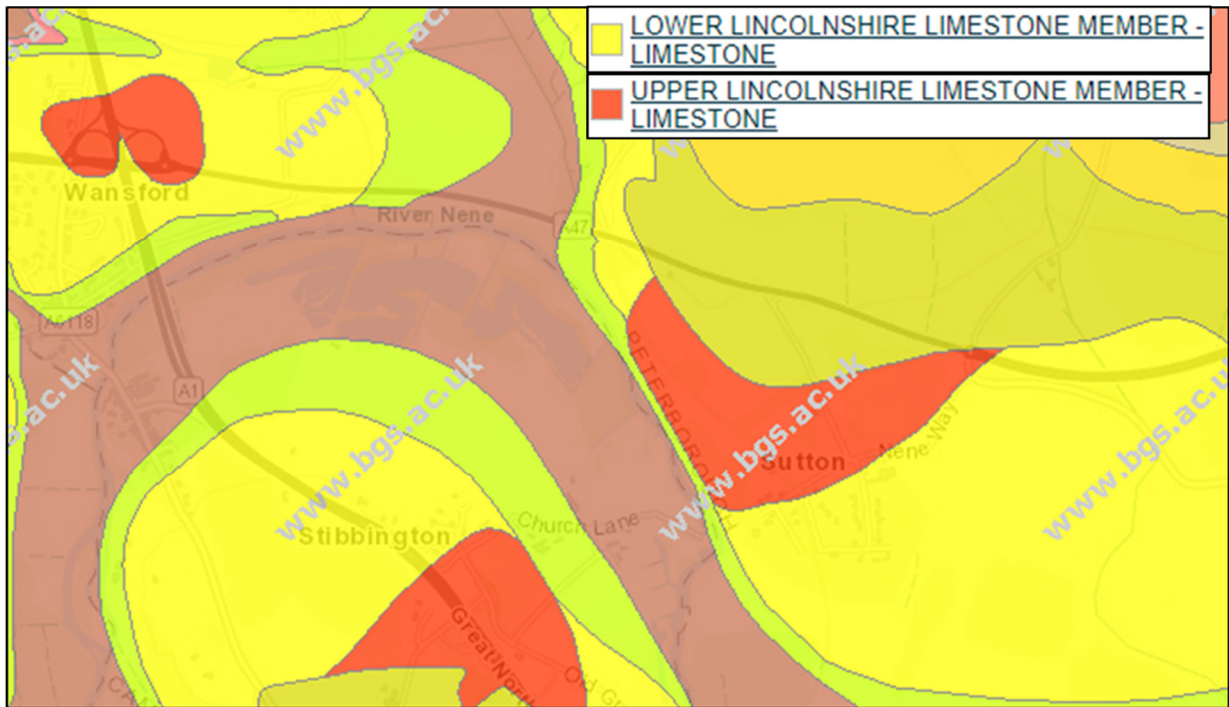


Figure 10.2 1:50,000 scale geological map-bedrock (British Geological Survey materials © UKRI [2020])

