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NOTES OF DEEP DRILLING PROPOSAL

St. Eugene Mine, Moyie, B. C.

N.T.S. 82G/5E

September , 1981
Vancouver, B. C.

J. J. McDougall

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NOTES OF DEEP DRILLING PROPOSAL

St. Eugene Mine, Moyie, B.C.

J. J. McDougall

September, 1981

INTRODUCTION

This short report is meant to clarify and/or simplify the St. Eugene - Moyie situation. A short compilation of pertinent data from our Joint Venture-Cominco file is included. Current thinking with respect to a possible deep orebody is updated and a series of recent photos simplify(?) the geography of the presentation. Ample geological data is available in the files and only the highlights are dealt with here. Pure geological theory alone has not been a breadwinner when applied within the Purcell Supergroup in the search for new orebodies and anyone interested in such is directed to the tons of paper published elsewhere on the subject. The writer advances a combination including the far more productive prospecting approach which is far from obsolete.

LOCATION AND ACCESS

The main target area lies deep below the St. Eugene Mine straddling Highway #3 and the CPR "Kettle Valley Line" at the village of Moyie about 15 miles south of Cranbrook and 25 miles South of Cominco's Sullivan Mine at Kimberley (Map SE1/81)(see Photo # 1, 6/81)

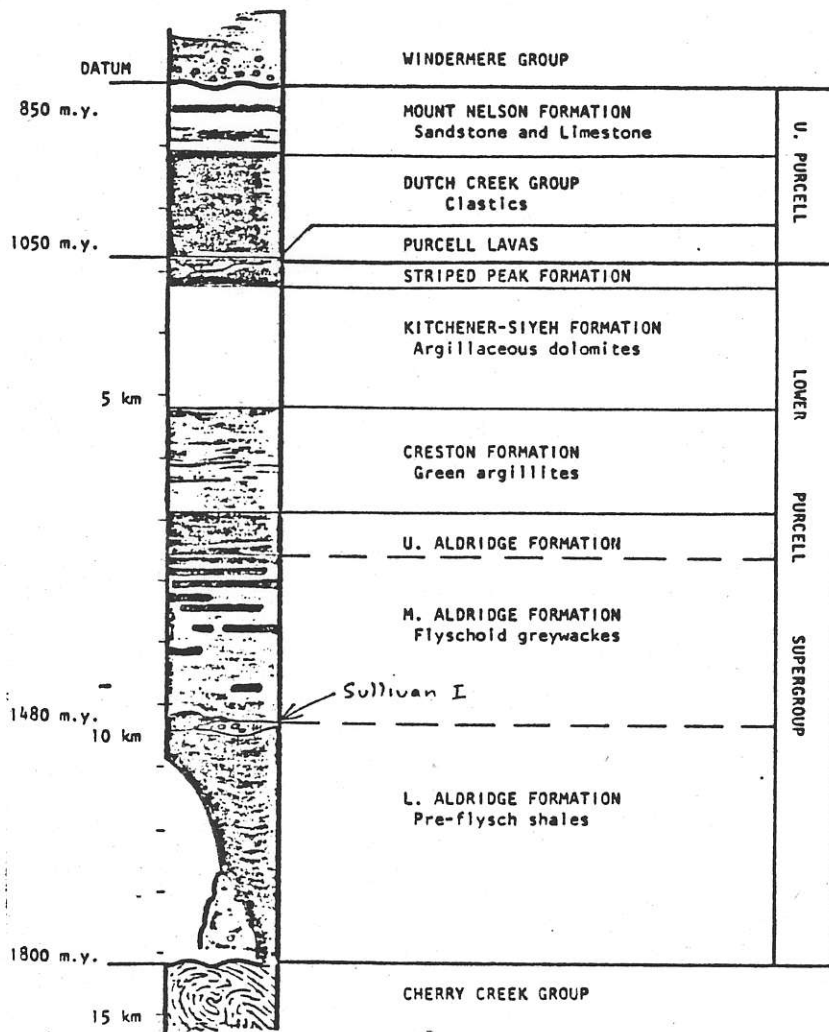
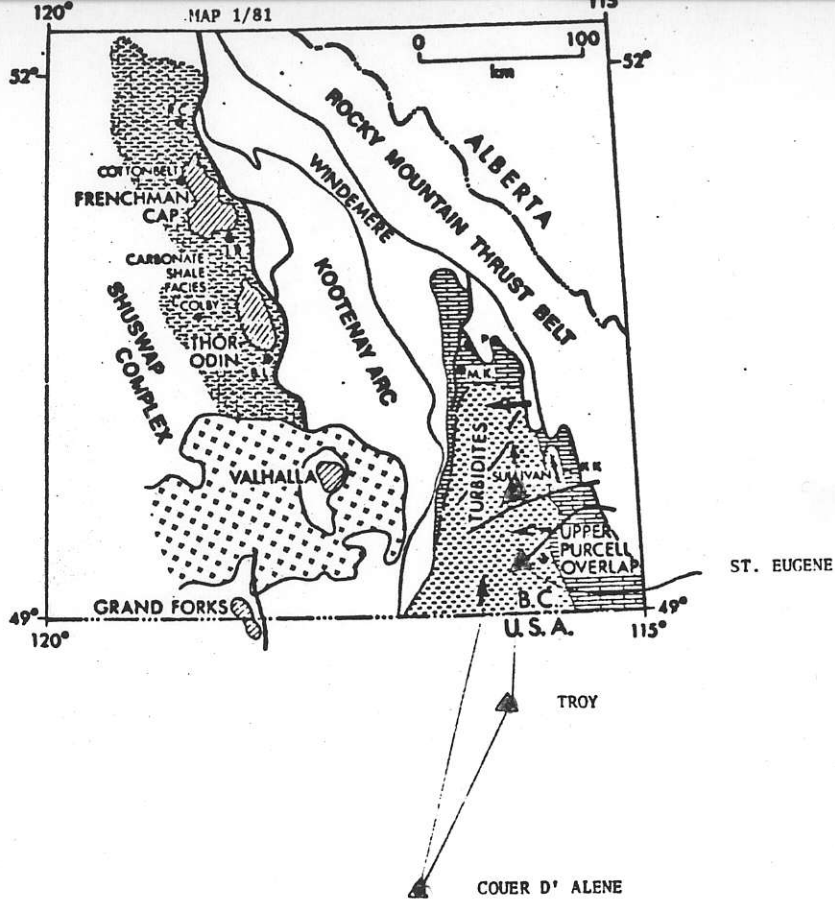


Fig 1(a) 81

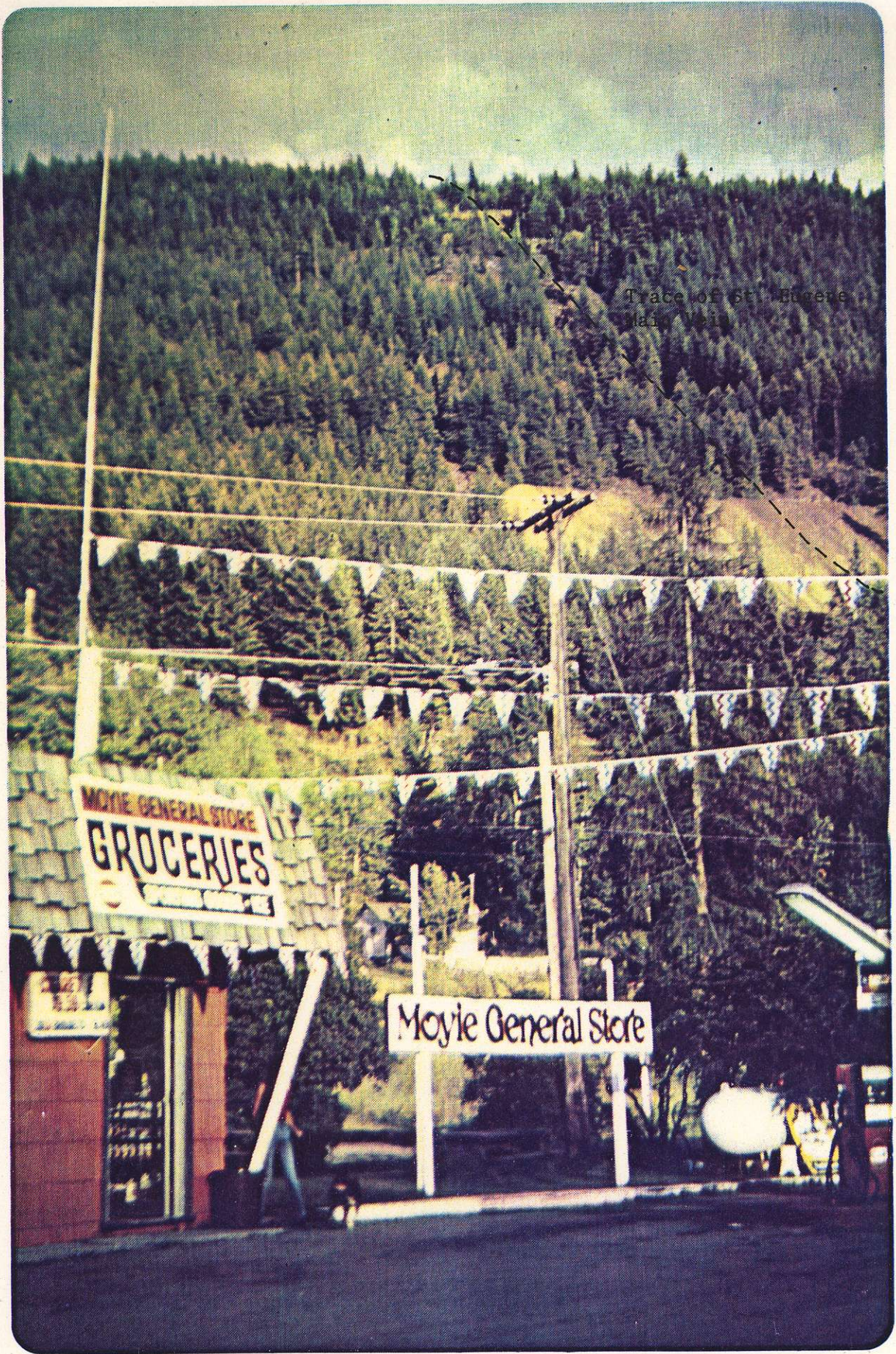


Photo # M1/81, looking east from S. end of Moyie village.



Photo M6/81, Looking NW from St. Eugene Dump
towards Moyie

HISTORY AND DEVELOPMENT

As per 1963 & later summaries enclosed * in reduced xerox form (Fig. SE/1-81), the veins constituting the known St. Eugene deposit were staked in 1893. The mine was started by St. Eugene Consolidated Company in 1900 and acquired by Cominco in 1906. It was finally closed in 1921 but Cominco returned to treat tailings in 1926. St. Eugene and Cominco formed a Joint Venture in 1962 with work completed in 1964 but the agreement has been left open to this date awaiting any new ideas.

For a few years St. Eugene was the most important contributor toward continued operation of the Trail Smelter while CPR (who took over mining operations as a side issue to the mines' railway - a needed link) financed successful flotation experiments resulting in exploitation of the huge pyrrhotite - rich Sullivan Deposit. Prior to the process, only the non-pyrrhotitic ores such as those secondarily developed at Kimberly, or those of the St. Eugene type, could be economically treated at the smelter. With the successful pioneer flotation process well developed at Sullivan, St. Eugene, total production 1,018,000 tons @ 7 oz Ag, 14% Pb, 5% Zn, was far too small to continue.

