PROPOSALS FOR THE APPROACH TO AND SCOPE OF AN ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL STATEMENT TO ACCOMPANY THE PROPOSED PLANNING APPLICATION FOR A REVISED RESTORATION LANDFORM AT COOKS HOLE QUARRY AND THORNHAUGH LANDFILL SITE, LEICESTER ROAD, THORNHAUGH, PETERBOROUGH

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1. Introduction

1.1 Augean South Ltd (Augean) operates the existing Cooks Hole Quarry and Thornhaugh Landfill Site. Cooks Hole Quarry (Cooks Hole) is a mineral extraction site which has been active since the 1950s. Thornhaugh Landfill Site (Thornhaugh) has been operational since the 1990s. Thornhaugh accepts a range of non-hazardous waste, and stable non-reactive hazardous waste including asbestos which is used to restore the previous mineral workings. Throughout this report when referred to collectively Cooks Hole Quarry and Thornhaugh Landfill Site will be called 'the sites'. The sites are located approximately 1km south west of the village of Thornhaugh and 10km west of Peterborough. Cooks Hole is to the south west of the A47 Leicester Road and Thornhaugh is adjacent to and south of the A47 Leicester Road. The site boundaries and locations are shown on Figure SR1.

1.2 The sites have a complex planning history and have been worked by various operators however the overarching principle of both sites is to restore them to a beneficial after use. The approved restoration scheme for Cooks Hole is to a low level and comprises agricultural grassland with some tree and shrub planting. The approved restoration profile for the north eastern corner of Cooks Hole is to return to original ground levels. The approved restoration scheme for Thornhaugh comprises a mixture of woodland, hedgerows, shrub and scrub and calcareous grassland. The currently approved restoration schemes for the sites are presented at Appendix A and B respectively.

1.3 Augean is proposing to revise the restoration schemes for Cooks Hole and Thornhaugh to provide an integrated, coherent landform for both sites. The proposed restoration scheme would extend the habitats from Thornhaugh to Cooks Hole so that a wider mix of habitats is available across both sites. In addition there is the potential for the restoration to tie in with wider aspirations for the enhancement of Rockingham Forest, to create green infrastructure links with Bedford Purlieus and for the proposals to contribute to landscape scale recovery.

1.4 The material that will be used to create the proposed landform at Cooks Hole will comprise clean, naturally occurring materials. Only clean naturally occurring materials which have been extracted as part of the existing landfill construction operations and will be extracted as part of the future construction operations for the

landfill at the East Northants Resource Management Facility (ENRMF) in Kings Cliffe and as part of the landfill construction operations at Thornhaugh will be used. It is proposed that only material arising from the construction operations at Thornhaugh and ENRMF will be deposited in Cooks Hole. Some of the additional void created at Thornhaugh will be filled with waste types already consented for disposal there. The creation of the proposed landform at Cooks Hole and its integration with the restoration scheme for Thornhaugh will facilitate the continued operation of ENRMF which is a Nationally Significant Infrastructure Project by utilising the material that arises during the construction operations of the landfill cells.

1.5 A single planning application will be submitted for the revised restoration profile for Cooks Hole and Thornhaugh. The planning application will include the continuation of the mineral processing operations at Cooks Hole and the continuation of the existing operations at Thornhaugh (construction of phases, landfilling and processing of waste) and changes to the order of the phasing at Thornhaugh. Further detail is provided in Section 4. It is proposed that the existing planning permissions would be revoked on granting of a new planning permission.

1.6 The proposed development falls under Paragraph 13a and 13b of Schedule 2 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended)[1] (the EIA Regulations) as there is the potential for the proposed development to have significant effects on the environment so an Environmental Impact Assessment (EIA) is necessary. MJCA is commissioned by Augean to undertake an EIA for the proposed development at Cooks Hole and Thornhaugh. The purpose of this scoping document is to explain the proposed development and to set out the proposed scope for the EIA. The objective of this scoping exercise is to agree the approach to and the scope of the EIA and Environmental Statement (ES) which will accompany the application for planning permission.

1.7 The detailed design for the proposed development is being progressed and the principles of the design of the proposed development are described in Section 4 of this report. The design development processes and the EIA process are iterative and will continue throughout the period of consultation with the local community, the key statutory consultees and other stakeholders up to the submission of the application.

[1] The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended)

The final design together with the findings of the EIA will be reported in the ES. The ES will be prepared in accordance with the EIA Regulations and will be submitted with the planning application.

2. The site location and description

2.1 The sites are located approximately 10km west of Peterborough and 1.7km west of the A1. The nearest villages to the sites are Thornhaugh approximately 1km to the north east of the sites beyond the A47, Wittering approximately 2km to the north of the sites and Yarwell over 2km to the south east of the sites. Cooks Hole is centred on National Grid Reference (NGR) 505207 299747 and is bordered by Thornhaugh to the north and by the A47 Leicester Road to the north east. Beyond the site boundary there are agricultural fields and scattered residential buildings. Immediately to the south of Cooks Hole Quarry lies an unrestored former quarry known as Thornhaugh II Quarry beyond which is Wansford Road which runs between the villages of Wansford and Kings Cliffe. To the south of Wansford Road are agricultural fields and woodland blocks. Immediately west of Cooks Hole Quarry is Old Oundle Road and Bedford Purlieus woodland (Figure SR2). Thornhaugh is centred on NGR 504902 300111 and is bordered to the north by the A47 Leicester Road, to the south by Cooks Hole and to the west by Old Oundle Road and Bedford Purlieus woodland. Old Oundle Road is a Public Highway with no cars permitted. Beyond the site boundary to the north are scattered residential properties and agricultural fields. Bedford Purlieus is an ancient woodland designated as a Site of Special Scientific Interest (SSSI) and a National Nature Reserve (NNR).

2.2 Cooks Hole Quarry comprises an active mineral extraction site. Ironstone, sandy limestones, silty sands and clays have been extracted from the site since the 1950s. The mineral extraction operations are now complete at Cooks Hole and no further mineral will be extracted. There are a number of stockpiles of mineral materials at Cooks Hole and there is mobile plant which is currently processing the material from the stockpiles and those materials arising from the construction operations at Thornhaugh.

2.3 Thornhaugh comprises an active landfill site which is being filled in phases (Figure SR3). The northern and north eastern phases of Thornhaugh have already been landfilled and are restored albeit that the planting is not yet well established. Phase 7C is currently being constructed, construction of Phase 2 west will commence in Winter 2023 and Phases 4B south, 5 and 7A are filled and awaiting capping. Access to Thornhaugh is from the A47 Leicester Road. The site access is shared by Cooks

Hole Quarry. A surfaced access road, site reception and welfare facilities, a weighbridge and wheel wash, landfill gas flare, hi pod storage area and car parking areas are located generally centrally within Thornhaugh Landfill Site. The access to Cooks Hole is to the east of the site entrance (Figure SR3).

2.4 The topography of the sites is varied due to the historical and ongoing operations with the ground level falling to the Thornhaugh Brook which runs through the middle of Cooks Hole generally from west to east. The Thornhaugh Brook rises to the west of Bedford Purlieus woodland and flows to the east to join the White Water Brook which is a tributary of the River Nene. The geology at and in the vicinity of Cooks Hole comprises the Lincolnshire Limestone Formation which is underlain by the Grantham Formation and the Northampton Sand Formation. The central part of the site comprising the Thornhaugh Brook Valley is underlain by the Grantham Formation. The Northampton Sand Formation is underlain in turn by the Whitby Mudstone Formation (formerly referred to as the Upper Lias). Groundwater is present generally in the Grantham Formation and Northampton Sand Formation and in the base of the Lincolnshire Limestone underlying the site. Groundwater in the vicinity of the site is abstracted for domestic water supply and agricultural use and provides base flow to local rivers and streams. The Thornhaugh Brook is fed by groundwater including from Cooks Hole Spring located adjacent to Cooks Hole Farmhouse. A settlement pond for mineral wash water is located in the south eastern corner of Cooks Hole.

2.5 The geology in the vicinity of Thornhaugh comprises Lincolnshire Limestone Formation which in turn is underlain by the Grantham Formation and Northampton Sand Formation. In parts of the site the sequence has been replaced partly with backfilled material comprising reworked Lincolnshire Limestone Formation and Grantham Formation. The Northampton Sand Formation is underlain by the Whitby Mudstone Formation (formerly referred to as the Upper Lias). The strata dip gently to the east at and in the vicinity of Thornhaugh. To the north, east and south of the site the Lincolnshire Limestone Formation, Grantham Formation and Northampton Sand Formation are cut by several valleys.

2.6 Cooks Hole Farmhouse and outbuildings are located in the centre of Cooks Hole adjacent to the Thornhaugh Brook. The buildings are surrounded by dense vegetation and are owned by Augean. The property has been uninhabited for some

time and is uninhabitable in its current state. Cooks Hole Farmhouse is a Grade II Listed Building. Beyond the sites there are 3 Grade II listed buildings to the north of the sites the closest being Home Farm House approximately 80m from Thornhaugh and 540m from Cooks Hole. The Home Farm House group of buildings includes a barn and stable. There are also four listed buildings located to the east of the sites. Sibberton Lodge is a Grade II* listed building which is approximately 495m from Cooks Hole and 940m from Thornhaugh. Sibberton Lodge is surrounded by four Grade II buildings which include a barn, a cottage and stables.

2.7 The nearest residential properties to the sites which are not listed are located to the north of the A47 Leicester Road and include Thornleigh House (25m) and Bedford Lodge (40m). Toll Cottage is located approximately 70m north west of Thornhaugh (Figure SR2). Oaks Wood Cottage is located approximately 270m to the north of the sites and beyond the A47 Leicester Road. Nightingale Farm is located approximately 210m to the south of Cooks Hole. Leedsgate Farm is located approximately 630m south west of Cooks Hole Quarry.

2.8 There is a network of Public Rights of Way (PRoW) in the vicinity of the sites as shown on Figure SR2. Footpath Thornhaugh No. 3 Section 3 and Section 4 runs between Thornhaugh and Cooks Hole in an east to west direction before turning north on Old Oundle Road and then turning west to run through Bedford Purlieus. Thornhaugh Footpath No. 4 Section 1 currently runs along the southern boundary of Cooks Hole before tuning north west along the A47 Leicester Road and then turning north east and running towards Thornhaugh village. Thornhaugh Footpath No 4 Section 1 originally ran through the centre of Cooks Hole between Cooks Hole Farmhouse before turning east north east towards the A47 before being diverted to its current route. Thornhaugh Footpath 2 Section 2 which ran through the centre of Cooks Hole is currently stopped up. The diversion of Thornhaugh Footpath 4 Section 1 and the stopping up of Thornhaugh Footpath 2 Section 2 remain in force until 2042. The PRoW in the vicinity of the site including the original routes, diversions and the potential new footpaths are shown on Figure SR2.

2.9 Barnack Hill and Holes Special Area of Conservation (SAC) is located approximately 4.5km to the north east of the sites. Bedford Purlieus located adjacent to the western boundary of the sites is designated as an ancient woodland, a Site of Special

Scientific Interest (SSSI) and a National Nature Reserve (NNR). Several other SSSIs (West Abbot's and Lound Woods SSSI, Wansford Pasture SSSI and Old Sulehay Forest SSSI) are located in the vicinity of the sites but are located more than 500m from the sites and are shown on Figure SR1. Phase 4A of Thornhaugh is a designated County Wildlife Site as it supports amphibians including Great Crested Newts. Thornhaugh, Bedford Purlieus and Thornhaugh II are designated as brownfield biodiversity sites (Figure SR1). Cross Leys Quarry to the west of Thornhaugh is also designated as a brownfield biodiversity site.

