



RAYMOND BROWN
QUARRY PRODUCTS

Sandland Extension to Brickworth Quarry, Whiteparish, Wiltshire

ENVIRONMENTAL STATEMENT

CHAPTER No. 5

CHAPTER: Water Environment

September 2025



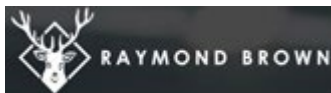
Raymond Brown Quarry Products Limited
**Proposed Phase 9 Extension to
Brickworth Quarry**
Whiteparish, Wiltshire, SP5 2QE

Planning Application

Proposed winning and working of sand followed by restoration
with inert fill

Hydrological/Hydrogeological Impact and Flood Risk Assessment

Version 2
August 2025



Raymond Brown Quarry Products Limited
A1 Omega Park
Electron Way
Chandlers Ford
SO53 4SE

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Planning Application

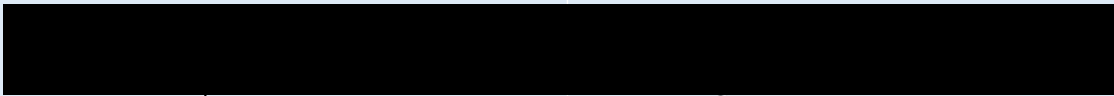
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Report Prepared By	Report Checked By
	
Henry Lister, B.Sc. M.Sc. FGS Principal Hydrogeologist & Director	Peter Simpson, B.Sc M.Sc. FGS Principal Hydrogeologist & Director

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BCL CONSULTANT HYDROGEOLOGISTS' EXPERIENCE & QUALIFICATIONS

BCL is an independent consultancy specialising in all aspects of hydrogeology and hydrology as they relate to minerals extraction, waste disposal, water supply and related industries.

Henry Lister (the author of this report) holds a Bachelor of Science (Honours) degree [Applied Geology] conferred by Plymouth University, 1992 and a Master of Science Degree [Groundwater Engineering], Newcastle University, 1994.

BCL has provided specialist services, advice and reporting to the extractive, waste and related industries since 2000. During this time, experience has been earned from involvement with a wide variety of assignments. BCL's work has included:

- Installation and management of information collection systems;
- Data interpretation;
- Conceptualisation of hydrogeological systems;
- Identification of potential impacts;
- Formulation of mitigation measures;
- Management and undertaking of operational impact monitoring and impact assessment;
- Review and auditing of contingency mitigation schemes, and;
- Reporting in connection with proposed developments within varying hydrological and hydrogeological terrains at over 250 quarries throughout the United Kingdom and Republic of Ireland.

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1 INTRODUCTION

- 1.1 Raymond Brown Quarry Products Limited (the Applicant) is submitting a planning application seeking permission for a Proposed Extension to Brickworth Quarry for the winning and working of sand followed by restoration to original ground level through the use of site-derived by-products and the importation and placement of inert materials. The Extension Area is referred to as Phase 9.
- 1.2 BCL Consultant Hydrogeologists Limited (BCL) has been commissioned to undertake a Hydrological and Hydrogeological Impact Assessment (H&HIA) with Flood Risk Assessment (FRA) of the Proposed Development, to form part of the wider Environmental Statement (ES) supporting the Application.

2 APPROACH TO ASSESSMENT

2.1 Scope of Assessment

2.1.1 The scope of the Assessment has been informed by national and local planning policies and associated guidance, which all reinforce the need to pay due regard to the likely effect of the Proposed Development upon various aspects of the water environment.

2.1.2 Relevant current national policy documents and associated guidance that have been consulted include:

- National Planning Policy Framework (NPPF, updated December 2024), as published by the Ministry of Housing, Communities and Local Government [MHCLG], formerly Department for Communities and Local Government (DCLG);
- Planning practice guidance for “Flood Risk and Coastal Change”, DCLG (now MHCLG), updated 25th August 2022 (referred to herein as PPG);
- Wiltshire Council’s Sustainable Drainage Design Guidance, which can be found at: <https://www.wiltshire.gov.uk/civil-emergencies-drainage>;
- “Rainfall Runoff Management for Developments”, Kellagher R, joint DEFRA / Environment Agency (EA) Flood and Coastal Erosion Risk Management R&D Programme, Report SC030219, October 2013;
- “The SUDS Manual v5”, Construction Industry Research and Information Association (CIRIA): report no. c753, 2015;
- “Surface water storage volume estimation for sites”, HR Wallingford, on-line calculation tool, UK Sustainable Drainage, Guidance & Tools (www.uksuds.com/drainage-tools/surface-water-storage-volume-estimation.html);
- “The Environment Agency’s approach to groundwater protection” (February 2018, Version 1.2);
- “Hydrogeological Impact Appraisal for Dewatering Abstractions”, Boak R, Bellis L, Low R, Mitchell R, Hayes P, McKelvey P, Neale S, EA Science Report SC040020/SR1, April 2007.

2.2 Methodology & Outcomes

2.2.1 This report presents the findings of the hydrological and hydrogeological Baseline Study and Impact Assessment that is intended to inform consultations both prior to submission of the Planning Application and during its determination.

2.2.2 The collection and interpretation of baseline data has facilitated a detailed understanding of the nature of, and interactions between, the groundwater and surface water systems operating at and around the Site.

2.2.3 The understanding of hydrological and hydrogeological conditions has been applied to assess the likely primary impacts of the Development upon the water environment.

2.2.4 Significant potential impacts identified during the course of investigations have been addressed by the incorporation of mitigation measures into the design of the Development.

- 2.2.5 Where appropriate, outline monitoring protocols have been advanced to facilitate validation / modification of mitigation measures.

2.3 Information Sources

- 2.3.1 Published and site-specific data sources referenced and adopted during Assessment are listed at *appendix 1*.

2.4 Site Reconnaissance

- 2.4.1 Water features monitoring and Site reconnaissance were undertaken by BCL on 16th September 2021.

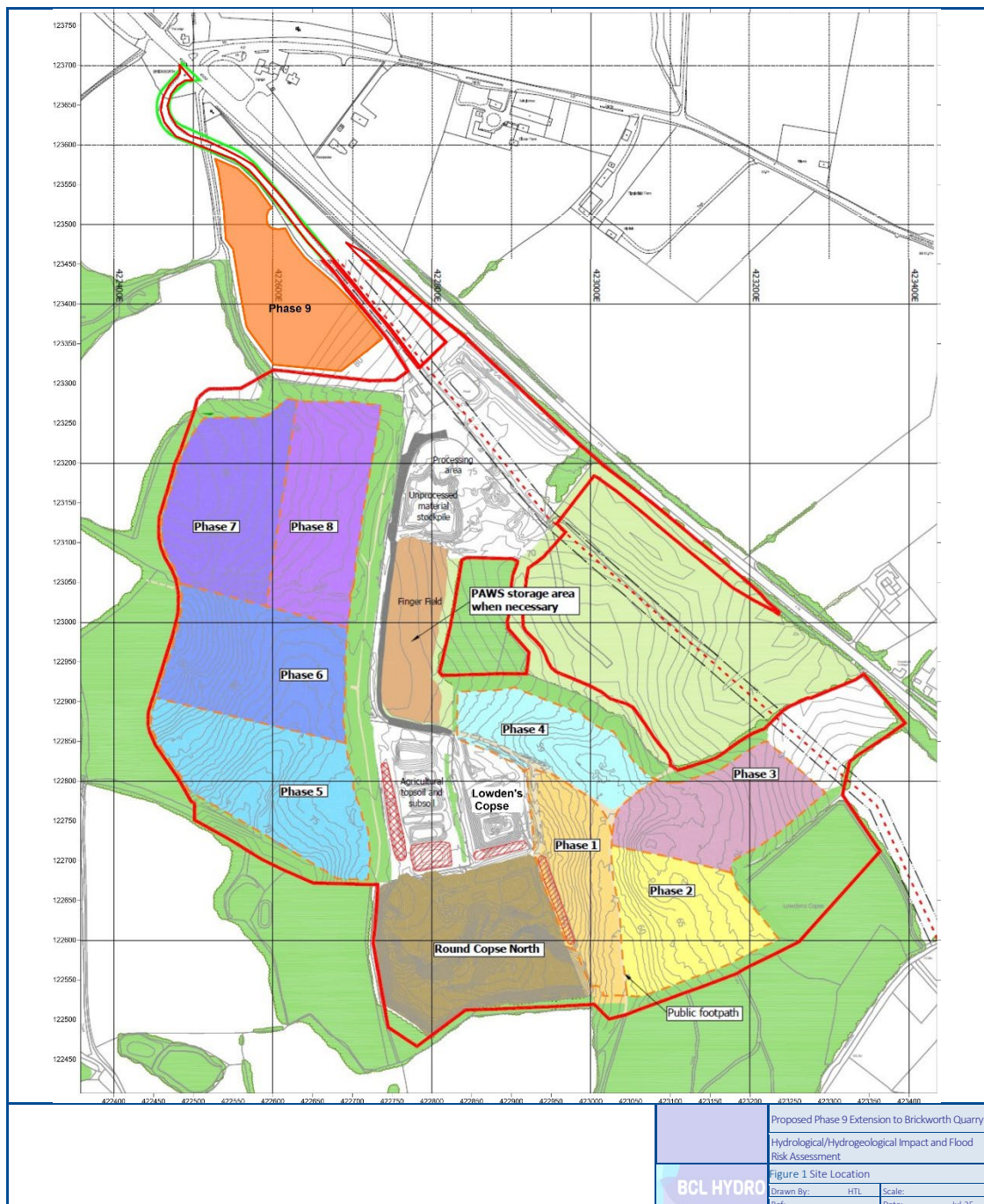
3 BASELINE CONDITIONS

3.1 Site Setting

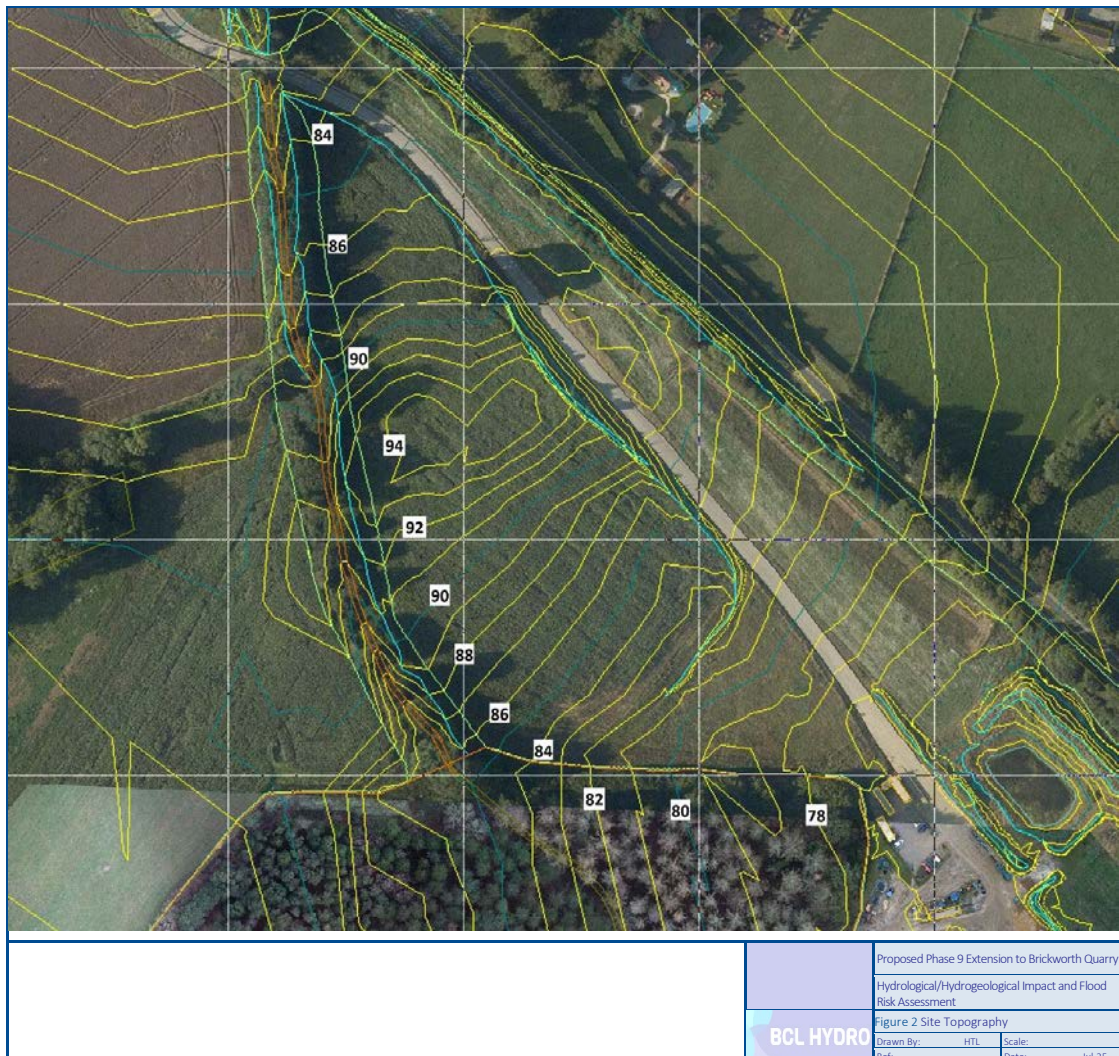
3.1.1 Site Location and Topography

3.1.1.1 Brickworth Quarry is located *circa* 1 km southwest of Whiteparish.

3.1.1.2 The Proposed Extension Area (Phase 9) is located to the northwest of the previously-worked areas at Phases 5-8 in Extension Area B (MSP B), Round Copse North (RCN), Lowden's Copse (LC) and Phases 1-4 in Extension Area A (MSP A) as well as the Finger Field (FF), which was landfilled under exemption and is now used for storing soils for "Restoration of lowland plantations on ancient woodland sites" (PAWS).



- 3.1.1.3 The Extension Area (Phase 9) will include an internal haul road linking to the existing processing plant at the Quarry.
- 3.1.1.4 Phase 9 is centred on National Grid Reference ⁴22620 ¹23420.
- 3.1.1.5 The land at Phase 9 currently comprises an elongate, arable field of approximately 3.0 hectares (ha). The proposed extraction area equates to 2.5 ha.
- 3.1.1.6 The topography peaks at an elevation of approximately 94 metres above Ordnance Datum (maOD) in northern central parts of the Site; and falls gently north and south to 84 maOD and 77 maOD respectively:



3.1.2 Designated Sites

- 3.1.2.1 Natural England's database has been consulted to check for Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), Special Protection Areas (SPA), National and Local Nature Reserves (NNR & LNR), Country Parks and Ramsar Sites.

- 3.1.2.2 At closest approach, New Forest SSSI, which is designated for its wet meadows interest, is located approximately 1.2 km southeast of Phase 9 (and 500 m southeast of MSP A). The SSSI is split into two units, Cabanne Meadow East and West, with the main habitat described as ‘neutral grassland – lowland’.
- 3.1.2.3 Brickworth Down and Dean Hill SSSI is 1.36 km to the northwest of Phase 9. The SSSI demonstrates the succession of chalk grassland through juniper scrub to yew woodland and is the best example of this transition in Wiltshire and Hampshire.

3.2 Geological Setting

3.2.1 Background

3.2.1.1 Information concerning the geology of the Study Area has been obtained from:

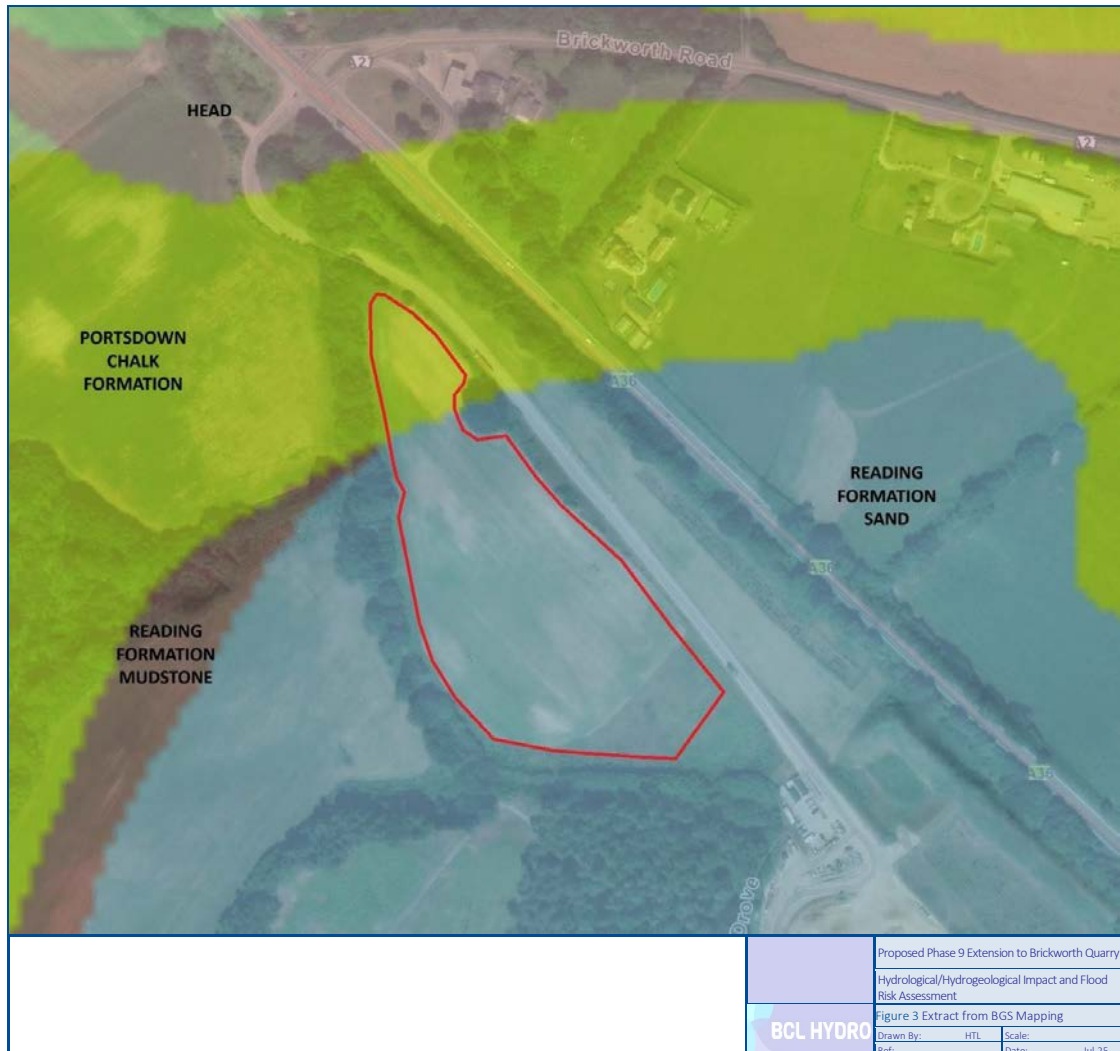
- Published geological mapping, including the British Geological Survey (BGS) on-line Geology Viewer of Britain;
- Site investigation drilling and piezometer installation logs; and,
- Publicly available third-party drilling logs.