In 1939 St. Eugene Mining Corporation N.P.L. was incorporated as the first Ventures Ltd. Company in B.C. and charged primarily with further investigations and possible reopening of the St. Eugene Mine, an option type agreement having been concluded with Cominco. The main mine workings were rehabilitated and some exploration took place but much of the financing advanced had by this time reportedly found it's way into other ventures, particularly gold prospects in the U.S. and Alaska. Surface exploration continued intermittently until 1966, particularly on adjoining claim groups optioned or staked by St. Eugene (Map 82G/5E - Appendix).

One programme on the St. Eugene structure itself was the Cominco - supervised drilling of 5 relatively deep holes

* Appendix. Followed by Claim and Property Maps, etc.

as close as possible to Moyie Lake which effectively masks almost half of the little explored new system (photo# M7/81). The purpose of these holes was two-fold; one was to test for any important strengthening of the known vein system at moderate depth, the other was to see if any clue existed suggesting a second Sullivan at greater depth which might be "feeding" the St. Eugene system. Evidence suggesting this included a close, if not exact, lead isotope correlation with Sullivan ores. (Fig. SE 2/81).

DESCRIPTION OF GEOLOGICAL INVESTIGATIONS TO PRESENT

Drill Holes # C1, C2, C3 and C5 were the shallowest holes (see Fig. SE 3/81), with the three completed intersecting the vein system without encountering any important mineable widths. # C4, as per photos # M2 and # M3/81, was designed to intersect at least a part of the St. Eugene system at depth and, more importantly, to test for any stratiform deposit which might reflect the "Sullivan II", which if present, would be expected at a greater depth known as the Sullivan Time Horizon (ST^H). Although largely unproven at this time despite some deep drilling elsewhere, expectations are that other Sullivan-type deposits will be restricted to the Lower-Middle Aldridge (Fig. 1(a)81) formations as is the case at Kimberly. These are proterozoic Purcell Supergroup sediments containing sills of dioritic rock.

Rocks within these sediments, largely argillites and quartzites, host besides Sullivan (the world's largest lead-zinc deposit), the world's largest silver camp, the Couer D'alene. Huge copper deposits also are present, including those at Troy and Flathead (Superior), Montana, the former being readied for production. St. Eugene occurs within a triangle formed by these deposits (Map 1/81). All were found by prospectors (Whites, Indians and mules) and to this date up to 100 years after discovery no accepted "learned" geological theory exists as to why these deposits are where they are. Thus St. Eugene can be promoted as well as any within the triangle. The chances are enhanced here more than else-

CARTOON DEPICTING THEORETICAL ST. EUGENE-SULLIVAN II RELATION

SCALE 1" = 1000'

JJM/'81

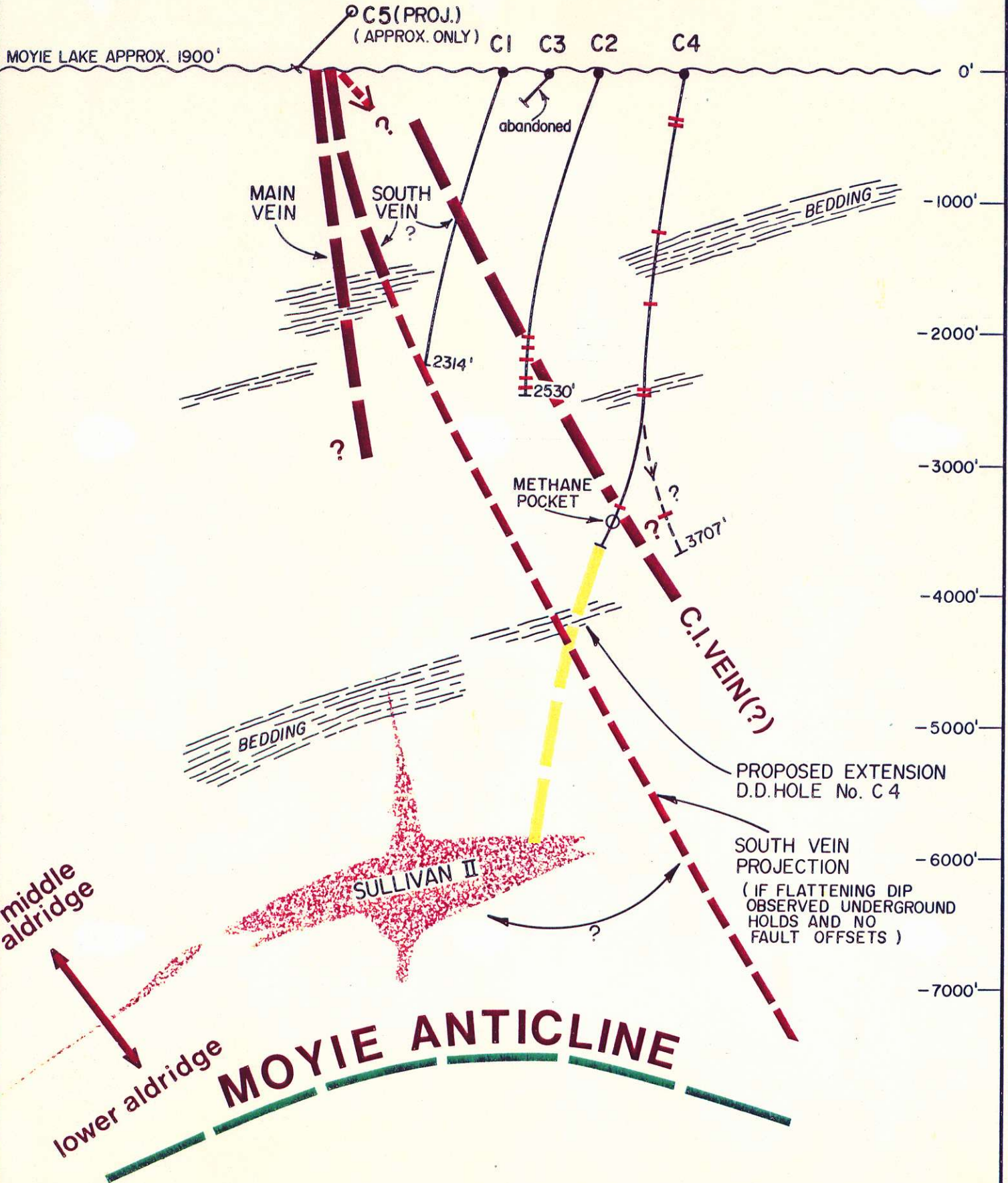




Photo M7/81 Looking westerly from St. Eugene dumps along trace of St. Eugene vein system towards Aurora Showings



Photo M2/81 - Looking south from St. Eugene Dump
towards 1963, 64 Deep drill holes, 62-64

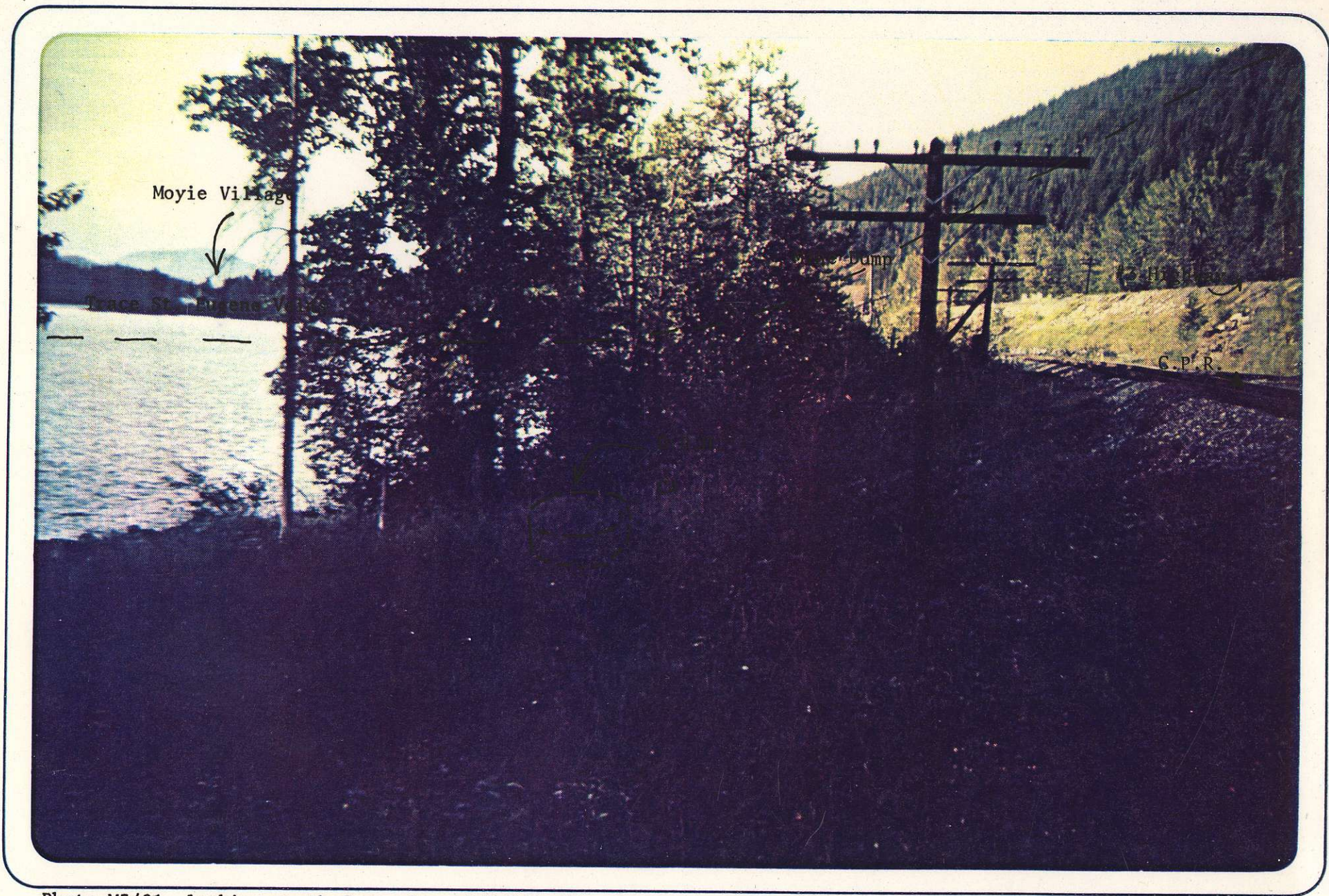


Photo M3/81, looking north from site of D.D.H. C4

where (even according to some in Cominco) by observations within drill holes such as C4 which did intersect mini-stratiform mineralization within a zone described, in relative terms, as being as "juicy" as any within the column. This is an important statement, considering exploration which has gone on for more Sullivans for nearly 100 years. Additional Sullivans present in the column are expected to occur at the STH as projected from Sullivan I. Relatively gentle folding has brought the STH near surface at several localities (ie: the Midway Mine southwest of Moyie) along a sinuous, fault complicated trace extending from Kimberly to beyond the U.S. border near Yahk. A few of the accepted geological indicators at Sullivan are present where an anticline (the Moyie Anticline at St. Eugene) brings the Horizon within 6000 feet (?) of surface. Conclusions are that any Sullivan II main targets should be at STH depths. As far as we know (judging by lack of head-frames) the best geological indicators are still those present at St. Eugene. Unfortunately STH depths at St. Eugene approach conventional drill limits.

