Land off Henfield Road, Albourne

Preliminary mineral resource assessment

27 October 2022

T1.02

Land off Henfield Road, Albourne

Prepared for

Croudace Homes Ltd
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Land off Henfield Road, Albourne

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2	26/10/2022	Final	Final report	JJG	CJB	RXD

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APPENDICES

1 Introduction

1.1 Instruction and Brief

Stantec UK Ltd (Stantec) has been instructed by Croudace Homes Ltd (the Client) to undertake a desk-based assessment to act as a preliminary Mineral Resource Assessment (MRA) for land off Henfield Road, Albourne, West Sussex (the Site).

It is understood that the Client has submitted an outline planning application (ref. DM/22/2416) to Mid Sussex District Council (MSDC), seeking consent for residential development at the Site.

Minerals and Waste Planning associated with the development is a County matter falling under the jurisdiction of West Sussex County Council (WSCC) as the Mineral Planning Authority (MPA). In its consultation response to the planning application, WSCC (Joanne Fisher) advised that the MPA requested further information as the Site is identified to be within a brick clay Mineral Safeguarding Area (MSA).

A copy of the consultation response provided by WSCC dated 25th August 2022 is included in Appendix A.

Stantec was instructed to proceed in line with the scope of work defined in proposal 330202290P1 via email on 13th September 2022 from Strutt and Parker Ltd, which is acting as agent on behalf of the Client for the planning application.

1.2 Report Scope

This report has been prepared as a preliminary MRA in response to WSCC's consultation response dated 25th August 2022 and to support the proposed planning application for the Site. The preliminary MRA comprises the following key elements:

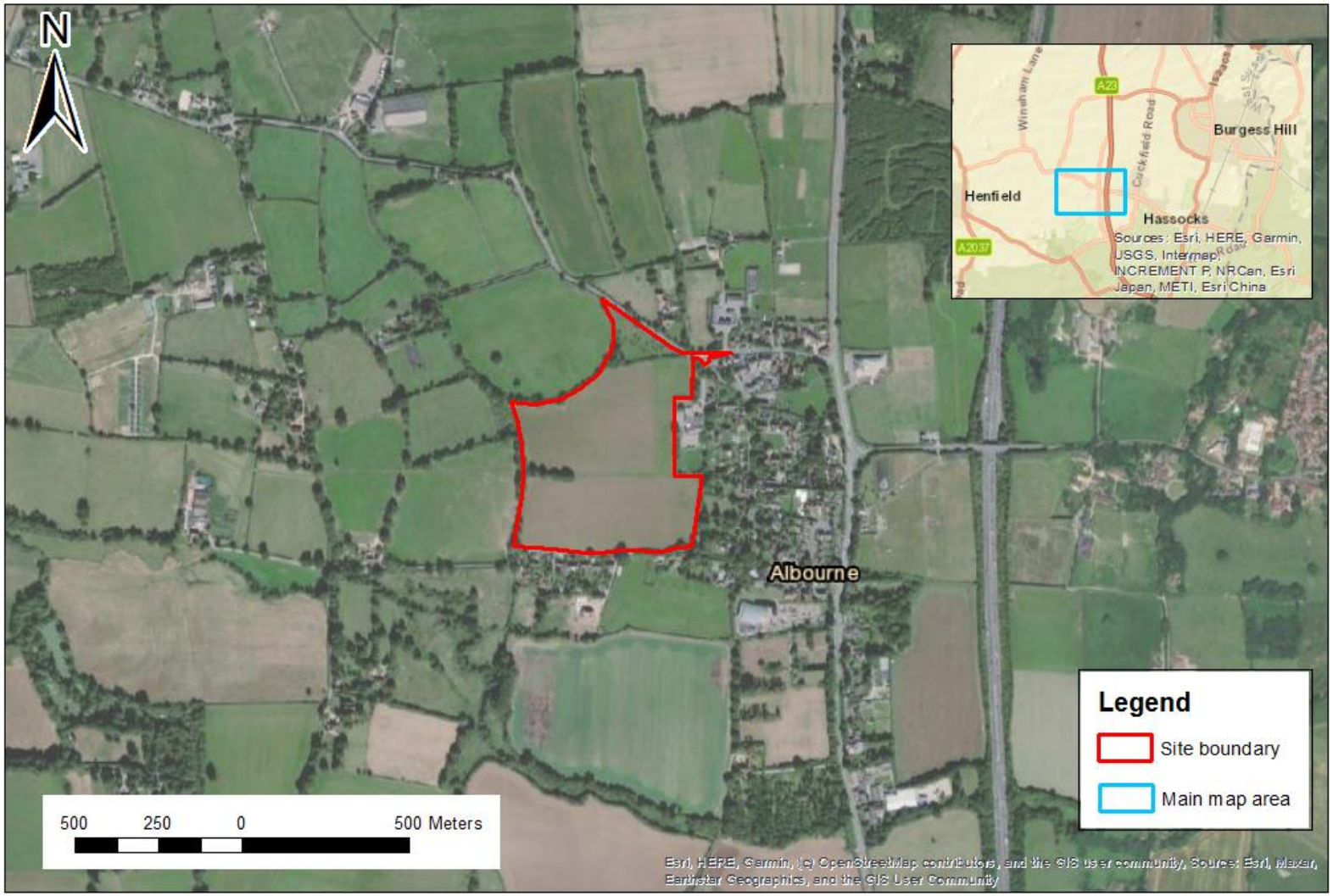
- Desk based review of geological conditions at the Site to provide a preliminary indication of the potential recoverable mineral reserves at the Site;
- Desk based review of prevailing minerals planning policy relevant to the Site; and
- High-level review of constraints pertaining to the commercial and practical viability of mineral extraction at the Site.

