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Kommer fra arkiv H.Fangel	Ekstern rapport nr	Oversendt fra Fangelfamilien	Fortrolig pga	Fortrolig fra dato:
Tittel Kjøli Sulphur & Copper mines				
Forfatter Fraser, L.M.		Dato År 12.08 1895	Bedrift (Oppdragsgiver og/eller oppdragstaker)	
Kommune Holtålen	Fylke Sør-Trøndelag	Bergdistrikt	1: 50 000 kartblad 17204	1: 250 000 kartblad Rørøs
Fagområde Historisk		Dokument type	Forekomster (forekomst, gruvefelt, undersøkelsesfelt) Kjøli	
Råstoffgruppe Malm/metall	Råstofftype Cu			

Sammendrag, innholdsfortegnelse eller innholdsbeskrivelse

Håndskrevet rapport på engelsk.

Går gjennom lokalisering og grovt geologien og malmlinsenes størrelse med påpekning av den store utbredelse mineraliserte soner har i området.

Det gjøres en beregning av mulig størrelse på malmuttak pr år. Driftskostnadene er kalkulert og det foreslås investerings objekter, bl annet el-verk.

Konkluderes med at prospektet er lønnsom dersom investeringsforslagene følges.

Copy.

London 12 August 1895.

Kjoli Sulphur & Copper Mines'

Gentlemen,

At your request I have carefully inspected these extensive mines, and now beg to submit my Report thereon.

These mines are situate about $9\frac{1}{2}$ miles in direct line from Reitan Station on the Government Railway from Christiania to Trondhjem Norway, about 80 miles from the latter shipping port.

The geological formation is the "micaceous schist" of the lower silurian series of rocks. The beds of ore run in a wave like form for two miles in a N. E. direction, dipping N. W. to an angle of abt. 15 to 20 degrees, the altitude 1065 metres above the sea level.

The old workings which are in two sections, western and eastern, divided by a bed of clay, are entered by a level from the outcrop, where the ore is seen one metre thick, following this bed of ore in the western section in a N. W. direction it varies in thickness for 75 metres, here it dips very sharp, and shows the ore 4 metres thick for a distance of 20 metres, from this point to the bottom it varies in thickness from $1\frac{1}{2}$ to 2 metres.

It is thus worked on the dip 140 metres by a breadth of 24 metres, the average thickness being 2 metres. The Eastern section is entered from the outcrop above mentioned by following a level northwards; here the ore is again seen in various thickness on the dip for 80 metres, and 30 metres in breadth, the average thickness being 2 metres.

About 60 metres S. W. of the western outcrop is another fine outcrop of copper and sulphur dipping N. W. The width is not seen, but it may be safely taken at 24 metres and the average thickness of 2 metres.

This bed of ore is in my opinion entirely intact and dips under the western section, and should be opened out at once to ascertain its width and thickness by uncovering the outcrop.

400 metres from the last mentioned outcrop in a N. E. direction is another outcrop, called Kjolli N^o. 2. This is also of great promise and should be opened out in depth and breadth. Still further N. E. are other outcrops until we arrive at the 'Middle Mine', a distance of 3 kilometres; here is an excellent outcrop, which should receive attention later on.

As all these outcrops lie at various heights above sea level, they may be taken as one continuous bed of ore, heaved here and there by the intrusion of beds of clay, as seen between the western and eastern workings.

From the above it will be seen there is a run of 2 miles on the beds of ore, but taking into consideration the intervening beds of clay, I will only estimate on 500 metres in length by 2 metres in thickness, which at 3 tons per cubic metre gives 3000 tons per metre, so that by working, say 20 metres in depth, every year would give 60,000 tons of ore. I also estimate the ore down to the present level of old workings in western & eastern sections at 20,000 tons, and from the West outcrop to a similar depth at 20,200 tons, making 40,200 tons to be extracted during the time the mines are further opened out.

It is noteworthy to remark that this ore is free from Arsenic and Zinc, which is detrimental to the ores in other mines in Norway. By carefully calculating the cost to raise and deliver the ore to Trondhjem shipping port, I find the following result:

3½ metres ore ground broken at 6 pence =	..	1 ^s	9 ^d
Explosives for same	=	..	1. 3 -

producing 3 tons of ore for 3 shillings, or	1 ^s per ton
loading into tubs	" - 6
sorting at the mine	" - 5.
smiths, &c	" - 5
transport by aerial tramway	" - 10
rail to Trondhjem port (to be reduced to 2/6 ^d)	3 - 3.
transshipment, loading & hire of yard &c.	" 7.
Cost delivered f.o.b. Trondhjem.	7 ^s - " per ton.
Taking the ore at only 2 ¹ / ₄ % Copper at 6 ^s ₁₁ ^d .	" 13. 6
and 48% Sulphur - 3 ^d .	" - 12. "
	£ 1. 5. 6.

less f.o.b. " 7. " 18/6 per ton,

out of which the freight and Brokers' commission must be deducted, leaving say. at net profit of 10 shillings per ton.

Therefore taking 60000 tons of ore per year at the above profit of 10 shillings per ton will realize £ 30,000 per year profit.

To accomplish this it will be necessary to expend the following:

For sinking and opening out the beds of ore	£ 5000
pumping and hauling machinery	600.
Turbine and electrical plant	2000.
6 drills (driving by air)	600.
loading Stations at Reitan & Trondhjem	500.
sorting sheds at Mine, rails, trucks &c.	1500.
aerial tramway from mine to Reitan railway	11,500.
dwelling house and Cottages at mines	500.
Superintendence, &c.	500
	£ 22,700.

Owing to the large reserves ready to Extract and to the payment for the ore being Cash, a portion of the profits may be laid aside for working Capital.

The electrical plant and turbine for transmitting the power to the mines should be placed at a distance of about 1300 metres on

the river Storebæk, where 123 feet fall can be obtained, and by banking up the lakes a sufficient water power can be obtained to drive the following:

Pumping machinery	12 horse
winding do	10 -
drilling do	35 -
stonebreaker	8 -
picking table	1 -
aerial tramway	4 -
<u>total 70 Horse Power.</u>	

Should however any further power be required, it would be advisable to have a petroleum engine.

In conclusion every facility was afforded me for an independent inspection of the mines, both above and below ground, and also of the country around the mines, and for taking samples of the ore from the bottom right up to the outcrop. These samples I forwarded to London and represent the value of the ore in the western and eastern sections, and the western outcrops.

Taking therefore a general review of the whole of the mine under inspection, together with the highly mineralized character of the district for many miles, I have the greatest confidence that the further development of the property both in depth and length from the various outcrops will last for many years at a good profit, if the works suggested in this Report are carried out.

Yours faithfully
(Signed) John L. M. Fraser.
Consulting Mining Expert.