An outside possibility exists that STH may not be the only horizon of interest. If Sullivan I is the result of a volcanic-related "blowout", as believed by many moderns, evidence is scarce which would eliminate similar earlier or later events. North-east faults are common in the Moyie Kimberly area and a number of deposits are felt structurally related to Sullivan, (Fig. 7 MM, Hoy, 1980). Some of the better tourmaline occurrences (a trademark at Kimberly) known outside Sullivan occur very near the STH. However, anomalous (but minor) boron has been detected geochemically at various localities, including St. Eugene, within the column. Interpretation may be slanted, however, since most of our work has been done near what we (not necessarily Cominco?) feel to be the STH trace. Boron is assumed related to a volcanic event but sulphides were not necessarily a part of such.

HOLE C4 DESCRIPTION

As per logs enclosed (Fig SE 2/81), hole C4, the deepest of the 5 Cominco directed holes, was completed to its proposed depth of 3,707 feet. Its collar was chosen as the best of several alternatives which considered depth to STH, St. Eugene vein dip, and available setups (Fig. SE 2/81). The hole started at -80°N (Photos M3, M4/81) steepened to 90°, then fell off to -70° at 3,700 feet. The direction of flattening is not known as the hole was not surveyed. Besides the official logs, various interpretations - some after assay results - were made by Cominco Geologists and these should be appended to the logs.

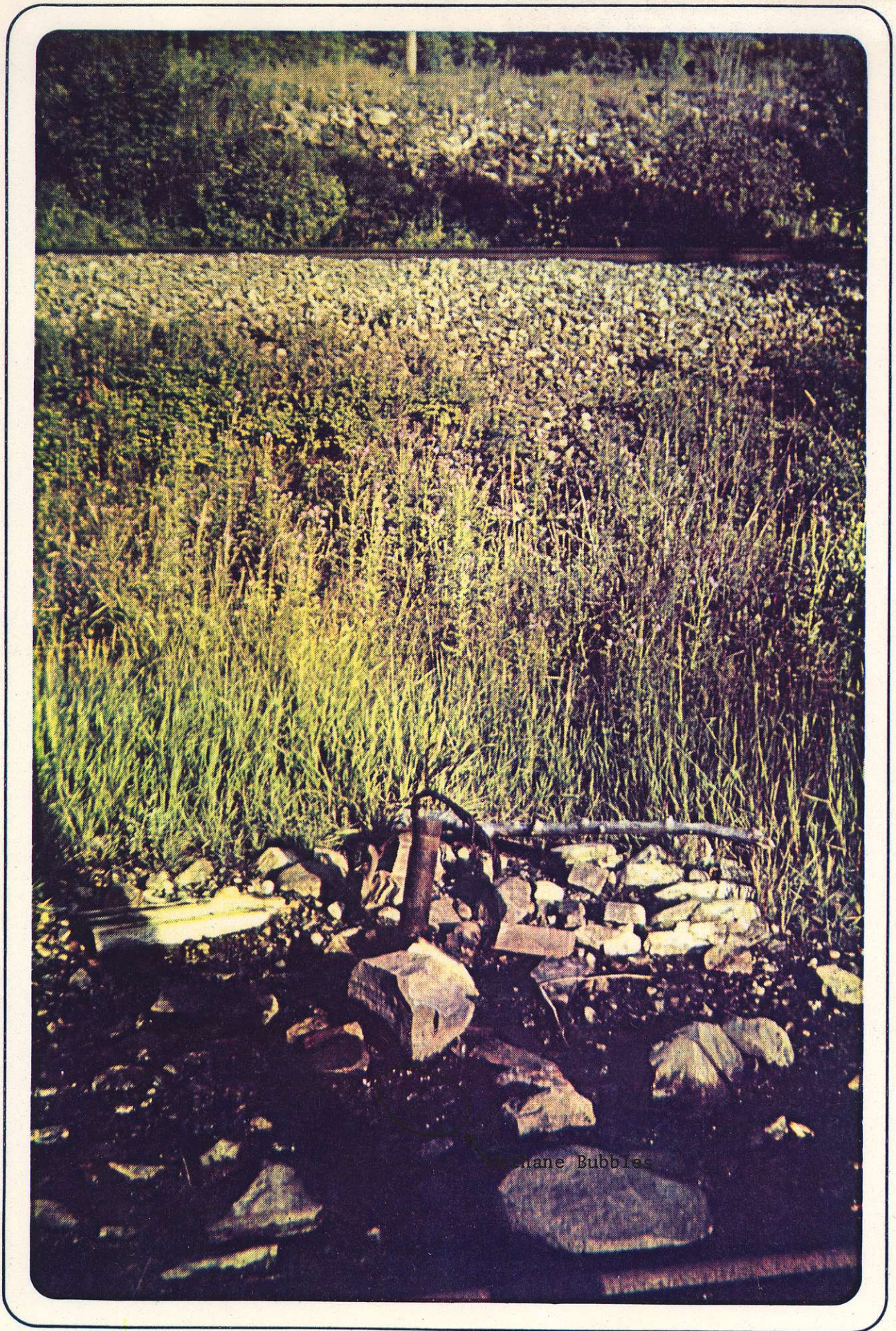
Results indicate that probably the most southerly veins of the St. Eugene system were intersected but the main system was not, particularly if the dip of the hole changed to southerly. No large stratiform deposit was indicated to this depth. A pocket of methane (well analysed) was encountered at 3510 feet and small amounts continue to flow to this date (photo M5/81). The writer recently asked Cominco to test for radioactivity (radon) commonly associated with methane but none was found, an environmental consideration when dealing with the drillers union.

Cominco geologists examining the core (other than the logger) commented on traces of stratiform zinc mineralization throughout.

We (Les Tihor accompanied by Cominco Geologist Don Hamilton) examined, in 1979, the core stored at Kimberly and decided that 'tourmaline' reported was incorrect, although tourmaline has been accepted elsewhere at St. Eugene.

PROPOSAL

Some of the Cominco geologists (those most directly involved) feel as we do that before cancelling our current but lingering joint venture we could do far worse than spend a few hundred thousand dollars+



Chane Bubbles

Photo M4/81 - Collar of D.D.H. C4 - inclined North @ -80°



Photo M5/81 - C4 Casing

determining for once and for all any potential of the STH at its projected 6,000 feet depth below St. Eugene. The possibility has also been advanced that the St. Eugene vein system might open up to commercial widths before the STH is reached, an added target as per Cartoon Fig. SE4/61.

PROCEDURE

This winter Cominco will have available a drill capable of plus 6,000 feet depths, and any programme capable of using it during this period would receive favorable rate consideration. Minimal prices quoted are about \$70.00/foot barring any unusual trouble.

Naturally the question of deepening Hole C4 to 6,000 or 6,500 feet arises utilizing the 3,700 feet already drilled.

Longyear (the only deep driller left in B.C.) suggests that we test out C4 with a LY44 machine, drilling a couple hundred feet and properly surveying the hole. If systems are "go", a V52 would be brought in and the job finished before the machine is required back at Kimberly. Minimal drilling costs would then approximate $70 \times 2300 = \$161,000.00$ or about \$300,000.00 all up. A new hole, starting with NQ and ending with BQ, would, at this rate require 5-\$600,000.00. Reaming C4 to 3,700, if required, would be cheaper than a totally new hole and the feeling is that C4 is worth a check out. Thought will be given to downhole geophysics, particularly Crone pulse-EM methods.

CONCLUSION


Sullivan II remains an attractive target whose presence, although largely based on theory, is far more positive than most geophysically and/or geochemically-suggested targets on which greater amounts of money have been initially spent.

RECOMMENDATION

We should hold further discussions with Cominco if our budget can stand this very legitimate venture. The writer would suggest that if Cominco is equally interested they should manage the project due to expertise in the area. We should use, as an interested and qualified consulting observer, someone such as Wilf Meyer who has some

background in the Beltian and is capable of constructive suggestions.
Compilation of all important 1962 to 1966 work could be accomplished
as approximated in this report.

There appears to be leeway as to financing vs equity, etc.



J.J. McDougall

JJM:ps

REFERENCES

- 1) St. Eugene Files - Cominco Joint Venture (Downtown Files)
- 2) Trig Hoy - Report of Activities B.C.D.M.(District C Paper, Oct. 24,80) .
- 3) Guidebook #1, GAC, SEG 1977 (BCMM)

APPENDIX

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED

GEOLOGICAL DEPARTMENT

WESTERN EXPLORATION

ST. EUGENE
PROPOSED PROGRAM FOR 1962 (STAGE I)

SUMMARY

The proposed program is intended to test the downward extension of the Moyie vein-fracture system where it may pass through favorable strata, and to explore for possible occurrences of stratigraphically controlled mineralization that may be associated with it at depths well below those previously explored.

It is estimated that four or five holes totalling about 8,000' of drilling will be required, and that the total expenditure including associated geological and geophysical work will amount to \$80,000.

DETAILS

Available information suggests that the vein system may step southward in an echelon fashion at successively greater depths. It also suggests that the stronger mineralization occurs where the system crosses strata that are thicker bedded and more quartzitic than average. The top of such a favorable quartzitic series projects to intersect the vein system about 200' below the old shaft. There is, of course, much scope for error in this projection. An attempt will be made to intersect the vein system well within these quartzites. As the location of the quartzites seems less definite than the location of the extension of the fracture system, the first hole, while directed to cross the fractures, will have establishment of the stratigraphy as its main purpose.

Considerable uncertainty exists as to the ability to drill a straight hole or to the amount of deviation that may occur. Cominco's experience with deep drilling in the corresponding strata in the Kimberley area shows that almost invariably a hole will eventually approach perpendicularity to the bedding. A similar result was obtained last season when drilling two 2,500-foot holes in sediments of variable hardness at Anyox. Therefore, it is assumed that deviation cannot be avoided, but an accurate estimate of the degree of deviation cannot be made until one or more holes have been drilled.

In order to avoid critical deviation in the first hole, it is proposed to drill it at minus 70° on bearing N 30° E, illustrated on the accompanying 200 scale cross-section. The plane of the hole is perpendicular to the vein system, and the hole will initially be about 30° from perpendicularity to the bedding. Whether the hole remains straight or rapidly deviates, it should provide full stratigraphic information. If, as is most probable, it follows a course intermediate to the two extremes just mentioned, it should cross most extensions of known and inferred vein-fractures within the quartzite series. It is proposed to continue the hole to at least 2,000', and if progress remains reasonable to well below that depth. It may reach, or even pass through the upper sill that projects into this area. The location of this sill here is, of course, very uncertain.

Considering all the uncertainties involved, this program can only be planned on a hole to hole basis. It may well require one or more additional holes to obtain the information that it is now hoped will be obtained from the first. However, as soon as stratigraphic and vein-fracture locations are satisfactorily established, additional

holes will be directed to intersect the fractures along strike, at reasonable intervals, to the west, and possibly to the east as shown on the accompanying 500-scale longitudinal section.

Concurrent with the drilling, detailed stratigraphic studies will be carried out in an attempt to correlate surface and drill hole data. Other known possibilities in the area will be reviewed and checked, which will probably involve limited magnetic surveys.

Attachments:

- (1) Cross-section showing proposed drill hole, 1" = 200'
- (2) Longitudinal section showing proposed drill holes, 1" = 500'

Report by: 
R. G. McEachern

GMcE:gmc
Exploration Office, Western District
May 11, 1962

Distribution:	St. Eugene	(2) ✓
	Exploration Division	(2)
	Western Exploration	(1)

Fig. SE2/81

MOYIE

PROPOSED HOLE NO. C-4

It is proposed to drill a deep hole to test for:

- (1) An improvement in grade in the vein mineralisation.
- (2) Conformable mineralisation.

This hole will be about 3,500' long and will cost approximately \$90,000. The following expenditures have been made to date:

Holes C-1 and C-2	-	\$ 40,000
Hole C-3		8,000
Miscellaneous		<u>2,000</u>
		\$ 50,000

Thus, about \$25,000 of the original appropriation for \$75,000 remain. The proposed hole will therefore cause an overexpenditure in Phase I of about \$5,000.