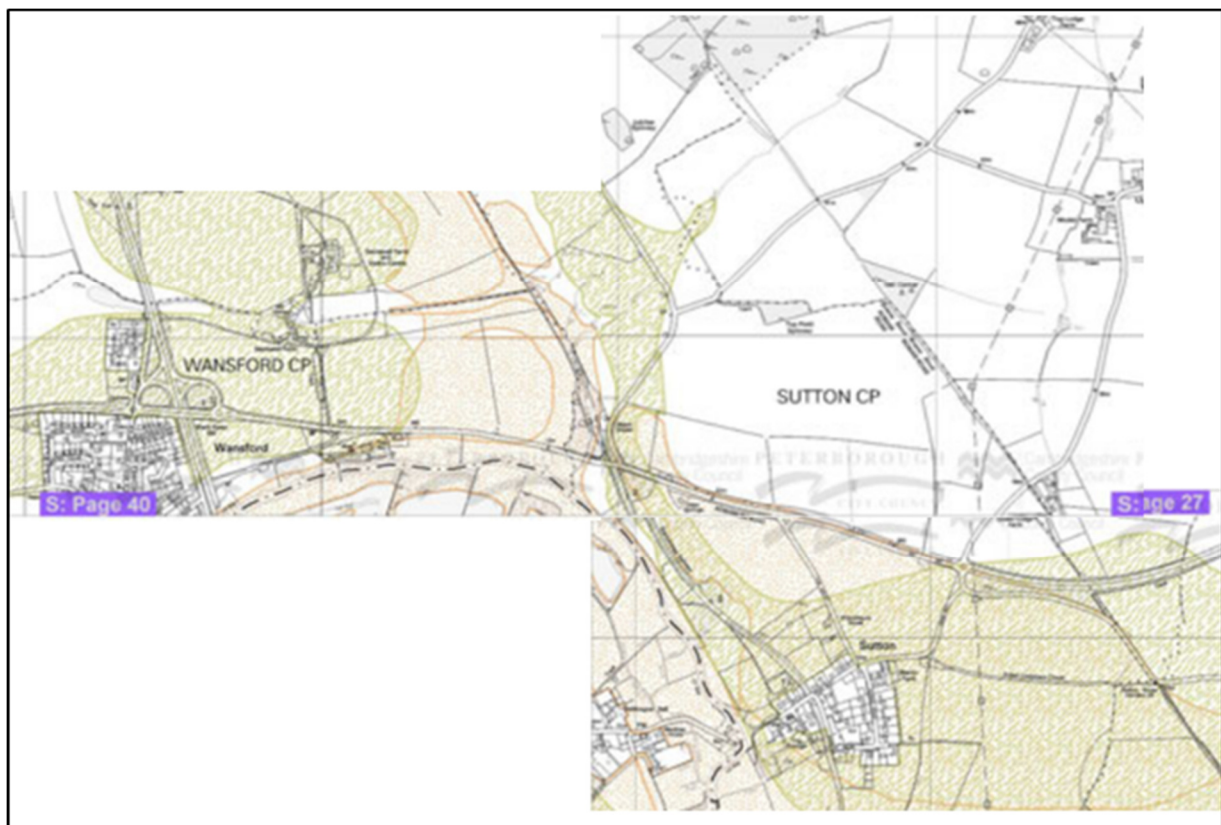


Figure 10.3 Proposals Map C: Mineral Safeguarding Areas

10.3.6. The most recent ground investigation for the Proposed Scheme was undertaken by Soils Limited between 29 August and 29 November 2018. Further details on the ground investigation are included in the A47 Wansford to Sutton Dualling Ground Investigation Report 2020 (GIR) (Sweco 2020) (HE551494-GTY-HGT-

000-RP-CE-00001 (**TR010039/APP/6.3**). Section 4 of the GIR presents a summary of the ground conditions across the Proposed Scheme. Geological long sections are provided in Appendix C of the GIR (Sheets 1 to 6 HE551494-GTY-HGT-000-DR-CE-30010-P02 to HE551492-GTY-HGT-000-DR-CE-30019-P02). Geological long sections are provided in Appendix C of the GIR (Sheets 1 to 4 HE551494-GTY-HGT-000-DR-CE-30016 to 30019).

- 10.3.7. ALV was encountered as both granular and cohesive material. Granular ALV was typically described as brown gravelly sand with low cobble content and multicoloured sandy gravel. Gravel clasts were typically angular to rounded, fine to coarse flint, sandstone, mudstone, limestone and ironstone. The alluvium was encountered on the north bank of the River Nene at depths between 0.1m and 0.3m below ground level (bgl), with a maximum thickness of 2.1m.
- 10.3.8. RTD were generally encountered beneath a layer of topsoil and/or made ground between the service station adjacent to the A47 and the eastern limit of the Proposed Scheme. Granular RTD were encountered as light to dark brown and orangish brown variably silty or clayey, gravelly sand or sandy gravel. Gravel was angular to rounded, fine to coarse flint, sandstone and limestone. RTD had a recorded thickness of between 0.4m and 5.6m, with an average thickness of 2.6m and was encountered to a maximum depth of 5.9mbgl.
- 10.3.9. Within the Proposed Scheme, the ULL is mapped as being present in the vicinity of the A1/ A47 intersection. The LLL is mapped as being present between the service station and the western extent of the Proposed Scheme and in the vicinity of Sutton Heath Road and the intersection with the A47. Deposits of LL were predominantly encountered as rock with interbeds of granular and cohesive soils from ground level or beneath superficial or made ground deposits. LL was typically recorded as very weak to medium strong, clayey, gravelly, fine to coarse sand with low to medium cobble content of angular and sub-angular limestone. Gravel clasts consist of angular and sub-angular, fine to coarse limestone. Cohesive LL was typically encountered as firm to very stiff (locally soft), sandy gravelly locally silty clay with gravel of limestone. LL deposits ranged in thickness from 0.6m to 11.7m, with an average thickness of 4.7m. Reworked LL where present was encountered at existing ground level and at 0.5mbgl. LL was recorded to a maximum depth of 12.3mbgl.
- 10.3.10. Reference should be made to the Sweco 2020 GIR (HE551494-GTY-HGT-000-RP-CE-00001) for further descriptive and interpretative detail of the strata at the Proposed Scheme.

10.4. Practicability and environmental acceptability for the extraction of mineral reserves and infrastructure

10.4.1. Paragraph 204 (d) of the NPPF requires Local Plans to:

'Set out policies to encourage the prior extraction of minerals, where practicable and environmentally feasible, if it is necessary for non-mineral development to take place'.

10.4.2. Prior extraction is the process by which mineral is won from a site prior to non-mineral development taking place. This can take place at a number of different scales, which would depend on the size of the Proposed Scheme, the depth of mineral, the type and quality of the mineral, and the nature of the proposed development. For example, it may take the form of a Materials Management Plan (MMP) which will form part of the Environmental Management Plan (EMP) (TR010039/APP/7.5).

10.4.3. Constraints to prior extraction of mineral resources include:

- existing landscape features
- designated habitats and species
- sites of archaeological significance
- historic buildings and their settings
- existing sensitives developments (including residential properties)

10.4.4. To determine whether the above constraints would inhibit the practical prior extraction of RTD, ALV and LL, a desktop was undertaken using GIS mapping produced for the Proposed Scheme.

10.4.5. The main points arising from the assessment of environmental constraints are as follows:

Within the Proposed Scheme boundary- RTD/ALV

- No significant environmental constraints would preclude the prior extraction of the granular RTD and ALV within the Proposed Scheme boundary.
- However, the safeguarded granular RTD/ALV intersect the Proposed Scheme in the footprints of the existing A47 road infrastructure. This precludes prior excavation in locations where the existing carriageway is being retained for use as a cycleway/footpath.
- Safeguarded granular RTD and ALV deposits are mapped in three general locations of proposed infrastructure (Figure 10.4).