3.2.2 Local Geology

- 3.2.2.1 The following information has been drawn from the “Geological Report and Mineral Resource Assessment: Brickworth Quarry Phase 9, Hampshire” prepared by Touchstone Geological Services Limited (TGSL) in June 2025.
- 3.2.2.2 The BGS’s Geology Viewer of Britain indicates that the Site is largely underlain by the Reading Formation sand (economic mineral) of Palaeogene age; this rests upon an undulating bedrock surface formed by the Portsdown Chalk Formation, indeed the Portsdown Chalk Formation is mapped as outcropping in the extreme north of Phase 9 (*figure 3*).
- 3.2.2.3 The Portsdown Chalk Formation has undergone karstic weathering in the geological past and in places, narrow collapse features oriented WNW-ESE have formed into which significant thicknesses of Reading Formation sand have accumulated.
- 3.2.2.4 TGSL supervised the drilling of two piezometers in 2025, one at either end of the proposed Phase 9, and eleven trial pits within the Site.
- 3.2.2.5 The boreholes confirm the undulating surface in the underlying Portsdown Chalk Formation dipping gently from 80 maOD in the north corner to 77 maOD in the southeast corner of the proposed Phase 9.
- 3.2.2.6 The base of the Reading Formation sand was encountered at 68 maOD in the recent piezometer in the south of the Site, which is at approximately the same base level as that found in the ancient karstic collapse features; and it is considered that the southern quarter of the proposed Phase 9 will encounter another of these narrow features.
- 3.2.2.7 The mineral thickness (Reading Formation sand) ranges from 4.0 m (northern and southern ends) to 14.0 m in northern central sections. On average the mineral is 8.0 m thick.

3.2.2.8

The Reading Formation is renowned for its variability due primarily to its depositional setting; the formation was laid down in rapidly alternating, near-coast fluvial, estuarine, and marine environments. Deposits therefore vary from thin, intermittent red-brown clays to clean, yellow and orange-brown sands of variable grade. Boreholes and trial pits demonstrate the sand is of identical quality to that worked in previous and current phases. In summary, the resource is a slightly silty, fine to fine/medium grained sand.



3.3 Hydrological Setting

3.3.1 Background

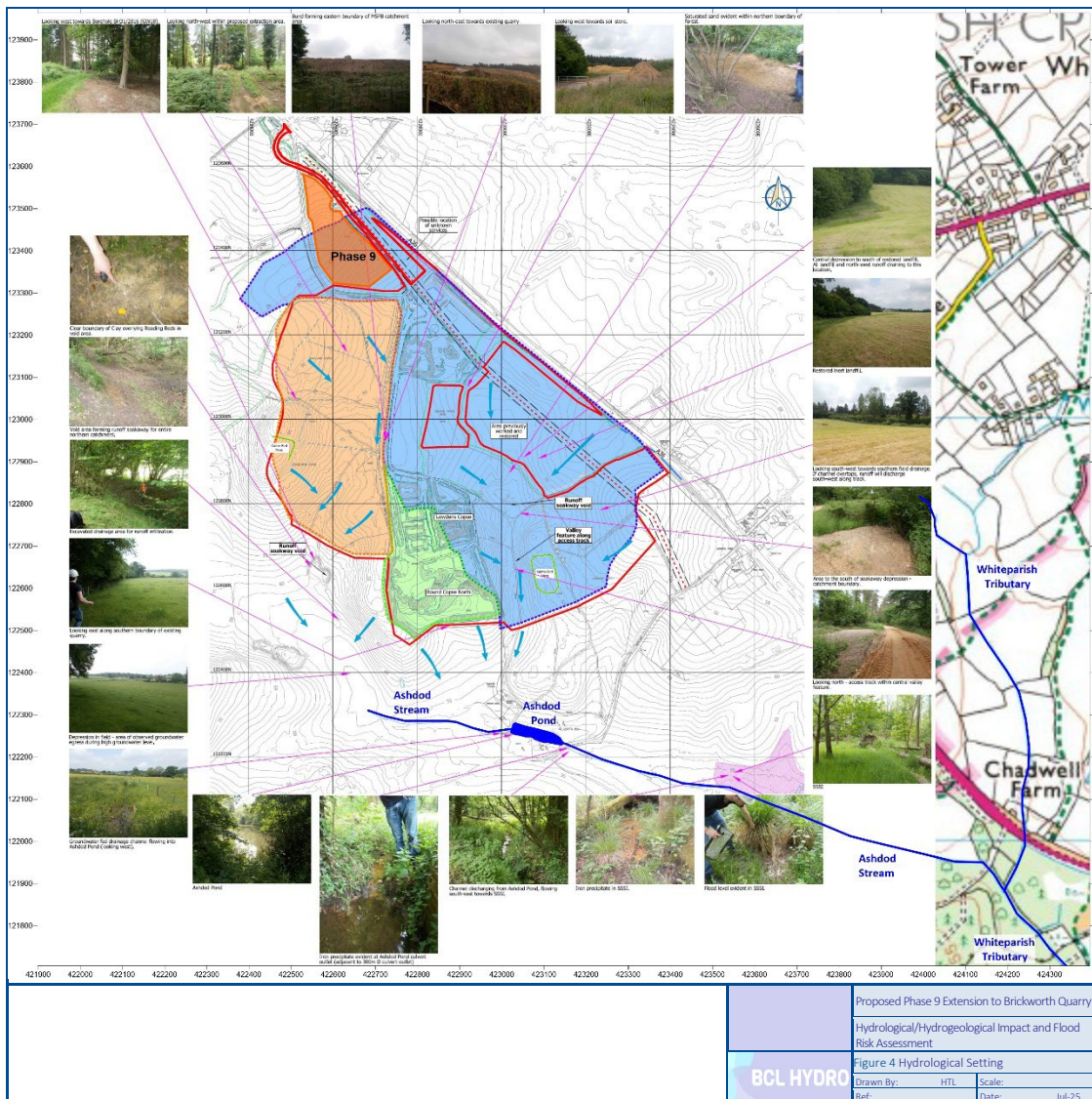
3.3.1.1

Information concerning the hydrology of the Study Area has been obtained from:

- Previous investigations conducted in support of earlier phases of the quarry, in particular “Hydrogeological and Hydrological Environmental Impact Assessment and Flood Risk Assessment for the proposed quarry and inert fill extension areas at Brickworth Quarry”, GWP Consultants LLP (GWP), Report Reference: 160701.v03, September 2016.
- Findings of BCL’s water features monitoring and Site reconnaissance, which was undertaken on 16th September 2021.

- Site specific hydrometric monitoring data, collected by ACS Environmental Testing Limited.
- The Centre for Ecology and Hydrology (CEH), National Rivers Flow Archive (NRFA) web service.
- EA Catchment Data Explorer web service.

3.3.1.2 The hydrological setting of the Site is illustrated upon GWP Drawing No. *BRCKPLAN1607F 2A*, which is reproduced below at *figure 4*.



3.3.2 Catchment Data

3.3.2.1 EA mapping (Catchment Data Explorer) shows that the entire quarry, including Phase 9, is located within the catchment area of Waterbody ID: GB107042016440, referred to as "Whiteparish Tributary". This joins the "Blackwater (Test and Itchen)" Waterbody ID: GB107042016791.

3.3.2.2 Whiteparish Tributary is listed as having "Moderate Ecological Status" in 2022, while "Chemical Status does not require assessment". Chemical Status was previously reported to "Fail" in 2019.

- 3.3.2.3 The failure was attributed to Priority hazardous substances, specifically Perfluorooctane sulphonate (PFOS) and Polybrominated diphenyl ethers (PBDE) together with Mercury and its compounds. This is a nationwide problem reported in all water bodies. No specific industry/activity/sector is held responsible for PBDE and Mercury; and the source of the PFOS is unknown (pending nationwide investigation).
- 3.3.2.4 Reasons for not achieving good status are attributed to high phosphate levels arising from the water industry (sewage discharge). There are no issues flagged up as being caused by mining and quarrying or waste treatment and disposal.
- 3.3.2.5 The EA's Test and Itchen abstraction licensing strategy (March 2019) examines "resource availability status" with respect to surface water features local to the Site. Resource availability is calculated at four different flows, Q95 (lowest), Q70, Q50 and Q30 (highest).
- 3.3.2.6 This indicates that there is "water available for new licensing" in the Whiteparish Tributary catchment area at Q30, Q50 and Q70; but there is "restricted water available" at Q95. Consumptive abstraction is available at least 70% of the time (or 266 days per year).
- 3.3.2.7 The Centre for Ecology and Hydrology (CEH) National Rivers Flow Archive (NRFA) reports flow rates within the Blackwater at Ower (Station Number 42014), which is some 12 km southeast/downstream from the Site.
- 3.3.2.8 The River Blackwater at Ower has a Q10 (high flows exceeded 10% of the time) of 2.96 m³/s; Mean Flow of 1.043 m³/s; Q50 (average flows exceeded 50% of the time) of 0.423 m³/s; and Q95 (low flows exceeded 95% of the time) of 0.143 m³/s with a catchment area of 104.7 km².

3.3.3 Local Watercourses

- 3.3.3.1 The land in the vicinity of Phase 9 is free-draining and characterised by a lack of any mapped surface water features. The closest watercourse is around 1 km to the south of Phase 9.
- 3.3.3.2 The southern half of Phase 9 slopes south-eastwards into the catchment area of MSP A. This catchment area is tinted blue on *figure 4*; and the approved restoration drainage scheme at MSP A was designed to accommodate runoff from this catchment area, including the southern half of Phase 9.
- 3.3.3.3 The approved restoration scheme at MSP A seeks to replicate the greenfield situation. The southerly grading valley feature leads into a soakaway at the southern boundary, which has been designed to deliver natural recharge to the groundwater system during average conditions. However, during periods of heavy rainfall, surplus runoff continues southwards at a controlled rate towards the spring line and stream at 235 m standoff to the south of the Brickworth Quarry (this being the approved means by which to replicate the greenfield situation at MSP A). The stream, referred to as Ashdod Stream, flows in an easterly direction into Ashdod Pond; and then continues in a southeasterly direction to join the Whiteparish Tributary.

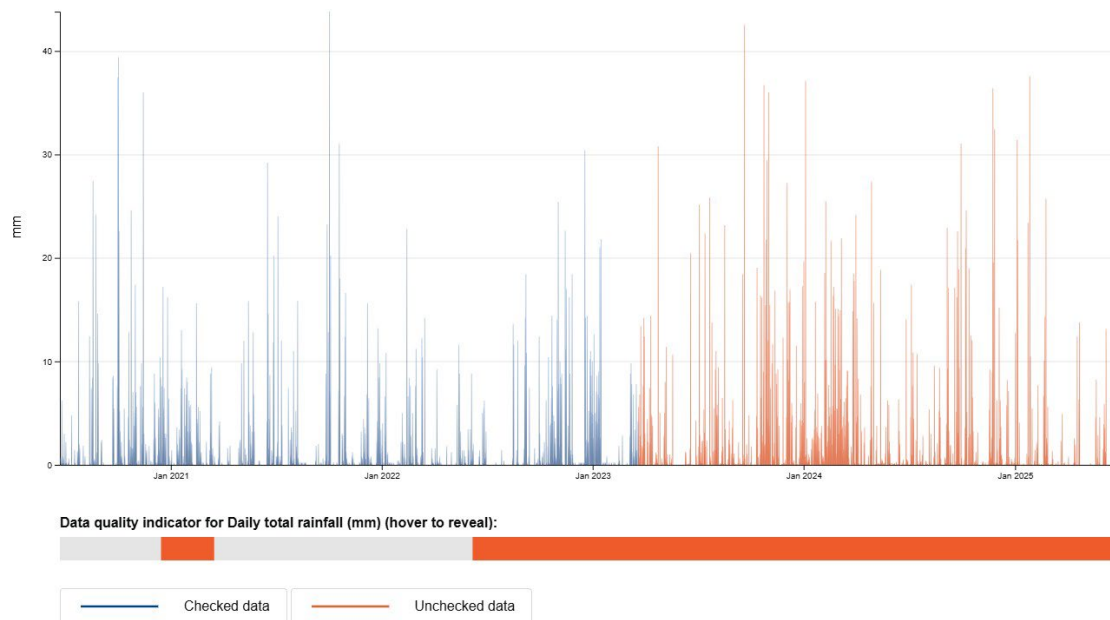
3.3.3.4 The northern half of Phase 9 (outside the tinted blue area on *figure 4*) slopes north-westwards into the woodland strip and agricultural land alongside the A36 road. There is a broad, shallow valley between Brickworth and Whiteparish, which descends from northwest to southeast. The upper reach of the valley floor is dry. The closest stretch of mapped watercourse is c.1.35 km southeast of Phase 9. The spring issues at the head of the tributary are close to the 55 maOD contour line.

3.4 Meteorological Setting

3.4.1 Local Rainfall

3.4.1.1 The EA has supplied rainfall data for the period January 1989 through to present day, recorded at the Testwood gauging station (NGR SU 35447 15066), approximately 15 km southeast of the quarry.

3.4.1.2 A summary chart showing daily rainfall totals for the last 5 years is presented below:



3.4.2 Flood Estimation Handbook (FEH)

3.4.2.1 Storm event data has been obtained from the Flood Estimation Handbook (FEH), with online Web Service (Centre for Ecology & Hydrology 2016, developed by Wallingford HydroSolutions).

3.4.2.2 The FEH data indicates that the long-term annual average rainfall total for the Site and its environs equates to c.826 millimetres per year (mm/yr).

3.4.2.3 The FEH modelling process gives a catchment design rainfall of 56 mm (100-year return period, 6 hours duration).

3.5 Hydrogeological Setting

3.5.1 Background

3.5.1.1 Information concerning the Hydrogeology of the Study Area has been obtained from:

- Findings of walkover field surveys.

- Published geological mapping.
- Site investigation drilling and piezometer installation logs.
- Previous geological / hydrogeological reports for the Site.
- Site specific hydrometric monitoring data.
- Published and third-party data sources.

3.5.2 Regional Setting

3.5.2.1 The Site is located on the Reading Formation (classed as a Secondary A Aquifer), which comprises a sequence of sands and clayey sands varying between 4 and 14 m thick at Phase 9. These are underlain by 120 m thickness of the Upper Chalk. The contact between the two strata is highly variable, both in elevation but also facies type, but is most typically observed at the Site as a 1-2 m thickness of clay-rich sediment. The base of the Reading Formation dips to the south-east.

3.5.2.2 The Chalk is a major regional aquifer (Principal Aquifer) supporting public water supplies and environmental baseflow to springs, streams and wetlands. Regional groundwater flow directions near the Site appear to be variable, with the GWP's Hydrogeological Map (GWP Drawing No. *BRCKPLAN1607F-4-A*) suggesting a groundwater level divide such that there is discharge to the east (River Test) and west (River Avon).

3.5.3 WFD Groundwater Body Designation and Status

3.5.3.1 EA mapping (Catchment Data Explorer) shows that Phase 9 overlies Groundwater Body ID: GB40701G501200, referred to as "*River Test Chalk*".

3.5.3.2 The River Test Chalk is listed as having "Good Quantitative Status" but "Poor Overall Status" in 2019, because of its "Poor Chemical Status".

3.5.3.3 The failure was attributed to "Poor nutrient management" related to "Agriculture and rural land management".

3.5.3.4 The previously worked phases at Brickworth Quarry rest upon Groundwater Body ID: GB40702G503800, referred to as "*Central Hants Lambeth Group*". This is recorded as having "Good Quantitative Status" in 2019; and "Good Chemical Status".

