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Kommer fra ..arkiv	Ekstern rapport nr	Oversendt fra Frank Vokes arkiv	Fortrolig pga	Fortrolig fra dato:
Tittel Geological Survey, Tydal				
Forfatter Ferriday, Ian L.		Dato    År <input type="text"/>	Bedrift (Oppdragsgiver og/eller oppdragstaker) BP NORGE AS Minerals	
Kommune Tydal	Fylke Sør-Trøndelag	Bergdistrikt	1: 50 000 kartblad 17213	1: 250 000 kartblad Trondheim
Fagområde Geologi	Dokument type		Forekomster (forekomst, gruvefelt, undersøkelsesfelt) Våråviken skjerp Gressli Grube	
Råstoffgruppe Malm/metall	Råstofftype Cu, Zn, Pb, Ag, Au			
<p><b>Sammendrag, innholdsfortegnelse eller innholdsbeskrivelse</b></p> <p>Beskriver en geologisk kartlegging i forbindelse med et malmletingsprosjekt rundt Våråviken skjerp, litt nordøst for Tydal sentrum.</p> <p>Hensikten med kartleggingen var å fastslå det geologiske miljøet for mineraliseringen og strukturene i området for å hjelpe på tolkningen av de geofysiske undersøkelser i området.</p> <p>Mineraliseringen i Våråviken er knyttet til en sekvens med bandede pelitter, antagelig fra gravakker, med band av basiske vulkanitter.</p> <p>Gressli ligger 4 km vest for Våråviken.</p> <p>Foldingen i området er tette isoklinalfolder, men en tidlig foldefase har gitt svake dome og bassengstrukturer.</p> <p>Er vedlagt en analysetabell over prøver fra Våråviken og Gressli.</p>				

BP NORGE A.S. MINERALS

Subject: GEOLOGICAL SURVEY, TYDAL

Period: 20. June - 1 July, 1983

Date: 4. July, 1983

By: I. L. Ferriday

Summary: A geological survey consisting of mapping at 1:20.000 and 1:50.000 scale was carried out around the Våraviken prospect and its surrounding areas in Tydal, Sør Trøndelag, in order to ascertain a) The nature of the environment of the mineralization and the possibility for extensions or further occurrences, and the relationships between Våraviken and other mineralizations to the west at Gressli and to the south in the old Kjøli-Allergot mining field, b) The structure for the area in order to aid interpretation of geophysical surveys. The Våraviken mineralization lies in a sequence of indurated banded pelites probably rep. metagraywackes which also contain basic metavolcanics, which appear to lie off the flanks of a mass of intermediate to acid volcanics which can be traced south to the Allergot mine area. This sequence has been intruded by numerous bodies of gabbroic to granodioritic composition on the E. flank of the Hyllingen gabbro. The Gressli mineralization occurs on the W. flanks of the Hyllingen gabbro, in a sequence of metavolcanics dominated by intermediate to acid tuffs, agglomerates, flows and qtz-porphyrries which have been intruded by basic feldspar-porphyry and veins of granodiorite. Although no direct continuity can be observed between the two notably Zn-rich mineralizations of Gressli and Våraviken due to the presence of the Hyllingen gabbro, it appears feasible that an indirect link exists via the Kjøli-Allergot mining field to the south of the gabbro mass. Due to very poor exposure in the area no extensions to the Våraviken mineralization could be detected. However, approximately 2km to the W. and 5km to the S.E. of the prospect, pyritic black shales were discovered near the contact between metapelites and massive basic metavolcanics, which would appear to be a similar setting for the Våraviken mineralizations. In the former locality a boulder of massive pyrite-(chalcopyrite) was also found.

2. | It is recommended that, due to the thick and extensive drift cover of this region that the only means of adequate and economic coverage/detection of this contact zone lies in the use of airborne geophysics. The area is somewhat plagued by high tension lines which limit ground geophysics but which should not pose any problems with modern airborne EM systems. The topography of the area is such that a fixed-wing system could probably be used.

Geology: A) VÅRAVIKEN AREA. The Våraviken mineralization, consists of variably textured pyrrhotite-pyrite-sphalerite-galena-chalcopyrite-arsenopyrite (16-137 g/t Ag, 7-1250 ppb Au, 1.3-30.0% Zn, 0.5-6.6% Pb, 0.6-2.3% Cu, 0.1-0.6% As). This is of limited thickness (<2m) lying within a massive biotite-porphyroblastic intermediate lithology which has been heavily pyritized, which either represents a silicified component of the metagraywacke sequence, or

an altered intermediate extrusive. Within a radius of 2kms of the prospect, there occur massive, locally partly biotite or amphibole-porphyroblastic basic to intermediate metavolcanics, which in the neighbourhood of the contact with schistose and well-banded biotite-porphyroblastic metagraywackes, are strongly silicified, epidotised and pyritized. At this horizon there also occur thin pyritic black graphitic schists. This horizon would appear to represent (with varying facies) the mineralizing event of the area, and the target time/stratigraphic zone for any future exploration. Around the Våraviken prospect there occur several intruded bodies of gabbro and coarse-grained amphibolite, which have no doubt been responsible for remobilization of parts of the Våraviken mineralization, and possibly also for the growth of biotite/hornblende porphyroblasts in the sediments and extrusives.

