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PENRESH EXPLORATIONS LTD.

Hunt Silica Quarry

Golden Mining Division

51° 12' North Latitude

116° 52' West Longitude

Map Sheet 82N/2W \*

by

A. R. Bullis, P.Eng.

1 Feb. 1980

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Map Sheet 82N/2W

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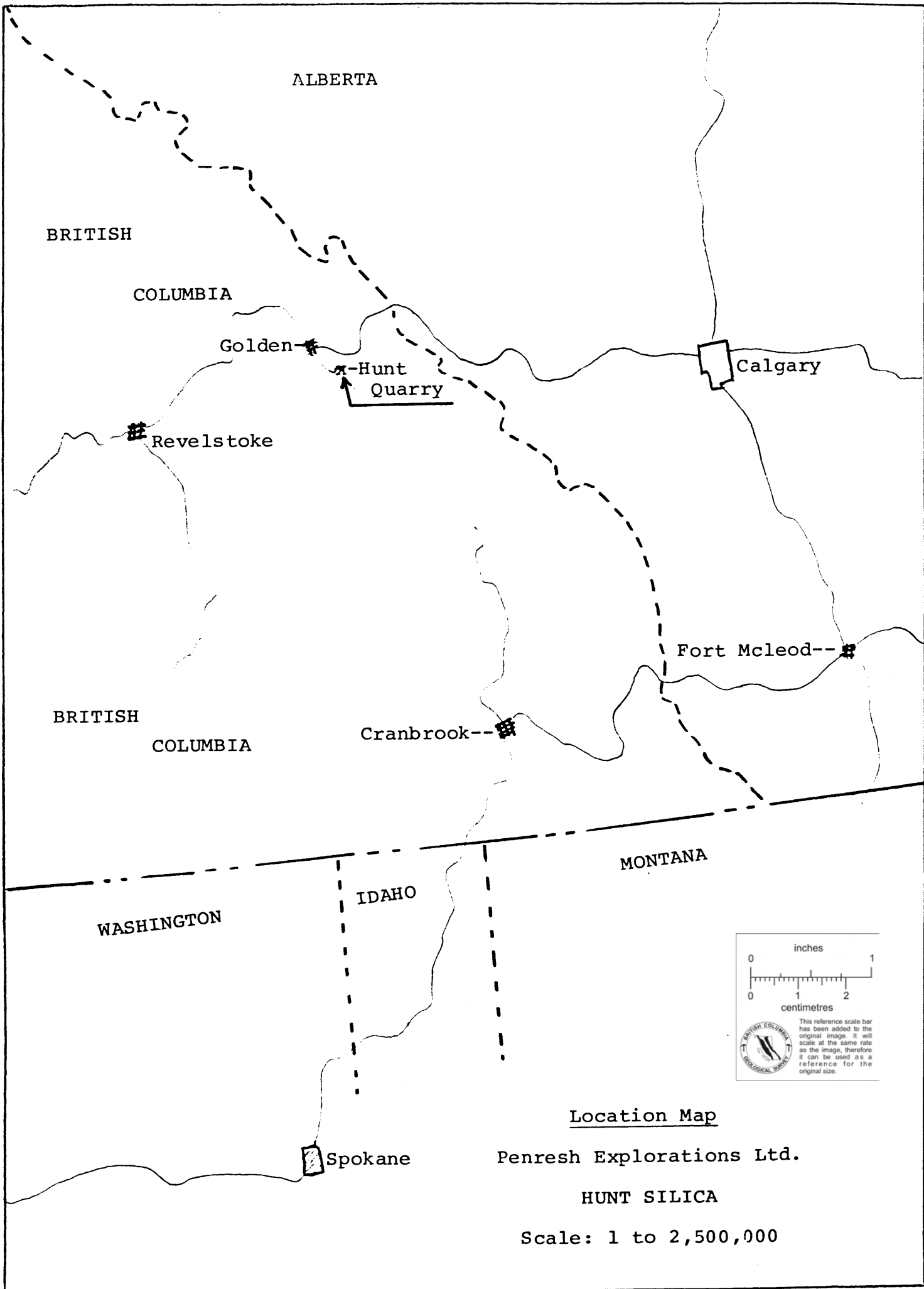
1 Feb. 1980

MINISTRY OF ENERGY, MINES & PETROLEUM RESOURCES	
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Oct. 1979



Location Map

Penresh Explorations Ltd.

