PRINCETON INDUSTRIAL MINERALS JOINT VENTURE

A PRELIMINARY GEOLOGICAL EVALUATION OF A ZEOLITE OCCURRENCE

ON THE

ALLENBY CLAIM - SIMILKAMEEN MINING DIVISION, BRITISH COLUMBIA

Owner:
S.A.S. Croft, P.Eng.
c/o Suite 500, 342 Water Street
Vancouver, B.C. V6B 1B6

Operator:
Princeton Industrial Minerals Joint Venture
Suite 500 - 342 Water Street
Vancouver, B.C. V6B 1B6

NTS Location Map: 92H 7E
Latitude: 49° 25' N
Longitude: 120° 31' W

SUMMARY

The Princeton Industrial Minerals Joint Venture holds rights to a deposit of zeolite situated on the Allenby Claim, south of Princeton, B.C.

During April and May 1991 the Joint Venture conducted a geological evaluation of the property for the purpose of delineating readily accessible reserves, preparing a development plan and determining surface and mineral claim boundary locations and ownership.

Previous analytical work has confirmed that the zeolite mineral present on the property is clinoptilolite, a particularly reactive mineral which may have applications in waste management and agriculture. The clinoptilolite forms a stratiform horizon within the Princeton Sedimentary Basin. In the area of interest, the deposit is inferred to be conformable with enclosing shales, siltstones and sandstones which strike approximately east-west and dip moderately towards the north. The principal exposure occurs on a northwest facing dip slope. It is readily accessible by road and is considered to be amenable to surface mining methods.

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1.0 INTRODUCTION

1.1 Terms of Reference and Scope

This report was prepared on behalf of the Princeton Industrial Minerals Joint Venture by Nevin Sadlier-Brown Goodbrand Ltd. It documents a geological reconnaissance conducted on the property during November 1990 and on April 23rd and 24th and May 2nd and 3rd, 1991. Work consisted of a preliminary geological evaluation, a survey conducted for the purpose of establishing surface lot and claim boundaries and recovery of a 100 kg bulk sample for testing.

1.2 Property Description and Ownership

The zeolite occurrence lies in the southeastern part of the Allenby Claim. The claim comprises twelve metric units recorded in Princeton, B.C. under Claim #3669 on May 15, 1990. The claim was staked in the name of S. A. Croft and is held by him under terms of an agreement with the Princeton Industrial Minerals Joint Venture.

The claim covers all or part of District Lots 1838, 2266, 2267 and 2927 registered in the Similkameen Division, Yale District, of the Penticton Assessment Area, and Lots 157, 292, 978, 981 and 983 in the Yale Division of the Yale District.

Results of the recent field work indicate that the bulk of the known and accessible zeolite occurs on Lot #1838. Possible extensions might underlie Lot #2927 and Lot #2267. East of the principal occurrence the deposit may traverse the AL Claims, a group of four two-post claims recorded just prior to the Allenby Claim.

Lot #1838 is held by Similco Mines Ltd., of 2100 - 505 Burrard Street, Vancouver, B.C. Lot #2927 is the property of Princeton Stock Ranch Ltd., Princeton, B.C.

1.3 Location, Access and Geographical Setting

The Allenby Claim is centred about 3 km due south of the town of Princeton, B.C., a community situated at the confluence of the Similkameen and Tulameen Rivers and served by the southern Trans-Canada Highway (Route 3) and the presently unused Kettle Valley Line of the Canadian Pacific Railway. Access to the property is via the Copper Mountain road, a paved road which leads

southerly from Route 3 just east of the town limits. At a point about 4 km from the highway the Allenby road leads southwesterly another 4 km to the site of the abandoned community of Allenby and the old Grandby Consolidated concentrator. The zeolite outcrops on the uphill side of an abandoned railway grade near the mill site and in the southeast corner of Lot #1838.

The area of interest lies on a northwest facing slope between elevations of about 750-900 m above sea level. Local vegetation consists partly of open pine forest and partly of sagebrush and meadow grass. The land has been selectively logged in the past and is presently used as cattle range.