The purpose of this preliminary MRA is to provide, in a clear and accessible format, adequate information to allow WSCC to consider minerals safeguarding and sterilisation in the context of the proposed built development at the Site.

1.3 Site location

The Site is located off Henfield Road on the western side of Albourne, postcode BN6 9FF, with an area of 11.29 ha and centred on National Grid Reference 526297 116587. The Site location is shown in Figure 1.

Figure 1 Site location plan



2 Policy review

The requirement to assess mineral reserve as part of a proposed development results from current planning policy. A high-level review of the relevant planning policy is set out within the following sections.

2.1 National planning policy

The National Planning Policy Framework (NPPF) (MHCLG, 2021) sets out the Government's planning policies for England and how these are expected to be applied. The presumption in favour of sustainable development is at the heart of the NPPF, and this requires that Local Planning Authorities (LPAs) should positively seek opportunities to meet the development needs of their area, and that local plans should meet objectively assessed needs, with sufficient flexibility to adapt to rapid change. The NPPF also states that development proposals that accord with an up-to-date development plan should be approved without delay (Paragraph 11c).

Section 17 of the NPPF sets out the requirements for planning policy to facilitate the sustainable use of minerals, including:

- the requirement to safeguard minerals from sterilisation by non-mineral development (whilst not creating a presumption that the resources defined will be worked) (Paragraph 210c);
- encourage the prior extraction of minerals, where practical and environmentally feasible, if it is necessary for non-mineral development to take place (Paragraph 210d);

It is also noted that Section 17 of the NPPF (Paragraphs 210 and 211) requires that if any mineral development is permitted, impacts on human health, amenity and environmental receptors can be adequately controlled and mitigated.

2.2 Local planning policy

As the MPA for the Site, WSCC's mineral planning policy is covered by the West Sussex Joint Minerals Local Plan (JMLP), adopted in 2018 by WSCC and the South Downs National Park Authority. Minerals safeguarding is covered by policy M9 of the JMLP, which states that:

> *Proposals for non-mineral development within the Minerals Safeguarded Areas… will not be permitted unless:*
>
> *(i) Mineral sterilisation will not occur; or*
>
> *(ii) it is appropriate and practicable to extract the mineral prior to the development taking place, having regards to the other policies in this Plan; or*
>
> *(iii) the overriding need for the development outweighs the safeguarding of the mineral and it has been demonstrated that prior extraction is not practicable or environmentally feasible.*

The supporting text for the policy states that:

Where non-mineral development is proposed, developers may be required to carry out investigation work to ascertain whether economically viable mineral resources are present and whether prior extraction is practicable. The results of this work should be reported in a 'Minerals Resource Assessment' that is submitted with any application.

3 Geo-environmental review

3.1 Summary

Geo-environmental baseline conditions have been interpreted based on a review of publicly available information and a Phase 1 Ground Conditions Assessment for the Site (Stantec, June 2022, ref. 332511088/3501), together with its accompanying environmental data report (Groundsure, 2022, ref. GS-8710813).

Topography	The Site is generally level with the surrounding topography and is gently undulating between 32 m and 40 m above ordnance datum (AOD).
Land Use	The Site comprises two arable fields, together with a small, triangular orchard in the north. Historical mapping contained within the Groundsure (2022) report indicates that the Site has been used for agriculture since at least 1874 (the date of the earliest available mapping).
Superficial Geology	A map of the superficial geology is included in Figure 2. British Geological Survey (BGS) mapping indicates that there are no superficial deposits underlying the Site.
Bedrock Geology	A map of the bedrock geology is included in Figure 2. BGS mapping indicates that in the wider area the strata dip towards the south at an angle of approximately 3 degrees. The southern half of the Site is shown to lie directly on the Lower Greensand Group that overlies the Weald Clay Formation which outcrops in the northern half of the Site. The Weald Clay Formation is the stratum that has been identified as a potential reserve of brick clay. The Lower Greensand Group is described by the BGS as typically sands and sandstones locally with silts and clays. The Weald Clay Formation is described by the BGS as mudstones, siltstones, sandstones and clay ironstones. The geological map states that the Weald Clay Formation is between 120 m and 275 m thick. The basal beds of the Lower Greensand Group, i.e., the part of this stratum that immediately overlies the underlying Weald Clay Formation and the geology likely to be present in the south of the Site, are described by the BGS as the Hythe Beds, comprising interbedded sandstones, up to 40 m thick. The geology is discussed in greater detail in section 4.2.
Made Ground	BGS mapping indicates that no artificial ground deposits are present at the Site.
Hydrogeology	The Lower Greensand Group is classed as a Principal aquifer, i.e., layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. The Weald Clay Formation is classed as an Unproductive Stratum, i.e., geology with low permeability that has negligible significance for water supply or river base flow. There are no source protection zones within 1 km of the site.
Hydrology	The OS mapping indicates that the nearest surface water feature is a stream which flows along the Site's north-western boundary. This stream flows to the north-west, joining with multiple other streams and flowing into the River Adur approximately 4.8 km north-west of the Site. A spring is located c.25 m south-east of the Site.

