Newsletter July 2011

Issue No. 26

Editor's Note

This is the last issue of the Newsletter to be compiled by Jonathan Derham (he was recently elected as Hon. Sec. and will be busy at that). From September 2011, EurGeol Marie Fleming PGeo (ARUP) will take over as editor of the Newsletter. All Articles to Marie at marie.fleming@arup.com .

IGI News

At the IGI AGM in the Geological Survey of Ireland on 1st June 2011 the following Board was elected to manage the Institute's affairs on behalf of the members for the 2011/2012 period.

BOARD EXECUTIVE
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Vice President EurGeol Gerry Stanley PGeo
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EurGeol Bruce Misstear PGeo
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Congratulations to:
Catherine Buckley; Ian Farrelly; Andrew Garne; Jeremy James; Maeve McElligott Claire Clifford; and David Power-Fardy, who were recently awarded PGeo and EurGeol professional titles, and Frances McGilloway who was awarded the PGeo title.

Contaminated Land:- Definition of Waste - Development Industry Code of Practice

On July 2nd CL:AIRE*, announced a significant initiative to improve the sustainable and cost effective development of land including greenfield, brownfield and contaminated land sites. A new and updated version of the Development Industry Code of Practice (CoP) has been released which will deliver cost, time, social and environmental benefits to those dealing with excavated site materials. The CoP provides a clear, consistent and streamlined process which enables the legitimate re-use of materials on site or their movement between sites with a significantly reduced regulatory burden.

The new updated CoP now enables the direct transfer and re-use of clean naturally occurring soil materials between sites.

The guidance is written with the UK regulatory system in mind, however as most EU waste regulatory schemes and policy are modelled on EU legislation and EU Court of Justice rulings there should be elements in the CL:AIRE approach that could be applied in Ireland.

* **Contaminated Land: Applications in Real Environments (CL:AIRE)** is a respected independent not-for-profit organisation established in 1999 to stimulate the regeneration of contaminated land in the UK by raising awareness of, and confidence in, practical and *sustainable remediation technologies.*

Follow up/References:

Guidance:
http://www.claire.co.uk/index.php?option=com_content&view=article&id=210&Itemid=82

"Now is not the time to put the environment in the back seat"

European Commissioner for Environment

In April the European Commissioner for the Environment Mr Janez Potocnik in a speech to the Special Standing Committee on European Affairs and Special Permanent Committee on Environmental Protection stated,

"If I were then to sum up what my main priorities are for my mandate as Environment Commissioner, they would be:

- Resource efficiency
- Biodiversity
- Better implementation of the existing EU environmental rules."

In January, the Commission adopted a Communication on resource efficiency, which will set the scene for different initiatives to be adopted in 2011 and 2012 (refer IGI Newsletter #25), and in Autumn the European Commission is to publish a policy paper in the autumn setting out plans to improve implementation of the EU's environmental laws.

"My ambition is to make resource efficiency an established and broad-ranging policy for the entire EU. And I want this to be your ambition too. Why - because it can transform our economies and put them on a sustainable path - so that we can promote competitiveness, prosperity and quality of life without risking future ecological crises. It can also mean jobs – the green jobs that we hear so much about."

Follow up/References:

Full speech:
http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/11/241

FEAD Priorities for Resource Efficiency

In May Peter Kurth, President of FEAD, the European Federation of Waste Management and Environmental Services, gave a presentation on 'recycling policy instruments' at the 2011 Green Week, organised by the European Commission and dedicated this year to "Resource Efficiency."

The key statements of his presentation were:

(1) The EC should take appropriate measures to further develop the demand-side of secondary raw materials and to stimulate markets. Hence, ambitious harmonised standards at EU level need to be further developed.

(2) Competition is a key driver for developing innovative technologies. Hence, it is important to create fair competition and ensure access of private waste management companies to the recovery of separately collected waste from households.

He further stated that 20-30% of resources used are imported into the EU, and 5.25 billion worth of recyclables (paper, glass, plastics, aluminium and steel) are disposed of yearly.