3.5.4 Groundwater Resource Availability

3.5.4.1 Groundwater availability is a measure of how much groundwater is available for abstraction after the river flow requirements for ecology have been met.

3.5.4.2 The EA's Test and Itchen abstraction licensing strategy (March 2019) indicates that there is "restricted groundwater availability" in the Test Chalk. The licensing strategy does not examine water availability in the Central Hants Lambeth Group.

3.5.5 Water Resources Charging Mapping Tool

3.5.5.1 The EA's Water Resources Charging Mapping Tool indicates that the Water Framework Directive (WFD) Status is "Good" at Phase 9; but Water Availability is "Restricted" (Yellow).

3.5.6 Groundwater Vulnerability Zonation

3.5.6.1 DeFRA groundwater vulnerability mapping shows that the economic strata at the Application Area are classified as having “High Vulnerability” with respect to their susceptibility to percolation of contaminants spilled at ground surface.

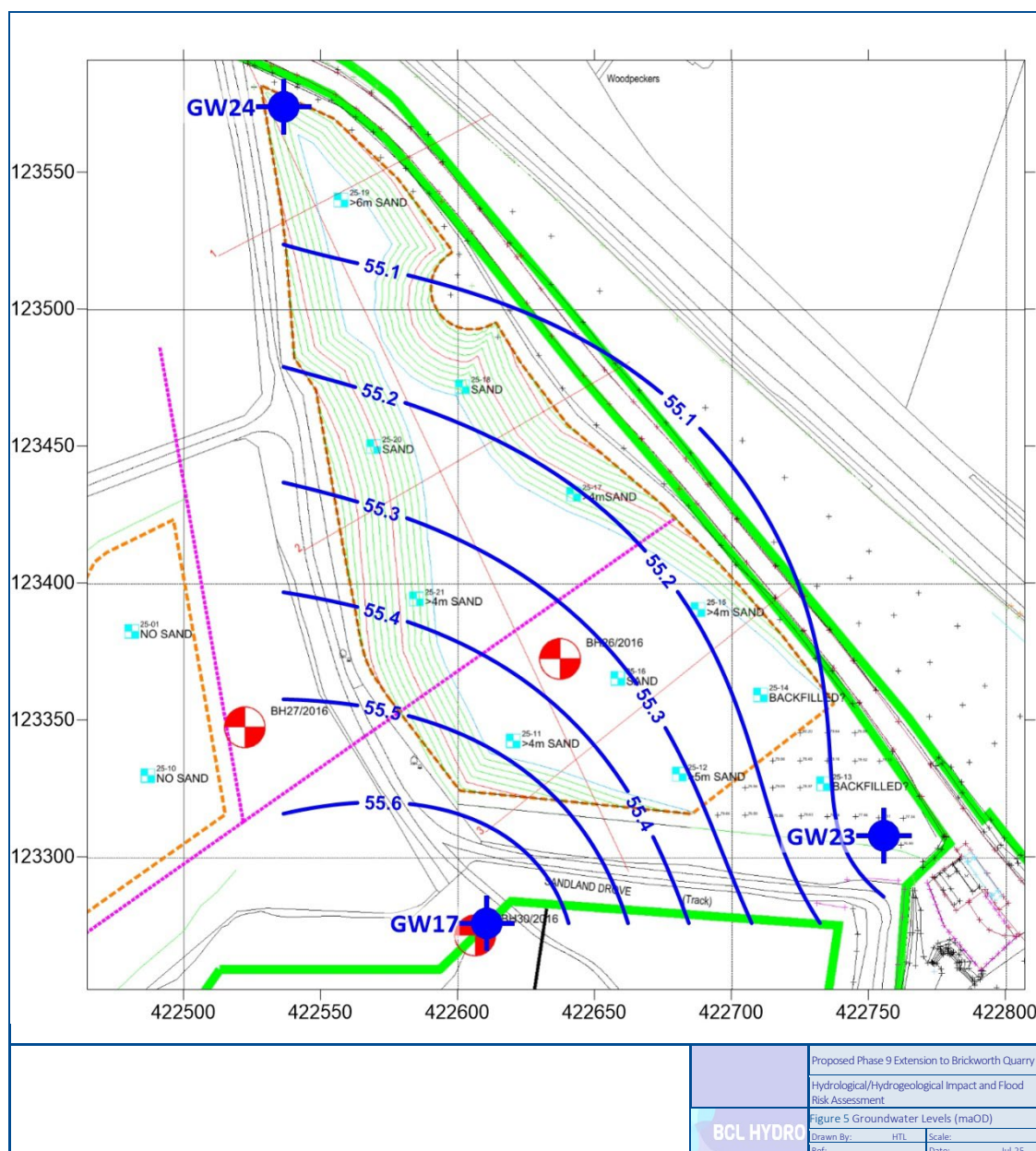
3.5.7 Groundwater Levels

3.5.7.1 TGSL supervised the drilling of two piezometers in 2025: Piezometer GW23 is close to the southeast corner of Phase 9; and Piezometer GW24 is at northern end.

3.5.7.2 Pre-existing Piezometer GW17 (completed in 2016 for an earlier phase of quarrying at MSP B) is located 45 m from the southwest corner of Phase 9.

3.5.7.3 Their locations are shown on *figure 5*.

3.5.7.4 The borehole logs are reproduced at *appendix 2*.



- 3.5.7.5 Based upon data collected in April-May 2025, groundwater levels in the Chalk Aquifer decline from 55.6 maOD at the southwest corner of Phase 9 down to 55.0 maOD at the northern and eastern corners (with a hydraulic gradient of 0.003), as illustrated upon *figure 5*. The groundwater flow direction is in a north-easterly direction towards the River Test, which passes 10 km to the east of the Site.
- 3.5.7.6 Having been installed in 2016, Piezometer GW17 gives an indication of longer-term variations in groundwater level. The peak reading at GW17 is c.59 maOD; and the minimum groundwater level is c.49 maOD. Thus, it is evident that the levels observed in April-May 2025 are slightly above average conditions.
- 3.5.7.7 The boreholes confirm the undulating surface in the Portsdown Chalk Formation is dipping gently from 80 maOD in the north corner to 77 maOD in the southeast corner of Phase 9. The base of the Reading Formation sand was encountered at 68 maOD in the recent piezometer in the south of the Site. The base of the quarry workings will extend down to 75 maOD. Therefore, during peak groundwater level conditions, there is c.16 m thickness of unsaturated Chalk lying below the base of the proposed workings.

3.5.8 Aquifer Parameters

- 3.5.8.1 Infiltration testing has previously been conducted at Brickworth Quarry to quantify the soakaway capacity of the Reading Formation sand.
- 3.5.8.2 Full details are given in the Technical Note: Infiltration Testing with respect to Condition 20 of Planning Permission 19/00380/WCM, prepared by BCL in October 2020.
- 3.5.8.3 The worst-case result arising from the soakaway tests was 0.007 m/hr; and the average infiltration rate in the final tests was 0.012 m/hr.
- 3.5.8.4 The hydraulic conductivity of the Chalk aquifer has been calculated from transmissivity values in the BGS Aquifer Properties Manual, using data from the closest 3 boreholes in Upper Chalk; and equates to 2.57×10^{-5} m/s (equivalent to 2.22 m/d).
- 3.5.8.5 Full details are presented in previous work completed on Site: “Extending into Area B at Brickworth Quarry: Application to vary Environmental Permit for Inert Landfilling: Hydrogeological Risk Assessment” (Permit Application Reference: EPR/FB3508GN) prepared by BCL in October 2021.

3.5.9 Groundwater Quality

- 3.5.9.1 GWP’s report (September 2016) included a full review of the groundwater quality data collected at Brickworth Quarry during the baseline period prior to the placement of inert waste in RCN, LC, MSP A and MSP B. A summary of GWP’s findings is reproduced below.
- 3.5.9.2 The data were compared with the Environmental Quality Standards ‘EQS’ (note where EQS standards were not available, Drinking Water Standards ‘DWS’ or World Health Organisation Standards ‘WHO’ were used, in order of preference).
- 3.5.9.3 Average and maximum chemical levels for Manganese exceeded the standard of 30 ug/l provided by EQS in all boreholes, which suggests that levels of Manganese in groundwater are high across the whole site.

- 3.5.9.4 Maximum chemical levels of Iron also exceeded the standard of 1000 ug/l provided by EQS across all boreholes.
- 3.5.9.5 It was postulated that the elevated concentrations of iron and manganese were due to rainfall percolation through the Reading Formation before entering the Chalk aquifer.
- 3.5.9.6 Elevated nitrates were assumed to have an agricultural origin. The baseline readings for Total Oxidised Nitrogen were typically above the standard of 11 mg/l provided by WHO. There were also spikes in Biochemical Oxygen Demand and Chemical Oxygen Demand at most locations across the monitoring network.
- 3.5.9.7 During the baseline period, GW7 recorded maximum values for Chromium that were above the specified quality standard, and GW8 recorded a maximum value of Potassium that again exceeded the standard.
- 3.5.9.8 GW12 and GW13 both recorded much greater numbers of maximum chemical values that exceeded the specified standard, with Chromium, Copper, Mercury and Iron for GW12; and Cadmium, Copper, Iron, Lead and Mercury for GW13. In GW13, the average chemical value for Lead also exceeded the standard of 25 ug/l provided by EQS.
- 3.5.9.9 The presence of Cadmium and Mercury were attributed to an anthropogenic source, whereas the other trace metals were thought to be due to dissolution of metals within the Reading Formation. GWP suggested that the Cadmium and Mercury may have come from a historical tip in Whiteparish (GWP Drawing No. *BRCKPLAN1607F-12-A*).
- 3.5.9.10 BCL's Hydrogeological Risk Assessment (HRA), which was prepared in October 2021 to accompany the application to vary the Site's Environmental Permit, provided the following summary table for Background Water Quality:

Table 7b: HRA Model Parameterisation: Background Water Quality		
Parameter	Value	Justification
Ammoniacal Nitrogen	T: 0.01, 0.067, 0.2	Background water quality is set using minimum, average and maximum data recorded at GW8, GW11 and GW13 from baseline data in <i>Reference 1</i>
Chromium	T: 0.0005, 0.00198, 0.0025	
Copper	T: 0.0005, 0.0022, 0.0025	
Mercury	U: 0.0001, 0.0005	
Nickel	T: 0.0025, 0.0056, 0.014	
Lead	T: 0.0005, 0.00227, 0.009	
Zinc	T: 0.001, 0.0054, 0.017	
Chloride	T: 19.8, 23.3, 25.8	
Sulphate	T: 7.6, 14.34, 26.7	
All units are mg/l.		
T: X, Y, Z: Triangular parameter distribution assumed; X, Y, Z representing bounding lower, mid and upper model values.		
U: X, Y: Uniform parameter distribution along a range with minima ad maxima described by X & Y.		

- 3.5.9.11 Groundwater samples for Phase 9 were collected from the Chalk aquifer at GW23 and GW24 on 7th April 2025. The laboratory certificates are reproduced at *appendix 3*.
- 3.5.9.12 The only data falling outside the range given in Table 7b were the readings for Copper (0.00387 mg/l) and Zinc (0.03237 mg/l).
- 3.5.9.13 It is noteworthy that higher spikes in Copper (0.180 mg/l) and Zinc (0.152 mg/l) were recorded at GW12 and GW11 (respectively) during the baseline period prior to the placement of inert waste in RCN, LC, MSP A and MSP B.

3.6 Water Resources Setting

3.6.1 Source Protection Zones

3.6.1.1 Source Protection Zones (SPZs) are allocated in line with the following classifications:

- SPZ1: Inner Zone – 50 day travel time to source, minimum 50m radius.
- SPZ2: Outer Zone – 400 day travel time to source, minimum radius 250 – 500m (depending upon scale of abstraction).
- SPZ3: Total Catchment – Area within which all groundwaters are ultimately assumed to contribute to the source.

3.6.1.2 The Chalk aquifer beneath Phase 9 forms part of a Total Catchment (SPZ 3) for the Hale boreholes public water supply lying 8 km to the southwest of the Site. On this evidence, the groundwater at Phase 9 would be expected to be drawn towards the licensed boreholes and therefore flow towards the southwest. However, the SPZ mapping is not supported by the piezometer data that has been collected at Phase 9, which indicates that the groundwater flow direction is to the northeast *i.e.* the opposite direction.

3.6.2 Local Water Supplies

3.6.2.1 During previous investigations relating to the application for (and variation of) the Site's Environmental Permit, two private water supplies were identified within 2 km of the Site (GWP Drawing No. *BRCKPLAN1607F-6-A*):

- Glendale Farm (2 km to the southeast of Phase 9).
- Newhouse (2 km to the south-southwest of Phase 9).

3.6.2.2 These water supplies are considered to be down gradient of the inert landfill in RCN, LC, MSP A and MSP B; and compared with Phase 9 (where the standoff is 2 km), they are in closer proximity to the existing landfill (1.1 km and 1.4 km standoff to Glendale Farm and Newhouse respectively). The risk to these water supplies is addressed by the Environmental Permit.

3.7 Landfill Sites

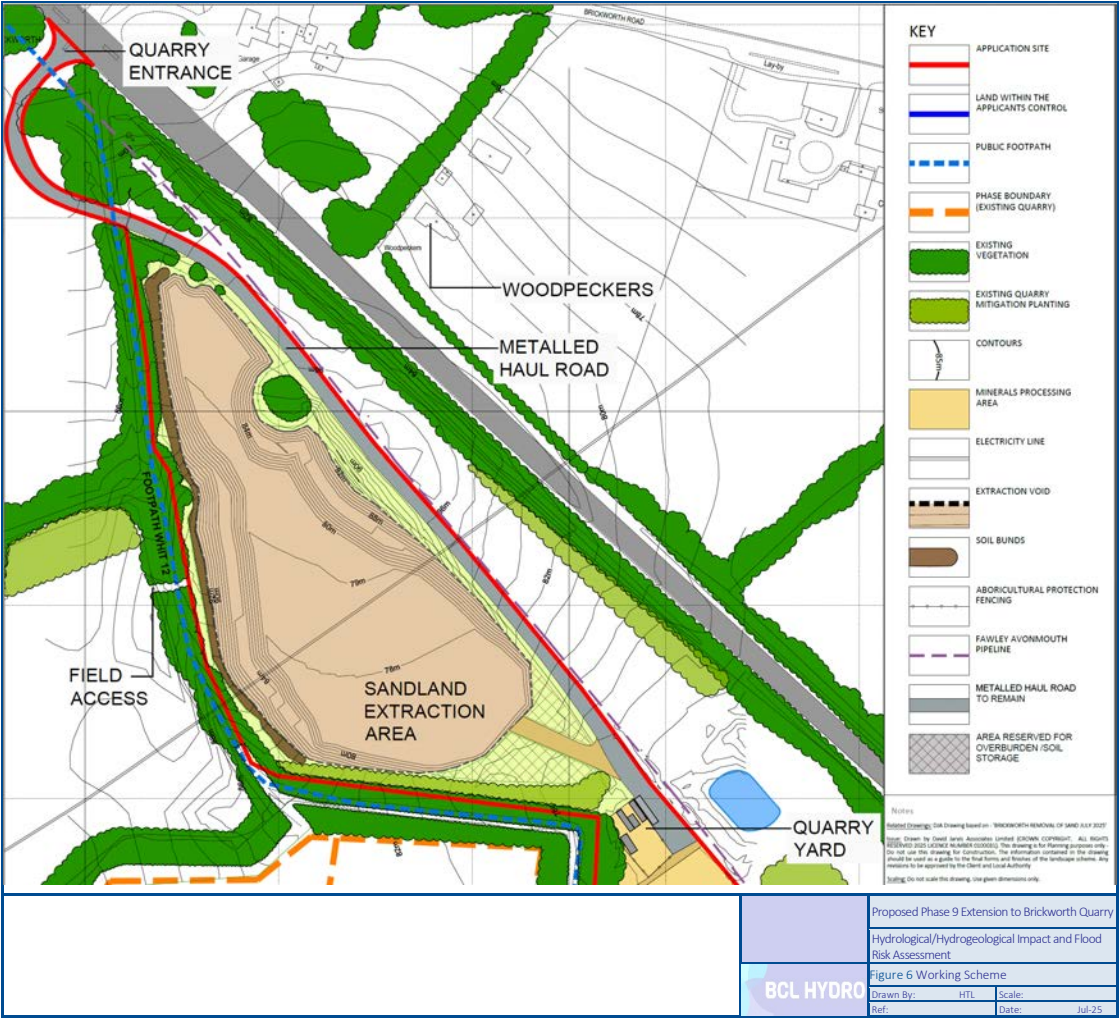
3.7.1 As outlined above, previous operational phases at Brickworth Quarry (RCN, LC, MSP A and MSP B) have been or are undergoing restoration by placement of inert landfill.

