Bergvesenet

Postboks 3021, 7002 Trondheim

Rapportarkivet

Bergvesenet rapport nr	Intern Journal nr	Internt arkiv nr	Rapport lokalisering	Gradering
BV 245			Trondheim	**Fortrolig**
Kommer fra ..arkiv	**Ekstern rapport nr**	**Oversendt fra**	**Fortrolig pga**	**Fortrolig fra dato:**
Trondheimske	Syd			

Tittel

The Knaben Area Rapport fra undersøkelsesarbeider 1981

Forfatter	Dato	Bedrift
Gvein, Øyvind	16.04 1982	Sydvaranger A/S

Kommune	Fylke	Bergdistrikt	1: 50 000 kartblad	1: 250 000 kartblad
Kvinesdal	Vest-Agder	Vestlandske	14123	

Fagområde	Dokument type	Forekomster
Geologi		Knaben
Råstofftype	**Emneord**	
Malm/metall	Mo	

Sammendrag

Drilling of one deep hole in the southern sectors of the Knaben II-deposite shows a splitted ore-zone consisting of about 10 m of bleached gneiss grading 0.06 - 0.07% MoS2, inside a 20 m sequence.

A reconnaissance survey along the western margin of the monzonite batholite east of Knaben with respect to Sn has given negative results.

Since 1) the regional investigations in 1979-80 seem to show that the molybenite occurrences in the region are small and uneconomic, 2) the Knaben II-deposite dissipates at depth and 3) no other mineralizations of economic interest is likely to occur, we propose to close down the exploration in the area.

Fun. 150/82 VB.

A/S Sydvaranger.
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Nordraaks vei 2. 1324 Lysaker, Norge.
Tlf: 538976 - 120518

INTERN RAPPORT.

DATO: 16.4.1982	RAPPORT NR: 1246	KARTBLAD NO 32-4 Mandal	Antall sider —«— bilag

SAKSBEARBEIDER Geologist Øyvind Gvein

RAPPORT VEDRØRENDE:

THE KNABEN AREA.
REPORT FROM THE FIELD SEASON 1981.

FORDELING

OSLO:

- [ ] Arkiv

KIRKENES:

- [ ] HK

ANDRE:

- [ ] UNION MIN. (2 eks.)
- [X] VESTLANDSKE BERGMESTER
- [ ] U.S.B.

RESYMÉ:

Drilling of one deep hole in the southern sectors of the Knaben II - deposite shows a splitted ore-zone consisting of about 10 m of bleached gneiss grading 0.06-0.07 % MoS_2, inside a 20 m sequence.

A reconnaissance survey along the western margin of the monzonite batholite east of Knaben with respect to Sn has given negative results.

Since 1) the regional investigations in 1979-80 seem to show that the molybdenite occurrences in the region are small and uneconomic, 2) the Knaben II-deposite dissipates at depth and 3) no other mineralizations of economic interest is likely to occur, we propose to close down the exploration in the area.