Follow up/Reference:

FEAD http://www.fead.be/

FEAD Press Release:
http://www.endseurope.com/docs/110526a.pdf

International Bar Association – Model Mining Development Agreement (MMDA) Project

At its 2009 Annual Meeting, the Mining Law Committee of the International Bar Association established a project to prepare a Model Mining Development Agreement (MMDA) that can be used by mining companies and host governments for

mining projects. The project is led by the Mining Committee[1], with civil society and university-based groups working with the Committee to ensure a well-balanced final product is achieved.

The Committee collected and analyzed over 50 existing mine development agreements and then assembled the model agreement to contain representative language for each provision with links to example clauses taken from the existing agreements. The project is aimed primarily as a tool for use with and in developing countries, in particular where a mature mining code is not in place or effective. The MMDA may also be of use where the mining code must be supplemented by private agreement, or as a template for agreements with state owned mining enterprises.

photo credits: CIFOR/Flickr

The MMDA project seeks to provide a tool with a specific starting point. It asks what a mining contract might look like if the process started from the precept of a project aiming to contribute to sustainable development not just of the project itself, but of the local, regional and national community as well. While the project clearly recognizes that a mining development must be commercially viable to proceed, it also recognizes this is no longer the only issue around which contract negotiations should proceed. Rather, all parties to a negotiation should take a broader, and integrated, look at the relationship between the proposed project, the state and the local communities. The natural, social and economic environments around mining projects are also essential considerations today. The final product is web-based and publicly accessible. It is not "prescriptive" in the sense of setting out one standard form. Rather, it seeks to provide an agenda for negotiations based on a sustainable development objective that is common to all parties. Its public nature will also allow local communities and civil society groups to contribute in a sound manner to negotiation processes. By setting out a comprehensive and common template, it is hoped the project will enable and assist better structured negotiations, and better lasting results in mining projects.

In April the MMDA project published a *Model Mine Development Agreement- A Template for Negotiation and Drafting*. Available from the web address below.

Follow up/Reference:

MMDA Website: http://www.mmdaproject.org/

1. Committee: http://www.mmdaproject.org/?p=1390

British Standard on Contaminated Land Investigation

BS10175:2011 INVESTIGATION OF POTENTIALLY CONTAMINATED SITES – CODE OF PRACTICE

The revised BSI 10175 was published in April and is available from BSI bookshop.

The standard non-member's price is £176.40 but the standard is available to Regulators (local authorities and environment agencies) at a special discounted price of £100 (this price is only available by calling BSI

customer services 0208 996 9001). The BSI member's price is £98.

Follow up/References: http://www.bsigroup.com/

Land management changes required to tackle nitrate pollution

[EU funded Policy Relevant Research Article]

Intensive farming is a major cause of nitrate pollution. Overloading fields with manure by grazing too many animals or using too much fertiliser on soils causes nitrate leaching - the draining of nitrogen-containing compounds from the soil into water systems. High levels of nitrates in water can be harmful to people and the environment. In the EU, legislation under the Nitrates Directive 91/676/EEC aims to reduce nitrate pollution and has had some success.

In this study, the researchers applied computational methods to estimate the cost-effectiveness of various nitrate leaching reduction measures on hypothetical farms in the UK. They looked at different types of land: grassland used for breeding of livestock or dairy and sheep farming, and grassland used only for grazing or silage production. For each farm type, they estimated total nitrogen production. They used models to predict how nitrates would be taken up by grass or lost to water systems depending on different variables, such as climate and type of grass or soil. In the UK, the government has created Nitrate Vulnerable Zones (NVZ), which have covered 62 per cent of England since 2010.

A range of nitrate pollution mitigation measures and their cost-effectiveness were considered. These were divided into plant-based approaches, such as the type of seeds sown, animal-based approaches, such as no grazing, manure-based approaches, such as uniform application of manure, and fertiliser-based approaches. The researchers also considered combined approaches, including the NVZ zones, which restrict manure application by weight and time of year.

