Castle Hill Quarry

784-B043634

Environmental Monitoring and Management Plan

Environmental Permit Application

Castle Hill Quarry Co. Limited

April 2023

Document prepared on behalf of Tetra Tech Limited. Registered in England number: 01959704

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1.0 INTRODUCTION

1.1 REPORT CONTEXT

1.1.1 This document has been prepared by Tetra Tech on behalf of the Operator, Castle Hill Quarry Co. Limited (CHQC) to support an environmental permit application in connection to their existing quarry site called Castle Hill Quarry at Cannington, Bridgwater, TA5 2QF.

1.1.2 This application relates to two extension areas (the site) at the quarry. The first area (known as 'Eastern Extension') is located to the south east of the existing quarry and is centred at approximate NGR ST 24834 40637. The second area (known as 'Old Golf Course Extension') is located to the south of the Eastern Extension and is centred at approximate NGR ST 24834 40637. The location of the site is shown on Drawing Number CHQC/B043634/PER/01.

1.1.3 CHQC are seeking to gain a bespoke waste recovery permit for the permanent deposit of inert waste to land to facilitate the infilling and restoration at the Eastern Extension and the Old Golf Course Extension Areas following the extraction of mineral.

1.1.4 This document corresponds to Part B4 of the Environmental Permit application forms, specifically detailing the environmental management and monitoring plan for the proposed deposit for recovery activity at the site.

2.0 GROUNDWATER MANAGEMENT AND MONITORING

2.1 Adherence to the Waste Acceptance Criteria will ensure that the waste deposited at the site complies with the inert classification thereby mitigating any risk to groundwater.

2.2 A HRA has been prepared for the application (Appendix F of the Environmental Permit Application). The objective of the HRA is to assess the potential risk of significant impacts on groundwater quality as a result of the proposal, to derive control and compliance limits for groundwater and surface water and to provide recommendations for contingency actions on the event of exceedances of those levels.

2.2 GROUNDWATER MONITORING SCHEDULE

2.2.1 The HRA recommends that groundwater should continue to be monitored at the existing monitoring points (BH1, BH4, BH5, BH6 and BH7). The location of all groundwater monitoring points is shown on the Drawing Number CHQC/B043634/BH/01.

2.2.2 The parameters to be sampled and monitoring frequency to be included in the Environmental Permit are presented in Table 1 below. These requirements are considered adequate in providing in an ongoing characterisation of the groundwater conditions.

Table 1: Proposed Groundwater Monitoring Determinands and Sampling Frequency

Monitoring Location	Parameter	Frequency
Upgradient BH7 Replacement borehole to be installed if removed.	Water Level, Electrical Conductivity, Chloride, Phenol, pH, Nickel, Sulphate, Lead	Quarterly
Downgradient BH1, BH5, BH6 and BH4	Water Level, Electrical Conductivity, Chloride, Phenol, pH, Nickel, Sulphate, Lead	Quarterly
BH1, BH4, BH5, BH6 and BH7	Base of monitoring point (mAOD)	Annually

2.2.3 The HRA provides compliance levels for boreholes BH01, BH04, BH05, BH06 and BH07 for nitrogen, chloride, lead and sulphate. The proposed compliance limits for use in the environmental permit are outlined in Table 2 below. Compliance limits should be revised following the capture of further baseline groundwater quality.

Table 2: Proposed Compliance Levels

Compliance Location	Parameter	Compliance Levels (mg/L)
BH1, BH4, BH5, BH6 and BH7	Chloride	250
	Sulphate	250
	Nickel	0.004
	Lead	0.0012
	Phenol	0.0077

Contingency Plan

2.2.4 Once compliance levels have been agreed, should site monitoring identify an increase in the concentration of the selected determinands then a series of contingency actions will be required. Suggested contingency actions, which require agreement with the Environment Agency (EA), are presented in Table 3.

Table 3: Suggested Contingency Actions for Exceeding Groundwater Compliance

Appropriate Contingency Action	Timescale
Advise Site Management	Immediately
Advise Environmental Manager of any detection limit issues	1 Week
Advise Environment Agency	1 Week
Confirm by repeat sampling and analysis	1 Month
Review existing monitoring information	1 Month
Review site management/operations, implement actions to prevent future failure	3 Months
Review assumptions in conceptual site model	3 Months
Review existing HRA Compliance Levels	6 Months
Consult EA about need for corrective action	6 Months

2.3 QUALITY CONTROLS PROCEDURES

Monitoring Personnel

2.3.1 Monitoring will be undertaken by suitably trained person(s) appointed by the site management who are familiar with the monitoring procedures. The monitoring personnel will have access to the Environmental Permit and any relevant accompanying application documents to gain an understanding of the conditions applicable to groundwater monitoring (levels and quality). Personnel will also be familiar with the assessment criteria to identify compliance and assessment levels.

Monitoring Procedures

2.3.2 The groundwater levels will be measured prior to sampling using an electronic dip tape/dip meter.

2.3.3 The groundwater samples will be collected using a portable electric submersible pump or other suitable sampling equipment. In order to obtain a sample of the groundwater, each monitoring borehole will be purged to at least three times the well volume (if possible) to prevent sampling non-representative, stagnant samples.

2.3.4 On-site analysis will include temperature, pH and electrical conductivity. All groundwater samples will be collected in 1 litre polyethylene or glass containers. Unless the containers already contain a preservative, they will be flushed three times with the sample prior to filling.

2.3.5 Filled sample bottles will be stored upright in cool boxes with ice packs. Sample bottles will be pre-labelled in accordance with laboratory requirements and will be submitted to a UKAS accredited laboratory within 24 hours of collection, together with the sample details, tests and suites required. If samples have to be kept overnight, they will be stored in a fridge/cool box and maintained at approximately 4°C.

