

Winchcombe CSEC - Mining Risk & Minerals Impact Assessment

National Grid Cotswolds Visual Impact Provision (VIP) Project

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1 INTRODUCTION

1.1 Purpose of Report

- 1.1.1 Arcadis Consulting (UK) Ltd. (Arcadis) was instructed by National Grid (“the client”) to undertake a mining risk and minerals impact assessment for the proposed Winchcombe Cable Sealing End Compound (CSEC) (hereafter referred to as the ‘Proposed Project’). The Proposed Project forms part of the wider Cotswolds Visual Impact Provision (VIP) Project (hereafter referred to as the ‘wider project’), the purpose of which is to underground a section of 400kV overhead electricity transmission lines, to mitigate the visual impact of existing electricity infrastructure through part of the Cotswolds National Landscape (previously known as Area of Outstanding Natural Beauty). The Proposed Project is for the construction of a CSEC at Winchcombe to facilitate the connection between new underground cables and the existing overhead line (OHL) and the associated permanent access road (and bell-mouth) to the CSEC, in addition to temporary bell-mouths created to support the cable construction along classified roads. The Proposed Project is located within Tewkesbury Borough.
- 1.1.2 There are three redline boundaries which relate to the Winchcombe CSEC planning application. These are shown in Figure 1 (Appendix A) and are located at approximate central grid reference SP 00969 27015. For the purposes of this report, the northern most redline boundary, (for the temporary bellmouth with Cheltenham Road (B4632)), will be named ‘Winchcombe A redline boundary’, the second redline boundary (incorporating the location of the Winchcombe CSEC) will be known as the ‘Winchcombe CSEC redline boundary’ and the third boundary for the other temporary bellmouth on a classified road, will be known as ‘Winchcombe B redline boundary’.
- 1.1.3 This report provides supporting information for the Proposed Project planning application and demonstrates that the works will likely not give rise to significant environmental effects related to mining risks and mineral impacts.

1.2 Scope and Objectives of Report

- 1.2.1 The objectives of this report are to:
- Provide a desk study-based review of all available information (as described in Section 1.4) related to the Proposed Project redline boundaries;
 - Provide supporting information for the CSEC planning application;
 - Demonstrate that the Proposed Project will not likely give rise to any significant environmental effects relating to mining risks; and
 - Provide a minerals impact assessment for the Proposed Project redline boundary.

1.3 Proposed Project

The Proposed Project forms part of the wider Cotswolds VIP Project (the 'wider project'), the purpose of which is to underground a section of 400kV overhead electricity transmission lines, to mitigate the visual impact of existing electricity infrastructure through part of the Cotswolds National Landscape. The wider project is located immediately south of the B4632 and from Breakheart Plantation, runs in a south-westerly direction to the east of Cleeve Common Site of Special Scientific Interest (SSSI), past Wontley, Drypool and Wood Farms, towards Dowdeswell Wood.

1.3.1 The wider project will comprise:

- The removal of a section of OHL, including the permanent removal of 16 pylons (18 pylons will be removed in total, however, two will be replaced under Permitted Development).
- Underground cabling of approximately 7km in length.
- Two new cable sealing end compounds (CSECs) at each end (north and south) and associated replacement terminal pylons (as mentioned above), to connect the new underground cables to the remaining existing overhead line.
- Associated temporary works to facilitate construction, including temporary/permanent access junctions and roads, a temporary haul road, construction compounds, material storage and welfare facilities.
- Ancillary off-site infrastructure (including installation of arcing horns and shunt reactor installation/connection).

1.3.2 The majority of the works will be undertaken using Permitted Development rights under Schedule 2 of the Town and Country Planning (General Permitted Development) (England) Order 2015 (as amended), however, the CSECs require planning permission. The scope of this report is for the Winchcombe CSEC and associated works only (hereafter referred to as the 'Proposed Project').

1.3.3 The Proposed Project is for the construction of a CSEC at Winchcombe to facilitate the connection between new underground cables and the existing OHL and the associated permanent access road (and bell-mouth) to the CSEC, in addition to temporary bell-mouths created to support the cable construction along classified roads. The Proposed Project is located within Tewkesbury Borough.

1.3.4 The proposed works within the Winchcombe CSEC redline comprise:

- Installation of a terminal pylon to connect the new underground cables to the remaining existing overhead line (note: the pylon is Permitted Development);
- CSEC infrastructure;
- Underground cabling from the Winchcombe CSEC towards the Whittington CSEC (note: this is Permitted Development);
- A permanent access road to the CSEC, including a bell-mouth and turning area;
- A hardstanding area where the overhead line meets with the new underground cables;
- A retaining wall;
- New screening comprising native trees, woodland and scrub planting; and
- Temporary bell-mouths with the B4632 and a classified road to facilitate construction.

1.4 Sources of Information

1.4.1 The following main sources have been resourced to compile the mining risk and minerals impact assessment in this report:

- British Geological Survey (BGS) BritPit records [1]
- BGS Memoirs [2]
- BGS Mineral Resource Map for Gloucestershire [3]
- BGS Geology maps [4, 5]
- BGS Mineral Resource Report [6]
- National Library of Scotland (NLS) – Historical Maps [7]
- The Coal Authority Interactive Map viewer [8]
- Gloucestershire City Council 07 - Mineral Safeguarding Document [9]
- Gloucestershire City Council 08 – The Future Supply of Minerals [9]
- Gloucestershire City Council 09 – Area for Future Aggregate Working [9]
- Gloucestershire County Council policies interactive map [10].

1.5 Limitations

1.5.1 This report has been prepared for the client in accordance with the terms and conditions of appointment. Arcadis cannot accept any responsibility for any use of or reliance on the contents of this report by any third party. The copyright of this document shall remain the property of Arcadis.

1.5.2 A site walkover was completed on 21st May 2024 for visual assessment only in areas where constraints were initially identified within this report.

1.5.3 This report has been compiled from several desk-based sources that Arcadis believes to be trustworthy. However, Arcadis is unable to guarantee the accuracy of information provided by others.

1.5.1 This report has been written based upon information available at the time of writing as well as a site walkover survey. It was agreed the site walkover survey would be completed in areas where potential site constraints were previously identified only.

1.5.2 As part of the assessment process, an initial consultation request was sent to Gloucester County Council in order to obtain their views on the likely mineral resource areas within the Proposed Project boundary and to focus the assessment on the areas of interest for the local authority. Gloucester County Council's response has been incorporated into this report.

1.5.3 Full study limitations are presented in Appendix B.

2 SITE SETTING

2.1 Site Location and Description

- 2.1.1 There are three redline boundaries (Figure 1 – Appendix A) associated with the Winchcombe CSEC planning application, one located at approximately SP 00767 27433, related to the temporary bellmouth with the B4632 (referred to in this report as Winchcombe A redline boundary, another at SP 00969 27015 [11] (Winchcombe CSEC redline boundary), where the Winchcombe CSEC itself will be located and another at SP 01307 26165 related to the other temporary bellmouth on a classified road (Winchcombe B redline boundary). The nearest postcode to the site is: GL54 5AG [11].
- 2.1.2 The redline boundaries are located within the Cotswolds, a National Landscape (previously known as Area of Outstanding Natural Beauty (AONB)) [12] and are approximately 7 km northeast from the centre of Cheltenham, located within Tewkesbury Borough in Gloucestershire.
- 2.1.3 The elevation of the site ranges from approximately 125-208 m AOD (metres Above Ordnance Datum) [13]. The highest point of the site is in the Winchcombe B redline boundary, with the site generally sloping downwards towards the Winchcombe CSEC redline boundary and the River Isbourne.
- 2.1.4 The Winchcombe A redline boundary is predominantly related to the B4632 (Cheltenham Road) with the perimeter of surrounding agricultural fields also encapsulated. The redline boundary related to the Winchcombe CSEC itself is predominantly agricultural land with a building in the west and part of an unnamed road in the northeast of the boundary. A tributary to the River Isbourne flows south to north through the site. Breakheart Plantation is located immediately south of the Winchcombe B redline boundary. A public footpath also runs through the site boundaries named “Winchcombe Footpath” [12].
- 2.1.5 None of the redline boundaries are located within any areas of Sites of Special Scientific Interest (SSSI) or wildlife reserves [14].