HUNT SILICA

Scale: 1 to 2,500,000

## HUNT SILICA DEPOSIT

### INTRODUCTION

Penresh Explorations Ltd. have obtained a lease on a large high-purity silica deposit near Golden, B.C. High-purity silica rock suitable for the production of silicon metal and ferro-silica alloys is rare; most of the high quality rock is obtained from pegmatites or pure quartz veins which usually are small and provide an uncertain supply. Only one other property in B.C. is supplying high-purity silica rock; the production there amounts to a few hundred tons per year and the rock is not used in the silicon metal trade.

Penresh Explorations has a contract to supply The Hanna Mining Company with 26,000 net short tons in 1979 to their smelter at Rock Island, near Wenatchee, Washington, and a further 40,000 short tons in each succeeding year. Production will begin in June and shipments to the smelter are scheduled to commence in July.

In addition to the sales to The Hanna Co., a by-product of undersize rock will be sold to metal smelters for flux, to cement producers, to abrasive manufacturers and to others who require a high-purity silica rock.

*CRS*

LOCATION:           Lat. 51° 12.6'           Long. 116° 51.8'           82N/2W

Between 3,100 and 4,100 feet elevation, at the mutual junction of Section 9, 10, 15, and 16 of Township 26, Range 21, west of the 5th meridian, one-quarter to 1 mile south of Horse Creek, and 1 mile east of Highway N. 95.

ACCESS

The property, which is located about ten kilometres south of Golden, is readily accessible from B.C. Highway 95 at the turn-off at Horse Creek, that lies two kilometres south of Nicholson and, thence, by private road which crosses the Milum property and Crown land (mineral claims) to the quarry at a distance of four kilometres from the Highway. The private road rises from 900 metres (above sea level) at the highway to 1,220 metres at the quarry and will have an average gradient of approximately six percent. (A short portion of the road will be rebuilt in 1979 to reduce the grade there from 12% to the road average of 6%).

PROPERTY

The property consists of nine unpatented mineral claims, named the Hunt 1A to Hunt 9A, that are held under assignment by the Coastal Mining Co. of Canada Ltd. Penresh Explorations Ltd. in turn, have leased the nine mineral claims from Coastal Mining.

In addition, A. R. Bullis, a principal of Penresh Explorations Ltd., has staked the Hunt 10 Mineral Claim, which is situated between the block of nine original claims and R. Milum's property. Milum owns that portion of the S.W. ¼ of Sect. 16, T 26, R 21, W5, which lies south of Horse Creek.

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GEOLOGY

after J.W. McCammon 1970

"The claims cover an area underlain by pure quartzite of the Ordovician Mount Wilson (formerly Wonah) Formation associated with dolomite of the Beaverfoot Formation.

On the property the ground rises from a flat area in the southwest to an irregular knob and gully region on the east. The knobs tend to be bare with bedrock well exposed while the remainder of the area is covered with trees and brush and reveals little outcrop. The south faces of the knobs form steep cliffs.

The three claims are in tandem astride the east boundary lines of Section 9 and 16 with No. 4A at the south and No. 6A at the north. Quartzite is well exposed in patches that cover about 10 per cent of No. 4A claim near its centre, about 20 per cent of No. 5A claim in the north central part, and about 25 per cent of No. 6A claim in the east half. Undoubtedly it also underlies considerably more ground now covered, particularly on claims 5A and 6A. Dolomite outcrops over about 7 per cent of claim 4A, chiefly in the central part of the east side and towards the northwest corner, and 20 per cent of claim 5A in the southeast corner.