2.10 Based on the Environment Agency Flood Map for Planning Thornhaugh is located in Flood Zone 1. Flood Zone 1 is defined as land having a less than 1 in 1,000 annual probability of river or sea flooding. The majority of Cooks Hole is located in Flood Zone 1 except a small area in the vicinity of Thornhaugh Brook that passes through Cooks Hole which is in Flood Zone 3. Flood Zone 3 is defined as land having a greater than a 1 in 100 annual probability of river flooding.

2.11 The RAF base at Wittering Airfield is located approximately 3km to the north west of the northern boundary of Thornhaugh at its closest point.

2.12 The only mains service to the site is water. Power is provided by site generators and foul sewage is collected in a cesspit.

3. Planning history and the existing development

3.1 As stated in Section 1 the sites have a complex planning history from the 1950s. A summary of the planning history is presented below and the detailed planning history is presented at Tables S1 and S2 respectively.

Cooks Hole

3.2 The planning history for Cooks Hole is long and complex with the first permissions granted for mineral extraction at the site in 1954 and 1957. Since then numerous planning applications have been submitted for site facilities, small extensions and amendments to various development details. Details of the planning permissions relating to Cooks Hole are provided at Table SR1. As set out in Table SR1 the most recent set of full planning conditions for Cooks Hole were set out in planning permission references 13/01372/WCMM and 13/01374/WCMM. The most recent amendment applications relevant to the proposed development are planning permission references 20/00977/NONMAT and 20/00978/NONMAT which revised the restoration contours for the site.

3.3 The planning permissions at Cooks Hole allow for the extraction and processing of limestone, sand and associated ironstone. The approved restoration contours for Cooks Hole include returning the ground to original ground levels in the north eastern area. The approved restoration scheme for Cooks Hole comprises agricultural grassland with some tree and shrub planting (Appendix A). The operations at Cooks Hole are currently permitted to continue until 21 February 2042.

Thornhaugh

3.4 Operations have been ongoing at Thornhaugh since 1957 with planning permission first granted at the site for opencast working of ironstone, limestone, clay, sand, gravel and gannister. Backfilling through the importation of inert materials was first established at Thornhaugh in 1977 with planning permission reference P0304/77. Since 1977 several additional planning permissions have been granted for the site for varying aspects of development as set out in Table S2. The extant planning permissions for Thornhaugh are planning permission reference 12/00463/MMFUL

which covers the whole of the landfill area at Thornhaugh and planning permission reference 20/01680/WCMM which covers the southern area of Thornhaugh.

3.5 The planning permissions for Thornhaugh allow for the landfill disposal of non hazardous waste and stable non reactive hazardous waste. The approved restoration scheme for Thornhaugh comprises a mixture of woodland, hedgerows, shrub and scrub and calcareous grassland (Appendix B). The landfilling operations at Thornhaugh are currently permitted to continue until 31 December 2034 and the restoration of the site must be completed no later than 31 December 2035.

4. The proposed development

4.1 The detailed design for the proposed development is being finalised. The design development process is iterative and will continue until the submission of the planning application with continued dialogue with stakeholders. The full details of the proposed development will be set out in the application documents. A summary of the main elements of the proposed development are presented below:

- The continuation of landfilling at Thornhaugh with non hazardous waste and stable non-reactive hazardous waste. No new landfill cells additional to those that are already permitted will be consented as a result of the proposed development.
- Extraction of mineral to facilitate the construction of the permitted landfill cells. The cells which are consented but which have not yet been constructed are shown on Figure SR3 together with the order in which they will be constructed.
- The continuation of stockpiling of materials imported to the site for use in landfill engineering operations.
- Amendment of the restoration profiles for Thornhaugh and Cooks Hole to form one integrated, coherent landform. The indicative restoration profile is presented at Appendix C. The elevation of the highest point of the restoration landform at Thornhaugh (71.5m Above Ordnance Datum (AOD)) will not change as a result of the proposed development.
- Continuation of the use of the existing Thornhaugh access for the importation of waste for deposition at Thornhaugh, material for use in landfill engineering at Thornhaugh and material for the restoration of Cooks Hole.
- The importation of in the order of 1.35 million m³ of clean, naturally occurring material from ENRMF to create the landform of Cooks Hole and to tie in with the landform at Thornhaugh. It is proposed that the landform to the south of Thornhaugh Brook will be created first.
- The continuation of processing of materials from mineral stockpiles at Cooks Hole.

- The continuation of crushing and screening of imported soil forming materials and minerals arising from the construction operations at Thornhaugh.
- The extraction and redeposition or processing of historically deposited waste from Phases 1 and 2 at Thornhaugh.
- Use of amenity access from the A47 at Cooks Hole following restoration and the provision of a small car park for approximately 12 cars (Figure SR2).
- The retention of the site management infrastructure at Thornhaugh for the continuation of monitoring and the management of landfill gas and leachate.
- The retention of Cooks Hole Farmhouse and the associated outbuildings for the duration of the operations at the sites. The future use of the listed building and associated outbuildings will be the subject of a separate application.
- Continuation of the operations at the sites until February 2042.
- Establishment of a surface water runoff management system at the sites.
- The restoration of the sites will be to nature conservation interest and the habitats currently included in the approved restoration scheme at Thornhaugh will be extended across to include and be integrated with Cooks Hole. It is anticipated that the revised restoration scheme for Cooks Hole will deliver biodiversity net gain compared with the previously consented restoration scheme. The initial concept restoration scheme is presented at Appendix C.
- The sites will be subject to an aftercare and maintenance period following the completion of restoration. The length of the aftercare period will be subject to agreement with Peterborough City Council.

4.2 There will be no changes to the principles of the landfilling operations at Thornhaugh as a result of the proposed development. The landfilling operations at Thornhaugh will continue to be the subject of an Environmental Permit. The Environmental Permit specifies the types of non hazardous wastes and stable non reactive hazardous waste which are permitted for deposition at the site as well as the detailed measures

necessary for the containment, management and monitoring of the wastes and the surrounding environment.

5. The scope of the Environmental Impact Assessment

Introduction

5.1 The aspects which it is necessary to assess in the EIA and those which it is considered can be scoped out are identified below. A summary of the aspects and matters which it is considered can be scoped out of the assessment are presented in Table S3. The term 'matters' refers to those parts that are a subdivision of the aspect, for example an assessment of a particular species is a 'matter' to the aspect of biodiversity.

5.2 The application boundary will encompass the sites. The baseline for the EIA is the currently permitted activities at the sites including the currently approved restoration schemes. The currently permitted activities for Cooks Hole comprise mineral extraction and mineral processing using mobile plant with restoration using on site materials to agricultural grassland with tree and shrub planting. The currently permitted operations at Thornhaugh comprise landfilling, extraction of minerals during cell construction, crushing and processing of materials arising from cell construction and imported soil forming materials using mobile plant, receipt and temporary storage of waste storage containers (hi-pods) and restoration to a mixture of woodland, hedgerows, shrub, scrub and calcareous grassland. The EIA for the proposed development will comprise an assessment of the in-combination impacts as a result of additional impacts or changes to impacts at the sites associated with the proposed development together with cumulative impacts with other developments in the vicinity of the site. The baseline section of the ES will also outline the likely evolution of the baseline environment with the implementation of the development as far as natural changes from the baseline can be assessed with reasonable effort.

5.3 As explained in Section 4 the proposed development comprises a revised restoration scheme to form a coherent landform across the sites which will result in the creation of additional areas of void and will require the importation of additional fill materials. The general operations undertaken at the sites as currently approved will remain largely unchanged. The impacts will be assessed for the changes to the consented operations including the restoration and the in-combination effects of the continued construction of containment engineering at Thornhaugh, landfilling operations at

Thornhaugh, mineral processing and materials placement to achieve the restoration landform at the sites.

5.4 The detailed design of the integrated, coherent restoration landform is still being finalised. There will be amendments to the details of the proposed development as the assessments progress, consultation takes place, including with statutory consultees, and the design details are finalised. The parameters that have been assessed for each aspect of the development will be set out clearly in the ES.

Ecology and biodiversity

5.5 A significant amount of ecological survey work has been carried out to inform the previous planning applications for the sites. The ecological information obtained previously for the sites has been used to inform the scope of the survey work currently being undertaken as part of the EIA for the proposed development. In 2023 habitat and species surveys have been undertaken across the sites. The surveys undertaken include habitat surveys, invertebrate surveys, great crested newt surveys, reptile surveys, breeding bird surveys, bat surveys and badger surveys. A tree survey has also been undertaken. In summary the results of the surveys to date in 2023 are:

- There are a number of notable invertebrates in key habitats at the site including the wet woodland. Species include grizzled and dingy skipper and the black headed mason wasp which are all on the list of species of principal importance under Section 41 of the Natural Environment and Rural Communities Act 2006 (as amended).
- There are great crested newts at the sites.
- No reptiles have been found to date.
- A range of breeding bird species have been found across the sites including breeding little ringed plover (Schedule 1 species under the Wildlife and Countryside Act 1981 (as amended)), breeding skylark, song thrush, dunnock, starling and linnet which are all Section 41 species.

5.6 On the basis of the survey results explained above the ecological assessment will be undertaken in accordance with Chartered Institute of Ecology and Environmental

Management Guidelines for Ecological Impact in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine published in September 2018. Appropriate avoidance, mitigation and compensation measures will be derived and assessed.

5.7 The proposed restoration scheme will provide for Biodiversity Net Gain in accordance with national guidelines and the restoration scheme will be designed to provide opportunities for future links to enhance the nature conservation interest including green infrastructure links with Bedford Purlieus and support to the wider aspirations for the enhancement of Rockingham Forest. The current DEFRA Biodiversity Metric will be used to determine the Biodiversity Net Gain (BNG) for the proposed development. The baseline for the BNG is the currently approved restoration schemes for Cooks Hole and Thornhaugh. The baseline for the BNG assessment will be the approved restoration schemes presented at Appendices A and B of this report.

Landscape and visibility

5.8 The sites are not located within a designated landscape ie a National Park or Area of Outstanding Natural Beauty (AONB). The sites lie adjacent to the Bedford Purlieus Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR). Bedford Purlieus is also an ancient woodland. The sites are located within National Character Area 92 - Rockingham Forest. The sites are located in Local Character Area 2: Nassaburgh Limestone Plateau[2]. Thornhaugh is located in LCA2c and Cooks Hole is located in LCA2b: Central Nassaburgh Slopes and Valleys and LCA2c: West Nassaburgh Limestone Plateau[3].

5.9 As stated in Section 4 the proposed development will result only in a change to the restoration profile and restoration scheme for the sites and will not result in any additional operations. It is proposed that a full EIA level Landscape and Visual Impact Assessment (LVIA) will be undertaken for the proposed development. The proposed viewpoints for the LVIA are presented at Appendix D and will be subject to feedback and agreement from the planning authority. A desk study together with a site visit will establish the baseline landscape character of the site and identify the visual receptors for the proposed development including any heritage assets, residential

[2] Peterborough City Council (2007) Landscape Character Assessment
[3] Peterborough City Council (2007) Landscape Character Assessment

properties and Public Rights of Way and other relevant features in the vicinity of the site. Due to the nature of the proposed development it is not considered that a Zone of Theoretical Visibility (ZTV) study is necessary in order to identify representative viewpoint locations and effectively assess visual effects.