	During the site visit undertaken in April 2022as part of the Stantec Phase 1 Ground Conditions Assessment, the pond shown on the OS map at the western end of the orchard in the north of the Site was observed to be dry. A further stream is present approximately 150 m south of the Site. This stream appears to flow towards the west, to a confluence with Cutlers Brook approximately 200 m south-west of the Site. Cutlers Brook flows to the west to a confluence with the River Adur approximately 6.0 km to the west of the Site. The EA's Catchment Data Explorer indicates that the southern half of the Site is located within the Chess Stream catchment and the northern half of the Site is located within the Adur East (Sakeham) catchment. The Chess Stream catchment received Water Framework Directive (WFD) classifications of "Moderate" for ecological quality and "Fail" for chemical quality in 2019. The Adur East (Sakeham) catchment received WFD classifications of "Poor" for ecological quality and "Fail" for chemical quality in 2019.
Water Abstractions	The Groundsure (2022) report indicates that there are no licenced surface water abstractions recorded within 500 m of the Site. In addition, the DEFRA's MAGIC map (DEFRA, 2022) indicates that the Site is not located within a surface Drinking Water Safeguard Zone or a surface water Drinking Water Protection Area.

Designated sites	The following designated sites are present on-Site:
	• Nitrate vulnerable zones:
	  ○ Chess Stream NVZ; and,
	  ○ Adur East (Sakeham) NVZ;
	• Site of special scientific interest (SSSI) impact risk zone.
	The SSSI impact risk zone exists to protect Woolstonbury Hill SSSI, c.2.7 km south-east of the Site, and Beeding Hill to Newtimber Hill SSSI, c.3.6 km south of the Site.

Figure 2 Superficial geology

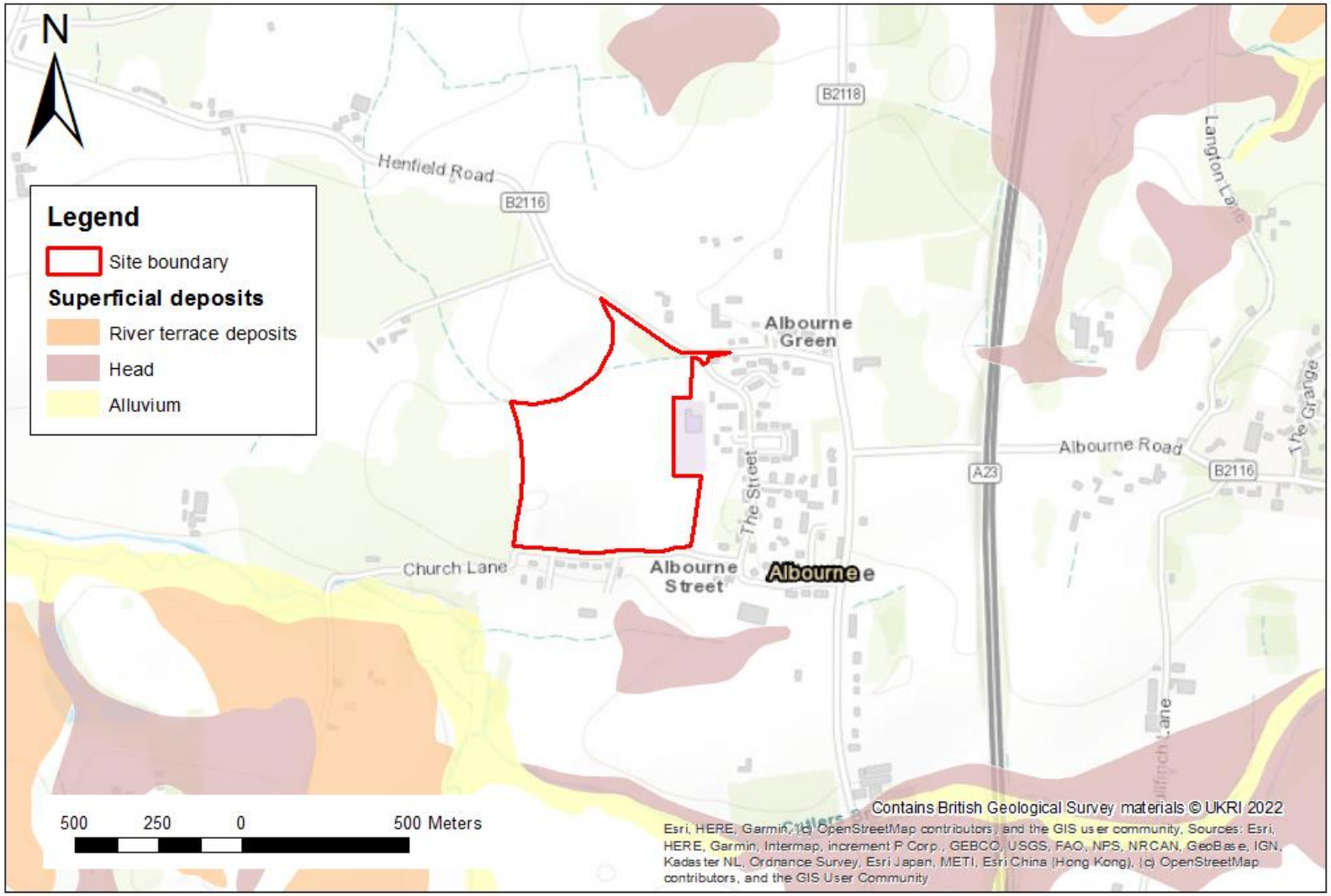
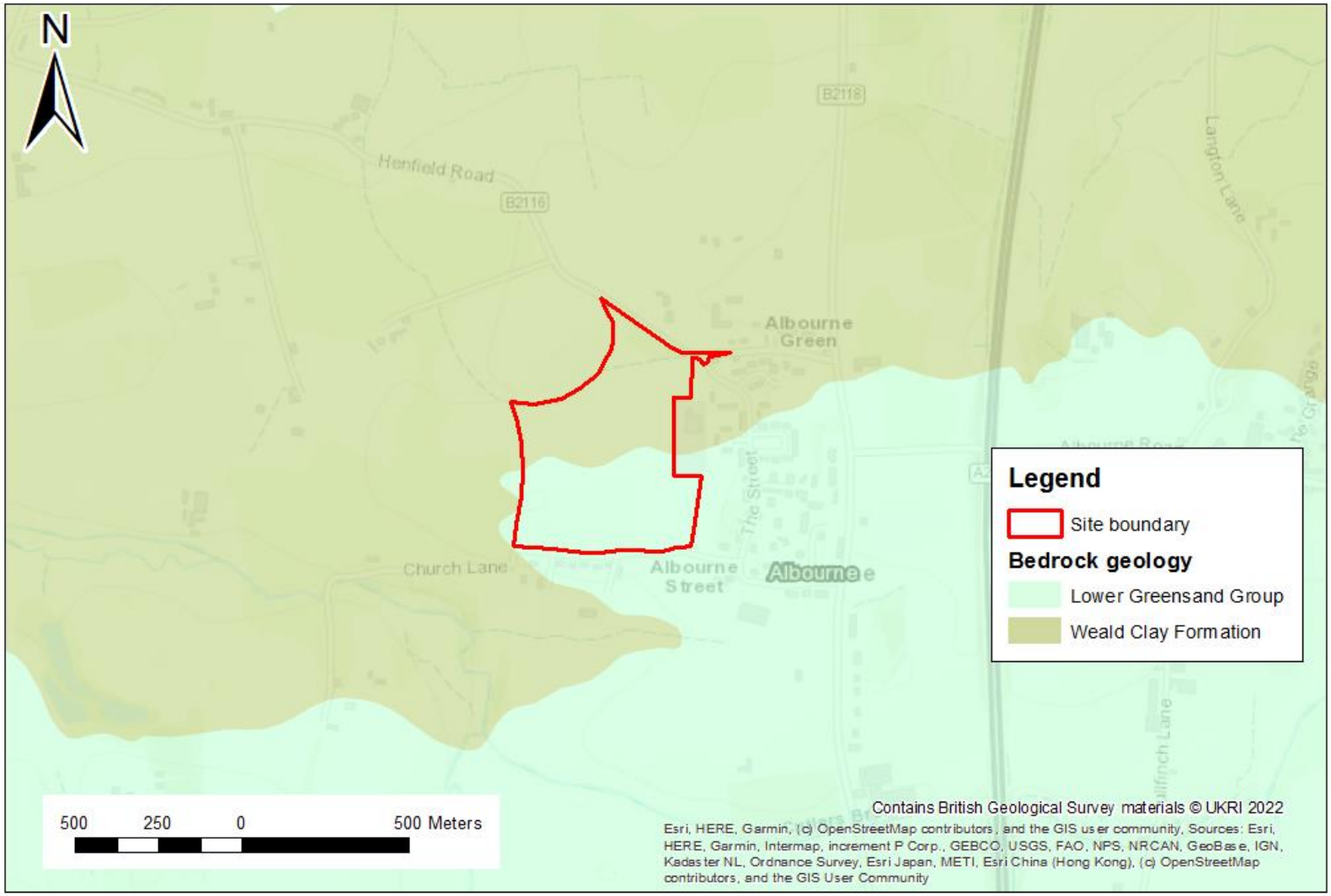