The quartzite is hard, firmly cemented, pale grey to white or light buff coloured rock. It weathers dull white. In three thin-sections examined it was seen to consist essentially of quartz grains in a silica cement with very few scattered grains of magnetite, mica and other minerals. The diameters of the quartz grains range from 0.12 to 0.85 millimetre with most being about 0.25 or 0.50 millimetre. The original grains were subrounded to well rounded but during lithification the silica cement formed irregular growths on the grains so they now have angular shapes.

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The dolomite is fine-grained, grey, thin-bedded rock with inclusions and layers of grey chert and many fossils, particularly cup corals. It forms one hump on No. 5A claim separated by sharp gullies from quartzite on the north and more dolomite on the south. The beds strike north 40 degrees east and dip 32 degrees northwest. The second dolomite hump, on No 4A Claim, overlies quartzite to the south, the beds striking north 80 degrees west and dipping 35 degrees northwest.

The rocks have obviously been disturbed by faulting with the quartzite on claims 5A and 6A being in a block up-faulted relative to other areas, and the dolomite on claim 5A in a block down-tilted to the northwest".

*CRCB*



SILICA ROCK RESERVES

The author has examined an area of quartzite outcrop underlying parts of Hunt 2A and Hunt 6A claims, that measures 400 feet (120 metres) by 1,200 feet (365 metres) which he and C. Warren Hunt, P. Geol. consider to be "High Quality Quartzite". The knob of rock, at the 4,200 foot level, from which the surface samples were obtained (See Sample Record) is part of this large outcrop and the 213 ton "bulk" sample was taken from the same outcrop.

The rock reserves underlying the large quartzite outcrop are therefore, 40,000 tons per vertical foot. (Given that 12 cu. ft. in place equals one short ton and the area is 400' by 1,200' then  $1' \times 400' \times 1,200' / 12 \text{ cu. ft.} = 40,000 \text{ tons}$ ). The vertical extent of the quartzite rock is unknown but can be traced stratigraphically from the 3,900 foot elevation to the top of the knob at an elevation of 4,200 feet and, therefore, the author has assumed the quartzite is at least 100 feet thick. Therefore, the potential reserves are:

40,000 tons per foot x 100 feet or 40,000,000 tons.

C. Warren Hunt has produced detailed geological maps of part of the property and, using these data, has calculated the reserves in the same area at 232,000,000 tons. In addition, Hunt has calculated reserves in two other area at 12,996,000 tons and 13,116,000 tons respectively. Hunt's total reserve is 258,000,000 to

The magitude of these potential reserves illustrates that the property will have a long life at the proposed rate of extraction, i.e. between 50 and 250 years.

*CLW/B*

PROPOSED MINING, PROCESSING AND SHIPPING, 1979

Penresh Explorations Ltd. will supply 26,000 short tons (net) to the Hanna Mining Co. silicon smelter in 1979. In order to net 26,000 short tons, a total of 35,000 tons (10,000 cu. metres) will be mined and processed on the property.

The drilling and blasting is scheduled for early in May and will be done under contract. That section of the haul road to be rebuilt will be reconstructed in May and the processing of the pit-run rock will begin in June.

A portable crushing and screening plant will be set up on the Hunt 10 mineral claim where 35,000 tons will be crushed, screened and washed to produce 26,000 tons of (plus 1 inch and minus 6 inch) material for the Hanna Mining Co. The undersize (minus one inch) material will be stock-piled for use as road ballast or for future sales.

The product for the Hanna Smelter will go into temporary storage at the plant site from where it will be drawn, in the latter half of the year, for loading on flat-bottomed gondola cars at the Nicholson siding. Arrangements have been made with the C.P. Railway to ship 1,000 to 1,200 tons ( 12 to 14 cars) per week from August through December.

Plans are underway to transfer the whole operation to a new site on the railway near Horse Creek, which will include a siding as well as the crushing-screening plant. Storage space for stock-piled silica rock will be incorporated in order that continuous loading on a year-round basis will be achieved.