5.1 The LVIA will be undertaken in accordance with 'Guidelines for Landscape and Visual Impact Assessment, 3rd edition' (April 2013)[4] and Technical Guidance Note 02/21 'Assessing landscape value outside national designations'[5]. The process of assessment of landscape and visual effects will evaluate sensitivity of the receptor to the proposed development and the magnitude of effects. These variables combine to give a scale of effects rating, the highest of which indicate that an effect is considered significant and is of material value in the determination process.

5.2 The viewpoint photographs to support the LVIA will be taken in accordance with the Landscape Institute and Institute of Environmental Management and Assessment Technical Guidance Note: Visual Representation of Development Proposals[6]. The effect of the proposed development on landscape features, the landscape character of the site and the local area together with the potential visual effects associated with the proposed development will be assessed. Compliance with planning policy will also be considered as part of the LVIA in relation to the potential effects on landscape receptors and visual amenity. Mitigation measures embedded within the design proposals will be summarised and the residual effects on landscape receptors (features and character) and visual amenity will be assessed. In addition cumulative effects, taking into account other relevant proposed developments within the study area, will be assessed as part of the LVIA.

Cultural heritage

5.3 As stated in Section 1 the sites have been consented for and subject to mineral operations since the 1950s. The soils and overburden at the sites have already been stripped so there is no potential for buried archaeology to be present. Accordingly

[4] The Landscape Institute (2013) 'Guidelines for Landscape and Visual Impact Assessment (GLVIA), 3rd edition

[5] The Landscape Institute (2021) Technical Guidance Note 02/21 Assessing landscape value outside national designations

[6] Landscape Institute and Institute of Environmental Management and Assessment (2019) Visual Representation of Development Proposals Technical Guidance Note 06/19

there is no need for an assessment of the potential impact of the proposals on buried archaeology.

5.4 As stated in Section 2 Cooks Hole Farmhouse in the centre of Cooks Hole is a Grade II listed building. The setting of Cooks Hole Farmhouse and the associated buildings has been affected by the operations that have been ongoing in the vicinity of the building since the 1950s. In the cultural heritage assessment the potential additional and cumulative impacts on the setting of Cooks Hole Farmhouse and the additional designated heritage assets located within 1km of the sites will be assessed. The cultural heritage assessment will consider indirect additional and cumulative impacts on designated assets through changes to their setting during the continued operation and after restoration.

5.5 A desk based assessment will be undertaken based on professional judgement and the guidance contained within the EIA Regulations, the NPPF (2023)[7] and The Setting of Heritage Assets (Good Practice Advice 3) Historic England 2017[8], Mineral Extraction and Archaeology (HE Advice Note 13) Historic England 2020[9] and Statements of Heritage Significance (HE Advice Note 12) Historic England 2019[10].

5.6 Initial discussions have been held with the Conservation Officer at Peterborough City Council and a site visit has been undertaken. The main issues for assessment are the condition of the listed building in Cooks Hole, any additional or cumulative impacts on the setting of the listed building and the footpath links between Cooks Hole Farmhouse and other properties in the area.

Water resources

5.7 Previous assessments of the potential impacts of the developments on the sites have been undertaken in 2015 for Thornhaugh and 2011 for Cooks Hole. These assessments established the baseline geology, hydrology and hydrogeology at the sites and assessed the potential impacts resulting from the activities at the sites including restoration activities. The assessments concluded that there would be no

[7] Department for Levelling Up, Housing and Communities (September 2023) National Planning Policy Framework (NPPF)
[8] Historic England (2017) The Setting of Heritage Assets (Good Practice Advice 3)
[9] Historic England (2020) Mineral Extraction and Archaeology (HE Advice Note 13)
[10] Historic England (2019) Statements of Heritage Significance (HE Advice Note 12)

significant risk to groundwater or surface water quality as a result of the operations on the sites.

5.8 The materials that are accepted at Thornhaugh will not change as a result of the proposals. The material that will be used to create the proposed landform in Cooks Hole will comprise clean, naturally occurring materials which have been extracted as part of the existing landfill construction operations and will be extracted as part of the consented future construction operations for the landfill at ENRMF and as part of the construction operations at Thornhaugh Landfill. It is proposed that only materials comprising clean, naturally occurring material arising from the construction operations at ENRMF and Thornhaugh will be placed in Cooks Hole. Other than the waste types consented currently for landfill disposal at Thornhaugh, contaminated materials will not be imported to the site therefore there are no additional risks to surface water or groundwater quality associated with the proposed importation of natural excavated restoration material.

5.9 As set out in Section 3 the proposed development will change the currently approved restoration schemes at the sites. The management of surface water during the operations and following restoration will be incorporated into the detailed designs for the proposed development. Surface water attenuation ponds will be designed and incorporated into the landform profile and will include calculations which take into account anticipated rainfall rates and intensities as a result of future climate change.

5.10 As the footprint of the sites will not change as a result of the proposed development the geology and hydrogeology at the site is known and will not change. The potential impacts on groundwater resources therefore will not be assessed in the ES. The water resources assessment will focus on the potential impacts of the proposed development on surface water runoff generation at the sites. The necessary measures for the mitigation of impacts on surface water quality and to attenuate the rate of surface water runoff during the 1 in 100 year plus climate change rainfall event to pre-extraction rates will be included in the design of the restoration profile and will be assessed.

Flood risk assessment

5.11 The majority of Cooks Hole is located in Flood Zone 1 with the exception of the land around Thornhaugh Brookk which is in Flood Zone 3 which is defined as land having a greater than 1 in 100 annual probability of river flooding. Thornhaugh is located in Flood Zone 1 which is defined as land having a less than 1 in 1000 annual probability of river or sea flooding. As the proposed development site area is greater than 1 hectare a flood risk assessment will be prepared. The flood risk assessment will focus on surface water flows and movement as a result of the proposed development. In carrying out the assessment consideration will be given to the potential effect of future climate change on the intensity of storm events. Mitigation will be proposed as necessary to ameliorate any significant impacts identified and the residual impacts will be assessed.

Traffic and transport

5.12 There are no changes proposed to the main site access as a result of the proposed development. Historically the vehicle movements associated with the sites have been up to 255 Heavy Goods Vehicles (HGVs) per day or 510 HGV movements (255 HGVs in and 255 HGVs out). In the assessments carried out as part of the 2015 Environmental Statement which was submitted with the planning application for planning permission reference 15/00230/MMFUL. it was assumed that the combined vehicle movements associated with the sites was 118 HGVs or 236 HGV movements (118 HGVs in and 118 HGVs out). It is anticipated that the HGV movements associated with the proposed development will not exceed the historical traffic movements associated with the operations of the site or the traffic numbers presented in 2015. Given that the vehicle numbers associated with the proposed development will not increase, it is considered that it is not necessary to assess the impacts of the proposed development on traffic therefore a transport statement is not included in the scope of the EIA.

5.13 As set out in Section 4 it is proposed that a small car park is constructed for use by members of the public visiting the site once restoration is completed. The location of the proposed car park and access to the car park is shown on Figure SR2. It is not considered necessary to assess the traffic movements associated with the restored

site as the traffic numbers will be significantly less than those consented currently for the operational activities.

Noise

5.14 Noise limits for the operations at Thornhaugh are specified in Condition 16 of planning permission reference 20/01680/WCMM. Noise monitoring for Thornhaugh is undertaken at the site in accordance with the Noise Monitoring Scheme dated April 2013. Noise limits for the operations at Cooks Hole are specified in Condition 5 of planning permission reference 15/00229/MMFUL and Condition 5 of planning permission reference 13/01372/WCMM and Condition 5 of planning permission reference 13/01374/WCMM.

5.15 An assessment will be carried out of the additional and cumulative potential noise impacts associated with the proposed development. The assessment will be carried out in accordance with the NPPF and the Planning Practice Guidance on minerals together with any other relevant national and local policies. The noise impact assessment for the proposed development will be conducted by assessing compliance of noise emissions from the proposed restoration operations against the existing noise limits for the current sites rather than setting new noise limits based on a repeat baseline noise survey undertaken specifically for this application.

5.16 There have been no new developments or activities in the vicinity of the sites that would be considered significant enough to notably change the baseline acoustic environment in the vicinity of the sites. The noise sensitive receptor locations remain appropriate for inclusion within the noise impact assessment for the proposed development. There has been one complaint within the last 5 years relating to noise from Cooks Hole suggesting that the current noise limits are suitable in terms of the ongoing control of impacts as a result of noise.

5.17 Operations associated with the proposed development will be studied and worst case noise level predictions will be made for each assessment location utilising the methodologies outlined in BS 5228-1:2009+A1:2014 ‘Code of practice for noise and vibration control on construction and open sites. Part 1: Noise’. This British Standard details methods to estimate noise from ‘open sites’ which can include quarries, waste disposal sites and long-term construction projects. The calculations will use plant

noise emission data collected at the sites and/or noise measurement data obtained at similar sites in the UK. The results will be presented against the existing noise limits for the site.

5.18 The proposals will not result in an increase in HGV traffic on the local road network hence an assessment of road traffic noise is not necessary and will not be undertaken. Where necessary mitigation measures, such as an updated noise management scheme, will be recommended so that there are no significant or unacceptable adverse impacts as a result of noise generation associated with the proposed development.

Amenity and dust

5.19 No part of the sites are located in an Air Quality Management Area (AQMA). There are no AQMAs in close proximity to the sites. The closest AQMA is on the eastern side of Peterborough approximately 16km to the east of the sites. The traffic movements associated with the sites will not increase as a result of the proposed development. A traffic air quality assessment is therefore not necessary and therefore is not included in the scope of the EIA (Table S3).

5.20 A qualitative dust assessment will be undertaken in accordance with the Institute of Air Quality Management document 'Guidance on the Assessment of Mineral Dust Impacts for Planning v1.1 (2016)'. The annual mean national air quality objective for PM_{10} is 40µg/m³. The annual background PM_{10} concentration for both sites in 2021 was 13.93µg/m³ [11] which is well below the national air quality objective for PM_{10}. As the background annual PM_{10} concentration for the site is below 17µg/m³ (the screening value specified in the IAQM guidance[12] for potential health effects) there is little risk that the process contribution from the proposed development would lead to an exceedance of the annual mean air quality objective for PM_{10} hence an assessment for the potential for dust to affect human health will not be undertaken and is not included in the scope of the EIA.

5.21 The existing operations at the site have established management plans in place with procedures for managing operations to minimise the potential for the generation of

[11] DEFRA (2023) UK Ambient Air Quality Interactive Map https://uk-air.defra.gov.uk/data/gis-mapping/

[12] Institute of Air Quality Management (2016) 'Guidance on the Assessment of Mineral Dust Impacts for Planning v1.1

dust. There have been no complaints regarding dust in the last 5 years. The assessment will consider the current background dust levels using publicly available data, likely sources of dust, meteorological conditions and the locations of identified potentially sensitive receptors. The Environmental Permit for Thornhaugh includes measures necessary to control the emissions of dust to acceptable levels for the protection of health and amenity. It is anticipated that with the continued implementation of suitable operational controls the potential for significant dust impacts as a result of the proposed changes to the restoration profile can be minimised. Mitigation measures will be proposed as necessary to ameliorate any significant impacts identified and the residual impacts will be assessed.