2.2 Geology

- 2.2.1 With reference to Figure 2 - Appendix C, superficial deposits are only mapped within the eastern most corner of the Winchcombe CSEC site boundary, and consists of the following [4, 5]:
- Alluvium (clay, silt, sand and gravel).
- 2.2.2 The detailed bedrock geology is shown in Figure 3 - Appendix C. The main sequence of bedrock geology comprises of the following [4, 5]:
- Marlstone Rock Formation (Winchcombe A redline boundary only).
 - Dyrham Formation (Winchcombe A and CSEC redline boundaries).
 - Whitby Mudstone Formation (Winchcombe A redline boundary only).
 - Birdlip Limestone Formation (Winchcombe B redline boundary only).

- 2.2.3 There are no faults that cross the redline boundaries as shown in Figure 4 (Appendix C).
- 2.2.4 Infilled ground (artificial deposit) is located in a small part of the northwestern Winchcombe CSEC redline boundary as seen in Figure 4 – Appendix C. No artificial deposits are located within the Winchcombe A or Winchcombe B redline boundary. The proposed Winchcombe CSEC asset itself is located (at its closest) approximately 36 m south from the mapped artificial deposits. A site walkover was completed on 21st May 2024 to visually assess the presence of artificial deposits. Upon completion of the site walkover no artificial deposits were visually identified within the Winchcombe CSEC red line boundary. However, it is artificial ground may still be encountered in some localities during excavations within the Winchcombe CSEC redline boundary which is thought to be associated with the construction of the paper mill.
- 2.2.5 Landslide deposits (historical downslope mass movements) are shown nearby to the site boundaries (approximately SP 00504 27296) and have occurred where there are steep gradients and mostly related to the Whitby Mudstone Formation. The closest landslide deposit is approximately 160 m south from the Winchcombe A redline boundary (see Figure 4 - Appendix C). There is a potential risk of further mass movements occurring where steep slopes exist on site but are not currently mapped.
- 2.2.6 Figure 4 - Appendix C shows the location of these additional geological features described above.

3 HISTORICAL MINE & QUARRYING ACTIVITIES

3.1 BGS BritPit Records

- 3.1.1 BritPit records provided by the BGS [2] show no BritPits located within any of the redline boundaries or within 50 m of them, as shown in Figure 5 (Appendix D). The closest BritPit record is located approximately 80 m east from the Winchcombe B site boundary, known as Corndean Hall Quarry. The pit was worked for limestone from the Birdlip Limestone Formation. The quarry was an open pit (surface working) and is now closed (see Figure 5 – Appendix D). There are no active pits / quarries within 1 km of the redline boundaries.
- 3.1.2 All BritPit records nearby to the redline boundaries correlate with the “quarry” locations noted from available open-sourced historical OS map information via the National Library of Scotland (NLS) website [7] and give an approximate view of their extent.

3.2 BGS Memoirs

- 3.2.1 BGS Memoirs [2] provide limited information on mining records within the redline boundaries, however they do provide details on mined commodities around the local area (precise locations unknown). The details provided in Table 1 below are extracted from *Mineral statistics of the United Kingdom of Great Britain and Ireland, being part 2 for 1858 (earthy minerals: clays and stones), 1860*:

Table 1 - Extract from BGS Memoirs on commodities extracted around the local area [2]

Name	Commodity Extracted	Usage
Naunton Lane (Fred Thackwell)	“Alluvial Clay”	Bricks for tin plate works
Tillery (J.Williams & Sons)	“Alluvial Clay”	Bricks and tiles
Cleeve Hill	Forest Marble	-
Leckhampton, Dowdeswell (William Shorey)	Cornbrash Limestone	-

3.3 Historical maps

- 3.3.1 Using the National Library of Scotland (NLS) website [7], the available open-sourced historical OS maps, the Winchcombe CSEC redline boundary can be seen to be adjacent to Postlip Paper Mills, with the earliest record on 1840 maps. The site is still titled under the same name on current OS maps. The historical maps also show many of the nearby historical quarries (outside the redline boundaries) correlate with the BGS BritPit records and give an approximate view of their location, although do not confirm their extent. Given the distance of the closest BritPit (approximately 80 m east from the Winchcombe B site boundary) and from reviewing historical maps and aerial imagery no nearby BritPits recorded were considered large enough to extend into the redline boundaries.
- 3.3.2 Some of the historical maps have limited information due to the scale of the map available for viewing and not all historical maps are covered for the redline boundaries.

3.4 BGS Geology maps

- 3.4.1 There is no correlation between the BritPit [1] records and quarry locations on historical maps [8] with the artificial ground shown on current BGS maps [4, 5] located in a small part of the Winchcombe CSEC redline boundary. Historical geological maps available on the NLS website [7] have also been reviewed and show little information related to the artificial ground. As such the artificial ground mapped in a small part of the Winchcombe CSEC redline boundary is possibly related to the Postlip Mills (now owned by Hollingsworth & Vose).

3.5 Coal Authority Map viewer & Metalliferous Mining

- 3.5.1 With reference to The Coal Authority interactive map viewer website [8] and the BGS geological maps [4, 5] the redline boundaries are not within a Coal Authority Reporting Area, Coal Authority Development High Risk Area, within an abandoned mines catalogue area or within a historical metalliferous mining area. Therefore, risks from coal mining and metalliferous activities are not anticipated within the redline boundaries.

3.6 Active Quarries

- 3.6.1 With reference to all available information, no active mines or quarrying operations were noted within the redline boundaries.

3.7 Summary

- 3.7.1 BritPit records show no historical quarries located within the redline boundaries. The closest BritPit record is approximately 80 m east from the Winchcombe B redline boundary with the main commodity historically extracted via surface workings from limestone of the Birdlip Limestone Formation. There are no active pits / quarries located within 1 km of the redline boundaries.
- 3.7.2 BGS Memoirs provide little information on site specific records other than local commodities mined.
- 3.7.3 The historical maps show a correlation of the nearby historical quarries (outside the redline boundaries) with the BGS BritPit records and give an approximate area for their location. However, their extent cannot be confirmed. The closest BritPit is located approximately 80 m east from the Winchcombe B redline boundary. Based upon the information to date and visual inspection during the walkover survey it is considered unlikely for any BritPits to extend into the redline boundaries.
- 3.7.4 Artificial ground has been mapped (Figure 4) in a small part of the Winchcombe CSEC redline boundary to the north and could be associated with the construction of the Postlip Mills (now owned by Hollingsworth & Vose).
- 3.7.5 A site walkover was completed in May 2024 to visually confirm the presence of any artificial deposits within the Winchcombe CSEC redline boundary. No visual or olfactory evidence of artificial deposits was noted. It is however considered likely that some localities near the main road and paper mill may contain artificial ground which could be encountered during excavations within the Winchcombe CSEC redline boundary. This will need to be considered for construction.
- 3.7.6 The closest landslide deposit is approximately 160 m south from the Winchcombe A redline boundary. There is a potential risk of further mass movements occurring where steep slopes exist on site but are not currently mapped.
- 3.7.7 The redline boundaries are not within a Coal Authority Reporting Area, a Coal Authority Development High Risk Area, an Abandoned Mines Catalogue area or within a historical metalliferous mining area. Therefore, risks from coal mining and metalliferous activities are not anticipated within the redline boundaries.
- 3.7.8 With reference to all available information, no active mines or quarrying operations were noted within the redline boundaries.