B) SOUTH AND EAST OF VÅRAVIKEN: The biotite-porphyroblastic metagraywacks sequence with massive basic to intermediate metavolcanics continues in a southerly direction, towards the Fosskleppen area where the latter thickens and are accompanied by voluminous massive acid to intermediate metavolcanics again with metagabbro bodies. If any area of Eastern Tydal could be chosen as an eruptive centre, for the Våraviken volcanics, then this would be in the Fosskleppen area. These acid to intermediate volcanics continue southward and westward over the river Tya to the Lauvøyvolla area and are presumably hence continuous with the predominantly basic to intermediate pillowbasalts and pyroclastics hosting the Allergot mineralization a further 5km to the south-west. Lying to the east and structurally above the Nea-Fosskleppen metavolcanics is a sequence of thickly interbedded metagraywackes and quartz-chlorite schists which do not appear to have an extensive continuation to the north-north-west back to the Våraviken area. These are in turn structurally overlain to the east, towards <sup>2</sup>Øfjellet by a sequence of massive to schistose basic metavolcanics containing thin metagraywacke and grit horizons, together with quartzite and a horizon of acid volcanics. To the south-west the latter sequence appears to become almost exclusively fine-grained amphibolitic in the Vessingssjøen-E. Nesjøen area, containing local acid horizons, and at one locality even a thin marble. By extrapolation one would expect the latter amphibolites (with amphibole schist and garbenschist) to structurally overlain the Fosskleppen acid-intermediate sequence.

C) NORTH AND WEST OF VÅRAVIKEN: The massive basic to intermediate volcanics and biotite-porphyroblastic metagraywakes of Våraviken continue northward for at least 3km into an extremely poorly exposed area. There are evidently several complications in this direction however, including at least some fracturing and thrusting along the Lødølja valley, and the intrusion of sheets of granodiorite reflecting increasing proximity to the Hyllingen gabbro complex

and its eastern diorite-granodiorite component.

D) WEST OF VÅRAVIKEN TO GRESSLI: This section is important regarding the relationships between the two similar mineralizations of Våraviken and Gressli, (pyrite-sphalerite-chalcopyrite). Approximately 4km west of Våraviken, the metagraywackes are structurally overlain by a thick zone of 6km across regional strike in which intrusives are dominant, both in volume and influence. This zone may be divided into a) an easterly component of 4-5km where acid intrusives predominate, including granodiorites, pegmatite and biotite-porphyrity granite, together with minor diorite, which occur both as massive bodies and as pervasive net veins in gabbro/amphibolite b) a westerly component of 1-2km consisting of metagabbro, feldspar-porphyrity dolerite and amphibolite which represent a part of the large N-S trending Hyllingen gabbro complex. It is therefore impossible to make any reasonable judgement of the stratigraphic relationships along this section. Within the intrusive-dominated zone however, there occur schistose fine-grained amphibolites which contain relics of amygdaloidal structures. Massive chloritic to fine-grained amphibolites of a similar nature with qtz and epidote-filled amygdales, occur also structurally above the Gressli mineralization, together with thin quartz-porphyrity flows, other acid flows and tuffs/agglomerates. These have been intruded by coarse feldspar-porphyrity intrusives which are later than, but locally grade into gabbroic lithologies. Occurring with the Gressli mineralization are mineralized cherts. The host rocks of Gressli and Våraviken are therefore, quite dissimilar, apart from the presence of massive fine-grained amphibolitic extrusives. Gressli would appear to have been deposited in a vent-proximal environment, enclosed by volcanics with abundant coarse pyroclastics and short-travelled acid flows, whereas the Våraviken environment probably represents a more distal facies, deposited in a graywacke filled basin at or near the contact with basic extrusives. Unfortunately it is not possible to ascertain the relative ages of the biotite-porphroblastic metagraywackes and the extrusives.

E) SEQUENCES TO THE EXTREME SOUTH OF TYDALEN: The amphibolite/garbenschist and metavolcanic sequences of the E. Nesjøen-Lauvøyvolla-Allergot areas are structurally overlain to the south, in the Mosjøen area by a thick (at least      km) thick sequence of slabby interbedded biotite and qtz-muscovite-garnet schists and gneisses containing acid horizons and carbonate-rich horizons. This sequence may represent a high-grade equivalent of the thickly interbedded meta-graywacke sequence occurring in the Nea section.

Structure: The general N-S to NNE-SSW moderately westerly dipping trend of lithologies immediately flanking the Hyllingen gabbro complex and its eastern

its

acid component are disturbed quite dramatically further eastward in the Våraviken-Øyfjell areas and further south towards E. Nesjøen-Mosjøen-Allergot. The primary folding is of extremely tight isoclinal style, generally producing an obvious schistosity, while locally mylonitization may also be present, being difficult to distinguish from possible fine primary sedimentary banding. Such early folds and this schistosity have been folded on an open scale along orthogonal axes running approximately E.W and N.S. producing a weak dome-and-basin effect.

The Våraviken prospect lies on the eastern flank of such a N-S elongated anti-form.

ANALYTICAL RESULTS

GRESSLI AND VÅRAVIKEN MINERALISATION, TYDAL

Sample No.	MnO [%]	As	Ba	Cu [%]	Pb [%]	Zn [%]	Ag	Au [ppb]
070 140 GRESSLI	0.00	309	118	1.3	0.01	11.4	22	
070 141 GRESSLI	0.00	278	77	1.4	0.02	23.8	25	6
070 142 GRESSLI WALLROCK CHERT	0.01	115	541	0.3	0.03	2.5	N.A.	N.A.
100 180 VÅRAVIKEN	0.02	452	140	2.3	0.5	4.0	21	1250
100 181 VÅRAVIKEN	0.04	3329	71	1.8	3.6	13.3	87	680
100 182 VÅRAVIKEN	0.06	3085	65	1.5	3.3	13.5	78	143
100 183 VÅRAVIKEN	0.00	1874	69	0.6	1.6	3.6	34	7
100 184 VÅRAVIKEN	0.14	5676	61	0.9	6.6	30.3	137	159

All values in ppm unless stated otherwise.

For location refer to MASC ANNUAL REPORT 1982.