



Bergvesenet

Postboks 3021, N-7441 Trondheim

Rapportarkivet

Bergvesenet rapport nr 4749	Intern Journal nr	Internt arkiv nr	Rapport lokalisering	Gradering Åpen
Kommer fra arkiv Rødsand gruver AS Rødsand gruver AS	Ekstern rapport nr	Oversendt fra	Fortrolig pga	Fortrolig fra dato:
Tittel Andørja Magnetite Deposits				
Forfatter Øverlie, Olav	Dato 20.01. 1960	År	Bedrift (Oppdragsgiver og/eller oppdragstaker) Rødsand Gruber AS	
Kommune Ibestad	Fylke Troms	Bergdistrikt	1: 50 000 kartblad 13321	1: 250 000 kartblad Narvik
Fagområde Boring Økonomisk	Dokument type	Forekomster (forekomst, gruvefelt, undersøkelsesfelt) Andørja Ibestad		
Råstoffgruppe Malm/metall	Råstofftype Fe magnetitt			

Sammendrag, innholdsfortegnelse eller innholdsbeskrivelse

Borlogger for borhullene 8 - 12 boret sommeren 1958

Tabelloversikt boring 1912, 1958, 1959 og 1960edlagt ligger også tabelloversikt boring 1912, 1958, 1959 og 1960

Andörja Magnetite Deposits.

The deposits are situated on the south-east coast of the island Andörja in Troms on ab. 69° north. The deposit goes down to the Astafjord which always is free from ice due to the Gulf-stream.

The ore can be followed from the fjord along the hillside up to the mountain Måsan ab. 700 m above sea level. The ore outcrop falls ab 19° and can be followed ab. 4500 m. The rights are owned by Christiania Spigerverk and agreement about purchase of the properties needed, is almost reached.

Previous investigations.

In 1912, altogether 7 holes, total 550 m, were drilled, and ore of good quality was found. No more investigations were however made before 1941 when part of the outcrop was uncovered. Since the rights were bought by us, quite a lot of investigations have been done, especially in the last 2 years. During the summer 1958, 5 holes, total 620,9 m, were drilled and in 1959, 19 holes totalling 2234,4 m. In only 2 of the 31 holes we didn't get ore. Besides topographical, geological and magnetical surveying has been done.

According to the diamond drilling, one may count with ab. 70 - 80 mill. tons raw ore with ab. 14 % magnetic and ab. 19 % total Fe. Ab. 5 - 5,5 tons ore have to be mined to give 1 tonn concentrate with 72 % Fe. Average thickness is thus ab. 27 m.

A greater part of the deposit drilled, with average thickness ab. 6 m, will give 1 tonn concentrate 72 % Fe on 3,5 tons raw ore. Within the drilled area, 12 - 20 mill. tons ore of this quality i.a. with ab. 21 % magnetic or 26 % total Fe, may be mined.

The ore limits are not known, and the deposit Måsan, 700 m above sea level, is not included in the above 70 - 80 mill. tons. It is likely to believe that the deposit contains far larger quantities than the 70 - 80 mill. tons known. Topographically it is possible to diamonds drill far larger areas than those drilled up to now. The possibilities of increasing the ore quantities up to 100 - 200 mill. tons is absolutely present.

Ore dressing.

Ore dressing tests carried out by A/S Rödsand Gruber showed that the ore, containing 26 % Fe in magnetite and 1,3 % P i apatite, easily can be dressed to magnetite concentrate with 72 % Fe and an apatite concentrate with ab. 17 % P and 1,5 - 2,0 % $Fe_2O_3 + Al_2O_3$. 8 tonns magnetite concentrate will give 1 tonn apatite.concentrate. It was also discovered that the SiO_2 -content, by very fine grinding, could be brought below 0,25 %. P- and S-contents may also by flotation, be brought down to the requested contents. Further investigations in this connection have been carried out by The Technical University of Norway, N.T.H.

The investigations at N.T.H. are directed by docent Digre who previously for 7 years was mill superintendent at A/S Sydvaranger Mines, mining taconite. Docent Digre is thus familiar with dressing of fine grinded concentrates.