The location of the proposed hole is on the lakeshore 800' south of hole C-2. This is very close to the collar of St. Eugene's hole No. 8, and is in an area of rock exposure or thin overburden. The small amount of casing required here will be left in the hole so that it can be deepened or/and wedged at any future time.

As shown on the attached section, the proposed hole will intersect the C-1-1 vein at a point 1,000' to 1,500' (depending on its deflection) down-dip from the intersection in hole C-2. It may also intersect the downward projection of the south vein system. The lead isotope ratios of the Sullivan and St. Eugene mineralisation are identical. Therefore, they can be presumed to have a common origin. It may well be that the St. Eugene vein mineralisation represents offshoots from conformable mineralisation of the Sullivan type at depth. If so, then there is a possibility that the vein mineralisation might improve with depth, or, more significantly, we may find conformable mineralisation in some suitable strata.

The strata that would be intersected near the bottom of the proposed hole would outcrop in the vicinity of the Midway Mine four miles south of Moyie. There is no conformable mineralisation known at that point nor is the strata known to be favorable for such. However, this point is four miles south of a possible center of mineralisation which may exist below and a short distance south (down-dip) of the St. Eugene veins.

It is true that a few other possibilities in the mine area still remain untested and that the probability of success in finding ore in them may be considerably greater than that in the hole proposed herein. However, these possibilities, at best, can give us small ore bodies or remnants that would have little or no profit potential. Although the probability of success for the proposed hole is low, the possibility of finding something big remains. The future of the property lies in finding the latter, so in this case allowing the possibilities to override the probabilities seems entirely justified.

JR:gae
Exploration Office, Western District
December 12, 1962
Copies: (4)

CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
MEMORANDUM

Senior Geologist, Western Exploration (JR) Date: January 7, 1963

Field Geologist, St. Eugene (RGG) File No.

PROPOSAL FOR HOLE C-4 - ST. EUGENE Ref.

Four drill sites were considered as possible locations for hole C-4. Of these, the site situated on bedrock on the East side of Moyie Lake was considered the best choice.

Possible drill hole locations:

- 1) Vicinity of Etna Creek Outlet - Since this site occurs on an alluvial fan that overrides an esker, it was ruled out because of the strong likelihood of deep overburden.
- 2) Off of Lake Ice - This was ruled out since the lake to date is not ice-covered. In addition, due to the mildness of weather this year it is extremely unlikely that sufficient ice would form this season for drilling purposes.
- 3) Vicinity of Most Easterly Outcrop in Etna Creek - Referred to as West Site.
 - i) From four different stratigraphic calculations it appears that the collar at this location is 600' ± 200' stratigraphically higher than the East Site collar (see Appendix II, Calculations A, B, C and D).
 - ii) The bedding appears to dip about 5° steeper here than at the East Site. Thus the stratigraphic gain per foot of vertical hole would be somewhat less than at the East Site.
 - iii) This site has same chance as East Site for being nearest fold crest.
 - iv) Located on steeper fold limb than at East Site.
 - v) Possibility of transecting Chubb Fault and testing its footwall side. (See Appendix III, Section GE-GF).
 - vi) Possibility of intersecting Aurora vein system at depth.
 - vii) Location of the hole in this area would give a much broader geologic picture than at the East Site.

Conclusions - Compared with the East Site this location is a poor choice for deep stratigraphic testing. The disadvantage that it is some 600' ± 200' stratigraphically above the East Site as well as there being a distinct possibility of some structural complications appears to outweigh the very attractive feature that this site would give a much broader geologic picture.

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED

EXPLORATION DIVISION

WESTERN DISTRICT

ENGINEERING REPORT

**ST. EUGENE - FORT STEELE N.B.
SUMMARY OF 1962 EXPLORATION**

Mine Series No. 115

February 11, 1963

SUMMARY AND CONCLUSIONS

The 1962 drilling program was designed to locate stratigraphically controlled mineralisation down-dip from the St. Eugene vein system. The area tested was below the deepest mine workings. Three holes were drilled to give a total footage of 5,129'. One of the holes was abandoned in overburden.

A wide mineralized zone was encountered by each of the two deep holes. The principal sulfide intersection in each case appeared to be a fissure filling, moreover each intersection appeared to be on the same structure.

The present program will continue into 1963.

PROPERTY

The property consists of 185 Crown granted claims, four located claims, and the surface rights to 17 lots. The following list gives the claims held by Cominco and St. Eugene Mining Corp.:

(a) Crown granted claims held by Cominco

L 665 Peter	L 413 Baltimore (11/16	L 6132 Columbia
L 666 St. Eugene	interest)	L 6133 Rustler
L 667 Loretta	L 4114 St. John Fr.	L 6134 Jubo Fr.
L 668 Queen of the Hills	L 4115 Mamlok	L 6135 Burton Fr.
	L 4116 Jameson	L 6136 Dally Fr.
L 669 Moyie	L 4117 Lakeview	L 6137 Dominion
L 756 Lakeshore	L 4118 Trade Dollar	L 7004 Clinton
L 1380 Rose Fr.	L 4119 Duds Fr.	L 7005 Balta Fr.
L 3546 Hall to Pay Fr.	L 6131 Keatsway Fr.	

(b) Surface rights held by Cominco

L 665 Peter	eL 756 Lakeshore	eL 4115 Mamlok
L 666 St. Eugene	L 1380 Rose Fr.	eL 4116 Jameson
L 667 Loretta	L 3546 Hall to Pay Fr.	eL 4117 Lakeview
Queen of the Hills	eL 4118 Trade Dol	eL 4119 Duds Fr.
L 668 Moyie	L 4114 St. John Fr.	

e Portions of the surface of these claims purchased by D.G. Dept. of Highways.

(c) Crown granted claims held by St. Eugene Mining Corp.

L 2167 Dorothy
L 2168 Toronto
L 2169 Maple
L 2330 Roberta
L 2331 Kruger
L 3545 Half Moon Fr.

**THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
MEMORANDUM**

To..... Senior Geologist, Western Exploration (WR)..... Date..... January 7, 1963.....
From..... Field Geologist, St. Eugene (RGG)..... File No.....
Subject: PROPOSAL FOR HOLE C-4 - ST. EUGENE..... Ref.....

- page 2 -

4) East Shore of Moyie Lake on Bedrock - Referred to as the East Site

- i) Has possibility of intersecting C-1-1 vein at depth in addition to the principal objective of testing for bedded mineralisation.
- ii) Good geologic control.
- iii) Collar is some 600' ± 200' stratigraphically lower than at the West Site.
- iv) Disadvantages are: (a) gives a confined geologic picture with respect to stratigraphy, structure and vein system; (b) limits entire 1962 Drill Program to small area and to Cominco-owned ground.

Conclusions - The disadvantages of this site, mainly the confined geologic picture, appear to be outweighed by its higher stratigraphic position compared to the attractive-looking West Site and the likelihood of closer geologic control. For this reason the East Site is suggested as being the best choice for hole C-4.

APPENDIX:

3 - Attachments

RGG:gae

Crown granted claims held by St. Eugene Mining Corp. (cont'd.)

L 4413 Baltimore (1/16 interest)
L 6126 Frisco
L 6127 Quinden
L 7015 Stna
L 7016 Purango
L 7017 Aurora
L 7022 Horse Shoe
L 7205 Portland
L 7662 Cambrian
L 9393 Mabelle Fr.
L 9805 Surprise
L 9806 Fereola
L 9807 Alice Fr.

L 15214 M.L. 1
L 15215 M.L. 2
L 15216 M.L. 3
L 15217 M.L. 4
L 15218 M.L. 6
L 15219 M.L. 7
L 15220 M.L. 8
L 15335 M.L. 9
L 15336 M.L. 12
L 15337 M.L. 13
L 15338 M.L. 14 Fr.
L 15339 M.L. 10
L 15340 M.L. 11
L 15341 M.L. 12 Fr.
L 15342 Adal No. 3 Fr.
L 15343 Adal No. 2
L 15344 M.L. 55 Fr.
L 15345 M.L. 19
L 15346 M.L. 20
L 15347 M.L. 21 Fr.
L 15348 M.L. 18
L 15349 M.L. 17
L 15350 M.L. 16
L 15351 M.L. 15
L 15352 M.L. 23
L 15353 M.L. 24
L 15354 M.L. 25 Fr.
L 15355 M.L. 26
L 15356 M.L. 27 Fr.
L 15357 Adal No. 7
L 15358 Adal No. 1
L 15359 Adal No. 4 Fr.
L 15360 M.L. 53
L 15361 M.L. 16
L 15362 Adal No. 5
L 15363 Adal No. 6 Fr.
L 15364 M.L. 31 Fr.
L 15365 M.L. 28
L 15366 M.L. 30
L 15367 M.L. 36
L 15368 M.L. 37
L 15369 M.L. 38
L 15370 M.L. 39
L 15371 M.L. 43
L 15372 M.L. 44
L 15373 M.L. 47
L 15374 M.L. 48
L 15375 M.L. 49
L 15376 M.L. 52
L 15377 M.L. West Fr.
L 15378 M.L. 61
L 15379 M.L. 60
L 15380 M.L. 63
L 15381 M.L. 62

Crown granted claims held by St. Eugene Mining Corp. (cont'd.)

L 15382 M.L. 65
L 15383 M.L. 64
L 15384 M.L. 67
L 15385 M.L. 66
L 15386 M.L. 69
L 15387 M.L. 68
L 15388 M.L. 71
L 15389 M.L. 70
L 15390 M.L. 35

(d) Located claims held by St. Eugene Mining Corp.

3917-H Pop No. 1
3918-H Pop No. 2
3919-H Pop No. 3
3920-H Pop No. 4

(e) Surface rights held by St. Eugene Mining Corp.

L 3039
* L 7662 Cambrian

* Excepting that portion lying within L 2803.

3. OWNERSHIP

Exploration and development costs are shared equally by Cominco and St. Eugene Mining Corp.

Cominco holds 23 Crown granted claims and an 11/16 undivided interest in Lot 4413. St. Eugene Mining Corp. holds four located claims, 81 Crown granted claims, and a 1/16 undivided interest in Lot 4413.

4. LOCATION

Lat. - 49° 17' N
Long. - 115° 50' W
Elev. - 3,100' - 5,200'
Prov. - B.C.
Mining Div. - Fort Steele

The property is 20 miles south of Cranbrook at the town of Moyie. It covers all lower Moyie Lake and about one mile either side of the lake shore.

Highway No. 3, The Canadian Pacific Railway and the East Kootenay Power transmission line cross the middle of the property.

5. HISTORY

1893 - J. Cronin, guided by Father Coecola and Peter the Indian, locate the Peter and St. Eugene claims.

1898 - Branch line of the Crow's Nest Pass Railway via Moyie is completed, the St. Eugene Group makes first ore shipment from Moyie.

Four separate mining groups work the Moyie vein system, they are:

(i) St. Eugene Group - Property consists of St. Eugene, Peter, Rose and Loretta claims. Owned by J. Cronin and J. A. Finch.

(ii) Moyie Group - Property consists of Moyie and Queen of the Hills claims. Owned by F. Houghton, E.P. Davis and others.

(iii) Lakeshore Claim - Owned by G. Furrall and others.

(iv) Aurora Group - Property consists of Aurora, Stm, Durango and Horse Shoe claims. Owned by Sanburn, Meitzel and Ole Johnson.

- 5 -

In the period 1915-1921 5,800 tons were produced. The mine shut down in 1921.

