

High Peak Borough Council Planning
PO Box 136
Buxton
SK17 1AQ

22/06/2016

Dear Sirs

**OBJECTION TO PLANNING APPLICATION HPK/2016/0276
BUCKINGHAM HOTEL REDEVELOPMENT**

We act for Nestle Waters UK Limited and have been instructed, in concert with Zenith International, to lodge an objection to the above mentioned Planning Application due to the concerns raised in respect of potential harm to the Buxton Water Source

The hotel is located approximately 450 m from Buxton Crescent, the location of the Source.

Planned development description

The proposed development is understood to comprise the demolition of the existing Buckingham Hotel and the erection of a new hotel comprising 110 rooms, ancillary facilities and underground parking. The development design includes a triple basement of approximate plan size 39m by 42m. Existing ground level is 297.5 to 299.7mAOD and the basement dig level is to approximately 292.3 to 290.5mAOD (up to approximately 9.2m depth). Subject to the established ground conditions at the site, the excavation could affect the local groundwater regime and therefore could pose short and / or long term risks to the Buxton spring supply.

Hydrogeological setting

The Buxton spring system emerges from the Monsal Dale Limestone and Low Limestone Formations;. Groundwater flow within the limestone is via discrete fracture flow although the fracture distribution and exact flow paths within the limestone remain poorly understood.

The proposed development is located on the Bowland Shale Formation which is younger than, and overlies the two limestone formations. This formation is typically comprised of low permeability mudstone with subordinate beds of sandstone and limestone units. The Bowland Shale Formation therefore typically acts as a low permeability confining layer which restricts upward groundwater flow and maintains groundwater under pressure within the underlying limestone units. Disruption to the Bowland Shale Formation could therefore potentially affect the groundwater flow regime within the underlying limestone aquifer and under worst case conditions affect the Buxton spring flow.

Local geological mapping indicate that the limestone aquifers dip to the north and northwest at an angle of between 15 to 20°. Based on the distance between the mapped limestone surface occurrence and Buckingham Hotel it would suggest that the top of the limestone is at a depth of approximately 80m beneath the site. However published data may not be entirely accurate and potential exists that localised geological variations result in the limestone depth beneath the development site being shallower than expected.

The Buxton spring emerges at an elevation of approximately 290mAOD at Buxton Crescent which is at approximately the same level as the planned basement depth (290.5mAOD). This would suggest that the excavation will not go deeper than the spring potentiometric surface although allowance must be made for potential irregular spring behaviour within the fractured limestone.

Completed groundwater study

A groundwater assessment report (dated 23 March 2016) was undertaken by WJ Groundwater. The study comprised a review of the available site specific and local data and did not involve any ground investigation. The main points from the study include:

- The study used information from four on site boreholes (from previous studies) at depths ranging between 5.8m and 23.6m. It is not known if the boreholes were installed and remain available for monitoring.
- Rest groundwater level from a monitoring point installed to a depth of 5.65m depth indicates a rest groundwater level of between 295.0 and 296.3mAOD (1.3 to 2.5m below ground level (bgl)).
- The Bowland Shale Formation at the site was proven to an elevation of 276.4mAOD (23.6m m bgl) with occasional interbedded sandstone and limestone units proven.

- The study estimates the thickness of the Bowland Shale Formation beneath the site to be between 74m and 100m based on local geological mapping.

- No data is presented regarding the hydraulic characteristics (hydraulic conductivity) of the Bowland Shale Formation at the site.

- No reports of thermal water at the site are referred to and it is assumed that thermal water was not encountered through the works completed to date.

- The potential sensitivity of the site with regard to the Buxton springs is recognised and a number of recommendations are included for further works including:

- o The drilling of an additional borehole to a depth of up to 25m including facilities to seal the borehole should thermal or artesian water be encountered.

- o Groundwater temperature monitoring during drilling.

- o Groundwater pressure monitoring of the borehole installation.

Preliminary risk assessment

The proposed development has potential to affect the underlying limestone aquifer if 1) the limestone is encountered during the development or 2) if the Bowland Formation is reduced to a limited thickness that enables hydrostatic pressure within the limestone to be released.

Due to the sensitive nature of the limestone aquifers, uncertainties on the limestone fracture distribution and the importance of the Buxton springs three potential risks are highlighted:

Additional borehole drilling is planned as part of the development to a depth beyond the confirmed depth of the Bowland Shale Formation and the spring potentiometric surface. Should limestone be encountered (if occurrence is shallower than expected) with hydraulically connected fractures, this could potentially affect the Buxton spring flow.

The excavation of the Bowland Shale Formation for the planned basement will result in reduced loading which could affect the underlying groundwater regime subject to the remaining thickness of the Bowland Shale Formation and the underlying hydrostatic pressures within the limestone.

Demolition and construction activities have potential to cause groundwater contamination if not properly managed.

Recommendations

It is recommended that due to potential risks associated with the irregular nature of the local geology and the sensitivity of the Buxton spring that the application should be refused, or if consented, the development should be subject to the following conditions:

The site specific hydraulic conductivity of the Bowland Shale Formation should be established to confirm that bulk low permeability conditions prevail across the planned excavation sequence.

A hydrogeological / geotechnical study should be undertaken to calculate potential hydrostatic uplift pressures to ensure appropriate measures are taken if necessary.

Future ground excavation works beyond the established depth of the Bowland Shale Formation must include precautionary measures to identify and control thermal groundwater should it be encountered:

Any deep boreholes must be designed to be able to control (with grouted surface casing and headworks) and seal if necessary (e.g. with a bentonite supply) artesian flows (if encountered).

Groundwater temperature should be continuously monitored during the drilling process. If the groundwater temperature exceeds 15°C drilling should cease and the Environment Agency, High Peak Borough Council and Nestle Waters UK Ltd should be informed and consulted on how best to proceed to avoid potential damage to the spring groundwater system.

Should Monsal Dale Limestone Formation be encountered the Environment Agency, High Peak Borough Council and Nestle Waters UK Ltd consulted as above.

All works should be undertaken in line with best practice to minimize the risk to groundwater contamination.

Yours faithfully

Peter Alcock
CEO
Alps Group