Figure 3 Bedrock geology



4 Mineral assessment

4.1 Mineral reserve

It should be noted that at the time of writing, Stantec has not been made aware of any intrusive investigations previously undertaken at the Site, therefore the information and conclusions contained herein are based solely on publicly available information such as records for nearby boreholes held by the BGS.

That said, it is believed that there is sufficient information to address WSCC's requirement to assess the Mineral Resource present within the Site in the context of policy M9 of the JMLP.

4.2 Weald Clay Formation

4.2.1 Lithology

The nearest BGS borehole records to the Site are located along the course of the A23 dual carriageway, which runs from north to south c.530 m east of the Site. Within 750 m of the Site, records are available for six boreholes that were drilled into the Weald Clay Formation, located between 540 m and 640 m north-east of the Site.

A weathered horizon generally comprising soft to firm mottled brown and light grey very silty clay was encountered from near surface to depths between 1.4 m bgl and 2.4 m bgl (mean 2.0 m bgl), while below this, the Weald Clay Formation was generally recorded as a stiff to very stiff finely laminated light grey and bluish grey silty clay with partings of white silt.

The deepest two of these boreholes were drilled to 35 m bgl and terminated within the Weald Clay Formation. The nearest deep (i.e., >50 m) BGS borehole record (ref. TQ21NW8/A) is located c.1.2 km west of the Site and is considered likely to be in a similar stratigraphical position to the Site. The record shows that the Weald Clay Formation extends to more than 75.2 m bgl at this location.

4.2.2 Regional context

The Site is located on the southern limb of the Wealden anticlinorium, a large, folded structure which dominates the geology of south-east England. Information on the geological map (BGS, 2006) and in its accompanying memoir (BGS, 1988) indicates that the boundary between the Weald Clay Formation and the Lower Greensand Group dips southward, therefore the Weald Clay Formation will be underlying the Lower Greensand Group in the southern part of the Site. A smaller fold, the Henfield Syncline, is also present nearby; its axis trends from west to east c.1.6 km south of the Site.

Generalised dips shown on the BGS map c.11 km west and 3.5-6 km north of the Site show that the Weald Clay Formation is dipping between 3° and 8° to the south.