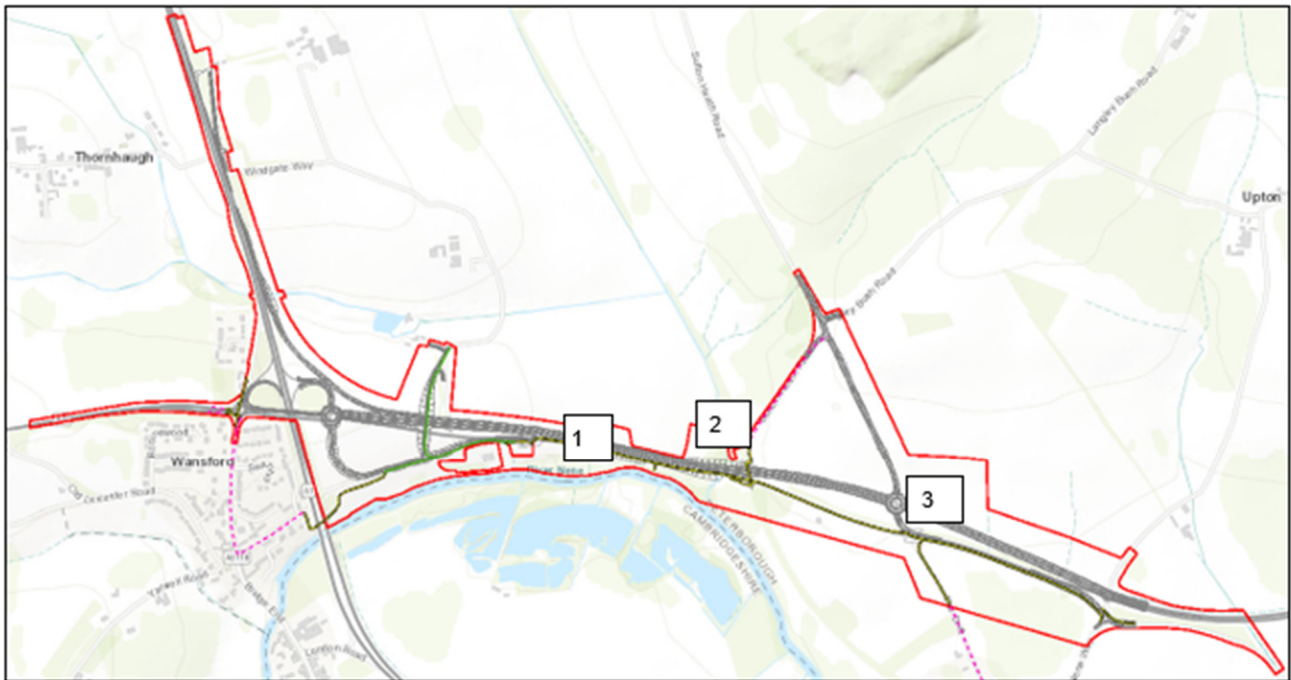


Figure 10.4 Areas of proposed new infrastructure which coincide with mapped RTD and ALV

- Geological Long Section HE551494-GTY-000-DR-CE-30010 indicates the presence of safeguarded RTD east of the service station along the existing A47 carriageway and west of the surface water drain adjacent to Sutton Heath Road (Location 1, Figure 10.4). In this location the proposed new carriageway follows the approximate topography of the existing A47 carriageway. There is a requirement to import material during the construction of this section of proposed carriageway. Prior extraction at this location may be restricted by the presence of the River Nene.
- Mapping indicates the presence of safeguarded deposits of ALV to the west of Sutton Heath Road (Location 2, Figure 10.4). A section of the proposed carriageway intersects this area of mapped deposits. However, Geological Long Section HE551494-GTY-HGT-000-DR-CE-30011 confirms that ALV was not encountered within exploratory locations sited within the inferred extent of the mapped deposits.
- Geological Long Sections HE551494-GTY-000-DR-CE-30012 and HE551494-GTY-000-DR-CE-30013 indicate the presence of safeguarded RTD beneath the proposed new carriageway to the east of Sutton Heath Road and new A47 roundabout with Peterborough Road and the Nene Way (Location 3, Figure 10.4). No excavation is required to construct this section of the Proposed Scheme.
- As excavation is not required at each of the discrete locations, it is not considered economically viable to prior excavate the safeguarded deposits. Prior excavation would result in the requirement to import material to either reinstate existing ground levels or to build up to required construction levels.

Within the Proposed Scheme boundary- LL

- No significant environmental constraints would preclude the prior extraction of the LL within the Proposed Scheme boundary.
- The safeguarded LL intersects the Proposed Scheme in the footprints of the existing A47 road infrastructure. This precludes prior extraction as the carriageways will be retained and amalgamated into the Proposed Scheme or retained for use as a cycleway/footpath.
- Safeguarded LL are mapped in four general locations of the proposed infrastructure (Figure 11.5).