4 MINERAL RESOURCE IMPACT ASSESSMENT

4.1 Introduction

- 4.1.1 The key purpose of this exercise is to determine if the Proposed Project will adversely affect the mineral resource capacity within the redline boundaries, located within the defined Mineral Safeguarding Area (MSA) of the local authority (Gloucestershire).
- 4.1.2 Areas of known extractable resources have been derived from available data provided by the local authorities and BGS materials.

4.2 National Planning Policy Framework

- 4.2.1 Mineral Planning is an important matter for local authorities as mineral resources make an essential contribution to the area and the country's prosperity and quality of life. As such, MSAs have been designated by some local authorities to protect potential mineral resources from sterilisation caused by incompatible developments. An incompatible development is defined as one which prevents future extraction of the mineral resources in that area.
- 4.2.2 The national basis for the development of local planning policies prepared by the local authorities is the National Planning Policy Framework (NPPF) [15], this document includes guidance for local authorities on protecting their mineral resource (pg. 58). A key feature of the NPPF is the production of MSAs so that mineral resources are not needlessly sterilised. A MSA is "an area designated by Mineral Planning Authorities which covers known deposits of minerals which are desired to be kept safeguarded from unnecessary sterilisation by non-mineral development" [15].

4.3 Mineral Safeguarding Areas

- 4.3.1 Mineral safeguarding is defined within Gloucestershire County Council's (GCC) Local Plan [9] 07 *Mineral Safeguarding Document* as the, "...means available to avoid the needless sterilisation of primary mineral resources by non-mineral developments. National policy and practice guidance advises this can be achieved through defining MSAs, which identify the location of specific minerals of local and national importance and an appropriate policy framework to assess the significance of the matter and to consider mitigation where appropriate".
- 4.3.2 MSAs also include Mineral Consultation Areas (MCA) and are "designed to ensure that mineral resource safeguarding is appropriately taken into account through the planning system..." in areas nearby to a primary mineral resource [9].
- 4.3.3 Facilitating sufficient supplies of future minerals is essential in achieving sustainable economic growth. However, in doing so a balance needs to be struck between contributing towards meeting the need for minerals both locally and beyond, and ensuring this is undertaken within environmental limits and without generating unacceptable impacts on local communities.

4.4 Local Authority Consultation & Local Plan

- 4.4.1 The Winchcombe A and CSEC redline boundaries are partially within a MCA (due to their close proximity to a primary mineral resource area (limestone), whilst Winchcombe B is located entirely within a primary mineral resource area (limestone). All locations are under the GCC (local authority) region and as such GCC act as the Mineral Planning Authority (MPA) [10,3] (see Figure 6 – Appendix E). There are minor parts of the Winchcombe A and CSEC redline boundaries that are not within a mineral resource assessment area.
- 4.4.2 As part of the assessment process, an initial consultation request was originally sent to GCC in 2023 in order to obtain their views on the likely mineral resource areas within the wider project boundary and to focus the assessment on the areas of interest for the local authority.
- 4.4.3 Consultation is an important aspect of the assessment in order to identify local authorities' individual requirements as well as addressing any queries they may have regarding potential mineral extraction within the site boundary.
- 4.4.4 GCC's response indicated that, as the wider project is not listed under Table 2 [9] ("List of non-mineral development types for which no mineral resource assessment will be required") a Mineral Resource Assessment will be required in order to demonstrate that the proposal would be in accordance with Policy MS01 of the adopted Mineral Local Plan. Due to the Proposed Project being in both a mineral safeguarding consultation area and a primary mineral resource area, consultation with the local planning authority will be required to gain approval of this mineral resource assessment report prior to commencement of any construction works.
- 4.4.5 Gloucestershire Mineral Resources Safe Guarding interactive map website [10] and GCC - *07 Mineral Safeguarding Document, 08 – The Future Supply of Minerals and 09 – Area for Future Aggregate Working* [10], indicates the redline boundaries are covered under the following policies: MS01 (Non-minerals development within MSAs), MW01 (Aggregate provision) and MW02 (Natural Building Stone).

4.5 Minerals Review

- 4.5.1 With reference to the BGS Mineral Resource Map for Gloucestershire [3], only the Winchcombe B site boundary is located within a primary mineral resource area, related to the Jurassic Birdlip Limestone Formation. An extract from the BGS mineral resource map is shown in Plate 1 below. Other bedrock units within the redline boundaries are not shown to be a mineral resource.

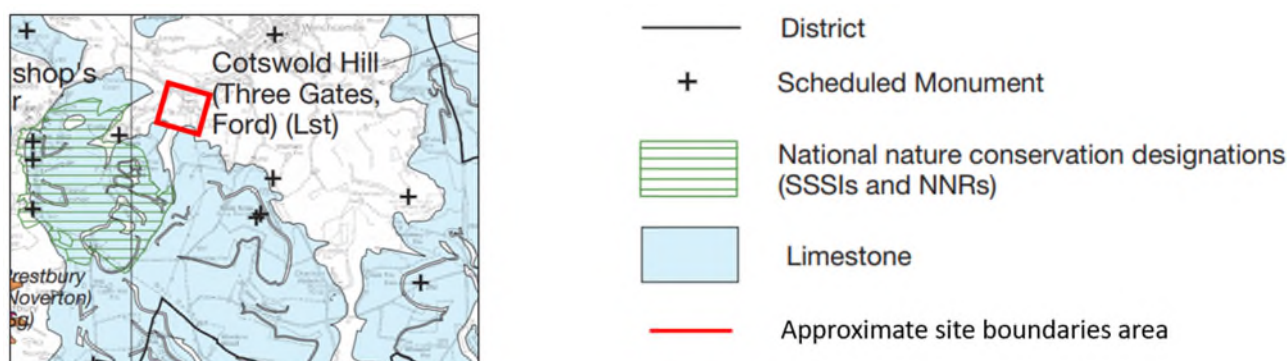


Plate 1 – Extract from BGS Gloucestershire Mineral Resources Map, 2005, 1:100,000. (Red outlined roughly defines all the redline boundaries) [3]

- 4.5.2 The GCC policies interactive map [10] indicates that the Winchcombe B redline boundary is entirely located within a primary mineral resource area related to limestone. The majority of the Winchcombe A and CSEC redline boundaries are within a MCA, with a primary mineral resource (limestone) located approximately 35 m south (at its closest) from the CSEC redline boundary (see Figure 6 – Appendix E). GCC's 07 *Mineral Safeguarding Document*, table 1 [9], indicates that the MSA for mineral sterilisation assessment for limestone is extended 500 m from the area beyond the known mineral resource, hence the majority of the Winchcombe A and CSEC redline boundaries fall within a MCA.
- 4.5.3 The BGS Mineral Resource Information for Gloucestershire report [6] indicates that the main limestone of importance for crushed aggregate in Gloucestershire is the Carboniferous limestone being “the most important resource”, with “almost all crushed rock aggregate quarries...have the capacity to produce building stone”. However, the Jurassic limestone is the “the most important source of building stone, which is worked at many quarries in the Cotswolds.”
- 4.5.4 There are no active quarries within the redline boundaries, with reference to the BGS Mineral Resource report [6], it states that “Today building stone is often provided from the larger aggregate quarries in the Forest of Dean”. Additionally, there are no areas within the redline boundaries designated within the local minerals plan allocation [10] as preferred locations for mineral extraction, the nearest is located approximately 10 km east (at its closest) from the CSEC redline boundary, named Naunton Quarry. Therefore, the limestone mineral resource which implements the consultation areas within the redline boundaries are found not to be of significant regional importance with low economic value. Depending on the final depths to be excavated for the CSEC construction it is assumed that shallow excavations (up to 1.5 m depth) are likely to only expose poor-quality weathered limestone.
- 4.5.5 Therefore, although the Proposed Project will create some mineral sterilisation from construction works, it is considered to create minimal impact to the regional mineral resource.