Their results show that most nitrate leaching mitigation measures are effective, but that relative effectiveness depends on local conditions, such as soil type and climate. For dairy herds, measures that reduced the number of animals and duration of grazing, and careful management of fertiliser and manure application, were most effective – leading to average reductions in leached nitrogen of around 31-32 per cent a year (from a baseline average of 27.5 kg of nitrogen leached per hectare per a year), but came with a high cost, estimated to be around €197-800 per hectare per year, on average. For beef herds, reducing the length of the grazing season was the most effective measure, reducing nitrogen leaching by an average of 18 per cent each year (from a baseline average of 26 kg of nitrogen leached per hectare per a year) and costing around €157 per hectare.

These results suggest that the most effective measures tend to be the most expensive, but other strong compromise solutions were identified. For example, correcting sulphur and potassium deficiencies in soil on dairy farms would reduce nitrate pollution to lesser extent but at a lower cost, and could potentially save farmers money - savings of around €106 per hectare per year were calculated, with average reductions in leached nitrogen of around 21 per cent. Similarly, adjusting fertiliser rates according to soil mineral nitrogen content could lead to average net financial savings of €196 per hectare per year for dairy farmers and moderate nitrate leaching reductions of 2-16 per cent.

The introduction of Nitrate Vulnerable Zones and associated measures in the UK was found to be very effective, at a small cost. However, costs incurred by the farmer, for instance, from lower milk production levels (as a result of reduced feed concentrates by dairy cows – a nitrate mitigation measure), may mean that compliance is not financially viable –

depending on the market value of milk. The researchers conclude that financial or legal incentives may need to be considered to encourage farmers to adopt these nitrate leaching mitigation measures.

The EU foresees financial support to farmers under the CAP, for adapting to new standards and agri-evironmental measures.

Follow up/References:

Source: Cardenas, L.M. Cuttle, S.P., Crabtree, B. *et al.* (2011). Cost effectiveness of nitrate leaching mitigation measures for grassland livestock systems at locations in England and Wales. *Science of the Total Environment*. 409: 1104-1115.

International Energy Agency 'Technology Roadmap' for Geothermal Power and Heat

A report launched in June by the International Energy Agency (IEA) shows that there is potential to achieve at least a tenfold increase in the global production of heat and electricity from geothermal energy – heat emitted from within the earth's crust – between now and 2050.

Renewable sources of energy such as wind, solar and geothermal will have to comprise a much greater share of the global energy mix in the coming years if the level of carbon dioxide in the atmosphere is to be kept below 450 parts per million – a key threshold in limiting global temperature increase to 2°C, which leaders agreed to at the UN climate change talks in Cancun in 2010.

The IEA report says that through a combination of actions that encourage the development of untapped geothermal resources and new technologies, geothermal energy can account for around 3.5% of annual global electricity production and 3.9% of energy for heat (excluding ground source heat pumps which the report did not consider) by 2050 – a substantial increase from current levels of 0.3% and 0.2%, respectively.

"This would be an important contribution to global efforts of reducing carbon emissions, using a reliable source of energy that is available all over the world, every day of the year, as it does not fluctuate with the weather or season," said IEA Executive Director Nobuo Tanaka, who launched the report, *Technology Roadmap: Geothermal heat and power,* at the EURELECTRIC annual conference in Stockholm.

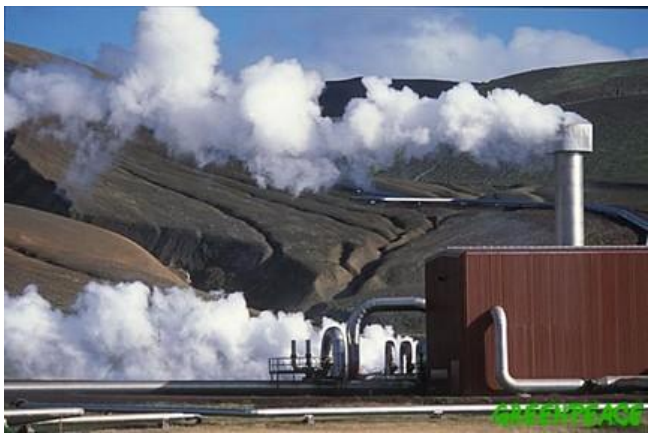


Photo: Geothermal Energy in Iceland, courtesy of Alternative-energy-resources.net

The report is the latest in the IEA series of technology roadmaps, which aim to guide governments and industry on the actions and milestones needed to achieve the potential for a full range of clean energy technologies.