1.4 Historical Background

The earliest activity in the general vicinity of the Allenby Claim consisted of placer mining for gold and platinum in the Similkameen and, in particular, the Tulameen Rivers.

Although copper occurrences had been known in the area since 1884, Princeton did not become a copper mining centre until about the time of the First World War. Ore from Copper Mountain was mined at a rate of 2000 tons per day and shipped by rail about 10 km north to a concentrator built at Allenby. Operation here ceased in 1957 and the mill and townsite were abandoned. The ruins of the concentrator lie immediately to the west of the zeolite prospect.

Since the termination of milling operations at Allenby and abandonment of the town, the area has been staked intermittently and some exploration work has evidently been carried out for copper and gold. Copper production from the ores at Copper Mountain resumed in the 1970's with the construction of a new mill near the mine site.

Zeolite deposits were originally identified in the area by the B. C. Ministry of Energy, Mines and Petroleum Resources during the course of an industrial minerals study which was carried out in 1985 and 1986. In 1990 the mineral claims which had hitherto covered the deposit expired and, on May 15, 1990, the Allenby Claim was staked.

2.0 GEOLOGY

2.1 General Setting

The Allenby Claim is underlain by a sequence of Tertiary volcanic and sedimentary rocks of the Princeton Group which are developed in the Princeton Basin, one of a number of Tertiary outliers in the B.C. interior. Its geology has been described in detail by Read (1987) and is therefore only summarily described here.

The Princeton Basin is a northerly trending trough or graben filled in Eocene time, principally by clastic sedimentary rocks but with coal measures and minor amounts of intermediate to felsic volcanics which form conformable rhyolitic tephra deposits. In the Princeton area these rocks collectively comprise the Allenby Formation which is to the order of 2,000 m thick, thinning to the west and offset or terminated by left lateral strike-slip faults. Its eastern limit is defined by a north-northeasterly trending normal fault or fault system which bounds the graben and traverses the southeast corner of the Allenby Claim.

The Eocene sequence within the graben has been subjected to folding, faulting and low-grade metasomatism. The principal structure underlying the Allenby Claim is a broad synclinal fold referred to by Read as the Tailings Syncline. It has an east-west axis striking approximately through the central part of the claim. The principal zeolite occurrence lies on the southern limb of the syncline near the eastern boundary of the graben.

2.2 Geology of the Zeolite Occurrence

The zeolite mineralization in the Princeton Basin forms at least one apparent stratigraphic horizon within the Eocene sequence of clastic and argillaceous sediments and coal seams. The zeolite horizons are interpreted as water-lain deposits of felsic tephra which have been subjected to hydrothermal alteration and recrystallization.

The only zeolite mineral identified to date on the claim is clinoptilolite. It is exposed in the southeast corner of the Allenby Claim at a rock cut on an abandoned spur line of the old Kettle Valley Railway, immediately east of the Allenby concentrator site. The outcrop represents part of the south limb of the

tailings syncline (Read 1987). The beds strike at between 87° and 100° and dip northerly at between 20° and 40°. The outcrop, with minor covered intervals, represents a true stratigraphic thickness of approximately 12 m. The stratigraphic sequence is depicted in Table 1 below.

Table 1 - Stratigraphic Sequence

Princeton Group - Allenby Formation

Interval above base (m)	Description
7-12	Zeolitized tuff (t); massive to nearly massive pale grey fine-to medium-grained.
6-7	Zeolitized tuff or mudstone (t); weakly laminated, pale grey, fine-grained to aphanitic.
3-6	Zeolitized crystal tuff (ct); massive to nearly massive pale grey, rust weathering medium-grained. Contains fragments of biotite and quartz.
2-3	Covered.
1.5-2	Zeolitized tuff or mudstone (t); grey, fine-grained.
0.5-1.5	Covered.
0-0.5	Zeolitized tuff or mudstone (t); grey, fine-grained.

The uppermost unit is also exposed on a north facing dip slope in a bulldozed area some 25 m to the east of the central part of the railway grade outcrop. Bedding here strikes at 100° and dips northerly at 30°.