4.6 Mineral Resource Impact Summary

- 4.6.1 In summary, there are no significant impacts to mineral resources within the three Winchcombe redline boundaries from the Proposed Project and as such no mitigation measures are required during construction. Due to the area being in a Mineral Consultation Area (MCA) and primary mineral resource area, approval from the local planning authority is still required, based on this mineral resource assessment and prior to commencement of any construction works.

5 DISCUSSION & POTENTIAL MINING & MINERAL CONSTRAINTS

5.1.0 Based upon all the available information reviewed as part of this report, the following potential project constraints are considered within the three Winchcombe redline boundaries and are shown in Table 2 below and in Figure 6 - Appendix E.

Table 2 - Potential Mining Constraints

Location	Risk	Immediate Impact	Appendix	Source*
Artificial Ground (exposed during excavating)	Loose surface materials	Unstable Ground/Ground Movement	C	BGS Geology
	Contamination	Risk to Human Health		
Mineral Resource Safeguarding Area & Consultation Areas	Mineral sterilisation/ loss of mineral resources	Project delays	E	GCC Mineral Safeguarding

* BGS = British Geological Survey, GCC = Gloucestershire City Council

5.2 Impact Assessment

5.2.1 Based on the potential project constraints, the following 5x5 style risk assessment matrix (Plate 2) has been adopted in Table 3 below. Risks which are designated to be high are considered to be significant for the purposes of assessing the significance of effects to the environment. Recommendations to reduce risks are discussed in Section 6.3 below.



Likelihood that exposure to the hazard will result in harm/damage

Severity of foreseeable consequences	Remote (1)	Unlikely (2)	Possible (3)	Probable (4)	Likely (5)
No Harm/Damage (1)	Low	Low	Low	Low	Low
Minor Harm/Damage (2)	Low	Low	Low	Medium	Medium
Significant Harm/Damage (3)	Low	Low	Medium	High	High
Major Harm/Damage (4)	Low	Medium	High	High	High
Catastrophic Harm/Damage (5)	Medium	High	High	High	High

Plate 2 – Arcadis 5x5 style Risk Assessment Matrix.

Table 3 - Risk Register

Ref	Location	Potential Risk	Consequence	Risk Assessment
R1	Artificial Ground (exposed during excavating)	Loose surface materials	Risk of injury or damage to machinery, structural impacts to the Proposed Project from unstable ground, possible relocation of route to avoid unstable ground	Medium
R2		Contamination	Risk to human health/environment, financial costs for waste disposal, possible relocation of route to avoid contamination	Low
R3	Mineral Resource Safeguarding Area & Consultation Areas	Mineral sterilisation	Minor damage/loss of mineral resources. Project delays due to consultation agreement and possible relocation of route to avoid mineral(s).	Low

5.3 Other Considerations

- 5.3.1 Landslide deposits are shown nearby to the site [4, 5] with the closest landslide deposit approximately 160 m south from the Winchcombe A redline boundary. There is a potential risk of further mass movements occurring where steep slopes exist within the redline boundaries which are not currently mapped.

6 CONCLUSIONS

6.1 Historical Mine and Quarrying Activities

- 6.1.1 BritPit records (historical mines and quarries) show no BritPits located within the redline boundaries. The closest BritPit record is approximately 80 m east from the Winchcombe B redline boundary, with the main commodity historically extracted via surface workings from limestone of the Birdlip Limestone Formation.
- 6.1.2 Historical maps show many of the nearby historical quarries (outside the redline boundaries) correlate with the BGS BritPit records and give an approximate area of their location. However, their extent cannot be confirmed. The closest BritPit is noted to be 80m east from the Winchcombe B redline boundary. Based upon the site walkover inspection, aerial imagery and existing mining information, it is considered unlikely for any BritPit workings to extend into the redline boundary.
- 6.1.3 Artificial ground is mapped in a small part of the Winchcombe CSEC redline boundary and is thought to be associated with the construction of the Postlip Mills (now owned by Hollingsworth & Vose). A visual inspection of the site during May 2024 did not record any visual or olfactory evidence of made ground. However, it is considered likely that some localities will encounter made ground during excavations near the main road and paper mill. The presence of potential made ground within the redlines will need to be considered for construction. Any visual or olfactory contamination should be recorded, segregated, appropriately sampled and stockpiled. An appropriate geoenvironmental consultant is then to be notified and if necessary works stopped in that location.
- 6.1.4 The redline boundaries are not within a Coal Authority Reporting Area, a Coal Authority Development High Risk Area, an Abandoned Mines Catalogue area or within a historical metalliferous mining area. Therefore, risks from coal mining and metalliferous activities are not anticipated within the redline boundaries.
- 6.1.5 With reference to all available desk study information, no active mines or quarrying operations were noted within the redline boundaries.
- 6.1.6 Potential constraints are related to artificial ground (during excavations) and the mineral resource safeguarding plan, with the majority of risks assessed as low. These could be generally mitigated through designing the Proposed Project through the recommendations suggested below (Section 6.3) to minimize the risks.
- 6.1.7 Landslide deposits are in the order of 200m from the redline boundaries. No landslide deposits were mapped onsite. No visual evidence of any slope instability onsite was noted during the site walkover.

6.2 Mineral Resource Impact Assessment

- 6.2.1 The Winchcombe A and CSEC redline boundaries are partially within a MCA (with minor parts not within a mineral resource assessment area), whilst the Winchcombe B redline boundary is located entirely within a primary mineral resource area (limestone) as defined by GCC's Local Plan. There are no active quarries present within the redline boundaries.
- 6.2.2 No Mineral Local Plan Allocations (preferred areas of mineral extraction) were identified within the redline boundaries or within 1 km of the site, and with the area located within a national landscape. It is considered unlikely that future quarries would open within the wider project boundary or the immediate locality. Local building stone requirements are now often derived from quarries located within the Forest of Dean. As such the nearby limestone primary mineral resource is not considered to represent a valuable mineral resource. Overall, there were found to be no significant impacts to mineral resources within all of the redline boundaries from the Proposed Project, with no mitigation measures required during construction. Due to the area being in a MCA and a primary mineral resource area, approval from the local planning authority is still required, based on this mineral resource assessment and prior to commencement of any construction works.

Summary

- 6.2.3 Overall, the assessment has identified that due to the two redline boundaries located within an MCA and one within a primary mineral resource area, there remains some minor residual risks related to the limestone primary mineral resource sterilisation. Depending on the final depths to be excavated for the CSEC construction it is assumed that shallow excavations (up to 1.5 m depth) are likely to only expose poor-quality weathered limestone. Therefore, although the Proposed Project will create some mineral sterilisation from construction works, in the scale of the MSA it is considered to create minimal impact to the regional mineral resource. The residual risks within the redline boundaries are not considered to present any significant environmental impacts with respect to mining risk and minerals impacts.

6.3 Recommendations

- 6.3.1 The following recommendations have been based on the above findings within this document for the Proposed Project and are suggested to help mitigate the risks outlined in Table 3 - Risk Register:

Artificial Ground

- 6.3.2 Made ground may be encountered during excavations within the Winchcombe CSEC redline boundary. Workers are to be briefed and are to be vigilant upon excavating within this area. Any visual or olfactory contamination should be recorded, segregated, appropriately sampled and stockpiled. An appropriate geoenvironmental consultant is then to be notified and if necessary works stopped in that location.

