
**Stanninghall Quarry,
Horstead, Norfolk**



**Stanninghall Quarry Northern Extension
and Consolidation Application**

ENVIRONMENTAL STATEMENT

NON-TECHNICAL SUMMARY

VOLUME 3

October 2020



**ENVIRONMENTAL STATEMENT
NON-TECHNICAL SUMMARY
VOLUME 3**

**STANNINGHALL QUARRY EXTENSION
Horstead, Norfolk**

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1.0 INTRODUCTION

1.1 Background

This is a Non-Technical Summary (NTS) of an Environmental Statement (ES) which sets out the results of an Environmental Impact Assessment (EIA) which has been undertaken to accompany a planning application submitted by Tarmac Trading Ltd (Tarmac) to Norfolk County Council (NCC).

The application seeks planning permission for a northern extension to Stanninghall Quarry, south of Horstead / Coltishall in Norfolk, and the integration of the existing quarry permitted area at Stanninghall Quarry with the northern extension area as an overall consolidation scheme. A plan showing the location of the existing quarry and proposed northern extension area is produced as **Figure 1.1**.

Planning permission for the extraction of sand and gravel at Stanninghall Quarry was granted by the Secretary of State in January 2006. Quarrying commenced in early 2015, and operations are proceeding in accordance with the approved scheme. The quarry contains remaining reserves of some 1.22 million (m) tonnes as at 1st January 2020. However, some 450,000 tonnes of the permitted reserve lies beneath the processing plant site area and will not be available until the processing plant and related infrastructure is removed. It would therefore be logical to exploit reserves present in land to the north of the existing quarry using the infrastructure at the existing plant site before the plant is removed.

A planning application is thus being submitted at this stage (autumn 2020) in the hope that permission will be in place in early 2021. This would provide for a smooth transition into the northern extension area as part of a revised overall working and restoration scheme. The scheme thus deals comprehensively with the future development and restoration of the overall quarry area, but also in the context of the limited 'available' reserve at the existing quarry.

There are additional reserves of some 3.8 m tonnes in land within the proposed northern extension area, which could be worked as a logical extension to the existing quarry as part of an updated comprehensive phased working and restoration scheme. The release of additional reserves would provide continuity of production to serve established markets.

In July 2019, NCC published 'Preferred Options' for the Norfolk Minerals and Waste Local Plan (NMWLP). The document confirms a requirement for the release of additional reserves of some 20.3m tonnes of sand and gravel over the plan period to 2036. It is proposed to meet this requirement by the release of reserves at 19 defined 'specific site allocations' for future extraction. The identified sites include the Stanninghall northern extension as Specific Site Policy MIN65. The allocation is the largest of the site allocations (assumed 4.5m tonnes), where the reserve represents over 22% of the overall supply requirement for Norfolk. The Stanninghall northern extension is thus a key component of the emerging mineral supply strategy for the county.

The NMWLP contains a site description and appraisal of planning issues for each of the proposed allocated sites. With respect to Stanninghall, the appraisal provides advice on the need for assessments of the effects of the development in terms of noise, dust, archaeology and the historic environment, landscape and visual amenity ecology, flood risk, hydrogeology, and bird strike hazard. This advice has been drawn upon in identifying the topics which it is proposed to address as part of the EIA, supplemented by a formal EIA scoping opinion issued by NCC, as discussed below.

The planning application is supported by an updated phased quarry development and restoration scheme for Stanninghall Quarry which reflects the enlarged surface area associated with the northern extension. The scheme integrates the proposed extension area into the remaining areas of the existing quarry which either remain to be worked or which will be required for operational purposes.

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Subject to the spatial extent of these developments, there would be no material changes to the established operation at the quarry in terms of general working practices, hours of working, noise limits, dust controls, and ground and surface water controls.

1.2 The Application Site

The application site, comprising the existing Stanninghall Quarry and proposed northern extension area is situated within an open area of land between Horstead to the north east and Frettenham to the south west.

It lies within a broad triangular area of land formed by the B1150 Norwich Road to the east, from where access to the Quarry is gained, Horstead Lane to the west, and Hall Lane to the south, which links Frettenham to the B11150.

The overall application site is some 106.8 hectares in extent, of which the existing permitted quarry area is 53.6 ha, and the extension area 53.2 ha.

The existing quarry is comprised of the current operational working and progressive restoration areas, land awaiting extraction in the western area, a processing plant site (also including a ready mixed concrete batching plant), a series of lagoons used as part of the sand and gravel washing process, and perimeter screen bunds which contain soils stored for use in final restoration works.

The northern extension area comprises 5 large fields and one smaller field in agricultural use, sub-divided by hedgerows of varying quality. The land has gently undulating topography, where the northern section of the extension area falls gently in a westerly direction from a high point of 23m AOD just north of the Water Tower to circa 17m AOD along the western boundary. In the south eastern area of the extension area the land rises gently from circa 10m AOD just south of the property at Beverley, to circa 18m AOD just north of the north eastern boundary of the existing quarry.

The site is located in a general rural setting with no public rights of way (PROW) or public vehicle access routes running through the site.

The current circumstances at the application site are illustrated on plan ref KD.SH.D.006, reproduced at a smaller scale below as **Figure 1.2**.

1.3 The Proposed Development

In summary, the proposed development comprises:

- (i) The phased extraction of some 5.03m tonnes of sand and gravel comprising some comprising some 770,000 tonnes with the Phase 4B area, some 3.83m tonnes within the northern extension area, and some 450,000 tonnes within the plant site area;
- (ii) The extraction of sand and gravel at an average rate of some 300,000 tonnes per annum, giving a working life of some 17 years
- (iii) The continued use of the existing Stanninghall Quarry processing plant and site access onto the B1150 as part of the extension development;
- (iv) The temporary retention of the screen bunds around the processing plant site, pending use of the soil resources in the bunds as part of the final restoration works;
- (v) The extraction of sand and gravel in 6 phases, comprising phase 4B within the western area of the existing permitted quarry, phases 5-8 within the northern extension area, and a final phase 9 associated with the extraction of sand and gravel from beneath the plant site area, pending final restoration works within the plant site;
- (vi) A phased programme of progressive extraction and ongoing restoration in phases behind the advancing working phase; and

- (vii) The progressive implementation of a restoration strategy designed to deliver landscape and biodiversity enhancements, as required by planning policy.

These issues are described further in section 2.0 below.

1.4 The Non-Technical Summary

An Environmental Impact Assessment (EIA) has been undertaken to consider the environmental effects of the proposed development. The results are presented in an Environmental Statement (ES) which accompanies the planning application.

This document is a Non-Technical Summary (NTS) of the Environmental Statement (ES) and presents the main findings of the Environmental Impact Assessment (EIA) in non-technical language. The NTS, as the title suggests, provides only a brief summarised account of a large amount of text and technical data contained in the ES and its supporting Appendix.

However, it is intended to provide a sufficient overview of the development scheme, and the environmental issues which would be associated with the development, to allow the reader to gain an understanding of the key issues, and the way in which the EIA has informed the preparation of the proposed development scheme.

The NTS comprises Volume 3 of a comprehensive submission which consists of:

- Volume 1: Environmental Statement (ES);
- Volume 2: Technical Appendices; and
- Volume 3: Non-Technical Summary of the ES (i.e. this document);

The planning application is supported by a Planning Application Statement (PAS) which includes the formal application plans which illustrate the details

of the proposed development. Selected plans are reproduced in this NTS for ease of reference.

1.5 Technical Studies

In order to ensure that the topics are comprehensively addressed, the Applicant has commissioned a number of specialist consultants to deal with the identified issues, namely:

- Landscape and Visual Impact and Restoration Design – Kedd Ltd;
- Ecology – Aecol Ltd;
- Hydrology and Hydrogeology – BCL Consultant Hydrogeologists Ltd;
- Agriculture and Soil Resources: Reading Agricultural Consultants Ltd
- Noise – WBM
- Air Quality – SLR Consulting Ltd;
- Traffic – Hurlstone Partnership;
- Cultural Heritage – Andrew Josephs Associates

In addition, technical inputs on geology, phased quarry development, working practices and operational mitigation measures have been prepared by in-house expertise available to the Applicant.

The EIA and preparation of the ES has been coordinated by SLR Consulting which has a specialist capability in mineral planning. SLR is a member of the Institute of Environmental Assessment and Management with an awarded EIA 'Quality Mark'.

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1.6 Document Availability

The ES Volumes and PAS will be available for inspection online via Norfolk County Council’s web site and a link to ‘current planning applications’. The application documents are also available to view via the web site below:

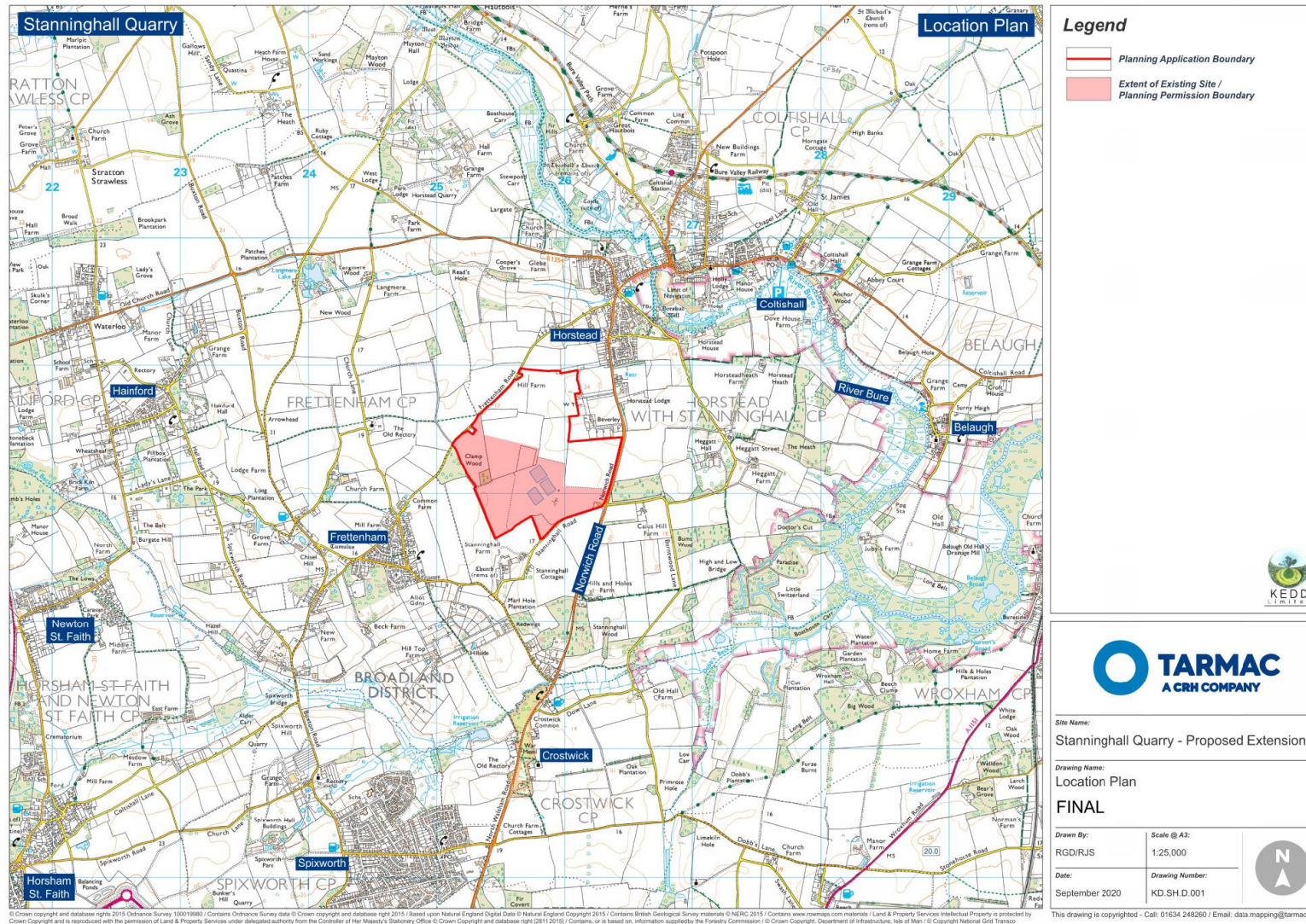
stanninghall.tarmac.com

Hard copies may be obtained from the Applicant’s Agents, SLR Consulting Ltd, Fulmar House, Beignon Close, Ocean Way, Cardiff CF24 5PB (Tel 02920 491010).