3.0 CONCLUSION

3.1 Discussion and Conclusions

The configuration of the deposit in the railway grade area suggests the zeolite horizon could persist along strike both to the northwest and southeast for hundreds of metres. A southeasterly strike extension over a distance of 70 m would imply reserves above the railway grade level to the order of 60,000 tons.

The value of the material will be a function of its reactivity or cation exchange capacity (CEC). Values above about 135 Meq-100gm indicate that the material is sufficiently reactive to be useful in a number of commercial applications. Markets in these applications are, however, not well developed.

Work conducted in the past (Read, 1987 & Marcille, 1990) suggests that CEC values from samples obtained from the railway grade exposure lie in the range between 123-170 Meq-100gm. These values are consistent with applications in such fields as sewage and wastewater treatment, odour adsorption and possibly acid mine drainage mitigation. Successful development of the deposit at Allenby will depend upon identification and development of these and other markets in waste management and possibly agriculture.

3.2 Recommendations

Although limited in magnitude, the readily accessible inferred reserves at the railway exposure are of economic interest. A program of physical work, including over-burden stripping, bulk sampling and, ultimately, drill testing, is therefore considered warranted and is recommended.

REFERENCES

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Eyde, Ted H., 1974: Exploration for Deposits of Natural Zeolite Minerals in the Western United States, Society of Mining Engineers Pre-print No. 74-11-336.

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Papke, Keith G., 1972: Erionite and Other Associated Zeolites in Nevada, Nevada Bureau of Mines and Geology Bulletin 79.

Read, Peter B., 1986: Industrial Minerals in Some Tertiary Basins of Southern British Columbia, B.C. Ministry of Energy, Mines and Petroleum Resources. Paper 1987-1

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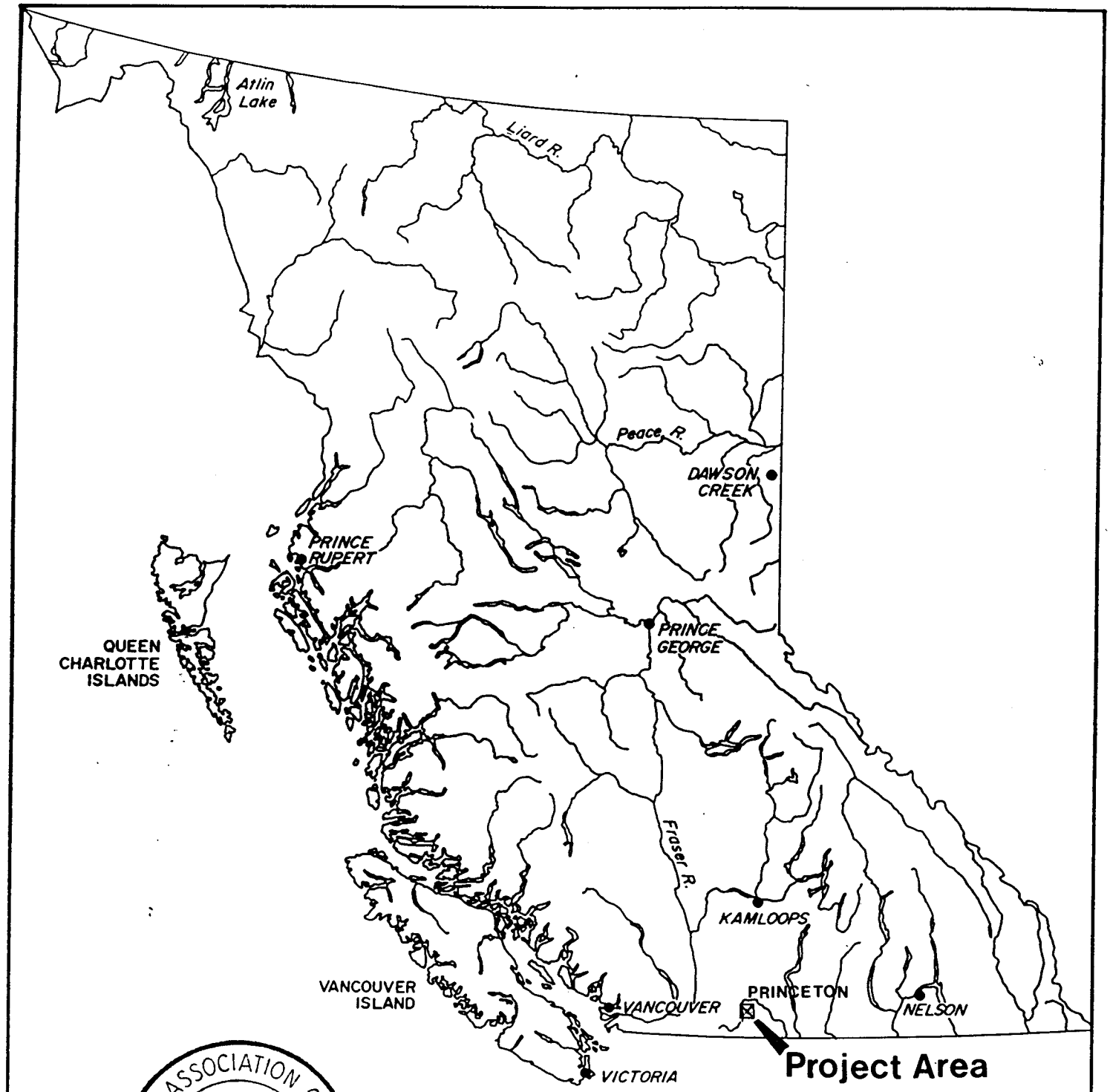