Mineral Resource Safeguarding Area

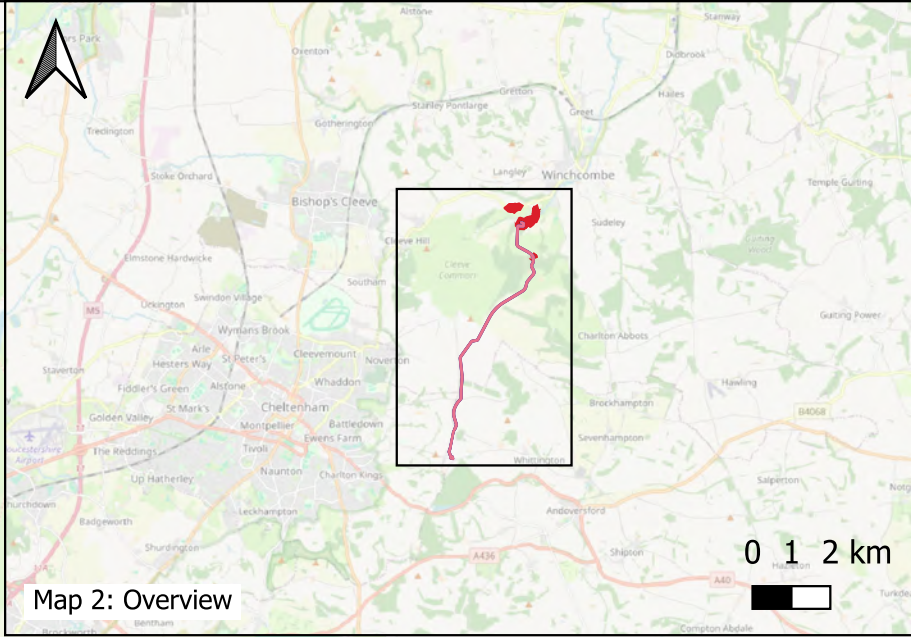
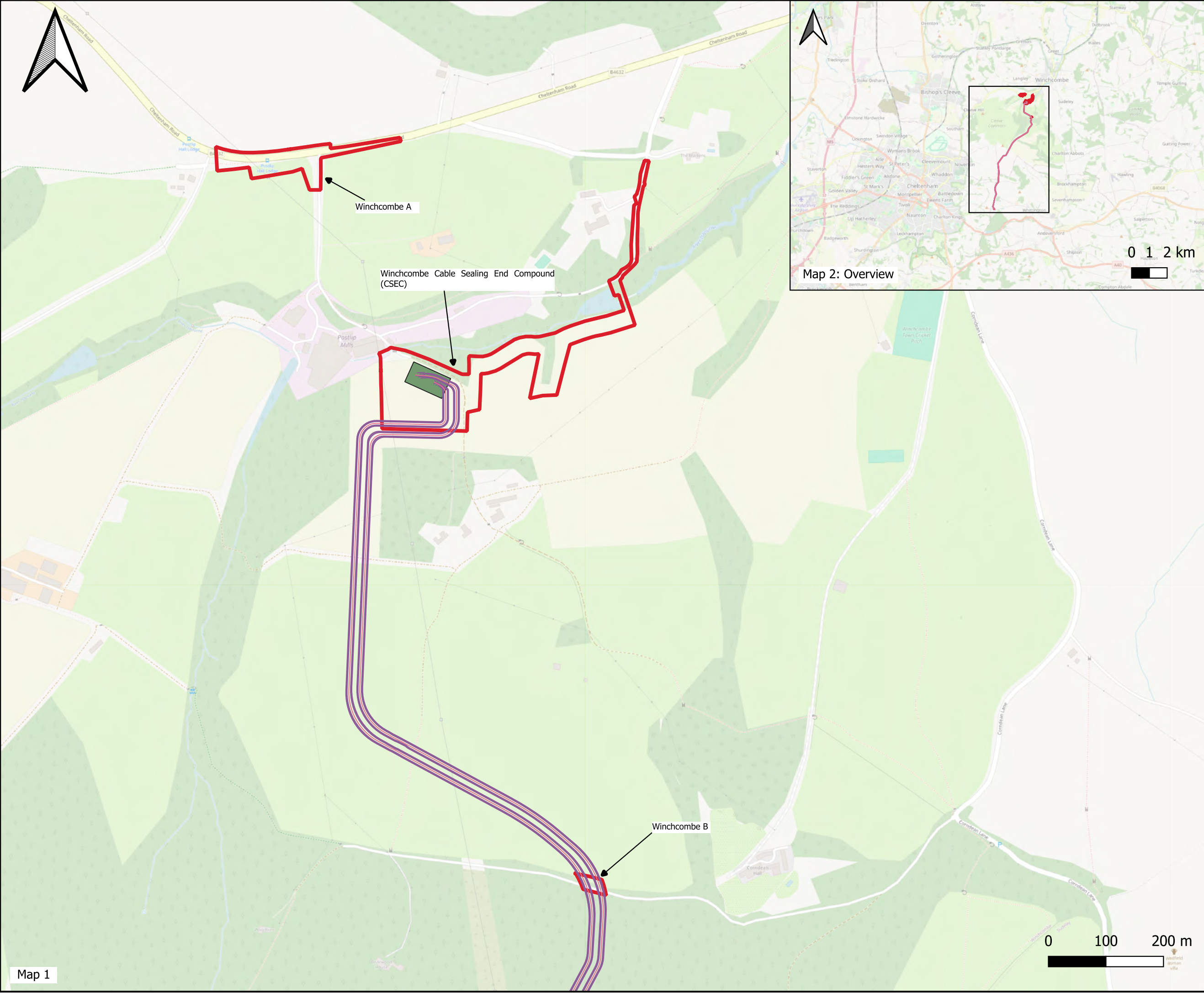
- 6.3.3 The local planning authority will need to be consulted with regards to agreement to the mineral resource assessment within this report prior to commencement of any construction works (R3).

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15. Ministry of Housing, 2018, National Planning Policy Framework (NPPF), updated December 2023.

Appendix A

Figure 1 – Site Location Plan



Legend

- Site Boundary
- Proposed Cable Route
- Cable Sealing End Compound (CSEC)

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Title: Site Location Plan

Site: Cotswolds VIP - Winchcombe CSEC

Client: National Grid

Project: 30167905	Figure 1
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Date: 20/05/24
Drawn By: S.Frith
DRG No: Figure 1



Appendix B

Study Limitations

IMPORTANT. This appendix should be read before reliance is placed on any of the information, opinions, advice, recommendations or conclusions contained in this report.

1 This report has been prepared by Arcadis Consulting (UK) Limited ('Arcadis'), with all reasonable skill, care and diligence within the terms of the Appointment and with the resources and manpower agreed with National Grid (the 'Client'). Arcadis does not accept responsibility for any matters outside the agreed scope.

2 This report has been prepared for the sole benefit of the Client unless agreed otherwise in writing. The contents of this report may not be used or relied upon by any person other than this party without the express written consent and authorisation of Arcadis.

3 Unless stated otherwise, no consultations with authorities or funders or other interested third parties have been carried out. Arcadis is unable to give categorical assurance that the findings will be accepted by these third parties as such bodies may have unpublished, more stringent objectives. Further work may be required by these parties.

4 All work carried out in preparing this report has used, and is based on, Arcadis' professional knowledge and understanding of current relevant legislation. Changes in legislation or regulatory guidance may cause the opinion or advice contained in this report to become inappropriate or incorrect. In giving opinions and advice, pending changes in legislation, of which Arcadis is aware, have been considered. Following delivery of the report, Arcadis has no obligation to advise the Client or any other party of such changes or their repercussions.

5 This report is only valid when used in its entirety. Any information or advice included in the report should not be relied upon until considered in the context of the whole report.

6 Whilst this report and the opinions made are correct to the best of Arcadis' belief, Arcadis cannot guarantee the accuracy or completeness of any information provided by third parties. Arcadis has taken reasonable steps to ensure that the information sources used for this assessment provided accurate information and has therefore assumed this to be the case.

7 This report has been prepared based on the information reasonably available during the project programme. All information relevant to the scope may not have been received.

8 This report refers, within the limitations stated, to the condition of the Site at the time of the inspection. No warranty is given as to the possibility of changes in the condition of the Site since the time of the investigation.