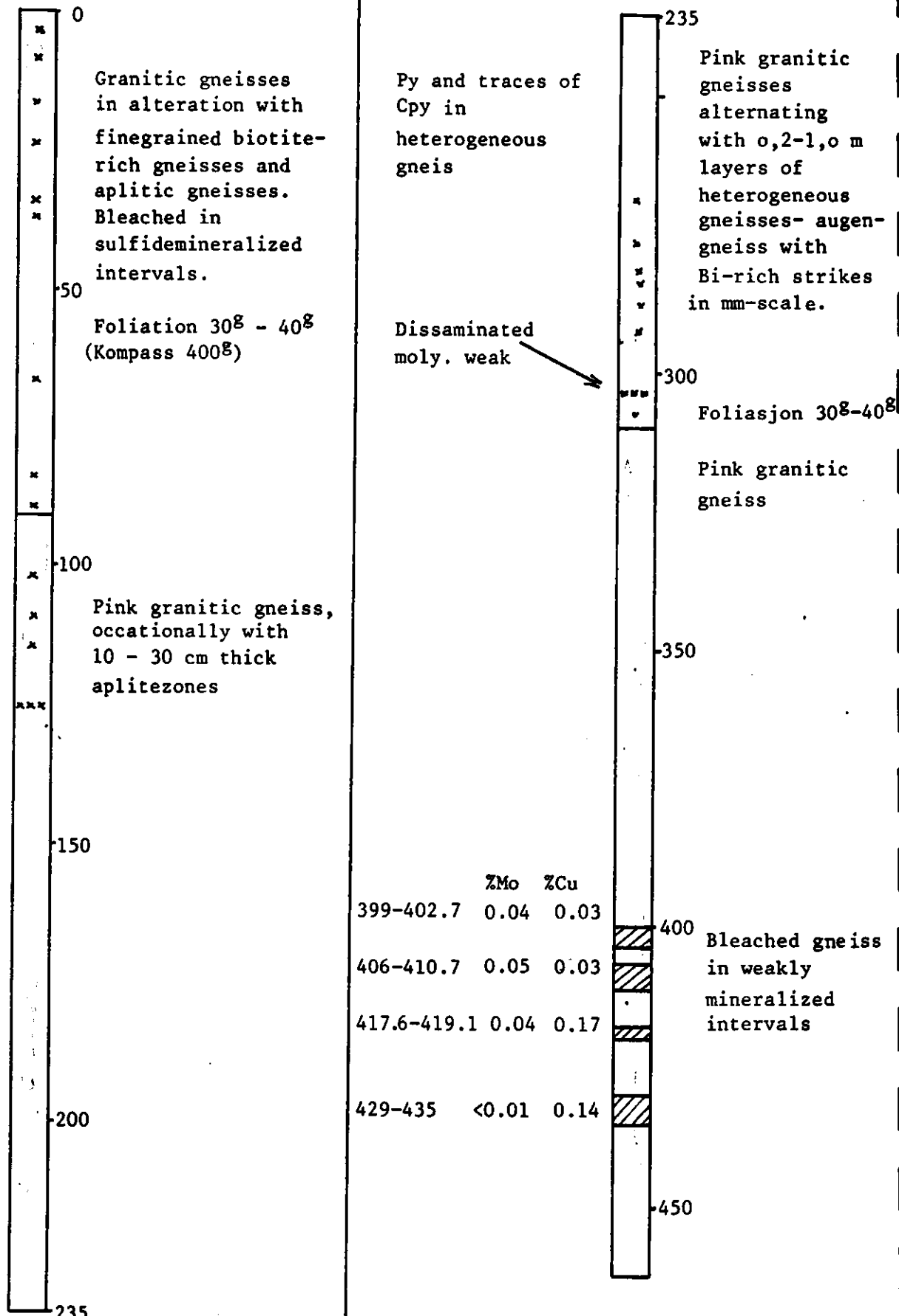
KOMMENTAR:

TRONDHEIMSKE BERGDISTRIKT

RAPPORTARKIV NR. 245.

THE KNABEN PROJECT 1981

Dh. 9.4 1981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Fe-sulfides and traces of moly (x) in all gneiss-variants.
Granitic gneisses in alteration with finegrained biotite-rich gneisses and aplitic gneisses. Bleached in sulfidemineralized intervals.
50
Foliation 30g - 40g (Kompass 400g)
100
Pink granitic gneiss, occationally with 10 - 30 cm thick aplitezones
135-136: 0.40% Mo
150
200
235
Py and traces of Cpy in heterogeneous gneis
Dissaminated moly. weak
%Mo %Cu
399-402.7 0.04 0.03
406-410.7 0.05 0.03
417.6-419.1 0.04 0.17
429-435 <0.01 0.14
235
Pink granitic gneisses alternating with o,2-1,o m layers of heterogeneous gneisses- augen-gneiss with Bi-rich strikes in mm-scale.
300
Foliasjon 30g-40g
Pink granitic gneiss
350
400
Bleached gneiss in weakly mineralized intervals
450

ØG/rf

THE KNABEN PROJECT 1981.

1. INTRODUCTION

A/S Sydvaranger's geologist Øyvind Gvein has been in the charge of the investigation in Knaben in 1981, assisted by the geologist Tormod Lid Larsen.

The purposes for the field season were

- Drilling of one hole in the southern sectors of the Knaben II - deposite.
- Reconnaissance mapping and solid rock geochemistry in the border zone along the monzonite - batholite east of Knaben.