5.22 A qualitative assessment will also be carried out with respect to the potential impacts on amenity associated with mud on the road. There has been one complaint in the last 5 years relating to mud on the road which suggests that the existing operational controls are suitable for controlling mud on the road. Where necessary suitable mitigatory measures will be proposed.

Climate change and major accidents

5.23 A separate chapter will not be provided in the ES on climate change. The potential effects on the operations and consequential impacts of and on the development site as a result of the predicted effects of climate change will be addressed in the relevant sections as part of the flood risk assessment and the surface water assessment. Measures which are included in the development design which comprise or allow adaptation to climate change will be identified and assessed.

5.24 An assessment will be undertaken of the potential impacts associated with the possible events and accidents associated with the manmade and natural environments at and around the site. The site location is not considered potentially vulnerable to severe earthquakes, tsunamis, avalanches or natural events such as sea level rises associated with predicted climate change hence these matters are not included in the scope of the EIA.

TABLES

Table S1

Planning permissions and variations relevant to the proposed development at Cooks Hole Quarry

Date of planning permission and status	Reference	Description of the development on the planning permission and interpretation in italics
10.09.2020 Valid	20/00978/NONMAT	Non material amendment (revised restoration contours) to planning permission 13/01374/WCMM. This decision must be read in conjunction with that granted under 13/01374/WCMM, and the following conditions replace the equivalent conditions in that permission (including that approved under 15/01710/NONMAT, although Condition 15 remains in force, and including that approved under 16/00607/NONMAT).
10.09.2020 Valid	20/00977/NONMAT	Non material amendment (revised restoration contours) to planning permission 13/01372/WCMM. This decision must be read in conjunction with that granted under 13/01372/WCMM, and the following conditions replace the equivalent conditions in that permission (including that approved under 15/01708/NONMAT, although Condition 15 remains in force, and including that approved under 16/00606/NONMAT).
30.08.2019 Withdrawn	19/01090/WCMM	Variation of Condition C8 (Ecological management plan) of planning permission 13/01374/WCMM.
11.04.2016 Superseded	16/00607/NONMAT	Non-material amendment (revised restoration contours) to planning permission 13/01374/WCMM – Application to vary Condition 11 of 13/00432/WCMM. The condition has been replaced by 20/00978/NONMAT.
11.04.2016 Superseded	16/00606/NONMAT	Non-material amendment (revised restoration contours) to planning permission 13/01372/WCMM application to vary Condition 11 of 13/00434/WCMM. Revised restoration contours and fixed location of minerals processing plant. The condition has been replaced by 20/00977/NONMAT.
19.11.2015 Valid	15/01710/NONMAT	Non-material amendment to planning permission 13/01374/WCMM Application to vary Condition 11 of 13/00432/WCMM. Revised restoration contours and fixed location of minerals processing plant.

Date of planning permission and status	Reference	Description of the development on the planning permission and interpretation in italics
		Conditions 1, 15, 17 and 18 were amended for the 2011 ROMP area References to plans were superseded by 16/00607/NONMAT and 16/00606/NONMAT. With the exception of Condition 15 the conditions have been replaced by 20/00978/NONMAT.
19.11.2015 Valid	15/01708/NONMAT	Non-material amendment to planning permission 13/01372/WCMM Application to vary Condition 11 of 13/00434/WCMM. Revised restoration contours and fixed location of minerals processing plant. Conditions 1, 15, 17 and 18 were amended for the 2011 extension area. References to plans were superseded by 16/00607/NONMAT and 16/00606/NONMAT. With the exception of Condition 15 the conditions have been replaced by 20/00977/NONMAT.
31.07.2015 Valid	15/00229/MMFUL	Restoration of part of quarry to original ground levels using inert materials and consequential amendments to the restoration contours. Relates to the northern part of the quarry and approves changes to restoration contours.
09.12.2013 Valid	13/01374/WCMM	Application to vary Condition 11 of 13/00432/WCMM to amend working hours. This consent relates to the 2011 ROMP area. This was the latest set of full conditions.
06.12.2013 Valid	13/01372/WCMM	Application to vary Condition 11 of planning permission 13/00434/WCMM to amend operating hours. This consent relates to the 2011 extension area. This was the latest set of full conditions.
12.07.2013 Superseded	13/00434/WCMM	Variation of Condition C11 of planning permission 12/01545/WCMM dated 25/01/2013 – to amend the operating hours.

Date of planning permission and status	Reference	Description of the development on the planning permission and interpretation in italics
12.07.2013 Superseded	13/00432/WCMM	Variation of Condition C11 of planning permission 12/01544/WCMM dated 25/01/2013 - to amend the operating hours.
25.01.2013 Superseded	12/01266/MMFUL	Proposed relocation of site offices and weighbridge as a result of the variation to the scheme of working under 12/01544/WCMM and 12/01545/WCMM.
25.01.2013 Superseded	12/01544/WCMM	Variation of Condition C1 of Planning Permission 03/01171/RMP - Application for the determination of updated planning conditions to vary the scheme of working.
25.01.2013 Superseded	12/01545/WCMM	Variation of Condition C2 of planning permission 10/01441/MMFUL – Extension of quarry area for the winning and working of minerals (limestone, sand and ironstone) to vary the scheme of working.
09.11.2012 Valid	12/00463/MMFUL	Continued operation and restoration (by landfill) of Thornhaugh Landfill Site until 31 December 2029, including restoration by landfill of Phase 4B and 4C, temporary storage of materials on part of Cook's Hole Quarry, revised restoration (nature conservation) and landscaping schemes, and recycling of soils for site restoration and for export off site.
27.04.2011 Superseded	03/01171/RMP	ROMP determination of new conditions for the quarry area subject to planning permissions 1900/40009/6 and 1900/4009/3. ROMP for the 1954/1957 permissions. The ROMP permission excludes mineral extraction in the northern corner of Cooks Hole Quarry however this area is included in the red line. A separate permission to work the mineral in the northern corner of the quarry was also issued in tandem (10/01441/MMFUL).
27.04.2011 Superseded	10/01441/MMFUL	New area forming an extension to the north of the quarry for the winning and working of minerals. An area in the northern corner of the site was excluded from the original permission 1900/40009/6. This 2011 permission granted

Date of planning permission and status	Reference	Description of the development on the planning permission and interpretation in italics
		approval for the extraction of mineral in the northern corner of the site.
27.04.2011 Superseded	10/01442/MMFUL	Construction of an alternative means of access and wheel wash facility.
27.04.2011 Superseded	10/01440/MMFUL	Installation of a weighbridge, weighbridge and site offices, mess room, fuel store, equipment store, processing plant, sub-station and other ancillary facilities. Relates to a small area of land in the central northern part of the site.
29.03.1957 Superseded	1900/40009/6	Winning and working of ironstone and overlying mineral in the eastern part of the site. Original planning permission for mineral working in the eastern part of the site. The original permission excluded mineral working in the northern corner of the site.
05.08.1954 Superseded	1900/4009/3	Winning and working of ironstone and overlying mineral in the western part of the site. Original planning permission for mineral working in the eastern part of the site.

Table S2

Planning permissions and variations for Thornhaugh Landfill Site

Date of planning permission and status	Reference	Description of the development on the planning permission and interpretation in italics
8 Mar 2021	20/01680/WCMM	Variation of condition C1 and C2 (to revise the order of approved phasing and allow the storage of Hi-pod containers) pursuant to planning permission 17/00726/WCMM
19 Jul 2017	17/00726/WCMM	Variation of conditions C2 (Plans and documents), C4 (Phasing Plans), and C7 (Lighting Scheme), of planning permission 15/00230/MMFUL
31 Jul 2015	15/00230/MMFUL	Continuation of landfilling in phases 1 and 2; consequential amendments to the phasing scheme; relocation of site roads and infrastructure including the landfill gas flare; minor amendments to the final restoration contours; continued periodic use of crushing and processing plant and the deferment of the dates for the cessation of landfilling and final restoration by 6 years
9 Nov 2012	12/00463/MMFUL	Continued operation and restoration (by landfill) of Thornhaugh Landfill Site until 31 December 2029, including restoration by landfill of Phase 4B and 4C, temporary storage of materials on part of Cook's Hole Quarry, revised restoration (nature conservation) and landscaping schemes, and recycling of soils for site restoration and for export off site
26 Jan 2012 Temporary permission end date passed	11/01993/WCMM	Variation of condition C1 of planning permission 10/01659/WCMM to allow continued siting and operation of temporary gas flare until 30/12/2016
15 Feb 2011 Temporary permission end date passed	10/01659/WCMM	Variation of condition C1 of planning permission 09/01458/WCMM - Siting and operation of a temporary gas flare and associated equipment - to extend date of commencement to 30 December 2011
3 Feb 2010 Temporary permission end date passed	09/01458/WCMM	Variation of condition 1 of planning permission 07/01466/MMFUL to allow for the retention of a temporary gas flare and associated equipment until 30.12.2010

Date of planning permission and status	Reference	Description of the development on the planning permission and interpretation in italics
23 Dec 2008	08/01260/WCMM	Variation of condition 1 of planning permission 07/01466/MMFUL to allow for the retention of the operation of a temporary gas flare and associated equipment
30 May 2008	08/00391/MMFUL	Installation and operation of a micro turbine landfill gas power generator, permanent flare and associated equipment
19 Oct 2007	07/01466/MMFUL	Siting and operation of a temporary gas flare and associated equipment
11 Oct 2006 Temporary permission end date passed	06/01069/MMFUL	Processing of secondary aggregate materials recovered from Phase 7 within Thornhaugh Quarry for use off-site; processing of secondary aggregates from suitable waste streams brought to the site for disposal for use off-site, for a temporary period ending 15 November 2011
8 Jun 2006	06/00145/MMFUL	Siting of temporary gas flare and associated equipment
21 Apr 2006	05/00685/WCMM	Variation of condition 7 of planning permission P070/97 to enable mineral extraction over a larger area within the currently approved boundaries of the Quarry
18 May 2004 Withdrawn	04/00329/CLE	Removal of material from north of site
18 May 2004 Withdrawn	04/00352/CLP	Construction using imported waste and other materials of the restoration landform
17 Feb 2004 Refused (allowed on appeal)	04/00004/MMFUL	Erection of 6m high mesh fencing around boundaries of landfill cells to prevent blown litter from leaving the site
25 Apr 1997 (associated appeal in 2004)	97/00006/MMFUL	Application for determination of new conditions for extraction of limestone and restoration to agricultural use by landfill
1 Aug 1980	P0610/80	Backfilling and restoration to agriculture of quarry
6 May 1977	P0304/77	Backfilling of the quarry prior to restoration by importing inert materials, top soil, subsoil and builders' rubble from contractors' sites
3 May 1963	T7767	Extraction of limestone
27 Jun 1957	T2466	Opencast working of Ironstone, Limestone, Clay, Sand, Gravel and

Date of planning permission and status	Reference	Description of the development on the planning permission and interpretation in italics
		Gannister and ancillary purposes in connection therewith