The cost of volumes (inclusive of VAT and postage) is:

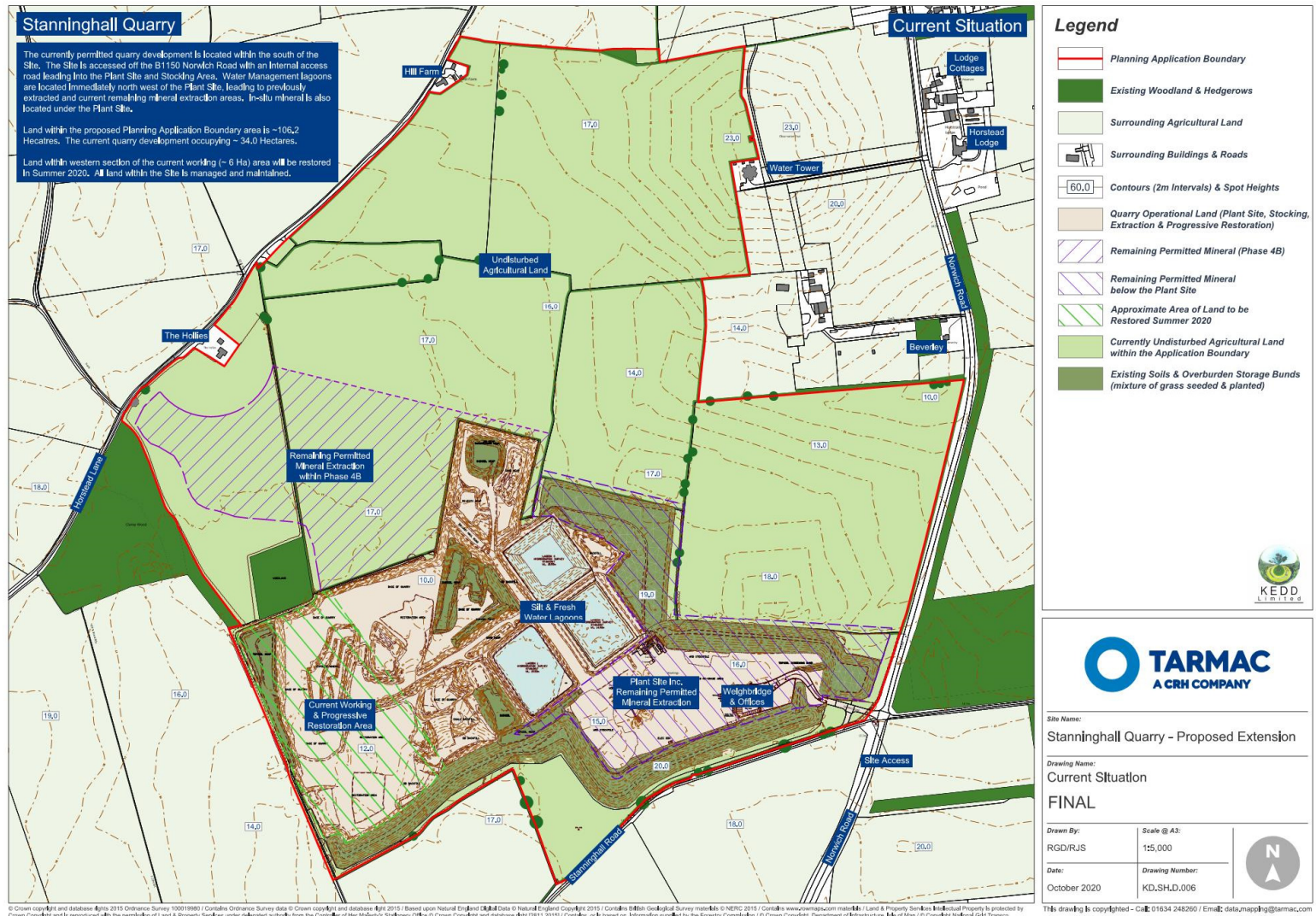
- ES Volumes 1 – 3
 - Printed versions £100.00
 - CD version £5.00
- Volume 3 NTS: (Printed version) £10.00

Figure 1-1 - Site Location Plan



Non-Technical Summary

Figure 1-2 Current Situation



2.0 THE PROPOSED DEVELOPMENT

2.1 Quarry Development Scheme

2.1.1 Design Objectives

The scheme has been designed to reflect seven key design principles, namely:

- (i) To reflect the boundary of the proposed 'site specific allocation' set out in the 'Preferred Options' for the Norfolk Minerals and Waste Local Plan (NMWLP), July 2019;
- (ii) To continue the phased working and restoration principles in place at the existing Stanninghall Quarry site across the overall site area including the northern extension area;
- (iii) To design a phased extraction scheme which minimises the extent of the operational area at any one time, with land in advance of the working area temporarily continuing in agricultural use, and land behind the working area being progressively restored to the defined after uses;
- (iv) To retain the processing plant in its current central location, where the plant, stockpiles and related operations are well screened from external vantage points;
- (v) To retain the existing access onto the B1150 Norwich Road;
- (vi) To sustainably use the on-site soil resources to restore the site to a predominantly agricultural landscape; and

- (vii) To design a sustainable long-term restoration scheme which reflects the local landscape character, with new habitat creation.

2.1.2 Development Scheme

The scheme has been designed as a 6-phase operation, as illustrated on the 'block phasing plan' ref KD.SH.D.008, reproduced at a smaller scale in this chapter as **Figure 2.1**.

This includes a 'Phase 4B' within the currently permitted Stanninghall Quarry area, with then phases 5 – 8 to be worked in a clockwise direction within the proposed northern extension area.

A final phase 9 would comprise the extraction of sand and gravel within the current plant site area as part of the final works within that area.

The anticipated progress of phased extraction and restoration is illustrated on the phasing plans ref KD.SH.D.009 – 014 which accompany the planning application. Aerial representations of the existing situation, the progress of the development at phase 6 / 7 and at final restoration are produced at the end of this chapter as **Figures 2.2 – 2.7**.

The overall site contains reserves of some 5.053m tonnes, comprising some 770,000 tonnes with the Phase 4 area, some 3.83m tonnes within the northern extension area, and some 450,000 tonnes within the plant site area (figures rounded). It has been assumed that the site would be worked at an output of some 300,000 per annum, which would give a working life for the development of just under 17 years

The phasing arrangement has been designed to facilitate the progressive restoration of the site by using soils and overburden to profile and restore preceding phases as a rolling programme of soil stripping, placement in the preceding phase and progressive sand and gravel extraction by phase. The

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scheme has been designed based upon a detailed materials balance by phase, which is set out in Chapter 6.0 of the Planning Application Statement.

The phases within the proposed northern extension area would not provide equal volumes of sand and gravel, but rather, they have been designed partly to reflect the existing field pattern, but also importantly, the logistics of the soil stripping and handling to achieve an efficient programme of progressive restoration as part of the overall materials balance.

The limits of extraction defined on the block phasing plan (**Figure 2.1**) have been defined to reflect:

- (i) Standoff margins of some 75m to the residential properties at The Hollies and Hill Farm along the western edge of the site, with temporary soil stockpiles to be accommodated in the standoff zone to provide temporary screening;
- (ii) A standoff margin of 40m to the Water Tower situated beyond the north eastern boundary of the northern extension area (Phase 7);
- (iii) A substantial standoff margin to the residential property at Beverly to the north east of Phase 8 (circa 230m) which reflects to absence of mineral in the land to the north east of phase 8 (but also the need accommodate temporary soil stockpiles). and
- (iv) Standoff margins to ensure the protection of the perimeter vegetation and the continued screening value which it provides, including a standoff margin to the ancient woodland block at Clamp Wood, to the west of Phase 4B.

As a continuation of operations within the existing quarry, the excavated sand and gravel would be hauled from the extraction phase to the existing processing plant by dump truck. The sand and gravel would then be washed and screened at the plant site, and the finished products would be placed in

stockpiles ready for off-site despatch. A proportion of the sand and gravel would be used in the on-site ready mixed concrete plant.

The phased development scheme would proceed in sequence in the northern extension area as phases 5 – 8 with land in advance of the working phase temporarily continuing in agricultural use, and land behind the working phase being progressively restored using soils stripped from the adjoining next working phase.

The final Phase 9 works would involve the extraction of the remaining reserves of sand and gravel situated beneath the plant site area requiring the decommissioning and removal of the plant and either processing the remaining sand and gravel using a mobile plant, or marketing the material 'as raised. On cessation of mineral extraction and processing, all quarry plant, offices and associated infrastructure would be removed from the site.

The silt lagoons would be allowed to dry out and the fresh water lagoon would be drained. The silt from the dried-out lagoons would be used partly to create restoration formation levels within the residual area to be restored, and partly with the lagoons to be restored in situ via capping and profiling. When ground conditions permit, all remaining land would be re-graded to achieve the final restoration formation levels. This would include regrading previous silt lagoons to create land gradients which tie into adjoining land and which achieve the desired surface water drainage arrangements.

The soils available to complete the final restoration works are currently stored in screen bunds around the plant site area, and this material would be used to complete the reprofiling and restoration of the phase 9 plant site area.

2.2 Hours of Working

The existing hours of working at Stanninghall Quarry are regulated by planning condition 9 of permission ref C/5/2015/5017 and are confined to:

- 07.00 - 18.00 Mondays to Fridays and
- 07.00 - 13.00 on Saturdays

No operations are to be carried out on Public or Bank Holidays or Sundays

No changes are proposed to these established working hours.

2.3 Output and Traffic Movements

Based on the proposed average production of 300,000 tonnes per annum, of which some 30,000 tonnes per annum is diverted to the ready mix concrete plant, the remaining 270,000 tonnes of sand and gravel would attract an average of 54 loads / 108 HGV movements per day, assuming average load sizes of 20 tonnes and that the distribution remains predominantly over a 5 day week (Monday to Friday), with only occasional loads on Saturdays.

The ready mix concrete plant generates an average of 13 loads / 26 HGV movements per day in average load sizes of 5.5m³. This results in an overall total of 67 loads / 134 HGV movements per average day, which equates to an average of 6 loads / 12 HGV movements per hour.

In terms of the distribution of traffic travelling to / from Stanninghall Quarry, approximately 10% of sales travels to / from the north via Horstead, whilst the remaining 90% travels to /from the south via Crostwick / Spixworth, with the majority of traffic travelling via the A1270 Broadland Northway (also referred to as the Norwich Northern Distributor Road).

2.4 Restoration

2.4.1 Objectives

The aim of the strategy is to ensure agricultural reinstatement and productivity of land to Best and Most Versatile Land capability, whilst creating and diversifying sustainable habitat or the promotion of biodiversity.

In addition to the principal restoration land use of agricultural land, the strategy seeks to also establish and manage the following key habitat types within the restored agricultural landscape:

- Native Woodland
- Native Species Hedgerow Planting
- Species Rich Grassland

2.4.2 Progressive Restoration

It is important to note that the whole site will not be worked / disturbed at the same time. All soil stripping, mineral extraction and restoration will be carried out in a sequence of progressive phases, with the progress of the development at phase 6 / depicted on the aerial illustrations shown on **Figures 2.4 and 2.6**.

The key features of the progressive restoration works include:

- The retention and safeguarding of all site boundary hedgerows and woodland blocks which form the outer landscape structure of the existing site and northern extension area. These will be enhanced by further additional native planting along the eastern and northern boundaries of the site.
- Where possible utilising soils and overburden stripped to expose mineral in a direct single movement to restore previously exposed and extracted land. This will minimise the area of land disturbed/ required for mineral operations at any one period of time.
- The phasing proposals incorporating the northern extension allow for a consolidated approach to help ensure large blocks of land can be restored in localised geographical areas of the site through the direct placement of restoration soils from the adjoining operational phase.

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2.4.3 Restoration Proposals

The restoration land uses to be established at the site are set out in Table 2.1 below:

Table 2-1 Land use Restoration Proposals and Areas

Restoration Land uses Proposed Landuses	Areas (as Ha / linear metres)
Native Woodland Planting	24.5 Ha
Agricultural Land	69.8 Ha
Species Rich Grassland	11.9 Ha
Native Hedgerow Planting	1,462 linear m's
TOTAL	106.2Ha

The proposed restoration strategy is illustrated on plan ref KD.SH.D.015, reproduced below at a smaller scale as **Figure 2.8**.