3.7.2 The inert landfill at MSP B is adjacent to the southern margin of Phase 9.

3.7.3 The historical tip in Whiteparish (GWP Drawing No. *BRCKPLAN1607F-12-A*) is c.500 m to the southeast of Phase 9.

4 THE PROPOSED DEVELOPMENT

- 4.1 Exploration drilling and geological modelling of the proposed Phase 9 at Brickworth Quarry has proved a resource of 210,000 saleable tonnes of sand (131,250 m³) resting beneath an overburden of 24,000 m³.
- 4.2 The following parameters have been assumed:
- Batter angles of minimum 1v:1.5h through both overburden and mineral.
 - A conversion factor of 1.6 tonnes/m³ for the mineral.
 - A waste factor of 20% to account for inherent silt and thin silt/clay interburdens.
 - A basal standoff of 0.1 m to avoid basal clay contamination.
- 4.3 Full details are given in the “Geological Report and Mineral Resource Assessment: Brickworth Quarry Phase 9, Hampshire” prepared by TGSL in June 2025.
- 4.4 It is anticipated that mineral output will be approximately 140,000 tonnes per annum, therefore it would take approximately 18 months to complete mineral extraction in Phase 9.
- 4.5 Upon completion of mineral working and exhaustion of the reserve, Site-derived clay waste will be placed to form the geological barrier required to form the tipping cell for inert waste acceptance.
- 4.6 Inert materials would subsequently be imported for backfill of the void and restoration of the land to a combination of agriculture and nature conservation; this would take a further two years following exhaustion of mineral reserves.
- 4.7 Inert waste is waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter that it comes into contact with, in a way likely to cause environmental pollution or harm to human health (<https://www.gov.uk/guidance/landfill-operators-environmental-permits/landfills-for-inert-waste>).
- 4.8 It is envisaged that temporary planning permission will be required until autumn 2030 to complete these works.
- 4.9 A site layout/working plan and excavation design is shown in accompanying Drawing No. *3404-5-2-DR-0003-P3_WORKING SCHEME*, reproduced overleaf:



5 IMPACT ASSESSMENT & MITIGATION MEASURES

5.1 Background

- 5.1.1 Assessment has facilitated the conceptualisation of the extant groundwater and surface water regimes operating within and around the Site.
- 5.1.2 This understanding has been utilised to inform assessment of the potential impacts that may be posed by the Proposed Development upon the water environment.
- 5.1.3 Where significant potential for adverse impact is identified, recommendations for specific mitigation measures are proposed.
- 5.1.4 Both specific mitigation measures and those incorporated into the design of the Proposed Development are described in this section of the report.

5.2 Generic Potential Impacts

5.2.1 Direct Impacts

- 5.2.1.1 As is typical of the majority of operations of this type and scale, the Proposed Development has the potential to impact upon the water environment in the following direct ways:
- Potential for impact upon groundwater levels and flows;
 - Potential for impact upon surface water levels and flows;
 - Potential for derogation of groundwater quality;
 - Potential for derogation of surface water quality, and;
 - Potential for the exacerbation of extant flood risk.

5.2.2 Indirect Impacts

- 5.2.2.1 The direct impacts outlined above may lead, in-turn, to indirect impacts upon:
- Potential for indirect derogation of surface water flow rates and / or waterbodies;
 - Potential for indirect impact upon the volume of groundwater and / or surface water available to existing abstractions;
 - Potential for indirect impact upon the quality of groundwater and / or surface water available to existing abstractions;
 - Potential impact upon floral and / or faunal habitats as a result of flow / quality derogation within surface watercourses / wetland areas.

5.3 Groundwater Levels and Flows

- 5.3.1 The base of the quarry workings will extend down to 75 maOD.
- 5.3.2 Based upon data collected in April-May 2025, groundwater levels in the Chalk Aquifer decline from 55.6 maOD at the southwest corner of Phase 9 down to 55.0 maOD at the northern and eastern corners (*figure 5*).
- 5.3.3 Having been installed in 2016, Piezometer GW17 gives an indication of longer-term variations in groundwater level. The peak reading at GW17 is c.59 maOD.

- 5.3.4 The proposed floor depth is 16 m above peak groundwater levels. It is concluded that there will be no risk of intercepting the watertable during the operational life of the quarry.

5.4 Groundwater Quality

5.4.1 Risk of mobilising contaminants from Previous Phases of Inert Landfill

- 5.4.1.1 There will be no dewatering at Phase 9.
- 5.4.1.2 The proposed development would not pose any risk of drawdown-related mobilisation of landfill-derived contaminants within the groundwater system.
- 5.4.1.3 The groundwater chemistry data being collected and submitted to the EA in support of the Environmental Permit for the Landfill should provide sufficient evidence to prove that the performance of the landfill liner is in compliance with the standards required to protect groundwater quality and to prevent contamination of the Chalk aquifer.

5.4.2 Accidental Spillages / Undetected Long-Term Leakage of Potential Contaminants

- 5.4.2.1 Significant volumes of potential contaminants associated with the quarrying element of the Proposed Development will be limited to refined petroleum hydrocarbons, comprising diesel fuel, lubricating and hydraulic oils serving mobile and fixed plant.
- 5.4.2.2 Quarrying is a historic and current activity at the wider Site, workings within the Proposed Development will be carried out in an equivalent manner and within the same hydrostratigraphic environment as these historic and current operations.
- 5.4.2.3 Therefore, the potential scale, likelihood of occurrence, or consequences of groundwater contamination by accidental spillage or long-term undetected leakage of hydrocarbons used in quarrying operations will not, in principle, be materially increased as a result of the working of the Proposed Development.
- 5.4.2.4 Furthermore, these factors and the extent to which they apply to the Proposed Development are identical to those associated with numerous similar operations situated throughout the region.
- 5.4.2.5 Notwithstanding this, should either accidental spillage or long-term undetected leakage of sufficient volumes of hydrocarbons used within quarrying operations occur, this has the potential to cause an adverse primary impact upon existing groundwater quality.

5.4.3 Fluids Handling Protocol

- 5.4.3.1 The operation of mobile and fixed plant presents a risk that pollutants may enter groundwater as a result of hydrocarbon spillage or leakage on Site.
- 5.4.3.2 The only practicable means by which this risk may be satisfactorily mitigated during the operational phase of development are:
- Precautionary measures to prevent of the release of potentially contaminating fluids in the first instance, and;
 - Adoption of contingency measures for treatment of such releases should they occur.

5.4.3.3 In recognition of the potential for groundwater quality derogation and consequent potential for secondary impacts to occur as a result of hydrocarbon contamination, a number of measures to minimise these risks have been put in place at the quarry and will continue to be implemented, as follows:

- Fuel-oil powered mobile plant shall be restricted to that necessary to undertake mineral extraction, remedial measures and subsequent restoration of the Site;
- Refuelling and maintenance of machinery will be carried out in accordance with the requirements of the Applicant's Environmental Management System governing operations at the Site. Such operations will only be carried out by trained personnel and take place within a surfaced area;
- All oil storage tanks will be sited upon impermeable bases enclosed by oil-tight walls. Each enclosure shall provide a retention volume of at least 110% of the capacity of the oil tank it serves and be maintained free of significant accumulations of rainwater;
- All fill and draw pipes emanating from oil storage tanks should be provided with locking mechanisms and be contained within the impermeable enclosure;
- No refuelling or maintenance should be carried out in areas of mineral working;
- Operators shall check their vehicles on a daily basis before starting work to confirm the absence of leakages and a reporting system be observed to ensure that repairs are undertaken to that vehicle before it enters the working area;
- Oil sorbent material (3M Oil-Sorb or similar) will be made available on Site to cope with a loss equal to the total fluid content of the largest item of plant. Following the use of such oil sorbent material, any contaminated materials would be disposed of from Site in accordance with current waste disposal legislation; and
- Hydraulic & fuel oil lines on all plant operated within the extraction areas shall be renewed at the manufacturer's recommended service intervals to minimise the potential for contamination following failure of hoses or lines.

5.4.3.4 These measures have been incorporated into the fluids handling protocol, presented here at *appendix 4*.

5.4.3.5 Assuming continued adoption of the recommended measures, the risks to groundwater and surface water quality in this regard are considered to be no greater than apply to operations currently undertaken at the Site or other similar quarries present throughout the region.

5.4.3.6 It is considered that the potential for contamination of groundwater by hydrocarbons present within the Proposed Development may be reasonably and satisfactorily mitigated by adhering to the measures outlined above.

5.4.3.7 Therefore, significant residual impacts are not anticipated with respect to these potential impacts.

5.4.4 Inert Landfill Operations at Phase 9

5.4.4.1 The materials to be imported for restoration of Phase 9 will be inert and therefore not form a significant potential contaminant source.

- 5.4.4.2 This aspect of the development proposal (*i.e.* the infilling of Phase 9 with restoration materials) will be subject to a separate Environmental Permitting application to be made to the EA.
- 5.4.4.3 The Environmental Permit application will be supported by a Hydrogeological Risk Assessment (HRA) that will be conducted in accordance with prevailing EA technical requirements.
- 5.4.4.4 The HRA will examine the containment and monitoring requirements necessary to ensure that the infilling can proceed without posing unacceptable risk to the water environment.
- 5.4.4.5 It will also specify a programme of groundwater quality monitoring and assessment (via formal and enforceable control and compliance limits) to ensure appropriate data is collected to allow confirmation and / or design and implementation of any remedial measures that may be required.
- 5.4.4.6 The Environmental Permit, if granted, will draw from the findings of the HRA and associated permit application reports to stipulate conditions to ensure that:
- All incoming restoration materials will be subject to inspection and segregation prior to use for infilling. Any materials requiring testing (such as potentially contaminated soils) will be assessed in accordance with formalised and enforceable Waste Acceptance Criteria (WAC) to ensure that they are truly classed as inert materials before being accepted for infilling;
 - In the eventuality that a load of unacceptable imported restoration material has to be stored temporarily on Site, it will be necessary to ensure that any rainfall-generated leachate from this material does not result in unacceptable quantities or quality of runoff. This would be achieved by provision of a bunded storage area (with an impermeable base and sides) to contain any leachate from temporary storage of a rogue load. Both the unacceptable restoration materials and any leachate will be removed as soon as practicable for appropriate permitted disposal. A series of sealed containers will be provided for temporary containment of small quantities of unacceptable materials prior to disposal off-site in accordance with prevailing regulatory requirements. Both the bunded storage area and the sealed containers will be placed at the Plant Site and not within the void. These risks are typically addressed by a Planning Condition of the form: *"No materials intended for restoration shall be received at the site until a bunded facility for the receipt those materials found to be unacceptable after delivery has been provided within the plant site area, in accordance with details which shall be submitted to and approved in writing by the Mineral Planning Authority"*;
 - The proposed restoration will be undertaken in accordance with EA Permit. The permitting process will determine what lining may be required. In accordance with prevailing regulation, this liner will provide the containment necessary to reduce the risk of contamination of groundwater to an acceptable level.
- 5.4.4.7 Assuming correct specification and construction of the lining system, the imported restoration materials will not unacceptably impact upon the water environment.

- 5.4.4.8 This will be demonstrated with a programme of monitoring of groundwater level and quality stipulated by the Environmental Permit.
- 5.4.4.9 The purpose of this monitoring is to record the baseline condition and to detect any impacts on water quality or level, should they occur.
- 5.4.4.10 The selection of Groundwater Compliance Points and the derivation of groundwater quality Compliance Limits will be covered by the Permitting process.
- 5.4.4.11 Adherence to the measures identified by the formal assessments accompanying the Environmental Permit application will provide appropriate safeguarding of groundwater quality in relation to the infilling aspect of the Application.

5.5 Surface Water Levels and Flow

- 5.5.1 As detailed at *section 3.3*, the land in the vicinity of Phase 9 is free-draining and characterised by a lack of any mapped surface water features. The closest watercourse is 1 km to the south of Phase 9.
- 5.5.2 The free-draining nature of the strata beneath the floor of the quarry means that incident rainfall will continue to recharge the aquifer and provide groundwater baseflow to the nearest surface water features.
- 5.5.3 Compared with current land use (agricultural fields), the rate of recharge by effective rainfall will be marginally higher during mineral extraction when the extension area is dominated by bare ground rather than crops/grass cover. At restoration, the land will be returned to agricultural use; therefore, recharge rates will be very similar to present day. It is considered that there is no risk of any reduction in baseflow to the surface water features; meaning that there will be no depletion in flow or decline in levels.
- 5.5.4 There will be no dewatering in the extension area; therefore, there is no risk of drawdown-related impact at any local surface water features.
- 5.5.5 Notwithstanding this, local groundwater levels will continue to be monitored using the network of piezometers installed at the Site.

5.6 Surface Water Quality

- 5.6.1 When screening bunds are being constructed upon the perimeter of the Site, there is a risk of silt-laden runoff draining from the outer slopes of the screening bank and entering roadside ditches *etc*. This risk will be mitigated by erecting silt fencing at the toe of the outer slope of the screening bund when it is under construction. On each new section of the screening bund, this silt fencing would be left in place until the slope was seeded and fully-vegetated.
- 5.6.2 Any silt-laden runoff will collect at the lowest point in the working area and discharge by passive soakaway (relying upon the infiltration capacity of the surrounding strata). The safe management of storm runoff is detailed in *section 5.8.7*.
- 5.6.3 The suspended solids will settle out on the quarry floor or be filtered out in the underlying sand and gravel. There is no risk of overflow/transfer of suspended solids from the working area into the local watercourses. The closest watercourse is 1 km to the south of Phase 9.

- 5.6.4 As explained in *section 5.4*, in the unlikely event of an accidental spillage or long-term undetected leakage of sufficient volumes of hydrocarbons used within quarrying operations, this would have the potential to cause an adverse primary impact upon existing groundwater quality in the Chalk Aquifer.
- 5.6.5 With baseflow linkage to the River Test, there is a risk of secondary impact upon surface water quality.
- 5.6.6 The potential for contamination of the groundwater pathway at the Site by hydrocarbons will be limited by adhering to the measures for the protection of groundwater quality described previously at *section 5.4*.
- 5.6.7 These measures are precautionary and are intended to minimise the potential for spillages and leaks in the first instance; and also to provide reactive procedures for the managed containment and safe disposal of such spillages should they occur.
- 5.6.8 It is considered that implementation of the measures advanced in *section 5.4* (protection of groundwater quality) will appropriately serve to prevent the derogation of surface water quality.
- 5.6.9 The restoration of Phase 9 will be achieved by importing soils and inert infill materials; which therefore should not form a significant potential contaminant source.
- 5.6.10 This aspect of the development proposal (*i.e.* the infilling of the Site with restoration materials) will be subject to a separate Environmental Permitting application to be made to the EA.
- 5.6.11 Assuming correct specification and construction of the lining system, the imported restoration materials will not unacceptably impact upon baseflow contribution to the surface water environment.
- 5.6.12 Adherence to the measures identified by the formal assessments accompanying the Environmental Permit application will provide appropriate safeguarding of surface water quality in relation to the infilling aspect of the Application.
- 5.6.13 Therefore, significant residual impacts are not anticipated with respect to these potential impacts.

5.7 Water Supplies

- 5.7.1 The Chalk aquifer beneath Phase 9 forms part of a Total Catchment (SPZ 3) for a licensed abstraction (public water supply boreholes) lying 8 km to the southwest of the Site.
- 5.7.2 On the evidence of the SPZ mapping, the groundwater at Phase 9 would be expected to be drawn towards the licensed borehole and therefore flow towards the southwest. However, the SPZ mapping is not supported by the site-specific piezometer data collected at Phase 9, which indicates that the groundwater flow direction is to the northeast *i.e.* the opposite direction.
- 5.7.3 Two private water supplies were identified at 2 km standoff to the southeast and south-southwest of Phase 9 (GWP Drawing No. *BRCKPLAN1607F-6-A*). They do not lie on the northeasterly flow path indicated by the piezometer data.

- 5.7.4 Water quality at local water supplies will be safeguarded by the same measures specified in *section 5.4*.
- 5.7.5 There will be no dewatering in the extension area; therefore, there is no risk of drawdown-related impact at these water supplies.

5.8 Flood Risk

5.8.1 Background

- 5.8.1.1 The National Planning Policy Framework¹ states that a site-specific Flood Risk Assessment (FRA) is required for “*any planning proposals of 1 hectare or greater in Flood Zone 1 (FRZ 1: i.e. outside the 1:1,000-year flood envelope); all proposals for new development (including minor development and change of use) in Flood Zones 2 (FRZ2: 1:1,000-yr to 1:100-yr) and 3 (<1:100-yr)*”.

- 5.8.1.2 As the area of the Proposed Development exceeds 1 ha, it falls within the scope of NPPF requirements regarding the need for Site-Specific FRA on scale alone.

5.8.2 Scope of FRA

- 5.8.2.1 Assessment has included:

- An appraisal of the availability and adequacy of existing information;
- Assessment of the flood risk posed to the Site;
- A quantitative appraisal of the potential impact of the development on flood risk elsewhere, and;
- Where appropriate, and based upon the findings of the above, consideration of possible measures to reduce flood risk to acceptable levels.