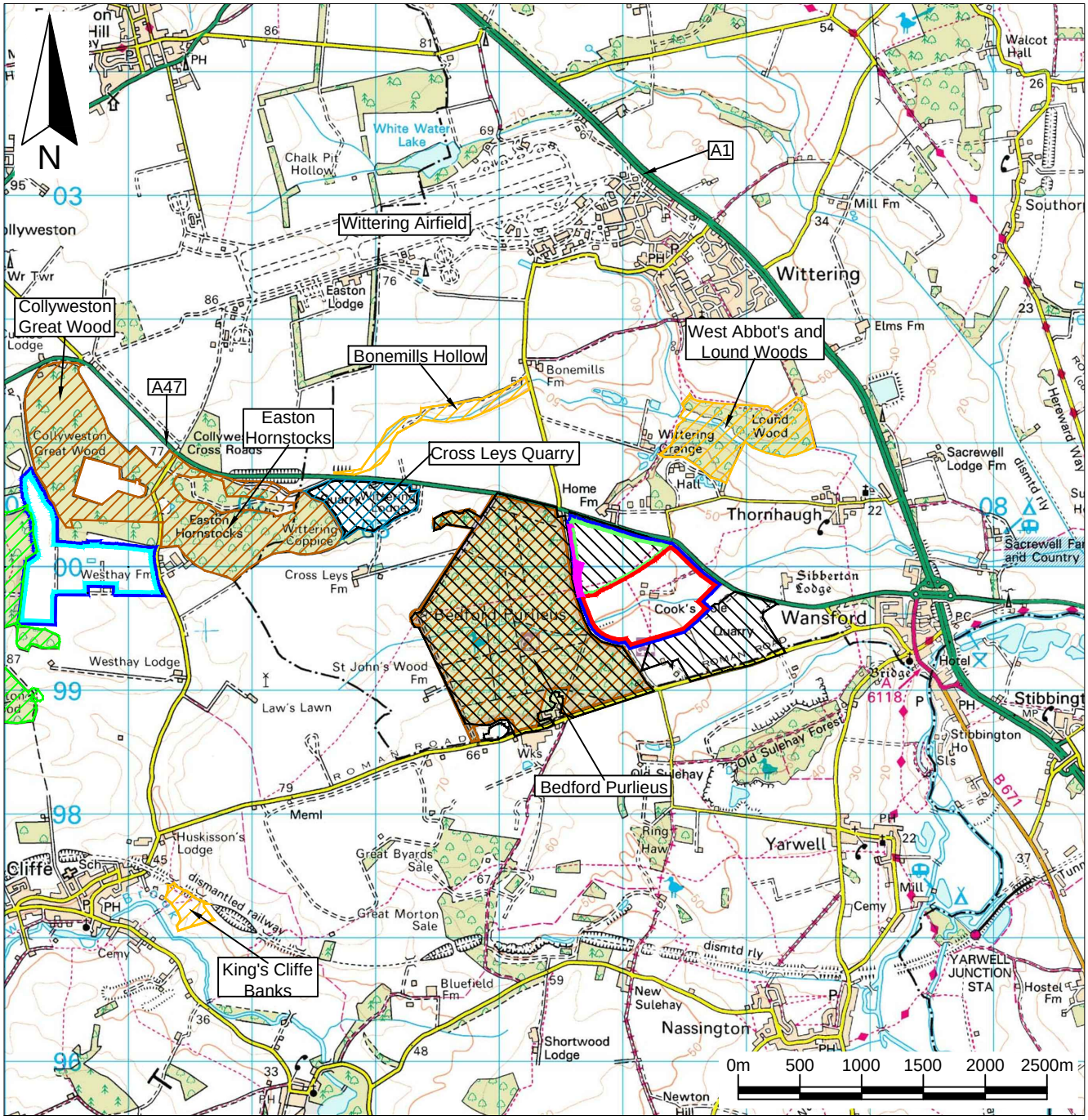
Table S3

Matters or aspects which can be excluded from the scope of the Environmental Impact Assessment

Topic	Matter/aspect to be excluded from the scope of the ES
Population and human health	There will be no changes to the type of waste accepted at Thornhaugh as a result of the proposed development. It is considered therefore that an assessment of the proposed development on the population and human health does not need to be included in the scope of the EIA.
Soils and agricultural land classification	The sites have been subject to historical mineral extraction and there are very limited soil resources available at the sites. It is considered that there is no need to include an assessment of the impact of the proposed development on soils and agricultural land quality in the scope of the EIA.
Cultural heritage	The baseline conditions together with the potential impacts from mineral extraction and landfilling with respect to cultural heritage has already been established at the site through previous planning applications and permissions. During the historical operations at the sites the soils and overburden at the sites have been stripped so there is no potential for buried archaeology. The assessment of the potential impacts of the proposed development on buried archaeology is therefore not included in the scope of the EIA.
Noise and vibration	There are no activities at the sites which will result in vibration. No further mineral will be extracted from Cooks Hole and no blasting will be undertaken. The proposed development will not result in changes to the operational methods at the sites including heavy plant movements. The assessment of impacts as a result of vibration is not included in the scope of the EIA.
	There will be no increase in the HGV movements as a result of the proposed development and there will be no changes to the site access arrangements during the operation of the site. A traffic noise assessment will not be undertaken and is excluded from the scope of the EIA.
Traffic	The proposed development will not result in any greater HGV movements than those associated in 2015. The traffic associated with the existing operations has previously been assessed and the traffic movements were acceptable. Traffic is scoped out of the EIA.
Traffic air quality	An assessment of traffic emissions is screened out using the screening criteria in the IAQM/EPUK guidance[13]. The screening threshold for a traffic air quality assessment is a change in flows of Annual Average Daily Traffic (AADT) of more than 100 Heavy Duty Vehicles (HDV). As there will be no increase in the HGV movements compared with the existing operations as a result of the amended restoration scheme an assessment for traffic air quality emissions is not included in the scope of the EIA.

[13] Institute of Air Quality Management (2017) Land-Use Planning & Development Control: Planning For Air Quality v1.2 http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf

Topic	Matter/aspect to be excluded from the scope of the ES
Groundwater	As set out in Section 4 the material that will be used to create the proposed landform in Cooks Hole will comprise clean, naturally occurring materials. Given the nature of the proposed development and proposed materials to be used it is considered that there will be no additional potential for impacts on groundwater resources or quality compared with those assessed in previous applications for operations at the site. It is considered that with the continuation of the monitoring and management measures currently in place there will be no additional impacts as a result of the proposed development. An assessment of the potential impacts of the proposed development on groundwater will not be undertaken and is not included in the scope of the EIA.
Major accidents	The site location is not considered potentially vulnerable to severe earthquakes, tsunamis, avalanches or natural events such as sea level rises associated with predicted climate change hence the assessment of the impacts associated with these matters are not included in the scope of the EIA.



Key / Notes

- Land in the control of the Applicant
- Boundary of Cooks Hole
- Boundary of Thornhaugh Landfill Site
- Boundary of East Northants Resource Management Facility
- Approximate location of a Site of Special Scientific Interest (SSSI)
- Approximate location of a Local Wildlife Site
- Approximate location of a Site of Special Scientific Interest (SSSI) and a National Nature Reserve (NNR)
- Approximate location of a Regionally Important Geological Site
- Approximate location of a Local Geological site
- Approximate location of a County Wildlife site
- Approximate location of a Brownfield Biodiversity site

Rev	Status	Drn	App	Chk	Date
	Final	KR	SPS	LH	13/10/23

Site: Cooks Hole Quarry and Thornhaugh Landfill Site

Client: Augean

Title: The site location

Figure SR1

Scale: 1:50,000@A4

Drawing Ref: AU/CH/09-23/23904

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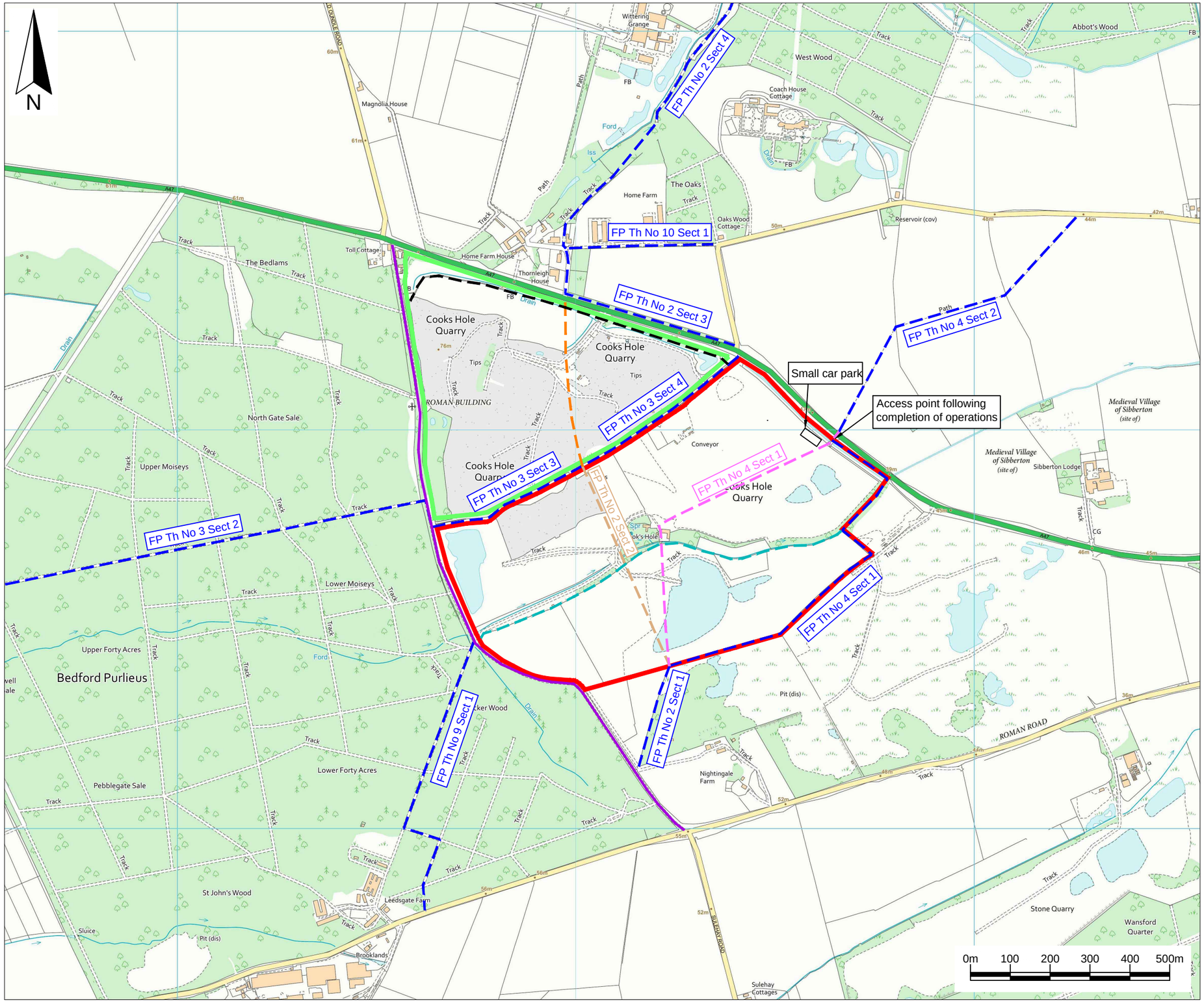

Key / Notes

- Boundary of Cooks Hole Quarry
- Boundary of Thornhaugh Landfill Site
- Approximate location of existing footpaths in the vicinity of Cooks Hole/Thornhaugh
- Approximate route of Footpath No 2 to be reinstated on restoration of Thornhaugh Landfill Site
- Old Oundle Road (Public highway. No cars permitted)
- Footpaths which are currently diverted
- Footpath which is currently stopped up
- New footpaths to be created following restoration under the extant planning permission
- Potential new footpath routes that could be created as part of the application

Note:
Existing footpaths taken from the Peterborough City Council Interactive Map https://peterborough.maps.arcgis.com/apps/webappviewer/index.html?id=6aa2abf2743a4a5db2c6827a03be9d60

The details shown on the Ordnance Survey base plan for the ground in Thornhaugh and Cooks Hole is out of date and does not reflect the current ground conditions.