Follow up/References:

Roadmap and Report:
http://www.iea.org/subjectqueries/keyresult.asp?KEYWORD_ID=4156

Press release:
http://www.iea.org/press/pressdetail.asp?PRESS_REL_ID=416

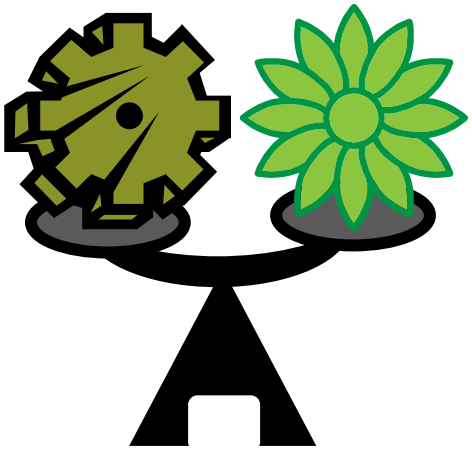
Legislation and Environmental Investment in Business

[EU funded Policy Relevant Research Article]

The exact impact of environmental law on investment by EU industry is relatively unknown. A new EU funded study has explored the effects of regulation on four types of industry investment and the results indicate that, in general, regulation tends to encourage more investment, but if restrictions are too tight investment levels can start to fall.

There is a wide range of views amongst environmental economists as to the impacts of environmental regulation on the behaviour of industry. At one extreme, some argue that firms always seek low costs and will reduce activities under

tight environmental standards and/or locate their activities to locations where standards are more moderate. Others argue that firms have a more long-term view and can see the benefits of environmental legislation on the amount of (clean) natural resources and on the demand for innovative technologies. In this latter case, industry will invest more under greater environmental regulation.



In order to gain better insight into this area, the study analysed the impact of greater expenditure on environmental protection and greater environmental taxation on four different industry investment activities. These were: investment in tangible goods, investment in new buildings, investment in machinery, and 'productive investment', which is the difference between investment in tangible goods and investment in technologies to reduce environmental impact. This can provide insight into whether changes are mainly driven by investment in technology to abate environmental impact. The data were taken from Eurostat databases from 1998 to 2007 and included 21 countries.

The results indicate that, in general, industry investment is affected by the level of national environmental regulation. On average, a ten per cent increase in national spending on environmental protection is associated with a 1.3 per cent increase in investment in tangible goods and a 1.5 per cent increase in investment in machinery. The impact on investment in new buildings is somewhat lower with an increase of only 0.6 per cent. A ten per cent national increase in environmental tax revenues, on average, increased investment by about one per cent in tangible goods and machinery, but in new buildings there was an increase in investment of about 2.5 per cent. However, at high levels of environmental expenditure and taxes, i.e. an increase of 90 per cent in spending and taxation, the effects on investment are less positive and at very high levels (99 per cent increase) the effects become negative.

The relationships between environmental regulation and investment indicate that European industries appear to focus on the comparative advantages resulting from an efficient and sustainable resource management, i.e. increased availability of resources (input factors) or enhanced quality due to a decrease in pollution. Alternatively, industry could recognise the advantage of investing in innovative technologies to improve efficiency or to sell technology as a product. Whatever the reason, this relationship does not hold when the costs to comply with regulation are much higher than the benefits. Such insight could help inform policy on the levels to which environmental legislation helps investment and, with further research, it could possibly provide limits of taxation and protection, above which the benefits no longer encourage investment.

Follow up and reference documents:

Leiter, A.M., Parolini, A. & Winner, H. (2010) Environmental regulation and investment: Evidence from European industry data. *Ecological Economics.* 70: 759-770.

See also Irish EPA Green Business Programme: www.nwpp.ie
Enterprise Ireland Green business: www.envirocentre.ie
SEAI Green Business Programme: www.seai.ie/Your_Business/

European Pollutant Release & Transfer Register (PRTR)

Europe's industrial pollution register was updated in May to include emissions to air, land and water from facilities across 32 countries in 2009. This list of facilities would include all mining activities covered by the extractive waste directive, as well as Waste and IPPC activities.