GEOLOGICAL ASSOCIATION OF CANADA
T. L. Sadlier-Brown
FELLOW

km
0 100 200 300

MILES
50 0 100 200

ALLENBY CLAIM
LOCATION MAP

FIG 1	MAY 9 1991

NEVIN SADLIER-BROWN GOODBRAND LTD.

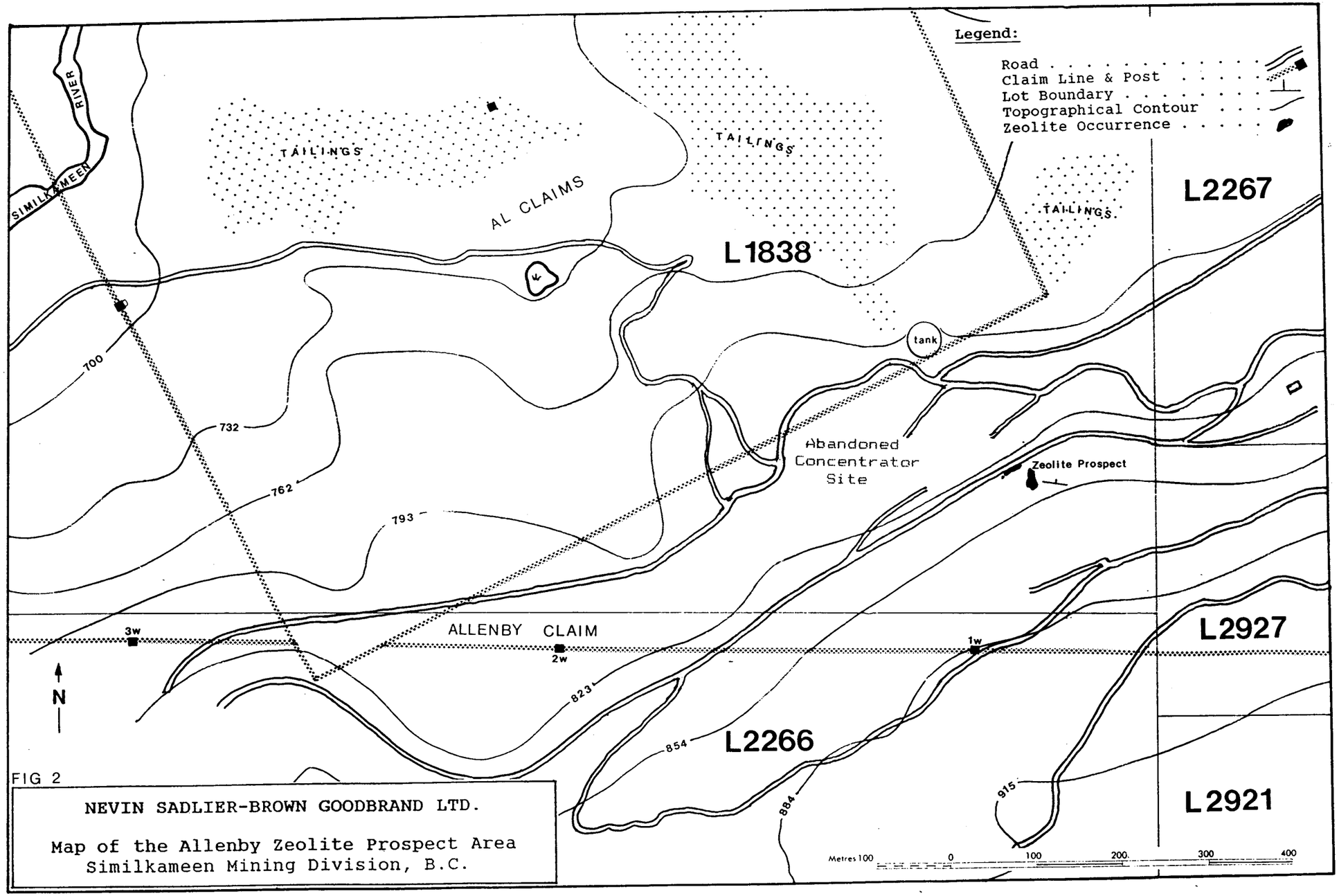
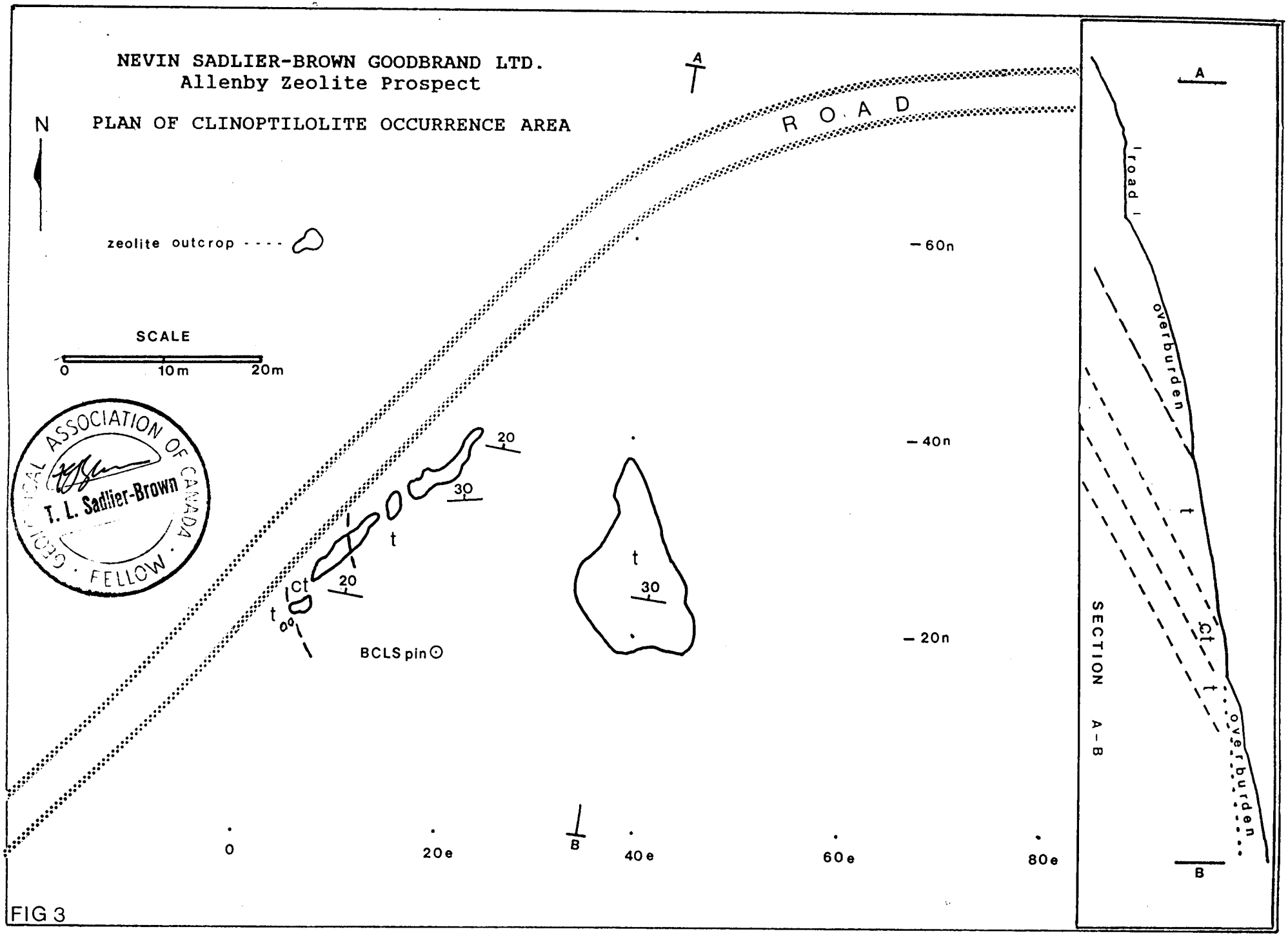