4.2.3 Resource estimate

An estimate of the potential tonnage is presented in Table 4-1. The following assumptions and simplifications were made in the calculation:

- Due to the thickness of the Weald Clay Formation in the vicinity of the Site, the maximum depth of any potential working would not be limited by the stratigraphy. For the purposes of calculating an estimate of the tonnage, a maximum working depth of 10 m has been assumed

based on Stantec's experience of other clay pits. The maximum potential working depth would be constrained by the stability of the sides of the quarry void and water ingress.

- The boundary between the Weald Clay Formation and the Lower Greensand Group dips to the south, therefore the Weald Clay Formation will be present below the Lower Greensand Group in the southern part of the Site. A dip of 3° has been assumed based on information in the BGS maps. As both the depth to the top of the Weald Clay Formation and the elevation of the topography increase going southwards (i.e., the overburden thickens), the area in which there is >1 m thickness of winnable resource has been calculated to extend c.50 m south of where the boundary between the Weald Clay Formation and the Lower Greensand Group outcrops at the surface. The thinning of the winnable resource to the south has not been accounted for then calculating its volume.
- Using figures derived from BS8002:1994 – Code of Practice for Earth Retaining Structures, a bulk density for the Weald Clay Formation of 2.40 t/m^3 has been used, based on the following information:
    - Nearby BGS borehole records generally describe the Weald Clay Formation as "very stiff", indicating a density of between 1.89 and 2.40 t/m^3.
    - BGS borehole records show that N-values for standard penetration tests (SPTs) undertaken during the drilling of the boreholes are generally above 30, indicating a stiff or very stiff clay. As a result, the higher end of the suggested density spectrum (i.e., 2.40 t/m^3) was used in the calculation of the estimated tonnage.
- Due to the lack of intrusive investigation data for the Site, an estimate of 2 m was used for the thickness of the overburden, as this was the mean thickness of the weathered horizon identified in the nearby BGS borehole records. It has been assumed that the weathered clay would not be of economic interest due to the reduced purity of the clay affecting the quality of bricks produced in the firing process. In calculating the volume of clay, this 2 m has been subtracted from the estimated maximum working depth of 10 m, giving an estimated 8 m of winnable brick clay at the Site.
- It is considered likely that bands of silt and mudstone identified in the BGS borehole records would also be present on-Site, reducing the proportion of the underlying Weald Clay Formation that could potentially be of economic interest.

Table 4-1 Tonnage estimate

Stratum	Area of outcrop on-Site (m^2)	Bulk density (t/m^3)	Approximate volume (m^3)	Gross tonnage (tonnes)
Weald Clay Formation	163,500	2.40	1,308,000	3,129,200

4.3 Brick clay extraction in West Sussex

The current situation of brick clay extraction within West Sussex is described in the JMLP and in monitoring reports released annually by WSCC (the most recently published monitoring report (WSCC 2022) covers the period from the 1st April 2020 to the 31st March 2021, but contains some information up to December 2021).

There are currently four active and two inactive brickworks within West Sussex. These are listed in Table 4-2 and their locations relative to the Site are shown in Figure 4. Average annual sales from brickworks within West Sussex from 2011 to 2020 was 0.33 Mt per annum, with a range between 0.28 Mt and 0.35 Mt. Permitted reserves for all brickworks in West Sussex total 14.2 Mt. All of the brickworks are safeguarded within the JMLP, with the exception of the inactive Rudgwick Brickworks.

The NPPF states that MPAs should plan for maintaining a stock of permitted reserves of brick clay of at least 25 years. Two of the brickworks within West Sussex are each estimated to have 25 years' worth of permitted reserves remaining.

An extension to West Hoathly Brickworks has been allocated in Policy M11 of the JMLP to provide two to three years' additional supply of clay; however, West Hoathly Brickworks ceased production in March 2020.

It is noted in the BGS memoir for the area that:

> *Impurities in the Weald Clay include calcite, siderite, pyrite and gypsum, as well as ostracod-bearing horizons; the last are occasionally troublesome in brick-making and are avoided, but generally the deposit is well suited to clay-brick manufacture by methods ranging from extrusion to soft-mud forming. The alumina content of the Weald Clay used in brick-making is about 20 per cent and a high iron-oxide content (7 to 8 per cent) is common.*