The register contains data reported by some 28 000 industrial facilities covering 65 economic activities within the following nine industrial sectors:

- energy
- production and processing of metals
- mineral industry
- chemical industry

- waste and waste water management
- paper and wood production and processing
- intensive livestock production and aquaculture
- animal and vegetable products from the food and beverage sector, and
- other activities.

Data is provided in the register for 91 pollutants falling under the following seven groups:

- greenhouse gases
- other gases
- heavy metals
- pesticides
- chlorinated organic substances
- other organic substances
- inorganic substances.

The data will continue to be revised until the autumn when the EEA will publish its analysis of the figures. Information on the amount and type of waste industrial facilities transfer to waste handlers inside and outside each country is also provided.

Follow up/References:

EU PRTR website: http://prtr.ec.europa.eu/pgAbout.aspx

EPA Report on Management of Low Levels of Landfill Gas

Landfill gas is principally composed of methane and carbon dioxide and contains many minor constituents. When uncontrolled, risks posed by landfill gas include: flammability and explosion risks, asphyxiation risks, potential health impacts, odour impacts and global warming potential.

To control these risks, the Environmental Protection Agency (EPA) requires that landfill gas is contained and collected to minimise migration off-site and that the collected landfill gas is utilised or, where that is not possible, flared in accordance with best practice. The EPA requires flares to be enclosed and operated at a minimum temperature of 1,000˚C and 0.3 seconds retention time to ensure adequate destruction. Where landfill gas has a low calorific value due to low flow and/or concentrations of methane, it may not be possible to sustain continuous flaring to best practice using the standard type of flares employed at landfills. Low calorific value landfill gas can occur during the start-up phase of a landfill, where the biodegradable content of waste is low and/or when landfill gas production declines after waste disposal has ceased.

The results of research commissioned by the EPA in 2010 on the options available for management of low calorific value landfill gas are detailed in this report. The report identifies and examines a range of techniques including:

- modification of existing flares
- use of existing flares at temperatures below 1,000˚C
- low calorific value, high temperature flares
- open flares
- supported combustion flares
- intermittent flaring
- non-catalytic thermal oxidation
- *in-situ* aeration
- biofiltration
- *in-situ* methane oxidation; and
- active and passive venting.

LFG Flare Unit

The report discusses the availability, appropriateness and cost of these techniques and is intended for landfill operators, consultants and contractors when assessing options for dealing with low calorific value landfill gas. However, each case will require site-specific risk assessment and approval from the EPA.

Follow up/References:

EPA Report:
http://www.epa.ie/downloads/advice/waste/waste/name,30775,en.html

Other EPA landfill and Waste Guidance:
http://www.epa.ie/downloads/advice/waste/waste/

EU Progress on Professional Recognition

The EU Commission has published a Green Paper* for a Directive on Recognition of Professional Qualifications. The paper is based on a public consultation which closed in January 2011. EFG contributed to this consultation.

The Green Paper provides opportunity for a second consultation, the results of which will be taken into account by the Commission in the preparation of the legislative proposal on the modernisation of the Professional Qualifications Directive (expected by the end of this year).

The Commission wishes to consult stakeholders on:

- new approaches to mobility
- ways to build on achievements
- and on the modernisation of the automatic recognition.

Everybody is welcome to contribute to this second consultation until 20 September 2011. Contributions are particularly sought from citizens, professional organisations, national governments and national competent authorities.