The production in 1980 will rise to 40,000 net tons to Hanna Mining and a market for the fine material (minus one inch) will be developed.

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SAMPLE RECORD

The Penresh (Hunt) Silica property has been surface-sampled by several persons and a bulk furnace sample was shipped to Hanna in 1978. The continuity and grade of the rock at depth has not been tested.

Large outcrops on the property expose the quartzite layers over several hundred stratigraphic feet and visual examination of these outcrops reveal very little change in the type and composition of the quartzite.

Dr. A. G. Jones, of Coastal Mining of Canada Ltd. obtained five "chip samples" in 1975 from the knob of rock on Hunt 6A M.C. at the 1,280 metre (4,200 feet) level that averaged 99.5% Silica, 0.07% Fe<sub>2</sub>O<sub>3</sub>, 0.14% Al<sub>2</sub>O<sub>3</sub>, 0.003% CaO and 0.12% loss on ignition. These analyses are excellent and represent "silicon-grade" rock.

The author repeated Dr. Jones sampling in July 1977 from the same area, with the following results:  
99.25% Silica, 0.05% Fe<sub>2</sub>O<sub>3</sub>, 0.25% Al<sub>2</sub>O<sub>3</sub>, 0.005% CaO and 0.10% L.O.I.

A bulk sample was obtained from the property in 1978 in order to test the rock in the arc-furnaces at the Hanna smelter near Wenatchee, Washington. Two hundred thirteen tons delivered to the Wenatchee plant permitted a limited test and additional chemical analyses of the rock. No adverse rock qualities were noted during the furnace tests. The entire sample assayed, on average and for impurities only, as follows:  
0.06% Fe<sub>2</sub>O<sub>3</sub>, 0.01% CaO, and 0.15% Al<sub>2</sub>O<sub>3</sub>.

All the above analyses indicate the deposit is a high-purity silica rock, suitable to the Silicon metal and Ferro-silicon metal markets.

*CURTS*

WORK COMPLETED IN 1979

The work schedule was "tight" because of the short season and difficulties experienced from lack of suitable contractors. Penresh Explorations Ltd. were further handicapped by the protracted negotiations required for the prime-contract with The Hanna Mining Co. The final draft of the contract was submitted by The Hanna Mining Co. in May, five months after the due date. In spite of these problems, work commenced in April with the removal of snow from the quarry road. The "new road" was surveyed and marked on the 14th May and construction commenced on 17th May. The "new road" and quarry site preparations were completed by June 30th.

The mining contractor began drilling at the quarry on 12th May and the final "blast" was shot on 21st July. A total volume of 11,000 cubic metres were broken in the quarry, in two separate "shots". Loading at the quarry and hauling of the broken silica rock to the crushing and screening site at Nicholson siding began on the 23rd July and was completed on the 19th September.

The crushing, screening (and washing) of the rock began on 13th August and was completed on 31st October. The loading of C.P. rail cars (flat-bottomed gondolas) began on 14th August and continued until 18th November when loading was suspended due to inclement weather. C.P. Rail were unable to supply sufficient

*CURIS*

was instigated with 40% dynamite and controlled by electric-delay caps. Eleven thousand cubic metres of silica rock were "shot" in two separate blasts.

#### Loading and Hauling

The loading of the rock at the quarry was done with a Cat 988 loader, supplied by Bert Miller Trucking Ltd., Box 744, Golden, B.C.

The hauling of the coarse rock from the quarry to the Nicholson siding was contracted to D & L Trucking, Box 2187, Golden, B.C. and to Bert Miller Trucking Ltd.

Four twelve-yard capacity, end-dump trucks were used to transport thirty thousand short tons of silica rock to the crusher-screening plant at the Nicholson siding, where it was initially stock-piled as "coarse ore".

#### Screening and Crushing

Penresh Explorations Ltd. were unable to contract the screening and crushing to local contractors and this work was, ultimately, carried out in two stages by two separate contractors.