9 The content of this report represents the professional opinion of experienced environmental consultants. Arcadis does not provide specialist legal or other professional advice. The advice of other professionals may be required.

10 Where intrusive investigation techniques have been employed they have been designed to provide a reasonable level of assurance on the conditions. Given the discrete nature of sampling, no investigation technique is capable of identifying all conditions present in all areas. In some cases the investigation is further limited by Site operations, underground obstructions and above ground structures. Unless otherwise stated, areas beyond the boundary of the Site have not been investigated.

11 If below ground intrusive investigations have been conducted as part of the scope, safe location of exploratory holes has been carried out with reference to the Arcadis ground disturbances procedure. No guarantee can be given that all services have been identified. Additional services, structures or other below ground obstructions, not indicated on the drawing, may be present on Site.

12 Unless otherwise stated the report provides no comment on the nature of building materials, operational integrity of the facility or on any regulatory compliance issues.

13 Unless otherwise stated, an inspection of the Site has not been undertaken and there may be conditions present at the Site which have not been identified within the scope of this assessment.

14 Unless otherwise stated, samples from the Site (soil, groundwater, building fabric or other samples) have not been obtained.

15 Arcadis has relied upon the accuracy of documents, oral information and other material and information provided by the Client and others, and Arcadis assumes no liability for the accuracy of such data, although in the event of apparent conflicts in information, Arcadis would highlight this and seek to resolve.

16 Unless otherwise stated, the scope of works has not included an environmental compliance review, health and safety compliance review, hazardous building materials assessment, interviews or contacting Local Authority, requests for information to the petroleum officer, sampling or analyses of soil, ground water, surface water, air or hazardous building materials or a chain of title review.

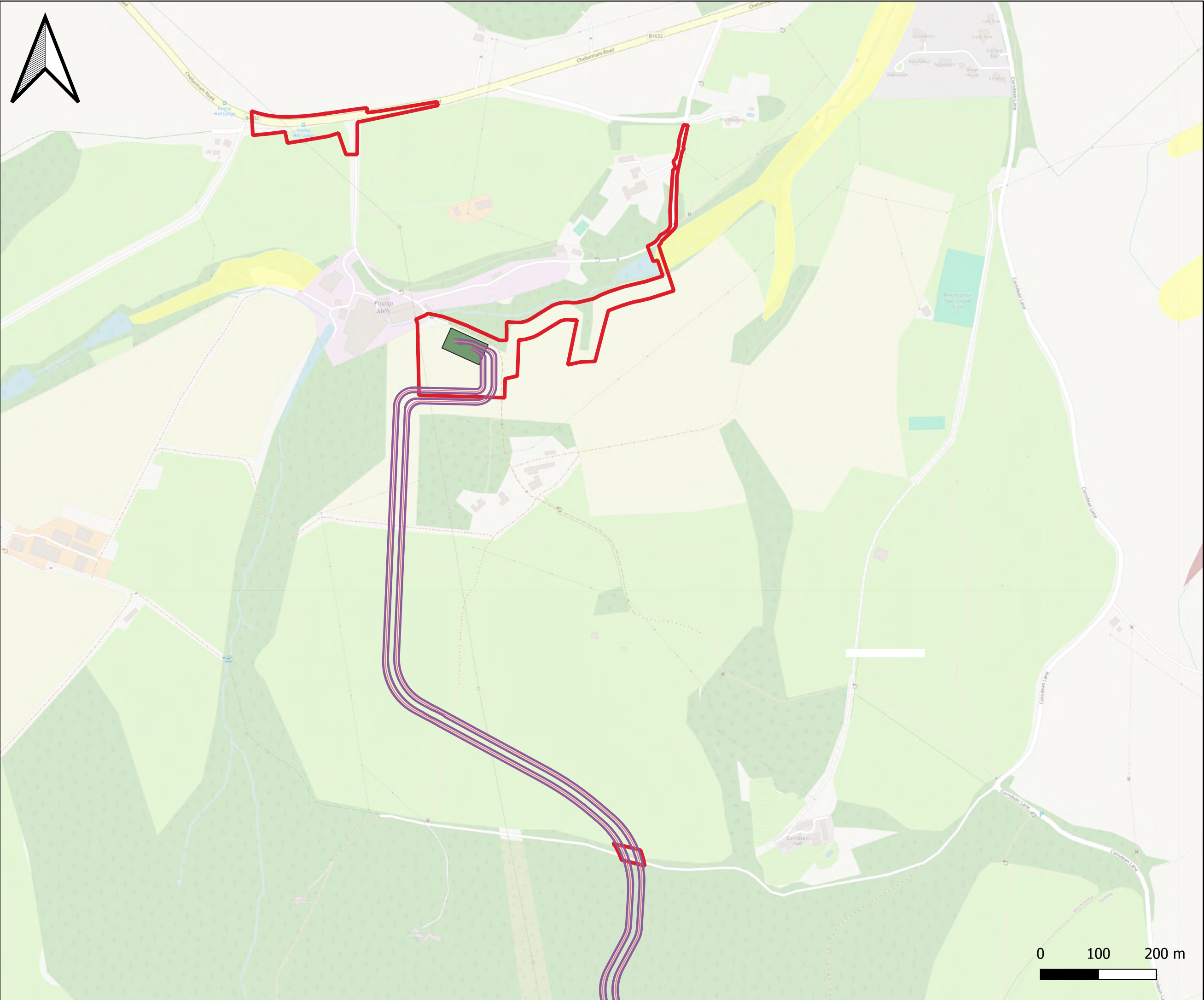
17 Unless otherwise stated, this assessment has considered the ongoing use of the Site and has not been prepared for the purposes of redevelopment which may act as a trigger for Site investigation and remediation works not needed for ongoing use.

Appendix C

Figure 2 – Superficial Deposits

Figure 3 – Bedrock Geology

Figure 4 – Additional Geological Features



Legend

Site Boundary

Proposed Cable Route

Cable Sealing End Compound (CSEC)

