

# EMILY HUNGER

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## ENGINEERING GEOLOGIST AND BLASTING ENGINEER

**Chartered geologist with much experience working in the UK  
and overseas quarrying industry.**

### **Key abilities:**

- Planning and supervising geological and geotechnical site investigations; drill rig supervision, rock core and soil logging to Eurocode 7 (and BS 5930), trial pitting and GPS Smart Rover surveying. Hydrogeological site investigations including multi-level piezometer installations, permeability testing, water well drilling and pumping tests.
- Geological interpretation and 3D modelling of data; hard rock, aggregate resources and coal. Resource evaluation and working knowledge of the PERC and JORC reporting codes.
- Experienced user of LSS for modelling and design use, with some knowledge of the DATAMINE mining evaluation software.
- Extensive experience in the auditing of drill and blast operations and designing improvement programmes to optimise those operations, focussing on producing the product required, safely.
- Much experience in the development of blast and vibration impact assessments.
- Experience in blast design and much in ground vibration and air overpressure monitoring and the control of blast vibration.
- Experience in and adaptable to overseas working conditions, including: Libya, Togo, Croatia, Scandinavia, Romania.

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## Education and Professional Status

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- BSc. Applied Geology (Class 1), University of Staffordshire (John Myers Award 2000 and IMM Student prize 2000).
- MSc. Mining Geology (Distinction), Camborne School of Mines (University of Exeter).
- Fellow of the Geological Society of London (FGS) (2001).
- Chartered Geologist (CGeol) (2012).
- Member of the Institute of Explosive Engineers (MIExpE) (2012).
- Holds current explosives supervisor and shotfiring certificates.

### **Professional affiliation**

- EIG (Extractive Industry Geology) Conferences  
September 2009-present: Member of the organising committee. Joint Editor of the 2010 conference proceedings. Editor in Chief of the 2012 proceedings.

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## Professional Experience

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**January 2014-Present:** **Rock Options Ltd**  
Partner and Engineering Geologist

Partner of an Independent consultancy service provider with skills specifically tailored to the cement and mining industries and its downstream processing industry. Services include feasibility studies, planning and business development, geology and quarry design, cost analysis and optimisation, operational optimisation and managerial advice.

**October 2001-April 2013:** **GWP Consultants LLP**

- Oct. 2012-April 2013: Associate Partner
- 2009-October 2012: Senior Geologist
- 2004-2009: Geologist
- October 2001-2004: Graduate Geologist (then called 'Geoffrey Walton Practice')
  
- April 2008-April 2013: Senior Blasting Engineer and General Manager  
Blast Log Ltd, a subsidiary company of GWP Consultants LLP.

### Selected detailed experience

#### October 2001 – April 2013: GWP Consultants LLP

##### Mineral deposit resource work and design:

Co-ordination and supervision of numerous site investigations, associated geological modelling, resource and reserve evaluation and quarry designs (conceptual final voids and individual designs including haul roads, cut and fill balance *etc*) for planning purposes and advice on the recoverable reserves and resources of a range of hard rock, clay and sand and gravel sites including:

**Coal deposit geological modelling, Wakefield, UK. 2013.** Collation of all available geological, geotechnical, hydrogeological and historic mining (opencast and deep mining) data. Development of a 3D model of old working interactions and the geology (complicated by a graben structure). Reporting on the geological conditions at site, state of old workings and the conceptual hydrogeological regime. Reporting included an outline of missing or required data ahead of detailed deep mining design.

**Quarry optimisation and resource evaluation, Libya, 2009-2010.** Reserve and resource evaluation and reporting of existing limestone and clay resources for an active cement works. Resource assessment of other potential clay sources. Re-design of quarry layout, bench heights and haul road positions for short term optimisation and long term development. Optimisation of face working methods, on-site counterpart training, surveying and licence applications. Blast optimisation works at the site described below.

**Geological and hydrogeological data collation and modelling, Cannock, UK. 2010.** Collation of data, analysis and 3D conceptual modelling of near surface and deep geological and hydrogeological regimes and interactions of a backfilled extraction in coal measures for an expert witness case.

**Aggregate site investigations and resource estimations, Hampshire, UK. 2003-2009**

Design and supervision of trial pitting, shell and auger and continuous flight auger drilling programmes for multiple sites. Responsibilities included: conducting desk studies, designing and supervising site investigations, logging and sampling of materials, geological modelling of the site, pit design and phasing, resource evaluation and reporting to the client for planning permission submissions. Also supervision of falling head tests, standpipe installation and continued management and interpretation of hydrogeological monitoring programmes (groundwater levels, springs and chemistry) and baseline reporting to the Environment Agency.