The first phase of the crushing and screening was done by "Jake & Jay Holdings Ltd", Box 655, Revelstoke, B.C., from 13th to 21st August, when 2,500 tons of rock was crushed, screened and washed. The fraction to be shipped to The Hanna Mining Co.,

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which was sized plus one inch and minus five inches, was loaded directly onto C.P. gondolas as available and/or stock-piled. The undersize fraction was stock-piled separately.

The second phase of the crushing and screening began on 24th September and was done by "Willow Creek Sand & Gravel Co." of Lethbridge, Alberta. Only a portion of this production could be washed due, mainly, to the lack of an adequate water supply at the crushing site and by inclement weather. The crushing-screening plant was fed from the coarse ore piled by the Cat 988 loader supplied by Bert Miller. The "ore" fraction and undersize fraction were stock-piled, using a Cat 966 loader rented from Finning Tractor. The work was completed on 31st October, when approximately 20,000 short tons of "ore" and 8,000 short tons of undersize rock were stock-piled at the Nicholson siding site.

#### LOADING & SHIPPING

The loading of the "ore" on gondola cars, spotted on the Nicholson siding by C.P. Rail, commenced as soon as sized "ore" was available, on 18th August. The loading was done with the Cat 966 "front-end loader" directly onto the low-sided gondolas. C.P. Railway experienced difficulties supplying the required number of gondola cars with the result that only 5,100 short tons were shipped from 18th August until 18th November when

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the operation was suspended for the season.

The loaded cars were shipped to Cranbrook where they were weighted via the Kooteney Division of C.P. Rail. From Cranbrook, the cars were routed via Kingsgate and Spokane by C.P. Rail and the Burlington Northern Railway and delivered to The Hanna Mining Co. plant at Rock Island, Washington.

*CPRB*

COSTS OF PROGRAM (1979)

Sub-Contractors

1.	Snow Removal	\$ 250
2.	Road Construction	17,959
3.	Drilling & Blasting	49,500
4.	Loading & Hauling from Quarry	137,369
5.	Crushing & Screening	47,800
6.	Cat 966 Rental	26,600
	Sub Total	<u>\$279,478</u>

Penresh Explorations Ltd.

7.	Wages & Salaries	15,000
8.	Miscellaneous	18,859
	Fuel, Trade Accts, Legal Audit, Transportation W.C.B. C.P.P. etc	
	Sub Total	<u>\$ 33,859</u>