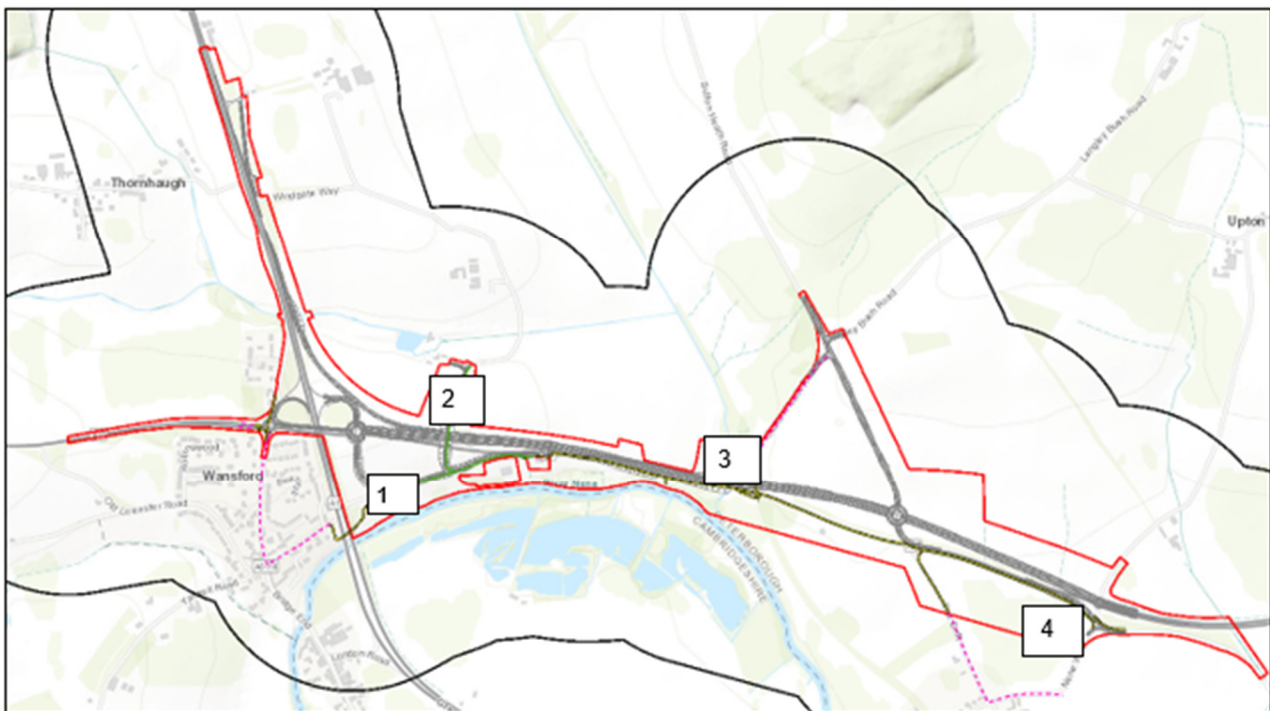


Figure 11.5 Areas of proposed new infrastructure which coincide with mapped LL

- Safeguarded deposits of LL are mapped in the vicinity of the proposed link road to the south of the existing western roundabout in Wansford providing access to Sacrewell Farm and the service station (Location 1, Figure 10.5). Geological Long Section HE551494-GTY-HGT-000-DR-CE-30016 indicates that LL underlies a thin veneer of topsoil or made ground at this location. There is a net requirement to import material to construct this link road, with the requirement to excavate a small portion of made ground and LL associated with the existing A47 carriageway. It would not be considered economically viable to prior excavate the safeguarded LL at this location due to the apparent thinness of the LL, presence of made ground that would otherwise remain in situ and the requirement to import material at this location. Additionally, the presence of the River Nene may restrict prior excavation at this location.
- Safeguarded deposits of LL are mapped beneath the proposed new section of carriageway adjacent to the north of the existing A47 carriageway and proposed link road (underpass) (Location 2, Figure 10.5). Geological Long Section HE551494-GTY-HGT-000-DR-CE-30017 indicates the presence of LL directly

beneath a thin veneer of topsoil. Excavation of a greater portion of the LL will be required to form the cutting for the Sacrewell Farm underbridge. Geological Long Section HE551494-GTY-HGT-000-DR-CE-30017 indicates that a large portion of the LL will be excavated during the excavation of the underbridge cutting.

- Safeguarded deposits of LL are mapped beneath a narrow section of the proposed new carriageway in the vicinity of Sutton Heath Road (Location 3, Figure 10.5). Geological Long Section HE551494-GTY-HGT-000-DR-CE-30011 does not provide a cross section of this specific section of the mainline, however there is a requirement to import material at this location and therefore prior extraction is not considered viable.
- Safeguarded deposits of LL are mapped beneath the proposed link road connecting to Nene Way (south of the existing A47 Nene roundabout) (Location 4, Figure 10.5). Due to an absence of deeper exploratory locations within this section of the GI, the Geological Long Section HE551494-GTY-HGT-000-DR-CE-30019 does not provide further information on the depths of LL. It is likely that import of material will be required for the construction of this section of the Proposed Scheme and therefore it is not considered economically viable to prior extract material at this location.

Outside the Proposed Scheme boundary

- 10.4.6. Safeguarded deposits of RTD are present at the location of the Scheduled Monument and therefore extraction of the mineral at this location is restricted.
- 10.4.7. Safeguarded deposits of RTD are located to the south of the existing A47 (north of Stibbington). Extraction of these deposits is restricted by the presence of the River Nene, residential development (Stibbington) and the existing A1 infrastructure.
- 10.4.8. Safeguarded deposits of ALV are located to the south of the existing A47 carriageway, forming a narrow corridor along the River Nene. The presence of the river Nene and residential property associated with Stibbington and Sutton precludes extraction of these deposits.
- 10.4.9. Safeguarded deposits of RTD are present to the south of the existing A47 carriageway between Sutton and Ailsworth. The Proposed Scheme does not restrict extraction of these deposits. However, the close proximity of the villages and the presence of a surface watercourse would likely restrict future extraction.
- 10.4.10. Safeguarded LL is present beneath Wansford, the current Wansford Junction and to the north of the existing A47 carriageway. Extraction of the LL at this general location is restricted by the presence of Wansford, existing highways infrastructure (existing Wansford Junction and A1 carriageway) and residential properties accessed from Windgate Way.

- 10.4.11. Safeguarded LL is present beneath Sutton (to the south of the existing A47 carriageway). Extraction of this LL is restricted by the presence of Sutton and the River Nene.
- 10.4.12. Safeguarded LL is present to the south of the existing A47 carriageway between Sutton and Ailsworth. The Proposed Scheme does not restrict extraction of these deposits. However, the close proximity of the villages and the presence of a surface watercourse would likely restrict future extraction.