2. DRILLING

The drillhole is situated in the previous drillsection 9, about 1.2 km south of the outcropping of the Knaben II - deposite (Block-diagram fig. 1246-02).

The reason for drilling at this locality was the idea that previous holes in the section is drilled too far west to hit the richest ore. The interpretation of the upper limit of the ore body show that it is possible (Block-diagram).

2.1. Performance

The drilling which was carried out by the company Terranor A/S, Trondheim, commenced June 29. At July 9. 225 m was reached, and here trouble started by loss of water. After cementing, drilling continued July 11 to 231 m where waterloss occured anew. After cementing and repeated cementing the drillrod fastened July 25. - in homogeneous unfractured gneiss.
The drillers worked for 2-3 weeks to loosen the rod, but did not succed, and a new hole was sited, half a meter from the first. After a lot of problems, partly accidential, the orezone was spud early November.

2.2 Results

The core is described at facing page and in log Appendix 1.
To a depth of 90 m the rocks are comprised of granitic gneisses in alteration with finegrained biotitegneisses. Iron sulfides and traces of moly are typical. As shown in map page 3 this is the gneiss-zone that has been target for the extencive exploration north of Knaben.

FIG.

- Pink granitic gneiss.
- Rusty gneisses with remnants of meta supracrustal rocks.
- Finegrained gneiss. Markerhorizon.
- Metadiabase.
- ---- Fault.
- . Prosp. pits and small mines.

Scale 1 : 50000

The small deposits Knaben I and Kvina are located to this zone in additions to a lot of small occurences.

90-235 m. Pink granitic gneisses dominate. Scattered grains of moly can be shown down to about 140 m, with a richer zone at the depth of 135-136 m, corresponding to previous recognized mineralization (Block diagram). Here the Mo-mineralization essentially is connected to two quartz-rich intervals of 2-3 cm thickness.

235-310. Pink granitic gneisses dominate and alterate with narrow zones (0.2 - 1.0 m) of heterogeneous gneisses - augengneisses with Bi-rich strikes in mm scale. Scattered grains of moly are recognized.

In the interval 304.0-311.5 bleached gneisses occur, but molymineralization is only observed in 1-3 mm streaks between 304.0 and 304.4, and as weak dissamination between 306.9-307.1. This bleached and weakly mineralized zone corresponds to previous recognized mineralization. (Block diagram)

310-463 m (T.D.) Pink granitic gneiss. The main ore-zone occurs between 399 and 419 m, splitted by two zones of non-mineralized, ordinary pink gneiss. In the weakly mineralized zones, moly, cpy and py occur dissaminated in a bleached or partly bleached granitic gneiss. Further down there is a partly bleached zone between 429-435, very weak in moly.

2.3. Conclusive remarks.

Looking at the section 9 in the block diagram the mineralized zones in the previous holes in the section is spud by the new hole. In the portion where the hole is sited the "central part" of the Knaben II - linse must be spud.
The results therefore confirm the generell idea that the Knaben II - mineralization weakens at depth.

3. RECONNAISSANCE INVESTIGATION ALONG THE MONZONITE-BATHOLITE-MARGIN EAST OF KNABEN.

In 1980 stream sediments were sampled adjacent to the south-western border of the monzonite- batholite (map 1246-1). Oxalic Acid Leachates of the samples were analysed by Emission Spec. and showed weak Sn-anomalies.

The southwestern and western margin of the batholite and the bordering gneisses are surveyed and sampled by Tormod Lid Larsen in 1981.

A selection of 22 samples are analysed by Emission spec. at Skyline Labs. (Table 1, Appendix) Map 1246-1 shows the geology and sampling points along the border.

3.1. The geology.

The monzonite is a younger intrusive rock, partly showing chilled margins adjacent to the gneisses. The rock is coarsegrained and contains 70-80 % microcline and plagioclase, 10-15 % quartz and about 10 % hornblende and biotite. Titanite and ilmenite are usual accessiories.

Graphic granites and pegmatites are associated with the monzonite. Graphic granite occur as irregular bodies and dikes intruded in the gneisses, while the pegmatites are 10-20 cm thick dikes, both as offset-dikes from the monzonite and as dikes in the monzonite itself. Microcline is the dominating feldspar in this rocks.