Rev	Status	Drn	App	Chk	Date
	Final	KR	SPS	LH	13/10/23

Site: Cooks Hole Quarry and Thornhaugh Landfill Site

Client: Augean

Title: Current and proposed footpath routes in the vicinity of Cooks Hole Quarry and Thornhaugh Landfill Site

Figure SR 2 | Scale 1:10,000@A3

Drawing Ref: AU/CH/09-23/23905

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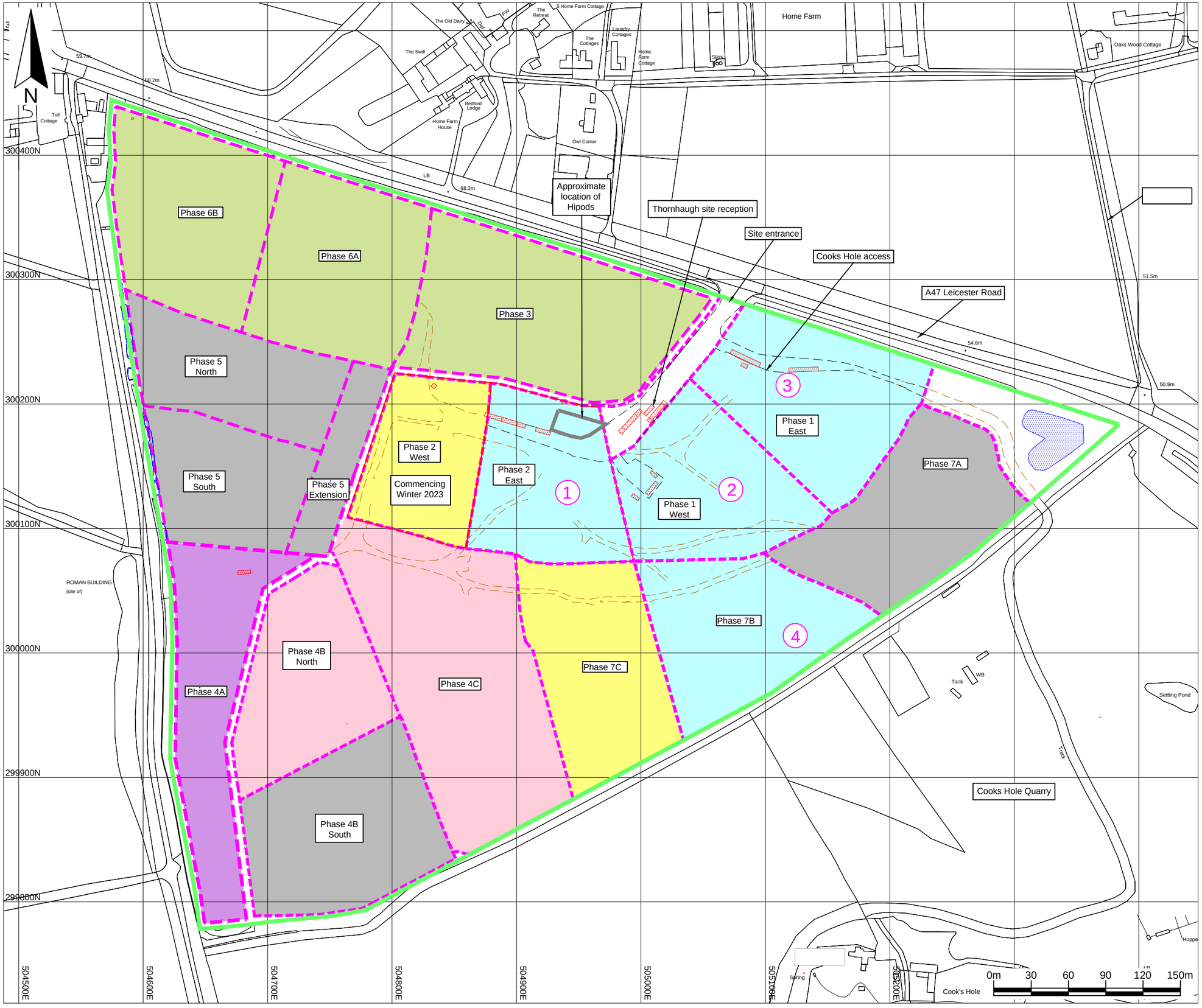

Key / Notes

- Boundary of Thornhaugh Landfill Site
- Phase boundaries
- 1 — Proposed order of phasing for remaining phases
- Phase 2 East — Original name of phase area
- Surfaced section of internal haul road
- Approximate route of haul roads
- Existing building
- Current surface water collection areas
- Unprepared area
- Excavation and preparation for landfilling
- Active landfill area
- Infill complete. To be capped
- Restored
- Nature conservation habitat for great crested newts

Note:
The proposed phasing is approximate, and while the principles are unlikely to change, phase boundaries may change in response to operational conditions

Rev	Status	Drn	App	Chk	Date
	Final	KR	SPS	LH	13/10/23

Site: Cooks Hole Quarry and Thornhaugh Landfill Site

Client: Augean

Title: The phasing of Thornhaugh Landfill site

Figure SR 3 | Scale: 1:3,000@A3

Drawing Ref: AU/CH/09-23/23906

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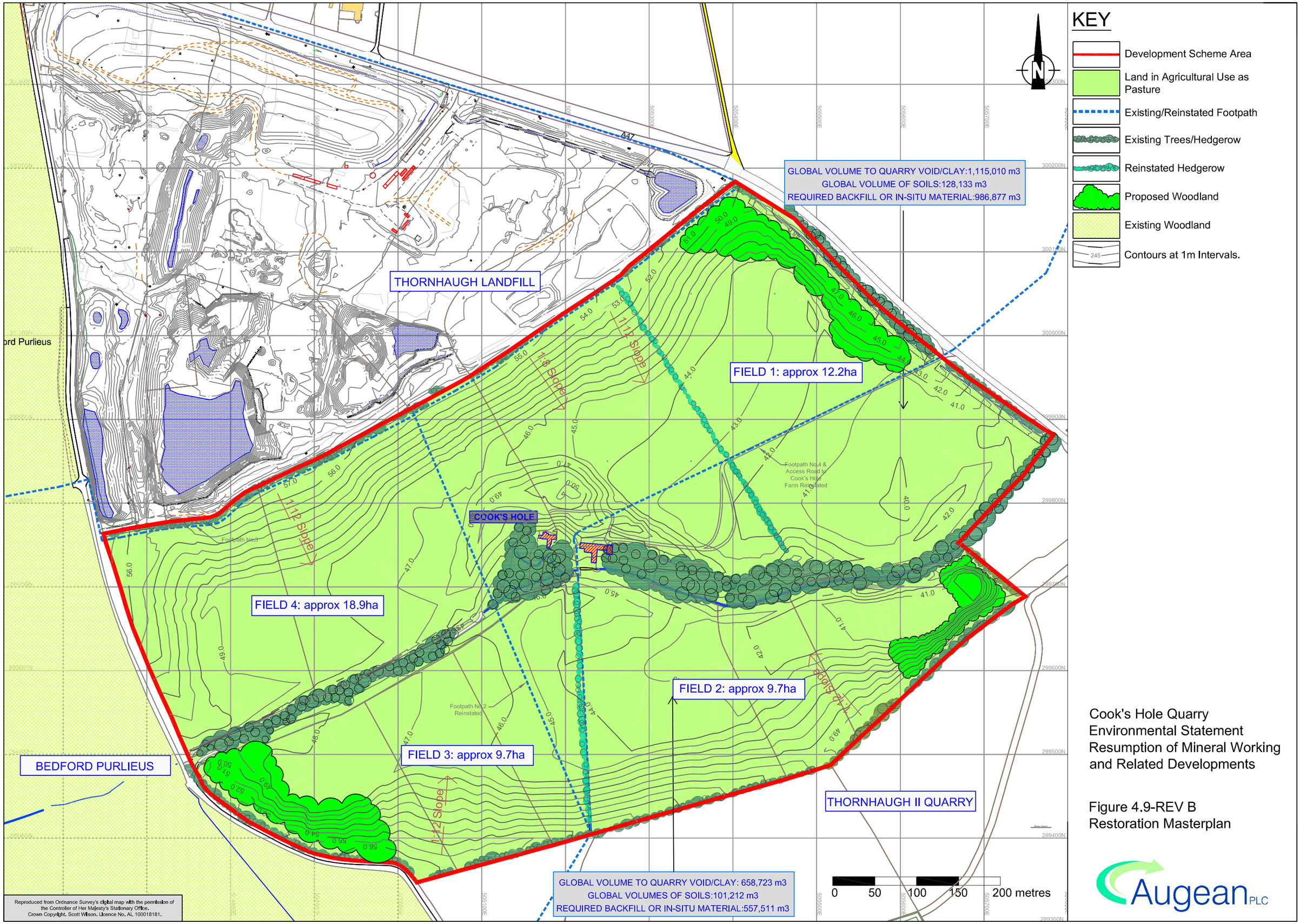
APPENDIX A

APPROVED RESTORATION SCHEME FOR COOKS HOLE QUARRY (FIGURE 4.9 REV B)



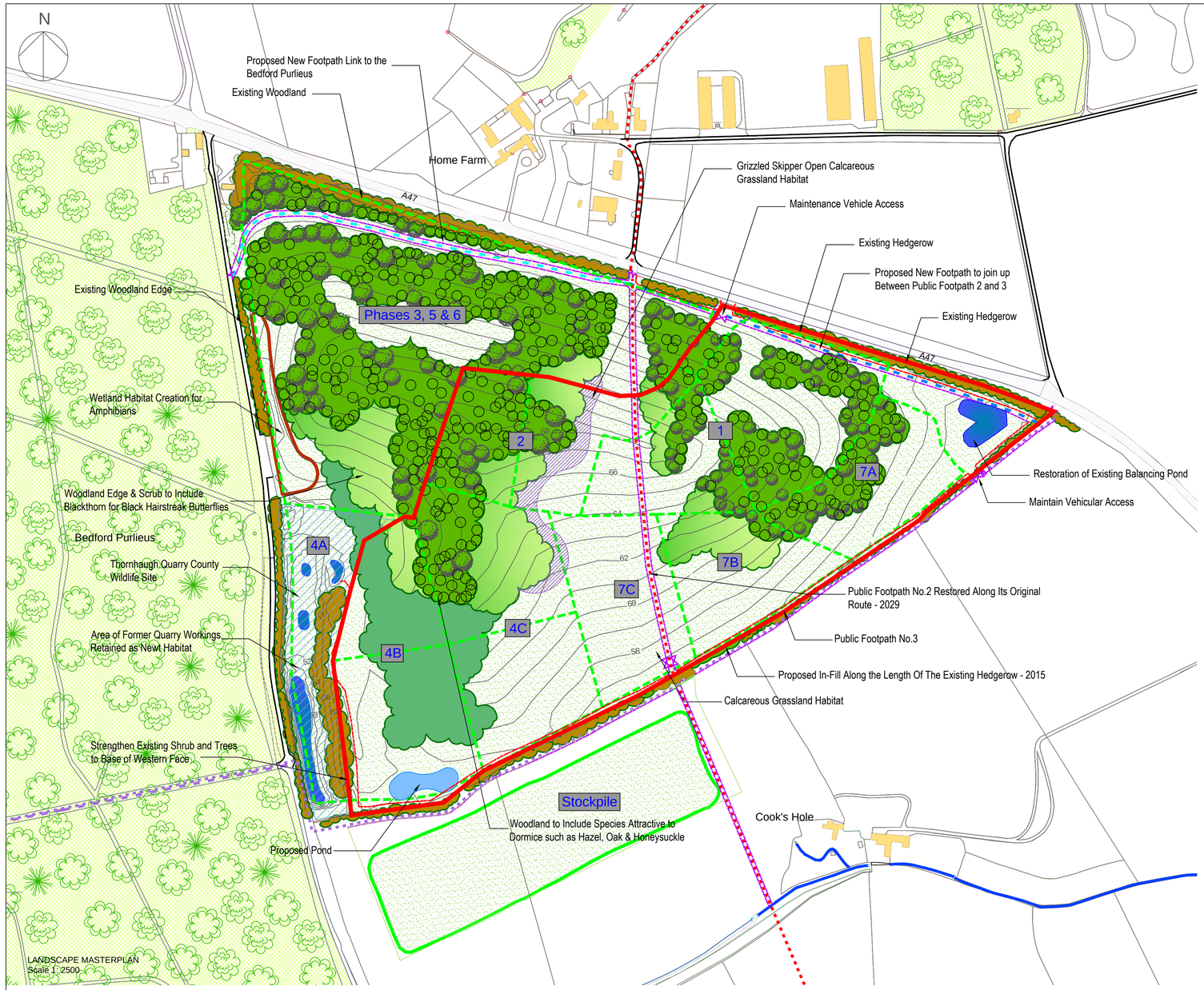
Cook's Hole Quarry
Environmental Statement
Resumption of Mineral Working and Related Developments