Alluvium

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Title:
Superficial Deposits

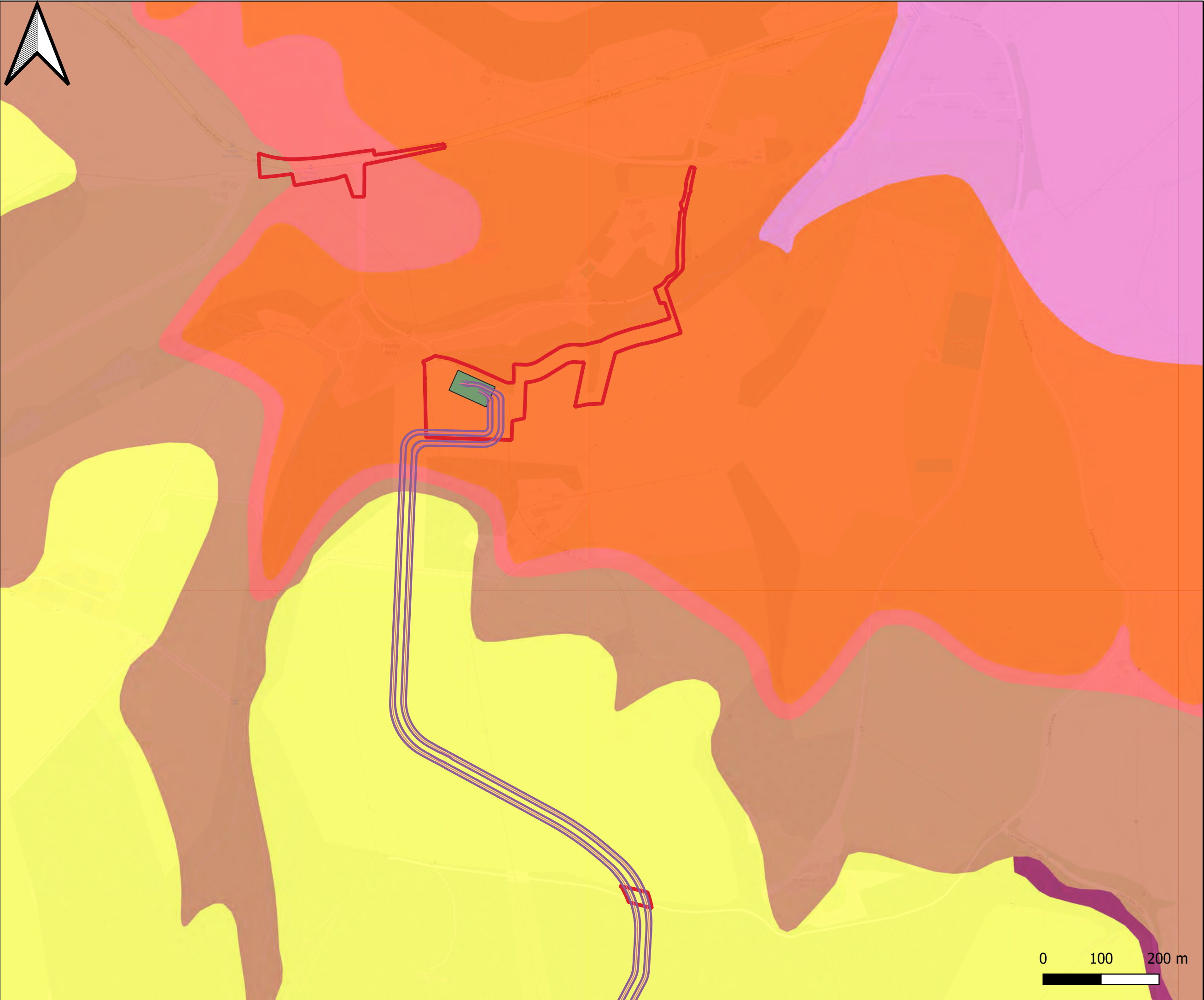
Site:
Cotswolds VIP - Winchcombe CSEC

Client:
National Grid

Project:
30167905

Figure 2

Date: 20/05/24
Drawn By: S.Frith
DRG No.: Figure 2



Legend

- Site Boundary
- Proposed Cable Route
- Cable Sealing End Compound (CSEC)
- Whitby Mudstone Formation
- Birdlip Limestone Formation
- Marlstone Rock Formation
- Dyrham Formation
- Charmouth Mudstone Formation

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Title:
Bedrock Geology

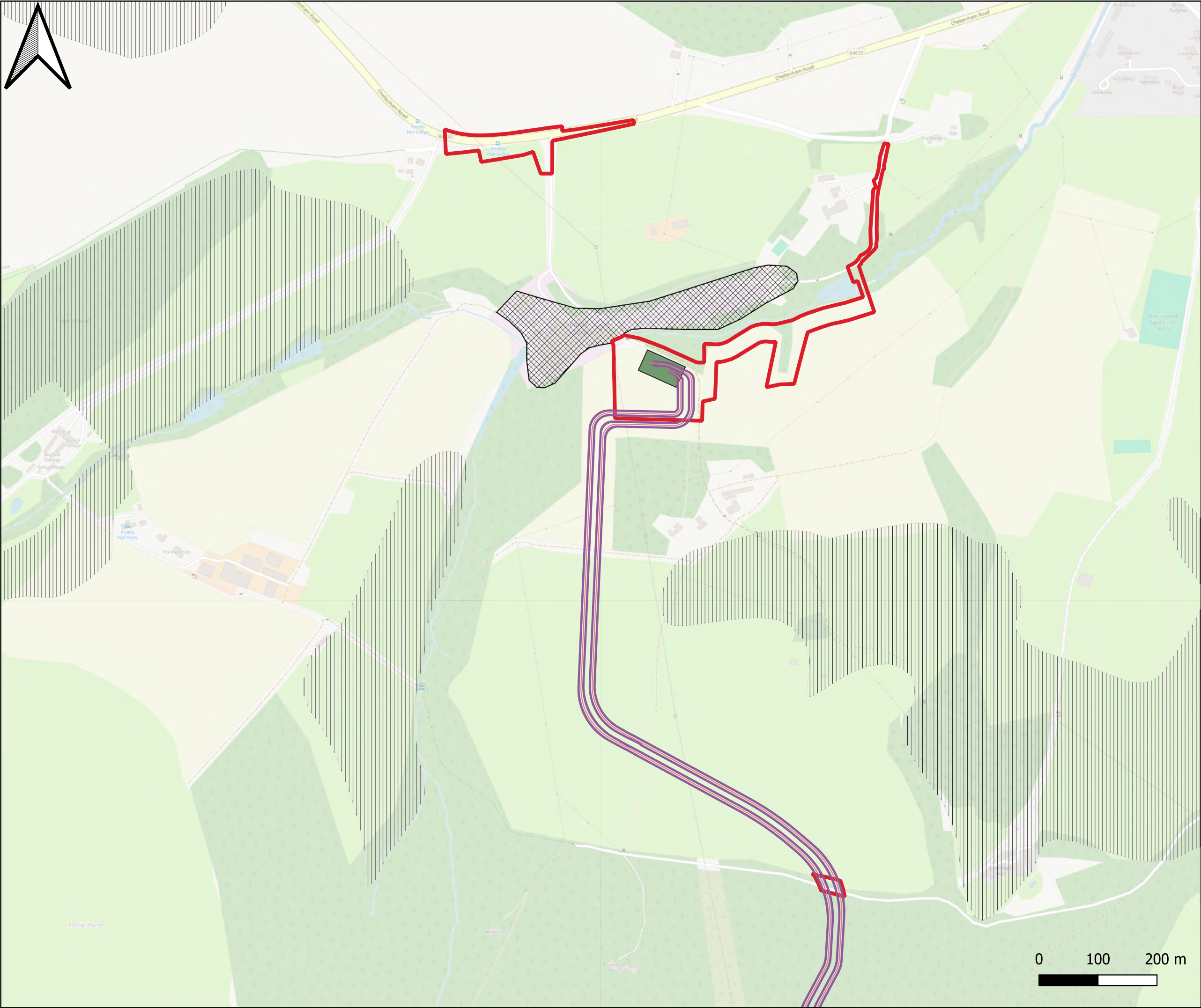
Site:
Cotswolds VIP - Winchcombe CSEC

Client:
National Grid

Project: 30167905	Figure 3
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Date:20/05/24
Drawn By: S.Frith
DRG No: Figure 3





Legend

Site Boundary

Proposed Cable Route

Cable Sealing End Compound (CSEC)

Artificial Ground

Infilled Ground - Artificial Deposits

Mass Movement Deposits

Landslide Deposits Unknown/Unclassified Entry

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Title: Additional Geological Features