Hydrothermal alterations are not observed along the monzonite-margin.

3.2. Analyses.

Table I in the appendix shows the results from the Emission-spec. analyses in the different rocks along the monzonite-border. (Sample-locations map 1246-1). The content of Sn and most of the other interesting elements are very low. Ba and Ti in the monzonite-samples (C-samples) is in the range 0.2-0.5 % for Ba and 0.3-0.7 % for Ti. No spesific Ba-mineral can be identified in thin-sections.

3.3. Conclusion.

The reconnaissance mapping and hard rock geochemistry along the monzonite margin has confirmed the lack of Sn-mineralization and other interesting mineralizations.

4. CONCLUSION AND FINAL COMMENTS.

The 1981-drillhole on the Knaben-deposite shows that the orezone is splitted. About 10 m mineralized bleached gneiss grading 0.06-0.07 % Mo S_2 occurs inside a 20 m sequence. This is a new indication that the orezone dissipates at depth.

When the Knaben Mine was closed down in 1972, proven ore reserves were estimated to about 5 mill. tonns grading 0.15 % Mo S_2. The new drillhole is sited in the continuation of the area for calculated reserves, and shows still

lower content. The logical consequense is therefore to close down the investigation of The Knaben Mine deposite.

The regional investigation during the years 1979-1981 and data from previous investigations by other companies and NGU, have shown that the known molybden-mineralization in the region are minor - and ineconomic occurrences.

Geochemical sampling, covering about 250 km^2 for reconnaissance data and about 600 km^2 in selected areas, has revealed only minor showing.

Mineralization of economic interest in the region is therefore not probable, and our final conclusion must be that the exploration in the Knaben area is brought to an end.

Stabekk, 16.4.1982

Øyvind Gvein

5. PREVIOUS REPORTS IN THE JOINT VENTURE PROGRAM BETWEEN A/S SYDVARANGER AND UNION MINERALS, NORGE

The results from previous investigations in the region by other companies and A/S Sydvaranger are summed up in the following reports:

1. GVEIN, Ø.; MØRK, K.; SVERDRUP. T.L. (1979).
   The molybdenite-province of south-western Norway.
   This is a compilation of available data in 1979.

2. GVEIN, Ø; RUI, I.J. (1980).
   Report from the field-season 1979 and a compilation of results from previous drilling and exploration work.
   (Report no. 1077)

3. GVEIN, Ø. (1981).
   The Knaben Area. Report from the field season 1980 and a compilation of results from Elkem's and N.G.U.'s exploration work in the region.

A P P E N D I X

Table 1. Emission spec.-analyses of rock-samples from the area along the monzonite-margin.

Corelog, DH. 9.4 - 1981.

TABLE 1.

EMISSION SPEC.-ANALYSES OF ROCK-SAMPLES
FROM THE AREA ALONG THE MONZONITE-MARGIN.

JOB NO. NJQ 005
PAGE 1

ITEM NO. SAMPLE NO.
1 = A-1 GRANITIC GNEISS
2 = A01 "
3 = A02 "
4 = A03 "
5 = A04 "
6 = A05 "
7 = A06 "
8 = A07

	A-1	A-1	A-2	A-3	A-4	A-6	A-6	A-7
ITEM	1	2	3	4	5	6	7	8
ELEMENT								
Fe	1.5%	1.5%	1.5%	1%	0.7%	1.5%	2%	1.5%
Ca	0.5%	0.7%	0.5%	0.3%	0.1%	0.7%	0.7%	0.5%
Mg	0.1%	0.2%	0.2%	0.15%	0.2%	0.2%	0.5%	0.2%
Ag	<1	<1	<1	<1	<1	<1	<1	<1
As	<200	<200	<200	<200	<200	<200	<200	<200
B	<10	<10	<10	<10	<10	<10	<10	<10
Ba	300	700	300	300	2000	300	500	300
Be	3	2	2	3	<2	2	2	2
Bi	<10	<10	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50	<50	<50
Co	<5	<5	<5	<5	<5	<5	<5	<5
Cr	<10	<10	<10	<10	<10	<10	<10	<10
Cu	10	5	3	2	2	5	2	2
Ga	30	30	20	30	10	20	20	30
Ge	<20	<20	<20	<20	<20	<20	<20	<20
La	50	100	50	50	30	30	50	30
Mn	200	300	500	200	300	200	500	200
Mo	<2	<2	<2	<2	<2	<2	<2	<2
Nb	<20	<20	<20	20	<20	<20	<20	<20
Ni	5	5	5	5	5	5	5	<5
Pb	200	50	30	50	30	50	30	50
Sb	<100	<100	<100	<100	<100	<100	<100	<100
Sc	<10	<10	<10	<10	<10	<10	<10	<10
Sn	<10	<10	<10	<10	<10	<10	<10	<10
Sr	100	100	100	100	200	100	100	100
Ti	1000	1500	1000	500	300	1000	1500	1000
V	10	20	<10	10	10	15	10	15
W	<50	<50	<50	<50	<50	<50	<50	<50
Y	30	15	50	15	<10	<10	<10	<10
Zn	<200	<200	<200	<200	<200	<200	<200	<200
Zr	70	200	100	100	20	150	200	200