Summary

- 10.4.13. In summary, there are no significant environmental constraints to the prior excavation of mineral resources within the Proposed Scheme boundary. Safeguarded mineral deposits are located within the footprint of existing road infrastructure. Prior extraction of minerals is precluded in location where the existing carriageway is being retained for use as a cycleway/footpath.
- 10.4.14. Safeguarded deposits of RTD and ALV within the Proposed Scheme boundary are located in three areas of proposed infrastructure. Excavation is not required at any of these areas of proposed infrastructure and as such prior excavation would result in the requirements to import material to either reinstate existing ground levels or build up to the required construction levels and is therefore not considered economically viable.
- 10.4.15. Safeguarded LL within the Proposed Scheme boundary is found within four areas of proposed infrastructure. A greater portion of the LL will be excavated to form the Sacrewell Farm underbridge, however there will be a requirement to import material at the remaining three locations and as such prior excavation of these sites is not considered viable. Additionally, excavation of the mineral reserves in the vicinity of the proposed link road (Location 1) would generate made ground arisings that would otherwise remain undisturbed.
- 10.4.16. Prior extraction of safeguarded mineral reserves is also restricted by the presence of the River Nene.
- 10.4.17. Extraction of safeguarded minerals outside of the Proposed Scheme boundary is restricted by the River Nene, existing road infrastructure (A47 carriageway and A1 carriageway), residential properties and urban developments (Stibbington and Sutton)

10.5. Mineral infrastructure sites

- 10.5.1. The mineral impact assessment also considers the constraints the Proposed Scheme may place on existing and proposed mineral extraction and mineral infrastructure sites.

10.5.2. The Cambridgeshire and Peterborough Minerals and Waste Development Plan Site Specific Proposals Plan identifies:

- existing mineral extraction sites and mineral infrastructure
- existing mineral sites and mineral infrastructure consultation area
- transport zones and safeguarding

10.5.3. There are no such designated sites in proximity to the Propose Scheme and it is concluded that the Proposed Scheme will not unduly restrict existing and proposed mineral operations within the county.

10.6. Policy CS26 Test: Safeguarding mineral and waste sites and mineral resources

10.6.1. This section examines the degree to which the Proposed Scheme satisfies the test set out in Policy CS26 of the Cambridgeshire and Peterborough Minerals and Waste Development Plan Core Strategy Development Plan Document (adopted 2011).

10.6.2. Policy CS26 states that development will only be permitted where it has been demonstrated to the Mineral Planning Authority that the safeguarded mineral is no longer of any economic or potential economic value, the mineral can be extracted prior to the development taking place, the development will not inhibit extraction if required in the future, there is an overriding need for the development and prior extraction cannot be reasonably undertaken or the development is not incompatible.

10.6.3. The Core Policies for Minerals outlined in the Core Strategy Development Plan Document cites Paragraph 13 of Minerals Policy Statement 1: planning and minerals *which 'cautions against proven mineral resources being 'needlessly' sterilised by non-mineral development'*.

10.6.4. Although no further definition of 'needlessly sterilised'; is provided within the Cambridgeshire and Peterborough Minerals and Waste Core Strategy (published and adopted July 2011), it can be assumed that this would include excavation and disposal of the safeguarded mineral resource, reduced access to safeguarded resources through development, proximal sterilisation and encroachment of existing development onto safeguarded resources.

10.6.5. Based upon the Proposed Scheme proposals at the time of writing, materials likely to be encountered within cuttings are the River Terrace Deposits (RTD), Lincolnshire Limestone and Grantham Formation (GF) (not safeguarded). To determine whether the RTD, LL and GF are suitable for reuse within the Proposed Scheme, the materials have been classified by virtue of grading in accordance with Table 6/2 within the Manual of Contract Document for Highway Works: Vol 1:

Specification for Highway Works (SHW), Series 600 (as amended) (published February 2016). For the purposes of this assessment, the ULL and LLL have been combined due to being indiscernible based upon the material descriptions provided with the exploratory hole logs, and their engineering properties being of a similar nature.

- 10.6.6. Whilst elements of the Proposed Scheme layout continue to develop, at the time of undertaking this assessment, all proposed cuttings are anticipated to generate a volume of excavated material of the order of 62,155m³, excluding stripped topsoil. The required volume of fill material on the Proposed Scheme is estimated to be approximately 90,420m³, resulting in a cut/fill balance deficit of approximately 28,265m³, with the difference made up through material import.
- 10.6.7. This preliminary assessment focuses on the cuttings to be formed either side of the Sacrewell Farm Underbridge, as it is estimated that these cuttings will provide approximately 50% (30,836m³) of all site won material for the Proposed Scheme.
- 10.6.8. Limited ground investigation data has meant that a preliminary re-use assessment for a number of the smaller cuttings is difficult. However, where possible, remaining cuttings have been assessed based upon available data of the material likely to be encountered.

Sacrewell Farm cuttings

- 10.6.9. The major cutting through the Proposed Scheme is to be provided either side of Sacrewell Farm underbridge between approximate chainages Ch.0 and Ch.320, detailed below (chainages given are for the access road and do not refer to the mainline chainage). The access road intercepts the mainline chainage at approximately Ch.280 to Ch.320.
- 10.6.10. The cutting is proposed to reach a maximum depth of circa 6mbgl beneath the A47 carriageway, where it is anticipated to lie predominantly within both granular and intact LL and granular deposits of the GF.
- 10.6.11. To the south of the underbridge, the available ground investigation information indicates the cutting is likely to lie predominantly within sand deposits of the LL. However, small volumes of granular GF may also be encountered where the cutting depth extends beyond approximately 3.5mbgl.
- 10.6.12. Beyond the underbridge to the north, at approximate chainage Ch.200, the cutting depth reduces to around 4m and is anticipated to lie predominantly within sand deposits of the LL. Further to the north at approximate chainage Ch.260, the cutting reduces in depth to around 1.3m and is anticipated to lie predominantly within clay deposits of the LL.

