

## **NUC case study**

### **Risk Assessment for BP – Professor Colin Thorne**

Professor Colin Thorne, from the School of Geography at the University of Nottingham, helped to reduce the risk of a serious oil-leak through his consultancy work with major oil and gas company BP.

Professor Thorne, a river scientist with particular expertise in erosion, sediment transport and sedimentation, was approached by BP to join a team of engineers and scientists performing a crucial risk assessment of the Western Route Export Pipeline, a pipeline which runs through the countries of Azerbaijan and Georgia.



The pipeline, which has been in operation since 1999, transports crude oil from off-shore oil fields in the Caspian Sea along over 800km of pipeline. It is capable of transporting more than 100,000 barrels of oil a day and traverses mountains, ravines and rivers before reaching its destination at a loading buoy in the Black Sea.

Risk assessment of the Western Route Export Pipeline was essential due to problems at multiple river crossings, as well as concerns about the integrity of the soviet-era pipeline and the consequent risk of an environmentally damaging oil leak. Keen to identify and eliminate any potentially adverse environmental or social impacts, BP decided to conduct an in-depth analysis to quantify all major risks facing the WREP. Professor Thorne acted as the principal geomorphologist for the team, leading the assessment of risks associated with bed scour and bank erosion at river crossings along the pipeline.

Professor Thorne, along with a team of experts, examined approximately 650 river crossings as part of a full programme of river crossing surveys. This broad analysis led to the identification of a number of troubling river crossings, of which 14 proved to pose a significant risk of pipeline exposure and rupture – an event which would have unacceptable environmental and social consequences.

Based on Professor Thorne's advice, BP took immediate remedial action – planning the replacement of those crossings that posed the greatest risks, repairing those crossings that posed significant environmental risk and introducing intensive monitoring at those with the potential to pose significant risks in the near to medium terms.

Lessons learned from this consultation have led BP to enhance civil protection works at many other river crossings and to adopt a rigorous risk-based management approach to protect all their pipelines. This will help them ensure that risks are properly identified and mitigated in order to avoid the risk of negative environmental and social impacts.



Professor Colin Thorne said: “The WREP project provided the opportunity to develop and implement the oil and gas industry’s first rigorous and systematic, quantitative risk assessment method for pipeline crossings on rivers and I’m very pleased that BP is now applying this approach to risk management in all its pipeline operations.

“This NUC consultancy gave me the opportunity to put some of my research ideas into practice and the experience gained from working with BP also informs my teaching on applied fluvial geomorphology.”

**Nottingham University Consultants**

e: [nuc@nottingham.ac.uk](mailto:nuc@nottingham.ac.uk)

t: +44 (0) 115 951 4613