JOB NO. NJQ 005
PAGE 2

ITEM NO. SAMPLE NO.
9 = A09 Granitic Gneiss
10 = B01 Granitic Granite
11 = B03 "
12 = B04 "
13 = B05 "
14 = C01 Monzonite
15 = C02 "
16 = C03 "

	A-9	B-1	B-3	B-4	B-6	C-1	C-2	C-3
ITEM	9	10	11	12	13	14	15	16
ELEMENT								
Fe	1%	0.1%	0.1%	5%	2%	5%	5%	3%
Ca	0.7%	0.3%	0.5%	0.1%	0.5%	2%	1%	1%
Mg	0.2%	0.03%	0.05%	0.15%	0.2%	1%	1.5%	0.7%
Ag	<1	<1	<1	<1	<1	<1	<1	<1
As	<200	<200	<200	<200	<200	<200	<200	<200
B	<10	<10	<10	10	<10	<10	10	<10
Ba	700	100	50	700	700	2000	1500	2000
Be	3	2	2	<2	<2	2	3	3
Bi	<10	<10	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50	<50	<50
Co	<5	<5	<5	<5	<5	<5	<5	<5
Cr	<10	<10	<10	<10	<10	<10	<10	<10
Cu	<2	2	3	2	10	5	5	5
Ga	20	20	15	20	15	30	20	20
Ge	<20	<20	<20	<20	<20	<20	<20	<20
La	20	20	20	20	30	70	150	70
Mn	500	30	50	1000	200	1000	1000	1000
Mo	<2	<2	<2	2	<2	<2	<2	<2
Nb	<20	<20	<20	20	<20	20	20	20
Ni	<5	<5	<5	<5	<5	10	<5	<5
Pb	20	70	30	30	30	30	20	20
Sb	<100	<100	<100	<100	<100	<100	<100	<100
Sc	<10	<10	<10	<10	<10	10	20	10
Sn	<10	<10	<10	<10	<10	<10	<10	<10
Sr	200	100	100	100	100	1000	500	500
Ti	1500	100	100	5000	1000	7000	5000	7000
V	10	<10	<10	70	10	50	50	50
W	<50	<50	<50	<50	<50	<50	<50	<50
Y	<10	<10	<10	<10	<10	50	70	50
Zn	<200	<200	<200	200	<200	<200	<200	<200
Zr	100	<20	20	<20	30	500	300	500

ITEM NO. SAMPLE NO.
17 = C04 Monzonite
18 = C05 "
19 = C07 "
20 = C09 "
21 = D02 Aplomite
22 = D04 "