Native Woodland Planting

Advanced woodland block planting is to be carried out to the northern and eastern boundaries of the site during the first available planting season.

This will be followed by progressive planting of native woodland species during Phase 4B through to the final restoration Phase 9.

Agricultural Land

Agricultural Land will form a key part of the restoration of the north / central, eastern and south western areas of the site, with a total of approximately 70 ha of the site restored to this land use.

The agricultural land will be restored at a full soil profile consisting of 0.3m of topsoil, 0.3m of upper sub soil, and 0.6m of lower subsoil / overburden capable of achieving best and most versatile land characteristics of Agricultural Land Classification data (ALC) grade 3a soils or above

The area to be restored to agricultural land will be enhanced for wildlife by creating grassed headland margins of at least 6 metres in width. This unimproved neutral grassland margin will contain species that provide an abundance of seeds for invertebrate, bird and mammals.

Species Rich Meadow Grassland

Land around the periphery of the Site / and as woodland glades is to be sown with a base seed mix to promote species diversity.

Hedgerows

The proposals incorporate a total of 1462 linear metres of new hedgerows/ hedgerow lined trees. The majority of hedges would be planted as part of restoration to again comprise a diverse range of native species, typical of the local area. This will help ensure that the landscape character and context of the site integrates into the local area.

2.4.4 Restoration Aftercare Management

All restored areas will be subject to a detailed 5 year Aftercare Management Programme.

The Aftercare Programme will cover each of the habitat types to be created during the life of the development or following cessation of mineral extraction. The programme will allow for annual site meetings between the developer, landowners, the local planning authority and/or other statutory or non-statutory bodies, as agreed, to monitor the establishment of the various habitats to be managed, assess the success of the restoration habitats, determine the work to be progressed in the following year, and any remedial action required to existing habitats.

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Figure 2-1 Block Phasing

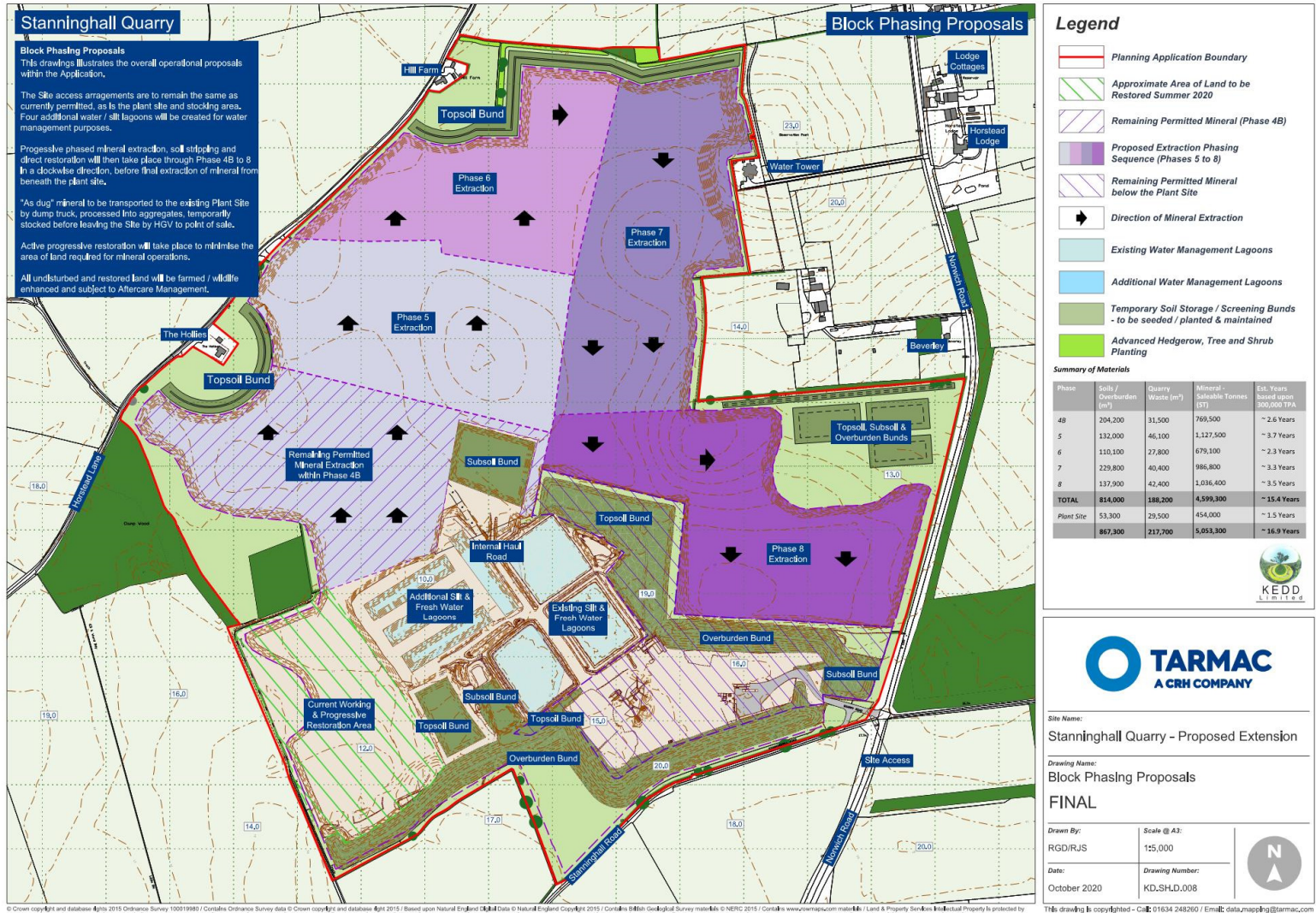
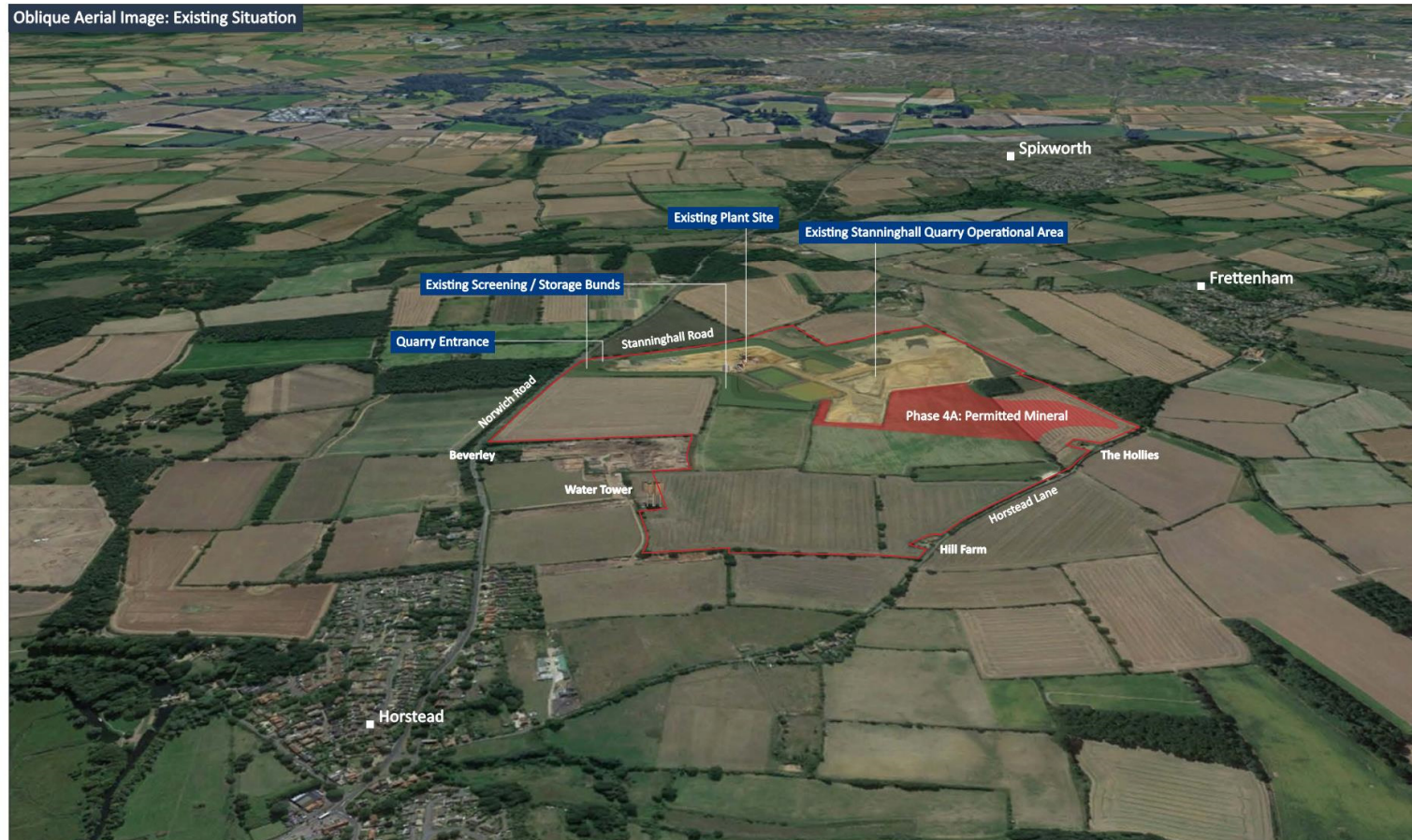


Figure 2-2 Aerial Viewpoint 1 Existing Situation

VIEWPOINT 1: Existing Situation illustrating the existing mineral extraction and plant site area, existing screening bunds and remaining permitted mineral

Oblique Aerial Image: Existing Situation



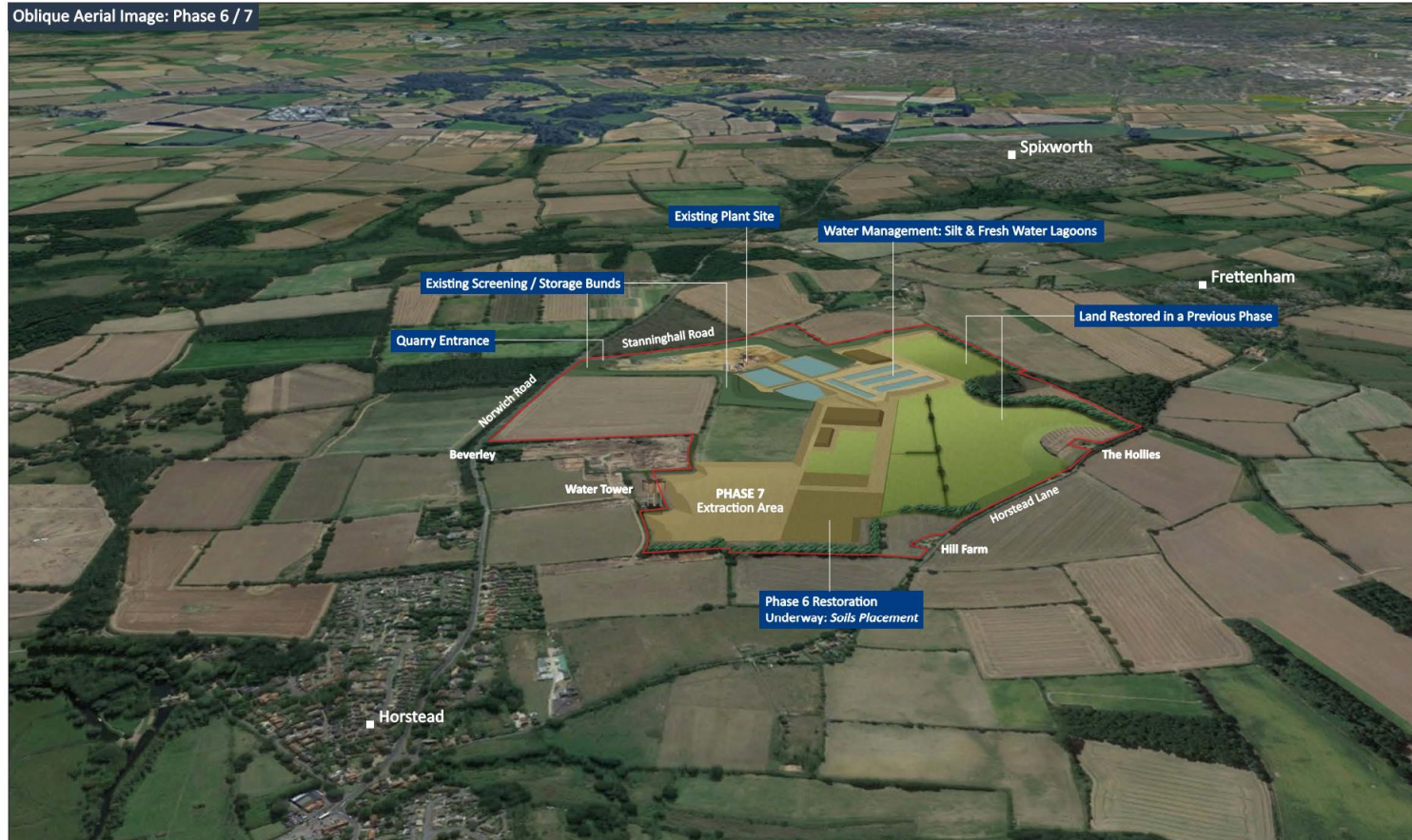
Stanninghall Quarry: Proposed Northern Extension