St. Eugene Tailings - In the period 1926-1929, 524,354 tons of material were retreated. Most feed came from the old St. Eugene tailings; a small tonnage came from St. Eugene dump material, Sullivan dump material and Sullivan middlings.

Aurora Mine - In the period 1910-1929, 3,352 tons of hand-sorted material averaging 3.3 os. Ag, 7.7% Pb, 18.5% Zn were shipped.

Sullivan Mine - In the period 1919-1927, 31 tons of hand-sorted material averaging 3.5 os. Ag, 11.8% Pb, 12.4% Zn were shipped.

Society Girl Mine - This property not controlled by Cominco-St. Eugene. In the period 1900-1952, it shipped 1,209 tons of hand-sorted material, mostly oxidized, averaging 4.2 os. Ag, 16.6% Pb, 0.0% Zn.

DEVELOPMENT

Prior to 1962

(a) Underground

St. Eugene Mine - The ore deposit was developed from 19 different levels spread through a vertical range of 2,300'. The longest drift was off the 1800 Level and explored the Main (North vein 4,000' eastward of the portal.

Drifting	- 37,000'
Crosscutting	- 3,000'
Sinking	- 930'
Raising	- 10,934'
Drilling	- 31,535'

Aurora Mine - Nearly all the development footage came from two levels.

Drifting and Crosscutting	- 2,200'
Sinking	- 40'
Raising	- 50'

Quindon Mine - Most of the development was on three levels.

Drifting and Crosscutting	- 1,100'
Raising	- 60'

(b) Surface - St. Eugene Mining Corp. drilled 20 EX size holes in the period 1940-1950 to give a total footage of 6,416'. Thirteen of the holes were on the east lake shore, two were near the Aurora Mine, three were near the Society Girl Mine, and two were at the southern limit of the property. Five of the holes located on the east shore did not reach bedrock.

The holes in general were designed to prospect for veins of the St. Eugene type.

1962 Joint Exploration Program

Cominco-St. Eugene Mining Corp. drilled three holes totalling 5,129' in 1962. All holes were on the east shore, south of the St. Eugene Mine. One of the holes was abandoned in overburden.

T. Connors contracted the drilling. Their crew worked three eight-hour shifts per day for a six-day week. The holes were drilled with a B.H.S. No. 2 drill machine and 30' pulls were utilized on all set-ups.

1899 - St. Eugene Consolidated Co. formed, property includes the St. Eugene Group, Moyle Group and Lakeshore claim.

1900 - St. Eugene Consolidated starts up mill on April 1st.

1905 - Fire destroys shaft-house, hoisting plant and 1800 portal at the St. Eugene Mine.

1906 - Cominco acquires St. Eugene Consolidated on January 1st.

1915 - Production declines at the St. Eugene mine.

1917 - Fire destroys the St. Eugene mill.

1921 - St. Eugene mine shuts down.

1924 - Leasers make small shipment from St. Eugene Mine.

1926 - Cominco builds 500-ton mill to retreat the St. Eugene tailings.

Road is constructed from Aldridge siding to Aurora Mine.

1927 - Coarse crushing plant is added to the St. Eugene mill.

1929 - St. Eugene retreatment mill shuts down.

St. Eugene Extension Mines formed, property includes Cambrian and Quindon Groups, an option on the Aurora Group, and a lease on Cominco's St. Eugene property.

1937 - Lakeshore shaft, St. Eugene Mine, is dewatered.

1939 - St. Eugene Mining Corp. acquires holdings of St. Eugene Extension Mines and negotiates a 20-year lease dated April 17, 1939, on Cominco's St. Eugene property.

1940 - St. Eugene Mining Corp. drills six surface holes totalling 2,859'.

1946 - St. Eugene Mining Corp. drills five surface holes totalling 1,360'.

1947 - Amendment dated October 14, 1947 adds two more claims to the Cominco lease, this brings total lease to 24 Crown granted claims.

1950 - St. Eugene Mining Corp. deepens four surface holes and drills nine new ones to give a total footage of 2,197'.

1958 - Lease on Cominco property expires.

1962 - Cominco and St. Eugene Mining Corp. participate in joint exploration program, agreement dated April 19, 1962.

Cominco-St. Eugene drill three surface holes totalling 5,129'.

6. PRODUCTION

St. Eugene Mine - The production up to 1915 was 1,018,323 tons averaging 7 os. Ag, 14% Pb, 5% Zn.

The St. Eugene mill produced a Pb concentrate only; tailings ran 1.4 os. Ag, 2.7% Pb, 5% Zn. Smelter yield on the total mine production was 5.3 os. Ag/T, 11.3% Pb.

From partial records the mine production was distributed as follows: Upper Mine (St. Eugene) shoot, 15%; Moyle shoot, 1; and Lakeshore shoot, 70%.

Hole C-1, 2,314' in length, was drilled entirely with standard AX equipment.

C-2 was 2,530' in length. The hole was drilled standard BX from bedrock collar to 602' then BX wire-line from 602' to 2,530'.

Both C-1 and C-2 encountered similar rock conditions. Comparing the two drilling methods used in the holes, the BX wire-line gave lower bit costs and greater rates of advance than standard AX. Moreover the wire-line particularly outperformed standard equipment at depths greater than 1,000'.

C-3 was abandoned in overburden at a depth of 295'.

8. GEOLOGY

The Moyie vein system cuts the crest of a broad north-plunging anticline and transects upper Middle Aldridge, Upper Aldridge and basal Creston strata. The system contains sulfide-rich sections through a strike length of 13,000' and a vertical range of 4,400'. Production to date has been chiefly from the upper 2,200' of Middle Aldridge.

Stratigraphy

The basal Creston strata in the Moyie area consists mainly of thick-bedded argillite with subordinate argillaceous quartzite. The Upper Aldridge is chiefly thin-bedded argillite and argillaceous siltstones. The incompetent character of both these formations appears to make them less favorable for hosting either fissure-controlled or bedding-controlled mineralization than the underlying thick-bedded units of the Middle Aldridge.

The upper Middle Aldridge sediments alternate from a 100' - 150' sequence of thick-bedded quartzite to a 100' - 200' sequence of thin-bedded argillite. The competent thick-bedded members appear to be the best host rock of the formation for both fissure-filled ore deposits and bedding-controlled replacement deposits of the Sullivan type.

Intrusives

Purcell diorite is the only intrusive observed near the Moyie vein system. A narrow dyke and a thin sill intrude sediments at the upper St. Eugene workings. Two thick sills occur 800' below the lowermost workings.

The lower sills, each about 150' thick, are separated by 200' of sediments. The lowest of the two is known to cross-cut the stratigraphy at a shallow angle. The stratigraphic gradient in this case is 50' down per 1,000' north.

The vein system is post-diorite. The thin sill at the upper workings is cut by the St. Eugene vein and one 1962 drill hole intersects the vein system below the lowest thick sill.

Ore Deposits

St. Eugene Mine

The St. Eugene deposits are associated with two sub-parallel fracture zones that cut upper Middle Aldridge and Upper Aldridge strata. The two zones trend N 70° W and dip 65° SW.

The ore minerals are galena and sphalerite. In addition there is much pyrrhotite and pyrite, some magnetite, and minor chalcopyrite. The vein matter is mostly quartz with minor amounts of biotite, chlorite, garnet and amphibole in decreasing order of abundance. According to Schofield (1915) magnetite was deposited first, the gangue minerals next, and sulfides last.

The 1962 drilling program showed that the St. Eugene veins extend at least 2,100' down-dip from the lowest mine workings. The altered

- 7 -

and mineralized zone at this depth has an estimated true width of 180'. Of this, the best mineralized part averaged 1.6 oz. Ag, 2.8% Pb, 9.1% Zn for an estimated true width of 3'.

The silver-lead ratio over the whole Moyie vein system is fairly consistent at 1 oz. Ag per ton to 2.4% Pb. There is scant information on the overall lead-zinc ratio, however it appears to be about 1% Pb to 1-3% Zn. Table I shows the metal ratios at various points in the vein system:

TABLE I

Location	Ratio		% Pb: % Zn	Remarks
	oz Ag / T	% Pb		
St. Eugene Mine	1:2	-	-	Ag ratios are consistent throughout mine sampling data and agree closely with the overall production record. Sampling data showing Zn grade is not available, some Zn-rich areas apparently were not mined.
Aurora Mine	1:2	-	1:2	Data from the overall production record.
Quindon Mine	1:3	-	1:1	Data from the overall production record.
Society Girl Mine	1:4	-	-	Data reported by Schofield (1915) for the sulfide material.
1962 Drilling Program	1:2 to 3	-	1:1 to 3	Data from C-1 and C-2 core sampling.

Aurora and Quindon Mines

The Aurora and Quindon deposits are on the west side of Moyie Lake in upper Middle Aldridge strata. The deposits are 4,000' northwesterly of the St. Eugene Mine and roughly on strike with the St. Eugene veins. Galena and sphalerite are the chief ore minerals present.

The Quindon vein is about 700' north of the Aurora. It strikes east and dips 60° S.

The Aurora deposits are associated with two veins trending N 75° W. The most southerly vein is vertical, the other dips 55° SW. It is reported the two veins should converge about 30' below No. 2 tunnel.

Society Girl Mine

The Society Girl deposits occur in basal Creston strata about 3,000' southeast of the St. Eugene Mine. The Society Girl is not part of the Cominco-St. Eugene Mining Corporation property.

The deposits occur in two veins about 200' apart. Both veins trend N 60° W and dip 60° SW.

Galena and sphalerite are dominant in the deeper unoxidized workings. The near surface deposits are oxidized to cerussite and pyromorphite.

ORE

Two holes in the 1962 drilling program intersected sulfides.

Both intersections appeared to be in the same vein structure. It is assumed the structure sub-parallel the St. Eugene South Vein. Projection places it 450' south of the South Vein at the 2400 Level (elevation 2,430').

Hole C-1 cut the structure 600' down-dip from the 2400 Level and C-2 cut it 1,500' below C-1. Sampling was from 1,001' to 1,111' in C-1 and from 2,110' to 2,357.5' in C-2. The significant intersections are shown in Table II:

TABLE II

Hole No.	From	To	Estimated True Width	oz Ag	% Pb	% Zn
C-1	1,105'	1,107'	1.5'	3.3	9.7	0.1
C-2	2,316' 2,349'	2,320.5' 2,350'	3' 0.5'	1.6 2.1	2.8 5.4	9.1 7.6

10. MINE METHOD AND COST

Not considered.

11. TREATMENT AND COST

Not considered.

2. & 13. EQUIPMENT AND BUILDINGS

Three buildings, one 24' x 50' and two 24' x 40', are in good repair. The largest building houses a compressor and hoist, those remaining contain assorted mining equipment including a drill sharpener, six one-ton mine cars and three 225 GPM electric pumps.

4. & 15. FINANCIAL AND ECONOMIC CONSIDERATIONS

Exploration expenditures for 1962 totalled \$67,750 and was equally shared between Cominco and St. Eugene Mining Corp.

Cominco and St. Eugene Mining Corporation agreed to combine their Moyie properties and embark on a program of joint exploration and development on April 1, 1962. An outline of this program follows:

Stage I - Total expenditure to equal \$75,000 by September 30, 1963.

Stage II - Total expenditure for Stages I and II to equal \$200,000 by December 31, 1964 or the agreement terminates.

If either party declines to participate in Stage II the other can proceed alone.

Stage III - On completion of Stage II a new specially limited company with authorized capital of four million shares to be formed by the party in control.

Stage IV - All rights of management control by either party terminate if the managing party does not wish to make expenditures directly or if the time limit on optional expenditures has expired.

