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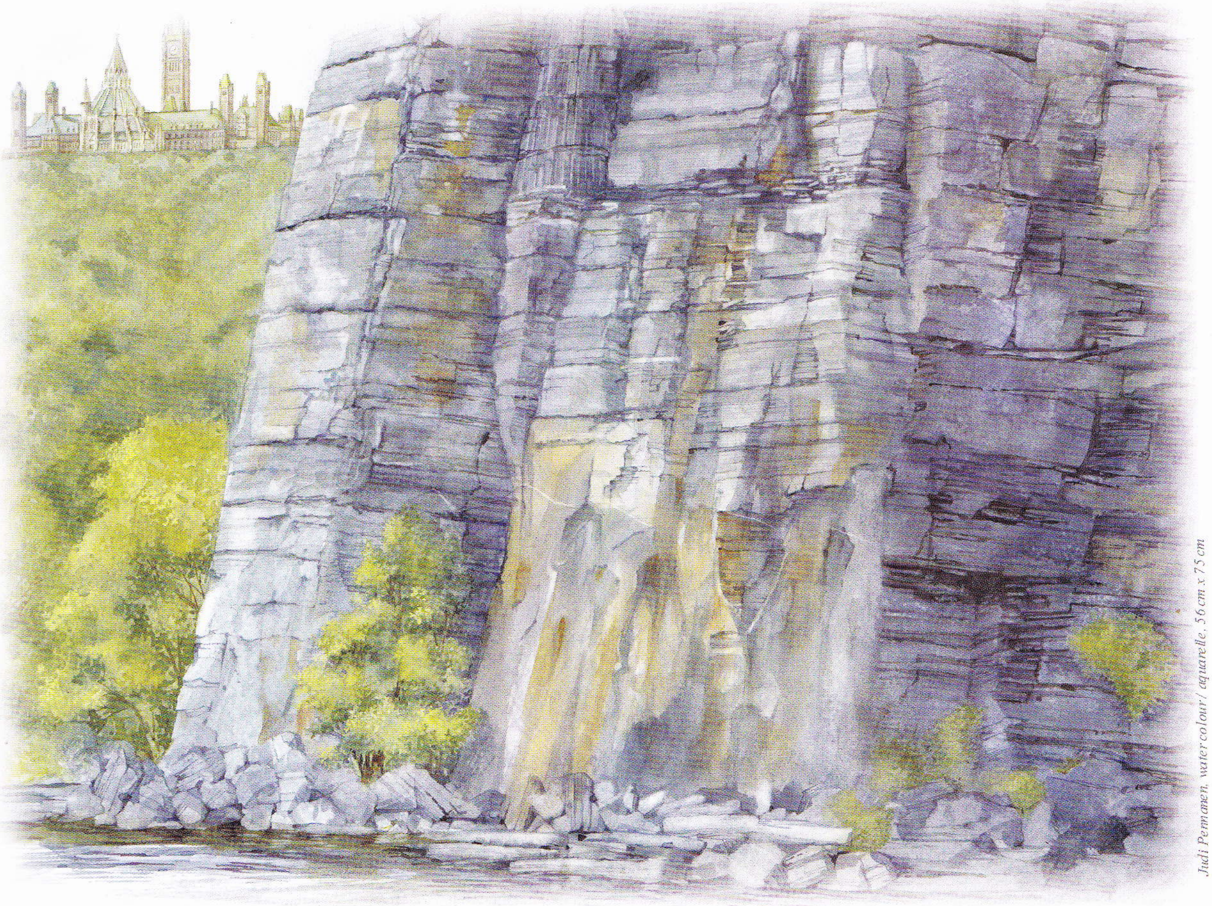

Judi Pennanen, watercolour/aquarelle, 56 cm x 75 cm

University of Ottawa/Université d'Ottawa
May 25-27 mai

Abstracts - Résumés Volume 34

Geological Association of Canada · Association Géologique du Canada · 1947

MAC | AMC

Society of Economic Geologists · Founded 1920

SEG
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Society for Geology Applied to Mineral Deposits succession comprises greenschist- to amphibolite-facies quartzites, marbles and amphibolites, which were origi- pelites, pebbly sandstones, sandstones, limestones and vol- rocks. The volcanics comprise basalts to basaltic andesites dacites to rhyolites. The basalts to basaltic andesites divide high-Mg group and a low-Mg group, and are chemically to and likely extrusive counterparts of the two groups of jia gabbronorites, respectively. The dacites to rhyolites two chemically different groups and are possibly upper- equivalents of the Liangcheng charnockites and S-type respectively. We suggest that the above gabbronorites- ites-S-type granites-volcanic succession and the regional high temperature metamorphism were most likely generated subduction just prior to the final amalgamation of the China Craton.