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Figure 2-3 Aerial Viewpoint 1 Phases 6 / 7

VIEWPOINT 1: Phase 6 / 7 Development Scenario illustrating the extent of both mineral extraction / operations and restoration at this stage



Stanninghall Quarry: Proposed Northern Extension



Figure 2-4 Aerial Viewpoint 1 Restoration

VIEWPOINT 1: Restoration illustrating the final restoration land form and land uses

Oblique Aerial Image: Restoration



Stanninghall Quarry: Proposed Northern Extension



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Figure 2-5 Aerial Viewpoint 2 Existing Situation

VIEWPOINT 2: Existing Situation illustrating the existing mineral extraction and plant site area, existing screening bunds and remaining permitted mineral

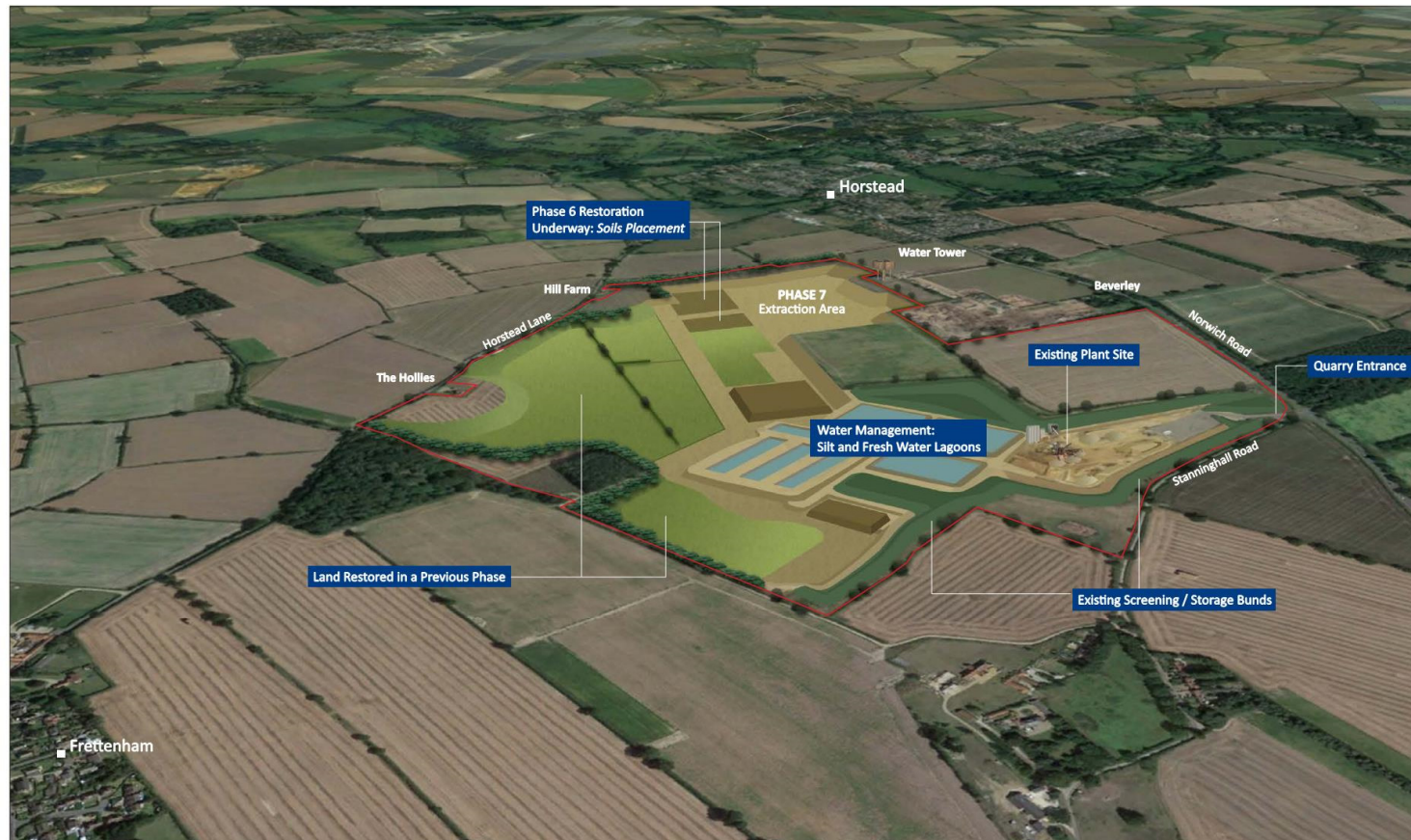


Stanninghall Quarry: Proposed Northern Extension



Figure 2-6 Aerial Viewpoint 2 Phases 6 / 7

VIEWPOINT 2: Phase 6 / 7 Development Scenario illustrating the extent of both mineral extraction / operations and restoration at this stage



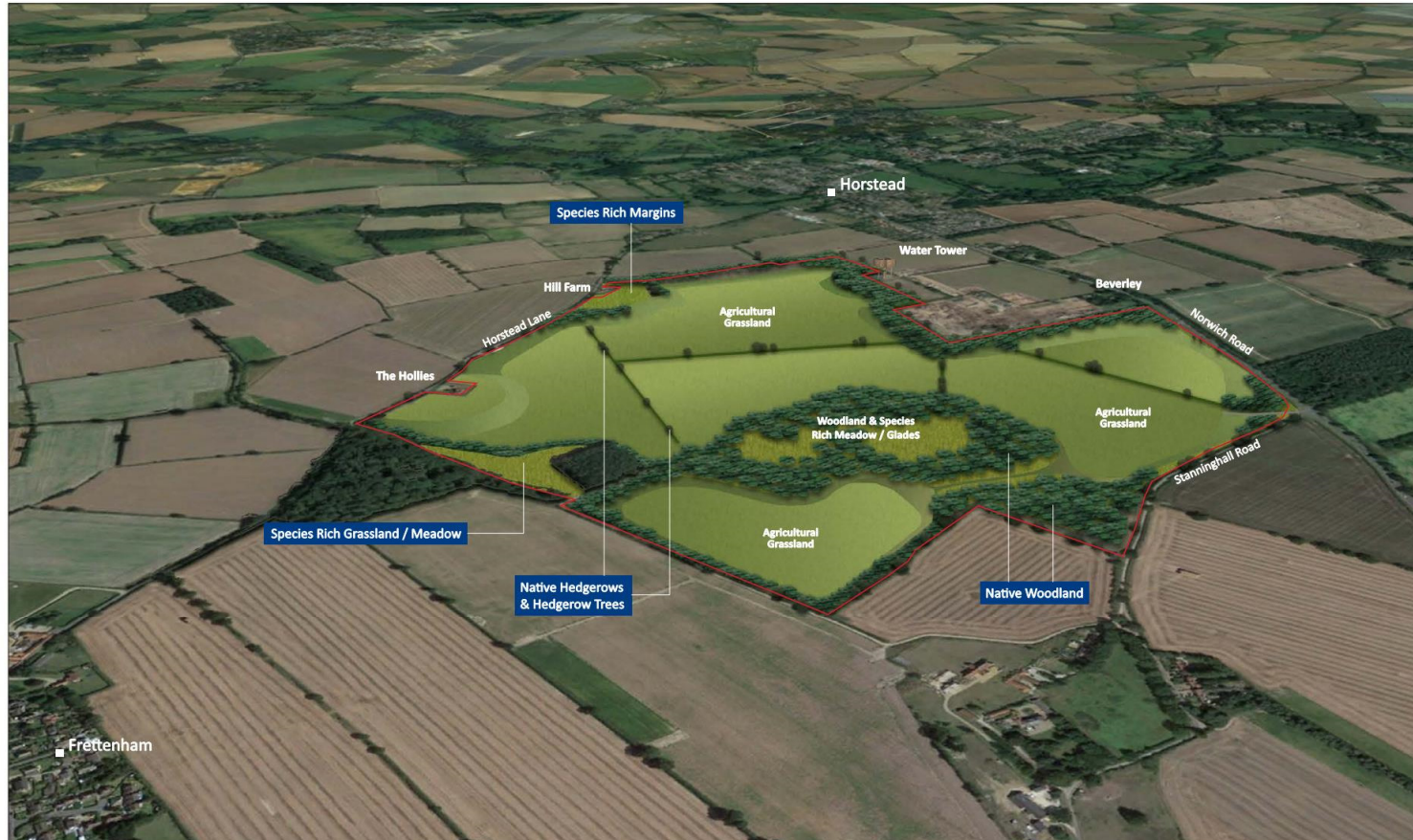
Stanninghall Quarry: Proposed Northern Extension



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Figure 2-7 Aerial Viewpoint 2 Restoration

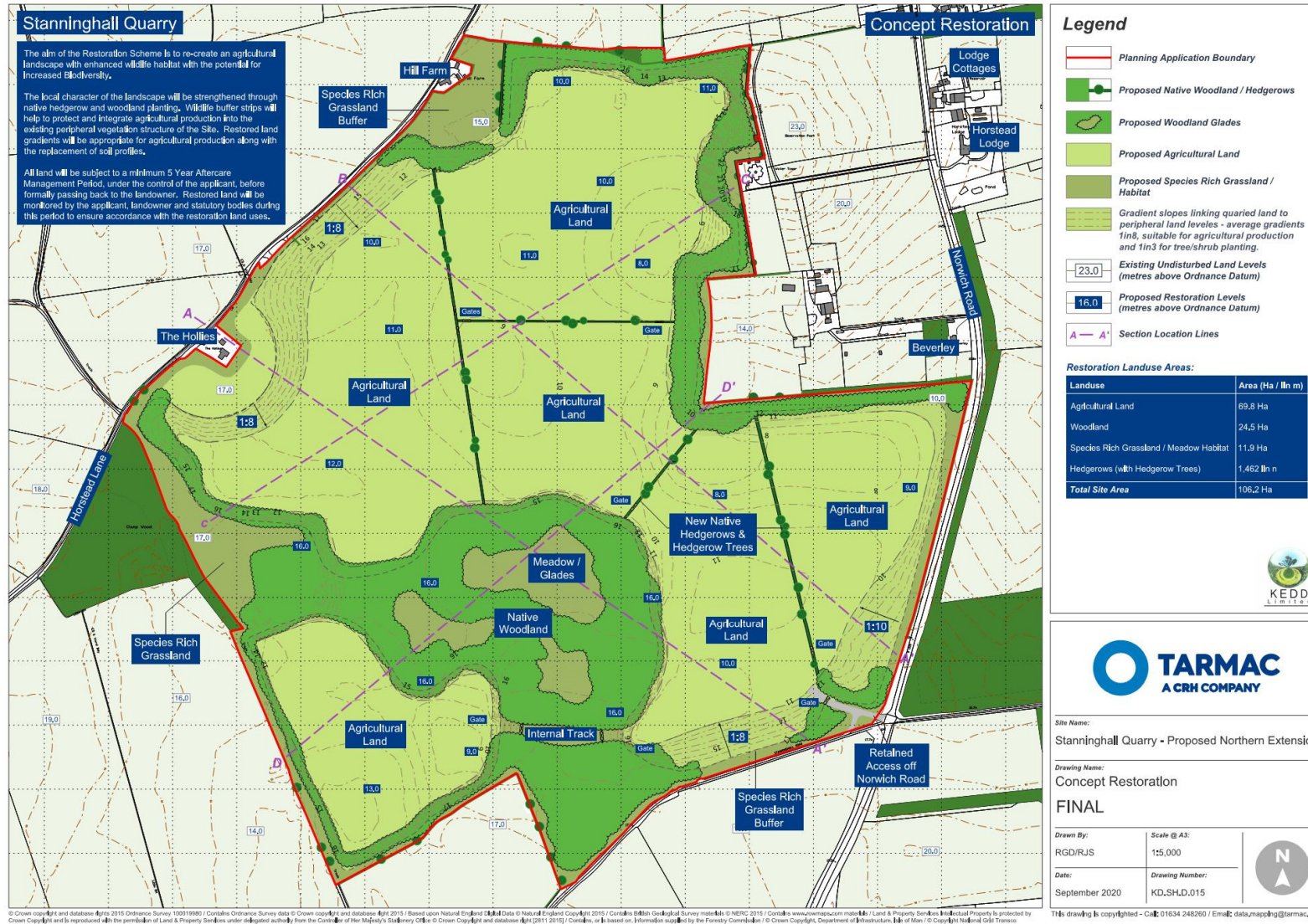
VIEWPOINT 2: Restoration illustrating the final restoration land form and land uses



Stanninghall Quarry: Proposed Northern Extension



Figure 2-8 Restoration Strategy



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3.0 SUMMARY OF ENVIRONMENTAL ISSUES

3.1 Introduction

The main Environmental Statement (ES) has considered the potential environmental effects of the proposed northern extension and consolidation scheme at Stanninghall Quarry.