Further financing and development is to be carried out by the new company, management is to be decided by existing shareholders.

APPENDIX

References:

- 1) Chubb, P.A. (1939) - St. Eugene Mining Corp., Moyie, B.C.
- 2) Gifford, R.G. (1962) - Progress reports, Moyie project.
- 3) Odillan, J.C. (1909) - St. Eugene Mine, Moyie, B.C.
- 4) Kerr, F.A. (1937) - St. Eugene Extension Mines, Moyie, B.C.
- 5) Minister of Mines, B.C. Annual Reports - Aurora, 1909, 1923; Quindoo, 1917, 1923, Mines Index 1937-5; Table I; St. Eugene, 1898, 1904, 1909; Society (B.C.), 1909, Mines Index 1937-5; Table I.
- 6) Schofield, S.J. (1915) - Greenbrook map-area, Geological Survey, Memoir No. 76.
- 7) Smith, A. (1949) - St. Eugene Mine, Moyie, B.C.
- 8) Swanson, C.O. (1948) - St. Eugene Mine, Moyie, B.C.

Attachments:

- 1) General Geology of Moyie Area
- 2) Ideal Section showing Stratigraphy between Midway and St. Eugene Mines.
- 3) Claim Map of Moyie Property.
- 4) Geological Section showing 1962 Drilling.
- 5) Summary of Estimated Costs - St. Eugene 1962.

Report by: R.G. Gifford
R.G. Gifford

Endorsed by: J. Richardson
J. Richardson

ROO:gae
Trail Exploration Office, Western District
February 25, 1963

Distribution: Exploration Division (1)
St. Eugene (1) ✓
Trail Expl'n Office (2)
Vanc. Expl'n Office (1)
Field file (1)

CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
MEMORANDUM

Senior Geologist, Western Exploration (JR)..... Date..... April 8, 1963
Field Geologist, St. Eugene (RGG)..... File No.....
ST. EUGENE PROGRESS REPORT..... Ref.....
MARCH 16-31, 1963

SUMMARY

Hole C-4 is 2,765' deep, condition of the last 400' has been poor often resulting in short runs and dropped core.

Minor clear-cut bedding controlled mineralisation was encountered from 2,378' to 2,456' (78'), overall estimated grade = 1r Zn, 1r Pb. The best mineralized section consisted of 2" of calcite-dolomite interlayered with subordinate sphalerite and galena, layering was parallel to the bedding and the estimated grade = 6% combined Pb-Zn.

Three small ore shoots were mapped in the Aurora Mine. They occur in a generally vertical dipping, NW striking vein structure and appear to pitch about 30° westward. The likelihood of finding other significantly larger shoots in the mine area seems poor.

DRILLING

a) Geological Log

From	To	Remarks
2,222'	2,402'	<u>Ninth Unit Quartzite</u> - Thick-bedded, medium-grained quartzite. Bedding = 60° in upper half, 75° in lower half.
2,373'	2,456' (78')	<u>Mineralized Zone</u> ; Minor Pb, Zn in narrow (1/3") calcite-dolomite veins parallel to bedding and disseminated in basal portion of certain dolomitized beds. Mineralization generally weak; best section at 2,386' consisting of 2" of banded calcite-dolomite, ZnS, and PbS parallel to bedding; estimated grade for 2" thickness = 6% Pb-Zn. (See attached diagram showing mineralization and alteration from 2,222' to 2,402').
2,476'	2,400' (4')	<u>Fault Breccia</u> ; calcite-dolomite fragment in black; serpentinized matrix; abundant scattered pyrite grains.

(cont'd.)

Signed.....

CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
MEMORANDUM

Senior Geologist, Western Exploration (JR)..... Date..... May 4, 1963
Field Geologist, St. Eugene (RGG)..... File No.....
ST. EUGENE PROGRESS REPORT..... Ref.....
APRIL 19-30, 1963

SUMMARY

Hole C-4, 3,515' deep, is transecting thick-bedded Middle Aldridge quartzites. The rock at present is bleached and pitted, probably because of its proximity to the gas and water course encountered at 3,510'.

The last 700' of sediments in C-4 contain intermittent zones of pink garnet, the last 600' show a somewhat higher metamorphic grade. The latter feature is evidenced by a weak but pervasive hornblende and white garnet alteration of the rock.

Minor ZnS mineralization occurs in the last 80' of core. Particles of ZnS intermixed with pyrrhotite are frequently found along the bedding surfaces in this zone.

DRILLING

a) Geological Log

From	To	Remarks
2,666'	2,818'	<u>Ninth Unit</u> - Thick, fine-grained quartzite beds separated by thin-bedded argillite sequences; overall con. condition is 60% quartzite, 40% argillite. Veinlets contain rare trace of ZnS. Bedding = approx. 70°, poorly defined.
2,818'	2,925'	<u>Tenth Unit</u> - Thin-bedded argillite and silty argillite, plentiful pyrrhotite. Bedding = 70°. Shattered zone, 2,831' - 2,835' (4'); crumpled, push gouge, strong local bleaching. Massive Argillite, 2,894' - 2,914' (20').
2,925'	3,515'	<u>Eleventh Unit</u> - Thick, fine-grained quartzite beds separated by thin-bedded argillite sequences. Rock, in general, is weakly altered to fine-grained hornblende and white garnet, occasional opalescent coarse quartz veins. Bedding = 70° ± 5°. Shattered zone, 3,343' - 3,345' (2'); some gouge, generally bleached.

(cont'd.)

Signed.....

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
MEMORANDUM

To..... Senior Geologist, Western Exploration (J.R.)..... Date..... July 3, 1963.....
From..... Field Geologist, St. Eugene (200)..... File No.....
Subject..... ST. EUGENE PROGRESS REPORT..... Ref.....
JUNE 21-30, 1963

SUMMARY

Hole C-4 was discontinued at 3,707'.

The drilling equipment is presently being moved to the C-5 site. It is expected the new hole will be collared early in the first week of July.

DRILLING

a) General

Work resumed June 21 following settlement of the driller's strike. Equipment is currently being moved to the C-5 site, about 600' above Moyle Lake and 1,200' south of the St. Eugene 1300 Level.

Sixteen feet of XI casing and 24' of XII casing were not retrieved from C-4.

It was intended to keep C-4 open by pulling all but 20' of the XI casing, depth to bedrock being 8'. Unfortunately the 16' loss of XI went undetected and the casing was pulled clear of bedrock. As a consequence the hole was lost, collapse being quickly brought on by the turbulent gas-water outflow.

Re-entry to C-4, if desired, should not be unduly difficult. Current outlines the hole for approximately 3' below the collar, this should guide a probe to the correct bedrock position.

b) Pajari Survey

Hole No.	Depth	Dip
C-4	3,000'	80°
	3,300'	73°
	3,600'	70°

OUTSIDE ACTIVITY

Pesc Silver has acquired an interest in the Midway Mine, five miles south of Moyle. Apparently they intend to first drift 1,500' on the

(cont'd.)

Signed.....

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED

EXPLORATION DIVISION

WESTERN DISTRICT

COMMENTS ON ST. EUGENE REPORT BY
R.G. GIFFORD DATED FEB. 17/63

Gifford's report and maps summarises and illustrates the results of the recent exploration work at Moyle quite comprehensively. In it Gifford describes the possibility of mineralization occurring in a number of localities, some of which have not been tested. These localities are described and discussed below:

(1) Bedded Mineralization

Hole C-4 intersected some bedding controlled mineralization 4,500' below the top of the Middle Aldridge. This mineralization occurs in a zone about 108' thick but is very weak, the best intersection assaying 1.0 oz. Ag and 1.7% Pb over one foot. Also, in our areal work we found strata 800' lower in the Middle Aldridge than that intersected at the bottom of C-4. Moreover, this strata was locally replaced, in part, by tourmaline, giving a rock very similar to the Kisberley "Chart".

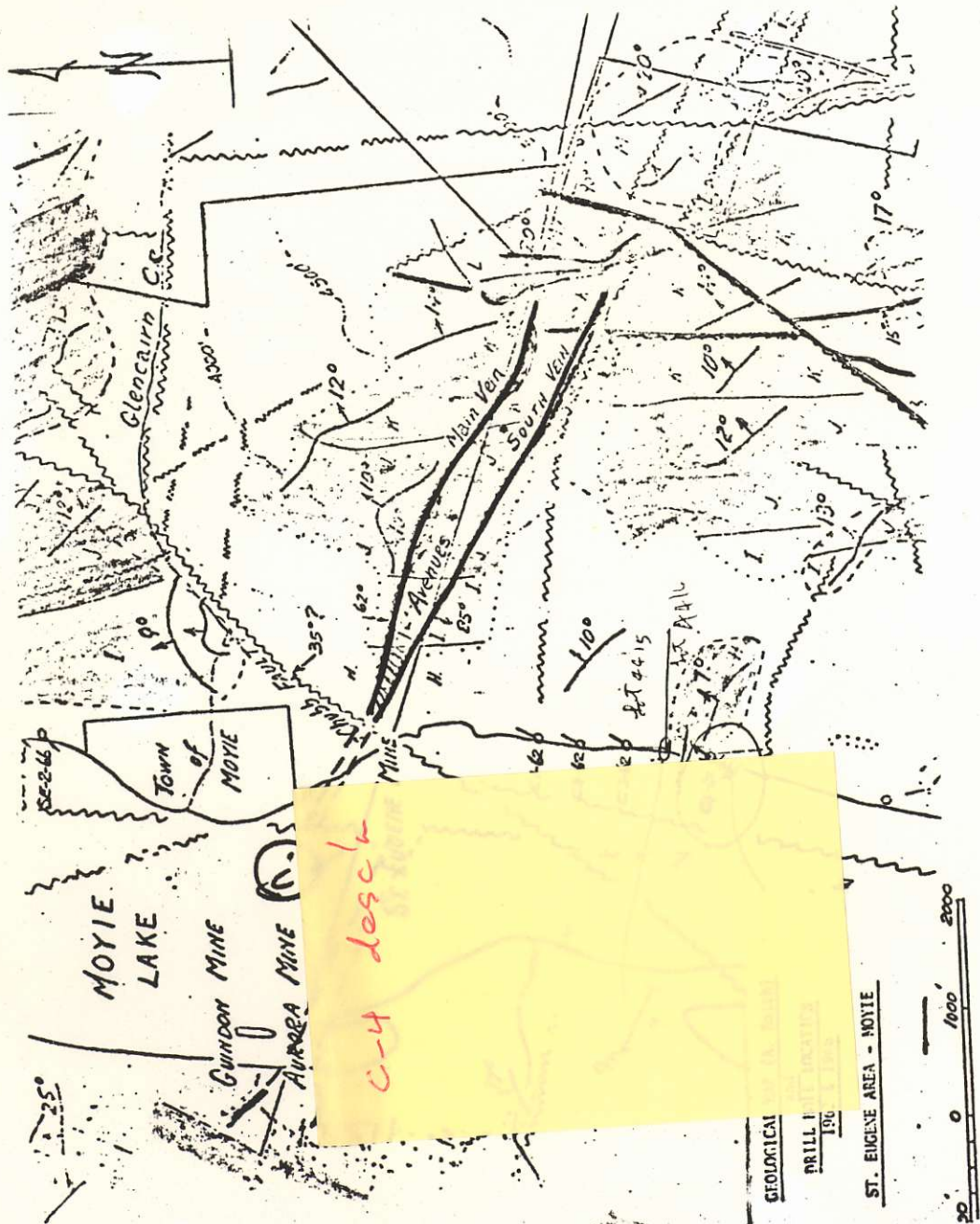
The search for bedded mineralization was our main hope and effort. Although the probabilities of finding such were small, the tremendous possible reward justified considerable exploration in this direction. The bedded mineralization and tourmaline alteration described above are somewhat encouraging but at the present time we can not justify any further drilling for bedded mineralization. However, as additional information accumulates further action may be warranted at some future date.