5.8.3 Historic Flooding

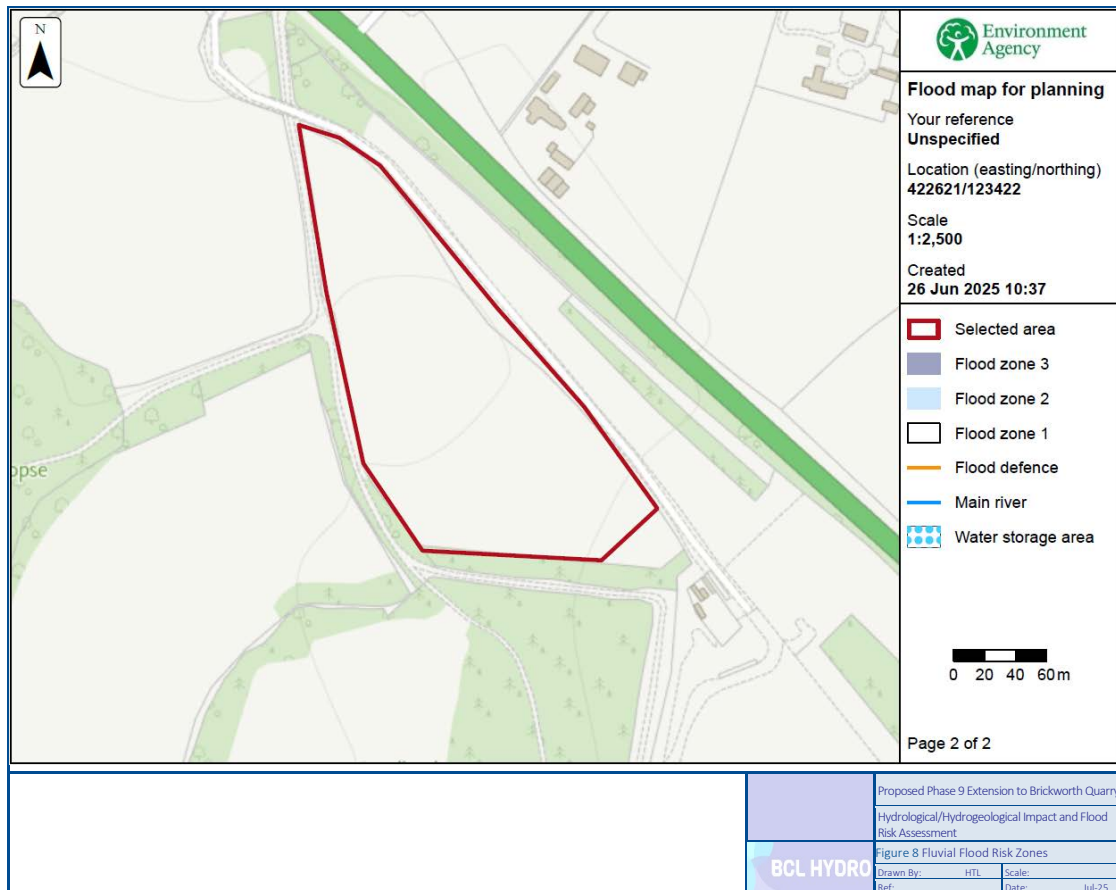
- 5.8.3.1 The Historic Flood Map published by the EA (Last updated: 22 August 2025) shows the maximum extent of individual Recorded Flood Outlines from river, the sea and groundwater springs that meet set criteria. It shows areas of land that have previously been subject to flooding in England.

- 5.8.3.2 There is no mapped record of any historic flooding in the vicinity of the Application Site.

5.8.4 Fluvial Flood Risk

- 5.8.4.1 The prevailing risk of fluvial flooding across the Study Area is presented at *figure 7*.

¹ “National Planning Policy Framework” (NPPF: Ministry of Housing, Communities and Local Government, July 2021).



5.8.4.2 EA Flood Risk mapping² defines prevailing flood risk through application of 3 no. Flood Risk Zones (FRZ) as below:

- FRZ1: Annual Exceedance Probability (AEP) of <0.001 (0.1% or less probability of flooding in any given year, return period 1 in 1,000 years or less likely). Applied to all areas not designated as FRZ2 or FRZ3.
- FRZ2: AEP of between 0.001 and 0.01 (between 0.1% and 1% probability of flooding in any given year, return period of between 1 in 1,000 years and 1 in 100 years).
- FRZ3: AEP of >0.01 (1% or greater probability of flooding in any given year, return period of 1 in 100 years or more likely).

5.8.4.3 The entirety of the Application Area is located within Flood Risk Zone 1 (FRZ1), which is land having less than 1 in 1,000 annual probability of fluvial flooding (*i.e.* lowest risk).

5.8.4.4 The closest stretch of floodplain is in the fields above the source of Ashdod Stream, some 900 m to the south of Phase 9, where ground level is at 55-60 maOD *i.e.* more than 15 m below ground level at the Site.

5.8.4.5 According to Annex 3 of PPG, the Flood Risk Vulnerability Classification for “Sand and Gravel Working” is defined as “Water-compatible”; and “Landfill” is deemed to be “More vulnerable”.

² <https://flood-map-for-planning.service.gov.uk/>.

5.8.4.6 Table 2 of PPG (reproduced below) indicates that the Proposed Development can be undertaken within Flood Risk Zones 1 and 2.

Table 1 Extract from Table 2 of PPG

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*
Key:					
✓ Development is appropriate					
✗ Development should not be permitted.					

5.8.5 Sequential Test and Exception Test

5.8.5.1 The general approach in relation to the sequential test is to keep development out of medium and high-risk areas.

5.8.5.2 As explained above, the Application Area falls entirely within Flood Zone 1 (lowest risk).

5.8.5.3 Accordingly, it is considered that the sequential test has been applied at site level as indicated by the NPPF.

5.8.5.4 It is therefore considered that the Sequential Test is passed.

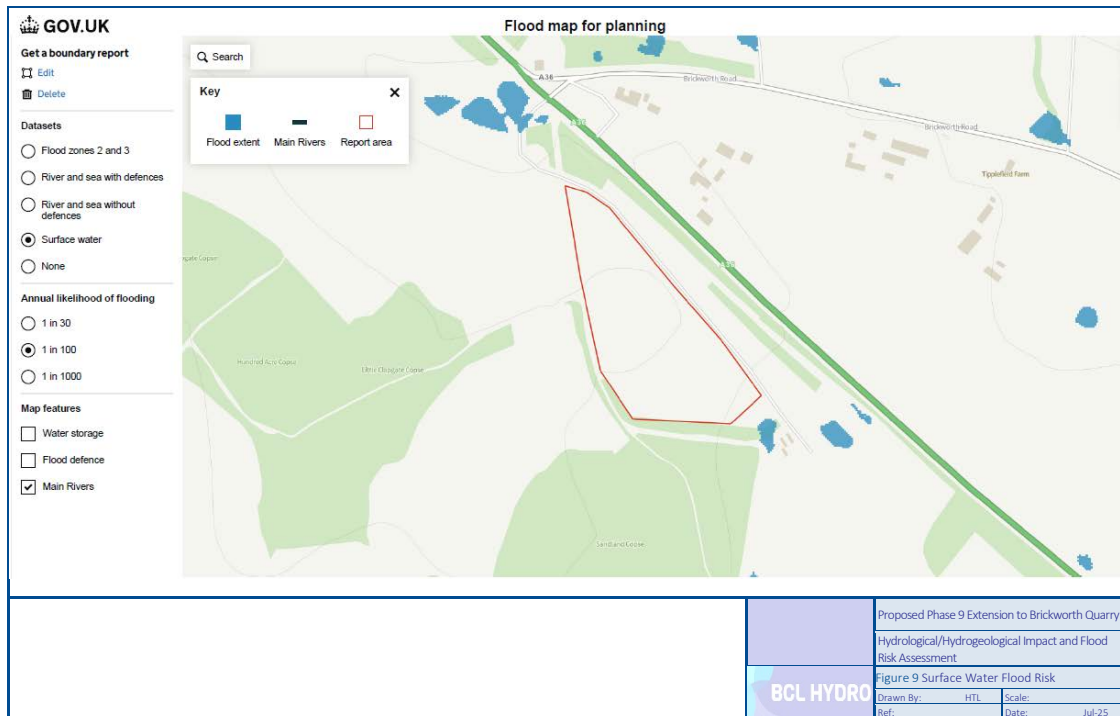
5.8.5.5 There is no requirement to apply the “exception test” in this instance.

5.8.6 Surface Water Flooding

5.8.6.1 There is considered to be negligible potential for significant flooding of the Proposal Site from rainfall runoff from adjacent lands.

5.8.6.2 *Figure 8* (overleaf) shows areas with 1 in 100 annual likelihood of flooding by surface water.

5.8.6.3 The proposed extraction boundary at Phase 9 does not overlap with any areas that are mapped as being at risk of surface water flooding.



5.8.6.4 A sufficiently severe pluvial event could theoretically result in an interruption in quarry operation, due to ponding of water on the quarry floor.

5.8.6.5 The likelihood of such problems is dependent not only on climatic conditions, but also when such a storm occurs and how robust the quarry management systems are and the level of risk that the operator wishes to take (*e.g.* it may be more cost effective to cease work for a small amount of time rather than incorporate an expensive water management system into the operational design).

5.8.6.6 In reality, the storage volume available at the base of the quarry, within the sumps and other localised depressions is considerable. As a result of this, the probability of a disruption to quarry operation is judged to be “Very Low” to “Low”. Any disruption that did occur would also almost certainly be very short in duration as it would probably have been caused by a short duration, high intensity storm. Given this, the magnitude of impact is considered to be low.

5.8.6.7 The risks are to the Applicant’s plant and equipment and not to the environment or third parties and there are no significant impacts to the environment.

5.8.7 Groundwater Flooding

5.8.7.1 The proposed floor depth is 16 m above peak groundwater levels. It is concluded that there will be no risk of intercepting the watertable during the operational life of the quarry.

5.8.7.2 The risk posed by flooding from groundwater is deemed acceptable.

5.8.8 Other Sources of Flooding

- 5.8.8.1 The UK Government Long Term Flood Risk Information Service shows that no part of the Application Area is vulnerable to potential flooding from catastrophic failure of reservoirs.
- 5.8.8.2 There will be no connection to mains drainage (water supply, foul sewer) at the Proposed Development. It is considered that there is negligible risk of flooding from artificial sources.

5.8.9 Potential for Impact Upon Extant Downstream Flood Risk

- 5.8.9.1 Assessment of the implications of storm events has been undertaken in respect of the catchment area presented by the Phase 9 Extraction Area at its maximum extent (2.5 ha).
- 5.8.9.2 Of this total, some 1.7 ha (68%) will drain to the southern end of the restoration landform; and 0.8 ha (32%) will drain to the northern corner.
- 5.8.9.3 The key requirement relevant to the Phase 9 is as follows: For the range of annual flow rate probabilities up to and including the one per cent annual exceedance probability (1 in 100 year) event, incorporating an allowance for climate change, the developed rate of run-off should be no greater than the existing rate of run-off for the 1 in 1 year Greenfield event.
- 5.8.9.4 Depth Duration Frequency (DDF) data for the Site have been taken from the FEH Web Service.
- 5.8.9.5 Attenuation Requirements (*i.e.* storm runoff “balancing volumes”) have been computed using methodologies developed by HR Wallingford³ (the “Guidance Models”) for differing magnitude storm events at the Application Site.
- 5.8.9.6 The climate change factor has been set in accordance with the Test and Itchen Management Catchment peak rainfall allowances: 1% annual exceedance rainfall event, with the Upper end allowance set at 45% for the 2070s epoch (for development with a lifetime between 2061 and 2125).
- 5.8.9.7 Full input parameters and model outputs are included here at *appendix 5*.
- 5.8.9.8 The results of calculation show that the storm runoff “balancing volume” required during the 100-year storm (with 45% allowance for climate change) would total approximately 568 m³.
- 5.8.9.9 Of this total 568 m³, given the configuration of the landform as outlined above, it is calculated that 386 m³ (68%) will drain to the southern end of the restoration landform; and 182 m³ (32%) will drain to the northern corner.

³ “Greenfield runoff estimation for sites”, HR Wallingford (HRW), on-line calculation tool, UK Sustainable Drainage, Guidance & Tools (<http://www.uksuds.com/drainage-tools-members/greenfield-runoff-rate-tool.html>); “Surface water storage volume estimation for sites”, HRW, on-line calculation tool, UK Sustainable Drainage, Guidance & Tools (<http://www.uksuds.com/drainage-tools-members/surface-water-storage-volume-estimation-tool.html>); “Rainfall Runoff Management for Developments”, joint DEFRA / Environment Agency (EA) Flood and Coastal Erosion Risk Management R&D Programme, Report SC030219, Kellagher R, October 2013.

- 5.8.9.10 Perimeter swales with detention basins will be incorporated into the design of the restoration landform in order to accommodate these runoff volumes. The perimeter swale and basin serving the southern end of the Site will need to have a capacity of 386 m³; and the northern swale-basin will need to provide 182 m³ of storage space.
- 5.8.9.11 The perimeter swales with detention basins will be excavated to include a minimum 300mm freeboard above the critical the 100-year storm (with 45% allowance for climate change). Given the surface area of the restored landform (2.5 ha) and the fact that it will comprise agricultural land with no impermeable surface, it is evident that there is no restriction on space (surface area) available for accommodating these swales.

5.8.10 Soakaway Capacity

Southern Basin

- 5.8.10.1 Where rainwater harvesting is not applicable, the second option in the “Surface Water Drainage Hierarchy” is to “Discharge into the ground via infiltration”.
- 5.8.10.2 Guidance recommends that the stormwater storage infrastructure should be half-empty within 24 hours of the design storm, so that it is ready for further rainfall events. The storm runoff “balancing volume” at the southern swale-basin will equate to 386 m³. Therefore, the half-emptying requirement equates to 193 m³.
- 5.8.10.3 Following abatement of the design storm, runoff will drain from the southern end of Phase 9 into the approved restoration drainage scheme at MSP A, which seeks to replicate the greenfield situation.
- 5.8.10.4 The sensitivity analysis for the greenfield pathway at MSP A (including exceedance flows) has been the subject of full investigation as part of previous applications (Planning Application 16/09386/WCM). Full details are presented in the “Hydrogeological and Hydrological Environmental Impact Assessment and Flood Risk Assessment for the proposed quarry and inert fill extension areas at Brickworth Quarry”, GWP Consultants LLP, Report Reference: 160701.v03, September 2016. GWP’s report states that “During extreme storm weather events, it is clear the current topography is such that runoff will emanate from the dry valley located in MSP A, and this will flow overland, via the Ashdod Pond, into the SSSI. Such storm flows currently occur at Green Field Runoff rates and are a natural part of the hydrological cycle of the wetland, introducing slightly turbid, possibly slightly acidic fresh oxygenated runoff water to the SSSI as short duration high peak flow events”. The approved scheme at MSP A has been designed to recreate this regime by delivering natural recharge to the groundwater system during average conditions but allowing overland flow at Green Field Runoff rates during storm events.
- 5.8.10.5 The run-off rate for the 1 in 1 year Greenfield event at Phase 9 is 2.3 l/s (*appendix 5*), equating to 200 m³/day.
- 5.8.10.6 This means that the 1 in 1 year Greenfield runoff rate at the southern end of the Site (68% of the overall catchment area) is equal to 136 m³/day.
- 5.8.10.7 This runoff will drain from Phase 9 into the approved restoration drainage scheme at MSP A (and thus account for 136 m³ of the half-emptying requirement within 24 hours of the design storm).

- 5.8.10.8 The remainder (57 m³) of the half-emptying requirement will be dealt with by soakaway.
- 5.8.10.9 Soakaway rates have been estimated using methodologies detailed in BRE Digest 365 on soakaway design (revised 2016), which describes the design and construction procedures for soakaways; and explains how to calculate soil infiltration rates.
- 5.8.10.10 BRE Digest 365 indicates that: Outflow from the soakaway (O) = internal surface area of pit at 50% storage depth (excluding base area) × soil percolation rate × duration. The method excludes the base area of the soakaway. This means that water must drain away laterally through the sides of the pit, which allows for the risk of silting on the base of the basin.
- 5.8.10.11 Infiltration testing has previously been conducted on site to quantify the soakaway capacity of the Reading Formation sand.
- 5.8.10.12 Full details are given in the Technical Note: Infiltration Testing with respect to Condition 20 of Planning Permission 19/00380/WCM, prepared by BCL in October 2020 (*appendix 6*).
- 5.8.10.13 The average infiltration rate in the final tests was 0.012 m/hr (0.3 m/day).
- 5.8.10.14 The length of the swale-basin serving the southern end of Phase 9 will measure 425 m. The model at *appendix 5* is based on a soakaway depth of 900 mm.
- 5.8.10.15 Using the BRE Digest 365 equation: The soil percolation rate is set at 0.3 m/day and the internal surface area of the basin at 50% storage depth (excluding base area) is fixed at 191.25 m². This method would deliver an outflow volume of 57.38 m³ over a period of 1 day.
- 5.8.10.16 Looking at the half-emptying requirement to be dealt with by soakaway (57 m³), it is evident that this would be delivered within 24 hours.
- 5.8.10.17 This complies with the relevant guidance, which recommends that the stormwater storage infrastructure should be half-empty within 24 hours of the design storm, so that it is ready for further rainfall events.

Northern Basin

- 5.8.10.18 The same approach to assessment has been completed for the northern swale-basin.
- 5.8.10.19 The storm runoff “balancing volume” of the northern swale-basin will be set at 182 m³. Therefore, the half-emptying requirement equates to 91 m³.
- 5.8.10.20 The 1 in 1 year Greenfield runoff rate at the northern end of the Site (32% of the overall catchment area) is equal to 64 m³/day.
- 5.8.10.21 This runoff will drain from the northern end of Phase 9 and follow the existing greenfield pathway *i.e.* north-westwards into the woodland strip and agricultural land immediately to the north of Phase 9, collecting within the area of pluvial flood ponding shown on *figure 9*.