FIG 2

NEVIN SADLIER-BROWN GOODBRAND LTD.

Map of the Allenby Zeolite Prospect Area
Similkameen Mining Division, B.C.


NEVIN SADLIER-BROWN GOODBRAND LTD.
Allenby Zeolite Prospect
PLAN OF CLINOPTILOLITE OCCURRENCE AREA
N
A
ROAD
zeolite outcrop
SCALE
0
10m
20m
60n
40n
20n
20
30
t
Ct
BCLS pin
0
20e
B
40e
60e
80e
SECTION A-B
road
overburden
overburden
FIG 3

APPENDIX A

Summary of Exploration Expenditures

		$
Geology		
Fees re Mapping and Sampling		
- T.L. Sadlier-Brown	3 days @ $450/diem	1,350
- D.W. Goodbrand	1 day @ $400/diem	400
	Sub Total	1,750
Disbursements		
Meals & Accommodations (field)		
- 4 man days @ $55/man day		220
Transportation		
- 4x4 mileage @ 33 cents/km x 2291		756
Miscellaneous Field Supplies		35
Air Photos/Maps		65
	Sub Total	1,076
Report Preparation		
- T.L. Sadlier-Brown	2.5 days @ $450/diem	1,125
- J. Renwick	3.5 hr @ $24/hr	84
	Sub Total	1,209
	Total	**$4,035**

APPENDIX B

Certificate and Statement of Qualifications

I, Timothy L. Sadlier-Brown hereby certify that:

1. I am a consulting geologist and partner in the firm of Nevin Sadlier-Brown Goodbrand Ltd., with offices at Suite 500, 342 Water Street, Vancouver, B.C. V6B 1B6.

2. I was educated at Carleton University, Faculty of Geological Sciences (1964), Ottawa, Ontario, and am a Fellow of the Geological Association of Canada.

3. I have acted in the field of exploration geology in positions of responsibility since 1965 and have been a principal in the firm of Nevin Sadlier-Brown Goodbrand Ltd., Consulting Geologists, since 1972.

4. I personally conducted the geological field work, surveys and sampling on the Allenby Claim, as described in this report.

T. L. Sadlier-Brown, F.G.A.C.

May 9, 1991