Site: Cotswolds VIP - Winchcombe CSEC

Client: National Grid

Project: 30167905

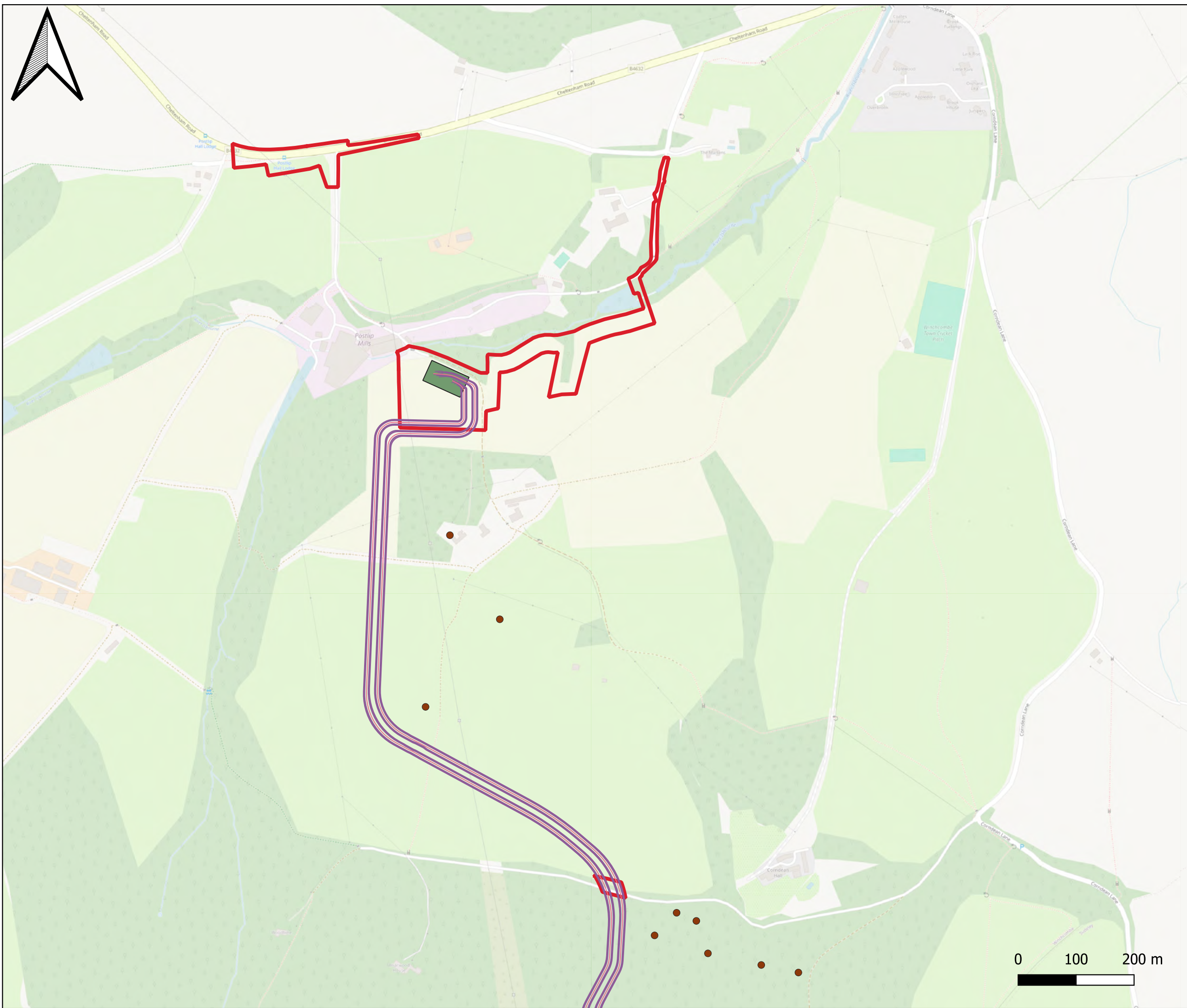
Figure 4

Date: 20/05/24
Drawn By: S.Frith
DRG No: Figure 4



Appendix D

Figure 5 – BritPit Records



Legend

- Site Boundary
- Proposed Cable Route
- Cable Sealing End Compound (CSEC)
- BritPits (BGS)

NOTES / DISCLAIMER:

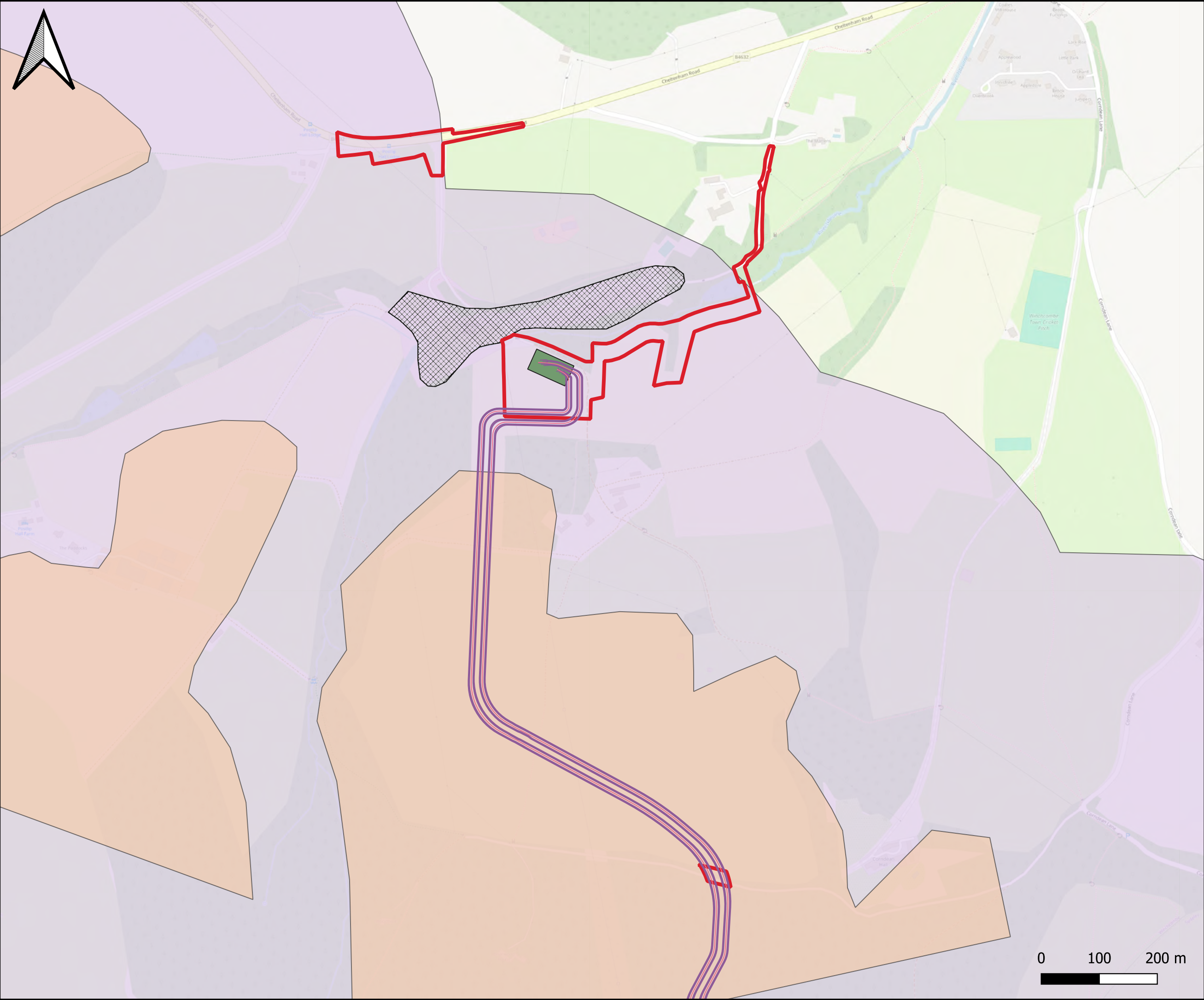
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Title: BritPit Records	
Site: Cotswolds VIP - Winchcombe CSEC	
Client: National Grid	
Project: 30167905	Figure 5
Date: 20/05/2024 Drawn By: S.Frith DRG No: Figure 5	

Appendix E

Figure 6 – Constraints Summary



- Legend**
- Site Boundary
 - Proposed Cable Route
 - Cable Sealing End Compound (CSEC)
 - Primary Mineral Resource Area - Limestone
 - Adopted Mineral Safeguarded - Consultation Area

Artificial Ground

- Infilled Ground/ Artificial Deposit

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Title: Constraints summary for Winchcombe CSEC site boundaries

Site: Cotswolds VIP - Winchcombe CSEC

Client: National Grid

Project: 30167905	Figure 6
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Date: 22/05/24
Drawn By: S.Frith
DRG No: Figure 6



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