(2) Lead Bluff Breccia

This structure of unknown size contains abundant pyrrhotite and Gifford suggests that leaching may have removed the ore minerals from the present exposures. He suggests that magnetic and geochemical work could guide packstack drilling for a preliminary test of this structure.

This modest program, costing less than \$1,000 would give a preliminary test of the structure, but I do not agree with the possibility of ore minerals, particularly galena, having been leached from the near-surface part of the exposure. Furthermore, the rock-cut on the highway gives enough new exposure to indicate that pyrrhotite is the only sulfide present in significant amounts.

Fig 5E5/81
A. Smith Summary, 1964



13. The three principal results of Conisco's 1962-63 drilling are:

1. Hole C.4 intersected a mineralized bedding zone 100 feet thick. The Pb-Zn mineralization was weak but the strata were altered "similar to the Sullivan horizon 1/2 mile down the flank from the mine." The zone was locally tourmalinized similar to the Kimberley "chert".

2. Hole C.5 cut 80 feet of I, 2% Pb. below the shaft argillite apparently on the downward projection of the South Vein structure. Although not ore grade, this showed the presence of widespread ore type mineralization below the argillite in which the old mine bottomed.

3. Hole C.2 intersected an "Upper Vein" which could be parallel to the producing veins and trend up a drift-covered gully.

16. The principal bets are: (see attached sketch)

1. A bedded Sullivan type deposit. The C.4 intersection (15-1) gives encouragement for such along the axis of the anticline out under the lake.

2. Further ore on the downward projection Lakeshore shoots below the argillite. The C.5 intersection could have been just a few feet from ore.

3. Exploration of the upper (St. Eugene) shoot to the east, e.g. on the Baltimore claim. Possibilities of ore trapped under a massive "conglomerate".

4. Exploration of parallel veins, e.g. the "Upper Vein" of Hole C.3.

17. St. Eugene now should:

1. Study Conisco's results.

2. Make a thorough geochemical study for "holes" of 1962-63 drilling plus earlier drilling and pertinent outcrop areas at Moyie.

3. Determine the best way of tackling each of the four principal bets, e.g. the bedded deposit under the lake: could we drill from a barge or do we have to have ice? Can we drill angle holes?

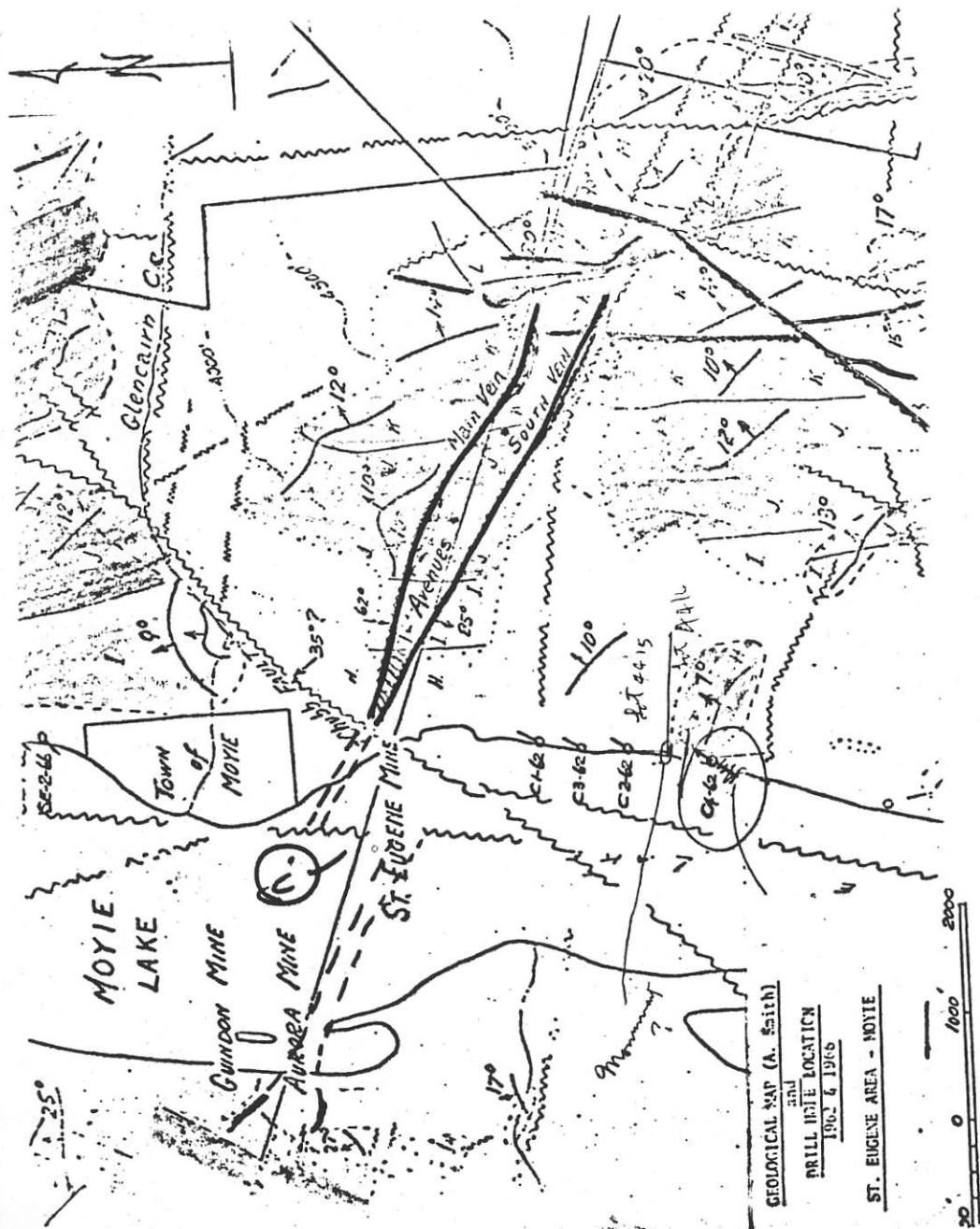
For Bet 2 (ore below the Lakeshore shoots) should we do further drilling from surface with 3000' holes or should we pump out the shaft and tackle it from underground?

What would it cost to drift out under the lake into a position where we could drill Bet 1? It is obvious we're going to need some engineering help on this.

Bets 3 and 4 are the easiest to explore by surface drilling and require the least planning. They offer the simplest way to complete Stage II, but they are not the best places to look for major crushes.

Yours very truly,

Fig 545/81
A. Smith Summary, 1964



13. The three principal results of Conine's 1962-63 drilling are:
1. Hole C.4 intersected a mineralized bedding zone 100 feet thick. The Pb-Zn mineralization was weak but the strata were altered "similar to the Sullivan horizon 1/2 mile down the flank from the mine." The zone was locally tourmalinized similar to the Kimberley "chert".
 2. Hole C.5 cut 80 feet of I.Z. Pb. below the float argillite apparently on the downward projection of the South Vein structure. Although not ore grade, this showed the presence of widespread ore type mineralization below the argillite in which the old mine bottomed.
 3. Hole C.3 intersected an "Upper Vein" which could be parallel to the producing veins and trend up a drift-covered gully.
16. The principal bets are: (see attached sketch)
1. A bedded Sullivan type deposit. The C.4 intersection (13-1) gives encouragement for such along the axis of the anticline out under the lake.
 2. Further ore on the downward projection Lakeshore shoots below the argillite. The C.5 intersection could have been just a few feet from ore.
 3. Exploration of the upper (St. Eugene) sheet to the east, e.g. on the Baltimore claim. Possibilities of ore trapped under a massive "conglomerate".
 4. Exploration of parallel veins, e.g. the "Upper Vein" of Hole C.3.
17. St. Eugene now should:
1. Study Conine's results.
 2. Make a thorough geochemical study for "holes" of 1962-63 drilling plus earlier drilling and pertinent outcrop areas at Moyie.
 3. Determine the best way of tackling each of the four principal bets, e.g. the bedded deposit under the lake: could we drill from a barge or do we have to have ice? Can we drill angle holes?
- For Bet 2 (ore below the Lakeshore sheets) should we do further drilling from surface with 3000' holes or should we pump out the shaft and tackle it from underground?
- What would it cost to drift out under the lake into a position where we could drill Bet 1? It is obvious we're going to need some engineering help on this.
- Bets 3 and 4 are the easiest to explore by surface drilling and require the least planning. They offer the simplest way to complete Stage II, but they are not the best places to look for major prospects.

Yours very truly,

Areas of tourmalinization (boron concentration) that Ethier and Campbell (1977) suggest are concentrated near basin fracture zones, and intraformational conglomerate that Hoy (in press) relates to syn-sedimentary faults appear to be concentrated in the vicinity of the transverse structural zone south of Kimberley, and in a zone coincident with the Hall Lake fault to the north. A number of stratiform lead-zinc deposits and occurrences are also preferentially located in the vicinity of these transverse zones (Figure 7). Both the Sullivan and the Kootenay King deposits occur in somewhat thickened sections and they and a number of other showings are associated with intraformational conglomerate and tourmalinization, suggesting that basin fractures and mineral deposits are genetically linked. Local north-trending breccia zones at Sullivan (Ransom, 1977; Hamilton et al., in press) suggest that second order basins cross-cutting a regional northeast-trending rift structure were the local control of mineralization.

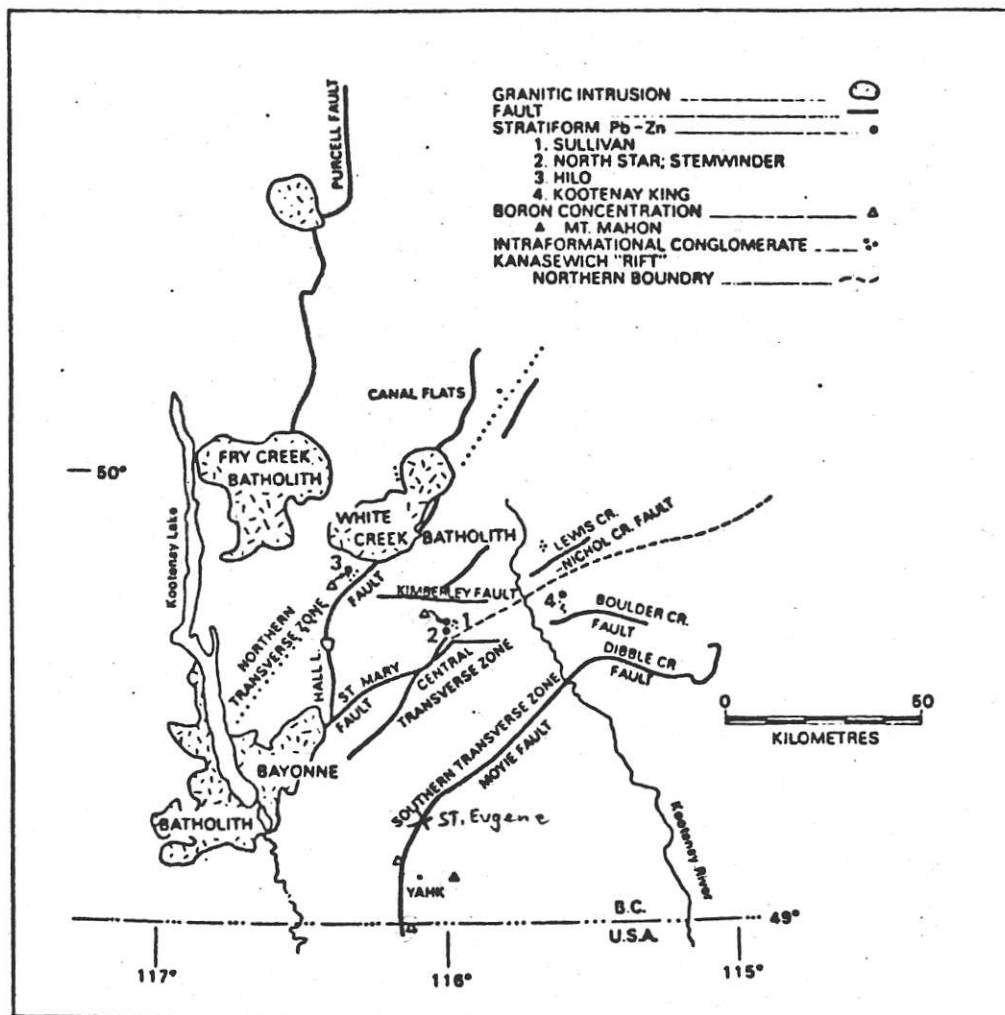


Figure 7: Location of northeast trending structures and distribution of stratiform Pb-Zn occurrences, boron concentrations, and intraformational conglomerate (data after Rice, 1941; Leech, 1960; Reesor, 1973; Ethier and Campbell, 1977; Gifford, 1971 and Hoy, 1979a).