Based upon the studies and content of the individual chapters, the underlying conclusion of the EIA is that the development is capable of proceeding in a way which would satisfactorily minimise environmental effects. Where relevant, the studies have made a series of recommendations for measures which could minimise effects.

These issues are set out below as a summary of the main findings of the ES and the conclusions which are drawn. For each topic, the summary describes the key elements of the study which has been undertaken, the mitigation measures which have been incorporated into the development scheme or which will be implemented as part of the ongoing development, and the conclusions which are reached regarding environmental effects.

3.2 Landscape and Visual Impact Assessment (LVIA) Study

3.2.1 LVIA Study

The Landscape and Visual Impact Assessment (LVIA) has been carried out in accordance with guidance produced by the Landscape Institute and the Institute of Environmental Management; Assessment Guidelines for Landscape and Visual Impact Assessment (GLVA 3); and Photography Technical Guidance Note TGN 06/19-Visual Representation of Development Proposals, published 17th September 2019.

LVIA is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource and on people's views and visual amenity" (ref GLVA3).

Data, collation and assessment has been carried out utilising both desktop and site survey works to identify the baseline landscape character and visual nature and condition of the site and its local area. Utilising site and site context topographical 3D data, the 'Zone of Theoretical Visibility' (ZTVI) has been prepared based upon:

- (i) the existing permitted development as part extracted;
- (ii) the operations within Phase 7 illustrating the in-place plant site and progressive mineral extraction at its northern limit with subsequent progressive restoration; and
- (iii) at Post Restoration when all land has been fully restored and all plant and machinery has been removed.

These were then used to inform and help define a study area within which the proposed development could influence / change both landscape character and visual amenity. It is emphasised that the ZTVI are a worst-case scenario in assessing the geographical land area from where the existing / proposed site development could be observed / influence landscape character as this method of analysis does not account for existing built form or vegetation structure which would affect / could screen views towards the site from landscape and visual receptors.

The Guidelines explain that both landscape and visual effects are dependent upon the sensitivity of the landscape resource or visual receptors and the magnitude of impact, from which an overall level of significance is then assessed.

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3.2.2 Landscape Impact

In respect of landscape character, the existing and proposed application development is wholly located within the Norfolk County defined Marsham and Hainsford Wooded Estate Character Area E2. It is assessed that the sensitivity of this area to a quarry type development is Medium as the landscape elements and features which comprise it are generally plentiful and robust. It is assessed that the magnitude of effect resulting from both the permitted plant site and the northern extension as Low. When combining the character area sensitivity to change from the proposed development during the operational period the assessed level of significance is Slight Adverse which in terms of the LVIA methodology is not Significant.

The progressive restoration proposals have taken on board the opportunities for National Level -NCA – The Broads Character area SE03: *“to maintain a sustainable and productive agricultural landscape while expanding and connecting semi-natural habitats to benefit biodiversity”*. This would be achieved through the concentration of higher quality soils in areas for agricultural productivity whilst developing approximately one third of the restored site for both landscape character enhancement and new wildlife habitat creation. The habitat would principally be associated with native woodland with a diverse range of shrub and tree species of ~24.6 Ha, along with species rich grassland and meadow of ~12.3Ha. Landscape structure will also be reinstated along with new habitats via the establishment of ~1,462 linear m's of hedgerows and hedgerow trees.

The restoration proposals also address Landscape Guidance specifically to Landscape Character Area E2 including the conservation and strengthening of landscape structure around the promotion of significant site internal woodland structure and the creation of woodland and hedgerow corridors. The development has also considered and is assessed to maintain the setting of both historic assets and the landscape setting of local villages. This would be achieved through both re-establishing original landscape

structure planting and the use of temporary screen bunding at appropriate levels which will be seeded, planted and maintained to mitigate potential adverse changes in setting.

At post restoration the original landform will be changed (lower) compared to the existing situation. The scheme has been designed to reflect locally observed landscape levels and provides land gradient suitable for a mix of agricultural uses and wildlife/ landscape structure. The site comprising ~106.8 Ha is large enough to allow for general topographical and gradient changes allowing assimilation into the wider landscape setting. The restored principal agricultural land uses combined with strengthened native species hedgerow, woodland planting and meadow/species rich grassland, provides a balanced suitable after use with increased potential for long term landscape and biodiversity enhancement. Post restoration a Slight Beneficial level of significance is assessed which in terms of the LVIA methodology is not Significant.

3.2.3 Visual Impact

In respect of visual matters, the site survey of individual visual receptors has found that due to a combination of topography, surrounding landform, existing and proposed tree planting and screening landform, views of both the existing and the proposed development are relatively limited in respect of both the number of actual visual receptors with views of the existing quarry/ proposed development and the magnitude of effects if receptors do have views.

Of the 23 representative receptors assessed, no visual receptor is currently experiencing or predicted to receive a Significant Adverse Visual Effect. Five representative visual receptors are assessed as currently receiving a Moderate Adverse effect from the existing development. These are all residential receptors (residents of Stanninghall Cottages, residents of Stanninghall Road, Barn conversions in Stanninghall, residents of The Hollies and residents of Beverley). Three of the receptors have a High sensitivity to change but a Low magnitude of effect from the existing

development. It is assessed that these levels of magnitude will remain during the proposed extension application as they generally emanate from the mineral processing plant and screen mitigation bunding.

It is predicted that only one additional receptor (Hill Farm) will receive a Moderate Adverse Significance Effect from the extension proposals which in terms of the LVIA methodology is not Significant. From Hill Farm receptors will have the opportunity to view soil stripping and mineral extraction during Phase 6 and 7, mainly screened behind an existing and strengthened tree lined hedgerow and temporary screening bund.

In respect of all representative visual receptors it is assessed that at post restoration with the establishment and management of the wildlife habitat and landscape structure enhanced agricultural landscape, the levels of visual significance will vary from Slight Adverse to Neutral to Slight Beneficial, none of which in terms of the LVIA methodology are significant. The slight adverse effects may result from the visual change in levels and landform morphology. These will only affect receptors at The Hollies and Hill Farm.

3.2.4 Landscape Mitigation measures

The main mitigation measures incorporated within the application design are:

- The retention of existing soil storage/ screening bunds during the operational period which are positioned around the peripheral boundaries of the fixed plant, processing, stocking and dispatch areas of the development. This is where the fixed structures of the existing development are located and will continue to be located during the extension period. It is also the location where the majority of quarry activity/ movement takes place. The existing seeded and maintained bunds will continue to screen the majority of the plant site activities.

- Advanced native tree and shrub planting and strengthening of existing peripheral hedgerows is to take place during winter 2021/22 to western, northern and eastern boundaries of the site.
- Advanced planting together with existing and progressive restoration planting is to be managed and maintained within a 5-year Aftercare Management Plan and a subsequent longer-term woodland and hedgerow management plan.
- To reduce the potential area of operational/disturbed land the quarry will be subject to progressive restoration. On completion of mineral extraction from the phased extraction area, land will be regraded, and restoration formation levels created utilising on site overburden and quarry dry waste silt onto which a full soil profile will be placed. The soils would be directly placed from soil stripping of the next phase (to expose mineral) supplemented by previously stripped and stored soils when required. All restored land will be planted or seeded in accordance with the Concept Restoration Scheme as illustrated on **Figure 2.8**. All restored land and land uses will be placed under a 5-year Aftercare Management Programme.
- Additional temporary soil screening bunds will be placed in advance of mineral extraction when working in phases 4B and 5 to screen the works from residents of the Hollies, and during phase 6 to screen residents of Hill Farm. These bunds will be 3m in height, grass seeded and maintained. A further 3m high temporary soil screening bund will be placed behind the existing hedgerow/tree planting along the northern boundary. This bund will also be seeded and maintained to help visually contain northern quarrying activities within phases 6 and 7 to potential visual receptors located within the southern areas of Horstead.

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- Higher quality soils are to be concentrated to ensure the retention of best and most versatile agricultural land characteristics for agricultural use.
- Significant areas of new habitat is to be created to both integrate into and strengthen local landscape character and also create opportunities to promote long term sustainable biodiversity. On completion of restoration over one third of the site will be utilised for landscape and wildlife enhancement involving ~24.6 Ha of native species planted woodland, 12.3 Ha of species rich grassland/meadow habitat and 1,462 linear metres of hedgerow comprise seven woody species and hedgerow trees.

3.2.5 Landscape and Visual Impact Conclusions

On the basis of the findings and conclusions of the assessment of the effects of the development on landscape character and on visual amenity, the study concludes that the proposed northern extension development and consolidation scheme is considered to be acceptable and appropriate in Landscape and Visual Effect terms.

3.3 Ecology

3.3.1 Ecology Study

The Ecological Impact Assessment (EclA) has been undertaken in accordance with guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM).

The EclA stages have comprised: -

- (i) Identification of the Zone(s) of Influence (ZoI);
- (ii) Identification of Important Ecological Features (IEF) within the ZoI;

- (iii) Impact Assessment of individual IEF, including compensation, avoidance and mitigation, in respect of: **a)** Wildlife Sites; **b)** protected habitats; **c)** invertebrates; **d)** fish; **e)** amphibians; **f)** reptiles; **g)** birds; **h)** mammals (not including bats); and, **i)** bats;
- (iv) An enhancement strategy to make the outcome of the development wholly positive;
- (v) The definition of a monitoring scheme to ensure the success of compensation, avoidance, mitigation, and enhancement strategies;
- (vi) A Cumulative Impact Assessment (CIA) to assess the effect of the development in the wider context; and
- (vii) Conclusions, which provide an objective account of the outcome, including the identification of any residual negative effects.

The study has considered the nature and significance of identified effects, drawing upon legal and policy guidance regarding protected habitats and species.

The ecological baseline in terms of existing habitat and species has been described, and potential impacts on the ecological receptors have been identified.

In addition to mitigation measures designed to minimise effects on the receptors the study also considers the biodiversity enhancements which the scheme could deliver. It concludes that the restoration will offer 20% greater surface area of important habitat compared to the baseline, and that the restoration strategy thus satisfies the national planning policy requirement for new developments to deliver a net biodiversity gain.