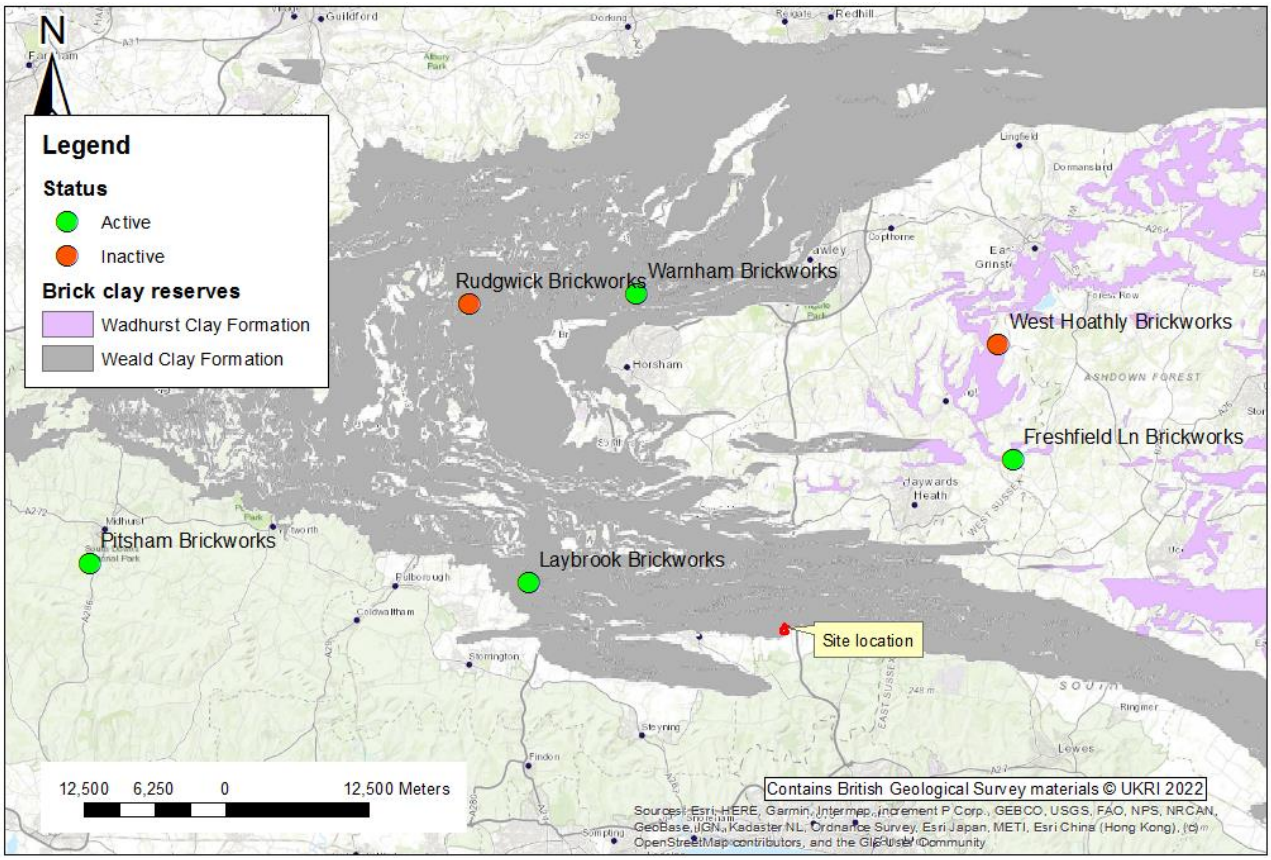
Due to the lack of intrusive data for the Site, the suitability of the underlying clay for brick manufacture is not known.

Table 4-2 List of brickworks within West Sussex

Site name	Operator	Comments	Driving distance from Site (km)	Formation
Freshfield Lane Brickworks, Danehill, Haywards Heath	Freshfield Lane Brickworks Ltd	Winning and working of clay and brick making.	23	Wadhurst Clay
Laybrook Brickworks, Goose Green Lane, Thakeham, nr Pulborough	Ibstock Brick Ltd	Winning and working of clay and brickmaking. Partially restored to fishing lakes.	23	Weald Clay
Rudgwick Brickworks, Lynwick Street, Rudgwick	Wienerberger Ltd	Inactive. Site partially restored, and buildings no longer used for mineral purposes.	34	Weald Clay
Warnham Brickworks, Langhurstwood Road, Horsham	Wienerberger Ltd	Winning and working of clay and brickmaking. Site is in 2 separate locations.	30	Weald Clay
West Hoathly Brickworks, Sharpethorne, West Hoathly	Ibstock Brick Ltd	Inactive. Winning and working of clay, major extension area. Restoration to mixed habitats and ponds.	30	Wadhurst Clay

Site name	Operator	Comments	Driving distance from Site (km)	Formation
Pitsham Brickworks, Cocking	Lambs	Winning and working of clay and brickmaking. Restoration by natural regeneration. Planning permission until 2042.	53	Gault Clay

Figure 4 Brickworks within West Sussex



With respect to the potential for brick clay extraction at the Site, all of the operational brickworks have adjacent extraction facilities. If the extraction of clay for brick manufacture were to occur at the Site, this would either require transporting to an established brickworks (nearest c.23 km away by road) or the construction of a brick manufacturing plant on-Site.

When the average annual brick clay production of West Sussex is divided between the four active sites, this equates to 0.0825 Mt per site per annum. The estimated tonnage of brick clay underlying the Site could sustain such a rate for up to 38 years.

5 Constraints review

The assessment of potential mineral resource has identified an estimated gross tonnage of 3,129,200; however, there are constraints which would reduce this figure, as well as additional constraints that could impact the economics of any mineral extraction and have a detrimental impact on the local environment.

A full list of potential constraints is presented in Table 5-1.

Table 5-1 List of constraints

Constraint	Potential impact	Comments	Impact level
Tonnage	The estimated tonnage alone is not considered a constraint to potential mineral extraction at the Site – if output from the Site was comparable to other brick clay extraction sites within West Sussex, reserves would last for approximately 38 years.	The mineral resource assessment (Section 4.2.3) estimated approximately 3,129,200 tonnes of brick clay is present within the Weald Clay Formation underlying the Site, however this figure is based on several broad assumptions and simplifications due to a lack of intrusive data for the Site, and does not consider areas lost to acoustic bunds, benching and quarry infrastructure.	Low
Quality	The BGS memoir notes that the Weald Clay Formation is generally well-suited to brick manufacture, however some impurities such as ostracod-bearing horizons can make it unsuitable at a local level.	BGS records for boreholes drilled along the course of the A23 dual carriageway record the unweathered Weald Clay Formation as being a silty clay with partings of silt. The thickness and frequency of these silt partings is not recorded, but their presence on-Site would reduce the winnable tonnage of brick clay.	Medium
Traffic	Assuming the mineral resource would have to be removed off site for processing, increased HGV traffic movements would potentially impact air quality and have dust and noise impacts. A Traffic Impact Assessment would be required to understand the impact on the local road network. The nearest brick making plants are located 23 km away from the Site at Haywards Heath and Thakenham, operated by Freshfield Lane Brickworks Ltd and Ibstock Brick Ltd	Logistical constraints are likely to include access arrangements for HGVs to the Site. Although access to the Site itself would be relatively straightforward as it is adjacent to the B2116 (Henfield Road), due to the proximity of the villages of Albourne (adjacent to the eastern Site boundary) and Hurstpierpoint (c.1 km east) traffic is likely to be heavy along this road, without additional traffic related to mineral extraction. Google Maps typical traffic data indicate that 'general' traffic can build up in the	High