- 5.8.10.22 The sensitivity analysis for the greenfield pathway (including exceedance flows) at the northern end of Phase 9 has been assessed by reference to site experience (runoff observations) at existing operations / haul roads on Site together with published OS and surface water flood mapping. The field that is shown to be at risk of surface water flooding (*figure 9*) is surrounded by woodland and established hedgerows, which would limit any risk of onward flow. According to Annex 3 of PPG, the Flood Risk Vulnerability Classification for “Amenity open space, nature conservation and biodiversity” is defined as “Water-compatible”; it is considered that the hedgerows and woodland would fall into the same category *i.e.* very low risk vulnerability.
- 5.8.10.23 The greenfield pathway will account for 64 m³ of the half-emptying requirement within 24 hours of the design storm.
- 5.8.10.24 The remainder (27 m³) of the half-emptying requirement will be dealt with by soakaway.
- 5.8.10.25 The length of the swale-basin serving the northern end of Phase 9 will measure 340 m. The model at *appendix 5* is based on a soakaway depth of 900 mm.
- 5.8.10.26 Using the BRE Digest 365 equation: The soil percolation rate is set at 0.3 m/day and the internal surface area of the basin at 50% storage depth (excluding base area) is fixed at 153 m². This method would deliver an outflow volume of 45.9 m³ over a period of 1 day.
- 5.8.10.27 Looking at the half-emptying requirement to be dealt with by soakaway (27 m³), it is evident that this would be delivered within 14-15 hours.
- 5.8.10.28 This complies with the relevant guidance, which recommends that the stormwater storage infrastructure should be half-empty within 24 hours of the design storm, so that it is ready for further rainfall events.

5.8.11 Operation and Maintenance of Soakaway

- 5.8.11.1 The operation and maintenance requirements for the soakaway are informed by the CIRIA: SuDS Manual C753:

Operation and maintenance requirements for soakaways		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

5.8.11.2 Responsibility for the operation and maintenance of the soakaway will be taken by Raymond Brown Quarry Products Limited during the operational phase of the Quarry and Landfill.

5.8.11.3 Upon completing restoration, responsibility will revert to the landowner in accordance with legal agreement between the two parties (mineral operator and landowner).

5.8.12 Floodplain Storage

5.8.12.1 The Application Area lies outside the floodplain.

5.8.12.2 Therefore, there will be no development-related reduction in floodplain storage.

5.8.13 Flood Risk Conclusions

5.8.13.1 In conclusion, the FRA has demonstrated:

- That the Proposed Development represents Appropriate Development in the context of prevailing Flood Zonations;
- That that the Proposed Development is safe with respect to flood risks and thus that there is no requirement to apply the Exception Test, and;
- That the Proposed Development will not increase flood risk elsewhere.

6 CUMULATIVE AND RESIDUAL IMPACTS

6.1 Cumulative Impact

- 6.1.1 The area local to the Site has a long history of sand and gravel extraction. Potential therefore exists for cumulative impacts to occur.
- 6.1.2 The baseline dataset (upon which impact assessment has been based) is representative of the extant conditions present at the time of assessment, which includes any influence upon the water environment resulting from existing permitted operations and any third party development in the vicinity of the Site (thus accounting for any potential cumulative impact in this regard). Where significant impact relative to baseline conditions has been identified, mitigation measures have been formulated to limit any such risk to acceptable levels.
- 6.1.3 Further consideration of cumulative impact / the formulation of additional mitigation in this regard is not considered necessary at this time.

6.2 Residual Impact

- 6.2.1 Flood risk to people and property can be managed but it can never be completely removed; a residual risk will remain after flood management or mitigation measures have been put in place.
- 6.2.2 In this instance, when the Site has been restored to agricultural land, the management of residual risk will, for the most part, be the responsibility of the landowner, who will need to be aware that there will be water level variations within the swales-basins during storm events, after which these features will dry out when the water soaks away into the underlying unsaturated strata. Land use should be tailored to allow for these variations.

7 CONCLUSIONS

- 7.1 In view of the findings of assessment and the planned approach to the Proposed Development, which includes specific measures for the protection of the water environment, there are considered to be no over-riding hydrogeologically or hydrologically based reasons why the Proposed Development should not proceed in the manner described by the Application.
- 7.2 This conclusion assumes that any permission, if granted, should be conditioned by implementation and adherence to any relevant recommendations advanced within this report and other such conditions that may be reasonably imposed by the Planning Authority.

Henry Lister, BSc, MSc, FGS
Principal Hydrogeologist

BCL Consultant Hydrogeologists Limited
August 2025



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Appendix 1. Data Sources

Regulatory & Industry Standard Guidance, Methodologies & Literature References

Published Data Sources

- Ordnance Survey (OS): Topographic maps at scales of 1:50,000 and 1:25,000.
- OS open-source digital data (Meridian 2, Panorama & Terra50 data-sets).
- British Geological Survey (BGS): Published 1:50,000 scale solid and drift geological mapping.
- BGS GeoIndex, well details and borehole logs.
- Environment Agency (EA), data regarding licenced abstractions, source protection zones, flood risk mapping & landfill sites.
- "Climate & Drainage", Technical Bulletin No.34, Ministry of Agriculture Fisheries & Food (MAFF), September 1976.
- Storm event data from the Flood Estimation Handbook (FEH), with online Web Service (Centre for Ecology & Hydrology 2016, developed by Wallingford HydroSolutions).
- "The Calculation of Actual Evaporation and Soil Moisture Deficit over Specified Catchment Areas", Grindley J, November 1969, Hydrological Memorandum 38, Meteorological Office, Bracknell, UK.
- "Estimation of Open Water Evaporation, Guidance for Environment Agency Practitioners", R&D Handbook W6-043/HB, J W Finch and R L Hall, October 2001.
- Environment Agency / British Geological Survey, 'The Physical Properties of Major Aquifers in England and Wales', Hydrogeology Group Technical Report WD/97/34, 1997.
- Environment Agency / British Geological Survey, 'The Physical Properties of Minor Aquifers in England and Wales', Hydrogeology Group Technical Report WD/00/04, 2000.
- "Surface water storage volume estimation for sites", HR Wallingford, on-line calculation tool, UK Sustainable Drainage, Guidance & Tools (www.uksuds.com/drainage-tools/surface-water-storage-volume-estimation.html).
- Flood studies report, Volume II: Meteorological Studies", National Environment Research Council (NERC), 1975.
- "Flood Estimation for Small Catchments (IH 124)", Institute of Hydrology, Report No.124, Marshall DCW & Bayliss AC, June 1994.
- Environment Agency, 'Hydrogeological Impact Appraisal for Dewatering Abstractions', Science Report SC040020/SR1, 2007.
- Environment Agency, 'Hydrogeological Impact Appraisal for Groundwater Abstractions', Science Report SC040020/SR2, 2007.
- "National Planning Policy Framework" (NPPF, updated December 2024): Ministry of Housing, Communities and Local Government [MHCLG].
- Planning Practice Guidance for "Flood Risk and Coastal Change", DCLG (now MHCLG), updated 25th August 2022 (referred to herein as PPG).
- Wiltshire Council's Sustainable Drainage Design Guidance, which can be found at: <https://www.wiltshire.gov.uk/civil-emergencies-drainage>.

- "Rainfall Runoff Management for Developments", Kellagher R, joint DEFRA / Environment Agency (EA) Flood and Coastal Erosion Risk Management R&D Programme, Report SC030219, October 2013.
- "The SUDS Manual v5", Construction Industry Research and Information Association (CIRIA): report no. c753, 2015.
- "The Environment Agency's approach to groundwater protection" (February 2018, Version 1.2).
- Domenico P.A, Schwartz F.W, Physical and Chemical Hydrogeology, Wiley, 1990.
- National Coal Board, '*Technical Management of Water in the Coal Mining Industry*', 1982

Site Specific Data Sources

- Site drilling and piezometer construction logs.
- "Hydrogeological and Hydrological Environmental Impact Assessment and Flood Risk Assessment for the proposed quarry and inert fill extension areas at Brickworth Quarry", GWP Consultants LLP (GWP), Report Reference: 160701.v03, September 2016.
- "Technical Note: Infiltration Testing with respect to Condition 20 of Planning Permission 19/00380/WCM", BCL, October 2020.
- "Extending into Area B at Brickworth Quarry: Application to vary Environmental Permit for Inert Landfilling: Hydrogeological Risk Assessment" (Permit Application Reference: EPR/FB3508GN), BCL, October 2021.
- "Geological Report and Mineral Resource Assessment: Brickworth Quarry Phase 9, Hampshire", Touchstone Geological Services Limited (TGSL), June 2025.
- Site specific groundwater level data (manual and logger readings) recorded between December 2016 and May 2025, collected by ACS Environmental Testing Limited on behalf of the Applicant.
- Water features monitoring and Site reconnaissance conducted by BCL on 16th September 2021.
- Proposed development plans, 2025.



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Appendix 2. Borehole Logs

Contract Name BLACKWORTH QUARRY

Contract No

Date MONDAY 17TH MARCH 2025Sheet 1 of 1 Working Day 1

DAILY DRILLING LOG

Tel: 01656 749149

E-mail: admin@apex-drilling.com

Client RAYMOND BADAN AGGREGATESOrder No MARK PENNANTDrill Crew PETER LONSDALE AND RICHARD LONSDALERig Type KLEMM KRB27-1

Bore Hole	Top Depth	Base Depth	Thickness	Recovery	Strata Description	Standing Time — Reason	INSTALLATION DETAILS
					Mobilise TO SITE		
					COMPLETE SITE SPECIFIC SAFETY INDUCTION TRAINING		
					MOVE TO BOREHOLE 01 AND SET UP		
01	0.00	8.50	8.50		SAND		
	8.50	12.00	3.50		CHALK		
		12.00			LOSE BOREHOLE		
	12.00	50.00	38.00		CHALK		
					RINSE BOREHOLE FROM TO INSTALLATION 30 MIN		
					EXTRACT DRILL STRING AND INSTALL PIEZOMETER		
					AS INSTALLED / DETAIL		
					PIT RAISED LOWER TOGETHER WITH A POST/RAIL		
					BOREHOLE GUARDING		
					END OF SHIFT - BOREHOLE COMPLETE		

Site Moves	1 (No)	Casing	12 m	Core Boxes	(No)	Fixed Plant	RIG COMPRESSOR AND DUMPER AND
Bore Moves	1 (No)	Open Hole	50 m	Core Liner	m		WATER BOWSER
Return Moves	(No)	W. Samples	m	SPT/CPT	(No)	Standing Times	AS DETAIL (hrs)
Security	YES / NO	Coring	m	Installation	50 m	Breakdown	NOT APPLICABLE (hrs)

Quantities							



Signed by Apex

Signed by Client

Date

Diameter UPVC 63MM x 50MM Ø

Well Casing GL-22MTS / 49-50MTS m

Well Screen 22MTS - 49MTS m

Gravel 24MTS m

Bentonite 22MTS m

Gas Bung (No)

End Cap x 2 (No)

Cover Type RAISED / FLUSH

Water Level m

Remarks POST AND RAIL

Blue - Client's Copy Yellow - QS Copy White - Site Copy

Contract Name BAIKLWATA QUARRY

Contract No

Date TUESDAY 18TH MARCH 2025Sheet 1 of 1 Working Day 2

DAILY DRILLING LOG

Tel: 01656 749149

E-mail: admin@apex-drilling.com

Client RAYMOND BROWN AGGREGATESOrder No MARK RENOUCCIDrill Crew PETER LONGDALE AND RICHARD COOPERRig Type KLEMM KR802-1

Bore Hole	Top Depth	Base Depth	Thickness	Recovery	Strata Description	Standing Time — Reason	INSTALLATION DETAILS
					MOVE TO BOREHOLE 02 AND SET UP		Borehole 02
15H02	0.00	3.00	3.00		SAND		
	3.00	3.50	0.50		CHALK		
		3.50			CASE BOREHOLE		
	3.50	50.00	46.50		CHALK		
					R/A LIFT BOREHOLE FROM TO INSTALLATION 30 MINS.		
					EXTRACT DRILL STRING AND CONSTANT PIEZOMETER		
					AS INSTALLED / DETAILLED		
					FIT RAISED COVER TOGETHER WITH A POST / RAIL		
					BOREHOLE SUMMARISED		
					END OF SHIFT - BOREHOLE COMPLETE		

Site Moves.....(No)	Casing.....3.50 m	Core Boxes.....(No)	Fixed Plant <u>RIG COMPRESSOR AND PUMPER</u>
Bore Moves...../ (No)	Open Hole.....50 m	Core Liner.....m	<u>AND WITH A POST</u>
Return Moves.....(No)	W. Samples.....m	SPT/CPT.....(No)	Standing Times <u>AS DETAILLED</u> (hrs)
Security YES / <u>(NO)</u>	Coring.....m	Installation <u>50</u> m	Breakdown <u>NOT APPLICABLE</u> (hrs)

Signed
by ApexSigned
by Client

Date

Diameter UPPER 63MM x 50MM Ø

Well Casing GL-22mm / 16.9-50mm m

Well Screen 22mm - 49mm m

Gravel 28mm m

Bentonite 22mm m

Gas Bung.....(No)

End Cap 12 (No)

Cover Type RAISED / FLUSH

Water Level.....m

Remarks POST RAIL

Blue - Client's Copy Yellow - QS Copy White - Site Copy



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Appendix 3. Laboratory Certificates

Certificate of Analysis

Certificate Number : 25-00736-Issue 1-Page: 1

Report Fao:

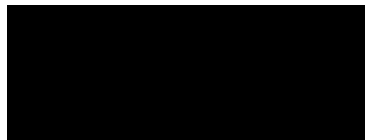
Site Address^: Brickworth
Client Order No: 25-52931
Date of Sampling^: 07/04/2025
Date Received: 07/04/2025
Date of Analysis: 08/04/2025 - 24/04/2025
Report Date: 25/04/2025

Please find your certificates of test attached for your samples received in the laboratory on 07/04/2025 under our laboratory reference 25-00736.

Remarks:

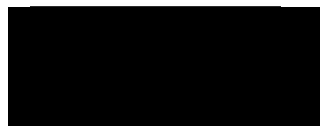
None

Results reviewed by:



Eoin Byrne Laboratory Manager

Test Certificates approved by:



Ryan Bennett - Dr Laboratory Coordinator

*Any opinions or interpretations indicated are outside the scope of our UKAS accreditation.
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.
Excel copies of reports are valid only when accompanied by this PDF certificate.
Client's Sample Description / ACS Material Description are noted for reference only.*

Head Office

Unit 14B
Blackhill Road West
Holton Heath Trading Park
Poole
Dorset BH16 6LE

Tel 01202 628680
Fax 01202 628642

Registered Office

Unit 14B
Blackhill Road West
Holton Heath Trading Park
Poole
Dorset BH16 6LE
ACS Environmental Testing Limited
Registered in England and
Wales No. 6000065

ACSE Sample Number	93744	93745
Sample ID	848166 - 25-52931	848167 - 25-52931
Clients Sample Ref.^	R730-001 Extension Area (GW23)	R730-001 Extension Area (GW24)
Location / Sample Depth (m)^	GW23	GW24
Date Sampled^	07/04/2025	07/04/2025
Time Sampled^	1055	1120
Sample deviating codes	f	f
Client's Sample Description^		
ACS Testing Material Description^	Groundwater	Groundwater
ACSE Material Description (Principal Matrix - As Received)	G.WATER	G.WATER

Determination	HWOL Acroynm	Units	Method	Prepared As	Result	AS	Result	AS
Anions								
Chloride		mg/l	MT/ACSE/204	AR	20.2	*	13.9	*
Sulphate		mg/l	MT/ACSE/204	AR	15.0	*	14.6	*
Carbon								
TOC (Total Organic Carbon)		mg/l	MT/ACSE/103	AR	73.3		69.3	
Total Nitrogen		mg/l	MT/ACSE/103	AR	29.0		17.0	
Metals and Metalloids (Water)								
Calcium		ug/l	MT_ACSE_208	AR	135990		138960	
Chromium (Total)		ug/l	MT_ACSE_208	AR	0.30	*	< 0.25	*
Cadmium		ug/l	MT_ACSE_208	AR	< 0.25	*	< 0.25	*
Copper		ug/l	MT_ACSE_208	AR	3.87	*	0.83	*
Iron		ug/l	MT_ACSE_208	AR	< 10.0	*	< 10.0	*
Mercury		ug/l	MT_ACSE_208	AR	< 0.20	*	< 0.20	*
Potassium		ug/l	MT_ACSE_208	AR	4117.7		1136.9	
Magnesium		ug/l	MT_ACSE_208	AR	3811.4		2746.7	
Manganese		ug/l	MT_ACSE_208	AR	15.57		0.80	
Sodium		ug/l	MT_ACSE_208	AR	20123		10917	
Nickel		ug/l	MT_ACSE_208	AR	1.21	*	< 0.25	*
Lead		ug/l	MT_ACSE_208	AR	< 0.25	*	< 0.25	*
Zinc		ug/l	MT_ACSE_208	AR	32.37	*	1.97	*
pH and Conductivity								
Conductivity (@ 20 °C)		uS/cm	MT/ACSE/303		745	*f	686	*f
pH (@ 20 °C)		units	MT/ACSE/301	AR	7.3	*f	7.2	*f
Waters and Leachates								
Alkalinity		mg/l	NAM/ACSE/X04	AR	360		330	
Ammoniacal Nitrogen as NH4		mg/l	MT/ACSE/203	AR	0.14	*	0.03	*
BOD (Biochemical Oxygen Demand)		mg/l	MT/ACSE/306	AR	7.29	f	5.91	f
COD (Chemical Oxygen Demand)		mg/l	MT/ACSE/307	AR	5.26	*	< 1.50	*
TON (Total Oxidisable Nitrogen)		mg/l	Calc	AR	18.0		12.4	

Technical Information for Analytical Results

Analysis

* - denotes analysis covered by our UKAS accreditation.