Figure 4.9-REV B
Restoration Masterplan

Augean PLC

APPENDIX B

APPROVED RESTORATION SCHEME FOR THORNHAUGH LANDFILL SITE (DRAWING NUMBER TLS6)



Phase					3, 5 & 6	1	2	4B	4C	7A	7B	7C
Species	Common Name	%	Size (cm)	Pot/Bare-Root								
Woodland Planting Mix					48100m²	17408m²	12956m²	766m²	6289m²	7097m²	908m²	0m²
Acer campestre	field maple	10	40-60	B-R	534	193	144	9	70	79	10	
Betula pendula	birch	10	40-60	1L	534	193	144	9	70	79	10	
Corylus avellana	hazel	10	40-60	B-R	534	193	144	9	70	79	10	
Malus sylvestris	crab apple	5	60-80	B-R	267	97	72	4	35	39	5	
Quercus robur	English oak	40	60-80	B-R	2138	774	576	34	280	315	40	
Rhamnus cathartica	purging buckthorn	5	40-60	B-R	267	97	72	4	35	39	5	
Sorbus torminalis	wild service tree	5	60-80	B-R	267	97	72	4	35	39	5	
Tilia cordata	small leaved lime	10	40-60	B-R	534	193	144	9	70	79	10	
Viburnum lantana	wayfaring tree	5	60-80	B-R	267	97	72	4	35	39	5	
Shrub/Scrub Planting Mix					7700m²	1627m²	5092m²	1958m²	6628m²	0m²	4608m²	164m²
Betula pubescens	downy birch	10	40-60	B-R	86	18	57	22	74		51	2
Crataegus monogyna	hawthorn	40	40-60	B-R	342	72	226	87	295		205	7
Corylus avellana	hazel	10	40-60	B-R	86	18	57	22	74		51	2
Malus sylvestris	crab apple	10	60-80	B-R	86	18	57	22	74		51	2
Rosa arvensis	field rose	10	60-80	B-R	86	18	57	22	74		51	2
Rhamnus cathartica	purging buckthorn	10	40-60	B-R	86	18	57	22	74		51	2
Viburnum lantana	wild service tree	10	60-80	B-R	86	18	57	22	74		51	2
Open Shrub/Scrub Planting Mix					1200m²	0m²	0m²	14201m²	3953m²	0m²	0m²	0m²
Betula pubescens	downy birch	10	40-60	B-R	4			45	13			
Crataegus monogyna	hawthorn	40	40-60	B-R	15			178	50			
Corylus avellana	hazel	10	40-60	B-R	4			45	13			
Malus sylvestris	crab apple	10	60-80	B-R	4			45	13			
Rosa arvensis	field rose	10	60-80	B-R	4			45	13			
Rhamnus cathartica	purging buckthorn	10	40-60	B-R	4			45	13			
Viburnum lantana	wild service tree	10	60-80	B-R	4			45	13			
Hedgerow Planting Mix					0m	0m	0m	0m	0m	0m	116m	45m
Crataegus monogyna	hawthorn	70	40-60	B-R							405	156
Corylus avellana	hazel	10	40-60	B-R							58	22
Cornus sanguinea ssp. sanguinea	dogwood	5	40-60	B-R							29	11
Rosa arvensis	field rose	10	60-80	B-R							58	22
Rhamnus cathartica	purging buckthorn	5	40-60	B-R							29	11

Phase	3, 5 & 6	1	2	4B	4C	7A	7B	7C
Calcareous Grassland	30600m²	18611m²	5455m²	12063m²	16298m²	16180m²	11675m²	18805m²
Open Calcareous Grassland	100m²	0m²	2346m²	0m²	1177m²	0m²	0m²	256m²

Aquatic Planting

Pond Zone	Latin name	Common name	Root Condition	Size	% Mix	No
ground level	*Lychnis flos-cuculi*	Ragged robin	RT	110cc	35	115
	Juncus effusus	Soft rush	RT	110cc	30	100
	Filipendula ulmaria	Meadowsweet	RT	110cc	35	115
shallow margins	*Caltha palustris*	Kingcup/Marsh marigold	RT	110cc	20	200
	Lythrum salicaria	Purple loosestrife	RT	110cc	15	100
	Veronica beccabunga	Brooklime	RT	110cc	15	100
	Mentha aquatica	Water mint	RT	110cc	15	100
	Iris pseudacorus	Yellow flag iris	RT	110cc	15	100
	Alisma plantago-aquatica	Water-plantain	RT	110cc	20	200
shallow aquatic zone	*Myosotis scorpioides/ Palustris*	Water (True) forget-me-not	RT	110cc	25	210
	Hippuris vulgaris	Common mare's tail	RT	110cc	25	210
	Sagittaria sagittifolia	Arrowhead	RT	110cc	25	210
	Ranunculus aquatilis	Water-crowfoot	RT	110cc	25	210
deep water zone	*Callitriche stagnalis*	Common water-starwort	RT	110cc	50	75
	Potamogeton natans	Broad leaved pondweed	RT	110cc	50	75

Calcareous Grassland Seed Mix

EM6: Meadow Mixture for Chalk and Limestone Soils

Herbs		
%	Latin name	Common name
0.5	*Achillea millefolium*	Yarrow
1.5	*Anthyllis vulneraria*	Kidney vetch
1	*Centaurea nigra*	Common knapweed
1	*Centaurea scabiosa*	Greater knapweed
0.5	*Clinopodium vulgare*	Wild basil
1	*Daucus carrota*	Wild carrot
0.5	*Filipendula vulgaris*	Dropwort
1	*Gallium verum*	Lady's bedstraw
1.5	*Knautia arvensis*	Field scabious
0.5	*Leontodon hispidus*	Rough hawkbit
1	*Leucanthemum vulgare*	Oxeye daisy
2	*Lotus corniculatus*	Birdsfoot trefoil
0.5	*Origanum vulgare*	Wild marjoram
0.5	*Pimpinella saxifraga*	Burnet-saxifrage
1	*Plantago media*	Hoary plantain
1	*Primula veris*	Cowslip
1	*Prunella vulgaris*	Selfheal
1	*Ranunculus acris*	Meadow buttercup
0.5	*Reseda lutea*	Wild mignonette
2	*Sanguisorba minor (Poterium sguisorba)*	Salad burnet
0.5	*Scabiosa columbaria*	Small scabious
20		

Grasses		
%	Latin name	Common name
1	*Briza media*	Quaking grass (w)
32	*Cynosurus cristatus*	Crested dogstail
22	*Festuca ovina*	Sheep's fescue
16	*Festuca rubra*	Slender-creeping red-fescue
1	*Koeleria macrantha*	Crested hair-grass (w)
5	*Phleum bertolonii*	Smaller cat's-tail
3	*Trisetum flavescens*	Yellow oat-grass (w)
80		

KEY

- Application Boundary
- Footpath No.3
- Footpath No.2 Reinstated
- Proposed Footpath To Join Footpaths No.2 And No.3
- Proposed Footpath To Bedford Purlieus
- Area Of Wetland Habitat Creation
- Phased Restoration Areas
- Proposed Post and Wire Fencing
- Proposed Tree Protection Fencing
- Proposed Field Gate
- Proposed Kissing Gate
- Proposed Stile
- Existing Vegatation
- Proposed Hedgerow Mix
- Proposed Woodland Planting Mix
- Proposed Shrub/Scrub Mix
- Proposed 'Open' Shrub/ Scrub Mix
- Existing Pond
- Proposed Pond
- Calcareous Grassland (BAP Target Contribution)
- Grizzled Skipper Habitat (Open Calcareous Grassland)
- 60 Elevation Contour mAOD

<u>Grass seeding</u>
All grass seeding to be undertaken during spring or autumn and to be sown at 20g/m2 and firmed in by rolling. Areas to receive tree and shrub planting will be sown with the calcareous grassland mix prior to planting.
Open calcareous grassland to be seeded to 70% of the total area with un-seeded areas not to exceed 5m2.
All seeds shall be of British Provenance and are to include provenance certification where applicable to proprietary mixes.
Seeding will occur either in the first Spring (mid April/mid May) or first autumn (mid August/mid September) following placement of the soils.

In advance of undertaking the seeding all areas to be seeded will:

- sampled for soil analysis of pH and nutrient status, not more than one month before seeding, in accordance with Appendix 3 "Sampling for Soil pH, P, K and Mg" of Fertiliser Manual RB209 (2010) published by Defra in order to establish that the substrate is suitable for the wildflower mix;
- be sprayed with translocated herbicide (glyphosate or similar) 14 days before cultivation if weed growth has established between the placement of the soils and the period of seeding;
- be cultivated to a depth of 100mm by disc/harrow to produce a fine tilth free of stones larger than will pass through a 75mm mesh sieve;
- no fertiliser will be applied to the planting areas in order to limit fertility as a means of promoting the wildflower sward and reducing grass growth competition with the trees/shrubs.

<u>Proposed Trees and Shrubs</u>
Native shrub and tree mixes to be notched planted at 3m centres in same species groups of 5 - 9 with a random distribution of species in a random configuration avoiding straight lines and regular geometric patterns.
Open shrub mix to be notched planted at 4m centres, over 50% of the area, in same species groups of 5 - 9 with a random distribution of species in a random configuration avoiding straight lines and regular geometric patterns.
Hedge mix to be notch planted at 350mm centres in a double staggered row 350mm apart. All trees and shrubs to be fitted with 600 mm high Tubex standard tree protector supported by an appropriate wooden stake and fitted as per manufacturers recommendations.
Planting will be undertaken in the period November to March into areas previously seeded with a calcareous grassland seed mix.
A 50 cm diameter weed free area shall be maintained around each planted tree.