Follow up/References:

EU Commission :
http://ec.europa.eu/ireland/press_office/news_of_the_day/consultation-professional-qualifications_en.htm

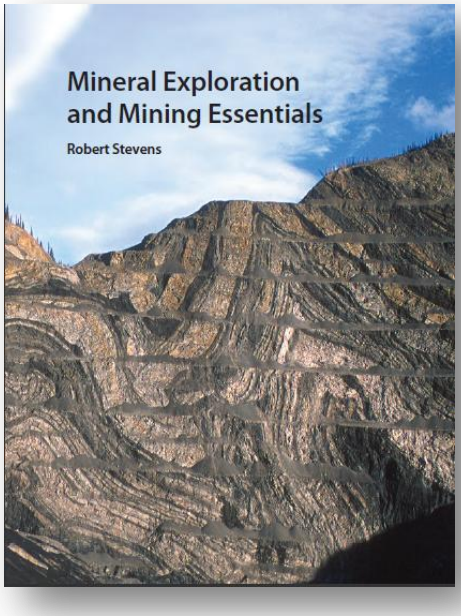
See EFG Submission

* **Green Paper**: A green paper released by the European Commission is a discussion document intended to stimulate debate and launch a process of consultation, at European level, on a particular topic. A green paper usually presents a range of ideas and is meant to invite interested individuals or organisations to contribute views and information. It may be followed by a white paper, an official set of proposals that is used as a vehicle for their development into law.

Book Review

Mineral Exploration and Mining Essentials. *Robert Stevens. 2010. Pakawau GeoManagement Inc. 322 pp. ISBN 978-0-9867221-0-3, Paperback, Europe CAD$99.95 + $10 shipping.*

Mineral Exploration and Mining Essentials is aimed primarily at non-technical professionals working in the mineral exploration and mining industry, but is equally useful to students entering a career in those industries. The author, Robert Stevens, is a professional geologist with a background in exploration and academia.



The organisation of the book begins with an industry overview and then proceeds with a brief review of geology and mineral deposits with an emphasis on those aspects that relate to exploration and mining. The chapter on mineral deposits includes a synopsis of ten major deposit types describing their significance and distribution; grade and tonnage characteristics; notable exploration drill intersections; typical mining methods; size, shape and form of mineralization; rock types; economic minerals;

formation and typical examples. This chapter also includes a section on terminology that might have been better placed in the very useful Glossary.

Chapter 4 discusses the technical aspects of mineral exploration in a very concise, but yet comprehensive manner. In addition, it includes a section on how exploration projects are financed. Chapter 5 describes the essentials of mineral resource project technical studies, with pertinent discussion of mineral resources estimation, and a short section on Canadian reporting and disclosure standards. Chapter 6 discusses underground and open pit mining methods, touching on critical components of the operations. In Chapter 7 the recovery of minerals and metals during mineral processing is described, with brief, yet adequate, description of leaching and flotation techniques. The critical issue of the environment is addressed in Chapter 8, including discussion of mine closure plans and reclamation. The final chapter presents some of the factors that should be taken into consideration in evaluating exploration companies and how to read between the lines in technical press releases.

Each chapter includes a list of references. This is one area where more detail would have been welcomed. For example, the single reference for a Dictionary of Geological Terms in Chapter One does little to add to the reader's understanding of the industry.

There are two very useful appendices. One with common conversion factors, and the second with grade-tonnage tables for 12 major deposit types. The book also includes a short Glossary of Terms.

As might be expected from the author's background the book has a North American slant with example projects predominantly taken from the Canadian and American resource sectors. This however in no way detracts from the value of the book to the target audience as the examples are pertinent and well chosen.

Illustrations are in colour and, in conjunction with high quality photographs, provide good explanatory back-up to the technical text, as well as making the book attractive. A particular feature of the book is the way it combines discussion of technical and economic issues. This reflects the author's view, correctly in my opinion, that exploration and mining is a business.

This book very successfully meets the objective of presenting an overview of the exploration and mining industry and I can highly recommend it to those in the business community dealing with the resource sector and to those students considering a career in the industry.