	C-4	C-5	C-7	C-9	D-2	D-4
ITEM	17	18	19	20	21	22
ELEMENT						
Fe	5%	3%	3%	3%	5%	5%
Ca	2%	1%	1.5%	1%	1.5%	20%
Mg	0.7%	0.7%	1.5%	0.7%	0.5%	20%
Ag	<1	<1	<1	<1	<1	<1
As	<200	<200	<200	<200	<200	<200
B	<10	<10	<10	<10	<10	10
Ba	2000	2000	2000	5000	1000	50
Be	3	2	<2	2	<2	<2
Bi	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50
Co	<5	<5	<5	<5	<5	50
Cr	<10	<10	<10	<10	<10	5000
Cu	5	15	7	3	30	10
Ga	20	20	20	20	30	<10
Ge	<20	<20	<20	<20	<20	<20
La	100	100	100	100	20	<20
Mn	1000	500	700	1000	1000	2000
Mo	<2	<2	<2	<2	2	<2
Nb	20	20	20	30	20	<20
Ni	<5	<5	<5	<5	10	200
Pb	20	30	50	20	20	<10
Sb	<100	<100	<100	<100	<100	<100
Sc	10	<10	<10	<10	20	70
Sn	<10	<10	<10	<10	<10	<10
Sr	700	700	700	500	200	100
Ti	3000	5000	7000	5000	5000	2000
V	20	50	50	<10	10	200
W	<50	<50	<50	<50	<50	<50
Y	50	15	30	50	20	<10
Zn	<200	<200	<200	<200	<200	<200
Zr	500	500	300	500	500	20

DIAMANTBORING KNABEN 1981.

Kjerneobservasjoner.

Borhull nr. 9.4 Profil 9. (mine-map)

Koordinator: Y X

Påsatt i høyde 780 m.

« i retning Vertical

« med helning

Borhullets lengde 463 m.

Boret meter	Bergart	~~Kjerne-mangel~~ Joints	~~Skifrighet~~ Foliation	Bergart prøve
0 - 2.5	Soil			
2.5 - 6.8	Pink granitic gneiss 2-3 % Bi, Bleached where sulfides occur. F.sp. - grains 5-10 mm. 3.25 m trace moly. 4-6 m Disseminated py 4.9 - 5 m Disseminated py, cpy, trace moly. 6.6 Joint	63	38 a)	
6.8 -10.0	Bi-rich gneiss with layers of Bi-schist, with disseminated py and cpy. Trace moly at 6.85. 9.85 Joint	88		
10.0 -15.7	Weakly bleached granitic gneiss with layers of Bi-rich gneiss. Py-imp. 12.65-12.8 Aplite.		37	
15.7 -15.9	Aplite			
15.9 -21.4	Pink granite gneiss, fractured. Calcitecoating and py. on jointplanes. Semented in this interval.			
21.4 -21.9	Aplite gneiss with disseminated py.			
21.9 -22.05	Biotite-gneiss.			
22.05-22.2	Pink granitic gneiss			
22.2 -22.85	Aplite gneiss, with mm-bands containing py, cpy and moly.		36	
22.85-23.6	Pink granitic gneiss.			

a) 400 grad. compass.

1 000-9-74. FS 0030. A 4. H. C.

Ark 2 Bh. nr. 9.4 Profil 9

Boret meter	Bergart	Joints	Foliation	Bergart prøve
23.6 - 24.6	Aplitic gneiss with disseminated py.		7	
24.6 -38.0	Weakly bleached granitic gneiss with a few 5 cm thick layers of biotiteshists. Py-dissemination, weaker downwards. Traces moly and cpy.		31	
	33.6 -34.2 Joint	96		
	36.7 -38 "	86		
38.0 -41.85	Granitic gneiss with Bi. Traces moly at 38.0.			
41.85-46.4	Bi and hbl. rich gneisses. Partly py-mineralization. Trace moly 42.75.		35	
46.4 -51.15	Pink granitic gneiss with biotiterich zones. Partly py.diss.			
51.15-89.6	Pink granitic gneiss.			
	60-67 Scattered py. A few grains of moly 66.0 -66.5.			
	71.9 Trace moly.		31	
	80-85 Scattered py. Trace moly at 84.35.			
	85-89.6 Scattered py. Trace moly 88.0 -88.6.			
89.6 -91.0	Bi-rich aplitic gneiss. Scattered py. Trace moly at 90.0.			
91.0 -92.2	Pink granitic gneiss			
92.2 -92.5	Py. disseminated partly clay-altered gneiss.			
92.5 -120.0	Pink granitic gneiss. Scattered py. Traces moly 100.8, 108.5-109.6, at 110.0, 111.75 and 114-115.		32	
120.0-135.1	Pink granitic gneiss. Pegmatitic zones 122.3-123.8 and 124.6-124.9. Scattered py. Traces moly. 132.45-132.65 aplite.			
135.1-135.3	15 cm of bleached gneissgranite with a 2-3 cm quartzrich strand on each side, enriched in moly and minor cpy. The gneiss is impregnated by moly and cpy.			
135.3-135.6	Weakly bleached granitic gneiss.			