TOTAL COST ----- \$313,337

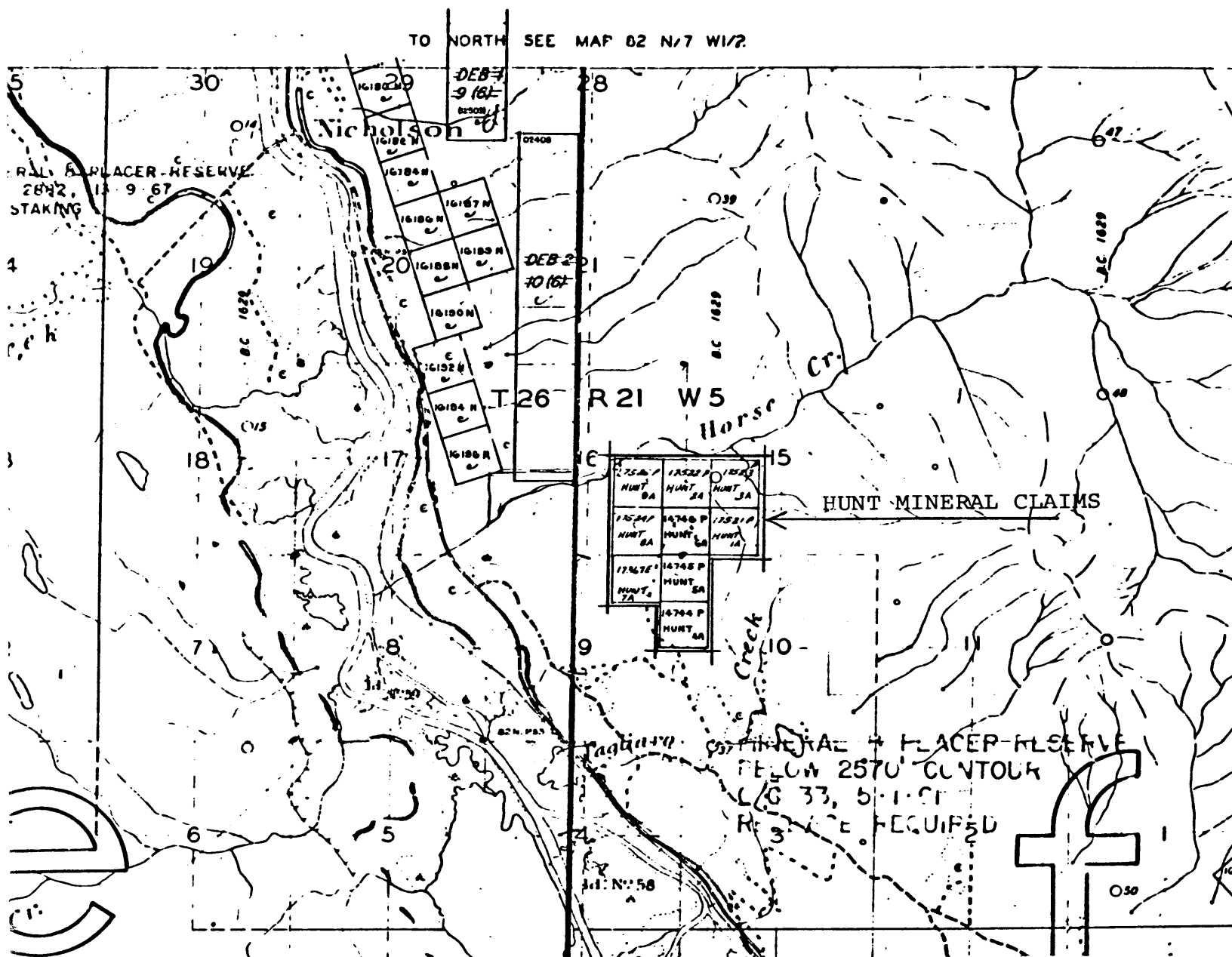
Respectfully Submitted



A. R. Bullis, P.Eng.  
Director: Penresh Explorations Ltd.



TO NORTH SEE MAP 02 N/7 W1/2



Penresh Explorations Ltd.

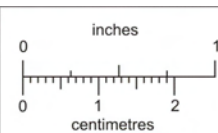
Mineral Claims Map

HUNT GROUP

Golden Mining Division

Scale: 1 to 50,000

Map 82 N/2W



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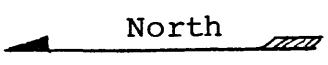
-- Claim Outline

Quarry Elev. 1215 metres

N.E. ¼ Sect 9

Steep section, old road

New construction, 1979



Hiway 95 to Cranbrook

C.P.R. Kootenay Branch

Horse

Elev. 895 metres.

Creek

2 Km to Nicholson

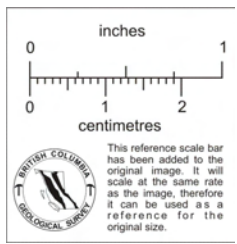
Columbia River

*clerk*

Penresh Explorations Ltd.

New Road & Quarry Site

Scale: 1 to 16,000



Section

A

12 metres

B

2 metres



44 metres

44 metres

A →

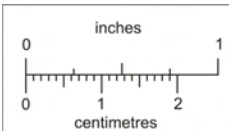
Section A - B

← B

11,000 cubic metres removed  
1979

42 metres

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Penresh Explorations Ltd.

HUNT SILICA QUARRY

Rock Outline, Oct. 1979

Scale: 1 to 350