**Hydrogeological and geotechnical site investigations and projects include:**

**Geotechnical core logging, coal measures, Scotland (multiple site investigations 2005-2012).** Detailed geotechnical core logging in coal measure strata to identify intraformational shear zones for the quarry design of an opencast coal operation.

**Geological core logging, limestone deposit, South Wales (2007):** Design, organisation and supervision of a drilling campaign for a quarry extension in South Wales in a heavily faulted area. Detailed geological and geotechnical core logging and sampling.

**Water supply borehole design, supervision and testing, Berkshire.** Project hydrogeologist on water supply borehole design, construction and testing: including Environment Agency permitting and licensing process liaison, drilling tender preparation and award, drilling contract supervision, production borehole construction and development supervision, pumping test supervision and local water supply well monitoring. Responsible for EIA report preparation and successful submission to EA for licence amendment approval.

**Hydrogeological Risk Assessment, Gloucestershire.** Use of geological logs and groundwater level monitoring datasets to characterise a multi-layered (4) aquifer sequence within the fault-blocked Jurassic limestones of the Cotswolds. Estimation of increased vulnerability of unconfined and confined limestone aquifers to pollution and water balance changes due to a proposed quarry extension into the un-saturated zone of this major aquifer, and possible impacts on down gradient groundwater dependent water courses. the cause of a high-wall slope failure in an active open cast coal site, Scotland.

**Projects working as a Blasting Engineer, 2007 – April 2013 for GWP Consultants, and on some projects acting on secondment for Blast Log Ltd.**

**Drill and blast optimisation, Europe. 2011-2013.** Optimisation of drill and blast operations in limestone and hard rock quarries in Norway, Sweden, Spain, Belgium and the UK. On-site review of drilling and blasting practices and recommending improvement measures to optimise the process to the site requirements (*i.e.* improving face conditions, improving fragmentation by reducing oversize and/or fines, increasing the blast size etc), ensuring best practice is implemented at every opportunity. Reviews of the reserves and resources and quarry development are also undertaken at some sites, and at all sites an understanding of the geological regime, quarry design and quarry development plan is required in order to complete the drill and blast assessment. The work is undertaken with operational (process) experts with the aim of improving efficiency throughout the quarrying process.

**Blast and vibration impact assessments, hard rock and limestone quarries. 2011.** Impact assessment for a planning permission to re-open a hard rock quarrying operation which included assisting in the design of a suitable test blast, vibration data analysis and

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reporting. Another assessment was carried out related to the impact of blasting operations on the diversion of a railway, within a limestone quarry.

**Blasting and blast monitoring schemes, Limestone quarry 2008-2013.** Development of blasting and blast monitoring schemes for multiple extensions to a limestone quarrying operation, required because blasting is in close proximity to sensitive structures (railway line, properties, world heritage site). The schemes specify requirements of the operator and specific blasting and monitoring techniques to be used when blasting within a certain distance of the sensitive structure to ensure control and minimisation of vibration levels.

**Drill and blast operations scoping project, Togo. 2011.** In country visit to determine whether drill and blast operations were possible at multiple hard rock outcrops identified as potential quarrying sites. Determination of a suitable operational drill and blast model (*i.e.* contract or in-house activities), liaison with local drilling contractors and explosive suppliers, preliminary blast design and costing of operations.

**Quarry and blasting optimisation, Libya. 2009-2010.** Optimisation of drilling and blasting operations at a limestone quarry in Libya. Initial assessment of drill and blast techniques and an improvement plan developed with the aims of increasing productivity, improving fragmentation and working safety and controlling vibration at a nearby pipeline. Implementing of the plan with regular on site visits and close supervision of a mining engineer, including;

- training staff in improving drilling technique, setting out holes, explosive loading and data recording,
- blast vibration monitoring and engaging with stakeholders concerned about vibration,
- design of higher production blasts included negotiating with the police and authorities to increase the blast size and importing different detonators into the country.
- recommending a new suitable drill rig to provide the production required which would also enable safer and more efficient blasting operations to be developed.

**Cracking at a property reportedly due to trial blasting, legal dispute, Northern Ireland. 2008-2009.** Data analysis and assisting in the preparation of reports relating to the case. Included a detailed review of test blast and quarry blasting documents and vibration results to ascertain whether test blasts and then production blasts were suitably designed and whether they may have influenced apparent cracking at a local residence.

**Property condition surveys, South Wales. 2009.** Desk study to identify potential properties that may receive vibration from blasting at an opencast coal site in Wales. Study involved a geological and old mineral working review to identify potential lines of transmission, identification of a suitable range of property types in the identified areas and with owners permission, conducting photographic records of the condition of properties.