Constraint	Potential impact	Comments	Impact level
	respectively. There would be a requirement for transportation of brick clay from the Site to these or another such processing facility in the area. Alternatively, if a brickworks were to be constructed on-Site, there would be increased HGV traffic associated with transporting the finished products to vendors.	villages near the Site during rush hours and near school closing times. As nearby brickworks have their own clay extraction, the import of brick clay from the Site to one of these facilities would also have an impact on traffic volumes at the receiving site. Wheel washing would be required to reduce the risk of mud and gravel impacting traffic on the nearby roads. Additional traffic movements would be associated with import of inert materials required during Site restoration.	
Timescale	From the initial high-level calculations undertaken herein, it is estimated that there are c.38 years' worth of winnable brick cay reserves underlying the Site.	If mineral extraction then subsequent restoration were to occur prior to the construction of the proposed housing development, the residential development would be delayed by three to four decades when it may be required sooner due to demand for housing. Conversely, it is not considered likely that mineral operators would invest in the construction of an on-Site brickworks if it was only to have 38 years' worth of clay supply.	High
Environment	Environmental impacts of potential mineral extraction at the Site could be expected to result in noise, dust and visual impacts adjacent to a residential area. If a brickworks were to be constructed on-Site, additional environmental considerations would include air quality and carbon emissions. Potential impacts to surface water and groundwater would also need to be considered due to presence of a stream on-Site and a spring c.25 m south of the Site. Ecological concerns would include impacts to hedgerow and aquatic habitats, and nesting birds.	The potential need for acoustic bunds to reduce noise impacts could potentially reduce the land area available for mineral extraction. Visual and amenity impacts would be further increased were a brickworks to be constructed on-Site, together with increased carbon emissions relating to gas firing of the bricks.	High

Constraint	Potential impact	Comments	Impact level
Proximity to human receptors	The proximity of the Site to human receptors such as residential dwellings and schools would be a likely cause of objection for local residents and may result in planning requirements for increased standoff distances.	Residential properties are located c.35 m north-east, c.35 east and c.20 m south of the Site, together with a primary school adjacent to the eastern Site boundary.	High
Spatial limitation	Spatial limitation of the potential mineral resource extraction will occur around the Site boundary due to surrounding infrastructure and residential properties. Experience of other operations and policy areas suggests a minimum standoff distance, or buffer zone, of 10 m would be applied to residential housing and public roads.	The presence of roads, residential properties and a school near to the Site boundaries, together with the stream on-Site will limit the area of the Site available for mineral extraction	Medium
Overburden	Overburden (topsoil and weathered clay) would require removal to access the unweathered Weald Clay Formation and would impact upon the economics of the excavation.	Weathered clay was recorded in the BGS's published borehole records to an average depth of 2 m bgl, which would equate to 327,000 m^3 of overburden to be removed, or 654,000 tonnes of material (assuming a density for firm, dense clay of 2.0 Mg/m^3 (BS8002:1994)). The thickening of the overburden in the southern extent of the potential mineral reserve has not been accounted for, therefore this tonnage would likely be higher. Overburden could be used to create screening or acoustic bunds.	High
Interburden	The amount of interburden on-Site is unknown, however silt partings are recorded in the nearby published borehole records. That said, the BGS notes that the Weald Clay Formation is generally well-suited to brick manufacture.	Any interburden present would reduce the winnable tonnage of brick clay from the Site. Interburden could be used to create screening or acoustic bunds.	Medium
Restoration	If the mineral was to be excavated, it would require an equivalent volume of material (1,308,00 m^3) to be imported to the Site to restore the ground levels. Such an activity would result in additional traffic movements and would need to be regulated by the	Engineering of the restored landform to provide a development platform would require the importation of suitable material to be placed to meet geotechnical and drainage specifications.	Medium

Constraint	Potential impact	Comments	Impact level
	Environment Agency under a suitable Environmental Permit.		
Water	A source of water for quarrying would need to be found for quarrying operations at the Site. Though there is a stream on-Site and a spring 25 m south of the Site, it is not considered likely that either of these would provide adequate water. It is unlikely that a suitable groundwater source exists, as the Weald Clay Formation is classified as an unproductive stratum and is in excess of 75 m thick in the vicinity of the Site.	Water would still be required on-Site for wheel washing (to prevent lorries from carrying sediment off-site) and dust suppression purposes (particularly during summer). However, the minimum water supply requirement would be unlikely to exceed 20 m^3/day and therefore an abstraction licence would not be required from the Environment Agency.	Medium
Surface watercourses	A stream is present on-Site, and a spring is located c.25 m south of the Site.	A buffer zone would need to be established adjacent to the watercourses to preserve the integrity of the riverbanks. The space required for the buffer zones would reduce the amount of mineral available for extraction. Dewatering of the quarry void will cause groundwater levels nearby to decrease, potentially causing the spring to dry up.	High
Stability	Benching of the sides of the quarry void would be required to maintain their stability	Benching would reduce the winnable tonnage of brick clay from the Site.	Medium
Designated sites	The Site is located within two nitrate vulnerable zones and an SSSI impact risk zone for SSSIs 2.7 km southeast and 3.6 km south of the Site.	A geological barrier is unlikely to be required as transmissivity within the Weald Clay Formation is likely to be low. Due to the separation distance from the SSSI's protected by the impact risk zones, consultation is not required for minerals developments.	Low

6 Conclusions

In recognition of WSCC's letter dated 25th August 2022, the preliminary MRA's conclusions are based on Policy M9 of the JMLP (Section 2.2).