- denoted analysis covered by our MCERTS certification & UKAS accreditation.

Loss on Ignition (MT/ACSE/302) is carried out at our laboratory at Unit D11 Admiralty Park, Station Road, Holton Heath, Poole, Dorset BH16 6HX.

AD = Sample tested in air dried condition.

AR = Sample tested in as-received condition.

AS = Accreditation status.

D = Sample tested in dry condition.

L = Laboratory prepared leachate.

SC = Sub contracted.

[^] = Clients supplied information. This may affect the validity of test results.

All MCERTS certified test values reported on a dry weight basis.

The preparation of 10:1 Leachates (to BS EN 12457-2:2002) and 2:1 leachates (to BS EN 12457-1:2002) fall outside the scope of our UKAS accreditation.

Soils and leachates are prepared at our laboratory at Unit D11 Admiralty Park, Station Road, Holton Heath, Poole, Dorset BH16 6HX.

Method uncertainty available on request.

Where results are less than the limit of detection, the value of 0 is used in calculations.

Key to HWOL Acronyms

Acronym	Description
HS	- Headspace analysis
EH	- Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	- Clean-up - e.g. by florisil, silica gel
1D	- GC - Single coil gas chromatography
Total	- Aliphatics & Aromatics
AL	- Aliphatics only
AR	- Aromatics only
2D	- GC-GC - Double coil gas chromatography
#1	- e.g. EH_2D_Total_#1 means humics mathematically subtracted
#2	- e.g. EH_2D_Total_#2 means fatty acids mathematically subtracted
-	- Operator - underscore to separate acronyms (exception for +)
+	- Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Deviating Codes

Deviating Samples

The use of any of the following symbols indicates that the sample was deviating and it is possible therefore that the results provided may not be representative of the sample taken.

- a - The date and /or time of sampling has not been provided, therefore it is not known if the time lapse between sampling and analysis has exceeded the acceptable holding time(s)*.
- b - The test item was received in a container which has not been recommended*.
- c - On receipt, the temperature of the sample received was found to fall outside the recommendations of BS ISO 18512:2007, Soil Quality. Guidance on long and short term storage of soil samples*.
- d - The sample was received in a container that had not been filled as recommended*.
- e - The delay between sampling and sample receipt is greater than the recommended holding time for the analyte of interest in this matrix*.
- f - The delay between sampling and analysis is greater than the recommended holding time for the analyte of interest in this matrix*.

In accordance with the requirements of Technical Policy Statement TPS 63; UKAS Policy on Deviating Samples, all UKAS accredited testing laboratories are required to notify their clients that calibration or test results may be invalid where samples are found to be deviating. It is the opinion of ACSE that the term invalid should be interpreted as 'not fully representative of the sample taken at source'.

The following Additional Deviating Sample Codes may also be used.

I/S - Insufficient sample mass/volume received for accurate quantification of this analyte.

U/S - The sample received was deemed unsuitable for accurate determination of this analyte using the Test Methods available.

S/C - The sample received was subcontracted for analysis.

Head Office

Unit 14B
Blackhill Road West
Holton Heath Trading Park
Poole
Dorset BH16 6LE

Tel 01202 628680

Fax 01202 628680

Registered Office

Unit 14B
Blackhill Road West
Holton Heath Trading Park
Poole
Dorset BH16 6LE
ACS Environmental Testing Limited
Registered in England and
Wales No. 6000065



Raymond Brown Quarry Products Limited
**Proposed Phase 9 Extension to
Brickworth Quarry**
Whiteparish, Wiltshire, SP5 2QE

Planning Application
Proposed winning and working of sand followed by restoration
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Appendix 4. Fluids Handling Procedure

Introduction

Inappropriate storage and handling of fuels and oils can result in contamination of ground, ground water and surface water.

This procedure covers

Bulk storage of fuels and oils, including waste oil
Filling of bulk storage tanks
Storage and handling of drums
Refuelling operations
Procedure for emptying bunded areas
Fuel and oil spills

Bulk storage of fuels and oils, including waste oil

1. All fuels and oils in bulk shall be kept in bunded storage, the location of which shall be identified on a site plan.
2. The walls and floor of storage bunds must be impervious to oil.
3. Tank filling points shall be inside the bunded area.
4. Delivery lines shall be overhead or, if underground, sleeved.
5. Delivery nozzles shall be stored inside the bund and locked when not in use.
6. Bund drain valves, where fitted, shall be designed so that they can only be removed by key or hand held tool, except when emptying the bund under controlled conditions.
7. All bulk storage tanks shall be appropriately labelled with contents and capacity.
8. Spill kits shall be provided close to hand.
9. Bunded areas shall be checked weekly for build-up of oil residues, rainwater or debris.
10. The inside of the bund shall have a line painted to identify when 10% of the capacity has been filled by rainwater etc.

Filling of bulk storage tanks

1. A member of site staff must supervise all tank filling operations.
2. Storage tank levels must be checked to gauge spare capacity before starting filling operations.
3. Check delivery hoses and hose connections for leaks.
4. Report spillages and leaks and clean them up promptly, disposing of waste correctly according to the requirements of prevailing regulation(s).

Storage and handling of drums

1. All drums and containers used for the storage of fuels and oils, including waste oil, shall be appropriately labelled and kept in designated areas identified on a site plan. This will include temporary storage areas.
2. All drums or containers will be kept in bunded storage or on bund trays. This will include temporary storage.
3. Where drum taps are fitted these should be secure. The tap should be positioned over a bund tray to collect drips and spillage.
4. No drum shall be stored in the open without a drum cap fitted.
5. Drums shall be secured when moving them about the site.
6. Report spillages and leaks and clean them up promptly.
7. Spill kits shall be provided.
8. Drum storage areas shall be checked weekly for evidence of poor practice.

Refuelling operations

1. The person refuelling the vehicle must be present throughout the entire refuelling operation.
2. Check vehicle fuel tank level before starting refuelling operations to gauge how much fuel is required.
3. Check delivery hose from the pump / tank to the nozzle for leaks.
4. All delivery nozzles shall be fitted with an automatic cut-out to prevent over-filling.
5. Ensure delivery nozzle is held upright when moving between storage tank and vehicle.
6. Operatives should be prepared to react to any gas oil splashing out whilst re-fuelling.
7. Fuel delivery nozzles shall be locked or similarly disabled when not in use.
8. Report spillages and leaks and clean them up promptly.

Procedure for emptying bunded areas

1. Authority of site management is required before emptying a bund.
2. Details of bund emptying shall be recorded and maintained on site.
3. If the contents of the bund include floating oil, then the water underneath this oil should be carefully pumped out. The remaining oil coated water should be collected and disposed of through a licensed contractor.
4. The reason for bund contamination shall be investigated.

Fuel and oil spills

1. Any spillage that cannot be cleaned up promptly with a rag or use of a shovel-full of absorbent material must be reported to the Site Manager or his designated deputy who will co-ordinate the response and investigate the cause.
2. Spills to ground shall be absorbed and prevented from spreading by using absorbent materials such as sand, flies, absorbent mats, paper or cloth.
3. Halt the movement of fuel or oil towards a watercourse by creating a barrier in front of it by sand bagging, deployment of absorbent boom or use of 3mm or finer dust.
4. If oil enters a watercourse, prevent it spreading by deploying an absorbent boom.
5. If spilt oil or fuel leaves the site the Site Manager must inform the Environment Agency.
6. Contaminated materials from clean-up should be put in an appropriately labelled container and disposed of through a licensed contractor in line with regulatory requirements as stipulated by the Environment Agency.



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Appendix 5. Attenuation Requirements

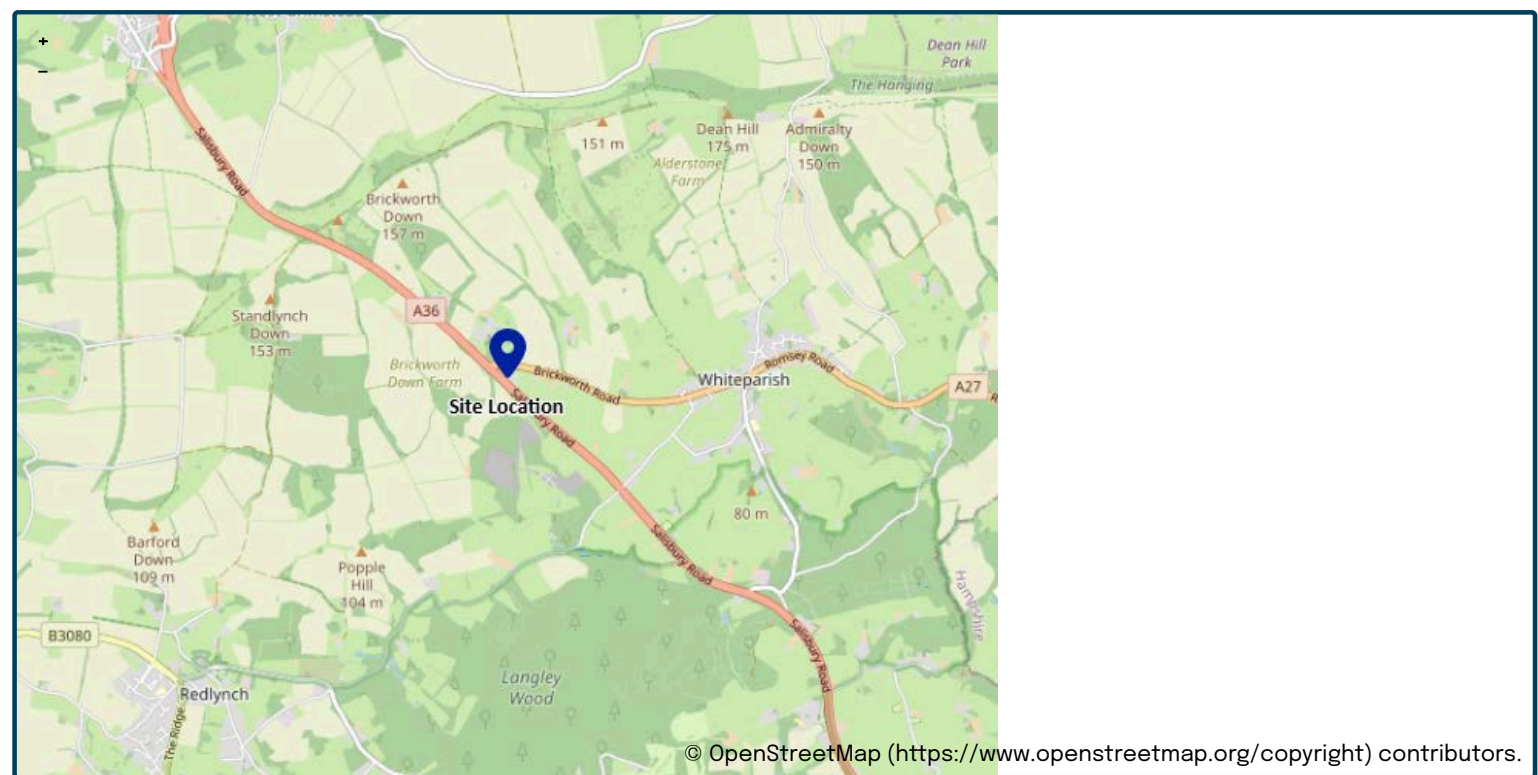
This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is recommended that the total storage volume for the site is distributed across the site using multiple SuDS and that hydraulic modelling software is used to undertake and finalise the detailed design of the drainage system.

Project details

Date	26/06/2025
Calculated by	
Reference	
Model version	2.0.1

Location

Site name	Phase 9
Site location	Brickworth Quarry



Site easting	422641
Site northing	123442

Site areas

Total site area (ha)	2.5	ha
----------------------	----------------------------------	----

Roof area

Total roof area (ha)	0	ha
Contributing roof area (ha)	0	ha
Non-contributing roof area (ha)	0	ha

Paved area

Total paved area (ha)	0	ha
Contributing paved area (ha)	0	ha
Non-contributing paved area (ha)	0	ha

Grass / vegetated area

Total grass / vegetated area (ha)	2.5	ha
Contributing grass / vegetated area (ha)	2.5	ha
Non-contributing grass / vegetated area (ha)	0	ha

Total area

Total contributing area (ha)	2.5	ha
------------------------------	----------------------------------	----

Contributing areas with urban creep allowance

Urban creep allowance factor	+0% (no creep)
------------------------------	---

Storage design parameters

Storage base shape	Rectangular / square	
Storage base length to width ratio	3:1	
Storage design depth (mm)	900	mm
Storage side slope (1 in x)	1 in 3	
Storage voids ratio (%)	100% (all voids)	
Storage volume design return period (years)	1:100 years	

Discharge flow rate from the site

Method

Type of site

Greenfield

Specify the method

FEH statistical

FEH statistical

My value

SAAR (mm)

826

mm

Map/default value

826

BFIHOST

0.866

QMed (l/s)

2.4

l/s

QMed-QBar conversion

1.136

1.136

Total area for greenfield runoff calculation (ha)

2.5

ha

2.5

QBar (l/s)

2.7

l/s

Hydrological region

7

7

Return period (years)

1:1 year

Growth curve factor

0.85

Flow rate (FEH statistical) (l/s)

2.3

l/s

Final discharge rate

Runoff calculation method

FEH statistical

Design flow rate (l/s)

2.3

l/s

Blockage risk

Specify the method

Flow rate

Minimum discharge flow rate to prevent blockage

1l/s

My value

Design orifice diameter (mm)

34

mm

Calculated value

34

Flow rate of orifice (l/s)

2.3

l/s

Rainfall and runoff

Rainfall input type

Generic rainfall CSV file

FEH_Catchment_Rainfall_FEH22_POT_438900_121950 for UK SuDS.csv

Climate change allowance factor

145%

Specify the runoff method from grass / vegetated areas

Fixed percentage - based on rainfall event depth and SPR

My value

How should SPR be derived?

Estimate using BFI

Map value

BFIHOST

SPR

0.144

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Model results

- **Maximum discharge flow rate:** 2.3 (l/s)
- **Outflow orifice diameter:** 34 (mm)
- **Storage base length:** 38.14 (m)
- **Storage base width:** 12.71 (m)
- **Storage base area:** 484.97 (m²)
- **Storage total volume:** 567.8 (m³)
- **Storage total water volume:** 567.8 (m³)
- **The storm duration rainfall requiring the most storage may not have been run. Check whether any other storm durations may require in greater storage.**
- **Storm return periods run:** 1, 2, 5, 10, 30, 100, 200 (years)
- **Storm durations run:** 15, 30, 60, 120, 180, 240, 360, 540, 720, 900, 1080, 1440, 1800, 2160, 2880 (minutes)

Return Period (years)	Critical Duration (minutes)	Peak Flow Rate (l/s)	Max Depth (m)	Max water volume (m ³)	Max storage volume (m ³)
1	2880	1.3	0.32	171.3	171.3
2	2880	1.5	0.39	213.9	213.9
5	2880	1.7	0.49	276.8	276.8
10	2880	1.8	0.57	330.8	330.8
30	2880	2	0.71	428.9	428.9
<u>100</u>	<u>2880</u>	<u>2.3</u>	<u>0.9</u>	<u>567.8</u>	<u>567.8</u>
200	2880	2.4	1.03	677	677

Disclaimer

This report was produced using the surface water storage volume design tool (2.0.1) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com) (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate surface water storage volumes for the whole site based on a limiting discharge rate from the site. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

HR Wallingford are not responsible for any rainfall data shared that is subject to licensing terms imposed by UK Centre for Ecology & Hydrology's Flood Estimation Handbook web service (<https://fehweb.ceh.ac.uk/Home/Terms> (<https://fehweb.ceh.ac.uk/Home/Terms>)).

