

## **The Importance of Engineering Geology and Geotechnics in the Design, Operation and Rehabilitation of Quarries**

**Presented by: Ruth Allington**

This talk will provide an introduction to quarry design, and highlight the applications of engineering geology and geotechnics in the responsible extraction of construction materials and industrial minerals from quarries and open pit mines.

Successful quarry design will be presented as a staged and iterative process that results in:

- the safe, efficient and profitable extraction of the maximum usable material from the available land  
*whilst causing*
- the minimum of environmental and social disturbance  
*and resulting in*
- beneficial final restoration and land-uses and public acceptance

There is consensus that reliable ground models, based on a sound understanding of the geology, are vital for successful civil engineering projects, and they are equally vital in quarrying and open pit mining. In addition to describing the characteristics of ground models developed for quarry projects, the talk will highlight three distinctive characteristics of the design and operation of quarries that impact on professional practice in this area.

- First, the lifecycle of a quarry from initial excavation to closure and final rehabilitation is considerably longer than the construction and commissioning phases of most civil engineering projects.
- Second, the inevitable outcome of surface mineral extraction is to make significant permanent and temporary changes to ground conditions in and around a site during a quarry's life.
- Third, in addition to understanding the ground conditions throughout the quarry lifecycle, some other issues must be thoroughly understood and taken into account in the planning and management of a quarry: the quality and quantity of recoverable material; the suitability of the recovered and processed material for its intended use; the viability of recovering and processing it; and the impacts on the natural environment and people.



**Ruth Allington** is an engineering geologist by training. She is Joint Senior Partner of GWP Consultants LLP, the firm she joined in 1981 immediately after graduating (then the Geoffrey Walton Practice). In addition to her BSc and MSc degrees, she also has an MBA, and she is a qualified commercial and community mediator. Throughout her career, she has specialised in the design of open pit mineral operations in the UK and overseas, particularly quarries for construction materials and industrial minerals. She is an experienced expert witness.

She is the immediate past President of the European Federation of Geologists, a member of the Pan European Reserves and Resources Reporting Committee (PERC) and chair of an IUGS task group on global geoscience professionalism. She is committed to promoting the highest professional standards amongst geologists and others involved in the application of geoscience, particularly through the promotion of professional titles such as CGeol and EurGeol.

She is passionate about promoting 'joined up thinking' and encouraging collaborative approaches to problem definition, problem solving and dispute resolution based on effective communication and co-operation. This is especially important in coordinating the wide range of professional disciplines involved in quarry planning and management, and also in facilitating effective communication between the public and operators or developers (and their advisors).

She received the Glossop Medal and delivered the 13<sup>th</sup> Glossop Lecture in 2012, and was featured as one of 100 Global Inspirational Women in Mining in a publication produced by Women in Mining in 2013. She is one of the principal authors of *A Quarry Design Handbook 2014* (free to download at [www.gwp.uk.com/qdeshbook.html](http://www.gwp.uk.com/qdeshbook.html)).

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