3.3.2 Ecology Mitigation measures

The primary ecological mitigation measure is the restoration strategy and the proposals to incorporate substantial areas of native woodland, species rich grassland and hedgerows which will have the potential to provide considerable biodiversity enhancements. Other measures have been integrated into the proposed development scheme or would be

implemented as additional mitigation measures. These recognise that whilst surveys have been undertaken as part of the EIA, circumstances can change over the duration of the development scheme, and, in certain cases, updated surveys are thus proposed on a phase by phase basis, as discussed below:

- A standoff margin would be applied to operations in the vicinity of the Clamp Wood Ancient Woodland to avoid physical impacts to the root system of trees at the woodland edge.
- The defined 'important' hedges present along the northern and western boundaries of the site would similarly be protected by standoff margins as a result of the proposed development.
- Prior to any works taking place within areas of amphibian habitat as identified within the ES, an Amphibian Conservation Area will be identified and enhanced for the benefit of common toads. Thereafter, the Conservation Area will be retained and maintained for common toads over the entirety of the duration of the development and restoration aftercare period. Prior to every operation that might destroy or degrade amphibian habitat in areas to be worked, or have the potential to result in mortality or injury to common toads, trapping and translocation to the Conservation area will be performed in line with the strategy described in the ES
- There is an abundance of habitat in the wider landscape, and no suggestion that the development might impact on any protected species of mammals (harvest mice, brown hare and hedgehogs) to such an extent that it might be unable to maintain its populations in the immediate locale. A safeguarding strategy is however proposed to avoid injury and mortality to protected species by undertaken further pre-development surveys, on a phase by phase basis, to identify any nests, forms, dens and setts which may be present and

taking responsible action with temporary standoffs prior to exclusion measures.

- Invertebrate species will be safeguarded by the details of the restoration planting scheme which will ensure that food plants are available for each invertebrate species within the restoration scheme.
- In relation to nesting birds, vegetation will be retained for as long as is reasonably practicable and soil stripping will only occur immediately prior to it being worked. As far as possible, vegetation clearance will take place outside the nesting season, in the period 1st September through to the end of February. Where it is impractical to perform an operation that will destroy nesting habitat outside the nesting season and works have to take place in the period 1st March through 31st August, a walkover survey will be performed by an appointed Ornithologist. If no nesting birds are present, works will continue with no further constraint. If nesting birds are encountered, a stand-off of 5 m around the nest will be marked and this area will be retained undisturbed until young have fledged.
- Pre-development surveys, on a phase by phase basis, will be undertaken to identify any badger setts which may be impacted by the development. An appropriate stand-off will then be marked round each sett, and if a mitigation strategy cannot be defined that would safeguard the sett from damage and any badgers therein from disturbance, then a Development Licence may be required from Natural England in order to close the sett and allow works to proceed within the legislation.
- Based upon surveys undertaken as part of the EIA, there are no trees containing bat roosts which would need to be removed as part of the development scheme. However, in view of the duration of the scheme, and the possibility that bats may utilise other existing trees for roosts, re-surveys will be undertaken on a phase by phase basis

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to check for the presence of any new bat roosts, and in the event of roosts being identified, this would be addressed in the conventional way via the Natural England licencing regime.

3.3.3 Ecology Conclusions

The conclusion of the EclA is that there are no grounds to predict that the development proposed will result in significant negative residual effects upon on important ecological habitats or species, nor are there grounds to suggest potential cumulative negative effects in combination with concurrent developments.

The restoration scheme, mitigation and enhancements measures proposed will result in a net increase in habitat extent for legally protected species and habitats and local biodiversity action plan habitats and species which are present within Stanninghall Quarry and the proposed extension area, and will ensure all important ecological features are maintained at favourable conservation status within the application site and wider area.

The restoration habitats will be created within a reasonable timeframe and managed and maintained as high quality, species rich, habitats as detailed in the outline aftercare strategy. It is therefore concluded that the development satisfies the national planning policy requirement by providing a net gain in habitat provision and biodiversity in general.

Due diligence safeguarding strategies and aftercare management strategies have been proposed and which could be made the subject of planning conditions.

3.4 Soils and Agricultural Land

3.4.1 Soils and Agricultural Land Classification (ALC) Study

The ALC and soil survey was undertaken based upon a network of hand augers on a 100m grid. This involved examining 111 soil profiles, supplemented by four soil inspection pits which allowed an examination of the soil profile characteristics in more detail.

The soil data was interpreted in accordance with the Agricultural Land Classification (ALC) System of England and Wales (revised guidelines and criteria for grading the quality of agricultural land) MAFF 1988.

The ALC system grades the quality of land for agricultural use, according to the extent by which physical or chemical characteristics impose long-term limitations. The system classifies land into five grades (1,2 3a,3b,4 and 5), of which Grades 1, 2 and subgrade 3a are considered within the 'best and most versatile' (BMV) land category.

The findings of the original land quality survey based upon a 106 ha site area (prior to the commencement of operations in the existing quarry) were that the area contains 69ha of best and most versatile land, comprising 45ha in subgrade 3a and 24ha in grade 2. There are also 36ha of lesser quality land in subgrade 3b, and about 1 ha of woodland.

The majority of the sub grade 2 land lies within the existing quarry area.

Topsoils are predominantly sandy loam with a small area of loamy sand to the north- east. Topsoils within the proposed northern extension area range between 300mm and 375mm with an average of 350mm.

Upper subsoils are predominantly sandy loam to loamy sand, with a thickness of 300mm within the northern extension area.

Lower subsoils are variable, having textures from sand to clay, and comprising sandy clay loams in the northern extension area, with thicknesses ranging from 300mm to 500mm in the northern extension area.

In addition, overburden and inter-burden are found across the site, and would be carefully examined and characterised according to their re-use potential. Suitable material would be used for forming batters, for tree planting areas, and for forming lower-subsoil substitute materials on parts of the agricultural land restoration.

Top soil and sub soil has been stripped from the currently operational area within the existing quarry, and has been placed in a series of temporary storage bunds. This material is earmarked for use in the restoration of the final 'Phase 9' of the proposed development, comprising the existing plant site and adjoining areas.

A detailed audit has been carried out of the available soil resources within the northern extension area, which together with the processing waste generated and existing top soil and sub soil in storage bunds would provide the overall restoration material.

The potential impacts on agricultural land quality are most significant where they affect BMV agricultural land. There would be a significant direct and permanent impact in policy terms if there was no intention to restore agricultural land to high-quality standards.

Equally significant would be the indirect impact that would result from poor quality restoration failing to meet the specified standards for intended high-quality land.

However, with an original pre-development area of some 69ha of BMV land, the restoration scheme which proposes the reinstatement of 69.8 ha of agricultural land would ensure that there would be no overall loss of BMV land provided the soil target profiles are adhered to and there is no damage to soil resources during soil handling.

In addition, the restored BMV land would be concentrated in the areas to be restored to agricultural use which will provide a consistent soil profile and land quality for future cropping.

The principal potential adverse impacts on soil would derive from the loss of the resource; loss of quality by gross mixing of the different components identified; and by compaction and smearing if the materials were handled under poor (wet) weather, ground and soil moisture conditions.

In addition, there is a risk of long-term damage to soil structure, and the loss of potentially valuable soil, if there is uncontrolled trafficking of land and soil by heavy machinery, especially wheeled machinery. Damage to, and loss of topsoil would also occur if other dissimilar materials such as subsoil or overburden were stockpiled directly on it.

Biodegradation of topsoil also occurs when it is compacted in storage, when stockpiled wet and when stockpiled in the medium - to long-term.

However, provided that the soil resource, including subsoil substitutes (overburden and inter-burden), is carefully handled under good weather, ground and low soil moisture conditions, there should be no direct permanent adverse impacts on the soil resource, nor indirect impacts on the quality and use potential of the restored land.

3.4.2 Soils Mitigation Measures

The key mitigation measure to address potential impacts on land quality is to ensure the careful handling of soil.

The aim of the restoration is to recreate the same overall area of BMV land as existed prior to the commencement of the initial quarry development (circa 69ha). The soil movement and handling scheme in this proposal intends to avoid soil compaction and smearing problems by ensuring that soil handling protocols are adhered to at all times.

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A suitably trained operator will ascertain when ground and soil conditions are suitable for soil movements. Soil movements for storage or restoration will normally take place as short summer campaigns and will open the area to be worked in the following 12 months, utilising soils to best effect to restore the areas already worked. Operations will be suspended when wet soil conditions predispose to damage, including during significant rainfall.

All soil stripping, handling, storage and placement will be undertaken using excavators and dump trucks in accordance with well-established MAFF Good Practice Guidelines for Handling Soils.

Topsoil, upper subsoil and lower subsoil will be removed in sequence in strips, the width of which will be determined by the size of machinery being used. As much soil as possible will be direct placed on the restoration formation levels of the previous worked out phase.

Other than during initial opening of areas to be stripped, and placement of soils in storage bunds, all machinery movements will take place on overburden or mineral, with no traversing of soils. All soil stores will be clearly marked as to the type and nature of the soil they contain, both on the site and on a plan.

3.4.3 Soils Conclusions

Provided that soil handling is carefully carried out, and the restoration soil profile is replaced to the thicknesses specified, there should be no long-term adverse effect on agricultural land quality or the overall extent of BMV land.

Similarly, and linked to restored land quality, provided that the soils are properly handled according to the defined good practice, there should be no adverse residual impact on the soil resource.

All the mitigation measures proposed to minimise the physical impact on soil resources are in accordance with long established and now

conventional soil handling methods (ref MAFF Good Practice Guide for Handling Soils).

All soil resources would be used sustainably to deliver the restoration after uses

The development would result in an overall loss of agricultural land within the original undisturbed 106ha site area. However, there would be no loss of BMV agricultural land within the restored area (69 ha), and for landscape and biodiversity reasons, the restoration strategy has consciously proposed the introduction of a wider range of restoration after uses (species rich grassland and native woodland) compared the original pre development predominant agricultural land use.

Overall, there would thus be no adverse effect on BMV land quality or on soil resources available to ensure the deliverability of the restored BMV land.

3.5 Hydrology and Hydrogeology

3.5.1 Hydrology and Hydrogeology Study

The Hydrological Impact Assessment has been assisted by background hydrological and hydrogeological studies prepared as part of the EIAs undertaken in support of the quarry development schemes submitted to NCC in 2002 and 2003. This has included groundwater monitoring at 4 x piezometers encircling the existing quarry and northern extension area which has been carried out from 1999 onwards, generally on a monthly basis.

As a further context, the study notes that the existing and proposed quarrying operations involve extraction of sand and gravel from above the watertable. In common with the existing operations, there is no requirement for dewatering or sub-watertable working at the extension site where the full depth of mineral reserve (sand and gravel) is above the watertable. In

addition, the free-draining nature of the sand and gravel allows works to proceed without the need for active surface water management. As a result, there is no need for off-site discharge from the application site.

The study describes the baseline surface and groundwater conditions, and identifies five generic potential impacts which might arise from the extraction and restoration works, namely:

- Derogation of groundwater resources, levels or flows;
- Derogation of groundwater quality;
- Derogation of surface water resources, levels or flows;
- Derogation of surface water quality; and
- Exacerbation of existing flood risk.

In response, the study concludes that:

- There will be no significant adverse modification of the current pattern of groundwater recharge, and thus no mechanism exists in this respect to cause discernible impact upon groundwater levels and flows.
- As at the existing site, potential contaminants present within the proposed development will be limited to diesel fuel, lubricating and hydraulic oils serving fixed and mobile plant. Nevertheless, there remains potential for accidental spillage or leakage of potentially contaminating fluids which would have potential to adversely impact existing groundwater quality within the localised section of Chalk Aquifer beneath the economic mineral.
- As with the existing site, the deposit will continue to be worked dry. There is no dewatering operation; and no requirement for off-site discharge. In these circumstances, the proposed development will not impact upon groundwater levels and flow, and there will be no derogation of surface water levels and flow.
- As with the groundwater system, the primary means by which existing surface water quality may be affected by operation the

proposed development involves accidental spillages and / or leakage of potential contaminants.

- The Flood Risk Assessment (FRA) has demonstrated that the proposed development represents appropriate development in the context of prevailing flood risk zonations, and that neither the operational nor post-restoration stages of the proposed development will increase flood risk elsewhere.

3.5.2 Mitigation Measures:

In the light of these findings, the mitigation measures are confined to procedures for the protection of water quality by minimising the likelihood of spillage or leakage of contaminants in the first instance, and a specification of reactive measures for the management of accidental spillage and / or leakage of fuel, lubricating or hydraulic oils should this occur.

3.5.3 Hydrology and Hydrogeology Conclusions

In view of the findings of assessment and the planned approach to the proposed development, which includes specific measures for the protection of the water environment, there are considered to be no over-riding hydrological or hydrogeological reasons why the planned development should not proceed in the manner proposed.