Appendix A - Rainfall Depths

Rainfall depths (mm) with climate change

Duration (minutes)	Duration (hours)	1 years	2 years	5 years	10 years	30 years	100 years	200 years
15	0.25	9.03	12.24	16.56	19.86	25.16	31.41	35.1
30	0.5	12.08	16.37	22.18	26.77	34.34	43.2	48.68
60	1	15.72	20.98	28.56	34.58	44.62	56.43	63.68
120	2	21.47	27.27	35.42	41.75	52.45	64.99	73.01
180	3	25.2	31.2	39.61	46.27	57.32	70.48	79.1
240	4	28.01	34.18	42.77	49.65	60.99	74.66	83.78
360	6	32.23	38.73	47.75	54.69	66.63	81.08	91
540	9	36.82	43.7	53.1	60.32	72.83	88.38	99.38
720	12	40.4	47.56	57.22	64.76	77.71	94.13	106.02
900	15	43.41	50.75	60.7	68.51	81.85	98.95	111.53
1080	18	46.07	53.56	63.76	71.82	85.48	103.12	116.25
1440	24	50.72	58.55	69.12	77.55	91.77	110.17	123.87
1800	30	54.68	62.81	73.79	82.53	97.24	116.22	130.27
2160	36	58.23	66.64	78	87.03	102.17	121.63	135.91
2880	48	64.52	73.47	85.56	95.11	111.01	131.24	145.78

Rainfall depths (mm) without climate change

Duration (minutes)	Duration (hours)	1 years	2 years	5 years	10 years	30 years	100 years	200 years
15	0.25	6.23	8.44	11.42	13.7	17.35	21.66	24.21
30	0.5	8.33	11.29	15.3	18.46	23.68	29.79	33.57
60	1	10.84	14.47	19.7	23.85	30.77	38.92	43.92
120	2	14.81	18.81	24.43	28.79	36.17	44.82	50.35
180	3	17.38	21.52	27.32	31.91	39.53	48.61	54.55
240	4	19.32	23.57	29.5	34.24	42.06	51.49	57.78
360	6	22.23	26.71	32.93	37.72	45.95	55.92	62.76
540	9	25.39	30.14	36.62	41.6	50.23	60.95	68.54
720	12	27.86	32.8	39.46	44.66	53.59	64.92	73.12
900	15	29.94	35	41.86	47.25	56.45	68.24	76.92
1080	18	31.77	36.94	43.97	49.53	58.95	71.12	80.17
1440	24	34.98	40.38	47.67	53.48	63.29	75.98	85.43
1800	30	37.71	43.32	50.89	56.92	67.06	80.15	89.84
2160	36	40.16	45.96	53.79	60.02	70.46	83.88	93.73
2880	48	44.5	50.67	59.01	65.59	76.56	90.51	100.54

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Raymond Brown Quarry Products Limited
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Whiteparish, Wiltshire, SP5 2QE

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Hydrological/Hydrogeological Impact and Flood Risk Assessment

Version 2
August 2025

Appendix 6. Infiltration Testing

Your Ref:
Our Ref: RB/BRK/010

Robert Storey
Raymond Brown
2nd Floor, Fryern House,
125 Winchester Road,
Chandlers Ford,
Hampshire,
SO53 2DR



Technology Centre
Wolverhampton Science Park
Wolverhampton, WV10 9RU

tel: 01902 824111
fax: 01902 824112
email: info@bclhydro.co.uk
web: www.bclhydro.co.uk

2nd October 2020

Dear Robert,

[Brickworth Quarry, Nr. Salisbury](#)
[Technical Note: Infiltration Testing with respect to Condition 20 of](#)
[Planning Permission 19/00380/WCM](#)

Background

As part of the restoration scheme at Brickworth Quarry (the Site), a soakaway is to be sited upon the southern boundary of Area MSP A.

Condition 20 of Planning Permission 19/00380/WCM includes the requirement that:

“Within 2 years of the date of this planning permission, infiltration testing to BRE 365 on, or close to, the indicated site for a soakaway as shown on drawing no. B19/RBA/2/28B shall be carried out”.

Full details of the design of the approved drainage infrastructure (attenuation pond leading to soakaway with overflow facility) are presented in previously submitted reports:

- “Area A at Brickworth Quarry: Review of surface water management on the restoration landform”, BCL, January 2019 (*Reference 1*);
- “Review of Soakaway Proposal on the Restoration Landform at MSP Area A”, BCL, January 2019 (*Reference 2*).

The first stage in the drainage infrastructure is an attenuation pond, which will provide storm balancing storage volume. It has been sized to store storm runoff in the 100-year event and restrict any onward flow to the Greenfield rate before it discharges into the soakaway.

In this way, the soakaway will receive water at a controlled rate from the attenuation pond. The soakaway will be situated at the southern margin of MSP A. As explained in previous reports, the soakaway has been designed to deliver natural recharge to the groundwater system, but only during average conditions.

During storm events, the soakaway would reach capacity and surplus water would be directed (by means of a weir structure) to overflow and follow its current route down to Ashdod Pond and onwards to the SSSI. This would be restricted to the Greenfield rate by means of the attenuation process in the primary pond (upstream of the soakaway).

The reason for allowing this overland flow down to Ashdod Pond is well-established: *“During extreme storm weather events, it is clear the current topography is such that runoff will emanate from the dry valley located in MSP A, and this will flow overland, via the Ashdod Pond, into the SSSI. Such storm flows currently occur at Green Field Runoff rates and are a natural part of the hydrological cycle of the wetland, introducing slightly turbid, possibly slightly acidic fresh oxygenated runoff water to the SSSI as short duration high peak flow events”*.

Full details are presented in the “Hydrogeological and Hydrological Environmental Impact Assessment and Flood Risk Assessment for the proposed quarry and inert fill extension areas at Brickworth Quarry”, GWP Consultants LLP, Report Reference: 160701.v03, September 2016.

Objective

As explained in *Reference 2*, the dimensions and performance criteria for the proposed soakaway were based upon a conservative estimate for the permeability of the Reading Beds, with the base and side infiltration rates being set at 1×10^{-6} m/s (0.0036 m/hr).

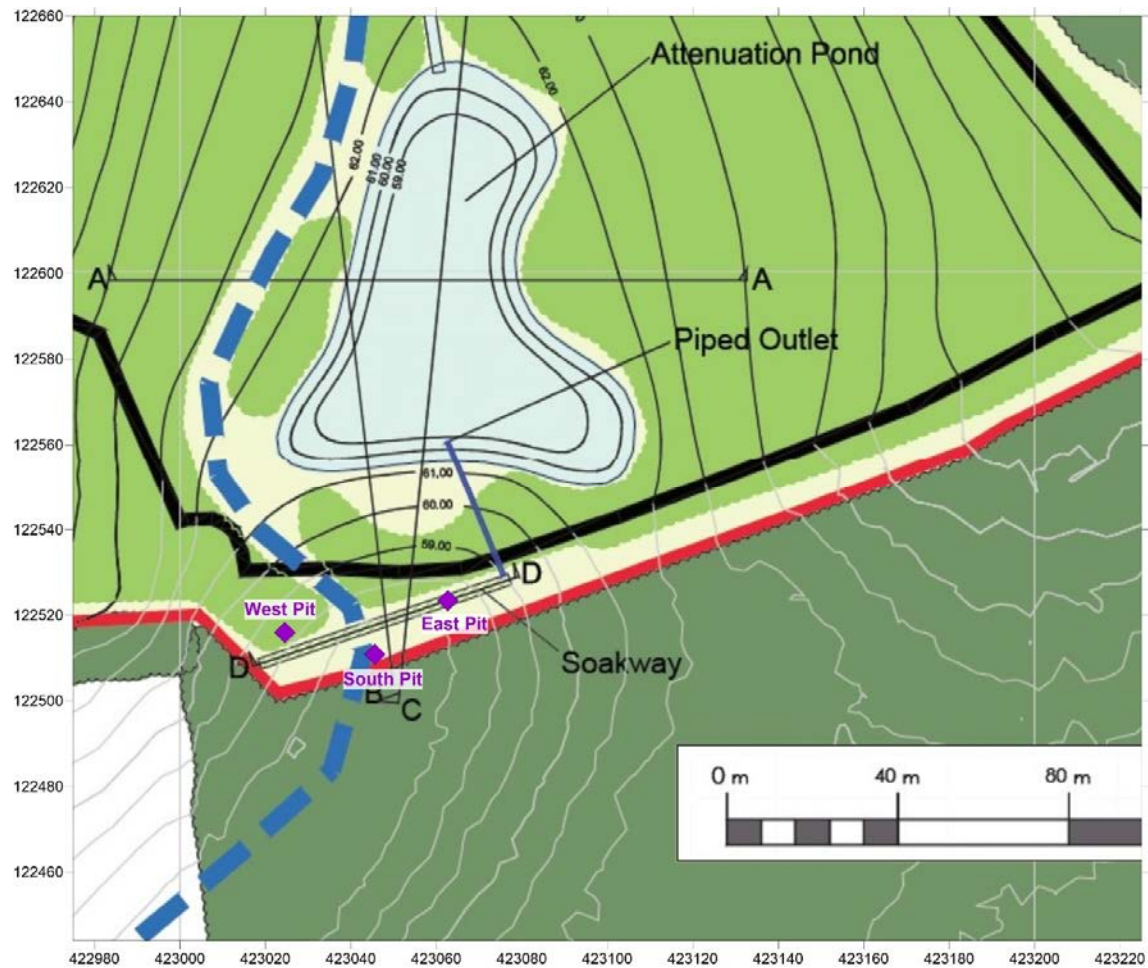
This is a relatively low rate, which explains why the soakaway will only provide infiltration during average conditions, while allowing overflow to Ashdod Pond to continue during storm events (but restricted to the Greenfield rate).

BCL has been instructed to undertake infiltration testing to assess whether ground conditions within the proposed footprint for the soakaway are in line with the theoretical infiltration rate (0.0036 m/hr) used in the original design of the soakaway.

Methodology

The test programme was completed on 18-19 August 2020 and involved three trial pits laid out to triangulate across the proposed footprint of the soakaway:





Each pit was excavated by the on-site shovel, encountering relatively consistent sand beneath 0.1-0.2 m thickness of topsoil. A band of clay was logged at 1.5 m depth in the East Pit, but this was absent in the West and South Pits. The original hydrogeological investigation by GWP (2016) demonstrated that *“the Reading Formation shows large lateral and vertical variability in the thickness and abundance of sand, silt and clay intervals, with the thickness of the sand horizon varying from 1.00m to 16.00m”*.



West Pit



South Pit



East Pit



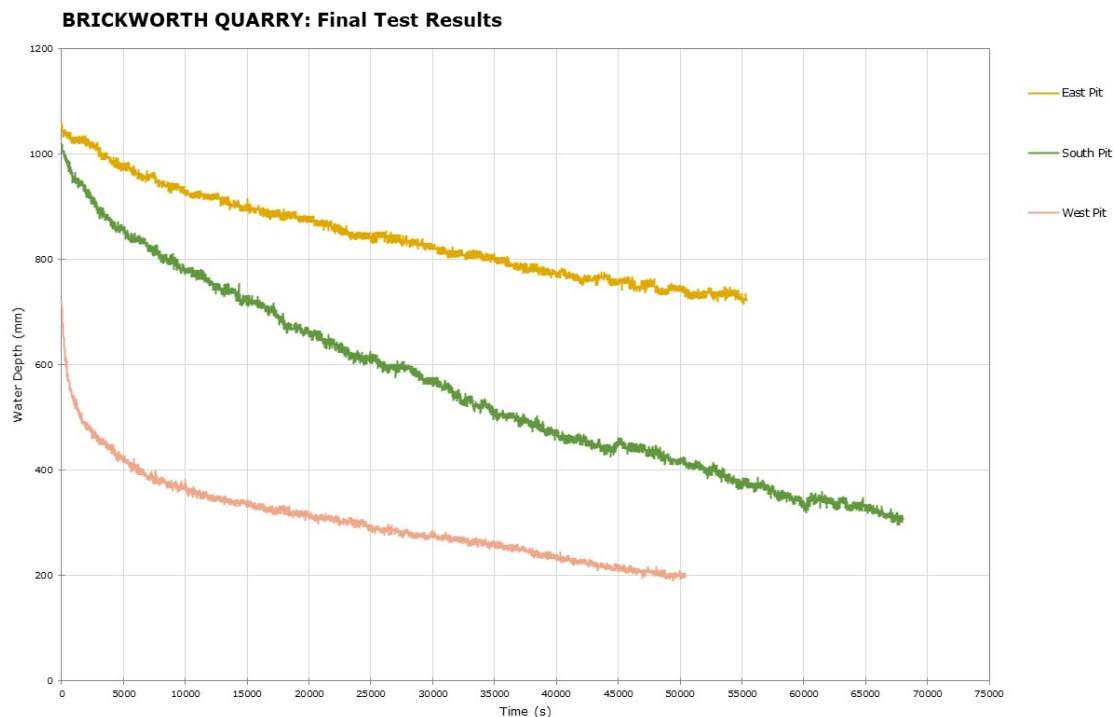
Results

Data loggers were fixed in place at the bottom of each pit using a slotted section of pipe. Water was pumped into each pit using the on-site water bowser.

Having repeated the tests at each pit, the full run of recorded data for the final test at each location was utilised to determine the soil infiltration rates tabulated below.

Flow Rate		West	South	East
Soil infiltration rate (m/hr)	Initial Test	0.018	0.025	0.041
	Final Test	0.017	0.013	0.007

Raymond Brown: Brickworth Quarry - Infiltration tests - West	
Infiltration test results	
Test	Final
Highest level of water (m above base)	0.720
Level of water at 75% of maximum level (m above base)	0.540
Level of water at 25% of maximum level (m above base)	0.180
Time water at 75% max depth (s)	190
Time water at 25% max depth (s)	55500
Time for water to fall from 75% to 25% max depth (s)	55310
Storage volume between 75 and 25% maximum depth (m ³)	0.399
Height of water above base when water at 50% of maximum level (m)	0.360
Internal surface area to 50% depth excluding base area (m ²)	1.519
Soil infiltration rate (m/s)	4.75E-06
Soil infiltration rate (m/h)	0.017
Raymond Brown: Brickworth Quarry - Infiltration tests - South	
Infiltration test results	
Test	Final
Highest level of water (m above base)	1.020
Level of water at 75% of maximum level (m above base)	0.765
Level of water at 25% of maximum level (m above base)	0.255
Time water at 75% max depth (s)	11000
Time water at 25% max depth (s)	81500
Time for water to fall from 75% to 25% max depth (s)	70500
Storage volume between 75 and 25% maximum depth (m ³)	0.510
Height of water above base when water at 50% of maximum level (m)	0.510
Internal surface area to 50% depth excluding base area (m ²)	2.040
Soil infiltration rate (m/s)	3.54E-06
Soil infiltration rate (m/h)	0.013
Raymond Brown: Brickworth Quarry - Infiltration tests - East	
Infiltration test results	
Test	Final
Highest level of water (m above base)	1.060
Level of water at 75% of maximum level (m above base)	0.795
Level of water at 25% of maximum level (m above base)	0.265
Time water at 75% max depth (s)	53080
Time water at 25% max depth (s)	210000
Time for water to fall from 75% to 25% max depth (s)	156920
Storage volume between 75 and 25% maximum depth (m ³)	0.918
Height of water above base when water at 50% of maximum level (m)	0.530
Internal surface area to 50% depth excluding base area (m ²)	2.904
Soil infiltration rate (m/s)	2.01E-06
Soil infiltration rate (m/h)	0.007



The West Pit showed the most consistent response, with only a small decline in infiltration rate between the initial and final tests. In contrast, the infiltration rate at the South Pit was halved; and the rate at the East Pit (with the clay band at 1.5 m depth) was diminished by one order of magnitude. This is consistent with soakaway test experience at other sites, where the infiltration rate decreases as the surrounding ground becomes saturated.

It is noteworthy that the weather deteriorated significantly during the duration of the tests, with 30-40 mm of rainfall in the week leading up to the tests and heavy showers on 18th August; followed by persistent heavy rain (Storm Ellen) on 19th August, bringing >40 mm from 19th to 21st August.

Notwithstanding this, the worst-case result arising from the soakaway tests was 0.0070 m/hr; and the average rate in the final tests was 0.0120 m/hr.

This compares favourably with the theoretical rate used in the original design calculations for the proposed soakaway, where the dimensions and performance criteria were based upon a conservative estimate for the permeability of the Reading Beds, with the base and side infiltration rates being set at 0.0036 m/hr.

Conclusion

The soakaway tests conducted on 18th to 19th August 2020 have validated the findings and advice given in the previously submitted reports:

- “Area A at Brickworth Quarry: Review of surface water management on the restoration landform”, BCL, January 2019 (*Reference 1*);
- “Review of Soakaway Proposal on the Restoration Landform at MSP Area A”, BCL, January 2019 (*Reference 2*).

Full details of the design of the soakaway and the sizing requirements are set out in full in *Reference 2*.

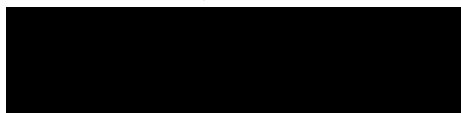
The key elements for the soakaway are as follows:

- The soakaway will receive water at a controlled rate from the attenuation pond. This upstream attenuation pond has been designed to provide storm balancing storage volume for the 100-year storm event and the pond will restrict any onward flow to the Greenfield rate before it discharges into the soakaway.
- The soakaway will be constructed with a length of 60m and width of 2m, excavated to a depth of 3.2m, with an emergency overflow spillway into the field ditch to the south.
- A weir with a 6m length (perpendicular to flow) has been specified as the overflow spillway. The overflow crest level is at the lowest point on the brim of the trench. It has been set at a height of 3.2m above the base elevation. The overflow weir will be vegetated and lined with erosion matting.
- The soakaway is located upon natural ground, which comprises the Reading Formation, a 7m thick sequence of sands and clayey sands (Borehole Log BH8-2016, GWP, 2016).
- The infiltration rate, proven by soakaway test, meets with or improves upon the design rate of 0.0036 m/hr.
- The purpose of the soakaway is to only provide infiltration during average conditions, while allowing overflow to Ashdod Pond to continue during storm events (but restricted to the Greenfield rate).
- The overland flow from soakaway at MSP A down to Ashdod Pond will replicate the pre-existing drainage pattern. Storm flows from the dry valley at MSP1 currently occur at Greenfield Runoff rates. They are a natural part of the hydrological cycle in the catchment area serving Ashdod Pond and the wetland SSSI further downstream, introducing slightly turbid, possibly slightly acidic fresh oxygenated runoff water to the SSSI as short duration high peak flow events.

Closure

I trust that this provides sufficient information to meet the requirement for infiltration testing in the footprint of the proposed soakaway, as specified under Condition 20 of Planning Permission 19/00380/WCM.

Yours sincerely,



Henry Lister
Principal Hydrogeologist
BCL Consultant Hydrogeologists Limited