- 10.6.13. By approximate chainage Ch.300, cutting depth reduces to less than 0.5m, providing access into Sacrewell Farm. Here the cut slope is anticipated to lie predominantly within sand deposits of the LL.
- 10.6.14. In order to determine the volume of material likely available for re-use within both the LL and the GF, available borehole records from the 2018 Soils Limited ground investigation have been cross referenced against Proposed Scheme profile cross-sections, to determine an average (mean) thickness of LL and GF. This averaged thickness has then been used to determine a ratio of LL relative to GF and hence, a percentage of material type likely to be available for re-use. Each material (LL and GF), has then been further split into whether it is likely to be acceptable Class 1A/B (granular) or Class 2A/B (cohesive) based upon PSD results, in accordance with grading requirements provided within Table 6/2 of the Manual of Contract Document for Highway Works: Vol 1: Specification for Highway Works, Series 600.
- 10.6.15. Cross referencing the available boreholes against the Proposed Scheme profile cross sections has determined an average (mean) thickness of the LL and GF of 2.9m and 1.4m respectively, returning a ratio of LL to GF of approximately 2:1. Using this ratio and the total volume of fill material estimated to be available from excavation of the cuttings, total volumes of LL and GF of 20,352m³ and 10,176m³ have been determined respectively.
- 10.6.16. Nine Particle Size Distribution (PSD) tests are available for the LL. Eight of these tests were undertaken on samples within predominantly granular LL, and a single test undertaken on a sample of predominantly cohesive LL. PSD results indicate the LL to comprise predominantly sand sized particles (refer to Figure 10.6). These results corroborate the borehole descriptions which show that generally, the material was encountered as a sand or gravel indicating that the excavated material may be predominantly suitable for reuse as a general granular fill. Therefore, for the purposes of this preliminary assessment, the PSD results from those tests undertaken on granular LL have been considered only. Based upon the available PSD testing, approximately 75% of the LL would classify as a Class 1A/B material by grading as the percentage passing the 63microns sieve is predominantly less than 15%. This equates to a volume of approximately 15,264m³.
- 10.6.17. Based upon PSD data alone, the remaining 25% is likely to classify as a Class 2A/B, resulting in a volume of approximately 5,088m³.

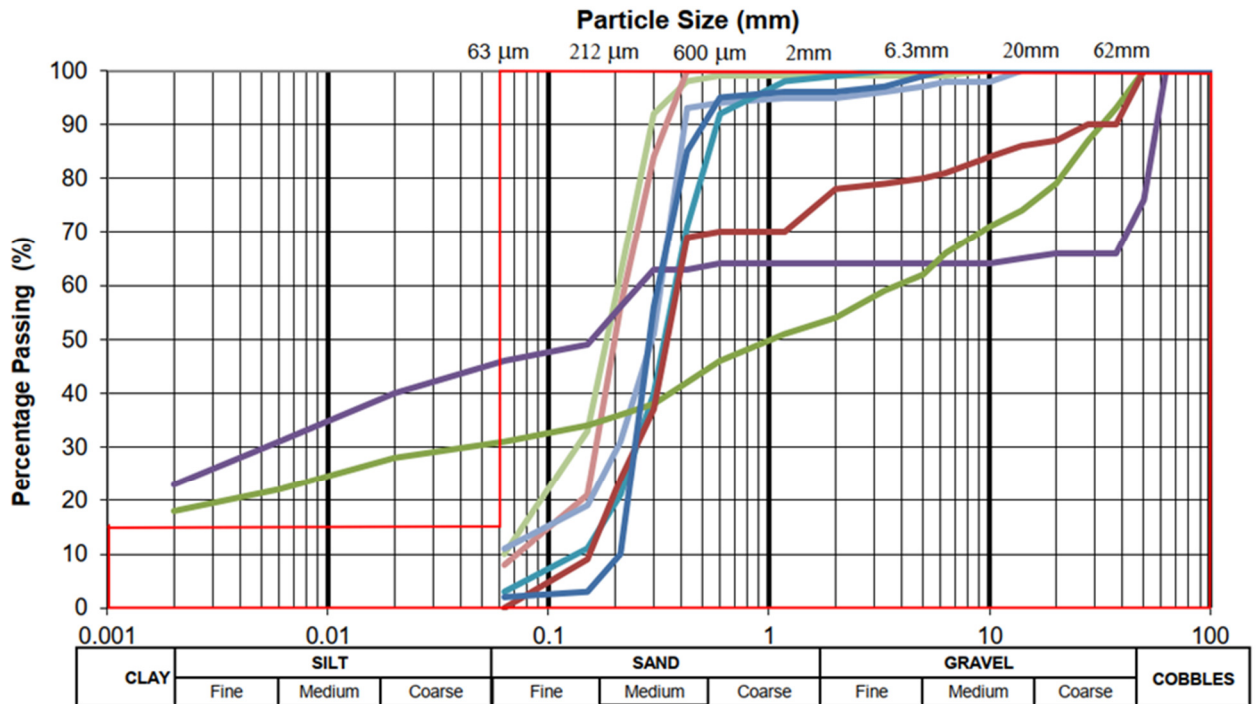


Figure 10.6 PSD results of the granular Lincolnshire Limestone Formation (gLL)

Service station link road cuttings

10.6.18. Cut slopes along the service station link road are typically less than 2m in depth. Limited ground investigation data is available along this section of the proposed alignment. However, review of available boreholes and geological maps indicate the shallow deposits to comprise predominantly granular LL. At the time of writing, the estimated volume of material arising from the cuttings is approximately 199m³.