3.6 Noise

3.6.1 Noise Study

A study of the noise effects associated with the proposed extraction and processing of sand and gravel has been undertaken in accordance with a methodology set out in Government Guidance (National Planning Policy Framework [NPPF]) and Planning Practice Guidance (PPG).

It draws upon routine noise monitoring surveys which have been undertaken on ten occasions at Stanninghall Quarry since 2015 with a total

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of 97 fully attended 15-minute measurements at eight locations as required by the current planning conditions. From examination of each noise monitoring report, completed as specified in the approved Scheme of Noise Monitoring, the site noise levels have always been determined to comply with the site noise limits for dwellings at all locations.

Further noise measurements were taken in January 2020 to obtain baseline data for dwellings in the area surrounding the proposed northern extension with attended sample measurements at six locations and a sound level meter installed at The Hollies on Frettenham Road for a period of 21 hours.

Suggested noise limits for extraction and processing of sand and gravel in the application area have been based on the requirements and advice contained in the PPG which accompanies the NPPF. This suggests noise limits should not exceed the background noise level by more than 10dB(A) during normal working hours (0700-1900), and that in any event, the total noise from the operations should not exceed 55dB.

Separate noise limits are recommended in PPG for temporary operations, such as those associated with topsoil and overburden stripping, bund formation and the final restoration processes. These activities are often noisier than extraction, as they tend to be closer to sensitive properties and are usually unscreened. Temporary operations are exempted from the nominal daytime noise limit in the PPG but should conform with a site noise limit of 70 dB at dwellings. In addition, the operations should not exceed a total of eight weeks duration at any noise sensitive properties in any twelve month period.

The study has calculated noise anticipated to arise from operations at the site based upon confirmation of the plant items which would be employed and measurements of sound power levels of the plant.

The study confirms that in the absence of mitigation, the calculated site noise levels comply with the suggested site noise limits at all locations apart from The Hollies and Hill Farm.

The calculated site noise levels for temporary operations comply with the PPG site noise limit at all of the receiver locations. The material movement associated with bund formation and removal can take place within the conventional 8 week period in any 12 months for temporary operations in the vicinity of any of the receiver locations.

3.6.2 Noise Mitigation Measures

The existing site noise limit at The Hollies imposed on the current quarry planning permission is 48 dB. As is the case with the noise mitigation measures embedded within the current permitted scheme, this noise limit could be adhered to with the temporary creation of a 3m high screen bund between the property and the operational area.

The proposed 'Phase 5 extraction' boundary is no closer to The Hollies than remaining permitted mineral extraction within 'Phase 4B'.

The 'suggested' site noise limit at The Hollies, based on 10 dB(A) above background levels is 45 dB, which could be adhered to with a slightly higher 4m temporary screen bund.

For The Hollies, the calculated site noise level of 45 dB is achieved at a separation distance of 320 m with no barrier attenuation, so it is appropriate to remove The Hollies bund in Phase 7 as shown on the phasing drawings.

The existing site noise limit at Hill Farm is 48 dB which could be adhered to with the temporary creation of a 3m high screen bund between the property and the operational area.

The 'suggested' site noise limit at Hill Farm, based on 10 dB(A) above background levels is 45 dB which could be adhered to with a slightly higher 3.5 m bund.

For Hill Farm, the calculated site noise level of 45 dB is achieved at a separation distance of 280 m with no barrier attenuation, so it is acceptable

to remove The Hill Farm bund in Phase 8 as shown on the phasing drawings.

3.6.3 Noise Conclusions

For all locations apart from The Hollies and Hill Farm, the calculated site noise levels for routine operations in the proposed northern extension comply with the existing / suggested site noise limits taking account of the separation distances and with no allowance for bunds / barrier attenuation due to the intervening ground.

For The Hollies and Hill Farm, the existing site noise limit is 48 dB and calculations demonstrate that this could be achieved with 3 m high Topsoil Bunds as shown on the phasing drawings for these two isolated dwellings. If a site noise limit of 45 dB were to be imposed by the Mineral Planning Authority this would need to be in the context of increased perimeter bund heights of 4 m for The Hollies and 3.5 m for Hill Farm.

It is recommended that a revised Scheme of Noise Monitoring be prepared for the proposed northern extension to include additional receiver locations in and near to Horstead and set with appropriate site noise limits.

3.7 Air Quality

3.7.1 Air Quality Study

The air quality study describes the scope, relevant legislation, assessment methodology and the baseline conditions currently existing at the application site and its surroundings. It then considers any potentially significant environmental effects that the proposed development would have on this baseline environment; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual impacts after these measures have been employed.

The assessment has been undertaken in accordance with the Institute of Air Quality Management (IAQM) *Guidance on the Assessment of Mineral Dust Impacts for Planning* document.

The IAQM method is a risk-based approach based which assess the characteristics and baseline conditions at the application site, estimates the dust impact risk for each nearby receptor, and estimates the likely magnitude of risk based upon the sensitivity of the receptors.

The Guidance indicates that large dust particles, which constitute the greatest proportion of dust emitted from mineral workings, will largely deposit within 100m of the source. Finer particles, which constitute only a small proportion of the dust emitted from most operations, are deposited more slowly, although the concentrations decrease rapidly from the source due to dispersion and dilution.

Dust is generally categorised into two size classifications; 'suspended dust' with diameters below 10µm (microns) (PM₁₀) and 2.5µm (microns) (PM_{2.5}), and 'deposited dust' generally with diameters between 10µm and 75µm. (A micron is a unit of measurement where 1 micron = one thousandth of a millimetre).

The IAQM minerals guidance indicates that dust impacts from sand and gravel sites are considered to occur mainly within 250m of the operations, and that if there are relevant receptors within 250m and 1km then a dust impact assessment for both dust deposition and PM₁₀ will be required. In this case, 12 human receptors and 1 ecological receptor surrounding the application site boundary were selected for further assessment.

In terms of the National Air Quality Objectives, background concentration data produced by Defra confirms that the existing air quality in the locality of the site is considered to be good for all pollutants considered. Concentrations are all 'well below' the annual objective of 40µg/m³ for PM₁₀ and NO₂ and 25µg/m³, for PM_{2.5}. (

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The IAQM minerals guidance states that if the PM₁₀ background concentration is less than 17µg/m³ it is considered unlikely that any process contribution from the additional activities proposed at the application site would lead to an exceedence of the annual mean AQAL. Utilising the Defra background maps, the maximum annual mean concentration in 2020 is 15.5µg/m³ and therefore less than 17µg/m³. In addition, background concentrations are predicted to decrease year on year.

It is therefore considered that in the absence of additional mitigation, the effect of proposed operations on human health from emissions of PM₁₀ at the application site will be negligible.

In relation to atmospheric emissions from road vehicles the guidance indicates that if a change in annual average daily traffic movements is less than 100 per day (outside an Air Quality Management Area) then a detailed assessment of traffic emissions is not required and would 'screen out' of further assessment.

Activities or sources associated with the proposed development that have the potential to result in the release of dust include:

- site preparation and restoration;
- mineral (sand and gravel) extraction;
- mineral processing;
- storage of material;
- on-site transportation; and
- off-site transportation.

3.7.2 Air Quality Mitigation Measures

Operational Mitigation Measures

Operations are undertaken in line with industry good practice. The control measures implemented, and equipment utilised as part of the existing, baseline activities are as follows:

- clear designation of stockpile area to prevent tracking over;
- all storage bunds are to be grass seeded;
- 10mph speed limit enforced on haul routes;
- tractor and bowser available for use in dust suppression;
- progressive phased working scheme reduces the storage and double handling of material; and
- wheel wash adjoins the weighbridge and is used by all HDVs leaving the Application Site.

Environmental Design Measures

The application site would be worked on a phased basis, with progressive restoration to minimise the exposed surface areas that may be subject to erosion and lead to dust generation. This is in line with practises adopted in the current working scheme.

Given the location of receptors in relation to potential dust generating activities a number of specific mitigation measures have been incorporated into the application site layout and design, these measures include:

- processing plant is located within the quarry void in the south-east section of the application site – which is largely surrounded by agricultural land free from sensitive receptors;
- a hard-surfaced haul road exists between the application site entrance off Norwich Road and the plant site;
- mature hedgerows and vegetation on the periphery of the proposed northern extension would be retained to protect sensitive receptors;
- topsoil bunds are incorporated into the application site design to shield sensitive off-site receptors; and
- internal haul roads are positioned within the centre of the application site and therefore positioned away from sensitive receptors.

The dust control measures below are recommended for inclusion during the construction of the soil bunds around the boundaries of the application site; the implementation of such measures would act to significantly reduce the potential for dust generation at the source, including:

- avoid construction of soil bunds within 100m of a receptor when winds are blowing in the direction of the receptor;
- ensure water suppression is used to dampen the material during periods of dry or windy conditions and continued in use until vegetation is well established;
- undertake daily visual monitoring of dust emissions travelling off-site from the area of activity;
- cessation of the activity during prolonged periods of dry / windy conditions whilst continuing to dampen down exposed surfaces; and
- ensure surfaces are vegetated with quick growing plants to minimise the period of exposed surfaces.

3.7.3 Air Quality Conclusions

With the exception of three receptors / nearby properties, the assessment concludes that the effects of the development on nearby human and ecological receptors would be 'negligible'.

At The Hollies, one 'moderate adverse' effect is predicted during the construction and removal of the temporary top soil screen bund, and one 'slight adverse' effect is predicted during the working of Phase 4B, which is closest to the receptor. The construction of the topsoil screening bund is of high dust emission potential; however, the bund would be grass seeded and therefore this potential significantly decreases as the bund re-vegetates. Once in place, it would act to shield the property from potential dust generated by other nearby activities. This moderate adverse effect would be temporary and short-term in nature and would only materialise if the bund

construction was carried out during adverse weather conditions (i.e. dry/windy).

A 'slight adverse' effect is predicted at The Hollies in relation to extraction and restoration activities undertaken within Phase 4B as some of this area is within 100m of the property. However, the topsoil screening bund will protect the property and therefore with effective mitigation in place, it is considered unlikely that this slight adverse effect will materialise or be significant.

It is also noted that these operations are already permitted as part of the current quarry planning permission.

At Hill Farm, one 'slight adverse' effect is predicted during the construction and removal of the proposed temporary topsoil screen bund, and one 'slight adverse' effect is predicted during the working of Phase 6, which is closest to Hill Farm. The construction of the topsoil screening bund is of high dust emission potential; however, the bund would be grass seeded and therefore this potential significantly decreases as the bund re-vegetates. Once in place, it would act to shield the property from potential dust generated by other nearby activities. This slight adverse effect would be temporary and short-term in nature and would only materialise if the bund construction was carried out during adverse weather conditions (i.e. dry/windy).

A 'slight adverse' effect is predicted at Hill Farm in relation to extraction and restoration activities undertaken within Phase 6 as some of this area is within 100m of the property. However, the temporary topsoil screen bund would protect the property and therefore with effective mitigation in place, it is considered unlikely that this slight adverse effect will materialise or be significant.

There are several storage bunds located within 250m of the property at Beverley where 'slight adverse' effects are predicted during the construction and removal of the bunds. However, the activities to construct and remove material storage bunds are short-term and therefore the potential 'slight

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adverse' effects would be temporary in nature. In addition, with the effective implementation of mitigation the risk of a 'slight adverse' effect occurring would be significantly reduced.

Given the dust suppression measures currently implemented, which are proposed to continue throughout the proposed scheme, it is considered unlikely that significant adverse impacts will materialise.

Considering all of the above, the overall effect of the proposed development is considered to be 'not significant'.

3.8 Traffic

3.8.1 Traffic Study

In transport terms, the proposed development represents a continuation of the permitted operations for an additional period of time. Whilst the sand and gravel would be extracted from a different area, it would be transported overland to the existing processing plant and either sold as processed aggregate or diverted to the on-site concrete plant, as per the existing, permitted operations. As previously described, the final remaining reserves beneath the plant site would be extracted and sold as-raised following the removal of the plant itself.

The proposed operating hours will remain as approved between 07:00 – 18:00 Monday to Friday and 07:00: - 13:00 on Saturdays, with no working on Sundays or Public Holidays.

The traffic movements associated with Stanninghall Quarry comprise the aggregate exports and concrete sales. Based on the exporting of 300,000 tonnes of aggregate in 20 tonne payloads over 275 working days per annum (50 weeks at 5.5 days per week), an average of 54.5 (say 55) loads / 110 HGV movements per day is established. By way of comparison, outputs of 200,000 tonnes and 400,000 tonnes per annum equate to averages of 36.3 (say 37) loads / 74 HGV movements and 72.7 (say 73) loads / 146 HGV movements per day respectively.