ROLE OF MINERALOGY IN ENVIRONMENTAL ORE DEPOSIT MODELS

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ploit an ore deposit with the least possible environmental and risks, it is important to understand how its mineralogy affect the local environs, both physically and chemically. terization of the quantity, texture, grain size, composition, inity and alteration history of minerals gives insights as to the minerals will react in processing and potentially impact ronment as waste products. The host rock, ore and gangue s can behave differently and thus may have detrimental or ficial effects on the environment. For example, it is well that carbonate gangue minerals associated with sulphide- ore bodies can help to minimize impacts from acid rock age upon oxidation of the sulphides. Secondary minerals ed in the surficial environment can act as a sink, or a source taminants such as metal(loids), sulphate, and acidity. At the lt, Ontario mining camp, alteration of primary niccolite and ite produces annabergite and erythrite, respectively, on the gs surfaces. These secondary arsenate minerals form by ef- escence enhanced by wetting and drying cycles. These soluble es can be flushed during rain events, thereby providing an on- g source of Ni, Co and As to the local watershed. In compar- , the formation of relatively insoluble minerals such as odite in lode-gold mine tailings, provides a longer-term sink ontaminants in the mine environment. However, if environ- al conditions change over time through depletion of sulphides mediation efforts, these secondary minerals can become un- e and act as new sources of contaminants. With current tech- gies, minerals can be studied at the macro- to the nano-scale, e field or in the laboratory, to determine how their surfaces react to natural (hydrothermal alteration, diagenesis, pedo- sis, weathering) and man-made processes (mineral extraction) time. This paper will examine the role of minerals as indica- of environmental change through case examples from several ng camps with different commodities (e.g. U, Ag, Au and Cu). ll focus on how mineralogy can be used in geo-environmental deposit models to anticipate potential environmental chal- es during mining and reclamation activities.

4D RADIO-WAVE GEOELECTRICAL MAPPING OF INTERWELL SPACE: SEARCHING AND MONITORING OF DEEP-SEATED MINERAL DEPOSITS

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Production technology development makes deep seated mineral deposits cost-effective. In order to provide necessary resolution of exploration of the deep seated areas, surface geophysical methods must be supported with borehole and crosshole geophysical studies. Crosshole radio-wave technique offers ample scope for exploration of such geological objects if they possess the resistivity contrast to bedrocks. The radio-wave technique is based on harmonic signal dependence from electrical resistivity of formations situated on a radio wave spreading route from a transmitter to a receiver. The crosshole measurements are carried out according to the "fan-shaped" pattern

Based on this method we have developed a new technology of 3D and 4D geoelectrical mapping. The new technology allows:

- the control and further account of the borehole transmitter characters;
- the adaptation of acquisition to various environments, by means of adjustment of radiation frequency and antennas (e.g. acquisition between distant wells, or in the low resistivity medium);
- the combined processing of several borehole-to-borehole sections, which permits to plot 3D resistivity maps, and to analyze diachronous observations.

The technology advantages are demonstrated by four examples of industrial application in various environments:

1. Search of the buried kimberlite pipes in the Jakutia region by means 400×400 m well grid. The area of 26 km^2 was examined. The 72% of the area was proved to be barren, that narrowed further investigation to the remaining 28% of the area. Main geological features were delineated.
2. Assessment of morphology and tectonics of the sulphide ore deposit in the Karelia region within 100×100 m well grid. The area of 1.1 km^2 was explored. Three ore zones were delineated by applying the radio-wave technology. The previous conception of the ore field morphology was changed.
3. Monitoring of the leaching process in the uranium field in the Ural region within 35×35 m well pattern. Block of 120×120 m was examined. The radio-wave observation, carried out before and after the leaching process start, permitted to determine the temporal and spatial distribution of the leaching solutions along the pay bed of the extremely low resistivity (<20 Ohmm). Morphology model of the ore block was corrected.
4. Monitoring of the artificial air body in the bearing formation of the uranium fields in the Uzbekistan region within 20×40m drilling grid. The area of 140×100 m was examined. Spatial distribution of air pumped into the pay bed was studied. The technology is therefore may be used for monitoring of the subsurface gas storage.

CRANSWICKITE $MgSO_4 \cdot 4H_2O$, A NEW MINERAL FROM CALINGASTA, ARGENTINA

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Cranswickite is a newly recognised mineral of composition $MgSO_4 \cdot 4H_2O$ from Calingasta, San Juan Province, Argentina (IMA2010-016). Cranswickite is monoclinic, space group *C2/c*, a = 11.9236(3)Å, b = 5.1736(1)Å, c = 12.1958(3)Å, ß = 117.548°(2), V = 667.0(1) Å^3, Z = 4, d_{obs} =1.917 g/cm^3, d_{calc}