10.6.19. As above, for the purposes of this preliminary assessment, the PSD results from those tests undertaken on granular LL have been considered only (refer to Figure 6). Based upon the available PSD testing, approximately 75% of the LL would classify as a Class 1A/B material by grading as the percentage passing the 63microns sieve is predominantly less than 15%. This equates to a volume of approximately 149m³.

10.6.20. Based upon PSD data alone, the remaining 25% is likely to classify as a Class 2A/B, resulting in a volume of approximately 50m³.

Mainline alignment cuttings

10.6.21. Cut slopes along the mainline are anticipated to provide an estimated 23,768m³ of material.

10.6.22. The cut slopes to the west and immediately south of the Scheduled Monument are located on sidelong ground, such that a cutting is formed on the Eastbound

(EB) carriageway and an embankment on the Westbound (WB) carriageway. These cuttings are typically less than 2m in depth and are anticipated to be predominantly within RTD, of both granular and cohesive nature.

- 10.6.23. Cuttings are proposed on both the EB and WB carriageways between approximate chainage Ch.1400 to Ch.1600. The maximum depth of the cutting is around 4m. Available existing ground investigation (GI) exploratory holes located west of the scheduled monument, are typically 80m to 100m south of the proposed alignment, therefore an accurate assessment of likely materials to be encountered cannot be made. However, based upon the available exploratory hole logs and review of geological maps, it is anticipated that cut slopes will be predominantly within RTD, of both granular and cohesive nature. Given the data set for cohesive RTD is limited to four results, this preliminary assessment is based upon the grading curves for the granular RTD. 22 PSD results are available for the granular RTD (refer to Figure 10.7).
- 10.6.24. Based upon the available PSD testing, approximately 64% of the GF would classify as a Class 1A/B material by grading as the percentage passing the 63microns sieve is predominantly less than 15%. This equates to a volume of approximately 15,212m³.

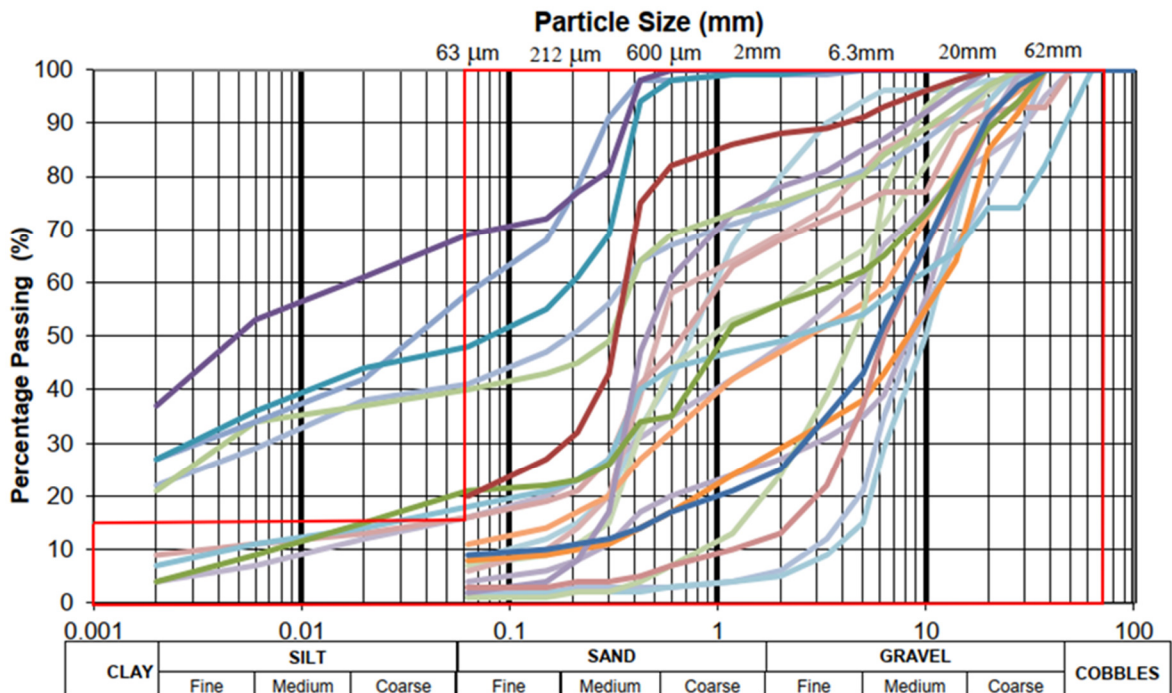


Figure 10.7 PSD results of the granular River Terrace Deposits (gRTD)

Summary

- 10.6.25. Based upon a limited set of PSD test results, it is considered that the RTD, LL, and GF are likely to be suitable for re-use as SHW Class 1 (granular) fill or SHW Class 2 (cohesive) fill. This is subject to the material meeting contract acceptability criteria, chemically suitable with respect to contamination risks and

being capable of being placed, trafficked and maintaining the required surface profile.