Recording and Reporting

2.3.6 A copy of the sampling results will be stored on site for the duration of the site operations.

2.3.7 The site management will ensure that copies of the sampling results are sent to the EA in an agreed format and at quarterly frequencies.

3.0 SURFACE WATER MANAGEMENT AND MONITORING

3.1 SURFACE WATER FEATURES

3.1.1 According to the HRA, the quarry complex is located within the lower reach of the River Parrett which flows north from Chedington in West Dorset, c.40 km to the south-east of the site and reaches the coast c.7 km to the north-east, where it flows into Bridgwater Bay.

3.1.2 Fiddington Brook lies c. 550 m to the north of the main part of the permit application area (eastern extension and old golf course extension); and Cannington Brook lies c. 1 km to the south. The application area lies across an undefined divide between the two catchment areas. Castle Hill Quarry and the northern part of the application area are located within the Fiddington Brook catchment. The southern part of the application area is located in a minor undefined sub-catchment that drains to the River Parrett to the east via various smaller ditches (locally referred to as rhynes).The distance between this undefined area and the Cannington Brook - Lower catchment is c. 350 m. The upper reaches that drain into Cannington Brook are divided into two further catchments known as Currypool Stream and Cannington Brook Upper.

3.2 SURFACE WATER MONITORING SCHEDULE

3.2.1 Surface water monitoring is currently undertaken at two locations (SW1 and SW2) which are identified on Drawing Number CHQC/B043634/BH/01.

3.2.2 The HRA does not provide any recommendations for surface water monitoring.

3.3 COMPLIANCE LIMITS

3.3.1 The HRA does not recommend any compliance limits for the surface water monitoring points.

4.0 GAS MANAGEMENT AND MONITORING

4.1 A Gas Risk Assessment (GRA) has not been prepared for the site. However, a screening report has been prepared which has been submitted with the Environmental Permit application as Appendix H.

4.2 MANAGEMENT

4.2.1 The Gas Screening Report, in Appendix H, indicates that due to the inert nature of the proposed waste types, the site will not give rise to significant quantities of gas. The negligible quantities of gas generated are unlikely to be under significant pressure which will minimise the likelihood of gas migration. The risk to nearby sensitive receptors associated with the generation and migration of gas is low.

4.2.2 Due to this low risk, it is considered that no active gas management will be required for the site.

4.3 MONITORING

4.3.1 In accordance with the EA's 'Waste recovery plans and deposit for recovery permits' guidance, if an operator intends to deposit waste more than 2m below the surrounding the ground surface, they must monitor the waste for methane, carbon dioxide and oxygen. The atmospheric pressure must also be recorded when taking gas readings.

4.3.2 As such, in-waste monitoring boreholes will be installed in areas where waste deposits exceed 2m below the surrounding ground surface. The location of in-waste boreholes will be confirmed through the completion of site surveys which will confirm areas that comprise waste deposits that exceed 2m.

4.3.3 All in-waste boreholes will be monitored in accordance with the monitoring programme detailed in Table 4.

Table 4: Monitoring Programme

Parameter	Monitoring Frequency
Methane, carbon dioxide, oxygen, atmospheric pressure, differential pressure, temperature.	Monthly for 12 months (i.e., 12 data sets) then quarterly.

4.4 COMLIANCE LIMITS AND ACTION LEVELS

4.4.1 Action Levels will be set for each borehole following the completion of 12 months background monitoring. Limits will be set based on guidance set out in the Technical Guidance Note LFTGN03 and Industry Code of Practice for Perimeter Soil Gas Emissions.

5.0 METEOROLOGICAL MONITORING

5.1 Due to the acceptance of inert waste at the site and with reference to the HRA, it is considered unnecessary to manage and monitor leachate. This negates the need to monitor meteorological conditions for the purpose of using water balance calculations as a tool for evaluating leachate production.

5.2 Atmospheric pressure and ground conditions will be monitored and recorded during all gas monitoring visits.

5.3 Weather conditions that may be unfavourable to infilling particularly dry loads will be used to determine the acceptability of such wastes on a particular day, for example strong winds given as severe weather warnings from the Meteorological Office.

5.4 Details on weather conditions will be recorded in the Site Diary on a daily basis.

6.0 AMENITY MANAGEMENT AND MONITORING

6.1 An Environmental Risk Assessment (ERA) has been prepared in accordance with the Environment Agency's Risk Assessment guidance. It specifically deals with the following: -

- Particulate Matter Management and Monitoring;
- Noise Management and Monitoring;
- Odour Management and Monitoring;
- Mud Management and Monitoring;
- Litter Management and Monitoring; and
- Birds, Vermin and Insect Management and Monitoring.

6.2 Due to the inert nature of the waste, the site will not produce odour or litter, nor will it attract birds, vermin and insects.

6.3 The ERA concluded that the risk of particulate matter and noise annoyance was not significant and therefore it is not proposed to implement monitoring regimes for these potential hazards.

6.4 The ERA also considered the risk of mud being transferred to the local highways as not significant. A wheel washing facility will be employed on site which will be used by HGVs before they leave the site. Water sprays will also be employed to dampen the access road. However, in the unlikely event that mud is deposited on the road then a road sweeper will be utilised as necessary.

7.0 HEALTH IMPACT MONITORING

7.1 Due to the inert nature of the waste, it is considered unnecessary to undertake health impact monitoring on the surrounding population.

DRAWINGS

CHQC/B043634/PER/01 – Environmental Permit Boundary

CHQC/B043634/BH/01 – Environmental Monitoring Location Plan