<u>Existing Shrub and Trees to Western Face</u>
Additional planting to area of existing shrubs and trees to be undertaken where sufficient gaps are present.

<u>Aquatic Planting</u>
The pond planting will use plant materials gained from site (Pond 7 clearance) where possible with off site supplementation where necessary.
Plants to be planted at a rate of 6/m2 spread in groups over 30% of the overall pond area. Plants to be grouped in 3-9 of each species.

<u>Planting Notes</u>
The handling of plants to be in accordance with National Plant Specification 'Handling and Establishing Landscape Plants'.

All plants and planting operations are to comply with the requirements and recommendations of all current relevant British Standard specification including but not limited to:

- BS 3936-1:1992. Nursery stock. Specification for trees and shrubs
- BS 3882: 2007 Specification for topsoil and requirements for use (incorporating Corrigendum No.1)
- BS 4428:1989. Code of practice for general landscape operations (excluding hard surfaces) (AMD 6784)
- BS 5837: 2012 Trees in relation to construction - Recommendations (AMD Corrigendum 15988)
- BS 7370-3:1991. Grounds maintenance. Recommendations for maintenance of amenity and functional turf (other than sports turf)

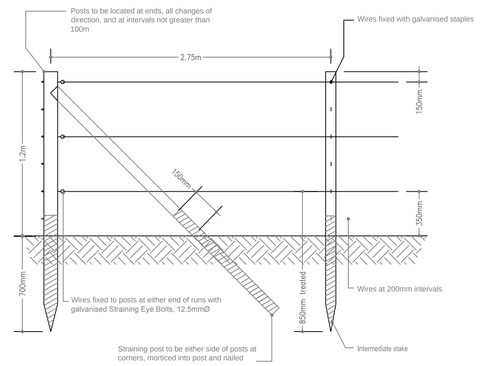
<u>Maintenance</u>

Management operations during the 10 year aftercare period would include;

- monitoring establishment of the grass/wildflower sward
- mowing/strimming of the vegetation between the plants in May and August as required
- spot weeding of unwanted ruderal weeds or noxious weeds;
- maintenance of tree guards or other forms of protection until trees are established;
- maintenance of a 50cm radius around each tree/shrub through herbicide application;
- fertiliser application to the base of plants as required to ensure continued growth;
- maintenance of any stakes and ties;
- removal of guards, stakes and ties at appropriate times;
- carry out replacement planting in the event that losses of greater than 10% of the original planting occur.
- grazing or mowing of the calcareous grassland sward in spring/late summer. (April/May and August/Sept)

Losses of less than 10% of the total numbers of plants will introduce an element of randomness and habitat variation within the planting areas, particularly the scrub, which is desirable.

Note: Phases as shown on figure TLS1



NOTES
1. All timber is to be sweet chestnut or larch, peeled.
2. Straining posts are to be 75mm diameter, approx 1.5m long, and treated with an approved timber preservative to 150mm above ground level.
3. Wires are to be fixed by means of galvanised Straining Eye Bolts through posts at beginnings and ends of runs, and by being fixed to intermediate stakes with galvanised staples.
4. Tree protection fence to be located 2m from the limit of extraction boundary where space allows.

TREE PROTECTION AND POST AND WIRE FENCING
Not to Scale

Plot Date: 06/02/2015 11:23:35
File Name: L:\2K WASTE MANAGEMENT\47072\5\5 THORNHAUGH RE ENGINEERING\3.0 TECHNICAL\DRAWINGS\FIGURE TLS\FIGURE TLS6 - CORRECT AREAS

This drawing is for preliminary purposes only and is subject to amendment during design development. UNDER NO CIRCUMSTANCES MUST THIS DRAWING BE USED FOR CONSTRUCTION PURPOSES

Revision Details	By / Check	Date	Suffix

NOTES

CONSTRUCTION RISKS	MAINTENANCE / CLEANING RISK	DEMOLITION RISKS

In addition to the hazard/risks normally associated with the types of work detailed on this drawing take note of above. It is assumed that all works on this drawing will be carried out by a competent contractor working, where appropriate, to an appropriate method statement.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION BOX

Purpose of issue: PLANNING

Client: Augean PLC

Project Title: THORNHAUGH LANDFILL / COOK'S HOLE QUARRY

Drawing Title: PROPOSED DEVELOPMENT THORNHAUGH LANDFILL SITE ENVIRONMENTAL STATEMENT PHASED RESTORATION SCHEME

Designed	Drawn	Checked	Approved	Date
RC	RC	NW	Approved by	Approved Date

URS Internal Project No.: 47047967
Suitability: PLANNING
Scale @ A1: 1:2500
Zone / Mileage: Zone / Mileage

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AECOM

Drawing Number: TLS6
Rev:

APPENDIX C

PROPOSED RESTORATION PROFILE AND INITIAL CONCEPT RESTORATION SCHEME FOR COOKS HOLE QUARRY AND THORNHAUGH LANDFILL SITE

KEY

RESTORATION CONTOURS (mAOD) (@ 1m INTERVALS)

PROPOSED HEDGEROWS

PROPOSED NATIVE WOODLAND BLOCKS

PROPOSED GRASSLAND AREAS - EXACT TYPE OF GRASSLAND (CALCAREOUS, NEUTRAL, SPECIES RICH MEADOW ETC.) TO BE DISCUSSED BASED ON TYPE OF RESTORATION MATERIAL AVAILABLE

PROPOSED SHRUB/ SCRUB AREAS

DETENTION BASINS LIKELY TO BE DRY FOR PART OF THE YEAR, WET/UNDER WATER AT OTHER TIMES. SIDE SLOPES LEFT BARE TO COLONISE NATURALLY

PROPOSED OPEN SHRUB/ SCRUB MIX

COUNTY WILDLIFE SITE INCLUDING PONDS CONTAINING NEWTS

PROPOSED NEW PONDS OUTSIDE OF COUNTY WILDLIFE SITE

AREA OF BARE/NATURALLY COLONISING GROUND FOR LITTLE RINGED PLOVERS

WATER STORAGE LAGOON

HIBERNACULA

0 100 METRES

SCALE 1:2000

N

A47

Small car park

Access point following completion of operations

BEDFORD PURLIEUS NATIONAL NATURE RESERVE

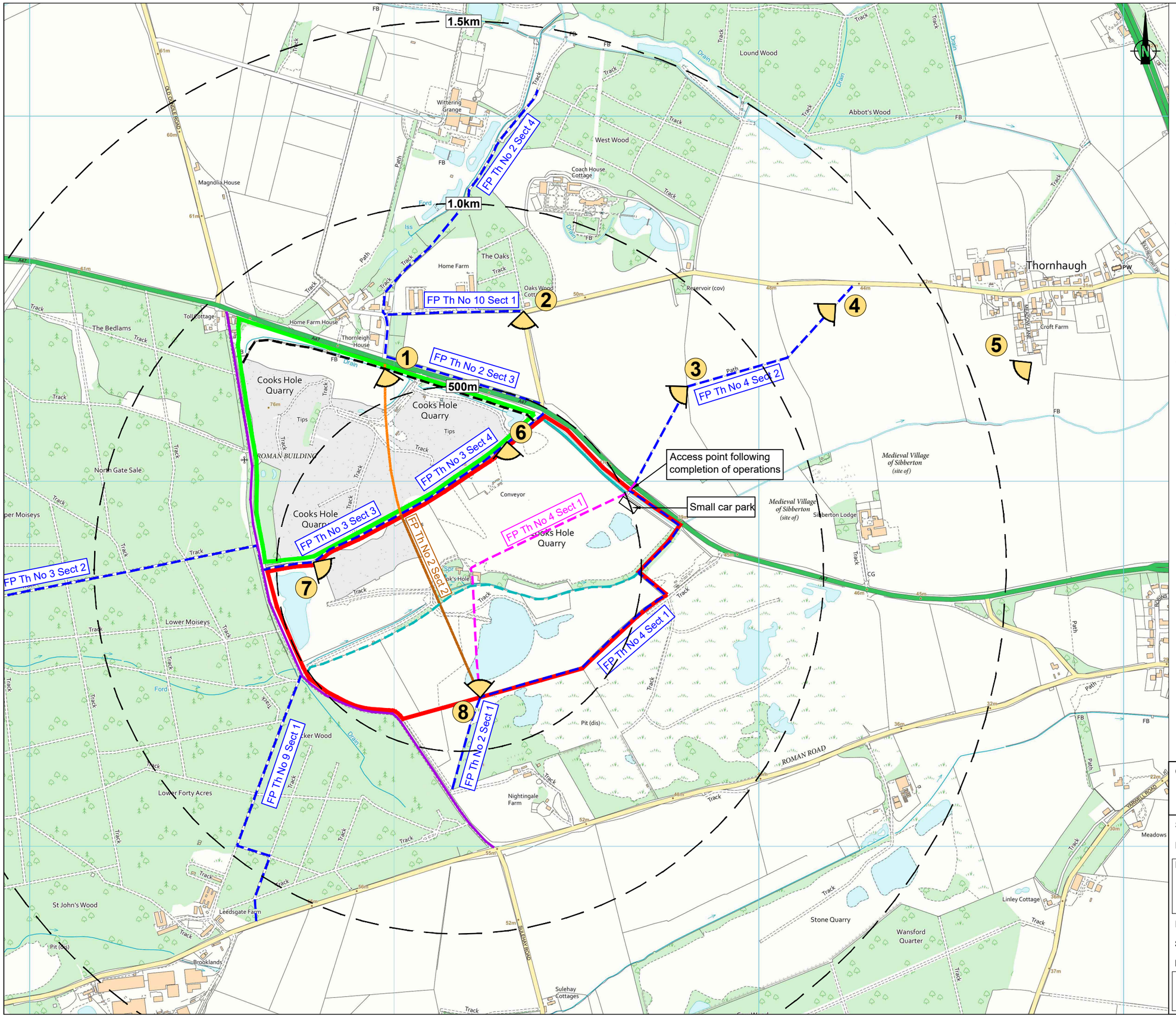
COOKS HOLE FARMHOUSE (GRADE II LISTED BUILDING)

Thornhaugh Brook

Initial Concept Restoration Scheme

APPENDIX D

PROPOSED VIEWPOINTS FOR THE LANDSCAPE AND VISUAL IMPACT ASSESSMENT



KEY

- BOUNDARY OF COOKS HOLE QUARRY
- BOUNDARY OF THORNHAUGH LANDFILL SITE
- RADIUS FROM CENTRE OF SITE AT 500m INTERVALS
- 1 POTENTIAL VIEWPOINT LOCATION AND DIRECTION OF VIEW
- APPROXIMATE LOCATION OF EXISTING FOOTPATHS
- REINSTATED ROUTE OF FOOTPATH NO. 2 ON RESTORATION OF THORNHAUGH LANDFILL
- CURRENTLY DIVERTED FOOTPATH
- NEW FOOTPATHS TO BE CREATED UNDER EXTANT PLANNING PERMISSION

0 100 200 300 400 500 METRES

SCALE 1:10000

Client: Augean plc

Site	COOKS HOLE QUARRY
Project	REVISED RESTORATION LANDFORM
Drawing Title	PROPOSED VIEWPOINT LOCATIONS
Date	SEPTEMBER 2023
Drawing No.	THORN035
Scale	1:10,000 @ A3
File Ref.	2023_008.006_THORN035_Prop VP Locs
Revision	0

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