On the basis that working on Saturdays is rare, the number of working days per annum averages 250 (50 weeks at 5 days per week), which based on exporting 300,000 tonnes per annum would result in an average of 60 loads / 120 HGV movements movements per day. The corresponding figures assuming a 200,000 and 400,000 tonnes per annum output would be 40 loads / 80 HGV movements and 80 loads / 160 HGV movements per day respectively

When distributed over an 11 hour working day, these flows equate to rounded up averages of 4 loads / 8 HGV movements, 6 loads / 12 HGV movements and 8 loads / 16 movements per hour respectively.

Based on the proposed average production of 300,000 tonnes per annum, of which 29,660 tonnes is diverted to the concrete plant, the remaining 270,340 tonnes of sand and gravel would attract an average of 54 loads / 108 HGV movements per day, assuming the distribution remains predominantly over a 5 day week (Monday to Friday). Adding the 13 loads / 26 HGV movements associated with the concrete production, results in an overall total of 67 loads / 134 HGV movements per average day, and 6 loads / 12 HGV movements per hour.

In terms of the distribution of traffic travelling to / from Stanninghall Quarry B1150 Norwich Road, it is understood that approximately 10% of production travels to / from the north via Horstead, whilst the remaining 90% travels to /from the south via Crostwick / Spixworth, with the majority of traffic travelling via the A1270 Broadland Northway (also referred to elsewhere in the ES as the Norwich Northern Distributor Road).

Traffic flow data on the B1150 and A1270 has been obtained, which reveals that Stanninghall Quarry traffic represents an insignificant proportion of overall flows and HGV movements, and the local road network is readily able to accommodate the continued activity together with overall predicted traffic growth.

In addition, a review of accident statistics confirms an absence of incidents involving the larger HGVs at the site access junction and local highway network, which demonstrates that the existing infrastructure is suitable to accommodate the routine HGV movements associated with Stanninghall Quarry and other activities in the area.

3.8.2 Traffic Mitigation Measures

The review of the existing site access, local road network and proposed development, has established that the recent traffic activity associated with Stanninghall Quarry has been satisfactorily and safely accommodated on the local road network.

The proposed development is predicted to maintain the recently experienced traffic activity associated with Stanninghall Quarry for an additional period of time.

Due to the proportion of the overall traffic volume associated with Stanninghall Quarry, any traffic growth that may occur on local roads as a result of other development would further reduce the proportion of quarry traffic, and could only arise having taken the quarry traffic into account when assessing and approving those other development proposals.

Taking this into account, no new mitigation measures are considered necessary in this case, beyond routine maintenance of the site access and continuing the management protocols adopted by Tarmac.

3.8.3 Traffic Conclusions

A review of the impact of the proposal has been undertaken based on current guidance, the existing site access and road geometry, and traffic flow information for Stanninghall Quarry and the wider highway network. The road safety impacts associated with the proposal have also been considered by reviewing recent collision records provided by Norfolk County Council.

During the working of the proposed time extension, there would be a continuation of traffic movements to / from Stanninghall Quarry. Notwithstanding this, the access and local road network can demonstrably accommodate the proposed continuation of activities.

Based on the safety record of the site access and local road network, together with their ability to accommodate the continuation of activities at Stanninghall Quarry for the predicted duration of operations, it is apparent

that the proposal would be acceptable in terms of its highway and transport impact.

Having considered the ability to retain and maintain a safe access to the site onto a road network which is able to safely accommodate the continuation of HGV traffic travelling to / from Stanninghall Quarry, when assessed against national planning policy, it is concluded that the transport and highway impact of the proposal would be acceptable.

3.9 Cultural Heritage

3.9.1 Cultural Heritage Study

The cultural heritage assessment considers both direct and indirect effects upon cultural heritage within the vicinity of the application site and with particular emphasis on the proposed extension area (PEA).

Direct effects result from, for example, the stripping of soils and overburden, the creation of storage and screening bunds, and the installation of infrastructure.

Indirect effects can occur as a result of changes to the setting of a landscape or asset, whether permanent or temporary. This is particularly relevant to designated cultural heritage assets, such as Scheduled Monuments, Listed Buildings, Conservation Areas and Registered Parks and Gardens.

The scope of the assessment has followed the advice set out in a Scoping Opinion issued by NCC, including advice from the County Archaeologist and Historic England.

It also draws upon a desk-based cultural heritage assessment that included the proposed extension area prepared in 2001, and the results of archaeological investigations which have been ongoing within the current quarry since 2004.

No designated assets of cultural heritage importance lie within the boundary of the PEA.

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After analysis of the current infrastructure, depth of the current workings, topography and the screening effects of intervening development and vegetation, a study area of 1km from the boundary of the PEA was considered the appropriate distance to assess potential effects upon the setting of designated heritage assets, and the environmental effects from dust, noise and traffic.

There are eighteen listed buildings and one Scheduled Monument within 1km of the PEA. There are no World Heritage Sites, Heritage Coasts, Registered Historic Parks and Gardens or Registered Battlefields within this radius.

One Scheduled Monument lies within 1km of the PEA. This is a Roman military camp and associated settlement which lies to the north of the PEA.

The Norfolk Historic Environment Record (NHER) was searched for archaeological sites located within 1km of the PEA. This includes 42 records of historic environment features and discoveries, five of which relate to the work in the existing quarry and one that relates to a geophysical survey undertaken as part of this planning application

In addition to the crop mark of the possible Roman camp north of the PEA, almost half of the records in the study area are of crop mark features, predominantly elements of possible field systems of various dates up to and including the post-medieval period. There are also records of artefacts found during systematic fieldwalking and metal detecting by members of the public.

Four entries are located within the PEA or extend into it, principally crop mark features of ditches.

The most recent observations during quarrying to the south of the PEA have been carried out over a number of seasons (2008, 2015 and 2017). The results include the recording of a number of ditches and pits. In the 2015 season there were four ditches of post medieval date and eight undated pits.

In 2017, in the western part of the quarry, nineteen small pits and elements of an undated ditch system were excavated. The most significant

discoveries were eight large steep-sided and flat-based pits identified as relating to probable clamps for the production of charcoal.

As required by the scoping opinion, a geophysical survey was carried out which identified a series of linear features, ditches and drains, many of which were identified also on aerial photographs, but where the study noted that *few potential features of likely archaeological interest were identified.*

Based upon the knowledge of archaeology within the current extraction area to the south of the PEA and the general vicinity, it is likely that archaeological sites will be located within the PEA. The geophysical survey however located only a handful of archaeological anomalies, and it is also clear that historically the PEA has been subjected to ploughing and that any archaeology will have been truncated to some extent.

There is no evidence of any archaeology of national significance that requires preservation *in situ*.

Indirect impacts are those that do not physically affect a cultural heritage asset or landscape, but that alter the context or setting. Only the scheduled monument to the north of the PEA is considered to experience potential adverse effects.

3.9.2 Cultural Heritage Mitigation measures

Direct Effects

In accordance with planning policy, loss of archaeology needs to be offset by a programme of mitigation. There is no evidence of archaeology of such importance as to require preservation *in situ*. Consultations should be held with NCC Historic Environment Service to agree the scope of mitigation that would be required post-consent. Given the success of the current strategy within the permitted quarry, a Strip Map and Sample approach during soil-stripping would appear appropriate and this would ensure that all archaeology within the PEA is recorded in advance of quarrying.

An archaeological contractor would be appointed to carry out the fieldwork with an experienced and appropriately qualified supervisor in charge of day-to-day site-based work.

Soils would be stripped using a backacting 360° machine equipped with a toothless bucket to a level agreed with the monitoring archaeologist. No tracking or movement of plant may take place on the exposed surface until it has been signed-off by the archaeologist. Machinery may need to be halted or diverted to allow archaeologists safe access to examine the stripped surface.

Details of methodologies will be formalised in a Written Scheme of Investigation, agreed with Norfolk County Council, prior to development commencing.

Indirect Effects

Within approximately 1km of the Application Site sit nineteen listed structures all Grade II except two Grade II* churches. Based upon field survey, no adverse effects upon visual or contextual setting are predicted from the proposed development due to distance, topography, and intervening development and vegetation.

One scheduled monument is situated within 1km of the PEA: Horstead Roman camp and settlement that covers an area of 11.7ha and straddles the Frettenham Road. The boundary of the southern part is approximately 110m north of the Application Site and 150m from the proposed extraction area.

Movement of plant would be discernible during the construction of the Hill Farm bund and during soil stripping for Phase 6 and 7, although this would be filtered by existing and enhanced hedgerows bounding both the PEA and the southern boundary of the scheduled monument. This would cause only a temporary change to setting of moderate significance. Visibility of movement would decrease as the quarry workings descend.

Although the ground within the restored application site will be about 6m lower this will not be perceptible from the scheduled monument (the boundary being about 150m north) even in the absence of the intermediate vegetation that currently exists. The restoration proposals include the planting of native woodland along the northern boundary of the PEA and this would be in keeping with the landscape of the Roman period based

upon evidence from excavations in the current quarry. There would be no residual effect upon the setting of the monument.

3.9.3 Cultural Heritage Conclusions

The proposed development would have no significant adverse effects upon known assets of cultural heritage, and those adverse effects that would occur would be offset by the opportunity, funded by Tarmac Ltd, to add to our knowledge of the archaeology of the application site and its landscape, that is currently being truncated by ploughing.

Restoration of the application site would include planting of native woodland that would be in keeping with the landscape of the Roman period, in particular in views southwards from the scheduled Roman camp.

Having regard to the baseline conditions and the assessment carried out against professional guidance, the proposed development therefore accords with both local and national cultural heritage policy.

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4.0 CONCLUSIONS

This document comprises a Non-Technical Summary (NTS) of an Environmental Statement (ES) which considers the environmental effects which would be associated with a northern extension and consolidation scheme at Stanninghall Quarry, south of Horstead in Norfolk.

The NTS describes the details of the phased quarry development scheme, and the restoration strategy which would be implemented.

There would be no material changes to the established operation at the quarry in terms of general working practices, hours of working, noise and dust controls, and quarry output and traffic generation.

The restoration strategy makes provision for a range of restoration land uses (agriculture, species rich grassland and woodland) designed to enhance the landscape and biodiversity value of the restored site.

The scope of the EIA and the content of the ES have been informed by a Scoping Opinion issued by NCC which confirmed the topics and issues which should be addressed as part of the EIA. All identified topics and issues have been duly considered and are reported in the ES.

The NTS provides a summary of the potential environmental effects which would be associated with the development. Each environmental topic has been assessed in accordance with up to date guidance and standards.

Where relevant, the studies make recommendations for measures to mitigate the environmental and amenity effects of the development which, in the majority of cases draw upon existing, well established and effective controls at the quarry.

Based upon the studies, the underlying conclusion of the EIA is that there is no single topic or combination of issues which should objectively prevent the development from proceeding.

This in part reflects the fact that the principle of the development of a northern extension to Stanninghall Quarry has been tested and accepted via the preparation by NCC of the draft MWLP, and the proposed allocation

of the northern extension area as an area for future sand and gravel extraction.

All quarry developments will give rise to some degree of environmental effects, and this is inevitable given the nature of the operations which are involved. However, the requirement of national planning policy is not to 'eliminate' impacts, but to ensure that effects are mitigated to 'acceptable limits' (ref NPPF).

The conclusion reached by the ES is that the proposed scheme would successfully minimise the environmental effects, and that the package of well-established mitigation measures is capable of being continued in relation to the ongoing operations at the site which would ensure that the effects of operations are mitigated to 'acceptable limits'. This is the case with the existing approved working and restoration scheme, and it would remain the case with the proposed Stanninghall Quarry northern extension development.

In the light of the above considerations, it is concluded that the proposed development could proceed in an environmentally acceptable way. In addition, the planning benefits associated with helping to meet the acknowledged need for sand and gravel aggregate to service construction projects, and the landscape and biodiversity enhancements associated with the restoration scheme, lend weight to planning permission being granted.

The planning policy analysis undertaken within the PAS also concludes that the development could proceed in accordance with the development plan policies for the area.

In all these circumstances it is considered that there should be a firm presumption in favour of permission being granted

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