1000-9-74. FS 0031. A 4. H. C.

Ark 3 Bh. nr. 9.4 Profil 9

Boret meter	Bergart	Joints	Foliation	Bergart prøve
135.6 -135.8	Bleached gneiss and aplite impregnated by cpy and moly.			
135.8 -137.5	Gradually pink granitic gneiss.			
137.5 -137.7	Aplite without sulfides. (The interval 135-136 shows by analyses 0.40 % Mo and 0.07 % Cu).			
137.7 -163.4	Pink granitic gneiss, minor amounts of py.			
163.4 -165.0	Aplitic gneiss.			
165.0 -214.15	Pink granitic gneiss, occasionally with 10-30 cm thick aplitezones.		40	
214.15-216.9	Aplitic gneiss.			
216.9 -235	Pink granitic gneiss.		38	
	224-225 Joint, almost parallell to the core. (Loss of water, may be in connection with this joint).	95		
	228-229 Joints coated with calcite near parallell to the core, and at an angle of 30°. Not fractured.	95 30		
	232.3 to 233.2 Two joints parallell to the core. Not fractured, but we would agree in waterloss here.	95		
	233.2-235 Homogeneous and solid gneiss. Here the drillrod fastened.			
	We continue from 235 in the second drill-hole sited 0,5 m from the first.			
235.0 -244.1	Pink granitic gneiss alternating with 20-30 cm thick layers of heterogeneous gneiss comprised of augengneiss banded by Bi-rich zones in mm scale.	40	40	
244.1 -245	Bi-containing amfibolite.			
245.3 -258.0	Pink granitic gneiss. 246.5-247.6 Three joints near parallell to the core-axes.	95		
258.0 -278.0	Pink granitic gneiss in alternation with heterogeneous banded gneiss as mentioned above. Py and traces of cpy are usual in the heterogeneous gneiss. Traces of moly at 267.5, 267.9 and 276.8-276.9.		42	
	261.75-261.9 Clayey altered gneiss.			
	262.75-262.85 Cave.			

Ark 4 Bh. nr. 9.4 Profil 9

Boret meter	Bergart	Joints	Foliation	Bergart prøve
	277.0 -278.8 Fractured rocks, partly clayey. This zone is cemented.		9	
278.0 -299.0	Pink granitic gneiss. Pyrite occurs scattered apart from richer dissemination in a few 10-20 cm thick intervals. Traces of moly at 282.2, 284.3, 287.85, 294.15.			
299.0 -304.0	Pink granitic gneiss alternating with 0.5-1.0 m thick layers of heterogeneous banded gneiss.		40	
304.0 -304.9	Banded gneiss - bleached. Dissemination py. Molystreaks of magnitude 1-3 mm in the interval 304.0-304.37. Traces moly at 304.5.			
304.9 -307.1	Bleached granitic gneiss with disseminated py. Traces moly 306.9-307.1.			
307.1 -310.5	Weakly bleached granitic gneiss.			
310.5 -311.5	Bleached granitic gneiss, with disseminated py and traces of moly.			
311.5 -353.5	Pink granitic gneiss.			
353.5 -353.7	Amfibolite. the host rock is bleached 5 cm at each side of the amfibolite.			
353.7 -399.0	Pink granitic gneiss.			
399.0 -401.0	Weakly bleached granitic gneiss, weak dissamination of moly and cpy.	Mo 0.06	Cu 0.04	
401.0 -402.7	As above.	0.03	0.02	
402.7 -405.95	Pink granitic gneiss.			
405.95-407.2	Gray aplite weak in moly and cpy.	0.01	0.05	
407.2 -409.0	Weakly bleached granitic gneiss weak in moly and cpy.	0.04	0.02	
409.0 -410.7	Bleached granitic gneiss weak moly/cpy.	0.08	0.03	
410.7 -417.6	Pink granitic gneiss. No mineralization.			
417.6 -419.1	Weakly bleached granitic gneiss, weak in moly and cpy.	0.04	0.17	
419.1 -429.0	Pink granitic gneiss. No mineralization.			