The book can be obtained from some associations in Canada (Geological Association of Canada, the Geological Survey of Canada and the Association for Mineral Exploration BC) and the US (Society of Mining, Metallurgy and Exploration) as well as on the website: www.miningessentials.com . A list of the current retailers can be found at:
http://www.miningessentials.com/Shop_Now.php

EurGeol John A Clifford PGeo

News of Members

Kevin Cleary joins Verde Environmental Consultants as Operations Director with responsibility for the growth and development of Verde Environmental Consultants in the Irish market and beyond. Kevin comes to Verde from WYG Ireland, where he was a Director at the Environmental and Planning Department. He has 15 years experience in the environmental sector including specialist knowledge in the area of contaminated land assessment, environmental monitoring, risk assessment and remediation. The Verde Environmental Group has a team of over 20 Environmental Consultants, Project Managers and Field Technicians in Cork, Galway and Wicklow. www.verde.ie

Conferences

Sardinia 2011

Thirteenth International Waste Management and Landfill Symposium

3 - 7 October 2011

Santa Margherita di Pula, Sardinia, Italy

see: http://www.sardiniasymposium.it/sardinia2011/programme/

Geoscientists Canada is pleased to announce that the 4th International Professional Geology Conference ("4IPGC") will take place in Vancouver, BC, January 22-24, 2012. 4IPGC will coincide with the annual Mineral Exploration Roundup convention of the Association of Mineral Exploration of British Columbia (AMEBC). "Roundup" is a vibrant, technically-oriented convention that attracts over 7000 participants each year from across Canada and around the world.

www.4ipgc.ca

Photo-File

'*Fly Rock*' (J Derham)

Please send a favourite geo- or env-picture to this spot.

Newsletter published by:

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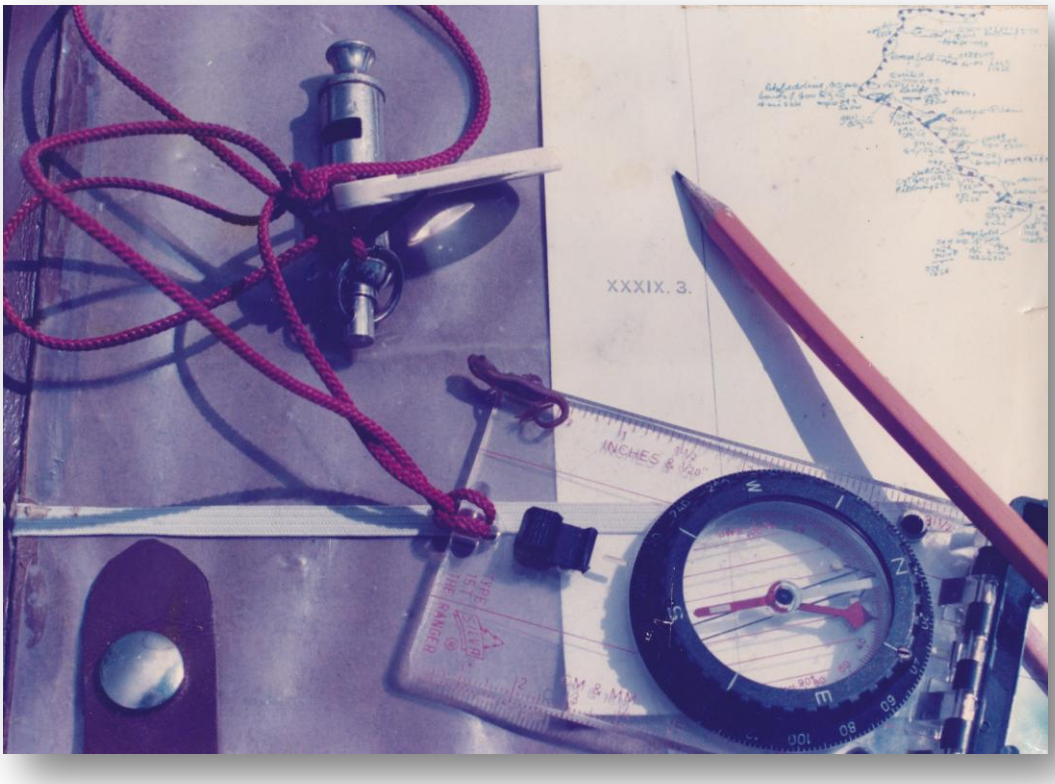
I hope you enjoyed the last four editions of the Newsletter, and that you found them of some value and interest. I enjoyed preparing them for you.
JD (outgoing editor)



'Scaling the Lizard'
(J Derham, 1983)