As indicated in Section 4.2.3, there is an estimated winnable tonnage of 3,129,000 of brick clay underlying the Site, estimated from geological mapping and records of nearby boreholes published by the BGS; however, no intrusive data is available for the Site. If the mineral were to be extracted, standoffs or buffers required for the nearby residential properties, school, stream and roads are considered (Section 5), this will reduce the quantity of available reserve, as will benching of the sides of the quarry void to maintain stability.

The key constraints identified while assessing the opportunity to work the mineral at the Site include stability of the quarry void, increased HGV traffic, requirement to import restoration material, timescales for extraction and restoration, spatial limitations with regards to nearby human and surface water receptors, and environmental and socio-economic constraints (Section 5).

Off-Site processing would potentially have additional environmental impacts associated with extraction (noise and dust) and traffic (noise, air quality and traffic movements). Extraction would require import of material for restoration which also would have added impact of additional traffic movements, noise, dust and air quality. If bricks were to be manufactured on-Site, there would be additional air quality, visual and amenity impacts associated with this, together with increased carbon emissions assuming gas was used for firing the bricks.

Overall, the potential mineral resource within the Site is likely to have limited commercial interest. At current production rates, the 14.2 Mt of currently permitted brick clay reserves in West Sussex identified in the 2020/21 JMLP monitoring report will provide c.43 years' supply. It is considered likely that this, together with West Hoathly Brickworks recently ceasing production, indicates that the need for brick clay in the area is met by the existing facilities and there is little economic demand for the development of a new brickworks. In addition, there are significant constraints as identified, and any extraction of the mineral would likely be subject to strong environmental objections. Therefore, when assessed in the context of the prevailing JMLP Policy M9,

> *(i) the overriding need for the development outweighs the safeguarding of the mineral and it has been demonstrated that prior extraction is not practicable or environmentally feasible.*

The close proximity of residential properties and the potential environmental impacts of mineral extraction and export, combined with the requirement to import restoration material, is such that there is likely to be significant objection to any proposed mineral extraction at the Site. If extraction of the brick clay were to occur prior to the proposed residential development, it is considered likely that the timescales associated with extraction and restoration would potentially delay the proposed residential development by three to four decades.

Whilst the desk-based information collated herein is considered adequate for determining that the MSA should not preclude the proposed development, intrusive investigation would generate additional information and confirm the on-Site composition and extent of the Weald Clay Formation.

REFERENCES

British Geological Survey, 1988. Geology of the country around Brighton and Worthing Memoir for the 1:50,000 geological sheets 318 and 333 (England and Wales).

British Geological Survey, 2006. Brighton and Worthing. England and Wales Sheet 318/333. Bedrock and Superficial Deposits, 1:50,000 Geology Series.

British Geological Survey, 2022. Geoindex https://mapapps2.bgs.ac.uk/geoindex/home.html [accessed October 2022].

British Standards Institution, BS 8002:1994 – Code of Practice for Earth Retaining Structures.

Magic, 2022. http://www.magic.gov.uk [accessed October 2022].

Groundsure Ltd, 2022 Groundsure Enviro+Insight report reference GS-8710813.MGCLG, 2018. National Planning Policy Framework, February 2019.

Stantec, 2022. Land at Henfield Road, Albourne: Phase 1 Ground Conditions Assessment. Ref:332511088/3501.

West Sussex County Council, 2018. West Sussex Joint Minerals Local Plan.

West Sussex County Council, 2022. West Sussex Joint Minerals Local Plan and Waste Local Plan: Monitoring Report 2020/21.

APPENDICES

Appendix A

WSCC Consultation response

WSCC CONSULTATION RESPONSE:
County Planning – Minerals & Waste Planning Authority

TO:	Case Officer: Joanne Fisher
DATE:	25/08/2022
LOCATION:	Land South Of Henfield Road, Albourne, West Sussex
SUBJECT:	DM/22/2416 | Outline planning permission for the erection of up to 120 residential dwellings including 30% affordable housing, public open space and community facilities. All matters are reserved except for access. |
RECOMMENDATION:	☐ Advice ☐ Objection ☐ Modification ☐ No Objection ☑ More Information ☐ Refusal

West Sussex Joint Minerals Local Plan (July 2018)

The site is within areas identified as a brick clay Mineral Safeguarding Area. Policy M9 of the JMLP notes that proposals for non-mineral development within these areas will not be permitted unless:

(i) *"Mineral sterilisation will not occur; or*
(ii) *It is appropriate and practicable to extract the mineral prior to the development taking place, having regards to the other policies in this Plan; or*
(iii) *the overriding need for the development outweighs the safeguarding of the mineral and it has been demonstrated that prior extraction is not practicable or environmentally feasible."*

The applicant has not considered the potential for the prior extraction of the resource by way of submission of a Mineral Resource Assessment, or the safeguarding of the mineral resource within their Planning Statement. Therefore, the MWPA would request that more information is submitted prior to a decision being issued, whereby the applicant should demonstrate that the proposal complies with Policy M9 as outlined above.

The applicant's attention is drawn to the WSCC Minerals and Waste Safeguarding Guidance, found here.

West Sussex Waste Local Plan (April 2014)

The decision maker should be satisfied that the proposals minimise waste generation, maximise opportunities for re-using and recycling waste, and where necessary include waste management facilities of an appropriate type and scale (Policy W23).

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