In his last report of 11th January 1960, docent Digre concludes:
"The tests have shown that the ore samples received, by table concentration combined with regrinding and magnetic separation, will give a fairly coarse super concentrate with 0,25 % SiO_2 . The grinding necessary depends mostly of how much table concentrate can be extracted in the first stage. With an extraction of 50 % magnetite, the super concentrate has to be grinded to ab. 50 % +325 mesh and by 75 % extraction to 70 % + 325 mesh. The P-content in the super concentrate will be ab. 0,03 %.
"Table concentrating of ore where the apatite is removed gives the same good result regarding SiO_2 and the P-content will in the super concentrate be below 0,01 %. Table concentration can only be made by fairly fine grinded ore: 5-10 % + 65 mesh, and 50 - 55 % +200 mesh and with a small table-charge, approx. 0,5 - 0,1 tonn/hour.

According to this test of a sample of 0,5 tonn, one may believe that 50 % of Andörja concentrate could be produced with under 0,25 % SiO_2 by grinding to 50 % + 325 mesh or 75 % of the concentrate with 0,25 % SiO_2 grinded to 70 % + 325 mesh.

It is important to have clarified if it is possible to sell a normal concentrate so fine grinded as it depends upon how much super con-

centrate can be produced with a SiO_2 -content below 0,25 %.

It has previously been mentioned that the mine could be operated with 3 - 3,5 tons raw ore per 1 tonn concentrate or if the quantities known which gives 5 - 5,5 tons raw ore per 1 tonn concentrate, should be included. Whatever is preferred, tracles mining in a room and pilar methode could be used, and the same equipment can serve both alternatives.

Due to the reasons above, I believe it is correct first to start with a production of 50 - 100000 tons concentrate per year with 175 - 350000 tons raw ore, with 3,5 tons raw ore per 1 tonn concentrate. It would then be possible to carry out experiments and finally establish the best flow sheet for apatite- and magnetite concentration. The mine could prove whether it would pay to include all ore known and have 5 - 5,5 tons raw ore per tonn concentrate. We will also find out how much concentrate with 0,25 % SiO_2 could be sold and if pellets with high or low P-content should be produced.

If we calculate with 100 mill. tons raw ore, it would last for 50 years with ab. 2 mill. tons a year. There is all reasons to believe that the quantity is far larger. 2 mill. tons raw ore would give a yearly production of ab. 400000 tons concentrate, of which 70 % or 280000 tons could be produced with 0,25 % SiO_2 grinded to 70 % + 325 mesh.

Rausand, January 20th, 1960

Approximate calculation for plant with capacity 50000 tonnes
concentrate or 175000 tonnes raw ore.

Plant cost.

Mine	N. kr.	2,0	mill.
Dressing plant	"	6,5	"
Roads, quay etc.	"	1,0	"
Offices, workshop, bath, sanitaries	"	1,5	"
Electrical power	"	1,0	"
Houses	"	1,0	"
Stores	"	0,5	"
Miscellaneous	"	1,5	"
Total plant costs	N. kr.	15,0	mill.

12 % interest & writing off gives 1,8 mill. kr. pr. year.

Per tonn concentrate: 1800000
50000 H.kr. 36,- per tonn concentrate.

Production costs:

Mine	Kr. 7,- x 3,5	N.kr. 24,50 per tonn concentrate
<u>Dressing plant:</u>		
Crushing	.2,50	
Grinding & separation	18,00	
Concentration	<u>-2,50</u>	" 23,00 "
Overhead		" 10,00 "
		<u>N.kr. 57,50 per tonn concentrate a 70 % Fe</u>

Estimated F.O.B., apatite Kr. 129.-

Production costs

Per tonn Kr. 88,-

8 tons concentration gives ab-

1 tonn apatite, reduction

" 19,00 " " "

N.kr. 47,50 per tonn concentrate a
70 % Fe

Reduction for Fe-content 70 %

Concentrate 65 %. Kr. 2.- / g.

Capital costs

Production costs incl. capital costs 65 % concentrate

Nkr. 73,50 per tonn concentrate

Super concentrate 0,25 % SiO_2 .

For production of super concentrate, another ab. N.kr. 2,0 mill is necessary for plant costs. Calculation is based upon 70 % of the production being super concentrate.

Production costs, concentrate with 70 % Fe	N.kr. 47,50 /tonn
Capital expences	<u>" 36,00 / "</u>
Sum	N.kr. 83,50 / tonn
12 % capital expences of 2 mill., N.kr. 240000 : 35000	" 7,00 / "
Additional production costs	<u>" 5,50 / "</u>
Production costs, super concentrate	N.kr. 96,00 / "

Rausand, January 26th, 1960.

H. & Berlin

PS. First plant 75 000 - 100 000,-
Capital