(after Hoy, 1980)

DDH C-4
24693
C-4

N.W. JAMESON L4416
S.W. MENLEK L4415
N.E. M.L. 4 L15217
S.E. ADEL 2 L15243
M.L. 55 FR.

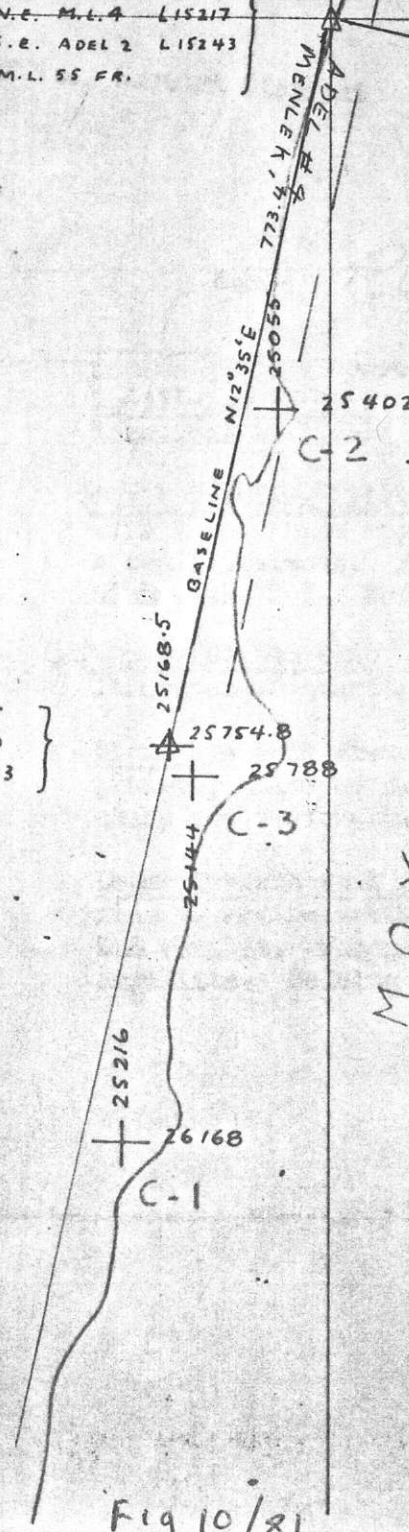
25000 N

ADL #2
ML #4

NORTH

MOYIE LAKE

L4415
L4049
L15343



The Consolidated Mining and Smelting Company of Canada Limited

DRAWN BY: RGG		TRACED BY:	
REVISED BY	DATE	REVISED BY	DATE

MOYIE

1" = 200' Mch 1963

MAP 82 G 5 E. Claim Map (1981) Moyie Area

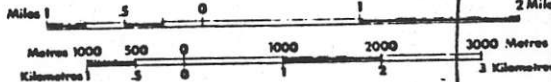
ST. Eugene
ZONE

CA

- Cominco
- ST. Eugene

LEGEND

- CROWN-GRANTED MINERAL CLAIM
- REVERTED C.C. MINERAL CLAIM
- FORFEITED MINERAL CLAIM
- VERIFIED LEGAL CORNER POST
- LEGAL SURVEY
- LEGAL CORNER POST & TAG NUMBER

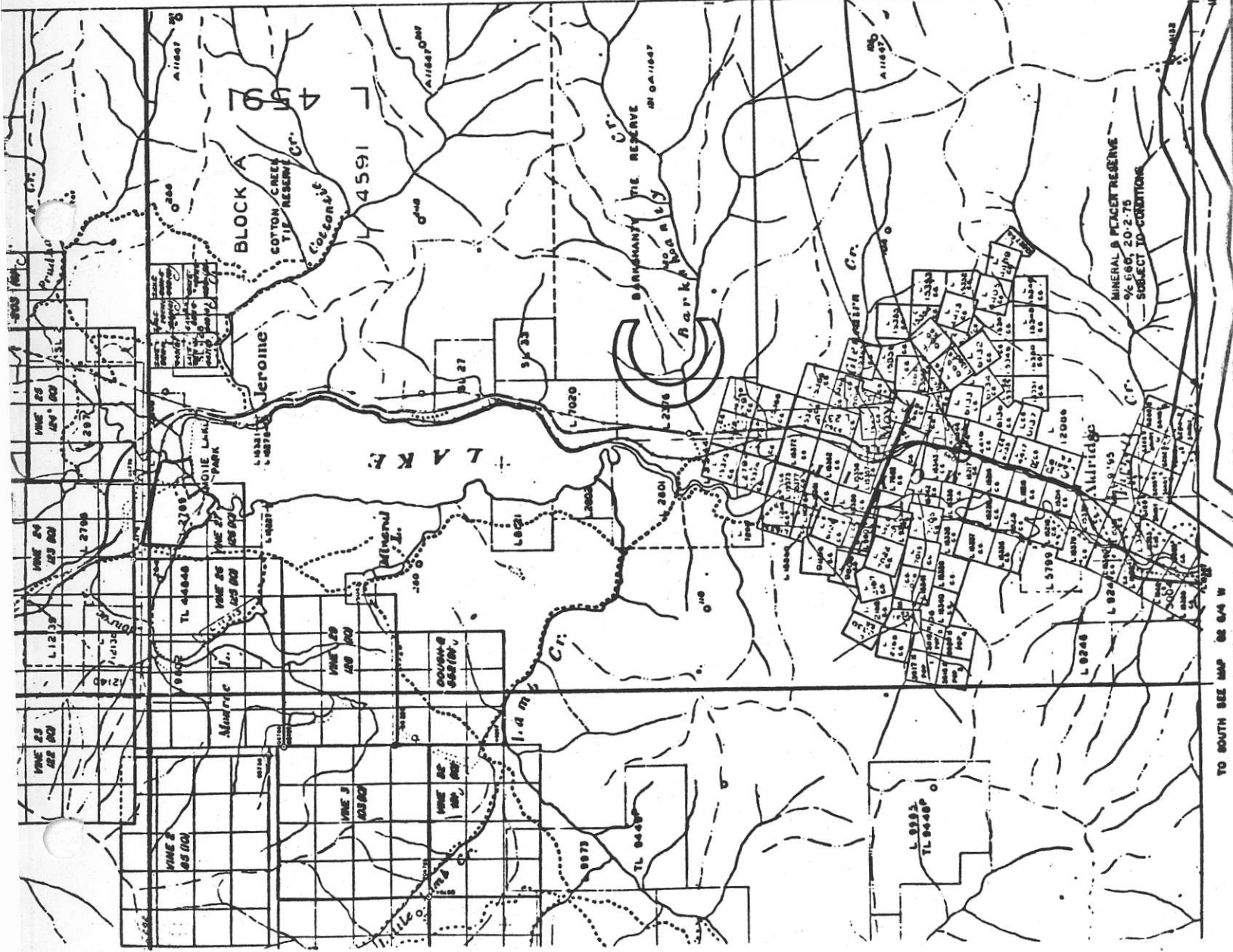


UNLESS VERIFIED OR SURVEYED, THE MAP POSITION OF A LEGAL CORNER POST IS BASED ON THE LOCATOR'S SKETCH. FOR FURTHER INFORMATION, APPLY TO THE OFFICE OF THE MINING DIVISION CONCERNED.

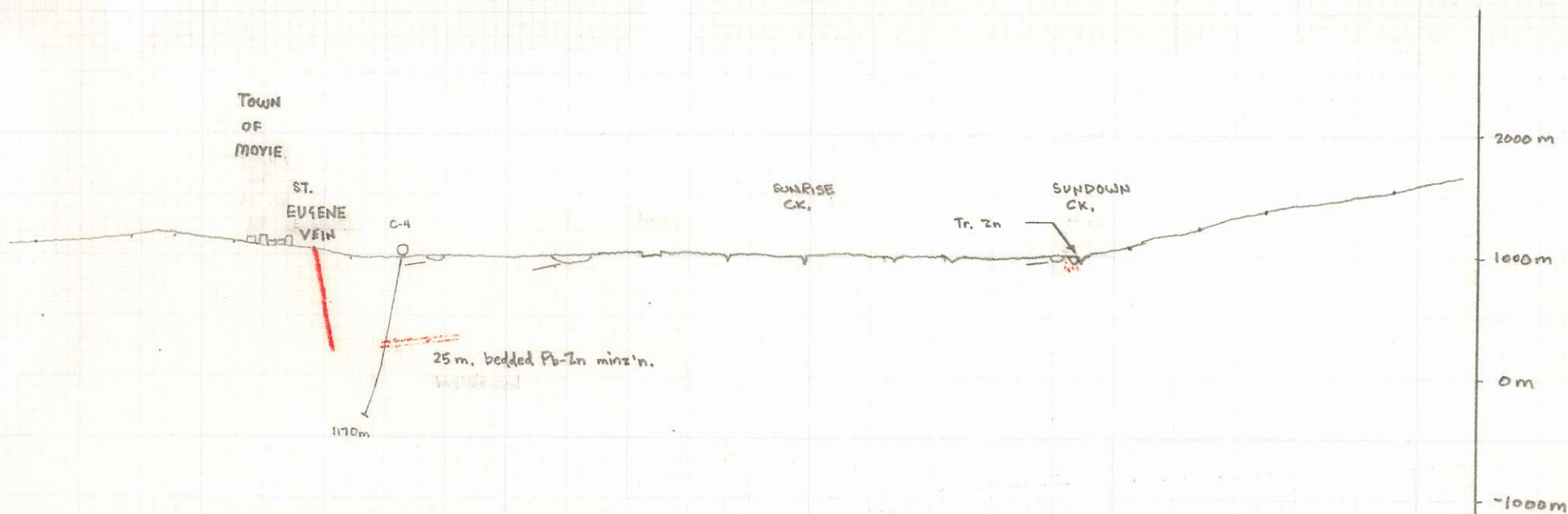
DATE OF MICROFILM: 81/82/19

79 EAST SEE MAP 82 G 5 E

49° 15' N



TO SOUTH SEE MAP 82 G 4 W



SECTION 020°
LOOKING WEST

ST. Eugene Mine - Sundown Ck:

1:50,000
CB March/92