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Ark 5 Bh. nr. 9.4 Profil 9

Boret meter	Bergart	Kjemisk analyse		Bergart prøve
		Mo	Cu	
429.0 -432.5	Bleached granitic gneiss, almost without moly, a little cpy.	0.01	0.12	
432.5 -435.0	As above.	0.01	0.17	
435.0 -463.0	Pink granitic gneiss.			

(84,09)

(03,09)

Kvina ⚒
gruver

Knaben ⚒
gruver

Öyvatnet

Surtevatnet

NÅVATNET

A4
B3
A2
B1
C1
D2
D4
A3
C2
B5
C3
B4
C4
C9
A9
A1
C5
A7
A6
A5
C7
A∝1

Monzonite
Granitic gneiss
Amfibolite

Samples A: Granitic gneiss
B: Graphic granite
C: Monzonite
D: Amfibolite

Sampling localities for analysed rockchips along the monzonite border east of Knaben	M 1:50 000
	T.L.L.
A/S SYDVARANGER	1246 - 01

(83,88)

(03,88)

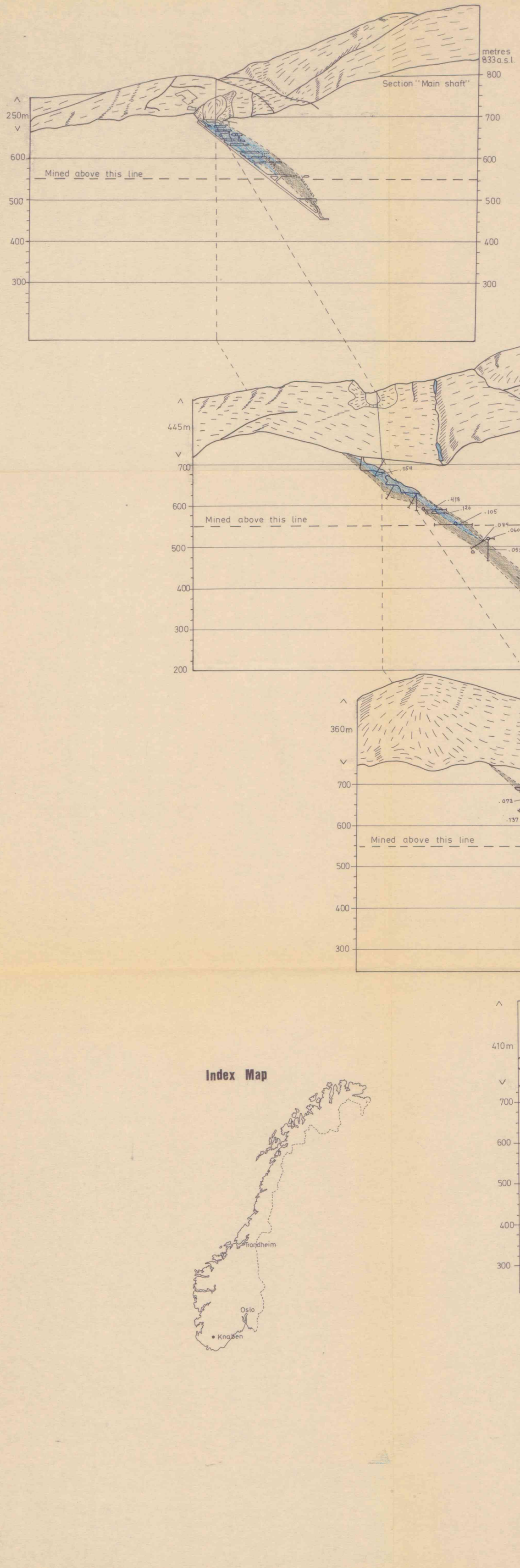
KNABEN II

Molybdenum Mine

Vest-Agder, Southern Norway

Compiled by

Ingolf J. Rui (1980)



LEGEND:

- Red granite
- Gray granite with a bundant quartz veinlets MoS_2 grades < 0.1 %.
- Do. with MoS_2 grades > 0.1 %.
- Rooms and drifts with drillholes

0 100 200 300 400 500
metres

N

Index Map

Report no. 1246-02