

# Quarterly Journal of Engineering Geology and Hydrogeology

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**Cover Photograph.** The journey-time between Gundewein and Mekane Selam, two towns located at approximately 2660 m a.s.l. in the Ethiopian Highlands, has been cut by more than 75% by the construction of 129 km of mountain road and a 300 m long bridge. The bridge is across the Blue Nile and 58 km of this new road descends and ascends the steep sides of the 1300 m deep Blue Nile gorge on an alignment with a cumulative rise and fall of over 2500 m over a straight-line distance of 21 km. The terrain is one of the most challenging of any for new road construction. Its underlying geology comprises Oligocene–Miocene basalt and pyroclastic rocks (pictured) overlying Cretaceous sandstone and siltstone which, in turn, overlie Late Jurassic limestone mudstone and shale. Its geomorphology comprises lithologically-controlled benches separated by sheer cliffs, with extensive deposits of colluvium, taluvium and rafted rock debris. Geohazards include large-scale rock toppling, rock falls, deep-seated and shallow landslides, flash flooding, shifting stream channels, slope erosion, stream erosion, debris flows, debris fans, seepage erosion and cavity collapse. The Total Geology Approach to design and construction involved landscape modelling, geotechnical reference condition mapping, engineering geological mapping and targeted ground investigation, implemented by a team of national and international specialists between 2006 and 2015. The dynamism of the terrain, and in particular the adjustment of its geomorphology to earthworks and road drainage systems, meant that slope stability and erosion problems required careful attention during construction, as they will during the operational lifetime of the road. The Gundewein – Mekane Selam road was designed initially by Renardet SA/SABA Engineering. This design was reviewed and revised by Scott Wilson (now AECOM). Construction was undertaken by CGC Overseas Construction Group, Beijing under the supervision of Scott Wilson/Dana & Associates and on behalf of the Ethiopian Roads Authority. Further details can be found at <https://doi.org/10.1007/s10064-015-0724-y> and <https://doi.org/10.1144/qj.egh2018-058>

Photograph by: G J Hearn