- 10.6.26. Outstanding volumes of RTD, LL and GF not meeting Class 1 or 2 requirements are likely to be suitable for Class 4 (landscape fills), with less stringent compaction requirements. Where RTD, LL and GF are found to be too wet, air drying, granular drainage layers and/or blending with drier materials may allow wetter materials to be more widely used on low height and/or non-sensitive landscape areas.
- 10.6.27. Given the limited dataset, more confidence is required. It is therefore recommended that further ground investigation and subsequent testing is undertaken.
- 10.6.28. It should be noted that a full assessment of reuse potential has not been carried out and the reusability of material will depend on other properties besides grading, including strength, moisture content and condition upon excavation and the feasibility to treat the material. However, as the Proposed Scheme has a significant earthworks material deficit, any opportunity to reuse this material in the works will be exploited and as much material as possible will be reused as general embankment fill (Class 1A/B or 2A/B) or alternatively for landscaping.

Design, mitigation and enhancement measures

- 10.6.29. The Proposed Scheme has been designed to avoid and minimise the impacts on material resources through the process of the assessment of alternatives and 'embedded' mitigation as defined in DMRB LA 104 (Environmental assessment and monitoring) (published August 2020). Design measures integrated into the Proposed Scheme for the purpose of minimising the environmental effects is reported in Chapter 2 (The Proposed Scheme) (**TR010039/APP/6.1**) of the ES.
- 10.6.30. Section 11.9 of the ES Chapter 11 (Material assets and waste) (**TR010039/APP/6.1**) reports on 'essential' mitigation required in addition to embedded mitigation to reduce and offset likely significant adverse environmental effects.
- 10.6.31. The following essential mitigation has been outlined to ensure that excavation material attributed to the ALV, RTD and LL is not 'needlessly sterilised':
- In accordance with the European Union Waste Framework Directive 2008/98/EC (published November 2008) 'waste hierarchy', the Proposed Scheme aims to prioritise waste prevention, followed by preparing for re-use, recycling and recovery and lastly disposal to landfill.
 - Design for re-use and recovery by identifying, securing and using materials that already exist on the Proposed Scheme.

- Design for materials optimisation by simplifying the layout and form to minimise material use and balancing cut and fill.

- 10.6.32. In accordance with DMRB LA 120 (Environmental management plan) (published March 2020) an EMP has been prepared parallel to the development of the Proposed Scheme design and construction methodologies. Measures and procedures within the EMP (**TR010040/APP/7.5**) include design, construction and operational mitigation, which have been developed in-line with the requirements arising from this ES.
- 10.6.33. The Principal Contractor will update the EMP (Second Iteration EMP) prior to commencement of works based on the First Iteration EMP. As part of this, the Principal Contractor will be required to generate an MMP.
- 10.6.34. The MMP will be developed in accordance with the CL:AIRE Definition of Waste Code of Practice (DoW CoP), Version 2 (published March 2011). This approach offers the most effective method of ensuring materials can be re-used on or off the Proposed Scheme. The MMP will detail the procedures and measures to be implemented to classify, track, store, re-use and dispose of all excavated materials encountered during the construction phase.
- 10.6.35. In addition to the mitigation outlined in ES Chapter 11 (Material assets and Waste) (**TR010039/APP/6.1**), Section 11.9 outlines potential enhancement measures to be incorporated into the Proposed Scheme including re-use of suitable surplus material outside of the Proposed Scheme boundary. Examples include the use of suitable surplus materials in engineered noise and landscaping bunding and on local projects such as fenland restoration that are concurrent to the construction phase of the Proposed Scheme.

10.7. Conclusions

- 10.7.1. Under its Roads Investment Strategy, the Applicant, Highways England, has identified that there is a requirement to improve the Wansford to Sutton section of the A47. The proposed upgrade is part of the wider programme of A47 corridor improvement programme required to improve connectivity and stimulate growing economic activity.
- 10.7.2. The Wansford to Sutton section of the A47 connects key economic growth areas of Peterborough. This section of the A47 is unable to cope with the high traffic volume and there are limited opportunities to overtake slower moving vehicles on this single carriageway.
- 10.7.3. The proposals will create a new dual carriageway and associated new junctions and access roads that will relieve congestion, provide extra road space, improve safety and help provide a free-flowing network.

- 10.7.4. Due consideration of the environmental impacts of the Proposed Scheme in the context of applicable National and local planning policy confirms that there is a clear need for the Proposed Scheme to proceed.
- 10.7.5. The Cambridgeshire and Peterborough Minerals and Waste Development Framework identifies the presence of Minerals Safeguarding Areas which intersect the Proposed Scheme in the footprint of the existing A47 road infrastructure. In these instances, mineral resources are sterilised by the existing development, whilst prior extraction is prohibited as the carriageway will be in use during the offline construction works and will be retained or amalgamated into the Proposed Scheme.
- 10.7.6. There are limited opportunities to prior excavate the safeguarded deposits due to the requirement to maintain existing topography, import materials as part of the required ground improvements and due to external constraints, such as the River Nene, residential properties and existing road infrastructure. The intention is to use excavated materials within the Proposed Scheme in accordance with the wider measures developed to avoid and minimise the impacts on material resources through the process of the assessment of alternatives and 'embedded' mitigation. As such, any safe guarded minerals that are encountered should be retained on the Proposed Scheme, if possible.
- 10.7.7. Where deposits of safeguarded minerals are present outside of the area of the DCO the Proposed Scheme is not considered likely to further constrain future extraction of deposits.
- 10.7.8. Any opportunity to reuse safeguarded material in the works will be exploited and as much material as possible will be reused. This approach is in accordance with the European Union Waste Framework Directive 2008/98/EC (published November 2008) "Waste Hierarchy" and is considered to present an appropriate means of ensuring proven mineral resources are not 'needlessly' sterilised by non-mineral development.

10.8. References

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